Grace Construction Products

Grace Air Barrier Systems

Contractor's Handbook

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PERM-A-BARRIER® • FLORPRUFE®

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November 2010

GRACE

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What is an Air Barrier?

Air barriers are a system of products, components and details that, when properly installed, prevent or limit the leakage or transport of air and air infiltration into and out of the building envelope. An effective air barrier must:

- Be fully bonded and fully adhered to the substrate to transfer positive and negative wind or air pressure loads to the substrate
- Provide continuous coverage across varying substrates to assure uninterrupted air barrier protection
- Feature integrated details across the entire building envelope
- Deliver waterproof performance to assure long term durability
- Offer flexibility in design for varying wall configurations and climatic conditions

With the growing understanding of air barriers as part of the full building envelope design, the construction products industry has responded with two major categories of air barriers; vapor impermeable air barriers and vapor permeable air barriers.

Vapor Impermeable (Air and Vapor Barrier)
Vapor impermeable air barriers prevent the passage of air and water vapor. Grace manufactures the following vapor impermeable air barriers:

- Perm-A-Barrier Liquid (Fluid Applied)
- Perm-A-Barrier Wall Membrane (Self-Adhered Sheet)

Vapor Permeable (Breathable)
Vapor permeable air barriers prevent the passage of air but allow for the passage of water vapor. Grace manufactures the following vapor permeable air barrier:

- Perm-A-Barrier VP (Fluid Applied)
- Perm-A-Barrier VPS (Self-Adhered Sheet)

Determining whether to use a vapor impermeable air barrier or a vapor permeable air barrier is dependent on a number of key factors including but not limited to:

- Climate – where the wall is located and the surrounding climatic conditions.
- Wall design – where the air barrier and the insulation layer are located in relation to each other in the wall and the amount of insulation within that wall.

For assistance with selecting the appropriate air barrier for specific application requirements, consult with a building science professional or contact a local Grace representative.

Why Use Air Barriers?

The problems associated with uncontrolled air leakage through the building envelope are becoming more and more established. As building designs continue to advance, and as the costs of energy continue to escalate, air barrier systems are becoming an integral part of the overall building envelope design.

A properly designed and installed continuous air barrier system provides:

Increased Energy Efficiency — Uncontrolled air leakage through a building envelope plays a significant role in temperature fluctuation of a conditioned interior space. Air barriers minimize temperature fluctuation of conditioned interior spaces by preventing or reducing uncontrolled leakage of the conditioned air, resulting in a dramatic savings in energy costs. The energy savings can reach up to 39% according to a third party industry study published by NIST (1) (National Institute of Standards and Technology).

Extended Building Durability — Uncontrolled air leakage passing through the building envelope carries with it significant quantities of moisture. Left to condense into liquid water within the wall cavity, the moisture transported in the air can corrode and degrade steel studs and other building components resulting in long-term durability issues. Air barriers applied to the building envelope prevent this migration of moisture-laden air through the building envelope.

Improved Indoor Air Quality — Moisture, coupled with mold spores and organic food sources may lead to organic (mold) growth resulting in indoor air quality issues. Air barriers applied to the building envelope prevent this migration of moisture-laden air through the building envelope.

Vertical Wall Waterproofing — Rain and other forms of precipitation deposit water onto a building exterior and can migrate through the building envelope. An air barrier that provides the primary drainage plane and waterproofing in an appropriate position within the building envelope can shed this water to minimize building problems.

(1)NIST Report – NISTIR 7238, 48, June 2005

PROJECT POINTERS

Design, application and quality products are the key to a successful air barrier project. Familiarizing yourself with the various air barrier options, accessory products and application techniques will help to assure a successful project. These instructions and tips are intended to help you get the most out of a working day.

• Safety First

Air barrier products must be handled properly. Vapors from solvent-based primers and mastic are harmful and flammable. Special consideration should be given to spray applied materials and the spraying process. For these products and processes, the best available information on safe handling, storage, personal protection, health and environmental considerations has been gathered. Material Safety Data Sheets (MSDS) are available at www.graceconstruction.com and users should acquaint themselves with this information. Carefully read detailed precaution statements on product labels and the MSDS before use. Check site conditions to ensure that all working areas are safe and free of hazardous conditions.

• Applications and Limitations

Avoiding moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air barrier in the wall. For assistance with exterior wall design, consult a building science professional or a Grace representative.

Air Barrier systems may be used in various applications including:

- Curtain Wall Systems
- Cavity Wall Systems (i.e. Steel stud backup wall with masonry or pre-cast veneer)
- EIFS Systems
- Metal Veneer Systems
- Above grade walls including CMU, concrete, plywood, OSB, and fiberglass faced gypsum board

There are several product limitations that the reader should know:

1. Air Barriers should not be permanently exposed to sunlight.
2. Perm-A-Barrier® is not intended for below grade waterproofing applications. Refer to Bituthene, Procor and Preprufe water-proofing systems.
3. Air Barrier membranes should always be applied to properly prepared substrates; never directly to insulation or lightweight fills.
4. Perm-A-Barrier® is not intended to be used in negative side applications in which it will be exposed to interior living space.
5. Bituthene Mastic is not recommended for use with PAB Liquid and PAB VP applications. Bituthene Liquid Membrane is approved for use with PAB Liquid and PAB VP applications.

6. Grace Air Barriers should not be used in applications where in-service temperatures will exceed the following:

– Perm-A-Barrier Liquid 160°F (71°C).
– Perm-A-Barrier Wall Membrane 160°F (71°C).
– Perm-A-Barrier High Temperature Wall Membrane 180°F (82°C).
– Perm-A-Barrier Wall Flashing 160°F (71°C).
– Perm-A-Barrier Detail Membrane 160°F (71°C).
– Perm-A-Barrier Aluminum Flashing 160 F (71 C).
– Perm-A-Barrier VP 175°F (80°C).
– Perm-A-Barrier VPS 150 F (65 C).

• Tools You Should Have

– Utility knives
– Chalk line
– Caulking gun and trowels
– Broom
– Membrane roller
– Roller or brush for primer
– Cleaning rags and fluid (mineral spirits)
– Mixer with flat paddle blades for mixing Bituthene Liquid Membrane
– Mixer with spiral blade for mixing Perm-A-Barrier Liquid
– Cutting board

• Equipment

– Use only Grace qualified spray equipment systems for Perm-A-Barrier Liquid and Perm-A-Barrier VP applications. For equipment details contact your local Grace representative.

• Storage of Materials

– Select a safe, secure site.
– Unload material for each day's use in a location that won't require movement a second time.
– Keep material covered until use.
– Do not store materials at extreme hot or extreme cold temperatures.

SUMMARY

No two jobs are the same. Conditions will vary from job to job. Time spent on planning, communication and training will likely result in a better job and a bigger profit. Your Grace representative can assist you with all phases of your project.

NOTES

Air Barrier Membranes

Products	Description/Usage	Coverage
Perm-A-Barrier® Liquid 75 gallon kit	• Air and vapor barrier • Two component, fluid applied • Use down to 20°F (-7°C) • Cures to fully-bonded elastomeric sheet	• 1875 ft²/kit at 60 mil (1.5 mm) thickness • Coverage rates will be reduced over rough surfaces
Perm-A-Barrier® Wall Membrane 3 ft x 75 ft (0.9 m x 25 m) roll	• Air and vapor barrier • 40 mil (1 mm) self adhered sheet membrane • Use at 40°F (5°C) and above	• 225 ft² (20.9 m²)/roll • Deduct up to 10% for overlaps and waste
Perm-A-Barrier® Low Temperature Wall Membrane 3 ft x 75 ft (0.9 m x 25 m) roll	• Air and vapor barrier • 40 mil (1 mm) self adhered sheet membrane • Use between 25°F (-4°C) and 60°F (16°C)	• 225 ft² (20.9 m²)/roll • Deduct up to 10% for overlaps and waste
Perm-A-Barrier® High Temperature Wall Membrane 3 ft x 75 ft (0.9 m x 25 m) roll	• Air and vapor barrier • 40 mil (1 mm) self adhered sheet membrane • For use at in-service temperatures up to 180°F (82°C)	• 225 ft² (20.9 m²)/roll • Deduct up to 10% for overlaps and waste
Perm-A-Barrier® Wall Flashing 75 Linear ft 12, 18, 24, and 36 in (305, 457, 610, and 914 mm) widths	• Through Wall Flashing • 40 mil (1 mm) self adhered sheet membrane • Use above 25°F (-4°C)	• 75 linear ft/roll • Deduct up to 10% for overlaps and waste
Perm-A-Barrier® Detail Membrane 75 Linear ft 6, 9, and 12 in (152, 225, and 305 mm) widths	• Flashing for windows, doors and other critical details • 40 mil (1 mm) self adhered sheet membrane • Use above 25°F (-4°C)	• 75 linear ft/roll • Deduct up to 10% for overlaps and waste
Perm-A-Barrier® Aluminum Finishing 75 Linear ft 6, 9, and 12 in (152, 225, and 305 mm) widths	• Flashing for windows, doors and other detail areas • 40 mil (1 mm) self-adhered sheet membrane • Use above 25°F (-4°C) • Extended UV exposure	• 75 linear ft/roll • Deduct up to 10% for overlaps and waste
Perm-A-Barrier® VP 55 gal drums or 5 gal pails	• Vapor permeable air barrier • Single component, fluid applied, 50% solids • Use above 40°F (5°C) • 11.2 perms	• 980 ft²/55 gal drum at 90 mil wet thickness • Coverage rates will be reduced over rough surfaces
Perm-A-Barrier® VPS 38.4 in x 141 ft (0.97 m x 43 m)	• Vapor permeable air barrier • 21 mil (0.5 mm) self-adhered sheet membrane • Use at 40°F (5°C) and above	• 450 ft² (41.8 m²)/roll • Deduct up to 10% for overlaps and waste
Florprufe® 120 4 ft x 115 ft (1.2 m x 35 m)	• Integrally bonded vapor barrier • Horizontal sub-slab applications • Use above 25°F (-4°C) • Not intended for hydrostatic head pressures • Use when concrete is cast directly against membrane	• 460 ft² (42 m²)/roll • Deduct up to 10% for waste

Surface Treatments

Products	Description/Usage	Coverage
Perm-A-Barrier WB Primer 1 gal (3.8 L) jug 5 gal (19 L) pail	• Water based primer • Use on all surfaces with PAB Wall Membrane, PAB Wall Flashing and PAB Detail Membrane • Dry until water has completely evaporated • Apply primer by roller • Use at 25°F (-4°C) and above	• 250-350 ft²/gal (6-8 m²/L) depending on surface roughness
Perm-A-Barrier Primer Plus 5 gal (19 L) pail	• Water based primer • Use on all surfaces with PAB VPS • Apply by roller or airless sprayer	• 450-550 ft²/gal (11-12 m²/L) depending on substrate and or surface roughness
Procor® Concrete Sealer 5 gal (19 L) pail 55 gal (209 L) drum	• Water-based conditioner for cast concrete and masonry substrates • Drying times vary • Use with PAB Liquid membranes • Apply by roller or airless sprayer	• 100-250 ft²/gal (2.5-6 m²/L) depending on surface roughness
Bituthene® B2 Primer 5 gal (19 L) pail	• Solvent-based primer for concrete, masonry, or wood • Use on all surfaces with PAB Wall Membrane, PAB Wall Flashing and PAB Detail Membrane • Green and damp concrete tolerant • Dry one hour or until tack-free • Apply by roller or brush at 25°F (-4°C) and above	• 250-350 ft²/gal (6-8 m²/L)
Bituthene® B2 LVC Primer 5 gal (19 L) pail	• Solvent-based primer for concrete, masonry, or wood • Use on all surfaces with PAB Wall Membrane, PAB Wall Flashing and PAB Detail Membrane • Green and damp concrete tolerant • Dry one hour or until tack-free • Low VOC (< 200g/L) • Apply by roller or brush at 25°F (-4°C) and above	• 325-425 ft²/gal (8-10.5 m²/L)

Details, Terminations, Repairs

Bituthene® Liquid Membrane 1.5 gal (6 L) kit 4 gal (15 L) kit	• Two component, trowel grade, asphalt modified urethane • Use for substrate repair, sealing patches, terminations, brick ties, etc. • Use at 25°F (-4°C) and above	• 17 ft²/gal (0.4 m²/L) at 90 mils (2.5 mm) thickness • Coverage rates will be reduced over rough surfaces
Bituthene® Mastic 30 oz (0.9 L) tubes 5 gal (19 L) pail	• Use for sealing patches, terminations, brick ties, etc. • Apply at 25°F (-4°C) and above • Do not apply under membrane unless fully cured	• 65 linear ft (20 m)/tube 0.25 x 0.25 in. bead (6 mm x 6 mm) • 100 linear ft (30 m)/gal 1 in. (25 mm) wide troweling

Application Instructions

For complete application instructions refer to the technical data sheet for PAB Liquid found at www.graceconstruction.com

1. Prepare substrate

- All surfaces must be sound and free from spalled areas, loose aggregate, loose nails or screws, sharp protrusions or other matter.
- Cementitious surfaces must be wood float or shutter finish and free from frost, dirt, grease, oil, or other contaminants.
- Surface irregularities and voids greater than 0.5 in (13 mm) in depth should be pretreated with Bituthene Liquid Membrane or with a concrete mix or grout.
- It may be necessary to apply Procor Concrete Sealer or a scratch coat of PAB Liquid to highly porous or dusty substrates.
- CMU surfaces should be smooth and free from projections. Strike all mortar joints full and flush and fill all voids and holes with a lean mortar mix or non-shrinking grout.
- Avoid deflection at exterior sheathing panel (OSB, plywood, glass faced wall board) joints; fasten corners and edges with appropriate screws as per manufacturer's recommendations. Tape the board butt joints with either 2 in (50 mm) wide reinforced or mesh-style wallboard tape (i.e. FibaTape® brand products).
- Gaps greater than ¼ in. (6 mm) should be filled with a compatible sealant, allowing sufficient time for the sealant to fully cure before application of the tape and Perm-A-Barrier Liquid. Refer to Technical Letter # 5 for compatible sealants and caulks.
- Refer to Technical letter # 6 "Substrate Preparation for Perm-A-Barrier Liquid Applications" for greater detail.

2. Application to "Green" or Damp Concrete Substrates

- PAB Liquid may be applied to "green" concrete or over surfaces that are damp to the touch.
- It may be necessary to apply Procor Concrete Sealer or a scratch coat of PAB Liquid to "green" or damp concrete substrates.
- Remove any visible water prior to application.
- Do not apply PAB Liquid in wet weather.
- Once applied, light rain showers will not affect the membrane.

3. Application Temperature

- It is possible to work at temperatures below 40°F (4°C) provided there is no frost or condensation on the substrate.
- The minimum temperature for spray application is 20°F (-7°C).
- Refer to Technical Letters # 9 and # 10 for spraying PAB Liquid at high and low temperatures, or contact your Grace Construction Products representative for details.

4. Detailing

- Detailing should be completed prior to applying the full coverage of PAB Liquid.
- The continuous field application should completely cover the detail areas to provide double thickness coverage.
- Transitions to beams, columns, window and door frames, etc. should be made with a strip of PAB Detail Membrane or PAB Wall Flashing.

- Optimum adhesion will be achieved when the tape is lapped onto the cured PAB Liquid. Refer to technical letter # 11 for further information.
- Gaps around penetrations should be caulked with a compatible sealant. Consult technical letter # 5 for further information.

5. Thickness Control

- Marking the area and spot-checking the thickness with a wet film thickness gauge control thickness.
- Swipe marks on the PAB Liquid membrane are acceptable as long as the minimum thickness is maintained.
- It is also possible that excessive exotherming (heat build-up) could occur on the substrate if PAB Liquid is applied too thickly in a single application.

6. Visual Work Inspection

- Review all work.
- Damaged PAB Liquid should be repaired by cutting away the affected area to solid, fully adhered membrane. The exposed area should then be patched with PAB Liquid to give a minimum overlap of 6 in (150 mm) onto the existing PAB Liquid.
- Where the surrounding area of damaged PAB is contaminated with dirt or is more than seven days old, it should be pressure washed or lightly abraded with a wire brush, course sanding disc or similar method to ensure good adhesion.

7. Application of Insulation and Finishes

- PAB Liquid is not suitable for permanent exposure and should be protected from the effects of sunlight.
- Insulation boards may be bonded to the PAB Liquid by pressing them into place after the PAB Liquid has set enough to hold their weight but is still tacky.
- Insulation clips are recommended for long-term attachment.
- If the insulation cannot be applied within 60 days of application of PAB Liquid, temporary protection should be used to protect the product from the effects of sunlight.

8. Cleaning

- Tools and equipment are most effectively cleaned by allowing the material to cure and simply peeling it off the next day.
- Procor Flushing Oil is available to clean spray equipment.

9. Storage and Handling Information

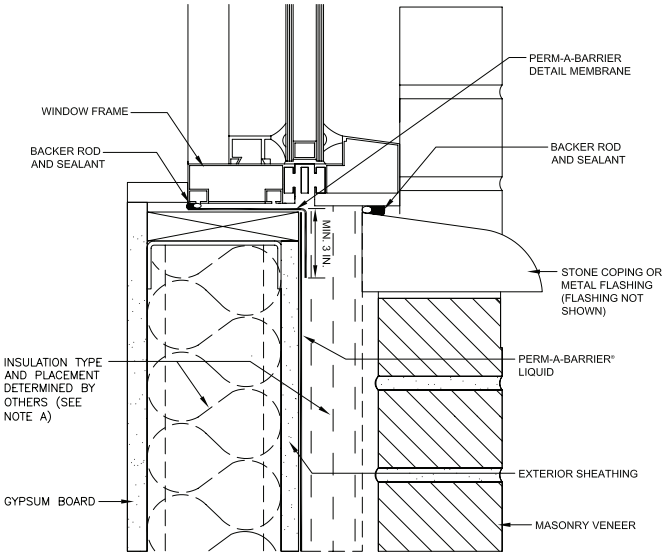
- PAB Liquid containers should be stored under cover in original sealed containers above 40°F (4°C) and below 100°F (38°C).
- Keep Part B from freezing during storage. The shelf life is 9 months in unopened containers.

10. Limitations

- PAB membranes should not be used in areas where they will be permanently exposed to sunlight, weather or traffic.
- Maximum exposure period is 60 days.
- Some asphaltic coatings may not be compatible with PAB Liquid.

■ PLQ-001 – Window Sill

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the vertical surface of the PAB Liquid.
3. Apply PAB Liquid and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

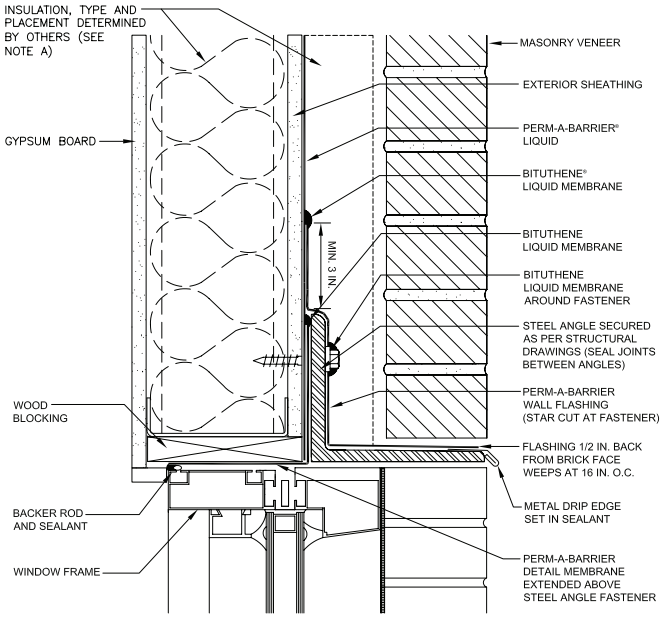
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-002 – Window Head

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending the membrane above the steel angle/fastener; seal termination with Liquid Membrane.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel angle, extending down over the steel angle stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB Liquid, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

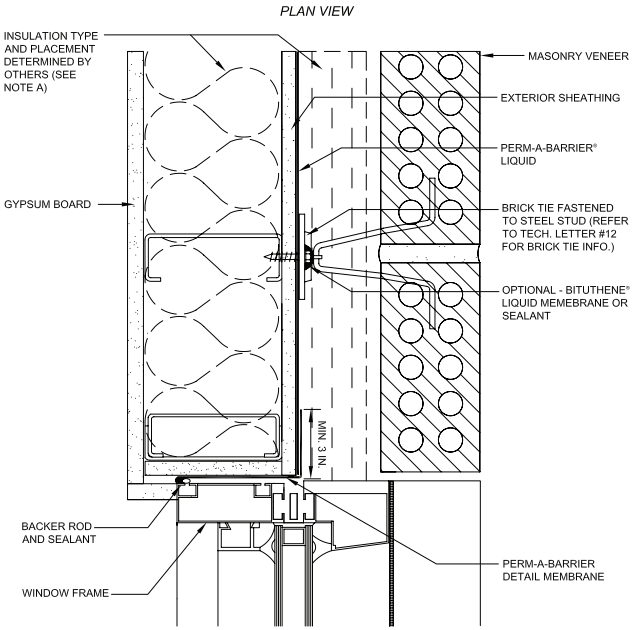
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-003 – Window Jamb

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the PAB Liquid.
3. Optional: Apply Liquid Membrane or sealant at brick tie fastener.
4. Apply PAB Liquid, and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

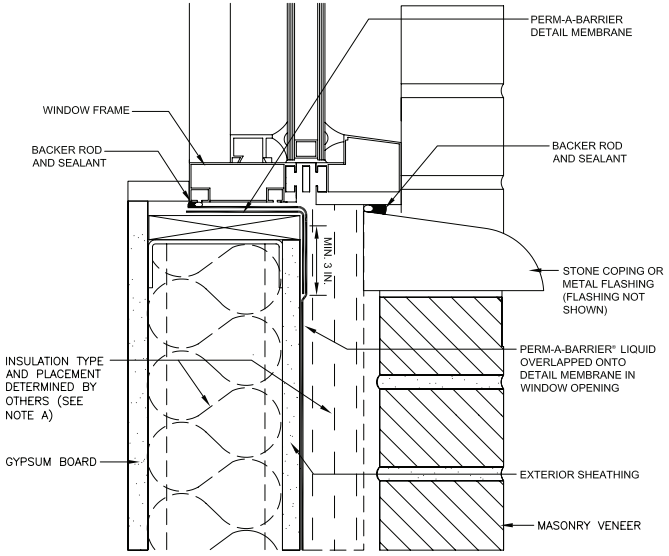
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-004 – Window Sill

(Option B-1)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending down onto the vertical substrate a minimum of 3 in (75 mm).
2. Apply PAB Liquid as shown ensuring a minimum 3 in (75 mm) overlap onto the vertical portion of Detail Membrane, extend onto the horizontal surface covering the Detail Membrane to create a double membrane layer.
3. Apply PAB Liquid and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

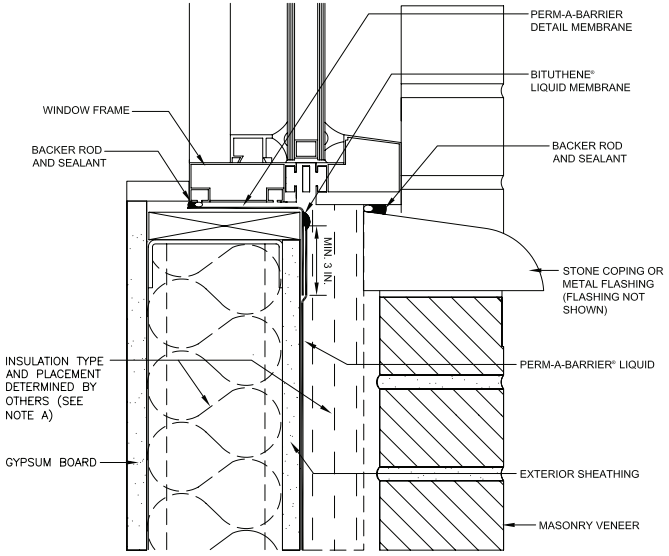
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-005 – Window Sill

(Option B-2)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending down onto the vertical substrate a minimum of 3 in (75 mm).
2. Apply PAB Liquid as shown ensuring a minimum 3 in (75 mm) overlap onto the vertical portion of Detail Membrane.
3. Seal PAB Liquid termination with Liquid Membrane.
4. Apply PAB Liquid and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

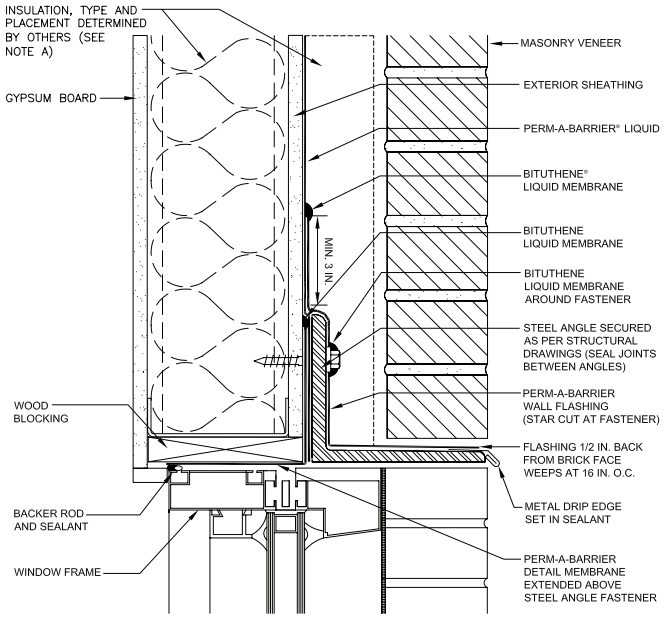
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-006 – Window Head

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending the membrane above the steel angle/fastener; seal termination with Liquid Membrane.
2. Apply PAB Liquid onto substrate overlapping the PAB Detail Membrane.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel angle, extending down over the steel angle stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB Liquid, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

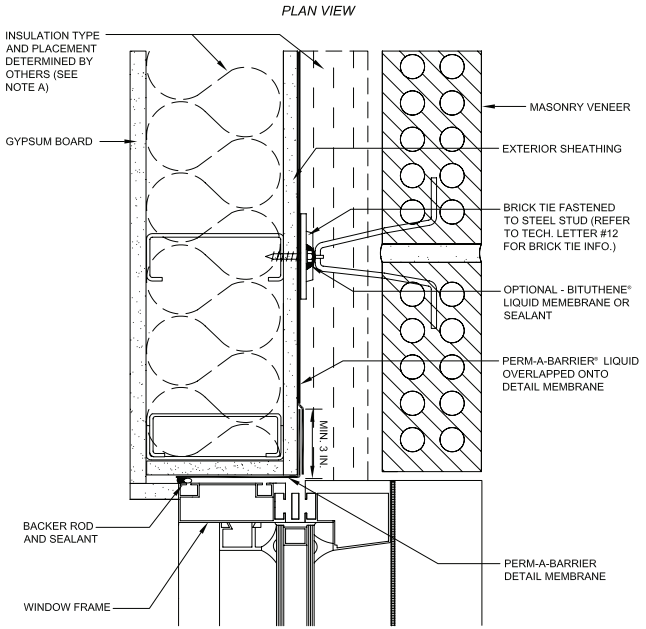
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-007 – Window Jamb

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the exterior sheathing.
2. Apply PAB Liquid onto substrate overlapping the PAB Detail Membrane by a minimum of 3 in (75 mm).
3. Optional: Apply Liquid Membrane or sealant at brick tie fastener.
4. Apply PAB Liquid and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

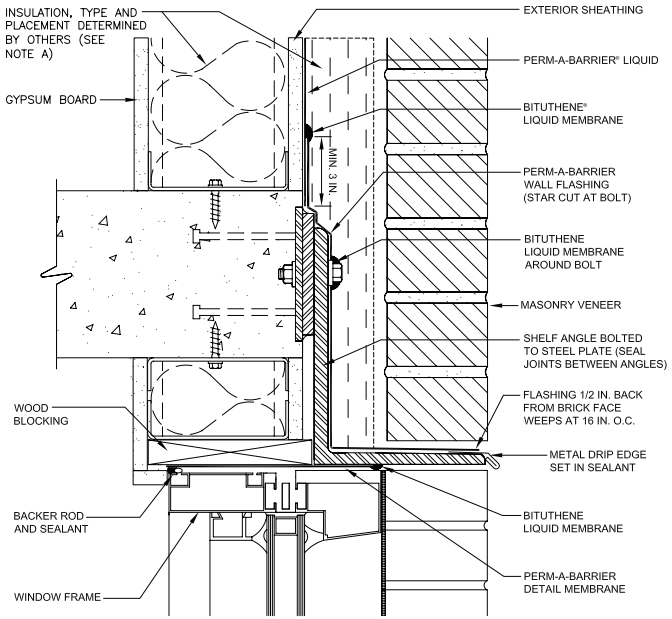
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-008 – Window Head at Floor

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown, sealing termination against the steel angle with Liquid Membrane.
2. Apply PAB Liquid onto substrate in accordance with the data sheet section on installation.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB Liquid, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

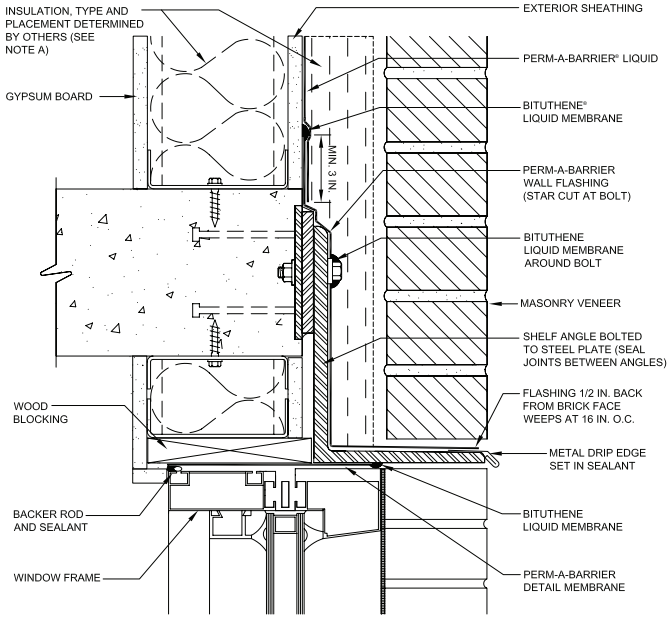
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-009 – Window Head at Floor

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown, sealing termination against the steel angle with Liquid Membrane.
2. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
3. Seal PAB Wall Flashing terminations with Liquid Membrane.
4. Apply PAB Liquid onto substrate overlapping the PAB Wall Flashing a minimum of 3 in (75 mm).
5. Apply PAB Liquid, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

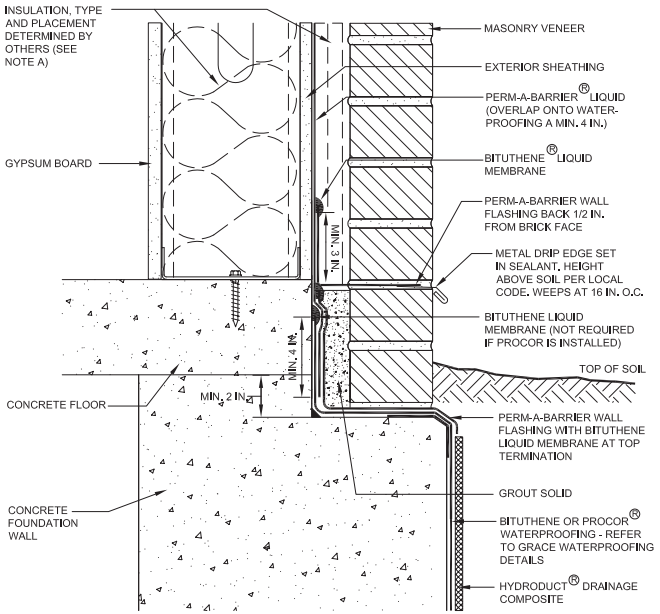
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-010 – Foundation

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Install a 0.75 in (20 mm) fillet of Liquid Membrane in corner extending 2.5 (65 mm) onto the vertical and horizontal portion of brick shelf.
2. Extend Bituthene® or Procor® from the foundation onto the horizontal brick shelf and vertically up the foundation and or concrete slab a minimum of 6 in (150 mm). If Bituthene is used the termination must be sealed with Liquid Membrane.
3. Apply PAB Liquid onto substrate overlapping the foundation waterproofing a minimum of 4 in (100 mm).
4. Apply PAB Wall Flashing from the top of the cavity to be grouted extending over the brick shelf and onto the vertical face of the below grade wall, seal the PAB Wall Flashing top termination with Liquid Membrane.
5. Apply Hydroduct Drainage Composite according to Hydroduct data sheet.
6. Grout space below weeps as shown.
7. Apply PAB Wall Flashing overlapping the PAB Liquid by a minimum of 3 in (75 mm) on the vertical surface and extending through the wall and stopping the 0.5 in (13 mm) from the brick face. Seal PAB Wall Flashing terminations with Liquid Membrane.
8. Apply PAB Liquid, Wall Flashing, Bituthene, Procor and Hydroduct according to the installation instructions found on the appropriate data sheets.

Special Notes

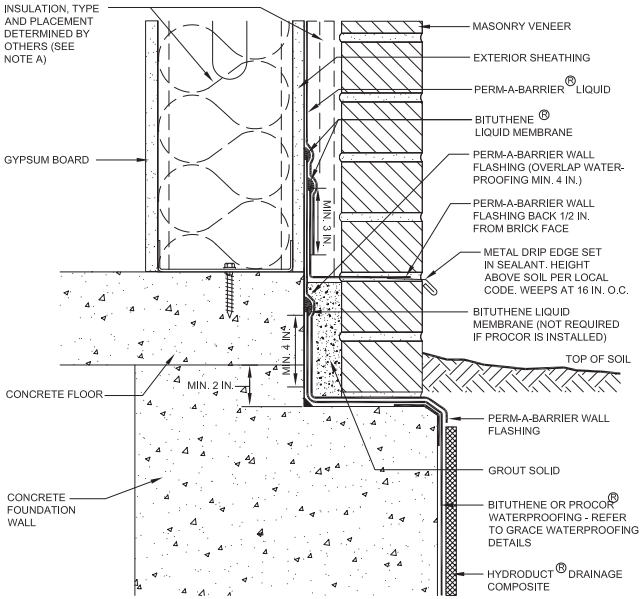
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-011 – Foundation

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Install a 0.75 in (20 mm) fillet of Liquid Membrane in corner extending 2.5 in (65 mm) onto the vertical and horizontal portion of brick shelf.
2. Extend Bituthene® or Procor® from the foundation onto the horizontal brick shelf and vertically up the foundation and or concrete slab a minimum of 6 in (150 mm). If Bituthene is used the termination must be sealed with Liquid Membrane.
3. Apply PAB Wall Flashing as shown onto substrate overlapping the foundation waterproofing a minimum of 4 in (100 mm) and extend over the brick shelf and onto the vertical face of the below grade wall, seal the PAB Wall Flashing top termination with Liquid Membrane.
4. Apply Hydroduct Drainage Composite according to Hydroduct data sheet.
5. Grout space below weeps as shown.
6. Apply PAB Wall Flashing overlapping the previously installed PAB Wall Flashing by a minimum of 3 in (75 mm) on the vertical surface and extending through the wall and stopping the 0.5 in (13 mm) from the brick face. Seal PAB Wall Flashing terminations with Liquid Membrane.
7. Apply PAB Liquid onto substrate overlapping the PAB Wall Flashing a minimum of 3 in (75 mm).
8. Apply PAB Liquid, Wall Flashing, Bituthene, Procor and Hydroduct according to the installation instructions found on the appropriate data sheets.

