SMARTci™

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HORIZONTAL INSTALLATION GUIDE
2-IN-1 SYSTEMS

System Installation Guide for Horizontal GreenGirt Applications Utilizing Rigid Foam Insulation Over Sheathing

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GreenGirt.com

a2p™ ADVANCED ARCHITECTURAL PRODUCTS

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Disclaimer

IMPORTANT

Please read all information related to the project before receiving materials at the job site and before starting the installation.

This installation guide is only to be used in combination with SMARTci™ installation drawings and Advanced Architectural Products, LLC's (henceforth also A2P) suggested details. Details shown in project shop drawings take priority over any similar information in this manual. Shop drawings may be created either by A2P or by the system installation contractor. A2P's Technical Service Department is available to aid the system installation contractor in the review of shop drawings. This guide is meant to furnish the system installation contractor with recommend methods, procedures and guidelines for the installation of the SMARTci system for commercial/industrial applications. Information presented is accurate but may not cover all circumstances, building conditions and/or details of the specific project. Consult an A2P technical representative where this guide does not cover every unique construction condition. It is the sole responsibility of the project engineer and system installation contractor to ensure specified air and weather tightness of a building by good design and workmanship in accordance with approved drawings, using only approved sealants/tapes. It is the sole responsibility of the owner's representative and system installation contractor to uphold quality workmanship in accordance with approved shop drawings to ensure the best operation of the system. A2P recommends installers read this document completely before receiving materials at the job site. Guide is subject to change without notice. Installation information is available through A2P at (269) 355-1818. Follow the architect's approved shop drawings and engineering computations for project-specific fastening designs. The engineer of record is liable for verifying applicable design loads and system fastening requirements. All safety methods are the duty of the installer, general contractor or construction manager.

Tools & Accessories Required

Abrasive Chop Saw &
Abrasive Wheeled Cutters

Levels

Heat Gun

Corded / Cordless
Screw Guns

Corded / Cordless
Drills

Caulk Guns

Hand Saws

Leather Gloves

Basic Safety Equipment

Rubber Mallets

Clamps

IMPORTANT

Personnel working with cutting equipment and power tools should wear proper eye protection and safety equipment at all times to prevent injury.

Galvanized Metal Angles & Strapping

Expandable Sealant

Approved Fasteners—as noted on GreenGirt Max CMH™ and GreenGirt Optima CMH™ brochures

Plastic Shims

⚠ Caution

GreenGirt must NOT be cut with plywood or toothed blades, as it is composed of metal, resin and glass fibers. Use only abrasive chop saw / hand saw blades. Do not use actuated fasteners, impact hammers / impact drills or reciprocating saws!

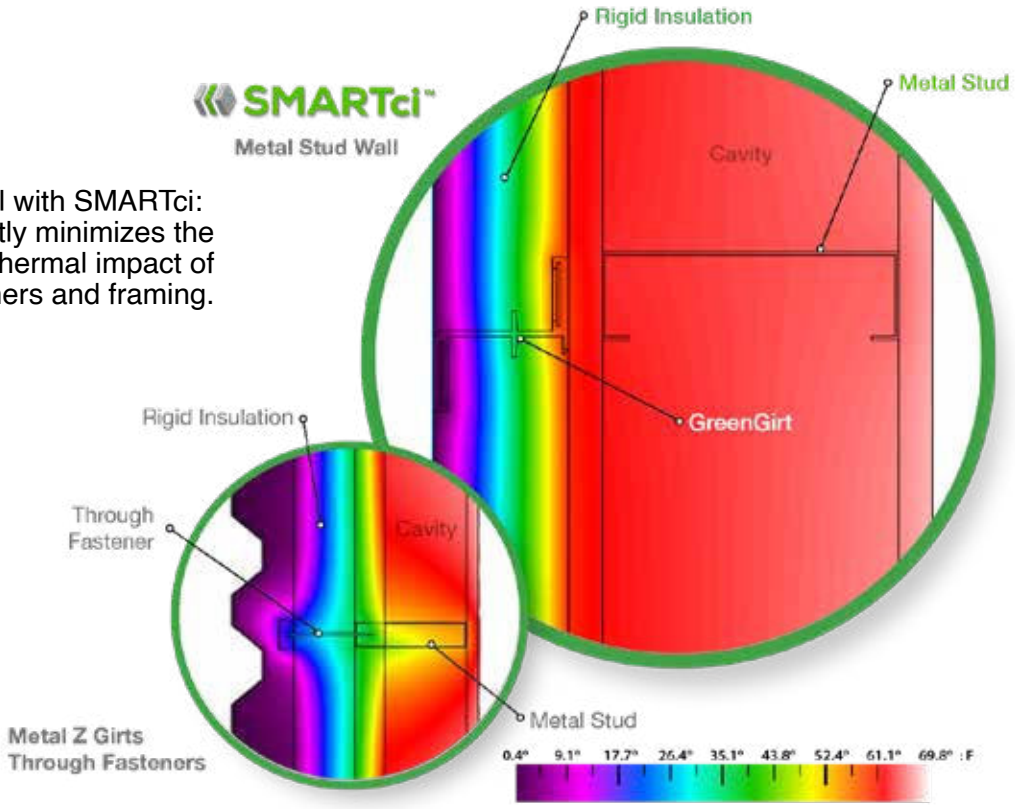
Why SMARTci?