Special Notes

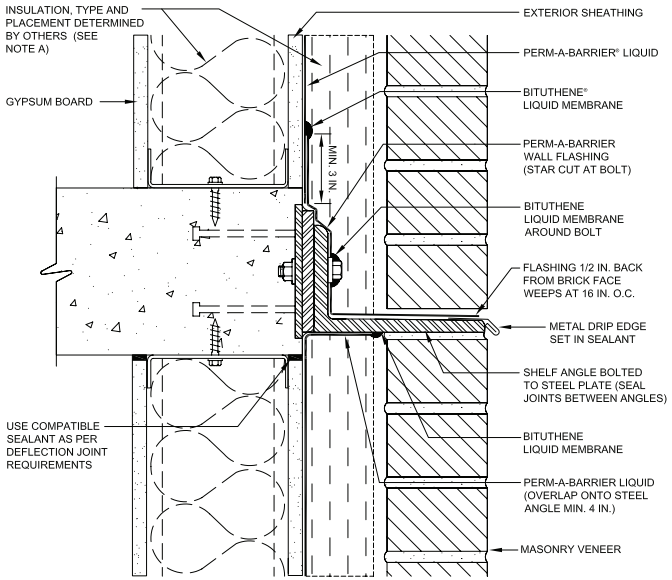
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-012 – Shelf Angle

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate below steel angle overlapping onto the steel angle by a minimum of 4 in (100 mm). Seal termination with Liquid Membrane.
2. Apply PAB Liquid onto substrate above steel angle as shown.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB Liquid and Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

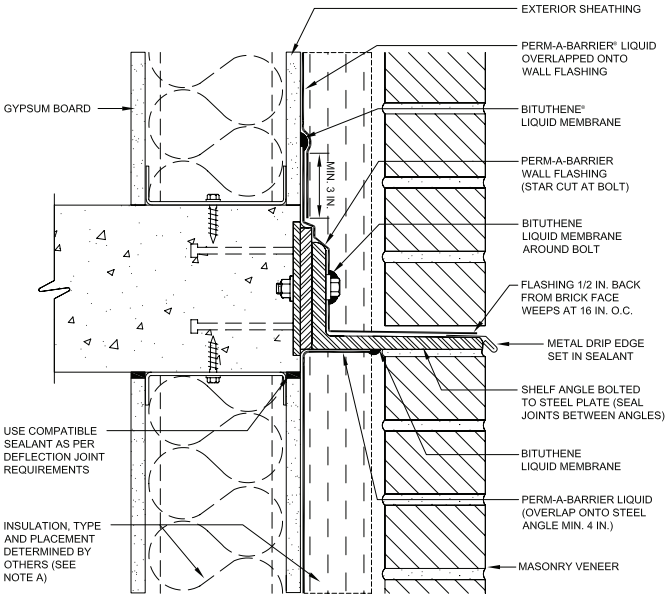
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-013 – Shelf Angle

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate below steel angle overlapping onto the steel angle by a minimum of 4 in (100 mm). Seal termination with Liquid Membrane.
2. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
3. Seal PAB Wall Flashing terminations with Liquid Membrane.
4. Apply PAB Liquid onto substrate overlapping the vertical portion of PAB Wall Flashing by a minimum of 3 in (75 mm).
5. Apply PAB Liquid and Wall Flashing according to the installation instructions found on the appropriate data sheets.

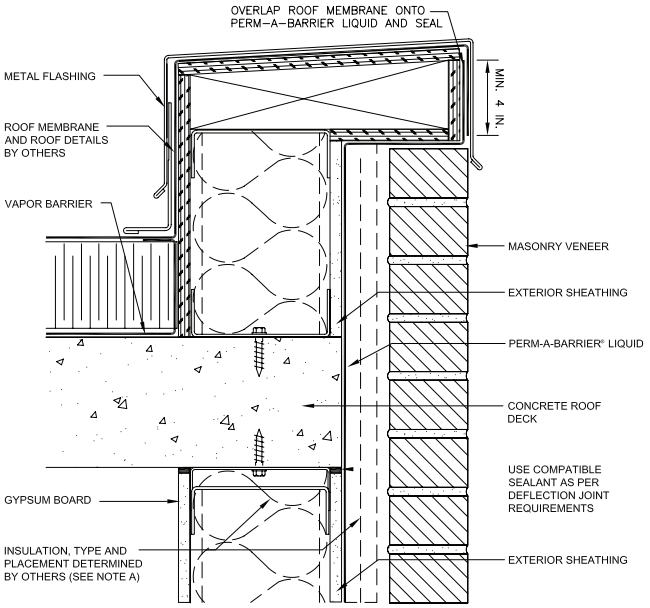
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-014 – Parapet



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate in accordance with the data sheet section on installation.
2. Roofing membrane (by others) should overlap PAB Liquid by a minimum of 4 in (100 mm).
3. Apply PAB Liquid according to the installation instructions found on the appropriate data sheets.

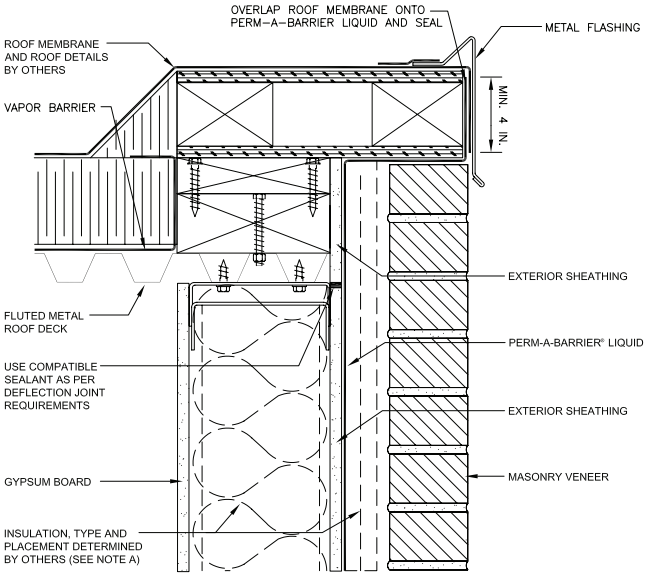
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-015 – Roof Edge



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate in accordance with the data sheet section on installation.
2. Roofing membrane (by others) should overlap PAB Liquid by a minimum of 4 in (100 mm).
3. Apply PAB Liquid according to the installation instructions found on the appropriate data sheets.

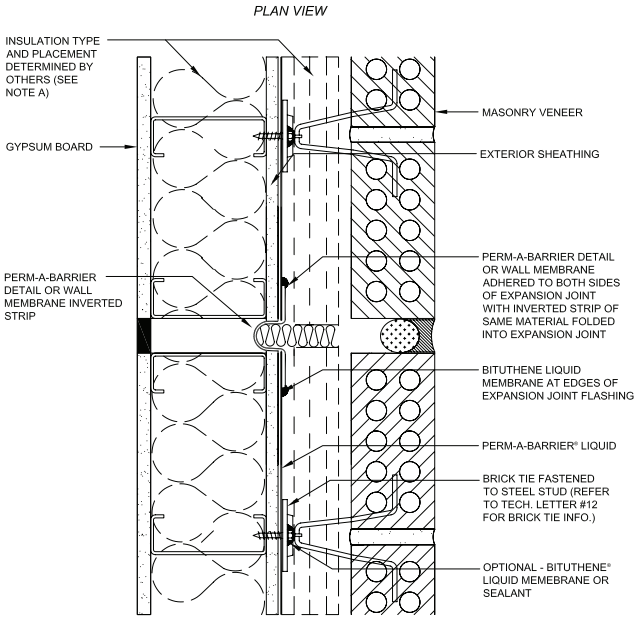
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-016 – Expansion Joint



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate as shown in accordance with the data sheet section on installation.
2. Apply PAB Wall or Detail Membrane so that it is adhered to both sides of the expansion joint with an inverted strip of same material folded into the expansion joint as shown.
3. Seal the edges of the expansion joint flashing with Liquid Membrane.
4. Optional: Apply Liquid Membrane or sealant at brick tie fastener.
5. Apply PAB Liquid and Detail Membrane according to the installation instructions found on the appropriate data sheets.

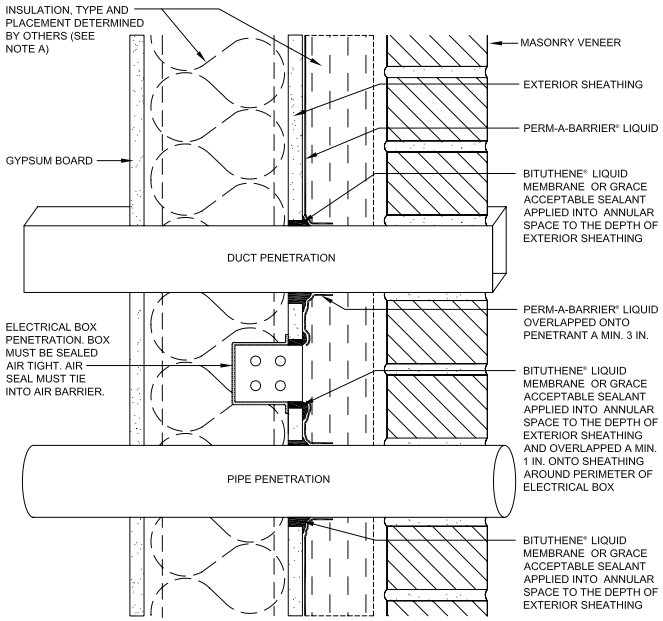
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-017 – Penetration



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply Liquid Membrane or Grace acceptable sealant into the annular space to the depth of the exterior sheathing and overlap 1 in (25 mm) onto sheathing around perimeter of penetration.
2. Apply PAB Liquid as shown overlapping onto penetration a minimum of 3 in (75 mm) if applicable.
3. Apply PAB Liquid according to the installation instructions found on the appropriate data sheets.

Special Notes

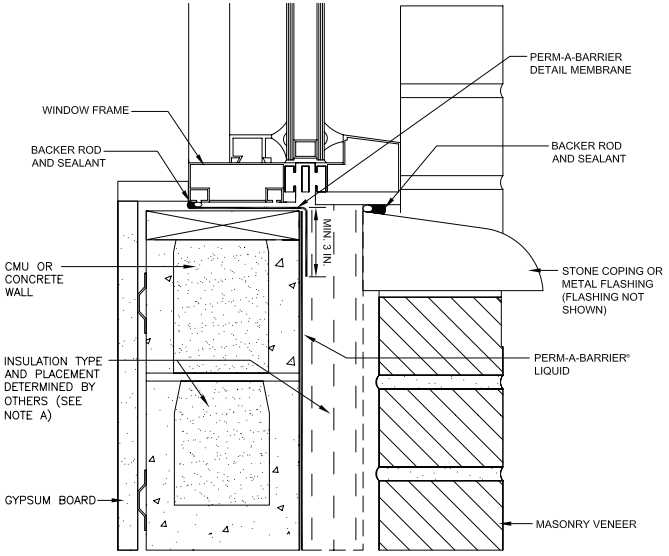
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-101 – Window Sill

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the vertical surface of the PAB Liquid.
3. Apply PAB Liquid and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

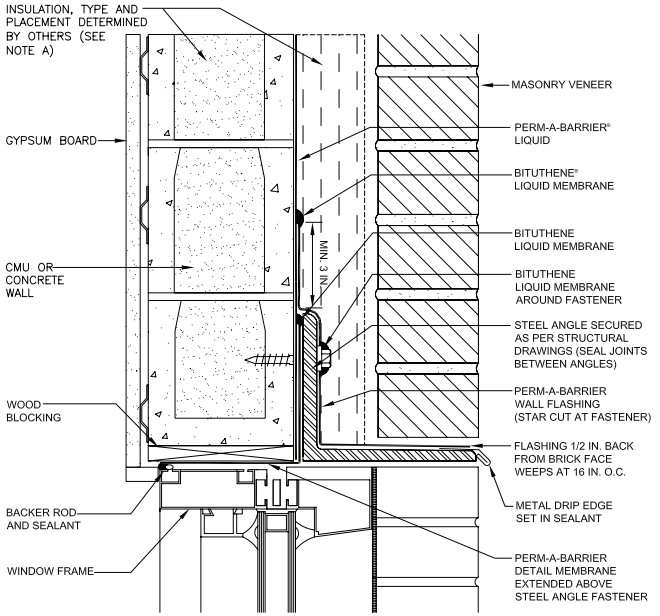
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-102 – Window Head

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending the membrane above the steel angle/fastener; seal termination with Liquid Membrane.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel angle, extending down over the steel angle stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB Liquid, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

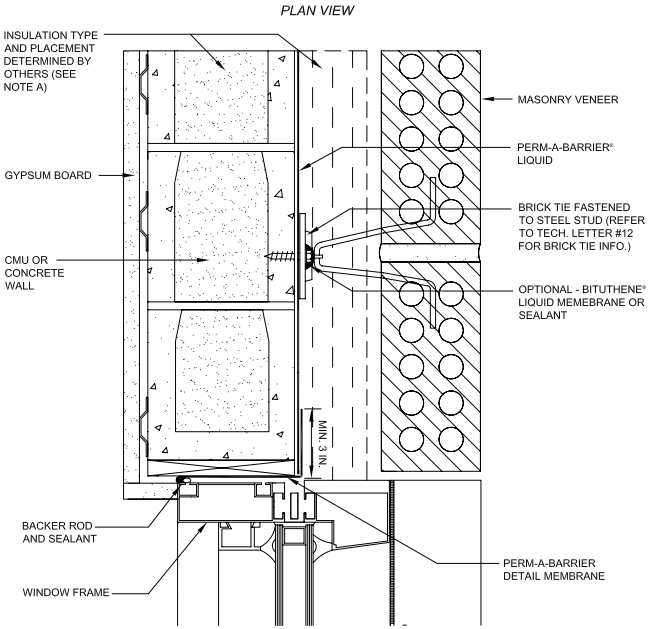
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-103 – Window Jamb

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the PAB Liquid.
3. Optional: Apply Liquid Membrane or sealant at brick tie fastener.
4. Apply PAB Liquid, and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

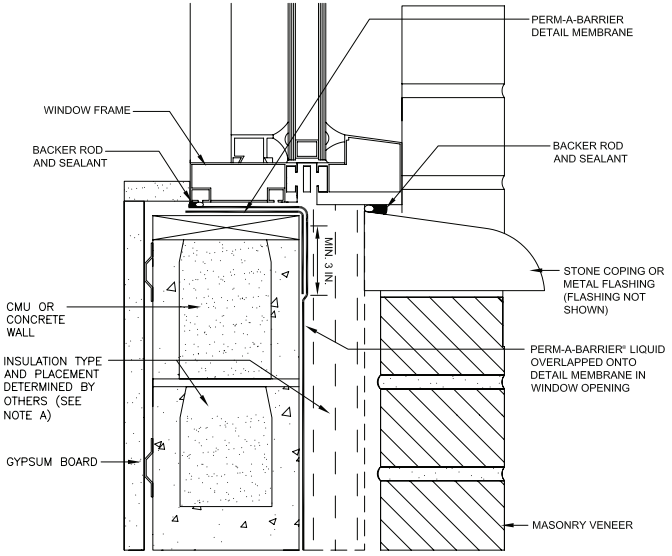
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-104 – Window Sill

(Option B-1)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending down onto the vertical substrate a minimum of 3 in (75 mm).
2. Apply PAB Liquid as shown ensuring a minimum 3 in (75 mm) overlap onto the vertical portion of Detail Membrane, extend onto the horizontal surface covering the Detail Membrane to create a double membrane layer.
3. Apply PAB Liquid and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

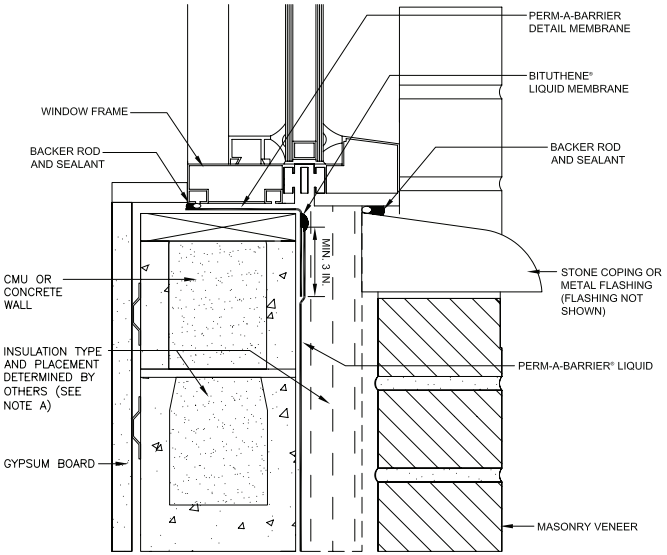
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-105 – Window Sill

(Option B-2)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending down onto the vertical substrate a minimum of 3 in (75 mm).
2. Apply PAB Liquid as shown ensuring a minimum 3 in (75 mm) overlap onto the vertical portion of Detail Membrane.
3. Seal PAB Liquid termination with Liquid Membrane.
4. Apply PAB Liquid and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

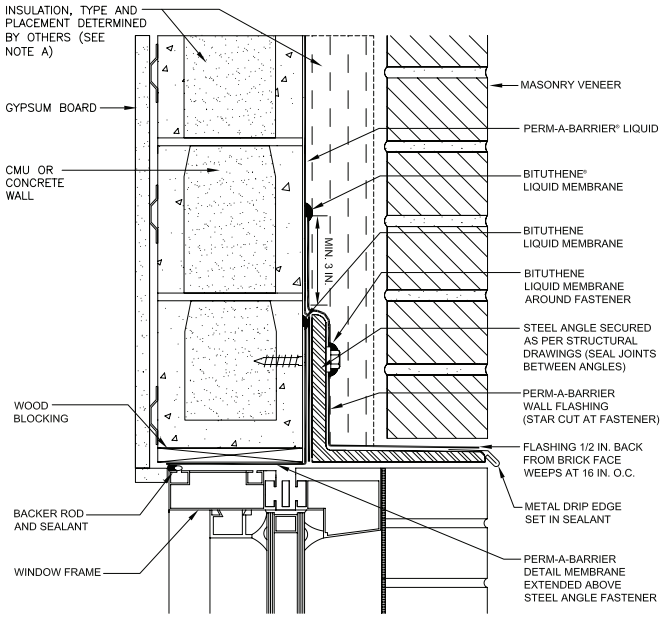
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-106 – Window Head

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending the membrane above the steel angle/fastener; seal termination with Liquid Membrane.
2. Apply PAB Liquid onto substrate overlapping the PAB Detail Membrane.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel angle, extending down over the steel angle stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB Liquid, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

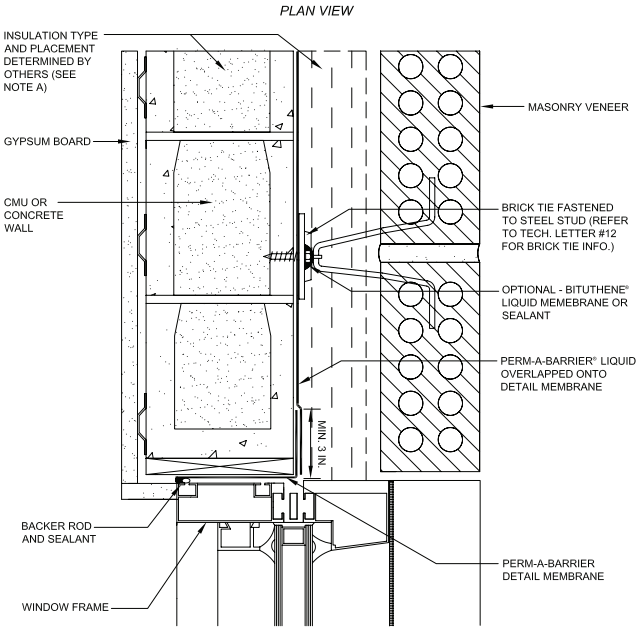
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-107 – Window Jamb

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the exterior face of the CMU or concrete wall.
2. Apply PAB Liquid onto substrate overlapping the PAB Detail Membrane by a minimum of 3 in (75 mm).
3. Optional: Apply Liquid Membrane or sealant at brick tie fastener.
4. Apply PAB Liquid and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

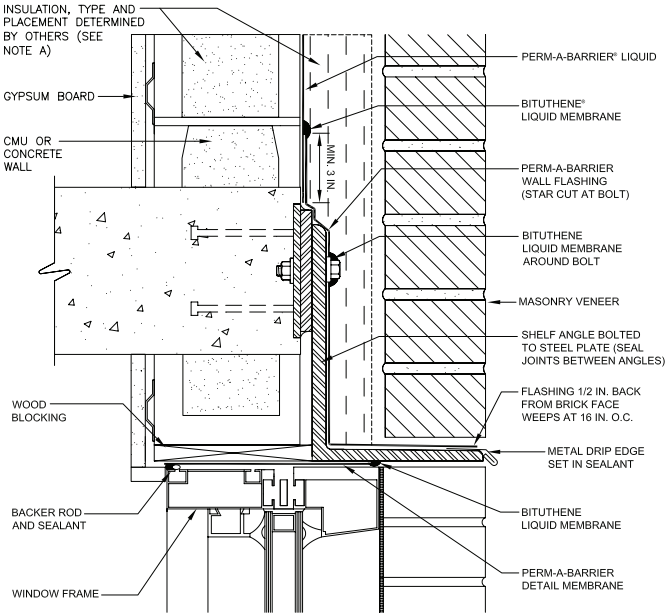
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-108 – Window Head at Floor

(Option A)



Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown, sealing termination against the steel angle with Liquid Membrane.
2. Apply PAB Liquid onto substrate in accordance with the data sheet section on installation.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB Liquid, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

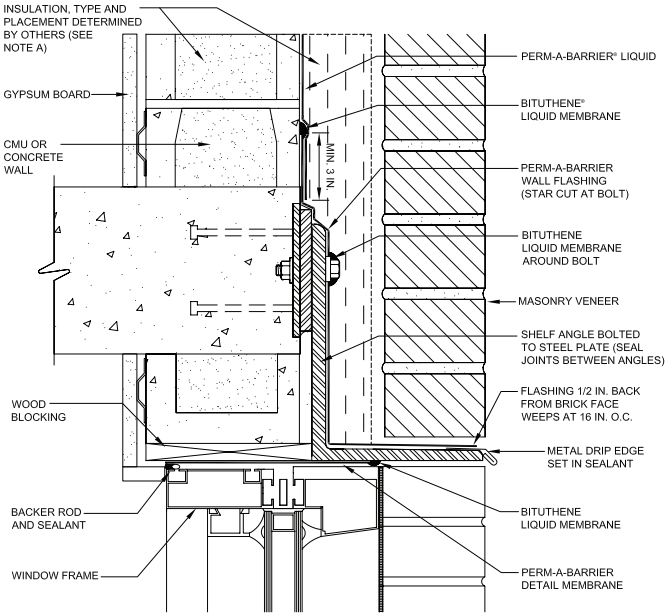
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-109 – Window Head at Floor

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown, sealing termination against the steel angle with Liquid Membrane.
2. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
3. Seal PAB Wall Flashing terminations with Liquid Membrane.
4. Apply PAB Liquid onto substrate overlapping the PAB Wall Flashing a minimum of 3 in (75 mm).
5. Apply PAB Liquid, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

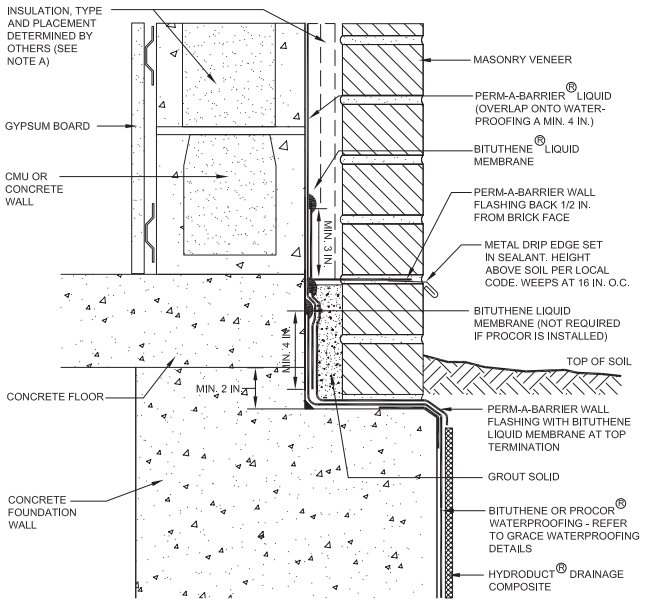
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-110 – Foundation

(Option A)



Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Install a 0.75 in (20 mm) fillet of Liquid Membrane in corner extending 2.5 (65 mm) onto the vertical and horizontal portion of brick shelf./
2. Extend Bituthene® or Procor® from the foundation onto the horizontal brick shelf and vertically up the foundation and or concrete slab a minimum of 6 in (150 mm). If Bituthene is used the termination must be sealed with Liquid Membrane.
3. Apply PAB Liquid onto substrate overlapping the foundation waterproofing a minimum of 4 in (100 mm).
4. Apply PAB Wall Flashing from the top of the cavity to be grouted extending over the brick shelf and onto the vertical face of the below grade wall, seal the PAB Wall Flashing top termination with Liquid Membrane.
5. Apply Hydroduct Drainage Composite according to Hydroduct data sheet.
6. Grout space below weeps as shown.
7. Apply PAB Wall Flashing overlapping the PAB Liquid by a minimum of 3 in (75 mm) on the vertical surface and extending through the wall and stopping the 0.5 in (13 mm) from the brick face. Seal PAB Wall Flashing terminations with Liquid Membrane.
8. Apply PAB Liquid, Wall Flashing, Bituthene, Procor and Hydroduct according to the installation instructions found on the appropriate data sheets.

Special Notes

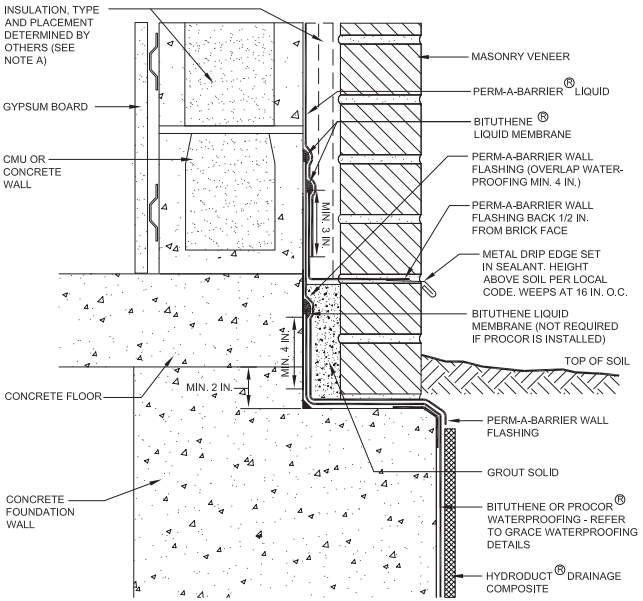
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-111 – Foundation

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Install a 0.75 in (20 mm) fillet of Liquid Membrane in corner extending 2.5 in (65 mm) onto the vertical and horizontal portion of brick shelf.
2. Extend Bituthene® or Procor® from the foundation onto the horizontal brick shelf and vertically up the foundation and or concrete slab a minimum of 6 in (150 mm). If Bituthene is used the termination must be sealed with Liquid Membrane.
3. Apply PAB Wall Flashing as shown onto substrate overlapping the foundation waterproofing a minimum of 4 in (100 mm) and extend over the brick shelf and onto the vertical face of the below grade wall, seal the PAB Wall Flashing top termination with Liquid Membrane.
4. Apply Hydroduct Drainage Composite according to Hydroduct data sheet.
5. Grout space below weeps as shown.
6. Apply PAB Wall Flashing overlapping the previously installed PAB Wall Flashing by a minimum of 3 in (75 mm) on the vertical surface and extending through the wall and stopping the 0.5 in (13 mm) from the brick face. Seal PAB Wall Flashing terminations with Liquid Membrane.
7. Apply PAB Liquid onto substrate overlapping the PAB Wall Flashing a minimum of 3 in (75 mm).
8. Apply PAB Liquid, Wall Flashing, Bituthene, Procor and Hydroduct according to the installation instructions found on the appropriate data sheets.

Special Notes

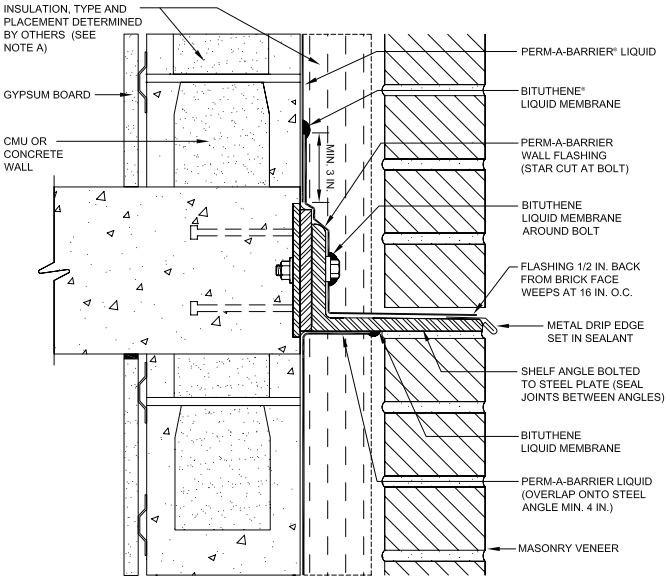
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-112 – Shelf Angle

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate below steel angle overlapping onto the steel angle by a minimum of 4 in (100 mm). Seal termination with Liquid Membrane.
2. Apply PAB Liquid onto substrate above steel angle as shown.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB Liquid and Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

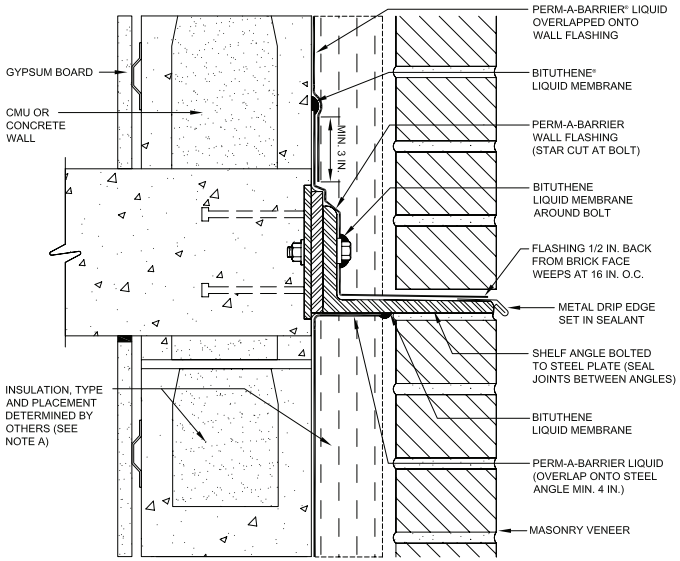
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-113 – Shelf Angle

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate below steel angle overlapping onto the steel angle by a minimum of 4 in (100 mm). Seal termination with Liquid Membrane.
2. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
3. Seal PAB Wall Flashing terminations with Liquid Membrane.
4. Apply PAB Liquid onto substrate overlapping the vertical portion of PAB Wall Flashing by a minimum of 3 in (75 mm).
5. Apply PAB Liquid and Wall Flashing according to the installation instructions found on the appropriate data sheets.

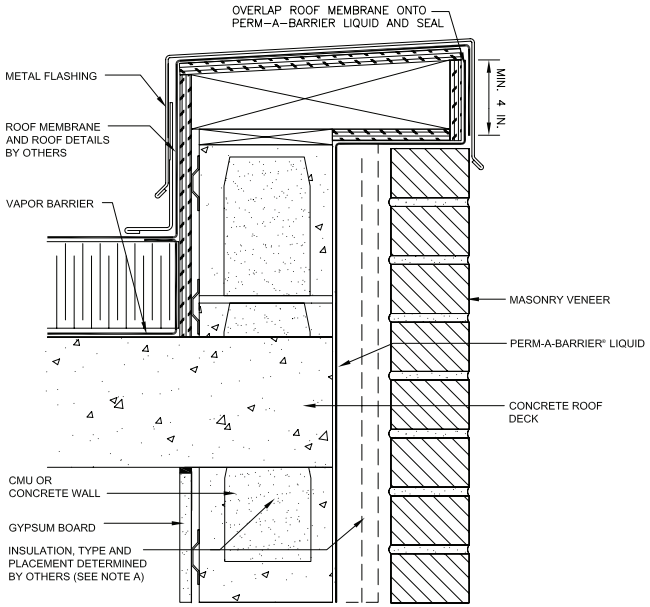
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-114 – Parapet



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate in accordance with the data sheet section on installation.
2. Roofing membrane (by others) should overlap PAB Liquid by a minimum of 4 in (100 mm).
3. Apply PAB Liquid according to the installation instructions found on the appropriate data sheets.

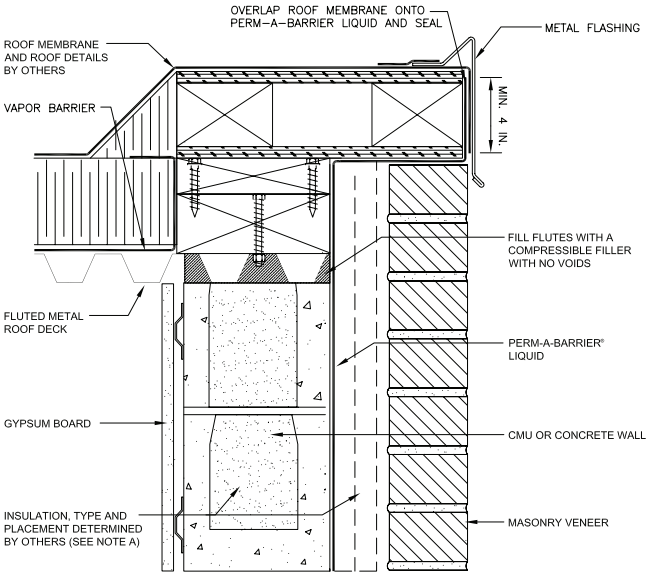
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-115 – Roof Edge



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate in accordance with the data sheet section on installation.
2. Roofing membrane (by others) should overlap PAB Liquid by a minimum of 4 in (100 mm).
3. Apply PAB Liquid according to the installation instructions found on the appropriate data sheets.

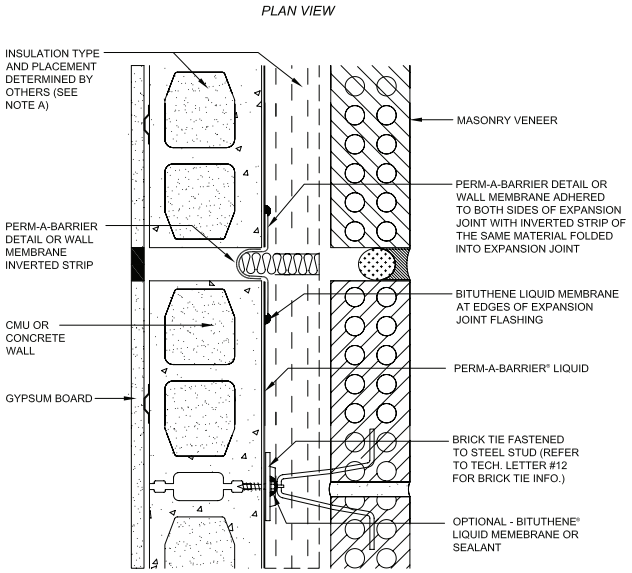
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-116 – Expansion Joint



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Liquid onto substrate as shown in accordance with the data sheet section on Installation.
2. Apply PAB Wall or Detail Membrane so that it is adhered to both sides of the expansion joint with an inverted strip of same material folded into the expansion joint as shown.
3. Seal the edges of the expansion joint flashing with Liquid Membrane.
4. Optional: Apply Liquid Membrane or sealant at brick tie fastener.
5. Apply PAB Liquid and Detail Membrane according to the installation instructions found on the appropriate data sheets.

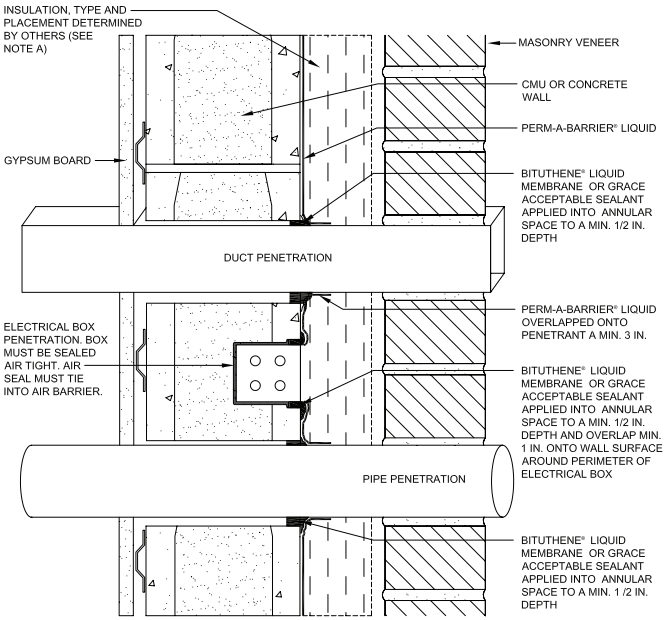
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PLQ-117 – Penetration



Prior to Membrane Installation, Review the Perm-A-Barrier® Liquid Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Liquid Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply Liquid Membrane or Grace acceptable sealant into the annular space to the depth of the exterior sheathing and overlap 1 in (25 mm) onto sheathing around perimeter of penetration.
2. Apply PAB Liquid as shown overlapping onto penetration a minimum of 3 in (75 mm) if applicable.
3. Apply PAB Liquid according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

Application Instructions

For complete application instructions refer to the technical data sheet for PAB Wall Membrane found at www.graceconstruction.com

1. Prepare Substrate

- All surfaces must be sound and free from spalled areas, loose aggregate, loose nails or screws, sharp protrusions or other matter.
- Clean loose dust or dirt from the surface using a clean, dry cloth or brush.
- For green or damp concrete substrates, allow it to dry or use Bituthene B2 (or LVC) Primer to prepare the area to receive the membrane.
- Refer to Technical letter # 2 “Substrate Preparation for Application of PAB Products to Glass-Mat Faced Gypsum Sheathing” for greater detail.

2. Apply Surface Treatment/Primer

- Spray or roll walls at recommended coverage
- Allow to dry approximately one hour or until primer is no longer wet.
- Only apply to recommended substrates, not to membrane.

3. Application Temperature

- Apply PAB Wall Membrane in dry weather when air and surface temperatures are above 40°F (5°C).
- Apply PAB Low Temperature Wall Membrane in dry weather when air and surface temperatures are between 25°F (-4°C) and 60°F (16°C).
- Apply PAB High Temperature Wall Membrane in dry weather when air and surface temperatures are above 40°F (5°C). PAB High Temperature Wall Membrane is for use at in-service temperatures up to 180°F (82°C).

4. Application

- Apply wall membrane horizontally or vertically to primed substrates receiving post-applied masonry anchors (ties), such as gypsum sheathing.
- Apply wall membranes horizontally to the primed block work with projecting masonry anchors, beginning at the base of the wall.
- Each length of the membrane must be installed so that the upper edge runs continuously along the underside of the line of masonry anchors.
- Cut the membrane at the location of the tie wires projection from the wall to enable the sheet to be laid in place.
- All side and end laps must be a minimum of 2 in (50 mm), with all laps shedding water
- Fit membrane around all penetrations and seal using Bituthene Mastic or Liquid Membrane.
- Use Bituthene Mastic or Liquid Membrane along the top edge of the membrane at its termination.
- PAB High Temperature Wall Membrane requires securing the top edge of the membrane with a mechanical termination bar fastened securely into the structure.

5. Visual Work Inspection

- Review all work.
- Patch all damaged areas or inadequately lapped seams with membrane and seal with Bituthene Mastic or Bituthene Liquid Membrane.

- Patch must extend 6 in (150 mm) each direction from the damaged area.

6. Membrane Protection

- PAB Wall Membrane must be protected from damage by other trades or construction materials.

7. Storage and Handling Information

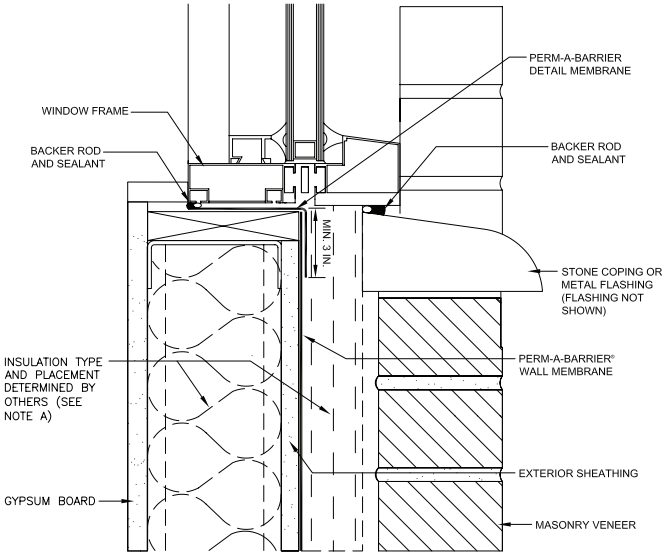
- Store membrane where temperatures will not exceed 90°F (32°C) for extended periods.

8. Limitations

- PAB Wall Membrane should not be used in areas where it will be permanently exposed to sunlight, weather, or traffic.
- Maximum exposure period is 30 days.

■ PWM-001 – Window Sill

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the vertical surface of the PAB Wall Membrane.
3. Apply PAB Wall and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

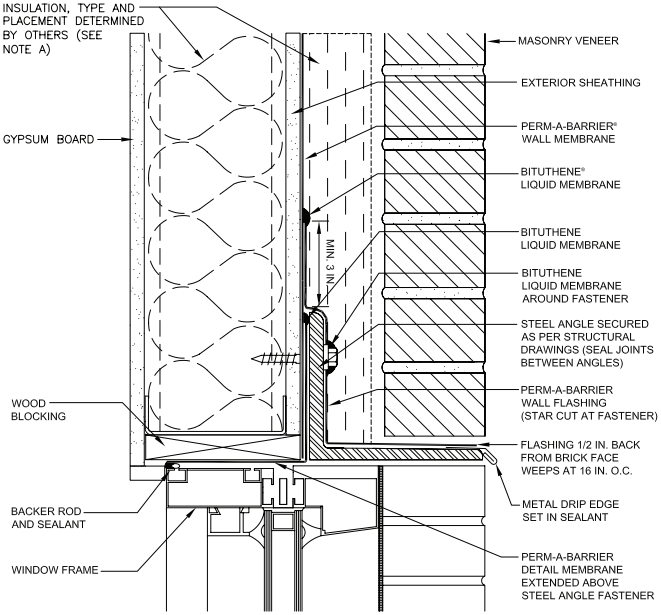
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-002 – Window Head

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending the membrane above the steel angle/fastener; seal termination with Bituthene Mastic or Liquid Membrane.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel angle, extending down over the steel angle stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Bituthene Mastic or Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
5. Apply PAB Wall, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

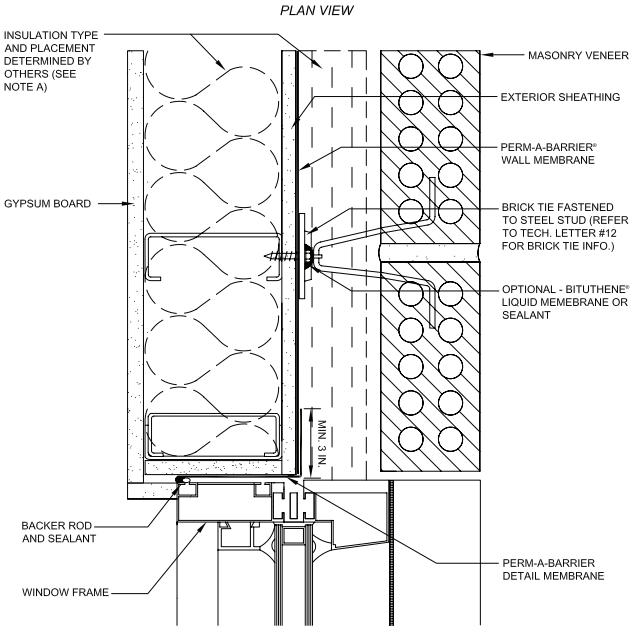
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-003 – Window Jamb

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the PAB Wall Membrane.
3. Optional: Apply Bituthene Mastic, Liquid Membrane or sealant at brick tie fastener.
4. Apply PAB Wall and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

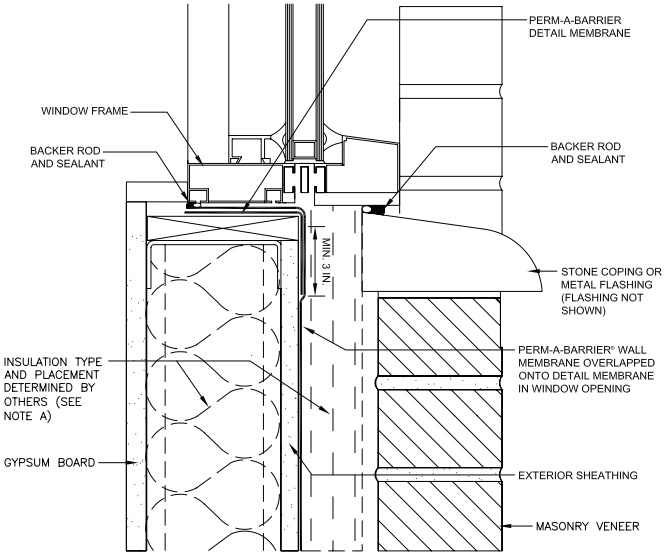
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-004 – Window Sill

(Option B-1)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Detail Membrane as shown extending down onto the vertical substrate a minimum of 3 in (75 mm).
2. Apply PAB Wall Membrane as shown ensuring a minimum 3 in (75 mm) overlap onto the vertical portion of Detail Membrane, extend onto the horizontal surface covering the Detail Membrane to create a double membrane layer.
3. Apply PAB Wall and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

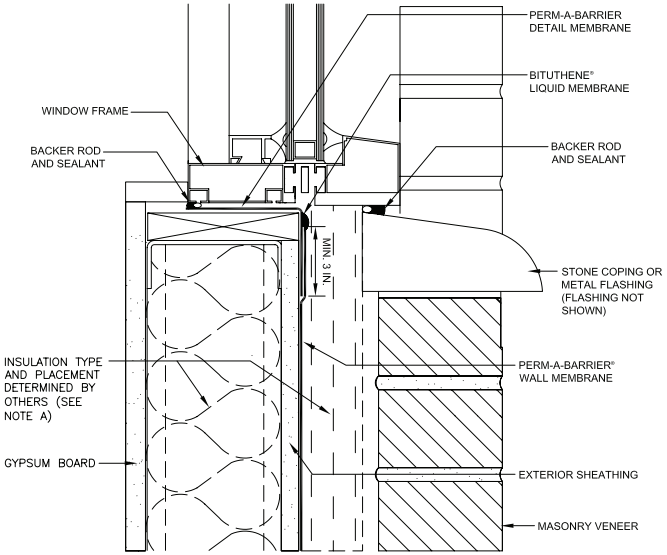
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-005 – Window Sill

(Option B-2)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Detail Membrane as shown extending down onto the vertical substrate a minimum of 3 in (75 mm).
2. Apply PAB Wall Membrane as shown ensuring a minimum 3 in (75 mm) overlap onto the vertical portion of Detail Membrane.
3. Seal PAB Wall Membrane terminations with Bituthene Mastic or Liquid Membrane.
4. Apply PAB Wall and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

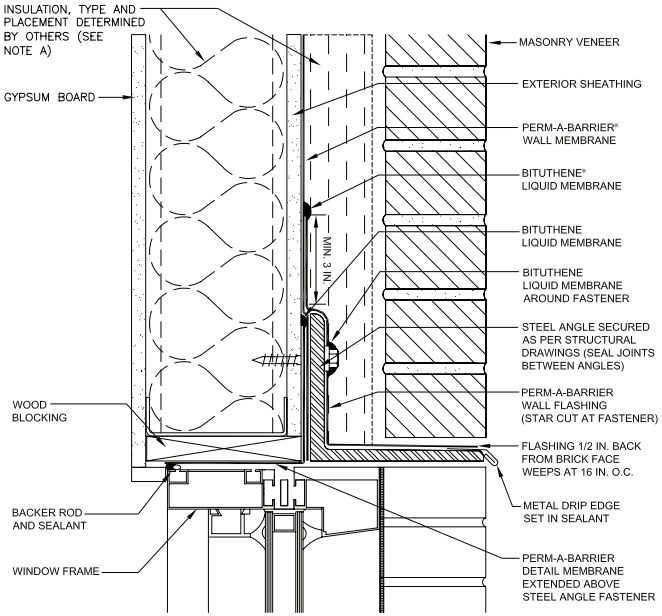
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-006 – Window Head

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Detail Membrane as shown extending the membrane above the steel angle/fastener; seal termination with Bituthene Mastic or Liquid Membrane.
2. Apply PAB Wall Membrane onto substrate overlapping the PAB Detail Membrane.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel angle, extending down over the steel angle stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Bituthene Mastic or Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
5. Apply PAB Wall, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

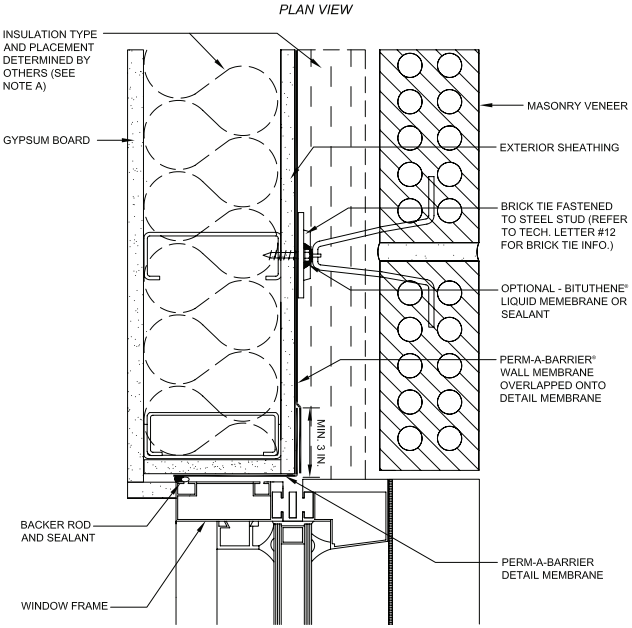
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-007 – Window Jamb

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the exterior sheathing.
2. Apply PAB Wall Membrane onto substrate overlapping the PAB Detail Membrane by a minimum of 3 in (75 mm).
3. Optional: Apply Bituthene Mastic, Liquid Membrane or sealant at brick tie fastener.
4. Apply PAB Wall and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

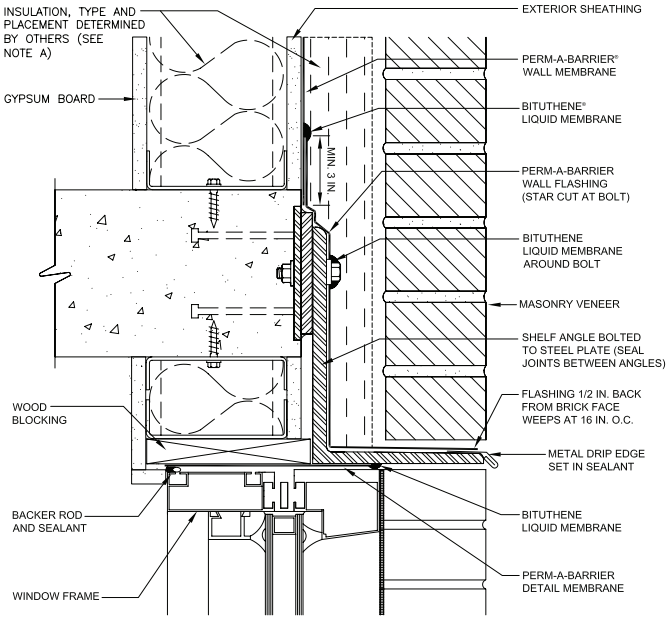
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-008 – Window Head at Floor

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Detail Membrane as shown, sealing termination against the steel angle with Bituthene Mastic or Liquid Membrane.
2. Apply PAB Wall Membrane onto substrate in accordance with the data sheet section on Installation.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Bituthene Mastic or Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
5. Apply PAB Wall, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

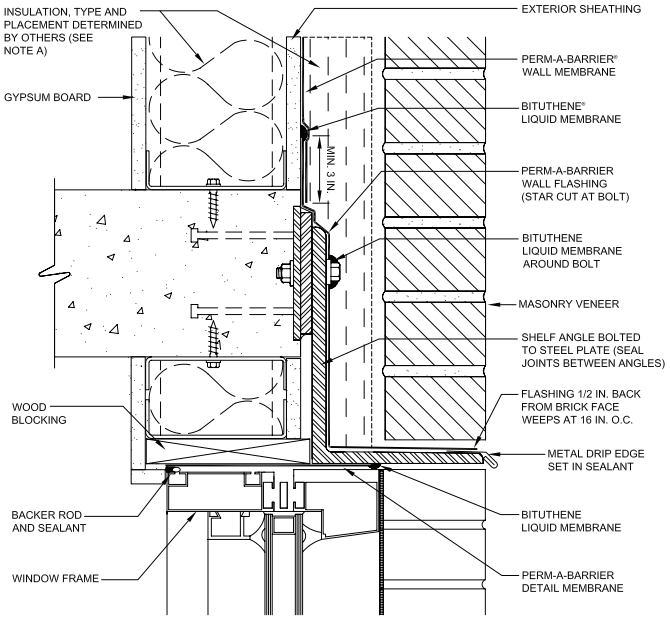
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-009 – Window Head at Floor

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Detail Membrane as shown, sealing termination against the steel angle with Bituthene Mastic or Liquid Membrane.
2. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Bituthene Mastic or Liquid Membrane.
3. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
4. Apply PAB Wall Membrane onto substrate overlapping the PAB Wall Flashing a minimum of 3 in (75 mm).
5. Apply PAB Wall, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

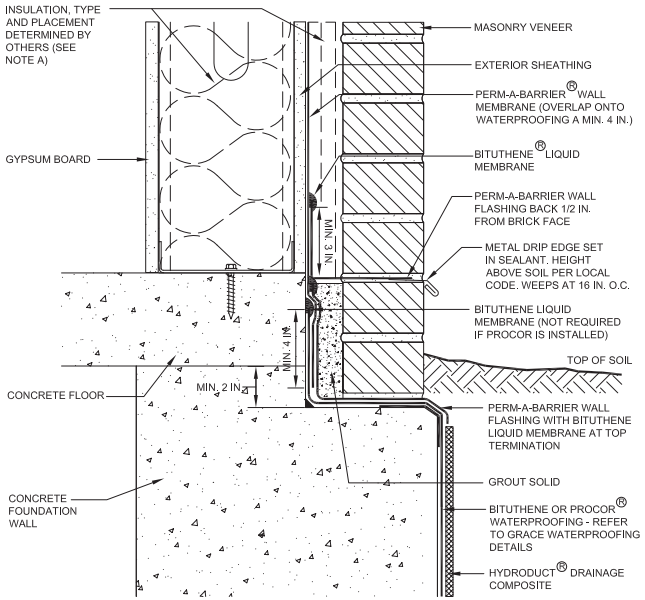
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-010 – Foundation

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Install a 0.75 in (20 mm) fillet of Liquid Membrane in corner extending 2.5 in (65 mm) onto the vertical and horizontal portion of brick shelf.
2. Extend Bituthene® or Procor® from the foundation onto the horizontal brick shelf and vertically up the foundation and or concrete slab a minimum of 6 in (150 mm). If Bituthene is used the termination must be sealed with Bituthene Mastic or Liquid Membrane.
3. Apply PAB Wall Membrane onto substrate overlapping the foundation waterproofing a minimum of 4 in (100 mm).
4. Apply PAB Wall Flashing from the top of the cavity to be grouted extending over the brick shelf and onto the vertical face of the below grade wall, seal the PAB Wall Flashing top termination with Liquid Membrane.
5. Apply Hydroduct Drainage Composite according to Hydroduct data sheet.
6. Grout space below weeps as shown.
7. Apply PAB Wall Flashing overlapping the PAB Wall Membrane by a minimum of 3 in (75 mm) on the vertical surface and extending through the wall and stopping the 0.5 in (13 mm) from the brick face. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
8. Apply PAB Membrane, Wall Flashing, Bituthene, Procor and Hydroduct according to the installation instructions found on the appropriate data sheets.

Special Notes

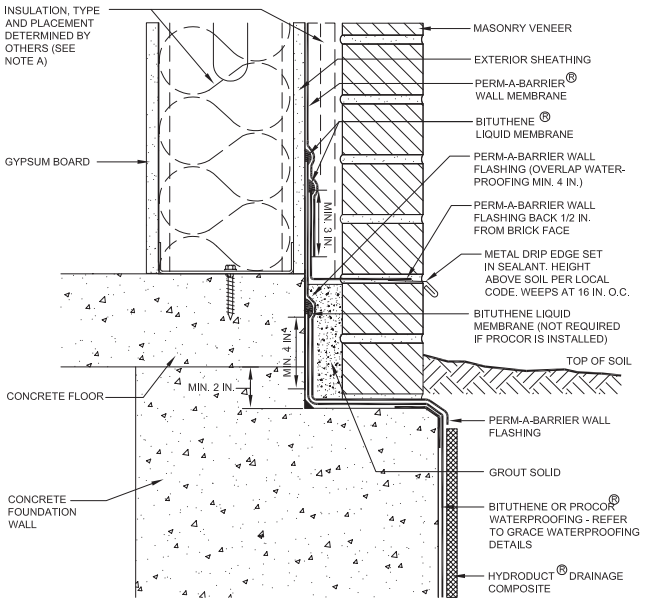
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-011 – Foundation

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Install a 0.75 in (20 mm) fillet of Liquid Membrane in corner extending 2.5 in (65 mm) onto the vertical and horizontal portion of brick shelf.
2. Extend Bituthene® or Procor® from the foundation onto the horizontal brick shelf and vertically up the foundation and or concrete slab a minimum of 6 in (150 mm). If Bituthene is used the termination must be sealed with Bituthene Mastic or Liquid Membrane.
3. Apply PAB Wall Flashing as shown onto substrate overlapping the foundation waterproofing a minimum of 4 in (100 mm) and extend over the brick shelf and onto the vertical face of the below grade wall, seal the PAB Wall Flashing top termination with Liquid Membrane.
4. Apply Hydroduct Drainage Composite according to Hydroduct data sheet.
5. Grout space below weeps as shown.
6. Apply PAB Wall Flashing overlapping the previously installed PAB Wall Flashing by a minimum of 3 in (75 mm) on the vertical surface and extending through the wall and stopping the 0.5 in (13 mm) from the brick face. Seal the top leading edge of the PAB Wall Flashing with Bituthene Mastic or Liquid Membrane.
7. Apply PAB Wall Membrane onto substrate overlapping the PAB Wall Flashing a minimum of 3 in (75 mm).
8. Apply PAB Wall Membrane, Wall Flashing, Bituthene, Procor and Hydroduct according to the installation instructions found on the appropriate data sheets.

Special Notes

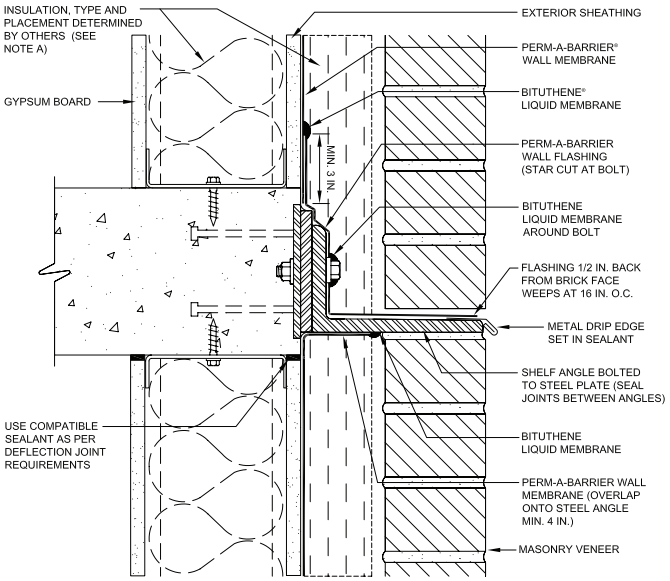
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system..

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-012 – Shelf Angle

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate below steel angle overlapping onto the steel angle by a minimum of 4 in (100 mm). Seal termination with Bituthene Mastic or Liquid Membrane.
2. Apply PAB Wall Membrane onto substrate above steel angle as shown.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Bituthene Mastic or Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
5. Apply PAB Wall Membrane and Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

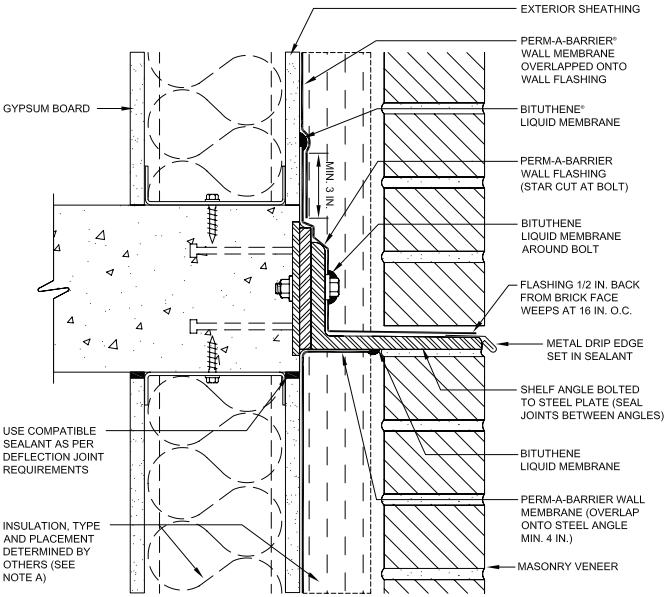
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-013 – Shelf Angle

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate below steel angle overlapping onto the steel angle by a minimum of 4 in (100 mm). Seal termination with Bituthene Mastic or Liquid Membrane.
2. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Bituthene Mastic or Liquid Membrane.
3. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
4. Apply PAB Wall Membrane onto substrate overlapping the vertical portion of PAB Wall Flashing by a minimum of 3 in (75 mm).
5. Apply PAB Wall Membrane and Wall Flashing according to the installation instructions found on the appropriate data sheets.

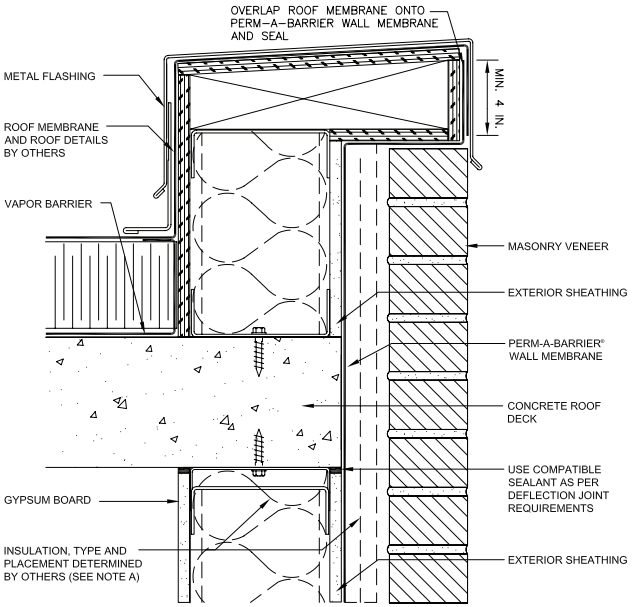
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-014 – Parapet



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate in accordance with the data sheet section on installation.
2. Roofing membrane (by others) should overlap PAB Wall Membrane by a minimum of 4 in (100 mm).
3. Apply PAB Wall Membrane according to the installation instructions found on the appropriate data sheets.

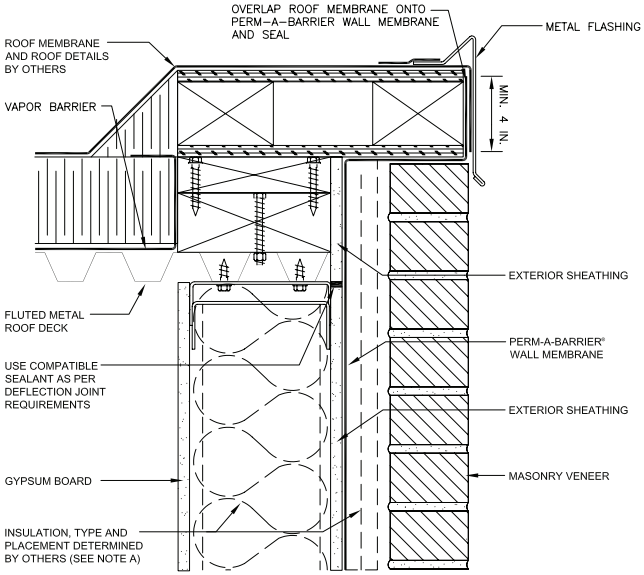
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-015 – Roof Edge



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate in accordance with the data sheet section on installation.
2. Roofing membrane (by others) should overlap PAB Wall Membrane by a minimum of 4 in (100 mm).
3. Apply PAB Wall Membrane according to the installation instructions found on the appropriate data sheets.

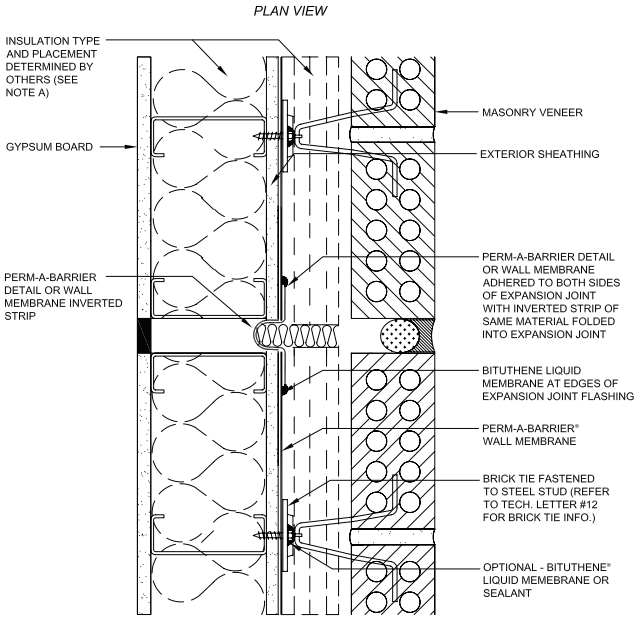
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-016 – Expansion Joint



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate as shown in accordance with the data sheet section on installation.
2. Apply PAB Wall or Detail Membrane so that it is adhered to both sides of the expansion joint with an inverted strip of same material folded into the expansion joint as shown.
3. Seal the edges of the expansion joint flashing with Bituthene Mastic or Liquid Membrane
4. Optional: Apply Bituthene Mastic, Liquid Membrane or sealant at brick tie fastener.
5. Apply PAB Wall and Detail Membrane according to the installation instructions found on the appropriate data sheets.

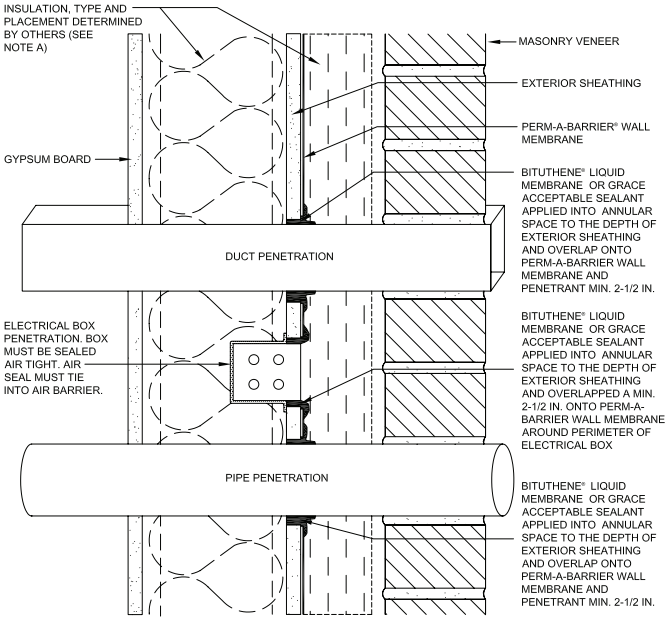
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-017 – Penetration



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane as shown.
2. Apply Liquid Membrane or Grace acceptable sealant into the annular space to the depth of the exterior sheathing and overlap onto PAB Wall Membrane and penetration a minimum of 2.5 in (64 mm) if applicable.
3. Apply PAB Wall Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

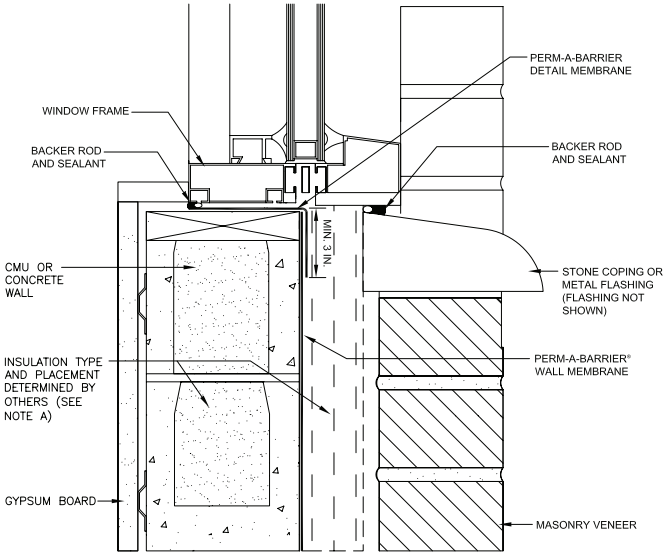
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-101 – Window Sill

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the vertical surface of the PAB Wall Membrane.
3. Apply PAB Wall and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

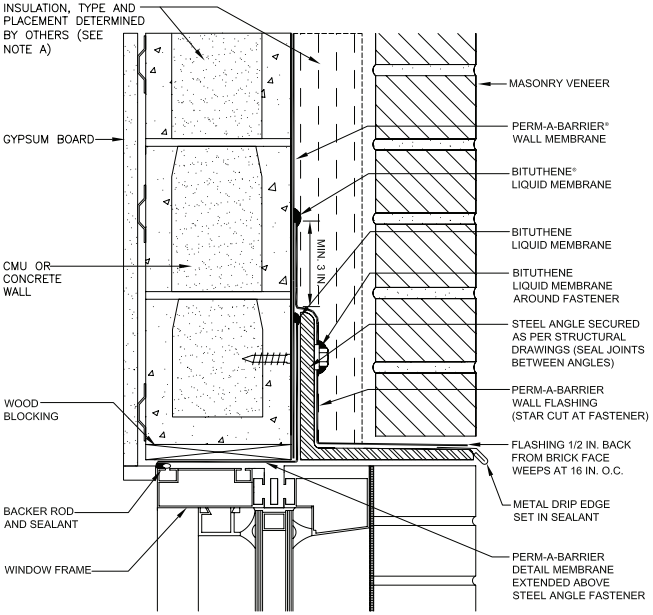
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-102 – Window Head

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending the membrane above the steel angle/fastener; seal termination with Bituthene Mastic or Liquid Membrane.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel angle, extending down over the steel angle stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Bituthene Mastic or Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
5. Apply PAB Wall, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

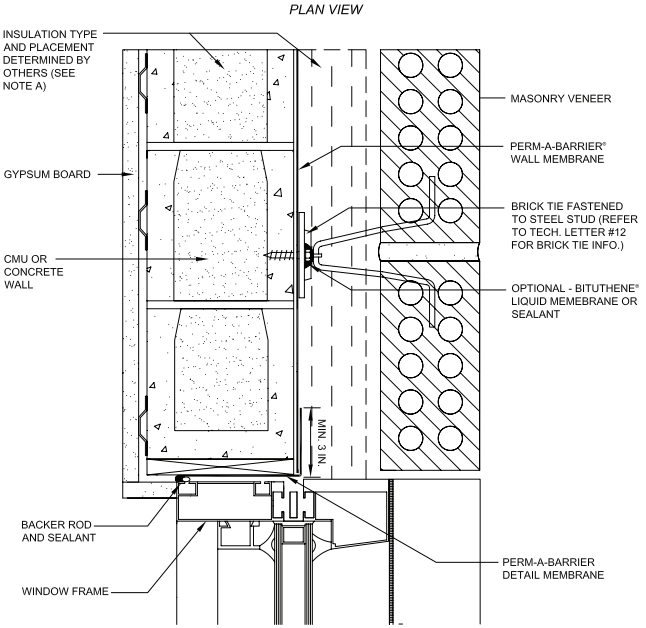
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-103 – Window Jamb

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the PAB Wall Membrane.
3. Optional: Apply Bituthene Mastic, Liquid Membrane or sealant at brick tie fastener.
4. Apply PAB Wall, and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

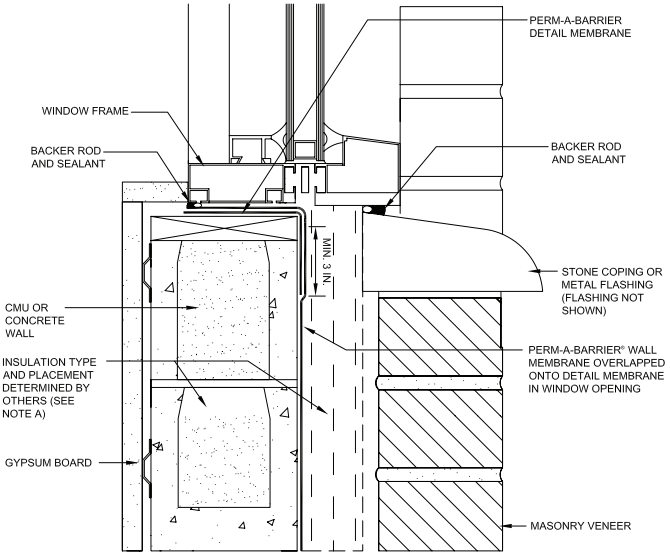
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-104 – Window Sill

(Option B-1)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Detail Membrane as shown extending down onto the vertical substrate a minimum of 3 in (75 mm).
2. Apply PAB Wall Membrane as shown ensuring a minimum 3 in (75 mm) overlap onto the vertical portion of Detail Membrane, extend onto the horizontal surface covering the Detail Membrane to create a double membrane layer.
3. Apply PAB Wall and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

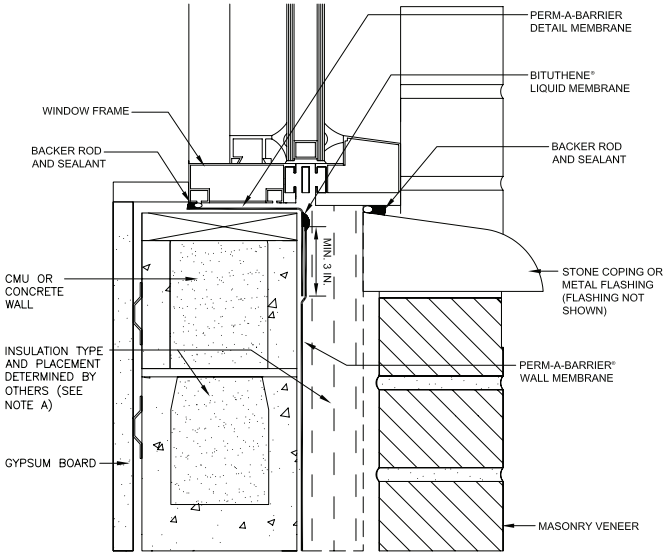
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-105 – Window Sill

(Option B-2)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Detail Membrane as shown extending down onto the vertical substrate a minimum of 3 in (75 mm).
2. Apply PAB Wall Membrane as shown ensuring a minimum 3 in (75 mm) overlap onto the vertical portion of Detail Membrane.
3. Seal PAB Wall Membrane terminations with Bituthene Mastic or Liquid Membrane.
4. Apply PAB Wall and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

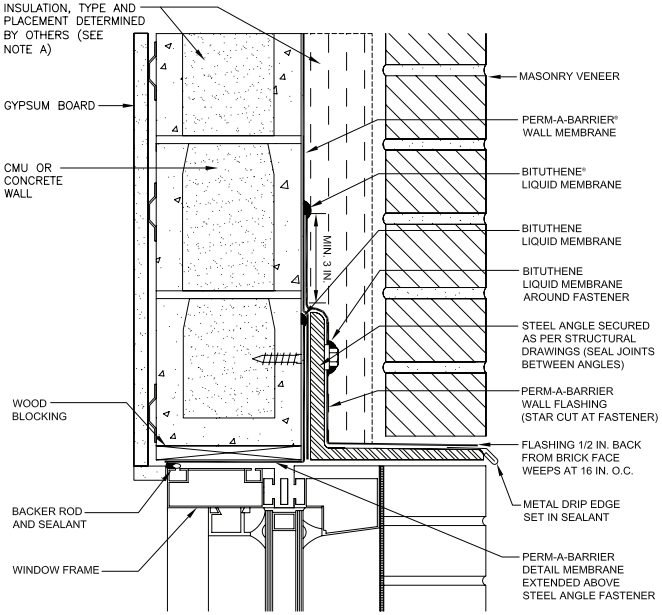
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-106 – Window Head

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Detail Membrane as shown extending the membrane above the steel angle/fastener; seal termination with Bituthene Mastic or Liquid Membrane.
2. Apply PAB Wall Membrane onto substrate overlapping the PAB Detail Membrane.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel angle, extending down over the steel angle stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Bituthene Mastic or Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
5. Apply PAB Wall, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

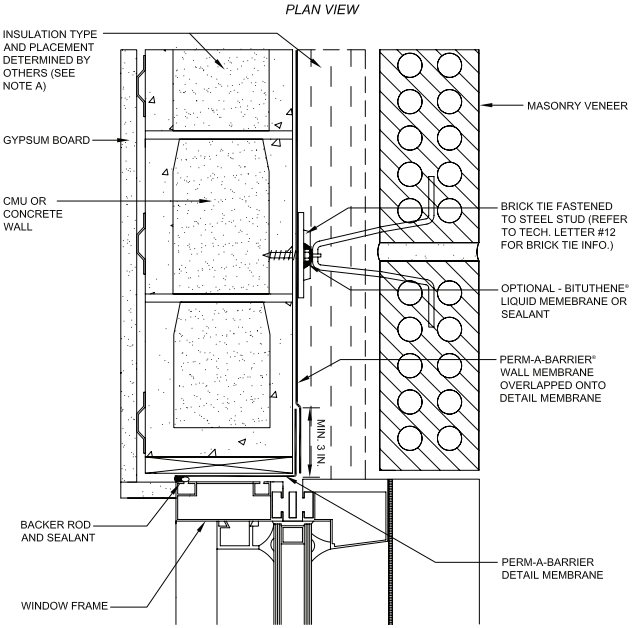
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-007 – Window Jamb

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the exterior face of the CMU or concrete wall.
2. Apply PAB Wall Membrane onto substrate overlapping the PAB Detail Membrane by a minimum of 3 in (75 mm).
3. Optional: Apply Bituthene Mastic, Liquid Membrane or sealant at brick tie fastener.
4. Apply PAB Wall and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

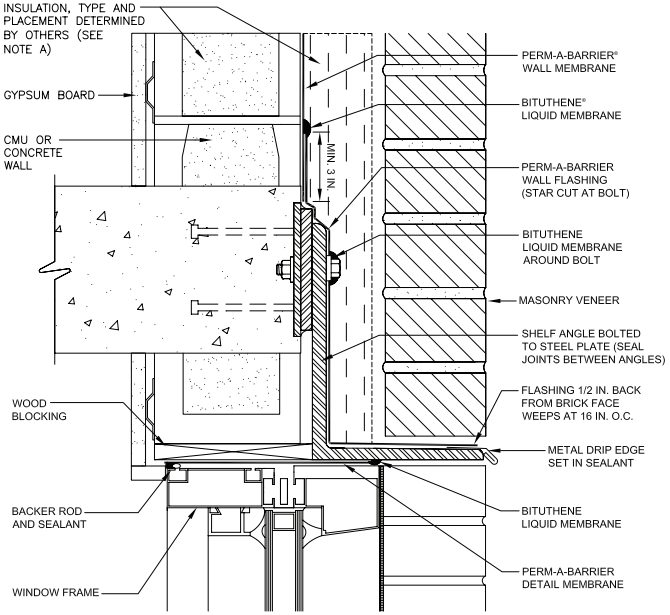
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-108 – Window Head at Floor

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Detail Membrane as shown, sealing termination against the steel angle with Bituthene Mastic or Liquid Membrane.
2. Apply PAB Wall Membrane onto substrate in accordance with the data sheet section on Installation.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Bituthene Mastic or Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
5. Apply PAB Wall, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

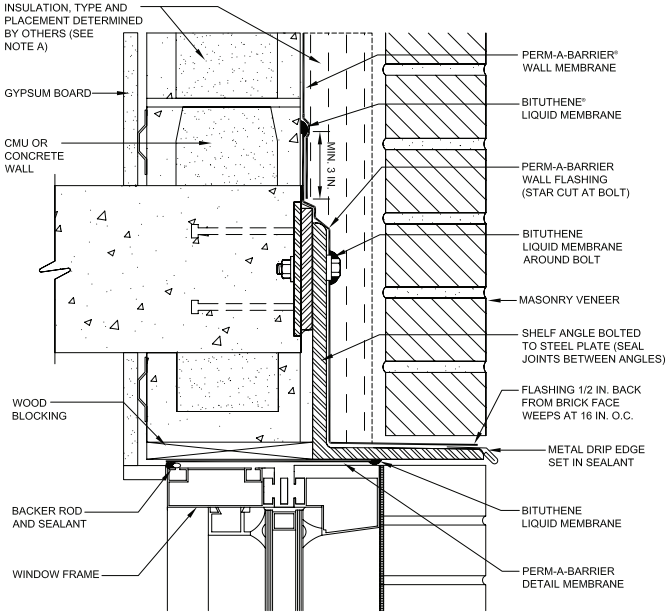
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-109 – Window Head at Floor

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Detail Membrane as shown, sealing termination against the steel angle with Bituthene Mastic or Liquid Membrane.
2. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Bituthene Mastic or Liquid Membrane.
3. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
4. Apply PAB Wall Membrane onto substrate overlapping the PAB Wall Flashing a minimum of 3 in (75 mm).
5. Apply PAB Wall, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

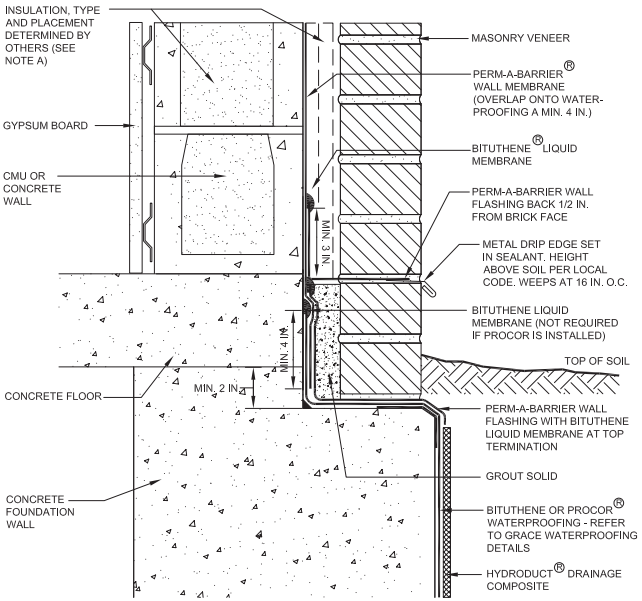
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-110 – Foundation

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Install a 0.75 in (20 mm) fillet of Liquid Membrane in corner extending 2.5 in (65 mm) onto the vertical and horizontal portion of brick shelf.
2. Extend Bituthene® or Procor® from the foundation onto the horizontal brick shelf and vertically up the foundation and or concrete slab a minimum of 6 in (150 mm). If Bituthene is used the termination must be sealed with Bituthene Mastic or Liquid Membrane.
3. Apply PAB Wall Membrane onto substrate overlapping the foundation waterproofing a minimum of 4 in (100 mm).
4. Apply PAB Wall Flashing from the top of the cavity to be grouted extending over the brick shelf and onto the vertical face of the below grade wall, seal the PAB Wall Flashing top termination with Liquid Membrane.
5. Apply Hydroduct Drainage Composite according to Hydroduct data sheet.
6. Grout space below weeps as shown.
7. Apply PAB Wall Flashing overlapping the PAB Wall Membrane by a minimum of 3 in (75 mm) on the vertical surface and extending through the wall and stopping the 0.5 in (13 mm) from the brick face. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
8. Apply PAB Membrane, Wall Flashing, Bituthene, Procor and Hydroduct according to the installation instructions found on the appropriate data sheets.

Special Notes

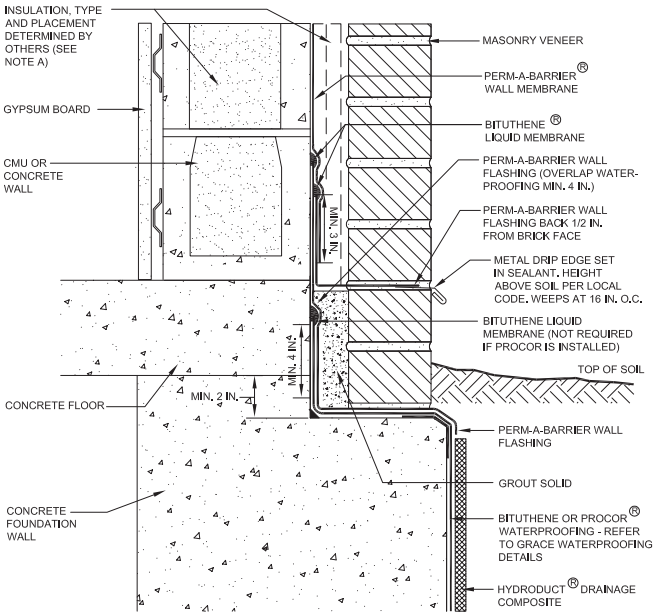
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-111 – Foundation

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Install a 0.75 in (20 mm) fillet of Liquid Membrane in corner extending 2.5 in (65 mm) onto the vertical and horizontal portion of brick shelf.
2. Extend Bituthene® or Procor® from the foundation onto the horizontal brick shelf and vertically up the foundation and or concrete slab a minimum of 6 in (150 mm). If Bituthene is used the termination must be sealed with Bituthene Mastic or Liquid Membrane.
3. Apply PAB Wall Flashing as shown onto substrate overlapping the foundation waterproofing a minimum of 4 in (100 mm) and extend over the brick shelf and onto the vertical face of the below grade wall, seal the PAB Wall Flashing top termination with Liquid Membrane.
4. Apply Hydroduct Drainage Composite according to Hydroduct data sheet.
5. Grout space below weeps as shown.
6. Apply PAB Wall Flashing overlapping the previously installed PAB Wall Flashing by a minimum of 3 in (75 mm) on the vertical surface and extending through the wall and stopping the 0.5 in (13 mm) from the brick face. Seal the top leading edge of the PAB Wall Flashing with Bituthene Mastic or Liquid Membrane.
7. Apply PAB Wall Membrane onto substrate overlapping the PAB Wall Flashing a minimum of 3 in (75 mm).
8. Apply PAB Wall Membrane, Wall Flashing, Bituthene, Procor and Hydroduct according to the installation instructions found on the appropriate data sheets.

Special Notes

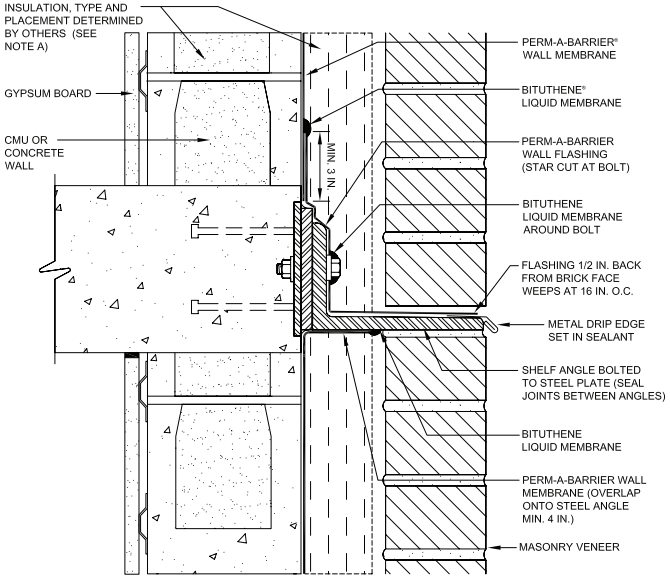
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-112 – Shelf Angle

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate below steel angle overlapping onto the steel angle by a minimum of 4 in (100 mm). Seal termination with Bituthene Mastic or Liquid Membrane.
2. Apply PAB Wall Membrane onto substrate above steel angle as shown.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Bituthene Mastic or Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
5. Apply PAB Wall Membrane and Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

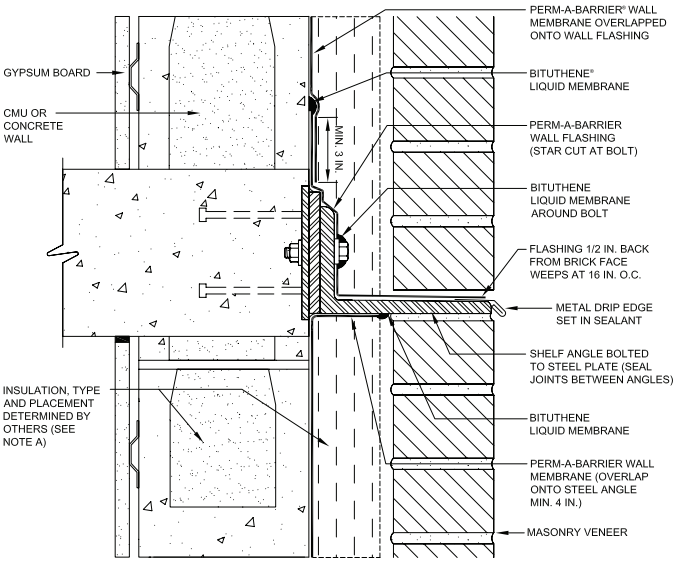
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-113 – Shelf Angle

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate below steel angle overlapping onto the steel angle by a minimum of 4 in (100 mm). Seal termination with Bituthene Mastic or Liquid Membrane.
2. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Bituthene Mastic or Liquid Membrane.
3. Seal PAB Wall Flashing terminations with Bituthene Mastic or Liquid Membrane.
4. Apply PAB Wall Membrane onto substrate overlapping the vertical portion of PAB Wall Flashing by a minimum of 3 in (75 mm).
5. Apply PAB Wall Membrane and Wall Flashing according to the installation instructions found on the appropriate data sheets.

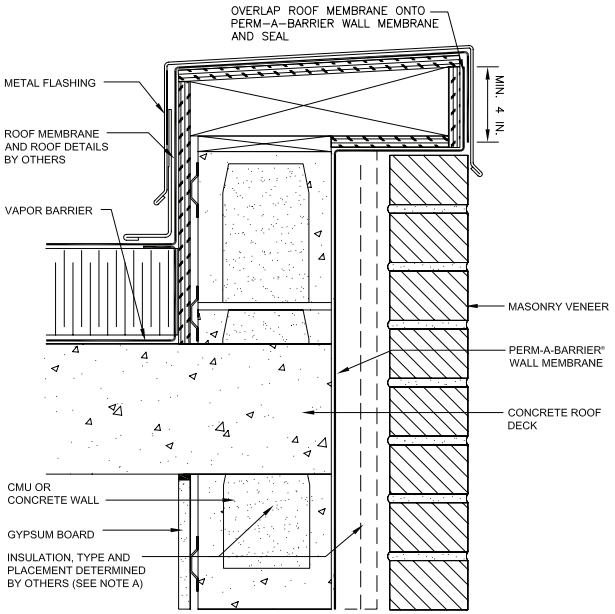
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-114 – Parapet



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate in accordance with the data sheet section on installation.
2. Roofing membrane (by others) should overlap PAB Wall Membrane by a minimum of 4 in (100 mm).
3. Apply PAB Wall Membrane according to the installation instructions found on the appropriate data sheets.

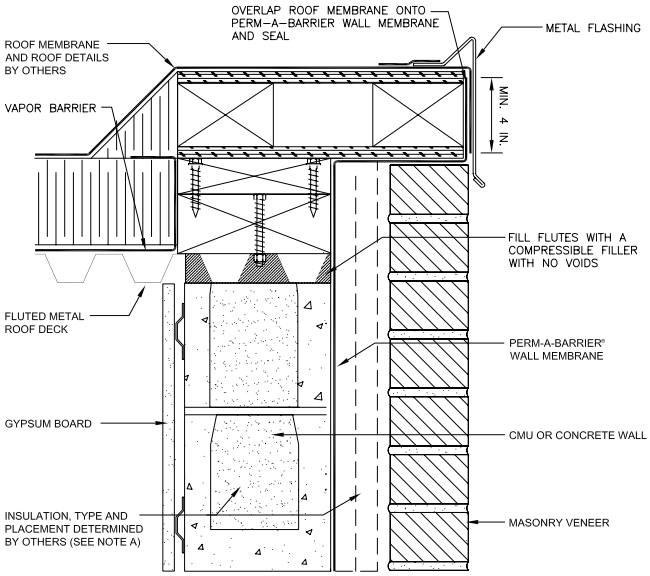
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-115 – Roof Edge



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate in accordance with the data sheet section on installation.
2. Roofing membrane (by others) should overlap PAB Wall Membrane by a minimum of 4 in (100 mm).
3. Apply PAB Wall Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

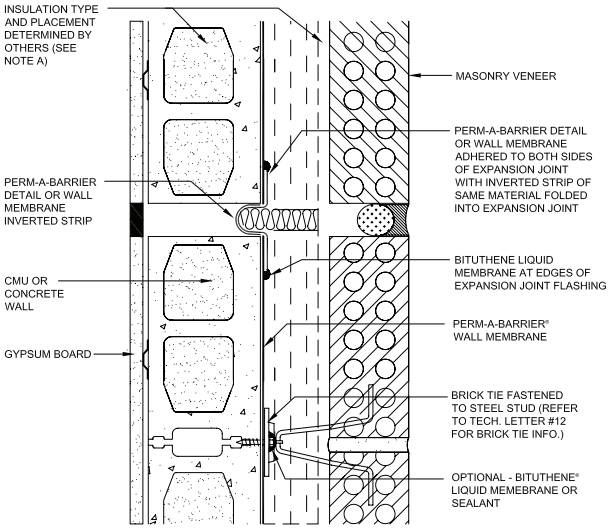
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-116 – Expansion Joint

PLAN VIEW



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane onto substrate as shown in accordance with the data sheet section on Installation.
2. Apply PAB Wall or Detail Membrane so that it is adhered to both sides of the expansion joint with an inverted strip of same material folded into the expansion joint as shown.
3. Seal the edges of the expansion joint flashing with Bituthene Mastic or Liquid Membrane.
4. Optional: Apply Bituthene Mastic, Liquid Membrane or sealant at brick tie fastener.
5. Apply PAB Wall and Detail Membrane according to the installation instructions found on the appropriate data sheets.

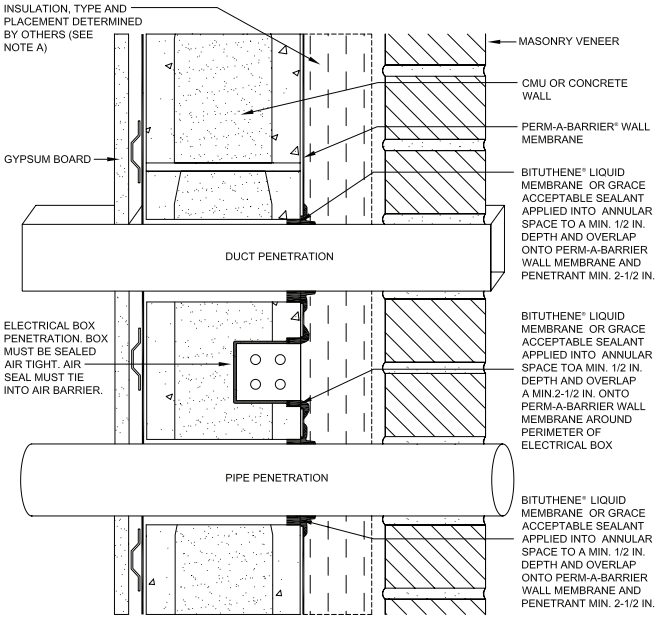
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PWM-117 – Penetration



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® Wall Membrane Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Membrane as shown.
2. Apply Liquid Membrane or Grace acceptable sealant into the annular space to the depth of the exterior sheathing and overlap onto PAB Wall Membrane and penetration a minimum of 2.5 in (64 mm) if applicable.
3. Apply PAB Wall Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

Application Instructions

For complete application instructions refer to the technical data sheet for PAB Wall Flashing found at www.graceconstruction.com

1. Prepare substrate

- All surfaces must be sound and free from spalled areas, loose aggregate, loose nails or screws, sharp protrusions or other matter.
- Clean loose dust or dirt from the surface using a clean, dry cloth or brush.
- For green or damp concrete substrates, allow it to dry or use Bituthene B2 (or LVC) Primer to prepare the area to receive the membrane.
- Refer to Technical letter # 2 “Substrate Preparation for Application of PAB Glass-Mat Faced Gypsum Sheathing” for greater detail.

2. Apply Surface Treatments/Primer

- Spray or roll walls at recommended coverage.
- Allow to dry approximately one hour or until primer is no longer wet.
- Only apply to recommended substrates, not to membrane.

3. Application Temperature

- Apply PAB Wall Flashing in dry weather when air and surface temperatures are above 25°F (-4°C).

4. Application

- Pre-cut flashing into easily handled lengths.
- Peel release paper from roll to expose rubberized asphalt and apply to substrate.
- Press firmly into place.
- Overlap adjacent pieces 2 in (50 mm) and roll lap with a steel hand roller.
- Apply Bituthene Mastic along all laps, seams, top edges, cuts and trowel into place. When installing PAB Wall Flashing against PAB Liquid or PAB VP, Bituthene Liquid Membrane should be used in lieu of Bituthene Mastic. Refer to appropriate PAB system details and data sheets for more information.
- Lay or trim edges of PAB Wall Flashing 0.5 in (13 mm) back from the face of the masonry.
- If applying PAB Wall Flashing to PAB Liquid that is more than 7-days old Refer to Technical letter #11 “Adhesion of Rubberized Asphalt Membranes to PAB Liquid in Air and Vapor Barrier Applications” for greater detail.

5. Visual Work Inspection

- Review all work.
- Patch all damaged areas or inadequately lapped seams with membrane and seal with Bituthene Mastic or Bituthene Liquid Membrane.
- Patch must extend 6 in each direction from the damaged area.

6. Membrane Protection

- PAB Wall Flashing must be protected from damage by other trades or construction materials.

7. Storage and Handling Information

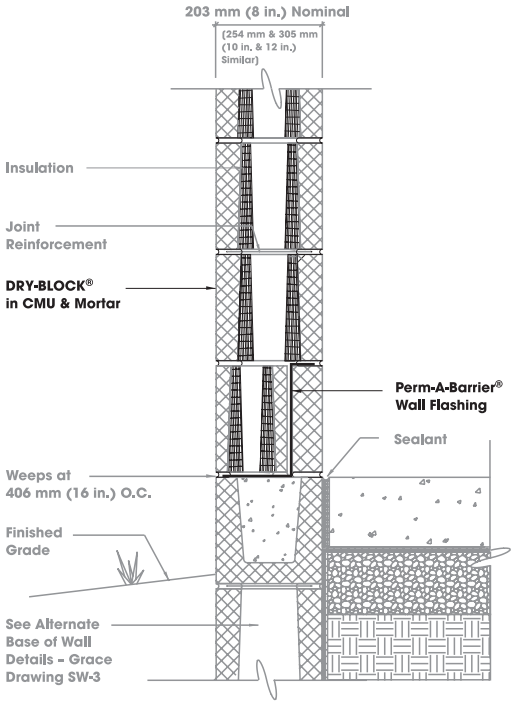
- Store membrane where temperatures will not exceed 90°F (32°C) for extended periods.

8. Limitations

- PAB Wall Flashing should not be used in areas where it will be permanently exposed to sunlight, weather, or traffic.
- Maximum exposure period is 30 days.

■ MP-503 – Base of Wall Detail

(SW-2)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

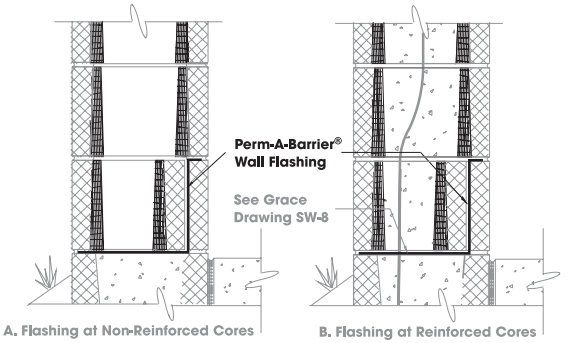
A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ MP-504 – Alternate Base of Wall Details

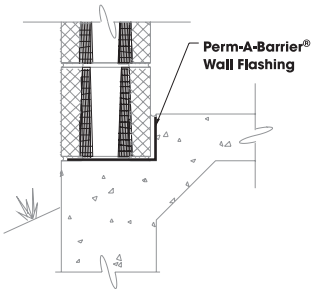
(SW-3)



A. Flashing at Non-Reinforced Cores

B. Flashing at Reinforced Cores

152 mm + 51 mm (6 in. + 2 in.) for 203 mm (8 in.) Walls
203 mm + 51 mm (8 in. + 2 in.) for 254 mm (10 in.) Walls (152 mm + 102 mm (6 in. + 4 in.) Optional)
254 mm + 51 mm (10 in. + 2 in.) for 305 mm (12 in.) Walls (203 mm + 102 mm (8 in. + 4 in.) Optional)



C. Stepped Foundation

Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

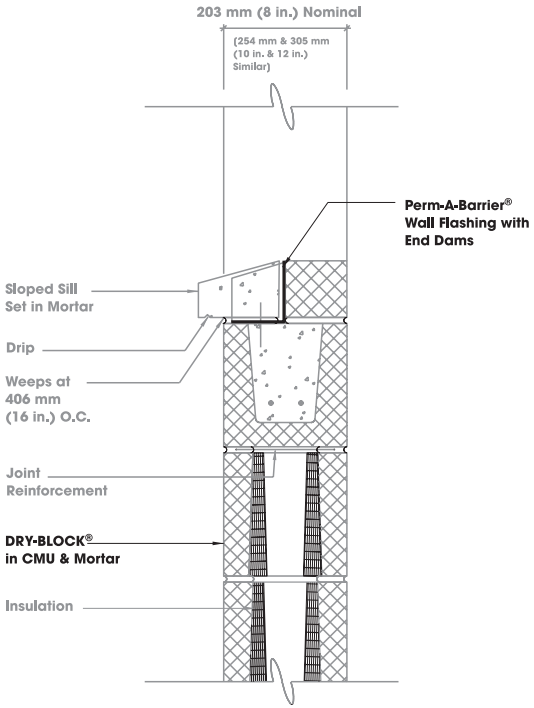
A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ MP-505 – Sill Detail

(SW-4)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

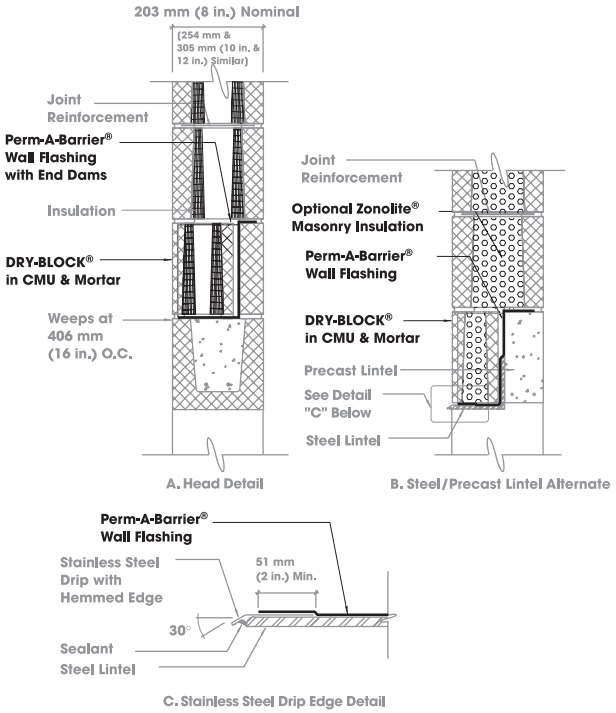
A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ MP-506 – Masonry Opening Head Flashing

(SW-5)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

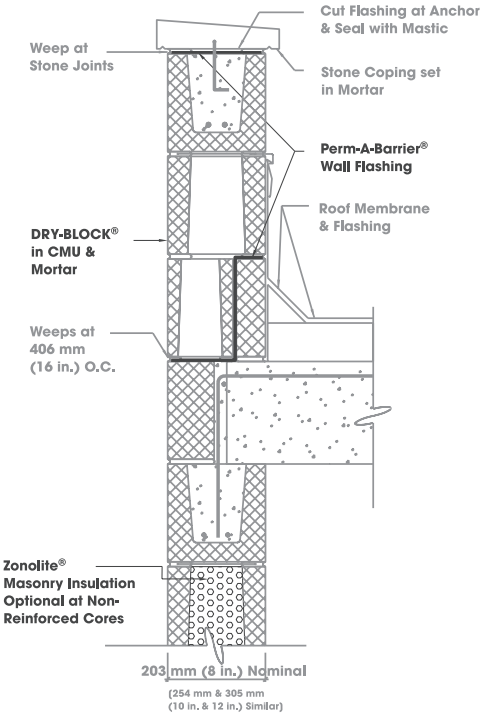
A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ MP-507 – Parapet/Roof Detail at Non-Reinforced Cores

(SW-6)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Cut PAB Flashing at anchor under coping stone and seal with Liquid Membrane or Bituthene Mastic.
3. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

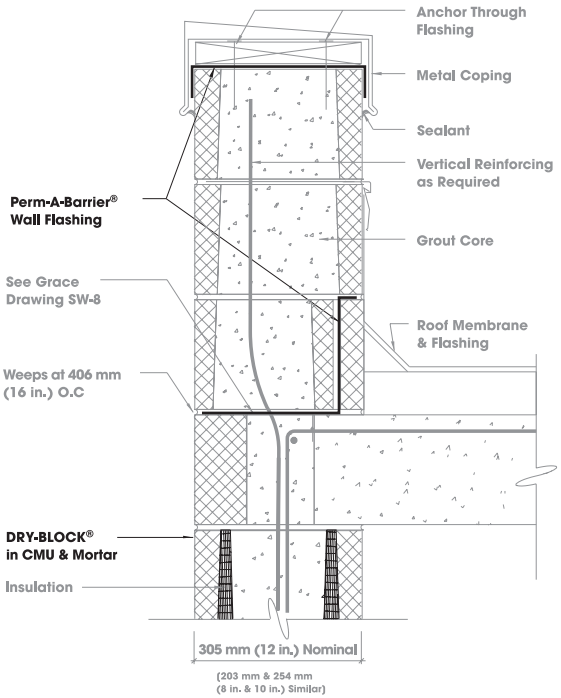
Special Notes

A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ MP-508 – Parapet/Roof Detail at Reinforced Cores



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

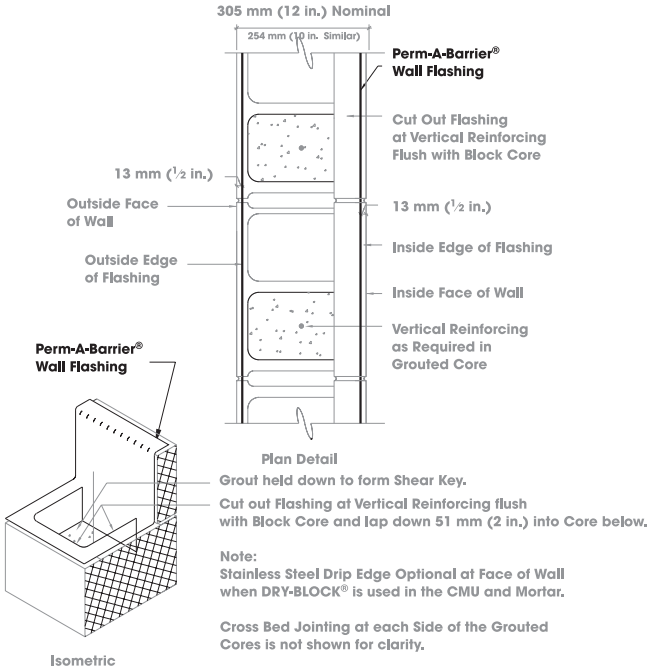
A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ MP-509 – Vertical Reinforcing through Perm-A-Barrier Flashing

(SW-8)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Cut out flashing at vertical reinforcing flush with block core and lap down 2 in (51 mm) into core below.
3. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

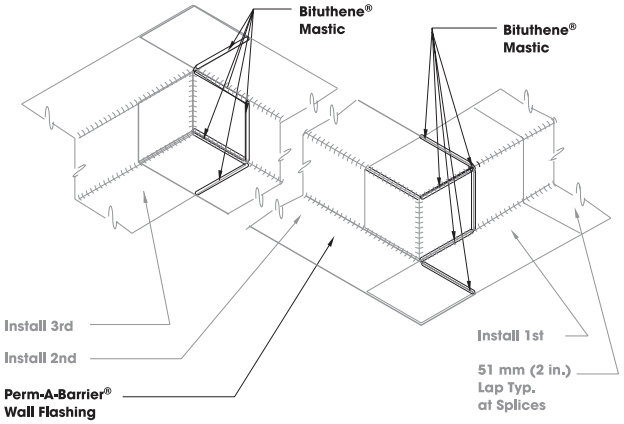
A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ MP-510 – Perm-A-Barrier Flashing Details at Inside and Outside Corners

(SW-9)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Seal all terminations with Bituthene Mastic.
3. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

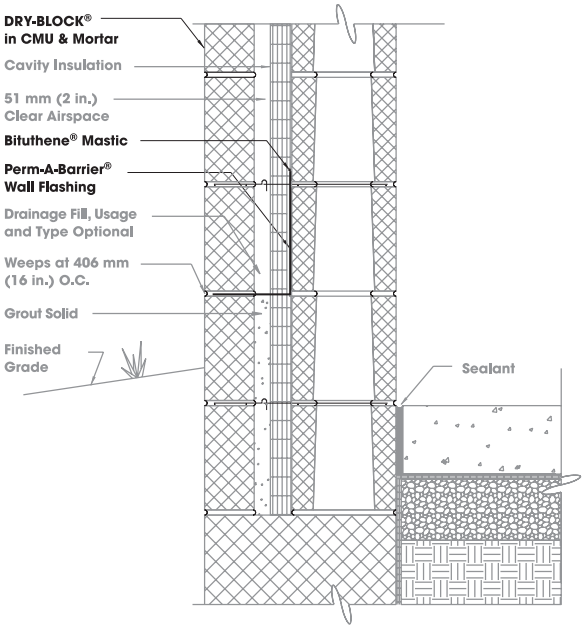
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

■ MP-603 – Base of Wall Detail

(CW-2)



Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

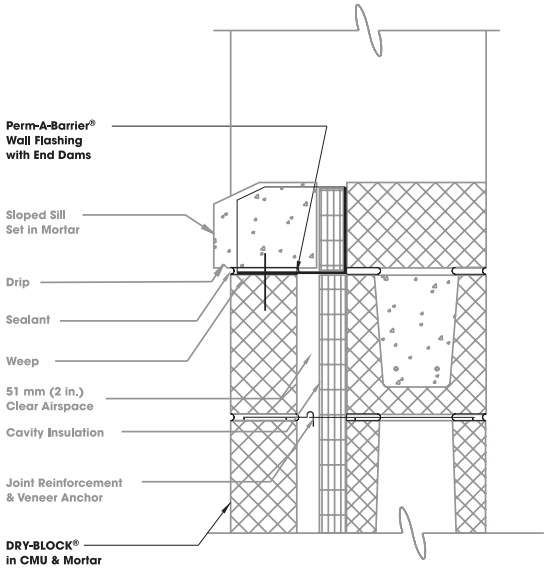
A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ MP-604 – Sill Detail

(CW-3)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

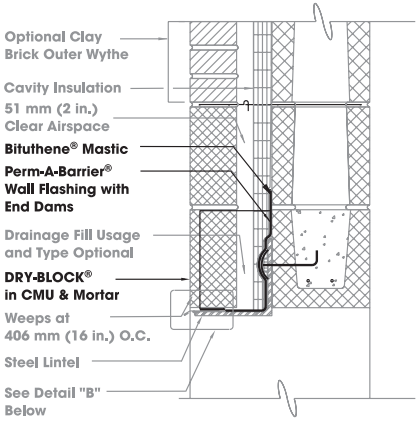
Special Notes

A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

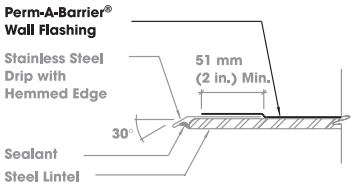
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ MP-605 – Masonry Opening Head Flashing



A. Head Detail



B. Stainless Steel Drip Edge Detail
Also See Grace Drawing CW-8

Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Seal all terminations with Bituthene Mastic.
3. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

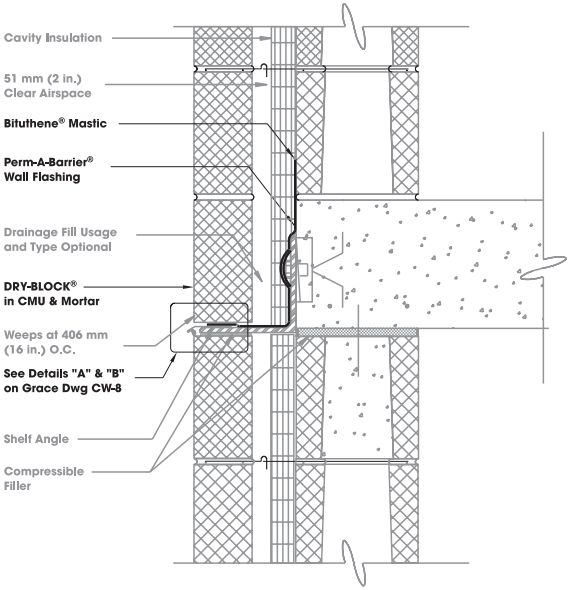
A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ MP-606 – Shelf Angle

(CW-5)



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Seal all terminations with Bituthene Mastic.
3. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

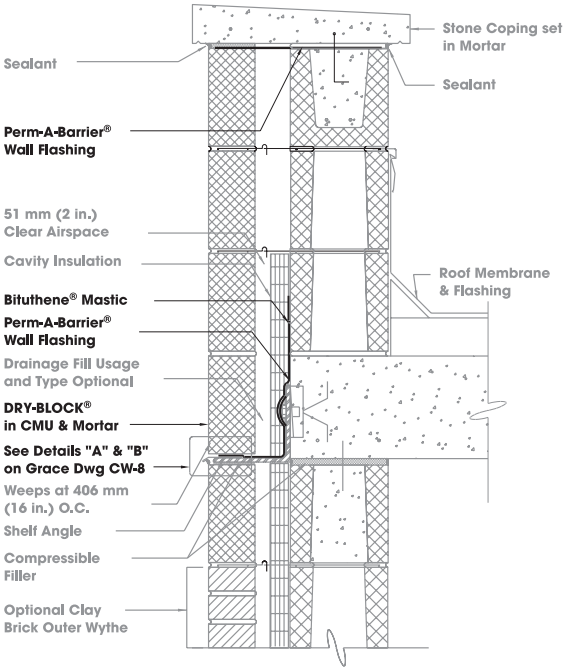
Special Notes

A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ MP-607 – Parapet Wall



Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Membrane Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Seal all terminations with Bituthene Mastic.
3. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

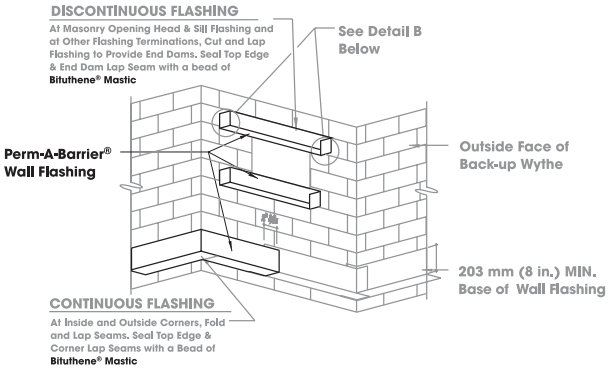
A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

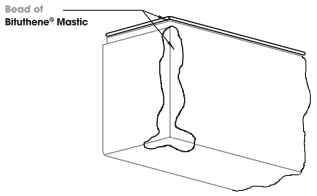
■ MP-608 – Through Wall Flashing Details

(CW-7)



A. Isometric

Note: Veneer not Shown for Clarity



B. Isometric of End Dam

Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Seal top edge and end dam lap seam with Bituthene Mastic.
3. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

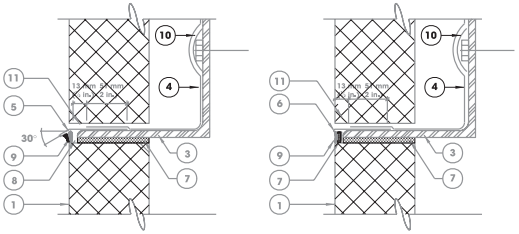
A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ MP-609 – Optional Flashing Details

(CW-8)



Note: Stainless Steel Drip Edge Optional at Face of Wall when **DRY-BLOCK®** is used in CMU and Mortar

1. CMU with **DRY-BLOCK®**
2. Mortar Joint with **DRY-BLOCK®**
3. Shelf Angle
4. **Perm-A-Barrier® Wall Flashing**
5. Stainless Steel Drip with Hemmed Edge set in Sealant
6. Alternate Stainless Steel Drip with Hemmed Edge
7. Compressible Filler
8. Backer Rod
9. Sealant Joint
10. **Perm-A-Barrier® Reinforcing Patch (102 mm x 102 mm (4 in. x 4 in. min.)) at Anchor Bolt**
11. Weeps at 406 mm (16 in.) O.C.

Prior to Membrane Installation, Review the Perm-A-Barrier® Wall Flashing Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the PAB Wall Flashing Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer.

Detailing

1. Apply PAB Wall Flashing on substrate as shown stopping the flashing 0.5 in (13 mm) from the brick face.
2. Apply PAB Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

For Details, refer to:

- *Perm-A-Barrier Liquid Details*
- *Perm-A-Barrier Wall Membrane Details*
- *Perm-A-Barrier VP Details*
- *Perm-A-Barrier VPS Details*

Application Instructions

For complete application instructions refer to the technical data sheet for PAB Detail Membrane found at www.graceconstruction.com

1. Prepare Substrate

- All surfaces must be sound and free from spalled areas, loose aggregate, loose nails or screws, sharp protrusions or other matter.
- Clean loose dust or dirt from the surface using a clean, dry cloth or brush.
- For green or damp concrete substrates, allow it to dry or use Bituthene B2 (or LVC) Primer to prepare the area to receive the membrane.
- Refer to Technical letter # 2 “Substrate Preparation for Application of PAB Products to DensGlass Gold® Gypsum Sheathing” for greater detail.

2. Apply Surface Treatments/Primer

- Spray or roll walls at recommended coverage.
- Allow to dry approximately one hour or until primer is no longer wet.
- Only apply to recommended substrates, not to membrane.

3. Application Temperature

- Apply PAB Detail Membrane in dry weather when air and surface temperatures are above 25°F (-4°C).

4. Application

- Pre-cut membrane into easily handled lengths.
- Peel release paper from roll to expose rubberized asphalt and apply to substrate.
- Press firmly into place.
- Overlap adjacent pieces 2 in (50 mm) and roll lap with a steel hand roller.
- Apply Bituthene Mastic along all laps, seams, top edges, cuts and trowel into place. When installing PAB Detail Membrane against PAB Liquid or PAB VP, Bituthene Liquid Membrane should be used in lieu of Bituthene Mastic. Refer to appropriate PAB system details and data sheets for more information.
- If applying PAB Detail Membrane to PAB Liquid that is more than 7-days old Refer to Technical letter # 11 “Adhesion of Rubberized Asphalt Membranes to PAB Liquid in Air and Vapor Barrier Applications” for greater detail.

5. Visual Work Inspection

- Review all work.
- Patch all damaged areas or inadequately lapped seams with membrane and seal with Bituthene Mastic or Bituthene Liquid Membrane.
- Patch must extend 6 in (150 mm) each direction from the damaged area.

6. Membrane Protection

- PAB Detail Membrane must be protected from damage by other trades or construction materials.

7. Storage and Handling Information

- Store membrane where temperatures will not exceed 90°F (32°C) for extended periods.

8. Limitations

- PAB Detail Membrane should not be used in areas where it will be permanently exposed to sunlight, weather, or traffic.
- Maximum exposure period is 30 days.

Application Instructions

For complete application instructions refer to the technical data sheet for PAB Aluminum Flashing found at www.graceconstruction.com

PAB Aluminum Flashing can be used in lieu of Perm-A-Barrier Detail Membrane. PAB Aluminum Flashing cannot be used in lieu of Perm-A-Barrier Wall Flashing.

1. Prepare Substrate

- All surfaces must be sound and free from spalled areas, loose aggregate, loose nails or screws, sharp protrusions or other matter.
- Clean loose dust or dirt from the surface using a clean, dry cloth or brush.
- For green or damp concrete substrates, allow it to dry or use Bituthene B2 (or LVC) Primer to prepare the area to receive the membrane.
- Refer to Technical letter # 2 “Substrate Preparation for Application of PAB Products to Glass-Mat Faced Gypsum Sheathing” for greater detail.

2. Apply Surface Treatments/Primer

- Spray or roll walls at recommended coverage.
- Allow to dry approximately one hour or until primer is no longer wet.
- Only apply to recommended substrates, not to membrane.

3. Application Temperature

- Apply PAB Aluminum Flashing in dry weather when air and surface temperatures are above 25°F (-4°C).

4. Application

- Pre-cut membrane into easily handled lengths.
- Peel release paper from roll to expose rubberized asphalt and apply to substrate.
- Press firmly into place.
- Overlap adjacent pieces 2 in (50 mm) and roll lap with a steel hand roller.
- Apply Bituthene Mastic along all laps, seams, top edges, cuts and trowel into place.
- If applying PAB Aluminum Flashing to PAB Liquid that is more than 7-days old Refer to Technical letter # 11 “Adhesion of Rubberized Asphalt Membranes to PAB Liquid in Air and Vapor Barrier Applications” for greater detail.

5. Visual Work Inspection

- Review all work.
- Patch all damaged areas or inadequately lapped seams with membrane and seal with Bituthene Mastic or Bituthene Liquid Membrane.
- Patch must extend 6 in (150 mm) each direction from the damaged area.

6. Membrane Protection

- PAB Aluminum Flashing must be protected from damage by other trades or construction materials.

7. Storage and Handling Information

- Store membrane where temperatures will not exceed 90°F (32°C) for extended periods

8. Limitations

- PAB Aluminum Flashing should not be used in areas where it will be permanently exposed to sunlight, weather, or traffic.

Application Instructions

For complete application instructions refer to the technical data sheet for PAB VP found at www.graceconstruction.com

1. Prepare Substrate

- All surfaces must be sound and free from spalled areas, loose aggregate, loose nails or screws, sharp protrusions or other matter.
- Clean loose dust or dirt from the surface using a clean, dry cloth or brush.
- All panel joints should be taped and all mortar joints should be full and flush.

2. Application to "Green" or Damp Concrete Substrates

- PAB VP may be applied to "green" concrete or over surfaces that are damp to the touch (minimum 3-day cure time).
- Remove any visible water prior to application.
- Do not apply PAB VP in wet weather.
- Once dry, the membranes will not be affected by light rain showers.

3. Application Temperature

- The minimum temperature for spray application is 40°F (4°C).

4. Detailing

- Detailing should be completed prior to applying the full coverage of PAB VP.
- The continuous field application should completely cover the detail areas to provide double thickness coverage.
- Transitions to beams, columns, window and door frames, etc. should be made with a strip of PAB Wall Flashing.
- Optimum adhesion will be achieved when the tape is lapped onto the cured PAB VP.
- Gaps around penetrations should be caulked with a compatible sealant. Consult technical letter #13 for further information.

5. Thickness Control

- Thickness is controlled by marking the area and spot-checking the thickness with a wet film thickness gauge.
- Swipe marks on the PAB VP membrane are acceptable as long as the minimum thickness is maintained.

6. Visual Work Inspection

- Review all work.
- Damaged PAB VP should be repaired by cutting away the affected area. The exposed area should then be patched with PAB VP to give a minimum overlap of 6 in (150 mm) onto the existing PAB VP.
- Where the surrounding area of damaged PAB is contaminated, it should be pressure washed or lightly abraded with a wire brush, course sanding disc or similar method to ensure good adhesion.

7. Application of Insulation and Finishes

- PAB VP is not suitable for permanent exposure and should be protected from the effects of sunlight.
- Insulation clips are recommended for long-term attachment.
- If the insulation cannot be applied within 150 days of application of the PAB VP, temporary protection should be used to protect the product from the effects of sunlight.

8. Cleaning

- Tools and equipment are most effectively cleaned using a damp cloth and removing as much material as soon as possible to prevent curing on tools and equipment.
- Flush all equipment with water for short term shut down and with flushing oil for long-term shutdown.

9. Storage and Handling Information

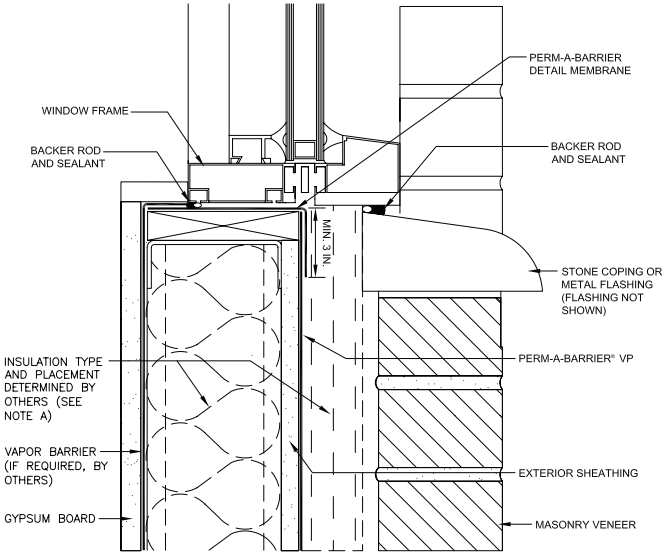
- PAB VP containers should be stored under cover in original sealed containers above 40°F (4°C) and below 100°F (38°C).
- Keep from freezing during storage. The shelf life is 9 months in unopened containers.

10. Limitations

- PAB VP membranes should not be used in areas where they will be permanently exposed to sunlight, weather or traffic.
- Maximum exposure period is 180 days.

■ PVP-001 – Window Sill

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the vertical surface of the PAB VP.
3. Apply PAB VP and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

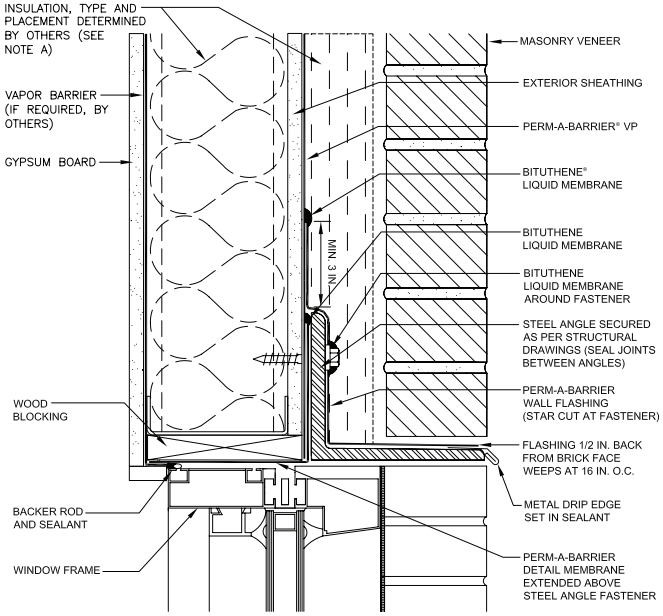
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-002 – Window Head

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending the membrane above the steel angle/fastener; seal termination with Liquid Membrane.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel angle, extending down over the steel angle stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB VP, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

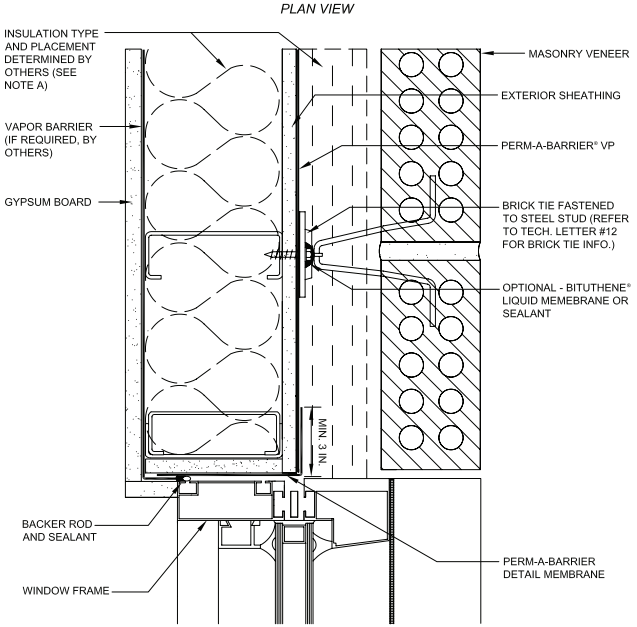
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-003 – Window Jamb

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the PAB VP.
3. Optional: Apply Liquid Membrane or sealant at brick tie fastener.
4. Apply PAB VP, and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

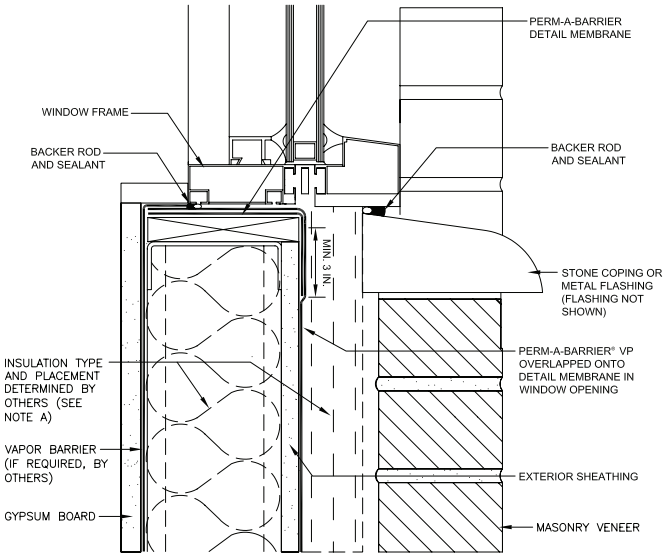
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-004 – Window Sill

(Option B-1)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending down onto the vertical substrate a minimum of 3 in (75 mm).
2. Apply PAB VP as shown ensuring a minimum 3 in (75 mm) overlap onto the vertical portion of Detail Membrane, extend onto the horizontal surface covering the Detail Membrane to create a double membrane layer.
3. Apply PAB VP and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

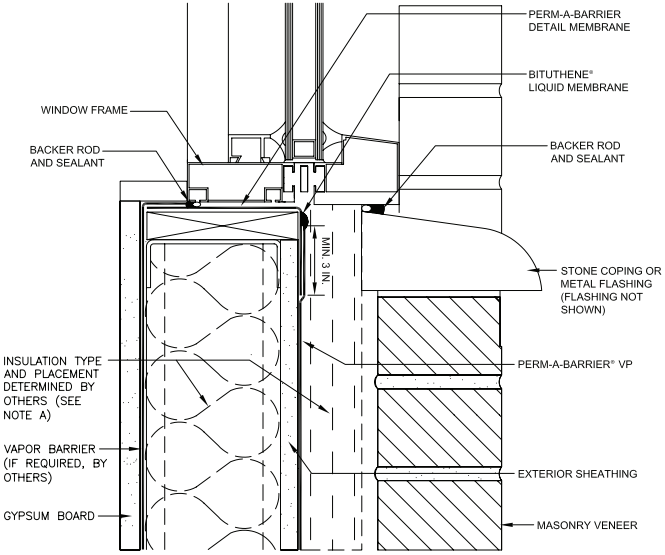
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-005 – Window Sill

(Option B-2)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending down onto the vertical substrate a minimum of 3 in (75 mm).
2. Apply PAB VP as shown ensuring a minimum 3 in (75 mm) overlap onto the vertical portion of Detail Membrane.
3. Seal PAB VP termination with Liquid Membrane.
4. Apply PAB VP and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

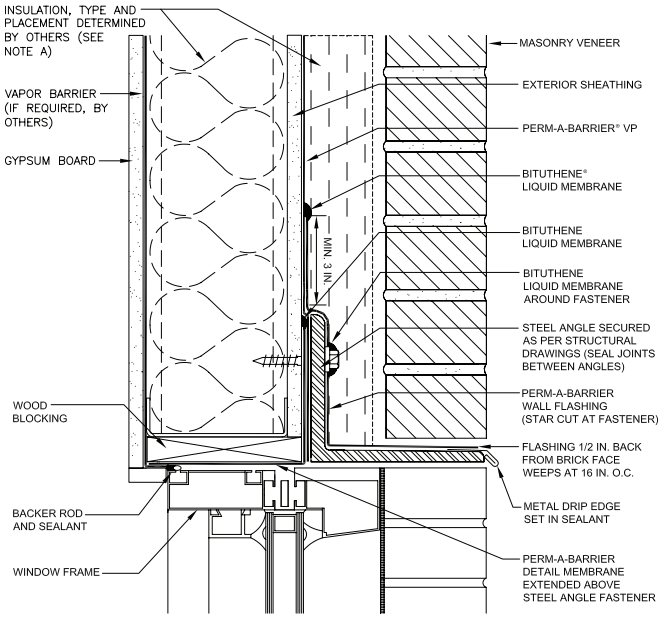
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-006 – Window Head

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending the membrane above the steel angle/fastener; seal termination with Liquid Membrane.
2. Apply PAB VP onto substrate overlapping the PAB Detail Membrane.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel angle, extending down over the steel angle stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB VP, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

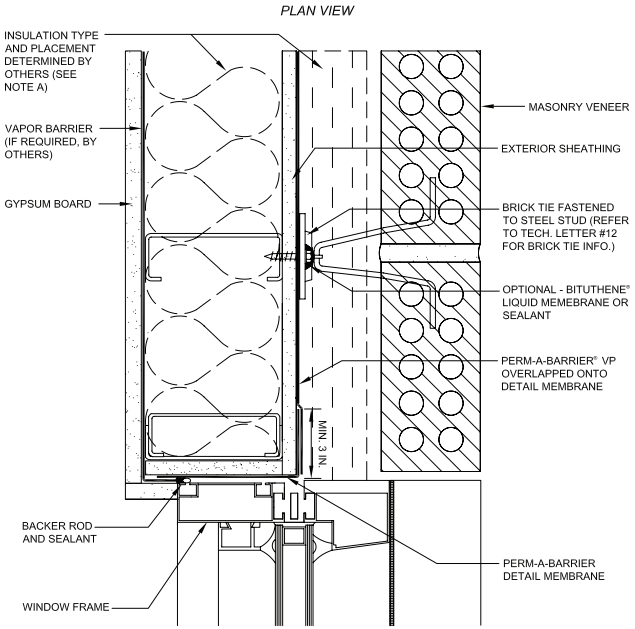
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-007 – Window Jamb

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the exterior sheathing.
2. Apply PAB VP onto substrate overlapping the PAB Detail Membrane by a minimum of 3 in (75 mm).
3. Optional: Apply Liquid Membrane or sealant at brick tie fastener.
4. Apply PAB VP and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

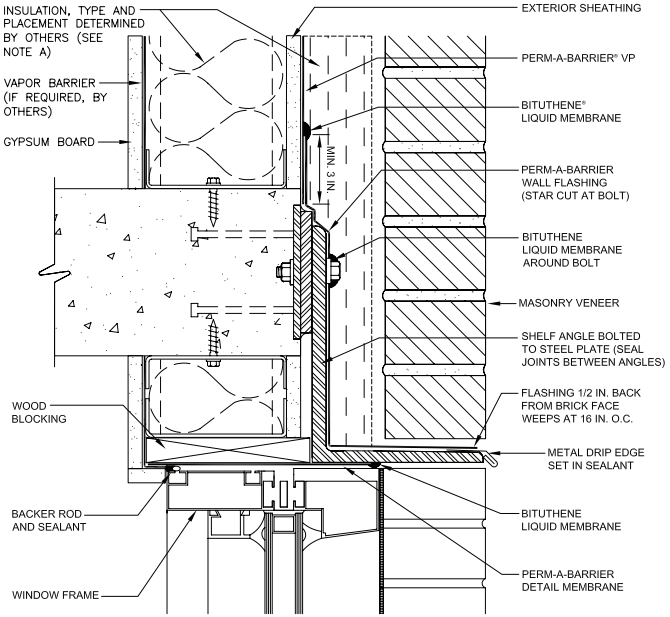
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-008 – Window Head at Floor

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown, sealing termination against the steel angle with Liquid Membrane.
2. Apply PAB VP onto substrate in accordance with the data sheet section on Installation.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB VP, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

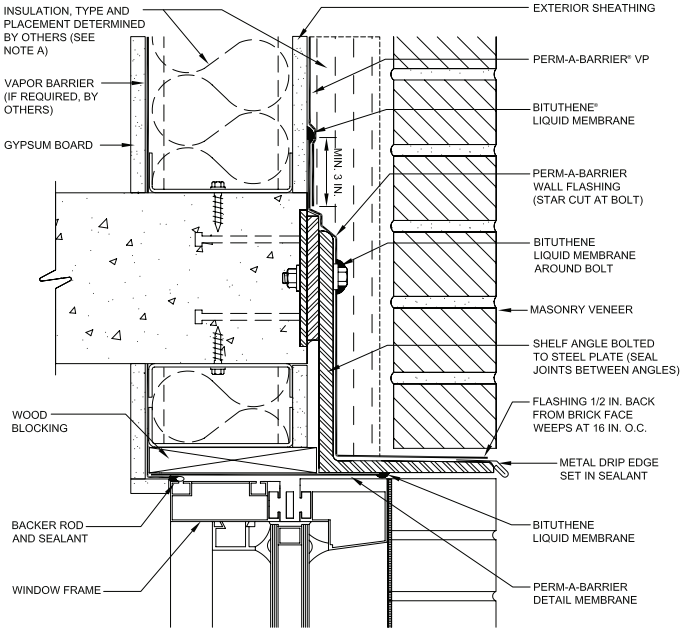
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-009 – Window Head at Floor

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown, sealing termination against the steel angle with Liquid Membrane.
2. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
3. Seal PAB Wall Flashing terminations with Liquid Membrane.
4. Apply PAB VP onto substrate overlapping the PAB Wall Flashing a minimum of 3 in (75 mm).
5. Apply PAB VP, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

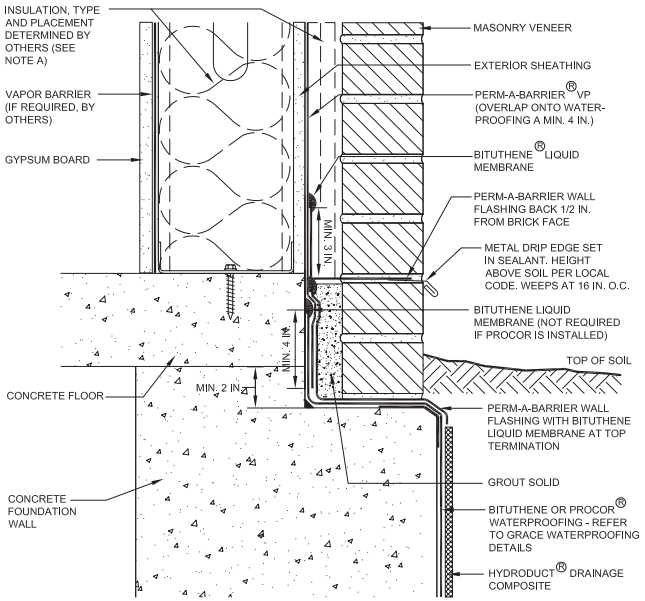
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-010 – Foundation

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Install a 0.75 in (20 mm) fillet of Liquid Membrane in corner extending 2.5” (65 mm) onto the vertical and horizontal portion of brick shelf.
2. Extend Bituthene® or Procor® from the foundation onto the horizontal brick shelf and vertically up the foundation and or concrete slab a minimum of 6 in (150 mm). If Bituthene is used the termination must be sealed with Liquid Membrane.
3. Apply PAB VP onto substrate overlapping the foundation waterproofing a minimum of 4 in (100 mm).
4. Apply PAB Wall Flashing from the top of the cavity to be grouted extending over the brick shelf and onto the vertical face of the below grade wall, seal the PAB Wall Flashing top termination with Liquid Membrane.
5. Apply Hydroduct Drainage Composite according to Hydroduct data sheet.
6. Grout space below weeps as shown.
7. Apply PAB Wall Flashing overlapping the PAB VP by a minimum of 3 in (75 mm) on the vertical surface and extending through the wall and stopping the 0.5 in (13 mm) from the brick face. Seal PAB Wall Flashing terminations with Liquid Membrane.
8. Apply PAB VP, Wall Flashing, Bituthene, Procor and Hydroduct according to the installation instructions found on the appropriate data sheets.

Special Notes

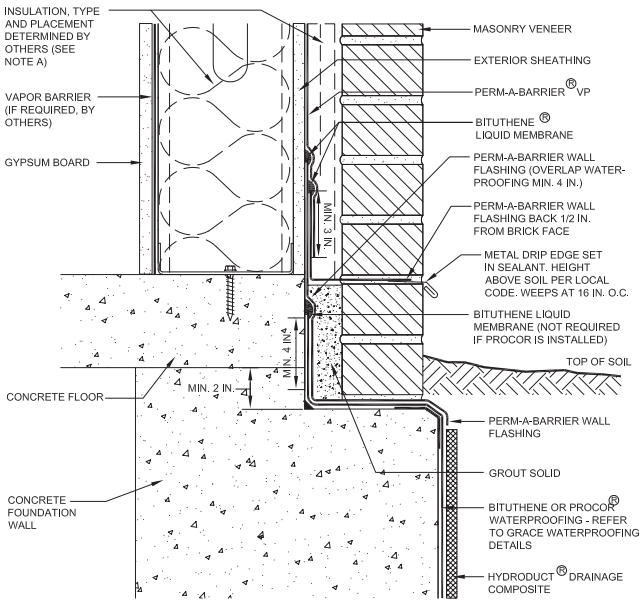
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-011 – Foundation

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Install a 0.75 in (20 mm) fillet of Liquid Membrane in corner extending 2.5” (65 mm) onto the vertical and horizontal portion of brick shelf.
2. Extend Bituthene® or Procor® from the foundation onto the horizontal brick shelf and vertically up the foundation and or concrete slab a minimum of 6 in (150 mm). If Bituthene is used the termination must be sealed with Liquid Membrane.
3. Apply PAB Wall Flashing as shown onto substrate overlapping the foundation waterproofing a minimum of 4 in (100 mm) and extend over the brick shelf and onto the vertical face of the below grade wall, seal the PAB Wall Flashing top termination with Liquid Membrane.
4. Apply Hydroduct Drainage Composite according to Hydroduct data sheet..
5. Grout space below weeps as shown.
6. Apply PAB Wall Flashing overlapping the previously installed PAB Wall Flashing by a minimum of 3 in (75 mm) on the vertical surface and extending through the wall and stopping the 0.5 in (13 mm) from the brick face. Seal PAB Wall Flashing terminations with Liquid Membrane.
7. Apply PAB VP onto substrate overlapping the PAB Wall Flashing a minimum of 3 in (75 mm).
8. Apply PAB VP, Wall Flashing, Bituthene, Procor and Hydroduct according to the installation instructions found on the appropriate data sheets.

Special Notes

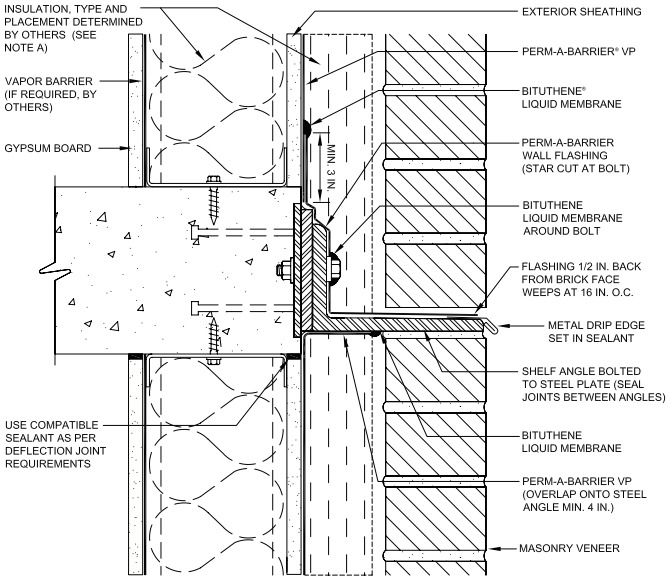
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-012 – Shelf Angle

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate below steel angle overlapping onto the steel angle by a minimum of 4 in (100 mm). Seal termination with Liquid Membrane.
2. Apply PAB VP onto substrate above steel angle as shown.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB VP and Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

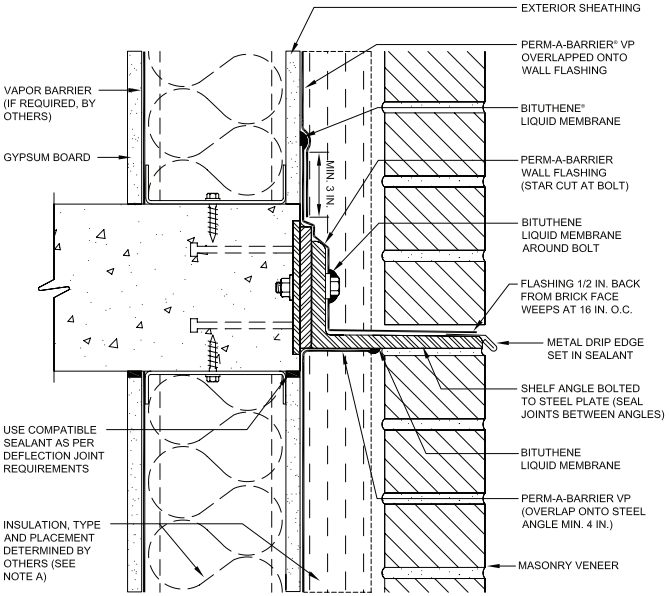
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-013 – Shelf Angle

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate below steel angle overlapping onto the steel angle by a minimum of 4 in (100 mm). Seal termination with Liquid Membrane.
2. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
3. Seal PAB Wall Flashing terminations with Liquid Membrane.
4. Apply PAB VP onto substrate overlapping the vertical portion of PAB Wall Flashing by a minimum of 3 in (75 mm).
5. Apply PAB VP and Wall Flashing according to the installation instructions found on the appropriate data sheets.

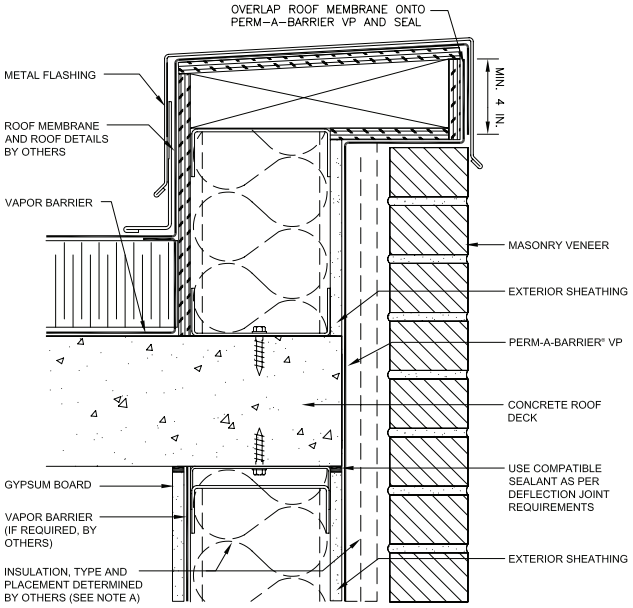
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-014 – Parapet



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate in accordance with the data sheet section on installation.
2. Roofing membrane (by others) should overlap PAB VP by a minimum of 4 in (100 mm).
3. Apply PAB VP according to the installation instructions found on the appropriate data sheets.

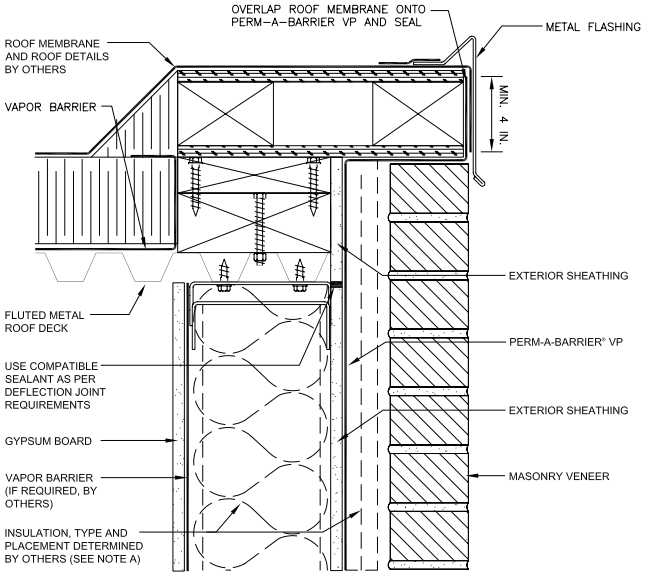
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-015 – Roof Edge



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate in accordance with the data sheet section on installation.
2. Roofing membrane (by others) should overlap PAB VP by a minimum of 4 in (100 mm).
3. Apply PAB VP according to the installation instructions found on the appropriate data sheets.

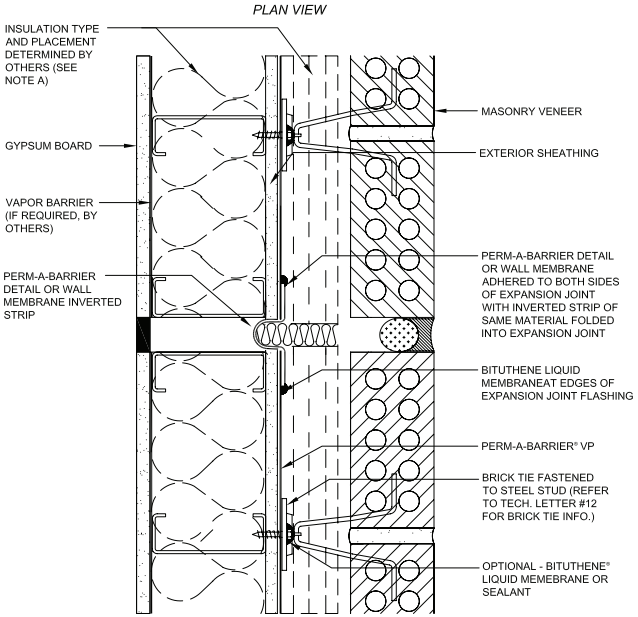
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-016 – Expansion Joint



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate as shown in accordance with the data sheet section on installation.
2. Apply PAB Wall or Detail Membrane so that it is adhered to both sides of the expansion joint with an inverted strip of same material folded into the expansion joint as shown.
3. Seal the edges of the expansion joint flashing with Liquid Membrane.
4. Optional: Apply Liquid Membrane or sealant at brick tie fastener.
5. Apply PAB VP, Wall and Detail Membrane according to the installation instructions found on the appropriate data sheets.

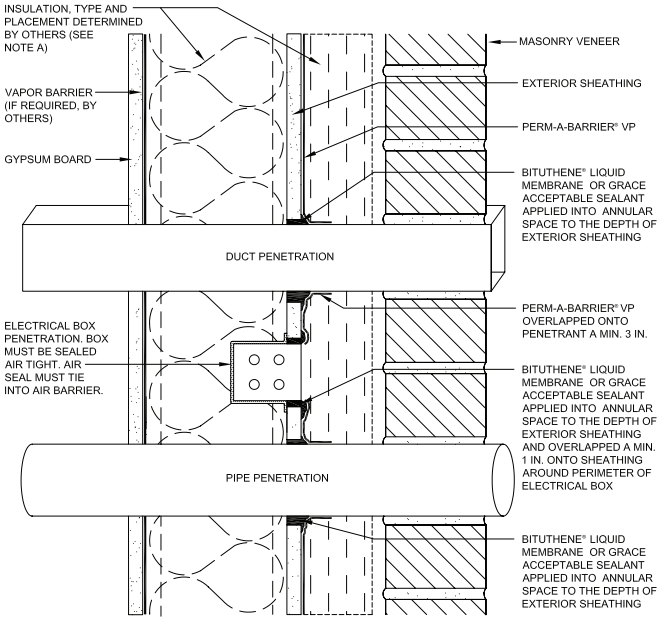
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-017 – Penetration



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply Liquid Membrane or Grace acceptable sealant into the annular space to the depth of the exterior sheathing and overlap 1 in (25 mm) onto sheathing around perimeter of penetration.
2. Apply PAB VP as shown overlapping onto penetration a minimum of 3 in (75 mm) if applicable.
3. Apply PAB VP according to the installation instructions found on the appropriate data sheets.

Special Notes

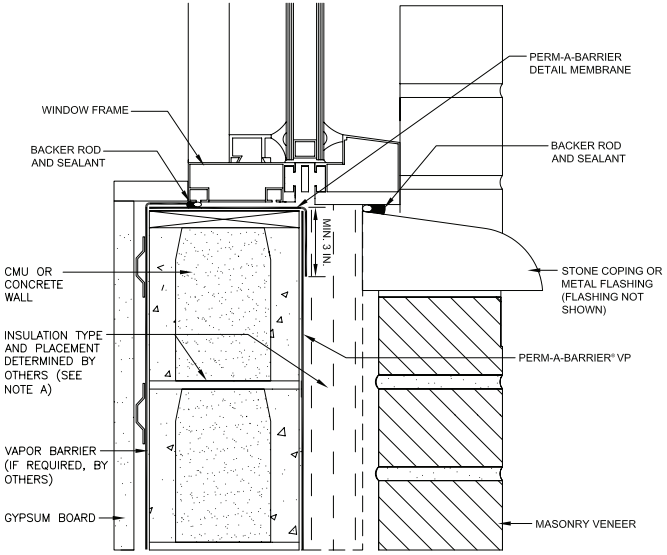
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-101 – Window Sill

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the vertical surface of the PAB VP.
3. Apply PAB VP and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

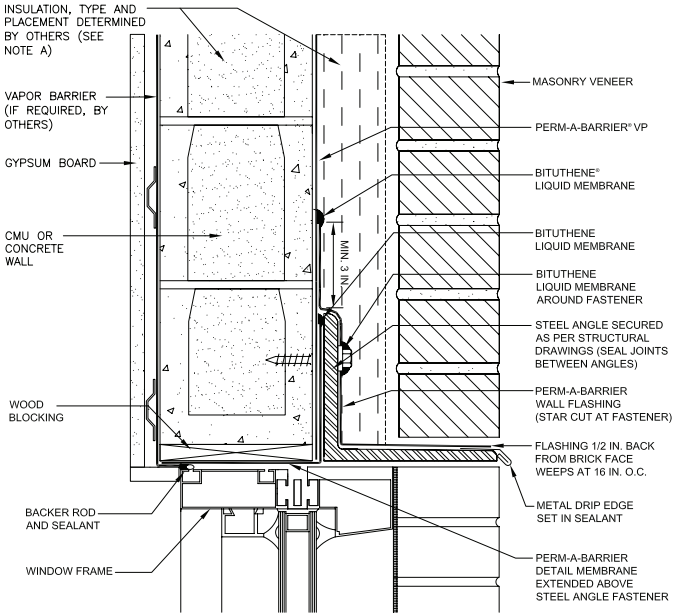
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-102 – Window Head

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending the membrane above the steel angle/fastener; seal termination with Liquid Membrane.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel angle, extending down over the steel angle stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB VP, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

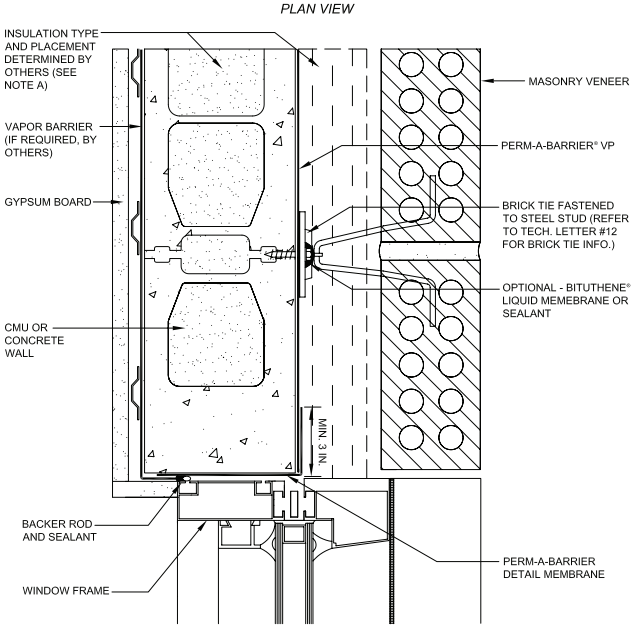
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-103 – Window Jamb

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate in accordance with the data sheet section on installation.
2. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the PAB VP.
3. Optional: Apply Liquid Membrane or sealant at brick tie fastener.
4. Apply PAB VP, and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

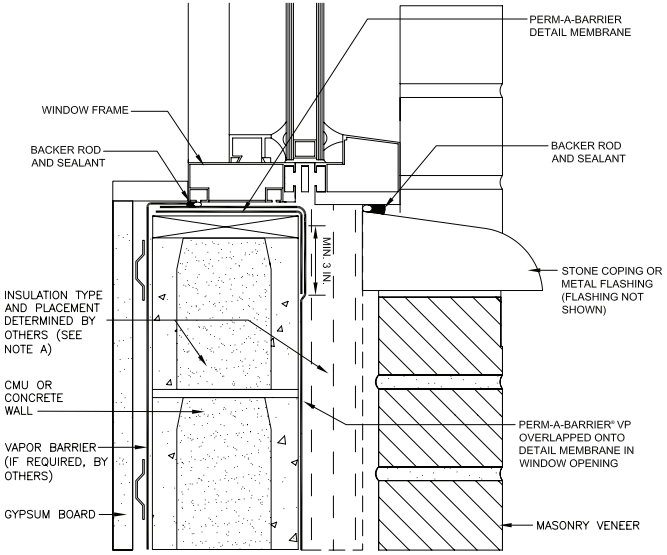
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-104 – Window Sill

(Option B-1)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending down onto the vertical substrate a minimum of 3 in (75 mm).
2. Apply PAB VP as shown ensuring a minimum 3 in (75 mm) overlap onto the vertical portion of Detail Membrane, extend onto the horizontal surface covering the Detail Membrane to create a double membrane layer.
3. Apply PAB VP and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

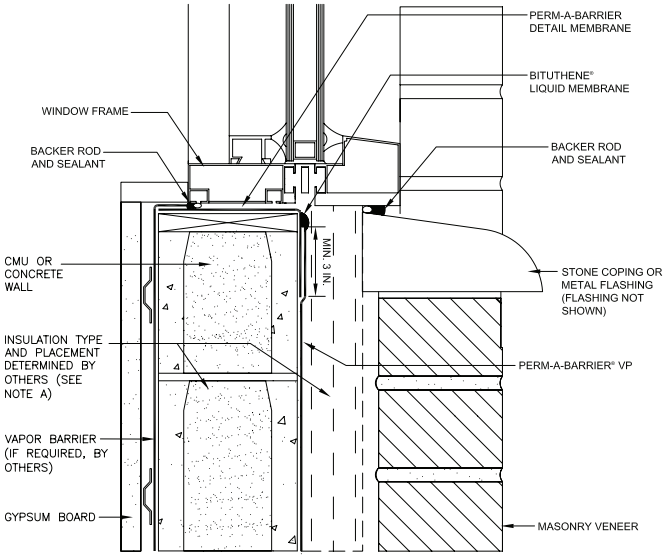
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-105 – Window Sill

(Option B-2)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending down onto the vertical substrate a minimum of 3 in (75 mm).
2. Apply PAB VP as shown ensuring a minimum 3 in (75 mm) overlap onto the vertical portion of Detail Membrane.
3. Seal PAB VP termination with Liquid Membrane.
4. Apply PAB VP and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

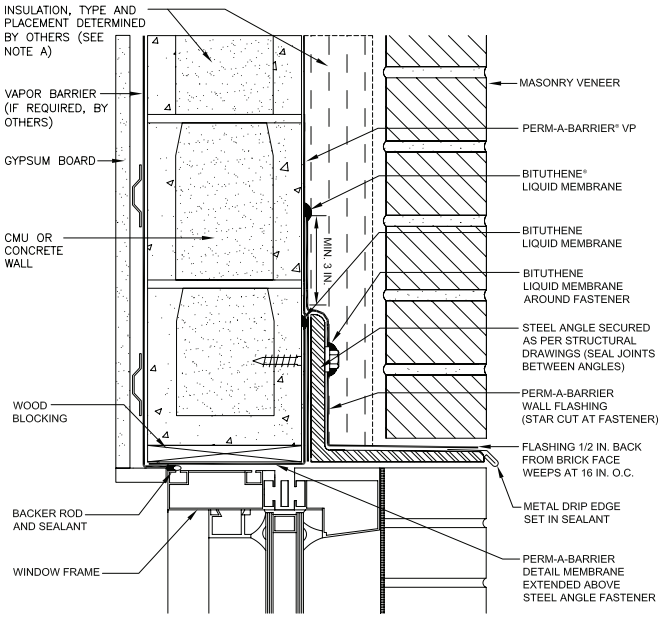
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-106 – Window Head

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending the membrane above the steel angle/fastener; seal termination with Liquid Membrane.
2. Apply PAB VP onto substrate overlapping the PAB Detail Membrane.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel angle, extending down over the steel angle stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB VP, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

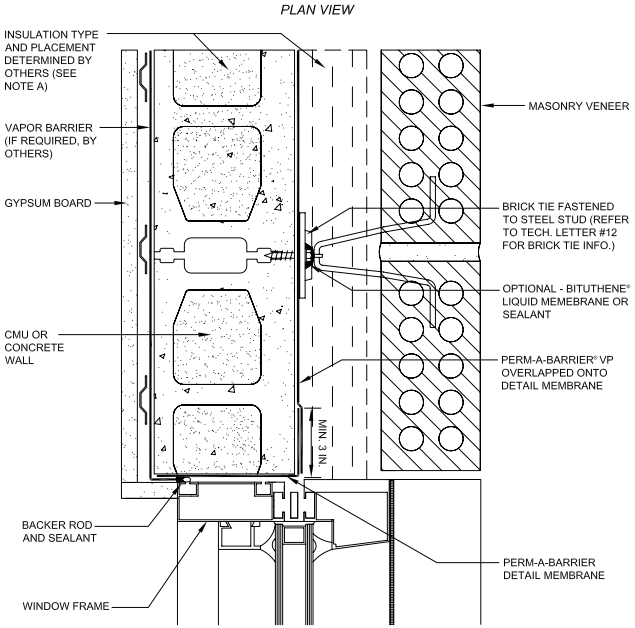
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-107 – Window Jamb

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown extending a minimum of 3 in (75 mm) onto the exterior face of the CMU or concrete wall.
2. Apply PAB VP onto substrate overlapping the PAB Detail Membrane by a minimum of 3 in (75 mm).
3. Optional: Apply Liquid Membrane or sealant at brick tie fastener.
4. Apply PAB VP and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

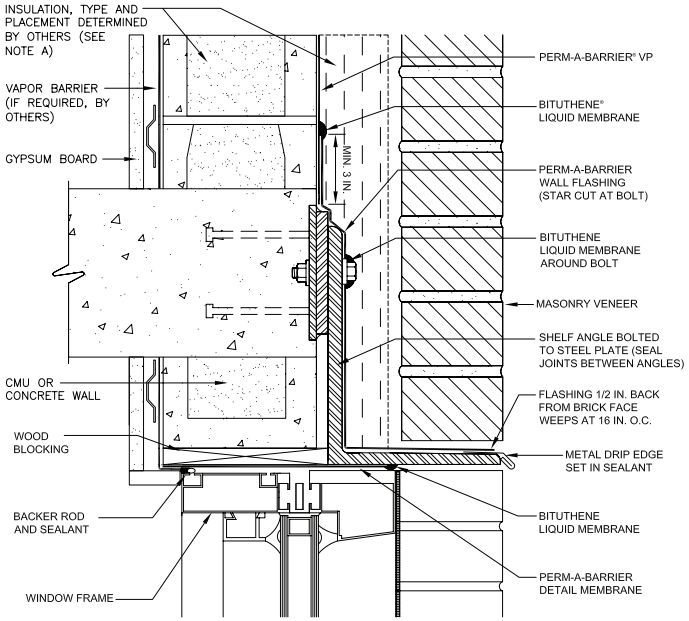
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-108 – Window Head at Floor

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown, sealing termination against the steel angle with Liquid Membrane.
2. Apply PAB VP onto substrate in accordance with the data sheet section on Installation.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB VP, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

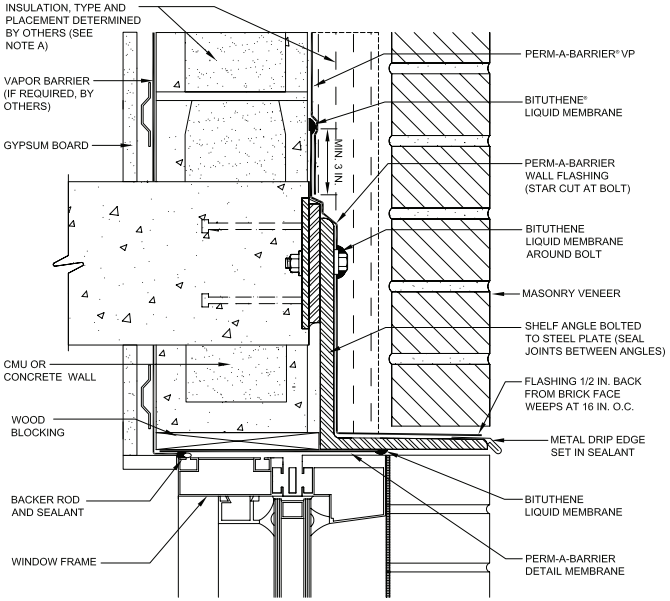
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-109 – Window Head at Floor

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB Detail Membrane as shown, sealing termination against the steel angle with Liquid Membrane.
2. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel angle stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
3. Seal PAB Wall Flashing terminations with Liquid Membrane.
4. Apply PAB VP onto substrate overlapping the PAB Wall Flashing a minimum of 3 in (75 mm).
5. Apply PAB VP, Wall Flashing and Detail Membrane according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

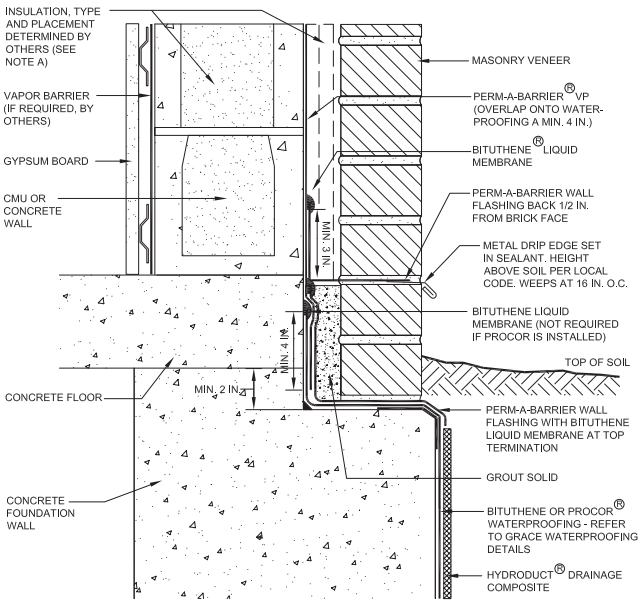
B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Ensure window system is properly aligned with wall insulation and installed per the window manufacturer's recommendation to ensure continuity of the air barrier system.

D. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-110 – Foundation

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Install a 0.75 in (20 mm) fillet of Liquid Membrane in corner extending 2.5” (65 mm) onto the vertical and horizontal portion of brick shelf.
2. Extend Bituthene® or Procor® from the foundation onto the horizontal brick shelf and vertically up the foundation and or concrete slab a minimum of 6 in (150 mm). If Bituthene is used the termination must be sealed with Liquid Membrane.
3. Apply PAB VP onto substrate overlapping the foundation waterproofing a minimum of 4 in (100 mm).
4. Apply PAB Wall Flashing from the top of the cavity to be grouted extending over the brick shelf and onto the vertical face of the below grade wall, seal the PAB Wall Flashing top termination with Liquid Membrane.
5. Apply Hydroduct Drainage Composite according to Hydroduct data sheet.
6. Grout space below weeps as shown.
7. Apply PAB Wall Flashing overlapping the PAB VP by a minimum of 3 in (75 mm) on the vertical surface and extending through the wall and stopping the 0.5 in (13 mm) from the brick face. Seal PAB Wall Flashing terminations with Liquid Membrane.
8. Apply PAB VP, Wall Flashing, Bituthene, Procor and Hydroduct according to the installation instructions found on the appropriate data sheets.

Special Notes

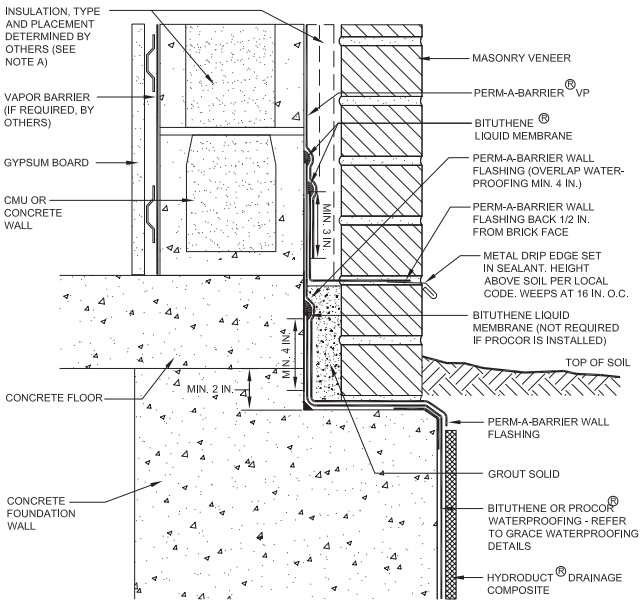
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-111 – Foundation

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Install a 0.75 in (20 mm) fillet of Liquid Membrane in corner extending 2.5” (65 mm) onto the vertical and horizontal portion of brick shelf.
2. Extend Bituthene® or Procor® from the foundation onto the horizontal brick shelf and vertically up the foundation and or concrete slab a minimum of 6 in (150 mm). If Bituthene is used the termination must be sealed with Liquid Membrane.
3. Apply PAB VP onto substrate overlapping the foundation waterproofing a minimum of 4 in (100 mm).
4. Apply PAB Wall Flashing from the top of the cavity to be grouted extending over the brick shelf and onto the vertical face of the below grade wall, seal the PAB Wall Flashing top termination with Liquid Membrane.
5. Apply Hydroduct Drainage Composite according to Hydroduct data sheet.
6. Grout space below weeps as shown.
7. Apply PAB Wall Flashing overlapping the PAB VP by a minimum of 3 in (75 mm) on the vertical surface and extending through the wall and stopping the 0.5 in (13 mm) from the brick face. Seal PAB Wall Flashing terminations with Liquid Membrane.
8. Apply PAB VP, Wall Flashing, Bituthene, Procor and Hydroduct according to the installation instructions found on the appropriate data sheets.

Special Notes

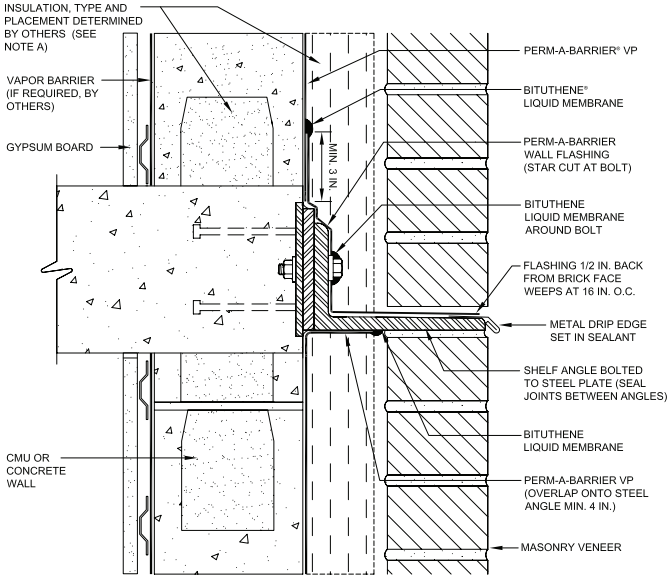
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-112 – Shelf Angle

(Option A)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate below steel angle overlapping onto the steel angle by a minimum of 4 in (100 mm). Seal termination with Liquid Membrane.
2. Apply PAB VP onto substrate above steel angle as shown.
3. Apply PAB Wall Flashing a minimum of 3 in (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
4. Seal PAB Wall Flashing terminations with Liquid Membrane.
5. Apply PAB VP and Wall Flashing according to the installation instructions found on the appropriate data sheets.

Special Notes

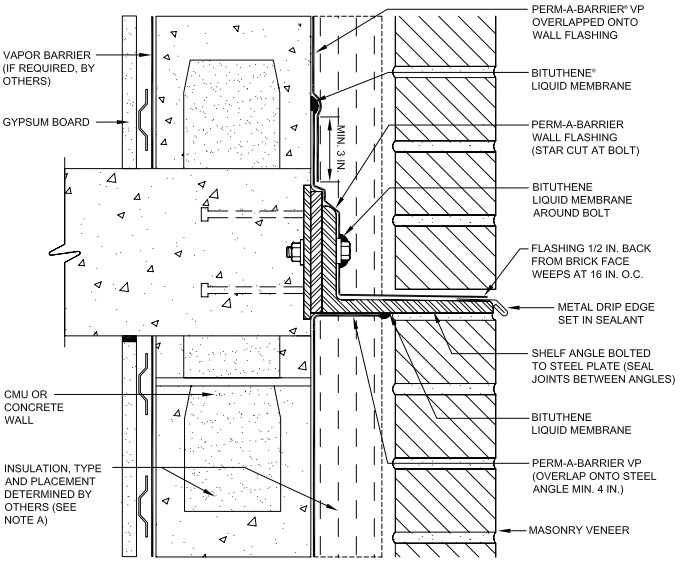
A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-113 – Shelf Angle

(Option B)



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate below steel angle overlapping onto the steel angle by a minimum of 4 in (100 mm). Seal termination with Liquid Membrane.
2. Apply PAB Wall Flashing a minimum of 3 in. (75 mm) above the steel, extending down over the steel stopping the flashing 0.5 in (13 mm) from the brick face. Star cut the membrane at fastener and seal with Liquid Membrane.
3. Seal PAB Wall Flashing terminations with Liquid Membrane.
4. Apply PAB VP onto substrate overlapping the vertical portion of PAB Wall Flashing by a minimum of 3 in (75 mm).
5. Apply PAB VP and Wall Flashing according to the installation instructions found on the appropriate data sheets.

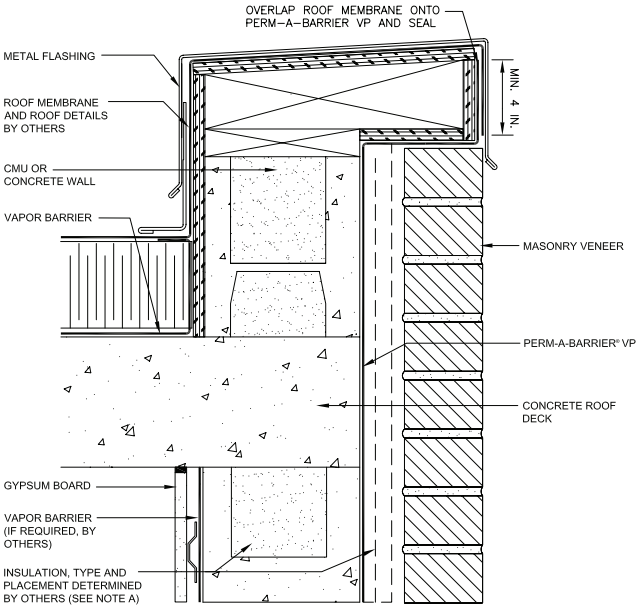
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-114 – Parapet



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate prime if applicable.

Detailing

1. Apply PAB VP onto substrate in accordance with the data sheet section on installation.
2. Roofing membrane (by others) should overlap PAB VP by a minimum of 4 in (100 mm).
3. Apply PAB VP according to the installation instructions found on the appropriate data sheets.

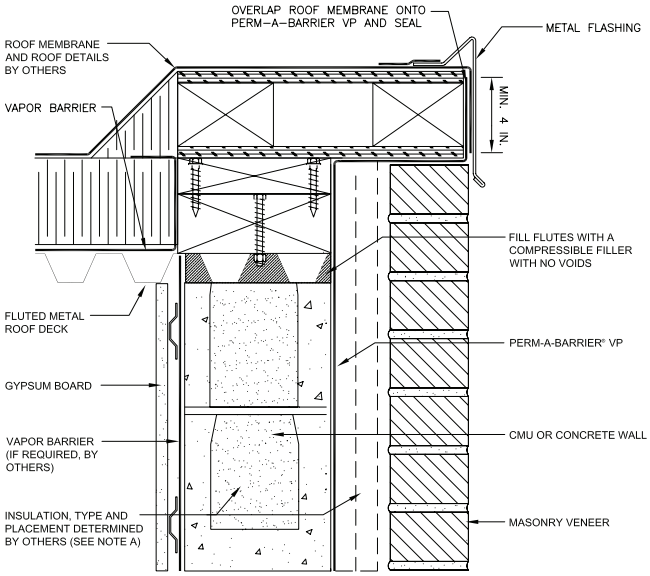
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-115 – Roof Edge



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate in accordance with the data sheet section on installation.
2. Roofing membrane (by others) should overlap PAB VP by a minimum of 4 in (100 mm).
3. Apply PAB VP according to the installation instructions found on the appropriate data sheets.

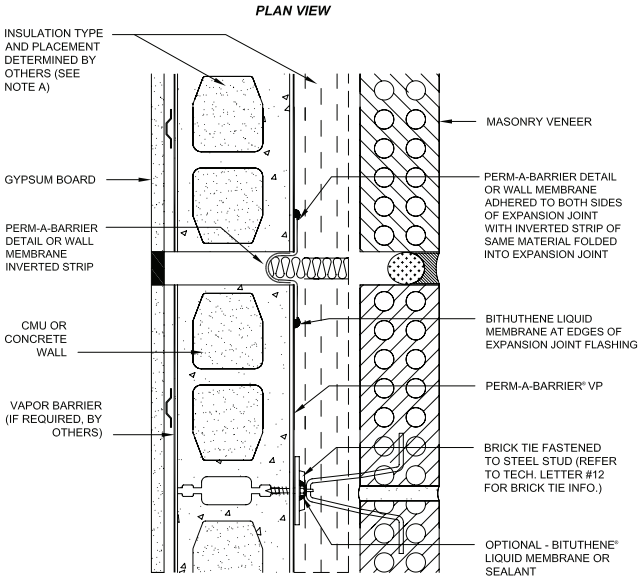
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-116 – Expansion Joint



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply PAB VP onto substrate as shown in accordance with the data sheet section on installation.
2. Apply PAB Wall or Detail Membrane so that it is adhered to both sides of the expansion joint with an inverted strip of same material folded into the expansion joint as shown.
3. Seal the edges of the expansion joint flashing with Liquid Membrane.
4. Optional: Apply Liquid Membrane or sealant at brick tie fastener.
5. Apply PAB VP, Wall and Detail Membrane according to the installation instructions found on the appropriate data sheets.

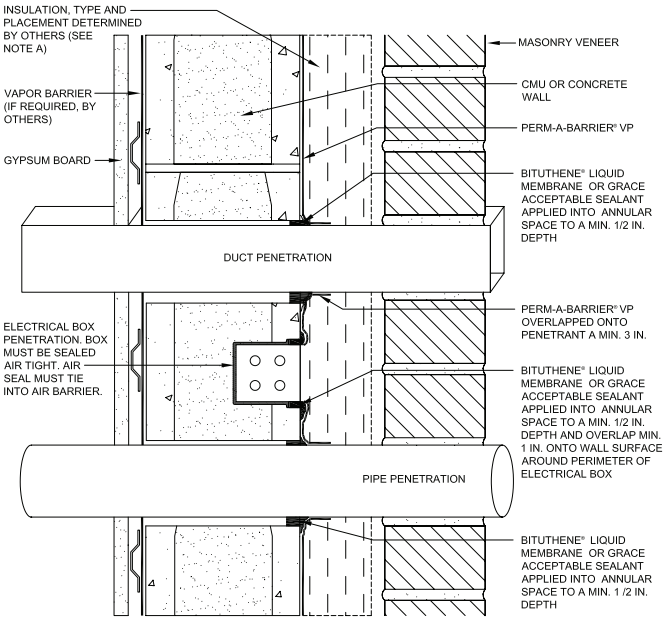
Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

■ PVP-117 – Penetration



Prior to Membrane Installation, Review the Perm-A-Barrier® VP Data Sheet

Surface Prep

All surfaces must be structurally sound and free from spalled areas, loose aggregate, sharp protrusions or other matter that will hinder the adhesion or regularity of the Perm-A-Barrier® (PAB) membrane installation. The surface should also be free from frost, dirt, grease, oil or other contaminants as outlined in the Perm-A-Barrier® VP Data Sheet section on Surface Preparation. Clean loose dust and dirt from the surface and prime with appropriate primer if applicable.

Detailing

1. Apply Liquid Membrane or Grace acceptable sealant into the annular space to the depth of the exterior sheathing and overlap 1 in (25 mm) onto sheathing around perimeter of penetration.
2. Apply PAB VP as shown overlapping onto penetration a minimum of 3 in (75 mm) if applicable.
3. Apply PAB VP according to the installation instructions found on the appropriate data sheets.

Special Notes

A. Detail not suitable for all climates. Avoiding excessive moisture accumulation in exterior walls is dependent on many factors including proper placement of insulation and air and vapor barriers in the wall. For assistance with exterior wall design, consult with a building science professional or a Grace representative.

B. To ensure a continuous air barrier across the building envelope, a fully continuous connection should be made to the roof system and Grace waterproofing system.

C. Install all Grace products in accordance with Grace product data sheets and Grace recommendations.

Application Instructions

For complete application instructions refer to the technical data sheet for PAB VPS and detail drawings found at www.graceconstruction.com

1. Prepare Substrate

- All surfaces must be sound and free from spalled areas, loose aggregate, loose nails or screws, sharp protrusions or other matter.
- Clean loose dust or dirt from the surface using a clean, dry cloth or brush.
- Refer to Technical letter # 2 “Substrate Preparation for Application of PAB Products to Glass-Mat Faced Gypsum Sheathing” for greater detail.

2. Apply Surface Treatment/Primer (Perm-A-Barrier® Primer Plus)

- Spray or roll walls at recommended coverage
- Allow to dry approximately until surface becomes tacky. Drying times may vary depending on temperature and humidity conditions.
- Only apply to recommended substrates, not to membrane.

3. Application Temperature

- Apply PAB VPS in dry weather when air and surface temperatures are above 40°F (5°C).

4. Application

- Apply PAB VPS horizontally or vertically to primed substrates receiving post-applied masonry anchors (ties), such as gypsum sheathing.
- Apply PAB VPS horizontally to the primed block work with projecting masonry anchors, beginning at the base of the wall.
- Each length of the membrane must be installed so that the upper edge runs continuously along the underside of the line of masonry anchors.
- Cut the membrane at the location of the tie wires projection from the wall to enable the sheet to be laid in place.
- All side and end laps must be a minimum of 2 in (50 mm), with all laps shedding water.
- In certain applications such as on soffits or ceilings, back nail the membrane along the side lap prior to installing the next sheet of membrane or install a termination bar that spans the soffit to ensure positive contact to the substrate.
- Fit membrane around all penetrations and seal using Bituthene® Liquid Membrane, Bituthene® Mastic or compatible sealant.
- Use Bituthene Liquid Membrane, Bituthene Mastic or compatible sealant along the top edge of the membrane at its termination.

5. Visual Work Inspection

- Review all work.
- Patch all damaged areas or inadequately lapped seams with membrane and seal with Bituthene Mastic, Bituthene Liquid Membrane or compatible sealant.
- Patch must extend 6 in (150 mm) each direction from the damaged area.

6. Membrane Protection

- PAB VPS must be protected from damage by other trades or construction materials.

7. Storage and Handling Information

- Store membrane where temperatures will not exceed 90°F (32°C) for extended periods.

8. Limitations

- PAB VPS should not be used in areas where it will be permanently exposed to sunlight, weather, or traffic.
- Maximum exposure period is 150 days.

Application Instructions

For complete application instructions refer to the technical data sheet for Florprufe 120 found at www.graceconstruction.com

1. Prepare Substrate

- Prepare substrate in accordance with ACI 302.1R section 4.1.
- Insure level and compact base.
- Surface does not need to be dry, but standing water must be removed.

2. Application Temperature

- Apply Florprufe 120 when air and surface temperatures are above 25°F (-4°C). Membrane installation is unaffected by wet weather.

3. Application

- Place the membrane with the smooth side down and the plastic liner side facing the concrete slab.
- Remove and discard liner.
- End laps should be staggered to avoid a build up of layers.

4. Laps

- Mechanically fasten laps at 39 in (1.0 m) maximum centers. Fix through the center of the lap area using 0.5 in (13 mm) long washer head, self-tapping, galvanized screws.
- Allow head to imbed into adhesive compound to self-seal.
- Affix membrane to itself. It is not necessary to secure membrane to substrate.
- Laps can be taped using Grace Preprufe® Tape for additional security. Remove release liner to ensure bond to concrete.

5. Detailing

- Mix and apply Bituthene Liquid Membrane® to seal around penetrations such as drainage pipes.

6. Visual Work Inspection

- Review all work.
- Repair slices and small punctures which are less than 0.5 in (13 mm) in using Preprufe Tape
- Repairs greater than 0.5 in (13 mm), apply a patch of membrane secured with Preprufe Tape. Patch should extend 6 in (150 mm) past damaged area in all directions.

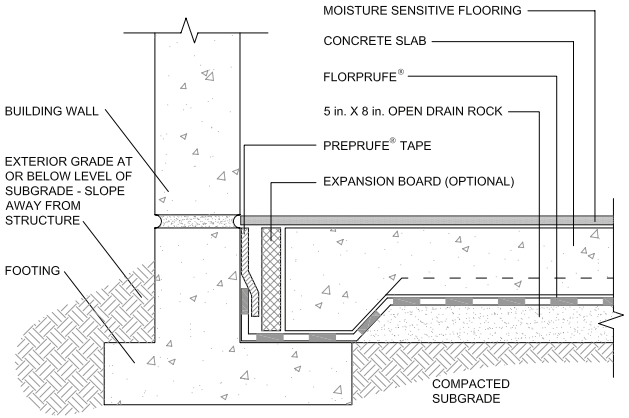
7. Membrane Protection

- Florprufe 120 must be protected from damage by other trades or construction materials.

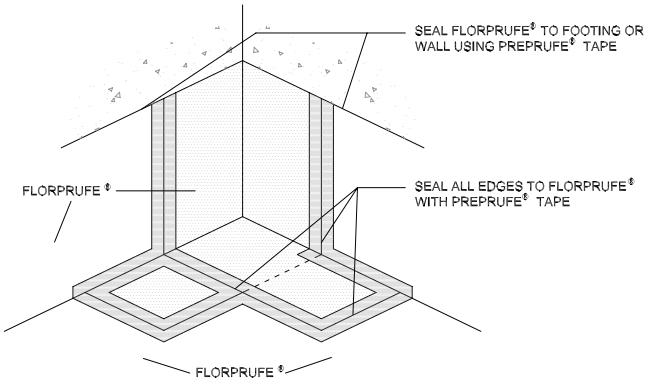
8. Concrete Placement

- Cast concrete within 30 days of application of the membrane.
- Ensure all liner is removed from membrane and tape before pouring the concrete.

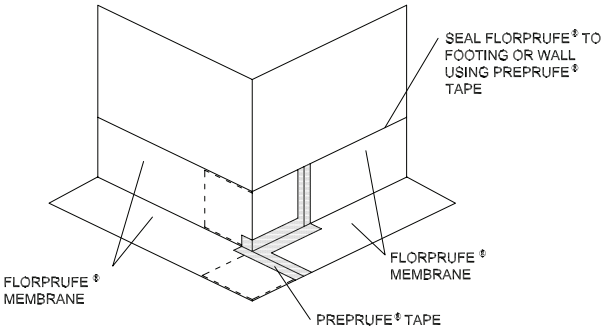
■ FLRDET-201 – Typical Assembly



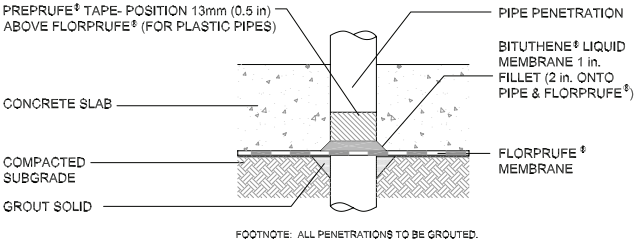
■ FLRDET-202 – Inside Corner



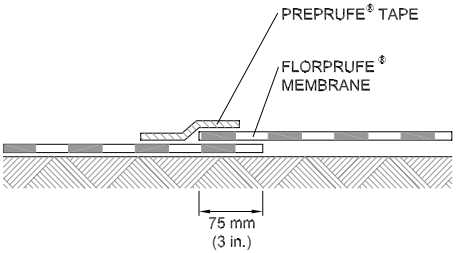
■ FLRDET-203 – Outside Corner



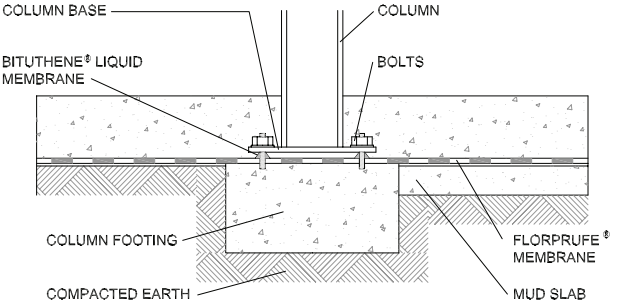
■ FLRDET-204 – Penetration



■ FLRDET-205 – Tape Lap Method



■ FLRDET-206 – Column



Perm-A-Barrier® WB Primer

Use

Perm-A-Barrier WB primer is used to facilitate adhesion of Perm-A-Barrier Wall Membrane, Wall Flashing and Detail Membrane to various substrates including DensGlass Gold®.

Safety, Storage and Handling Information

- Perm-A-Barrier WB Primer is nonflammable.
- Perm-A-Barrier WB Primer has a freezing point of 32°F (0°C).
- Read product label and the Material Safety Data Sheet before use.

Application

- Perm-A-Barrier WB Primer is packaged ready to use.
- For best results use a synthetic 0.5 in (13 mm), nap roller
- Apply Perm-A-Barrier WB Primer to clean, dry, frost-free surfaces at a coverage of 250-350 ft²/gal (6.0-8.0 m²/L).
- A moderately thick coating of primer should be applied and rolled out evenly.
- Back roll over all applied areas.
- Allow primer to dry 45 min – 1 hr in temperature 90°F (32°C) or greater, 1 – 3 hrs in 50°F (10°C) and 3 hrs + less than 50°F (10°C). Drying times could vary, depending on temperature, humidity, wind, sunlight and coverage rate.
- Do no prime polyethylene surfaces.
- Before primer dries tools should be cleaned with water.
- After primer dries tools should be cleaned with mineral spirits. Mineral spirits is a combustible liquid which can only be used in accordance with manufacturer's recommendations.
- Do no use solvents to clean hands or skin.
- Do not dilute with water or solvent.

Perm-A-Barrier® Primer Plus

Use

Perm-A-Barrier Primer Plus is a water-based primer which imparts an aggressive, high tack finish on the treated substrate. It is specifically designed to facilitate tenacious adhesion of Perm-A-Barrier VPS to various substrates including plywood, oriented strand board (OSB), concrete masonry units (CMU) and glass faced wall boards.

Safety, Storage and Handling Information

- Perm-A-Barrier Primer Plus is non flammable.
- It is important that Perm-A-Barrier Primer Plus be protected from freezing. Best storage temperature is 60–80°F (15–27°C). Higher temperatures reduce normal storage life. Lower temperatures can cause increased viscosity of a temporary nature. This primer will become unusable with prolonged storage below 40°F (4°C).
- The VOC (Volatile Organic Compound) content is <1 g/L, and it meets the U.S. EPA Volatile Organic Compound Emission Standard for Architectural Coatings.
- Read product label and the Material Safety Data Sheet before use.

Application

- Perm-A-Barrier Primer Plus is packaged ready to use.
- Apply primer in dry weather with ambient and substrate temperatures above 40°F (5°C). Surface must be dry and clean. Perm-A-Barrier Primer Plus can be applied by brush, roller or airless sprayer. Use typical brushes, rollers and air sprayers designed for use with latex.
- Apply at a coverage of 450–500 ft²/gal (11–12 m²/L) on Glass-mat faced gypsum sheathing such as DensGlass®. Gold. Additional primer may be required for CMU and Securock®.
- Allow Perm-A-Barrier Primer Plus to dry until surface becomes tacky. Drying times may vary depending on temperature and humidity conditions.
- Wet adhesive may be removed using soapy water. For dry primer, citrus based cleaners may be used.

Bituthene® Primer B2

Use

Bituthene® Primer B2 is used to prime "green" concrete, damp concrete, masonry or wood surfaces on which Bituthene waterproofing membranes will be applied.

Safety, Storage and Handling Information

- Bituthene Primer B2 vapors are flammable.
- Read product label and Material Safety Data Sheet before use.

Application

- Bituthene Primer B2 may be applied by roller or brush. Use a heavy nap roller made of natural material, such as lamb's wool.
- Apply it to clean dirt-free, frost-free surfaces at a coverage rate of 250-350 ft^2/gal (6-8 m^2/L).
- Do not apply to frozen concrete or to areas with standing or visible water.
- Do not use during wet weather.
- Allow Bituthene Primer B2 to dry one hour or until tack-free.
- Deep puddles of primer should be avoided as this will lengthen drying time.
- Back roll over all applied areas.
- Avoid pouring primer directly onto a horizontal substrate.
- In general, priming should be limited to an area that can be covered with Bituthene water-proofing membrane within 24 hours.
- Although it may be used on green concrete and damp surfaces, moisture may become trapped under the Bituthene waterproofing membrane. Therefore, cover the membrane as soon as possible to minimize blistering.
- If blistering occurs, allow membrane to cool and re-roll with heavy roller.
- Blisters over 4 in (100 mm) in diameter should be cut and patched.
- Do not prime polyethylene surfaces.
- Clean tools with mineral spirits at the end of each day. Mineral spirits is a combustible liquid and should be used only in accordance with the manufacturer's safety recommendations.
- Do not use solvents to clean hands or skin.

Bituthene® Primer B2 LVC

Use

Bituthene® Primer B2 LVC is used to prime "green" concrete, damp concrete, masonry or wood surfaces on which Bituthene waterproofing membranes will be applied.

Safety, Storage and Handling Information

- Bituthene Primer B2 LVC vapors are flammable.
- Read product label and Material Safety Data Sheet before use.

Application

- Bituthene Primer B2 LVC may be applied by roller or brush. Use a heavy nap roller made of natural material, such as lamb's wool.
- Apply it to clean dirt-free, frost-free surfaces at a coverage rate of 325-425 ft^2/gal (8-10.5 m^2/L).
- Do not apply to frozen concrete or to areas with standing or visible water.
- Do not use during wet weather.
- Allow Bituthene Primer B2 LVC to dry one hour or until tack-free.
- Deep puddles of primer should be avoided as this will lengthen drying time.
- Back roll over all applied areas.
- Avoid pouring primer directly onto a horizontal substrate.
- In general, priming should be limited to an area that can be covered with Bituthene water-proofing membrane within 24 hours.
- Although it may be used on green concrete and damp surfaces, moisture may become trapped under the Bituthene waterproofing membrane. Therefore, cover the membrane as soon as possible to minimize blistering.
- If blistering occurs, allow membrane to cool and re-roll with heavy roller.
- Blisters over 4 in (100 mm) in diameter should be cut and patched.
- Do not prime polyethylene surfaces.
- Clean tools with mineral spirits at the end of each day. Mineral spirits is a combustible liquid and should be used only in accordance with the manufacturer's safety recommendations.
- Do not use solvents to clean hands or skin.

Procor® Concrete Sealer

Use

- Procor® Concrete Sealer is used to mitigate problems associated with the application of Procor to cast concrete and masonry substrates in conditions where an air or vapor drive is likely to cause blistering or pinholing of the Procor surface.

Safety, Storage and Handling

- Procor Concrete Sealer is nonflammable.
- Store above freezing 32°F (0°C).
- Read product label and Material Safety Data Sheet before use.

Application

- All cementitious surfaces must be free from frost, dirt, grease, oil or other contaminants.
- All substrates must be wire-brushed, swept with a stiff broom, or blown off with compressed air to remove dirt, dust and loose stones.
- If in doubt about the suitability of the surface or method of surface preparation, a test patch should be prepared and adhesion assessed.

Horizontal Applications

Roller Technique

- A moderately thick coating should be applied and rolled out evenly using a 0.5 in nap roller.
- A properly applied coating will have uniform coverage and leave a slight sheen to the concrete surface when dry.
- When rolling out the primer, avoid puddling and work the material into the surface of the concrete.
- If a second coat is needed, it is recommended that the time between the first and second coat is at least 1/2 hour.

Airless Spray Technique

- It is critical that the spray applied coating be applied heavily enough and to ensure an even coat. Too heavy a coating is preferred over too light.
- A properly applied coating will make the concrete look wet as it is applied and will impart a slight sheen to the concrete surface when it dries.
- Standard airless spray equipment is suitable.
- Use enough pressure to yield uniform spray, usually around 1000 psi (17 bar).
- Tip sizes of 0.020 in.-0.030 in. (0.51 mm-0.76 mm) are preferred.
- For maximum performance, it is HIGHLY RECOMMENDED that if spray application is used, another worker follow with a roller to work the material into the surface.
- A spray applied coating that is not back rolled will not be as effective in preventing blisters or pinholes.

Vertical Applications

Roller Technique

- The same technique as for the horizontal orientation should be followed for the vertical orientation.
- It is recommended that the roller be reloaded with material more frequently for the vertical orientation and worked into the surface to fill in surface imperfections.

Spray Technique

- When spraying the primer onto a vertical surface, the best results will be achieved when the above guidelines are followed.
- It is HIGHLY RECOMMENDED that a final quick spray be completed from BOTTOM TO TOP, with the spray nozzle angled upward during spraying. This will force Procor Concrete Sealer into all exposed surface imperfections. Failure to do this may result in a poor coating and ultimately blisters or pinholes in the applied Procor.
- As with spraying on horizontal deck, it is highly recommended to work the material in with a roller.

Highly Porous Block

- For highly porous block, spray techniques are not recommended for applying the Procor Concrete Sealer.
- The recommended technique is to use a synthetic roller with a 0.5 in nap.

Bituthene® Liquid Membrane

Use

- The two parts of Bituthene® Liquid Membrane are mixed on site and trowelled to provide a simple and quick waterproofing detailing aid in conjunction with Bituthene, Preprufe® and Procor® systems. Liquid Membrane is ideally suited for the following uses:
- Fillet material at inside corners
- Reinforcement material at inside corners
- Flashing material around drains, protrusions, curbs and parapets
- Sealing material at terminations
- Repair material for defects on concrete surfaces
- Flashing material at corners

Compatibility

- Liquid Membrane is completely compatible with Bituthene, Preprufe and Procor and with existing asphalt or coal tar-based waterproofing materials.
- It is also compatible with cured silicone and polyurethane sealants.
- It is not compatible with creosote, pentachlorophenol, linseed oil or polysulfide-based sealants.

Safety, Storage and Handling Information

- Read product label and Material Safety Data Sheet before use.

Application Procedures

- All surfaces must be dry and free from dirt, grease, oil, dust or other contaminants.
- Bituthene Liquid Membrane may be applied at temperatures of 25°F (-4°C) or above.
- Below 40°F (5°C), store in a warm place before application.
- Add the entire contents of the Part B container to Part A and mix for 3 to 5 minutes until uniform.
- A low speed (150 rpm) mechanical mixer with flat paddle blades is required. Take care to scrape material from the side and bottom of the container to assure thorough mixing. Do not apply any material if streaks can be seen due to insufficient mixing.
- Once mixed, apply immediately. Pot life varies with temperature.
- The material will cure to a very flexible rubber-like material.
- Liquid Membrane must be applied at a minimum thickness of 90 mils (2.3 mm) unless otherwise noted on details.
- In fillet applications, the face of the fillet should be a minimum of 0.75 in (20 mm).
- In corner flashing application details, it should extend 6 in (150 mm) in each direction from the corner.
- Liquid Membrane will adhere to primed or unprimed concrete.
- Liquid Membrane should be allowed to cure at least 24 hours before flood testing.
- Clean tools and equipment with mineral spirits before the material has cured. Mineral spirits is a combustible liquid and should be used only in accordance with the manufacturer's safety recommendations.
- Do not use solvents to clean hands or skin.

Bituthene® Mastic

Use

- Bituthene® Mastic is designed to seal terminations, edges of patches, and overlaps in detail areas for Bituthene Waterproofing Membranes. On vertical applications, Bituthene Mastic must be applied to both the top and bottom terminations.

Safety, Storage and Handling Information

- Bituthene Mastic vapor is combustible.
- Read product label and Material Safety Data Sheet before use.

Application Procedures

- Apply Bituthene Mastic either with a caulking gun or trowel.
- If applied with a caulking gun, level the bead with a trowel to about 0.125 in (3 mm) thickness and a 0.5 in (13 mm) to 1 in (25 mm) width.
- When applied as a temporary cutoff, trowel Bituthene Mastic to 95 mils (1.5 mm) thickness.
- Bituthene waterproofing membrane may be placed over the thin cutoff the next day.
- On the bottom edge of vertical applications, the mastic should be troweled upward.
- Bituthene Mastic should be used liberally at membrane terminations.
- Clean tools with mineral spirits at the end of each day. Mineral spirits is a combustible liquid and should be used only in accordance with the manufacturer's safety recommendations.
- Do not use solvents to clean hands or skin.

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Page No.	Liquid	Wall Membrane	Wall Flashing	Detail Membrane	VP	VPS
336	✔	✔	✔	✔	✔	✔
338		✔	✔	✔		✔
344	✔	✔	✔	✔	✔	✔
348	✔					
350	✔					
352	✔					
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368	✔					
372					✔	
373					✔	
376					✔	
378	✔	✔			✔	
381		✔			✔	✔
386	✔	✔	✔	✔	✔	✔

VOC TECHNICAL BULLETIN

VOC Regulations for Architectural and Industrial Maintenance (AIM) Coatings

AIM regulations include regulations which limit the Volatile Organic Compound (VOC) content in products classified as Architectural Coatings. Currently regulations can be broken into six basic categories in the USA:

- US EPA National AIM Rule
- Ozone Transport Commission (OTC) AIM Rules (CT, DE, ME, MD, MA, NH, NJ, NY, OH, PA, RI, Northern VA, & Washington DC), including IL
- Canadian National AIM Rule
- California Air Resources Board (CARB 2000) AIM Suggested Control Measure
- South Coast Air Quality Management District (SCAQMD)
- California Air Resources Board (CARB 2007, effective 1/1/2011) AIM Suggested Control Measure

These regulations have an impact on Grace waterproofing and air barrier systems as well as their accessory products as shown in the following table:

The information in this document is current as of 9/1/2010, due to the dynamic nature of Architectural and Industrial Maintenance Coating VOC Regulations, which include the regulations themselves, and the states and local jurisdictions that adopt them, you should always consult requirements in your state and local jurisdiction to determine specific requirements.

Labels for products classified as Architectural Coatings must include the necessary information to address regulations (VOC content, date of manufacture and dilution recommendation).

Please refer to product labels and consult regulations within your jurisdiction to determine if use/supply restrictions exist.

Volatile Organic Compound Regulatory Restrictions

Product Name	US EPA National AIM Rule	OTC/CARB 2000 & Canadian AIM Rule	South Coast AQMD & CARB 2007
Bituthene Mastic	✔	✔	X
Bituthene B2 Primer	✔	X	X
Bituthene B2 LVC Primer	✔	✔	X
Perm A Barrier VP LT	✔	✔	X

✔ = Compliant for use under local limits
X = Not allowed for use under local limits

TECHNICAL LETTER #1

Chemical Compatibility of Perm-A-Barrier® Self-Adhered Membranes with Other Materials

Frequently during the design of an assembly, the designer will question the chemical compatibility of Perm-A-Barrier® self-adhered membranes (including Perm-A-Barrier Wall Membrane, Perm-A-Barrier Wall Flashing, Perm-A-Barrier Detail Membrane and Perm A-Barrier VPS) with other materials. Generally, there is not a chemical compatibility issue if the material contacts the film (top) surface of the membrane. If the contact area is the adhesive component of the membrane, there is need to investigate further. As a general rule, the connecting material must be sound, functional and firmly bonded to the substrate. The Perm-A-Barrier membrane should overlap onto the existing product a minimum of 6 in. (150 mm).

The design of the connection between the two materials will vary depending on the composition of the material. Some of the more common materials are detailed below.

Waterproofing Materials

Cured Neoprene

Perm-A-Barrier membranes may be applied directly to clean cured neoprene. Dusty neoprene must be cleaned and primed with Bituthene® B2 Primer prior to the attachment of the new membrane.

Uncured Neoprene

Uncured neoprene is not compatible with the adhesive component of the membrane. Therefore, Perm-A-Barrier membranes should not be applied directly to uncured neoprene. When the membrane must terminate onto uncured neoprene, an oil resistant barrier layer between the adhesive and the uncured neoprene is required. This barrier layer should be a 0.004 in. to 0.006 in. (0.1 mm to 0.15 mm) aluminum or polyester sheet, fully adhered to the uncured neoprene. Priming of the aluminum or polyester is not necessary. A two part polyurethane may also be utilized as a barrier, if fully cured.

Butyl Sheet

Perm-A-Barrier membranes can be applied directly to butyl sheet using the same guidelines as described for cured neoprene.

Chlorinated Polyethylene (CPE)

Perm-A-Barrier membranes can be applied directly to chlorinated polyethylene. Follow the guidelines for cured neoprene.

Polyvinyl Chloride (PVC)

Plasticized (flexible) PVC is not compatible with the adhesive of the Perm-A-Barrier membrane. Therefore, the membrane should not be applied directly to PVC sheet waterproofing without the use of a barrier layer. Refer to uncured neoprene for application guidelines. Perm-A-Barrier membranes can be applied to PVC pipe or other rigid PVC.

Ethylene Propylene Diene Monomer (EPDM)

EPDM is not compatible with the adhesive component of the Perm-A-Barrier membranes. Therefore, these membranes should not be applied directly to EPDM. Refer to uncured neoprene for application guidelines.

Asphalt or Coal Tar Residue

Asphalt or coal tar must be fully-cured, sound, and firmly bonded to the substrate. All surfaces must be primed with Bituthene primer prior to installation of the Perm-A-Barrier membranes.

Polyurethane Based Fluid Applied Waterproofing

Many fluid applied waterproofing systems are made from polyurethane. Perm-A-Barrier membranes will adhere to clean, dry, fully cured polyurethane waterproofing. Priming of the polyurethane surface with Bituthene primer is necessary. Polyurethanes modified with asphalt or coal tar do not affect compatibility with Perm-A-Barrier membranes.

Asphaltic Dampproofing

Perm-A-Barrier membranes may be installed directly over cleaned, asphaltic dampproofing. Priming of the dampproofing with Bituthene primer is necessary. Allow primer to dry fully prior to applying membrane and follow all other application instructions.

Wood Preservatives and Treatments

Avoid contact with wood treated with creosote, pentachlorophenol or linseed oil.

Sealant and Caulking Materials

For Perm-A-Barrier Wall Membrane, Perm-A-Barrier Wall Flashing, Perm-A-Barrier Detail Membrane (see subsequent section for Perm-A-Barrier VPS).

Adhesion and or compatibility with individual caulks and sealants may vary. It is recommended that particular products be pre-tested prior to full application.

Polyurethane

Two part polyurethanes are acceptable for use under Perm-A-Barrier membranes, provided they are fully cured (i.e. solvent has evaporated completely). Single part urethanes are generally moisture cured and, if covered by the membrane, will not cure. One part and two part polyurethanes may be used on top of the membrane.

Silicone

Both acetoxy and neutral cure silicones are compatible with the self-adhesive layer and the film of Perm-A-Barrier membranes. Most silicone sealants have good adhesion to the film, but Perm-A-Barrier membranes may only have moderate adhesion to silicone sealants.

Acrylic Latex

Acrylic based sealants are acceptable for use under Perm-A-Barrier membranes. Perm-A-Barrier membranes have moderate adhesion to these sealants. Acrylic Latex sealants, however, are generally slow to cure and may have poor adhesion to the film of Perm-A-Barrier membranes.

Butyl

Butyl sealants are acceptable for use under the membrane, provided they are fully cured (i.e. solvent has evaporated completely). Butyl sealants may be used on top of the membrane.

Sealant and Caulking Materials

For Perm-A-Barrier VPS

Adhesion and or compatibility with individual caulks and sealants may vary. It is recommended that particular products be pre-tested prior to full application.

Polyurethane

Two part polyurethanes are acceptable for use under Perm-A-Barrier VPS, provided they are fully cured (i.e.

solvent has evaporated completely). Single part urethanes are generally moisture cured and, if covered by the membrane, will not cure. One part and two part polyurethanes may be used on top of the membrane. Most polyurethanes may only have moderate adhesion to the film of Perm-A-Barrier VPS.

Silicone

Both acetoxy and neutral cure silicones are compatible with the self-adhesive layer and the film of x Perm-A-Barrier VPS. Most silicone sealants may only have moderate adhesion to the film, and the adhesive layer of Perm-A-Barrier VPS.

Acrylic Latex

Acrylic based sealants are acceptable for use under Perm-A-Barrier VPS. Perm-A-Barrier VPS has moderate adhesion to these sealants. Acrylic Latex sealants, however, are generally slow to cure and may have poor adhesion to the film of Perm-A-Barrier VPS.

Butyl

Butyl sealants are acceptable for use under the Perm-A-Barrier VPS, provided they are fully cured (i.e. solvent has evaporated completely). Butyl sealants may be used on top of the Membrane, but may only have moderate adhesion to the film of Perm-A-Barrier VPS.

Note: *Bituthene Liquid Membrane and Bituthene Mastic have excellent adhesion to the film of the Perm-A-Barrier VPS and are used for end of day terminations and repairs. Please refer to our standard details for specific detailing requirements.*

TECHNICAL LETTER #2

Substrate Preparation for Application of Perm-A-Barrier® Products to Glass-Mat Faced Gypsum Sheathing

Glass-mat faced gypsum sheathing is used for direct mechanical application to structural framing as a backing for a variety of exterior claddings or as a soffit material. Its unique glass mat facing provides greater resistance to rain, heat and wind than regular paper-faced gypsum sheathing. The following are recommendations for substrate preparation when applying Grace's Perm-A-Barrier® products to glass-mat faced gypsum sheathing. Full membrane application guidelines are described on the product data sheets available for download at www.graceconstruction.com.

Perm-A-Barrier Liquid

Perm-A-Barrier Liquid is a two-component, synthetic rubber, cold-vulcanized fluid applied air and vapor barrier membrane. It cures to form a resilient, monolithic, fully bonded elastomeric sheet.When installing Perm-A-Barrier Liquid over glass-mat faced gypsum sheathing, no surface treatment is required. Perm-A-Barrier Liquid has excellent adhesion to the surface of the glass-mat faced gypsum sheathing. In order to ensure a quality application, we recommend the following:

- To avoid deflection of glass-mat faced gypsum sheathing at panel joints, fasten corners and edges with appropriate screws as per manufacturer's recommendations.
- Tape the sheathing board butt joints using either reinforced or mesh-style wallboard tape (i.e. FibaTape® brand products).
- Gaps greater than ¼ in. (6 mm) should be filled with a compatible sealant, allowing sufficient time for the sealant to fully cure before application of the tape and Perm-A-Barrier Liquid. Refer to Technical Letter # 5 for compatible sealants and caulks.

Perm-A-Barrier® VP

Perm-A-Barrier VP is a vapor permeable, fluid applied, acrylic air barrier membrane that cures to form monolithic, fully-bonded elastomeric sheet when applied to construction surfaces. Perm-A-Barrier VP may be applied directly to exterior glass-mat gypsum sheathing. In order to ensure a quality application, we recommend the following:

- To avoid deflection of glass-mat gypsum sheathing at the panel joints, fasten corners and edges with appropriate screws as per manufacturers recommendations.
- Tape the sheathing board butt joints using either reinforced or mesh-style wallboard tape (i.e. FibaTape brand products).
- Gaps greater than ¼ in. (6 mm) should be filled with a compatible sealant, allowing sufficient time for the sealant to fully cure before application of the tape and Perm-A-Barrier VP. Refer to Technical Letter # 13 for compatible sealants and caulks.

Perm-A-Barrier® Wall Membrane
Perm-A-Barrier® Wall Flashing
Perm-A-Barrier® Detail Membrane

Perm-A-Barrier Wall Membrane is a tough, selfadhering, self-sealing waterproofing membrane for air and vapor barrier applications. Perm-A-Barrier Wall Flashing is a tough, self-adhering, self-sealing water-

proof through-wall flashing for cavity wall applications. Perm-A-Barrier Detail Membrane is a tough self-adhering, self-sealing waterproof membrane ideal for flashing windows, doors and other critical areas. In order to ensure a quality application, we recommend the following:

- To avoid deflection of glass-mat faced gypsum sheathing at panel joints, fasten corners and edges with appropriate screws as per manufacturer's recommendations.
- Gaps greater than ¼ in. (6 mm) should be filled with a compatible sealant, allowing sufficient time for the sealant to fully cure before application of Perm-A-Barrier membranes. Refer to Technical Letter # 1 for compatible sealants and caulks.
- When installing Perm-A-Barrier Wall Membrane,Wall Flashing or Detail Membrane over DensGlass® Gold, GlasRoc®, or e2XP™, the surface of the sheathing must first be primed with 1 coat of Perm-A-Barrier WB Primer. Apply Perm-A-Barrier WB Primer by roller at a coverage rate of approximately 250–350 ft2/gal (6–8 m2/L). Allow to dry for a minimum of 1 hour (longer at low temperatures).
- When installing Perm-A-Barrier Wall Membrane,Wall Flashing or Detail Membrane over Securock®, the surface of the sheathing must first be primed with two coats of Perm-A-Barrier WB Primer. Apply Perm-A-Barrier WB Primer by roller at a coverage rate of approximately 250–350 ft2/gal (6–8 m2/L). Allow to dry for a minimum of 1 hour between applications (longer at low temperatures).

- Perm-A-Barrier WB Primer is a water-based primer, which imparts an aggressive, high tack finish on the glass mat substrate of the sheathing. It is packaged ready to use and is specifically designed to facilitate tenacious adhesion of Perm-A-Barrier Wall Membrane, Wall Flashing and Detail Membrane to glassmat surfaces.

Perm-A-Barrier VPS

Perm-A-Barrier VPS is a tough vapor permeable, self-adhering waterproofing membrane for air barrier applications.

- To avoid deflection of glass-mat faced gypsum sheathing at panel joints, fasten corners and edges with appropriate screws as per manufacturer's recommendations.
- Gaps greater than ¼ in. (6 mm) should be filled with a compatible sealant, allowing sufficient time for the sealant to fully cure before application of the Perm-A-Barrier VPS. Refer to Technical Letter # 1 for compatible sealants and caulks.
- When installing Perm-A-Barrier VPS over glass-mat faced gypsum sheathing including DensGlass Gold, GlasRoc, e2XP or Securock, the surface of the sheathing must first be primed with 1 coat of Perm-A-Barrier Primer Plus. Apply Perm-A-Barrier Primer Plus by spray, brush or roller at a coverage rate of approximately 450-500 ft2/gal (11-12 m2/L) on Glass-mat faced gypsum sheathing such as DensGlass Gold. Additional primer may be required for CMU and Securock. Allow to dry for a minimum of 1 hour (longer at low temperatures).
- Perm-A-Barrier Primer Plus is a water-based primer, which imparts an aggressive, high tack finish on the glass mat substrate of the sheathing. It is packaged ready to use and is specifically designed to facilitate tenacious adhesion of Perm-A-Barrier VPS to glass-mat surfaces.

TECHNICAL LETTER #3

The Evolution of Grace's Vulcanized Latex Technology

Grace's Vulcanized Latex Technology has evolved through constant design and formulation improvements since it was first explored and commercialized by Grace businesses in Europe over 20 years ago. The technology was first introduced in 1976 as Servidek® waterproofing, a membrane system used in traffic deck and bridge deck applications. The Servidek product provided the primary waterproofing layer when used with a fully bonded protection course.

During the 1980's, through studies conducted by Grace Research and Development, the Servidek waterproofing technology showed tremendous promise in low-slope roofing applications. As a result, Grace engineered a system that paired Servidek waterproofing technology with its existing Bituthene® sheet membrane technology. The system was marketed in Europe under the Servirufe® brand name. The Servirufe system has been used in low-slope roofing applications for over 15 years.

Encouraged by the success of the Servidek and Servirufe product lines in Europe, this technology was introduced into North America in the early 1990's. Further development of the technology resulted in novel and highly inventive formulations that circumvented the need for using bitumen and created a tougher, more resilient membrane. The bitumen-free, latex rubber-based formulation avoided environmental, health and safety issues. The formula produced a material essentially impermeable to air and water vapor, resistant to hydrostatic head pressure, and which maintained high crack bridging characteristics. Further, the product is unique in its ability to be applied to damp surfaces or green concrete, and it is compatible with polystyrene insulation. This formulation is available worldwide under the Procor® brand name.

Procor waterproofing systems are engineered for use in below grade and plaza deck applications. Procor waterproofing systems are used effectively in interior and exterior, vertical and horizontal, and spray and trowel applications throughout the world. Procor fluid applied waterproofing and it's time-tested forerunners, the Servidek and Servirufe technologies, are highly effective waterproofing systems.

The most recent development in the evolution of this vulcanized latex technology is Grace's Perm-A-Barrier® Liquid, designed specifically for above grade air and vapor barrier applications. Grace's Perm-A-Barrier Liquid combines the unique characteristics of Procor, plus offers improved UV resistance and weatherability. For project references and further information, contact your local Grace Specialty Building Materials representative.

TECHNICAL LETTER #4

Blistering and Pinholing of Fluid Applied Membranes

Whenever liquid applied coatings are used over cementitious or other porous substrates, the possibility of blisters and/or pinholes exists. This phenomenon is caused by the expansion of moisture vapor and air that is trapped in the substrate (out-gassing). Blisters and/or pinholes are most likely to be generated on hot, sunny days when the initial temperature of the substrate is relatively low, but increases rapidly due to heat generated from direct sunlight on the membrane. The rapid increase in temperature converts the moisture in the substrate to the vapor phase and creates a vapor drive towards the source of the heat. Any air trapped in the substrate will also expand as it heats up.

There are many factors that influence the amount of moisture transmission and air expansion including temperature during coating application, change in temperature following application, humidity, moisture content of the concrete, concrete formulation, concrete age and surface porosity.

With Perm-A-Barrier® Liquid there are a number of techniques that can be used to reduce the level of blistering and pinholing experienced on-site. One effective technique is to adjust the application time to avoid conditions outlined above, i.e., applying the membrane later in the day or avoiding areas that are in direct sunlight.

Some applicators have found it useful to apply a thin application or “scratch coat” of Perm-A-Barrier Liquid (0.010 in. to 0.015 in.) to fill the surface irregularities and raise the surface temperature before application of the full membrane.

Procor® Concrete Sealer has been found to be the most effective and flexible way to minimize the possibility of blisters and pinholes. This is a specially formulated, water-based coating that is applied to the substrate by roller or spray prior to the full membrane application. For a product use guide and full details of application procedures consult the Procor Concrete Sealer product data sheet.

Care must be taken with all fluid applied membranes when the substrate contains moisture or if there are voids in the substrate. However, the combination of the unique characteristics of Perm-A-Barrier Liquid membrane coupled with an understanding of the mechanisms that create blisters and pinholes will allow projects to progress quickly with quality results.

TECHNICAL LETTER #5

Adhesion Compatibility of Perm-A-Barrier® Liquid with Sealants and Caulks

Frequently during the design or implementation of an assembly, the designer or contractor will need to select a sealant or caulk that is compatible with Perm-A-Barrier® Liquid.

Perm-A-Barrier Liquid is chemically compatible with all of the following materials with the noted degree of adhesion. Other materials not listed may be compatible but were not tested.

Material[1] Over PAB Liquid	Under PAB Liquid[2]	
Procor	✔✔✔	✔✔✔
2 pt. Polysulfide	✔✔✔	✔✔✔
1 pt. PU	✔✔✔	✔✔
Acrylic Caulk	✔✔	✔✔✔
Acrylic + Silicone	✔✔	✔
2 Pt. PU	✔	✔✔
Silicone Caulk	✔	✖
Acrylic Sealer	NA	✔✔✔
Bituthene Liquid Membrane	✔✔✔	✔✔

✔✔✔ Excellent Adhesion ✔✔ Good Adhesion
✔ Moderate Adhesion ✖ Low Adhesion

[1] Adhesion results with individual caulks and sealants may vary. It is recommended that particular products be pre-tested prior to full application.

[2] The materials tested under Perm-A-Barrier Liquid were allowed to cure in accordance with their manufacturer's recommendations prior to application of Perm-A-Barrier Liquid.

[3] Grace has tested the above materials for adhesive and chemical compatibility. Grace can not, however, guarantee the in-place performance of an other Manufacturer.

TECHNICAL LETTER #6

Substrate Preparation for Perm-A-Barrier® Liquid Applications

Perm-A-Barrier® Liquid air and vapor barrier is commonly applied to one of the following substrates:

Concrete Masonry Units (CMU)

Application of an air and vapor barrier on CMU walls is important because most concrete block is porous and susceptible to moisture and air infiltration. Standard application procedures should be followed and attention should be given to the following:

- The CMU surface should be smooth and free from projections. Strike all mortar joints full and flush to the face of the concrete block. Fill all voids and holes, particularly at the mortar joints. Alternatively, a parge coat (typically one part cement to three parts sand) may be used over the entire surface.
- All penetrations should be grouted or filled prior to application.

When necessary, provide temporary protection, such as plastic or tarpaulin, at the top of the wall to prevent precipitation from accumulating in the core of the block. In applications where the membrane will be exposed over 60 days, provide plastic or tarpaulin protection over the membrane to prevent exposure to UV rays.

Glass-Mat Faced Gypsum Sheathing

Glass-mat faced gypsum sheathing is used for direct mechanical application to structural framing as a backing for a variety of exterior claddings or as a soffit material. Its unique glass mat facing provides greater resistance to rain, heat and wind than regular gypsum paper-faced sheathing.

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When installing Perm-A-Barrier Liquid over glass-mat faced gypsum sheathing, no surface treatment is required. Perm-A-Barrier Liquid has excellent adhesion to the glass-mat surface. In order to ensure a quality application, we recommend the following:

- To avoid deflection of glass-mat faced gypsum sheathing at panel joints, fasten corners and edges with appropriate screws as per manufacturer's recommendations.
- Tape the board butt joints using either reinforced or mesh-style wallboard tape (i.e. FibaTape® brand products).
- Gaps greater than ¼ in. (6 mm) should be filled with a compatible sealant, allowing sufficient time for the sealant to fully cure before application of the tape and Perm-A-Barrier Liquid. Refer to Technical Letter # 5 for compatible sealants and caulks.

Oriented Strand Board (OSB) and Plywood

Oriented Strand Board (OSB) has become a common material used as a structural wall sheathing. OSB is a structural panel made of wood strands sliced in the long direction and bonded together with a binder under heat and pressure. The product is also manufactured with a textured surface for use in roofing applications to improve safety.

Perm-A-Barrier® Liquid Air & Vapor Barrier

When installing Perm-A-Barrier Liquid over OSB or plywood, no surface treatment is required as long as the surface is free from frost, dirt, grease, oil or other contaminants. Perm-A-Barrier Liquid has excellent initial and long-term adhesion to both surfaces of OSB as well as to plywood. In order to ensure a quality application, we recommend the following:

- Use OSB and plywood panels that meet the American Plywood Association (APA) Exposure 1 or Exterior exposure durability classification.
- To avoid deflection at panel joints, fasten corners and edges with appropriate screws as per manufacturer's recommendations.
- Tape the board butt joints using either reinforced or mesh-style wallboard tape (i.e. FibaTape brand products).
- Gaps greater than ¼ in. (6 mm) should be filled with a compatible sealant, allowing sufficient time for the sealant to fully cure before application of the tape and Perm-A-Barrier Liquid. Refer to Technical Letter # 5 for compatible sealants and caulks.

TECHNICAL LETTER #7

Exotherm of Perm-A-Barrier® Liquid Membranes

Perm-A-Barrier® Liquid is a two component reactive system. One of the reactions that takes place during the cure process is exothermic (generates heat) and if the heat generated is not able to dissipate then rapid temperature rise could be seen. This process can also take place if Perm-A-Barrier Liquid Part A is contaminated with water. During the exotherm process temperatures as high as 290°F (130°C) could be reached and under these conditions the residual water from the Perm-A-Barrier Liquid Part B will vaporize creating pressure and resulting in a foamy consistency.

Exotherming is most likely to be seen if mixed Perm-A-Barrier Liquid is left in the pail after mixing. Once mixed, always install the entire contents of the pail as soon as possible. Do not seal containers once mixed with Part B or contaminated with water. Sealed containers may explode due to pressure from the reaction.

It is also possible that exotherming could occur on the substrate if Perm-A-Barrier Liquid is applied too thickly in a single application. The thickness at which the exotherm will occur depends upon PAB Liquid ambient temperature. The following guide summarizes when exotherm is likely to occur. If it is necessary to apply Perm-A-Barrier Liquid at thicknesses greater than those given below then the membrane should be applied in more than one layer, leaving a minimum of one hour between applications.

Ambient Temperature		
40°F (5°C)	70°F (21°C)	100°F (38°C)
Greater than 0.5 in. (12.5 mm)	Occurs at 0.5 in. (12.5 mm)	Occurs at 0.25 in. (6.25 mm)

Areas of sponginess due to exotherming should be repaired by cutting away the affected area to solid, fully adhered, correct thickness membrane.

The exposed area should then be patched with Perm-A-Barrier Liquid to give a minimum overlap of 6 in (150 mm) onto the existing membrane. Where the surrounding area of Perm-A-Barrier Liquid is contaminated with dirt or is more than seven days old it should be primed with Bituthene® Primer B2, Perm-A-Barrier Liquid Part B or Procor® Part B.

TECHNICAL LETTER #8

Disposal of Perm-A-Barrier® Liquid

Waste and Used Containers

Although Perm-A-Barrier® Liquid is a relatively safe material in use and storage, and is classified as non-hazardous under the US Environmental Protection Agency and Department of Transport regulations, it is important that waste materials be disposed of in a safe and environmentally conscious way and in accordance with the appropriate local regulations.

Empty Containers

Empty containers (pails or drums) of unmixed Perm-A-Barrier Liquid Part A, Part B or mixed A and B can be disposed of as general industrial waste. In general this means that they can be placed in site dumpsters along with other site trash though local regulations may vary and should be checked with the local waste collection company. Such empty containers must meet the US EPA definition of empty as follows:

1. All wastes have been removed that can be removed using methods commonly used to empty that type of container, and:

2. Less than one inch of residue remains in the container.

Note that Perm-A-Barrier Liquid Part A reacts with Part B and also with water. The reaction is exothermic resulting in release of fumes and heat. Sealed containers can explode. Do not seal containers for disposal.

If full or part used containers must be disposed of, or if for some reason it is not possible to empty a drum or pail to less than one-inch then the container and contents must be disposed of as chemical waste.

Perm-A-Barrier Liquid Waste

Dispose of Perm-A-Barrier Liquid waste in accordance with all applicable regulations. Consult all regulations (federal, provincial, state, local, etc.) or a qualified waste disposal firm when characterizing waste for disposal. There are many local chemical waste disposal companies around the country that can be found via local trade directories. If there are no local chemical waste disposal companies then the following national companies will be able to help:

Safety Kleen 1-888-217-7859
Clean Harbors 1-800-444-4244
Phillip Services 1-888-655-4331

When contacting these companies to arrange disposal it is important to have the latest copy of the MSDS for the product in question, which can be downloaded from the Grace Construction Products web site at www.graceconstruction.com or received via fax by phoning 866-333-3SBM (3726).

Spills

Do not allow material to saturate ground, enter drains, runoffs, streams, lakes or ground water. Immediately absorb all spills with a dry inert material, such as sand, and dispose. Report all spills into or with the potential to reach navigable (surface) waters of the United States or adjoining shorelines, as soon as there is knowledge of the spill, to the National Response Center 1-800-424-8802.

TECHNICAL LETTER #9

Spraying Perm-A-Barrier® Liquid at Low Temperatures

General

Perm-A-Barrier® Liquid is a 100% solids, two component, synthetic rubber, cold-vulcanized, liquid applied waterproofing membrane. It cures to form a resilient, fully bonded elastomeric sheet. Perm-A-Barrier Liquid can be spray applied to horizontal or vertical surfaces in a single layer of up to 1⁄8 in (3 mm) thickness with correctly specified spray equipment. With spraying, application rates of up to 300 liters/hour (75 gallons/hour) are achievable. Perm-A-Barrier Liquid can be sprayed at ambient temperatures as low as 20°F (-7°C).

Material Handling

Part A:
At temperatures above 20°F (-7°C) no additional heating is required to pump and spray Part A. The Part A drums should be thoroughly pre-mixed before spraying.

Part B:
Perm-A-Barrier Liquid Part B is water-based and it is essential that it be kept above freezing in storage and use. At ambient temperatures of below freezing, some form of low level heating system should be used. The easiest way to achieve this is to store the Part B in a heated store or box truck. If the temperature is likely to drop below freezing, it is important not to leave Part B in the machine or hoses when it is not being used. The Part B should be flushed out with Procor® Flushing Oil to prevent the hose freezing up.

Heated/Insulated Hoses

The key to successful cold weather application is to minimize pressure drop and cooling as the material is pumped along the hoses. Even if the materials are stored or pre-heated to temperatures above freezing, there can be significant cooling along the length of the hoses, particularly during down-time when the material will quickly cool to ambient temperature. To counteract this either insulated or heated and insulated hoses should be used.

Pre-insulated and heated hose systems are available from the spray equipment manufacturer, but it is also possible to insulate and/or heat the hoses using materials that are available from most hardware stores. Electric trace heaters can be wrapped around the hoses, followed by flexible pipe insulation and an outer protective layer of heavy gauge polyethylene or hose sleeve (black to maximize additional solar heating). This can be powered by an electric generator when needed.

To minimize pressure drop it is critical to use hoses with the recommended diameters (3⁄8 in for Part A and 5⁄16 in for Part B) or larger. If extension hoses are needed, they must have a greater diameter than noted above and must be fitted between the spray machine and the lower diameter hose. For example to achieve a hose length of 150 ft (50 m), use a 19 mm (3⁄4 in.) diameter extension hose for Part A and 1⁄2 in (13 mm) diameter extension hose for Part B.

Substrate Temperature and Condition

Although Perm-A-Barrier Liquid can be sprayed onto substrates as low as 20°F (-7°C), care should be taken to ensure that there is no condensation, ice or frost on the surface of the substrate as this will affect adhesion of the membrane. If ice is detected, steps should be taken to melt the ice. Also, at temperatures below 40°F

Continued on next page

(5°C) a longer cure time will be required to ensure that the membrane is sufficiently cured to allow protection board installation and back-filling.

Spray Gun Set-up

With Perm-A-Barrier Liquid there is little need to adjust the spray gun set-up until you get to very high temperatures [greater than 80°F (27°C)]. The following guide details the recommended settings to be used though the pressure settings required may vary with specific pump or hose configurations.

	Low Temperature – 20°F to 55°F (7°C to 13°C)	Mid Temperature 55°F to 80°F (13°C to 27°C)	High Temperature 80°F (27°C) or higher
A Side Orifice	Blank Plug	Blank Plug	Blank Plug
B Side Orifice	0.035 in.	0.035 in.	Blank Plug
Static Mixer (1/4 in. dia.)	3 turns	2 turns	2 turns
Spray Tip Opening	0.039 in. to 0.045 in.	0.039 in. to 0.051 in.	0.039 in. to 0.051 in.
Pump Manifold Pressure	75 psi to 80 psi	60 psi to 75 psi	55 psi to 85 psi

Spraying Perm-A-Barrier® Liquid at High Temperatures

When spraying Perm-A-Barrier® Liquid at high ambient or material temperatures (above 27°C/80°F) certain adjustments may be needed to the equipment set-up depending on the equipment type, hose configuration and current spray gun set-up. If these adjustments are not made and the same set-up is used as for lower temperatures then the following effects may be seen:

Pulsing

Due to the lower viscosity at high temperatures there is less back-pressure created by the hoses and spray tip. This will result in pulsing or pressure drop off as the fluid pumps cycle. This will be felt as a variation in pressure when holding the spray gun and could be seen as a color variation in the form of vertical stripes of A or B rich material across the whole width of the spray fan. The white stripes may be more visible after curing. (see photo below)

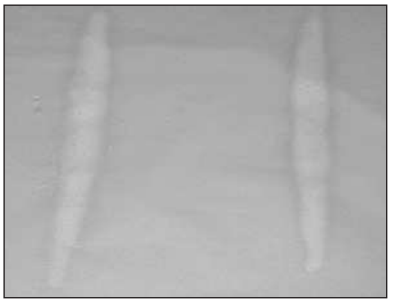

Photo 1. Pulsing

Solution:
If this problem is seen, then the hose configuration will need to be modified and a 150 ft section of existing Part A hose should be replaced with 0.25 in. hose. To even out the pulsing, at least 1600 psi should be seen on the Part A side pressure gauge. It will probably be necessary to increase the pump inlet pressure to achieve this.

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Rough Spray Pattern

A slightly rough surface is to be expected with Perm-A-Barrier Liquid, if the spray fan is even and thickness control good then this is not a problem. At high temperatures Part A and Part B mix together more freely and if they become over-mixed then the surface of the Perm-A-Barrier Liquid will be excessively rough and the spray fan may appear stringy. (see photo below).

Photo 2. Over-mixing

Solution:
If this problem is seen, then an adjustment to the spray gun set-up will be needed. The following spray gun set-up should be used:

High Temperature Spray Gun Set-up

A Side Orifice	Blank Plug
B Side Orifice	Blank Plug
Mixing:	2 turns static mixer
Spray Tip:	0.039 in. to 0.051 in., 50° Graco Reverse-A-Clean®
Inlet Pressure:	55-85 psi
Material Line Pressure A Side:	1600 to 2000 psi
Material Line Pressure B Side:	800 to 1000 psi
A Transfer Pump:	30-40 psi
B Transfer Pump:	30-40 psi

Note: At very high material temperature, if a rough surface, is seen remove the static mixer entirely. As the temperature drops it may be necessary to replace the static mixer and increase to 3 turns.

Material Temperature

When spraying at high ambient temperatures it is very important to store both A and B drums away from direct sunlight. If covered storage is not available then a light colored tarp or tent should be placed over the drums to keep the sun off them. It is important to remember that even if the air temperature is relatively low, the heating affect of the sun can raise the temperature of black or dark colored drums and hoses to well above 100°F. White hose wrap will also help reduce material temperatures in very sunny conditions.

TECHNICAL LETTER #11

Adhesion of Rubberized Asphalt Membranes to Perm-A-Barrier® Liquid in Air and Vapor Barrier Applications

Adhesion of flexible flashings (such as Perm-A-Barrier® Wall Flashing and Perm-A-Barrier® Detail Membrane) to Perm-A-Barrier Liquid may be reduced if the Perm-A-Barrier Liquid surface develops a chalky film. This film may be the result of improper spray gun set-up or the result of extended exposure to heat and moisture. This technical letter provides guidance for adhering flexible flashings to Perm-A-Barrier Liquid that has developed a chalky surface. Note: The procedures in this technical letter can also be used if the Perm-A-Barrier Liquid surface has been subjected to surface contamination by general construction dirt and dust.

A chalky film may develop when Perm-A-Barrier Liquid is exposed to elevated temperatures (greater than approximately 60°F), and moisture (rain, dew, high humidity) and has been unprotected for more than one day. This film discoloration does not affect the functional performance of the film.

To adhere Perm-A-Barrier Wall Membranes and Flashings to Perm-A-Barrier Liquid, once this chalky surface has appeared, apply Perm-A-Barrier Liquid Part B (for temperatures above 40°F) or Bituthene® Primer B2 (for temperatures between 20°F and 50°F) to the area where the flashing will be adhered.

Application Directions

For temperature above 40°F

Material:	Use Perm-A-Barrier Liquid Part B or Procor® Part B
Application:	Apply a thin, continuous layer with a paint roller or brush.
Drying Time:	Allow Part B to dry for a minimum of one hour (or dry to touch). If the flashing has not been adhered within 3 days, or if contaminated, reapply the primer.
Coverage:	10-12 m^2/L (400-500 ft^2/gal) To aid in ease of application and increase coverage area, Part B can be diluted to 50% with water.

For temperatures between 20°F and 50°F

Material:	Use Grace's Bituthene Primer B2
Application:	Apply a thin, continuous layer with a paint roller or brush. See product data sheet for more specific guidance.
Drying Time:	Allow the Bituthene Primer B2 to dry for a minimum of one hour (or dry to touch). If the flashing has not been adhered within 3 days, or if contaminated, reapply the primer.
Coverage:	6-8 m^2/L (250-350 ft^2/gal) Once a primer has been applied and dried, roll the surface of the flexible flashing with a hard surface roller to ensure adequate adhesion. Terminate critical flashing edges with Bituthene Liquid Membrane.

Note: Applying flexible flashings to freshly applied Perm-A-Barrier Liquid (approximately one half hour after spraying and no longer than 12 hours after the Perm-A-Barrier Liquid application) may eliminate or reduce the need for primer.

TECHNICAL LETTER #12

Impact of Substrate Roughness and Coating Thickness on Fluid Applied Air Barrier Performance

To achieve desired air barrier performance, the coating thickness of a fluid applied membrane must be continuous. Continuous membrane coverage requires that the coating thickness be sufficient to cover the high and low points of the substrate. Lack of continuity in the membrane results in voids that reduce overall system performance.

As the roughness of the substrate surface increases, the coating thickness required to achieve a continuous membrane also increases. To better understand the impact of substrate roughness on a fluid applied air barrier thickness requirements, tests were conducted at Grace laboratories for both commercially available asphalt emulsion and Perm-A-Barrier® Liquid products.

Two substrates were evaluated, a relatively smooth surface (DensGlass Gold® Exterior Guard) and a rougher, more irregular surface (commercially available concrete block). Fluid applied air barrier coatings were sprayed by an ABAA certified commercial contractor. Samples were then evaluated for membrane continuity by microscopic analysis and performance by ASTM E 1186 “Air Leakage Site Detection in Building Envelope and Air Retarder Systems”.

The results indicate that the coating thickness required to achieve acceptable performance increases with substrate roughness. A summary of findings is shown below:

DensGlass Gold® Exterior Guard

A carefully applied, consistent 40 mil dry film thickness can be adequate to pass ASTM E 1186.

- For discontinuities in the board system, such as panel joints and penetrations, additional coating thickness is required. Such discontinuities should be taped, treated with a 40 mil dry film thickness and then the entire assembly should be sprayed with an additional 40 mil dry film thickness.

Concrete Block (commercially available, medium density concrete masonry unit)

A carefully applied, consistent 60 mil dry film thickness can be adequate to pass ASTM E 1186.

- A 40 mil dry film thickness coating does not achieve a continuous membrane. (See Figures 1 & 2)

- Grace recommends that a minimum 60 mil dry film thickness coating be applied. While a 60 mil dry film thickness is generally sufficient, the contractor must carefully inspect each application for continuity and apply additional material for situations where excessive surface roughness exists.
  (See Figures 3 & 4)

- A 90 mil dry film thickness coating was also applied to concrete block. While possibly more than required, a 90 mil dry film thickness coating provided a continuous membrane with safety margin. The full laboratory report is available upon request. Please contact your local Grace Representative for additional information.

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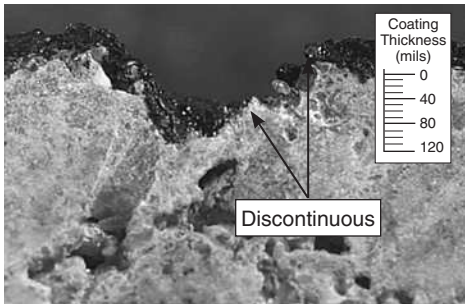
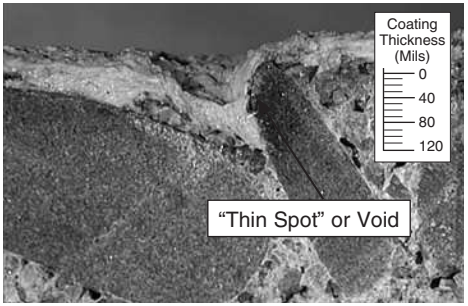
Figure 1: Asphalt Emulsion 40 mil dry film thickness on Concrete Block



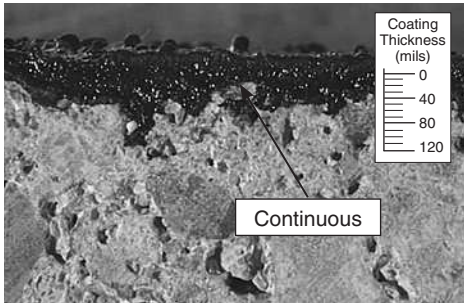
Magnification: 10X

Figure 2: Perm-A-Barrier Liquid 40 mil dry film thickness on Concrete Block



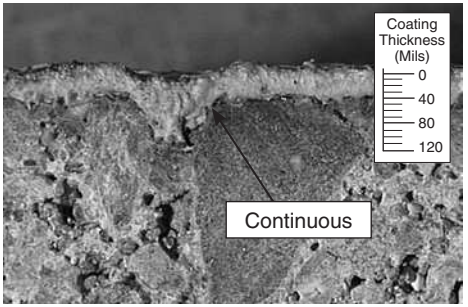
Magnification: 10X

Figure 3: Asphalt Emulsion 60 mil dry film thickness on Concrete Block



Magnification: 10X

Figure 4: Perm-A-Barrier Liquid 60 mil dry film thickness on Concrete Block



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TECHNICAL LETTER #13

Adhesion Compatibility of Perm-A-Barrier® VP with Sealants and Caulks

Frequently during the design or implementation of an assembly, the designer or contractor will need to select a sealant or caulk that is compatible with Perm-A-Barrier® VP. Perm-A-Barrier VP is chemically compatible with all of the following materials with the noted degree of adhesion. Other materials not listed may be compatible but were not tested.

Material[1] Over PAB VP	Under PAB VP[2]	
Procor®	✔✔	✔✔✔
1 pt. PU	✖	✖
Acrylic Caulk	✔	✔✔
Acrylic + Silicone	✔	✔✔✔
2 Pt. PU	✔	✔
Silicone Caulk	✔✔	✔
Acrylic Sealer	NA	✔✔✔
Bituthene Liquid Membrane	✔✔✔	✔

✔✔✔ Excellent Adhesion (5+ lbs/in.) ✔✔ Good Adhesion (2-5 lbs/in.)
✔ Moderate Adhesion (1-2 lbs/in.) ✖ Low Adhesion (Below 1 lbs/in.)

[1] Adhesion results with individual caulks and sealants may vary. It is recommended that particular products be pre-tested prior to full application.

[2] The materials tested under Perm-A-Barrier VP were allowed to cure in accordance with their manufacturer's recommendations prior to application of Perm-A-Barrier VP.

[3] Grace has tested the above materials for adhesive and chemical compatibility. Grace can not, however, guarantee the in-place performance of an other Manufacturer.

TECHNICAL LETTER #14

Substrate Preparation for Perm-A-Barrier® VP Applications

Perm-A-Barrier® VP vapor permeable air barrier is commonly applied to one of the following substrates

Concrete Masonry Units (CMU)

Application of an air barrier on CMU walls is important because most concrete block is porous and susceptible to air infiltration. Standard application procedures should be followed and attention should be given to the following:

- The CMU surface should be smooth and free from projections. Strike all mortar joints full and flush to the face of the concrete block. Fill all voids and holes, particularly at the mortar joints. Alternatively, a parge coat (typically one part cement to three parts sand) may be used over the entire surface.

- All penetrations should be grouted or filled prior to application. When necessary, provide temporary protection, such as plastic or tarpaulin, at the top of the wall to prevent precipitation from accumulating in the core of the block. In applications where the membrane will be exposed over five months, provide plastic or tarpaulin protection over the membrane to prevent overexposure to UV rays.

Glass-Mat Faced Gypsum Sheathing

Glass-mat faced gypsum sheathing is used for direct mechanical application to structural framing as a backing for a variety of exterior claddings or as a soffit material. Its unique glass-mat facing provides greater resistance to rain, heat, and wind than regular gypsum paper-faced sheathing.

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When installing Perm-A-Barrier VP over glass-mat faced gypsum sheathing, no surface treatment is required. Perm-A-Barrier VP has excellent adhesion to the glass-mat surface. In order to ensure a quality application, we recommend the following:

- To avoid deflection of glass-mat faced gypsum sheathing at panel joints, fasten corners and edges with appropriate screws as per manufacturer's recommendations.
- Tape the board butt joints using either reinforced or mesh-style wallboard tape (i.e. FibaTape® brand products).
- Gaps greater than ¼ in. (6 mm) should be filled with a compatible sealant, allowing sufficient time for the sealant to fully cure before application of the tape and Perm-A-Barrier VP. Refer to Technical Letter # 13 for compatible sealants and caulks.

Oriented Strand Board (OSB) and Plywood

Oriented Strand Board (OSB) has become a common material used as a structural wall sheathing. OSB is a structural panel made of wood strands sliced in the long direction and bonded together with a binder under heat and pressure. The product is also manufactured with a textured surface for use in roofing applications to improve safety. When installing Perm-A-Barrier VP over OSB or plywood, no surface treatment is required as long as the surface is free from frost, dirt, grease, oil, or other contaminants. Perm-A-Barrier VP has excellent initial and long-term adhesion to both surfaces of OSB as well as to plywood. In order to ensure a quality application, we recommend the following:

- Use OSB and plywood panels that meet the American Plywood Association (APA) Exposure 1 or Exterior exposure durability classification.
- To avoid deflection at panel joints, fasten corners and edges with appropriate screws as per manufacturer's recommendations.
- Tape the board butt joints using either reinforced or mesh-style wallboard tape (i.e. FibaTape® brand products).
- Gaps greater than ¼ in. (6 mm) should be filled with a compatible sealant, allowing sufficient time for the sealant to fully cure before application of the tape and Perm-A-Barrier VP. Refer to Technical Letter # 13 for compatible sealants and caulks.

TECHNICAL LETTER #15

Disposal of Perm-A-Barrier® VP Waste and Used Containers

Although Perm-A-Barrier® VP is a relatively safe material in use and storage and is classified as non-hazardous under the U.S. Environmental Protection Agency and Department of Transport regulations, it is important that waste materials be disposed of in a safe and environmentally conscious way and in accordance with the appropriate local regulations.

Empty Containers

Empty containers (pails or drums) of unmixed Perm-A-Barrier VP can be disposed of as general industrial waste. In general, this means that they can be placed in site dumpsters along with other site trash though local regulations may vary and should be checked with the local waste collection company. Such empty containers must meet the EPA definition of empty as follows

1. All wastes have been removed that can be removed using methods commonly used to empty that type of container, and;

2. Less than one inch of residue remains in the container. If full or part used containers must be disposed, or if for some reason it is not possible to empty a drum or pail to less than one inch, then the container and contents must be disposed of as chemical waste.

Perm-A-Barrier VP Waste

Dispose of Perm-A-Barrier VP waste in accordance with all applicable regulations. Consult all regulations (federal, provincial, state, local, etc.) or a qualified waste disposal firm when characterizing waste for disposal. There are many local chemical waste disposal companies around the country that can be found via local trade directories. If there are no local chemical waste disposal companies, then the following national companies will be able to help

Safety Kleen 888-217-7859
Clean Harbors 800-444-4244
Phillip Services 888-655-4331

When contacting these companies to arrange disposal, it is important to have the latest copy of the MSDS for the product in question which can be downloaded from the Grace Construction Products web site at www.graceconstruction.com or received via fax by phoning 866-333-3SBM (3726).

Spills

Do not allow material to saturate ground, enter drains, runoffs, streams, lakes, or ground water. Immediately absorb all spills with a dry, inert material, such as sand, and dispose. Report all spills in accordance with all local, state, and federal governmental regulations and guidelines.

TECHNICAL LETTER #16

Penetrations Through Perm-A-Barrier® Systems

Perm-A-Barrier® Liquid, Perm-A-Barrier VP and Perm-A-Barrier Wall Membrane

For an air barrier system to be effective, the air barrier material must be continuous onto the substrate they are applied, without any voids, gaps or holes. Often it may be more convenient or cost effective, from a design and application perspective, to penetrate an air barrier assembly after installation of the air barrier. Appropriate care must be taken to ensure continuity of the air barrier assembly when an installed air barrier will be penetrated.

Typical penetrations include anchors, brick ties, and screws. The best practice is to limit or eliminate the number of penetrations through an air barrier assembly, however, it is not always feasible to eliminate all penetrations.

Grace has conducted in-house testing on Perm-A-Barrier Air Barrier Systems with a number of penetrations installed through the previously installed air barrier. The testing included an evaluation of both air leakage and water penetration, in accordance with ASTM E 1186 *Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems* and ASTM E 331 *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.*

The results demonstrated that Grace Perm-A-Barrier Air Barrier Systems provide a seal with the penetrants tested that prevented air and water leakage past the air barrier.

The following is a chart of the types of penetrants that have been evaluated by Grace and when installed correctly as per manufacturers written instructions can provide an air and watertight seal without additional sealant.

Fastener Type	E1186	E331
Heckman Pos-I-Tie with insulation	No Leakage	No Leakage
Heckman Pos-I-Tie without insulation	No Leakage	No Leakage
Hohman & Bernard DW-10 Anchor	No Leakage	No Leakage
*Hohman & BernardCorrugated Brick Tie	No Leakage	No Leakage
*Wire-Bond RJ-711 Adjustible Veneer Anchor	No Leakage	No Leakage

*Evaluated with Perm-A-Barrier Liquid and Perm-A-Barrier VP only.

The following measures must be included to achieve this seal:

1. Ensure all fasteners are secured to a stud or other stable substrate and that the fastener head is tightened snug to the air barrier.
2. If a fastener is not secured to a stable substrate, then the fastener shall be removed entirely and the air barrier shall be repaired with a min. 4 inch by 4 inch patch of the original air barrier material or appropriate sealant.
3. If a fastener is over-tightened such that the head of the fasteners is embedded into the air barrier, then a min. 4 inch by 4 inch patch of the original air barrier material or appropriate sealant must be installed over the fastener.

Continued on next page

4. All self-tapping screws should have a tap (tip) diameter no greater than the pilot (shaft) diameter.

Brick ties that allow for a tight seal between the air barrier and the brick tie, such as brick ties listed above, have been proven to provide an effective airtight and watertight seal without additional sealant. While these penetrations, in conjunction with Perm-A-Barrier Air Barriers, provide a seal, variability in installation may warrant the use of a sealant. When using brick ties other than those listed above, Grace recommends using an appropriate sealant to detail the brick tie penetrations.

Proof of Air Barrier Assembly Testing Performance ASTM E 2357 Testing

Introduction

To provide proof that our air barrier assemblies function as a continuous air barrier, Grace has successfully completed independent testing on its Perm-A-Barrier® air barrier products in accordance with ASTM E 2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies. Testing Perm-A-Barrier Liquid, Perm-A-Barrier VP, Perm-A-Barrier VPS and Perm-A-Barrier Wall Membrane, the ASTM E 2357 test entails installing a full air barrier assembly onto an 8 ft by 8 ft (2.5 m by 2.5 m) mock-up of a realistic exterior wall assembly. Measuring performance simulating real-life commercial structures, the mock-up includes a tie in to a foundation wall, tie in to a roof, duct and pipe penetrants, electrical outlet penetrants, a window opening and post applied brick ties. All these conditions must be sealed and flashed to the air barrier assembly to withstand positive and negative sustained wind and wind gust loading simulating real life in place conditions.

The ASTM E 2357 Standard

The ASTM E 2357 Standard was developed to provide a uniform method to evaluate a full air barrier assembly. Until this test method was developed, one could only evaluate pieces of the air barrier assembly such as the air barrier material alone, the flashing material alone and the sealing materials alone. This method also incorporates wind loads that will push and pull on the air barrier assemblies, exposing weak areas that could leak air, which is an advancement from the previous test methods.

Continued on next page

The Test

The mock-up is exposed to positive and negative sustained wind loading of 12.5 psf (600 Pa) for a one-hour duration in each direction. The wind gust loading reaches 25 psf (1200 Pa), which is equivalent to wind gusts of 99 mph, again in both the positive and negative direction. After all of the wind loading is completed the air barrier assembly is measured for air leakage in both the positive and negative direction.

ASTM E 2357 Test Results

Grace Product Assembly Tested	Independent Test Results(1)
Perm-A-Barrier Liquid	<0.0008 cfm/ft² (2)
Perm-A-Barrier VP	<0.0008 cfm/ft² (2)
Perm-A-Barrier VPS	<0.0008 cfm/ft² (2)
Perm-A-Barrier Wall Membrane	<0.0008 cfm/ft² (2)

(1) ABAA specified requirement is 0.04 cfm/ft².
(2) Air leakage rates below detectable limit of laboratory test equipment

"Air barrier products have abounded on the market place in recent years as the industry has embraced a new understanding in building construction, which itself is a rare occurrence. By providing test results utilizing ASTM E 2357 a product manufacturer can demonstrate the sufficiency of their materials when combined into an assembly that will work with the whole building system. This enables all interested parties to make informed decisions with assurance for the buildings design and sustainability. Grace is to be congratulated for their accountability in this process."

Lance E. Robson, Jr., AIA
Building Envelope Technologies, Inc.

The Results

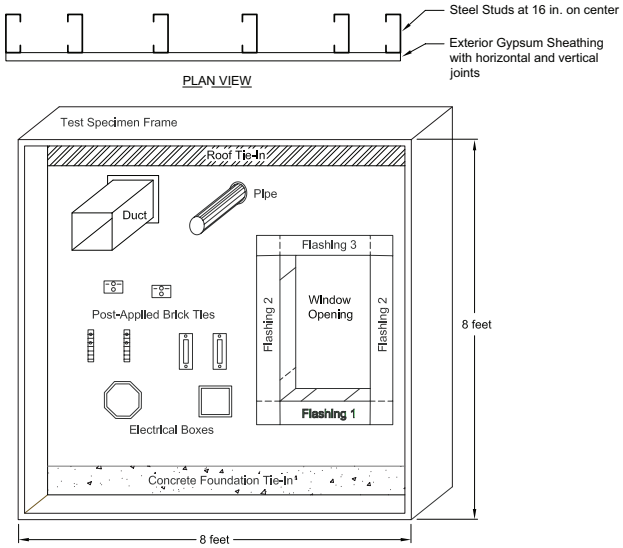
With test results of <0.0008 cfm/ft² (0.004 L/s*m²), Grace's Perm-A-Barrier Liquid, Perm-A-Barrier VP, Perm-A-Barrier VPS and Perm-A-Barrier Wall Membrane all achieved air leakage rates below the detectable limits of the test laboratories equipment and are 50 times below the allowable air leakage rates specified by the Air Barrier Association of America (ABAA) and a proposed revision to ASHRAE 90.1 of 0.04 cfm/ft² (0.2 L/s*m²).

Grace Perm-A-Barrier Flashing was used to flash the window opening on all three mock-ups and Grace Bituthene® Liquid Membrane was used in areas required by standard Grace details and recommendations, such as water bucking laps of flashing membrane and annular space around the duct, pipe and electrical box penetrants.

After successfully completing the ASTM E 2357 testing on the air barrier assemblies, Grace chose to subject the assemblies to extreme wind loading beyond the requirements of the test. The Perm-A-Barrier air barrier assemblies withstood the equivalent of 168 mph wind gusts, air pressures of 72 psf (3445 Pa), before allowing air leakage through the assembly. The dramatic photo below shows how the steel studs, steel fasteners and gypsum sheathing were brought to failure prior to the air barrier assembly finally giving way and allowing air leakage. This is proof positive that Grace Air Barrier Assemblies provide an air barrier solution for real life air barrier conditions.

Grace air barrier systems withstood wind gusts equivalent to 168 mph, remaining fully adhered and intact while substructure was brought to failure.

ASTM E 2357 Test Assembly



"ASTM E 2357 is the only test method that gives the user any information on the performance of an installed air barrier assembly. Every building contains multiple air barrier materials. It is only when a material is selected and combined into an assembly does it actually perform the function of an air barrier. ASTM E 2357 determines the air leakage rate after being conditioned under real world loads which provides the user with a precise air leakage rate and confidence that it will provide this performance when installed. Data from ASTM E 2357 is critical to every design professional."

Mr. Laverne Dalgleish
Executive Director of the Air Barrier Association of America

TECHNICAL LETTER #18

Use of Grace Perm-A-Barrier® Systems with Stucco

The stucco and air barrier industries, both recognize the need for drainage between an air barrier assembly (used in lieu of building paper in exterior walls) and a stucco veneer. Building science sources/guides recommend that a drainage space be provided between the stucco and the air barrier drainage plane. Grace supports this recommendation and offers the additional information below.

Grace allows the use of traditional stucco and lath exterior veneers over Perm-A-Barrier® Systems under the following conditions:

- The Grace air barrier material and assembly is appropriate for the intended wall design (by others) in consideration of air barrier type (permeable vs. impermeable) and climatic conditions.

- Because stucco is a relatively absorbent cladding, proper wall design requires drainage of water down and out of a wall assembly. If it is expected that the stucco could become bonded to the air barrier assembly, Grace strongly recommends drainage between the stucco and the Perm-A-Barrier System.

- While ultimately the type of method used to provide for this drainage is up to the designer, it has been shown this can often be accomplished via a number of different ways:

  - A layer of conventional building paper/felt between the stucco lath and Perm-A-Barrier System.

  - A type of metal lath or other method that stands the stucco away from the Perm-A-Barrier System and creates a drainage channel behind the stucco.

  - Or similar means to facilitate proper drainage between the stucco assembly and the Perm-A-Barrier System.

- Regardless of which drainage method is incorporated, an air and water tight seal should be achieved at any fasteners through the air barrier to provide for air and water tight performance as required per project specifications.

Grace is continuing to evaluate the use of stucco and lath exterior veneers with our Perm-A-Barrier Systems to determine best practice techniques.

Please refer to the Grace Perm-A-Barrier Stucco Details for additional information about the use of Stucco Veneers with our Perm-A-Barrier Systems. Grace Perm-A-Barrier Aluminum Flashing is not included in the Grace Perm-A-Barrier Stucco Details due to a requirement per ASTM C926 Standard Specification for Application of Portland Cement-Based Plaster[1] indicating that no aluminum flashing should be used with stucco veneer. All flashing material used with stucco veneer shall be comprised of corrosion-resistant materials.

[1] ASTM C926-06 Standard Specification for Application of Portland Cement-Based Plaster, paragraph A2.1.2

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Printed in USA 11/08 AVB-180B SPN/PDF

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