The Problem: Thermal Bridging

When metal is used to connect the exterior components of a building directly to the interior framing it causes a thermal bridge. This thermal path of least resistance allows heat (or cold) to escape, creating a vulnerability (or cold spots), and allows moisture problems. Using materials that eliminate the thermal bridge help avoid unnecessary heating and cooling costs.

Stud wall with SMARTci: greatly minimizes the thermal impact of fasteners and framing.

Stud wall with a conventional system: fasteners and framing contribute to energy loss.



The Solution: SMARTci

SMARTci was designed to address the inadequacies of other continuous insulation solutions. Its individual parts were created as a simple, complete solution to help create smarter buildings. Plus, it's the best assembly to help earn points toward LEED certification. Unlike other attachment systems, SMARTci completely prevents thermal bridging that is created by metal fasteners and framing. It doesn't create cold spots for condensation inside your walls. It has a universal attachment design for virtually any cladding and it can be used over multiple surfaces, not just stud walls.

* U.S. and Global Patents Pending

Introduction

Welcome to SMARTci by Advanced Architectural Products, LLC. This document serves as the installation guidelines for SMARTci.

SMARTci provides buildings with a continuous insulation system and thermal break, as well as a mounting platform for the cladding application. It is an open design that works with almost any substrate, insulation or cladding.

SMARTci was created with one goal in mind: to make buildings more efficient. Specially designed to block off heat gaps that other systems neglect, SMARTci's thermal efficiency makes it a greener, long-term building investment for the future.

The SMARTci system consists of innovative insulated composite GreenGirt™ sub-framing, a primary insulator and auxiliary accessories as needed.

1. GreenGirt is available in 1.5", 2", 2.5", 3", 3.5", 4", 4.5", 5" and 6" depths and can be installed horizontally or vertically. Standard girt length is 96", and a clip system consisting of 6" pieces is also available. GreenGirt spacing is typically 16", 24" or 48" on center. Consult an A2P Technical Representative for loading design and capabilities for dead and live loads.

2. Insulation for SMARTci can be specified as rigid insulation, mineral wool or expandable sprayed foam:

    a. Custom-profiled rigid insulation panels from A2P provide both insulation and a weather seal, in either rigid polyisocyanurate (polyiso) or extruded polystyrene.

    b. Mineral wool may be installed between GreenGirts over a solid substrate and a properly-applied waterproof drainage plane.

    c. Expandable, sprayed foam insulation may be installed between GreenGirts over a solid substrate.

1. System Diagrams

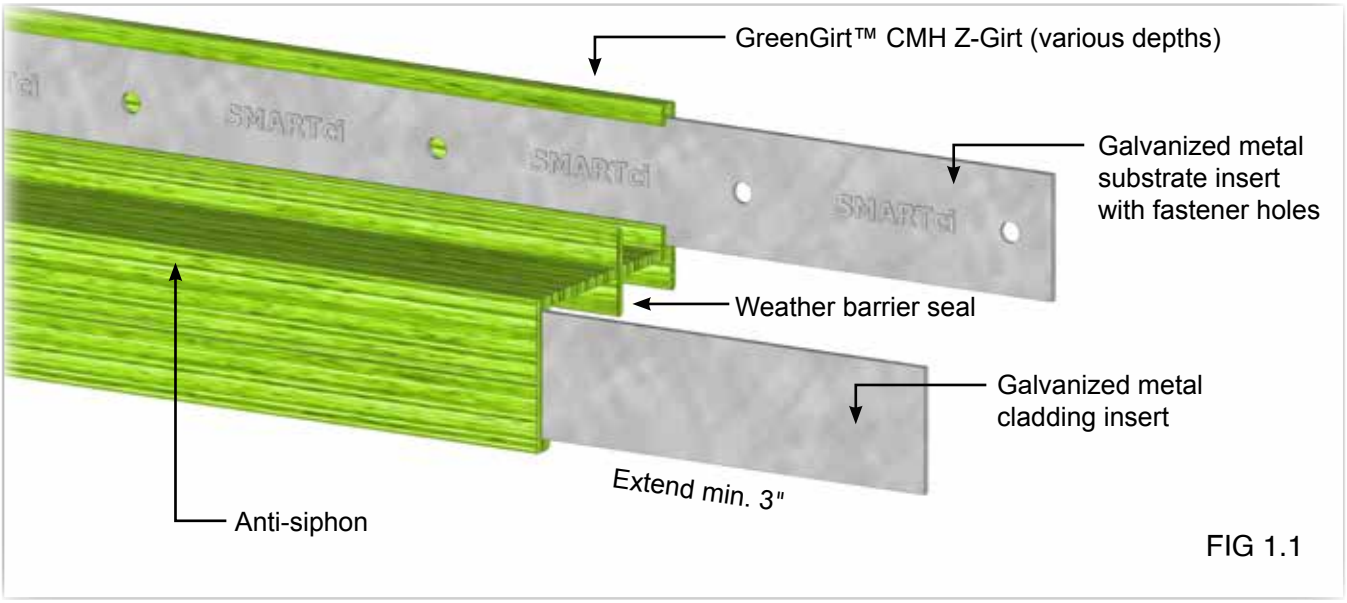


FIG 1.1

GreenGirt components shown, not to scale.

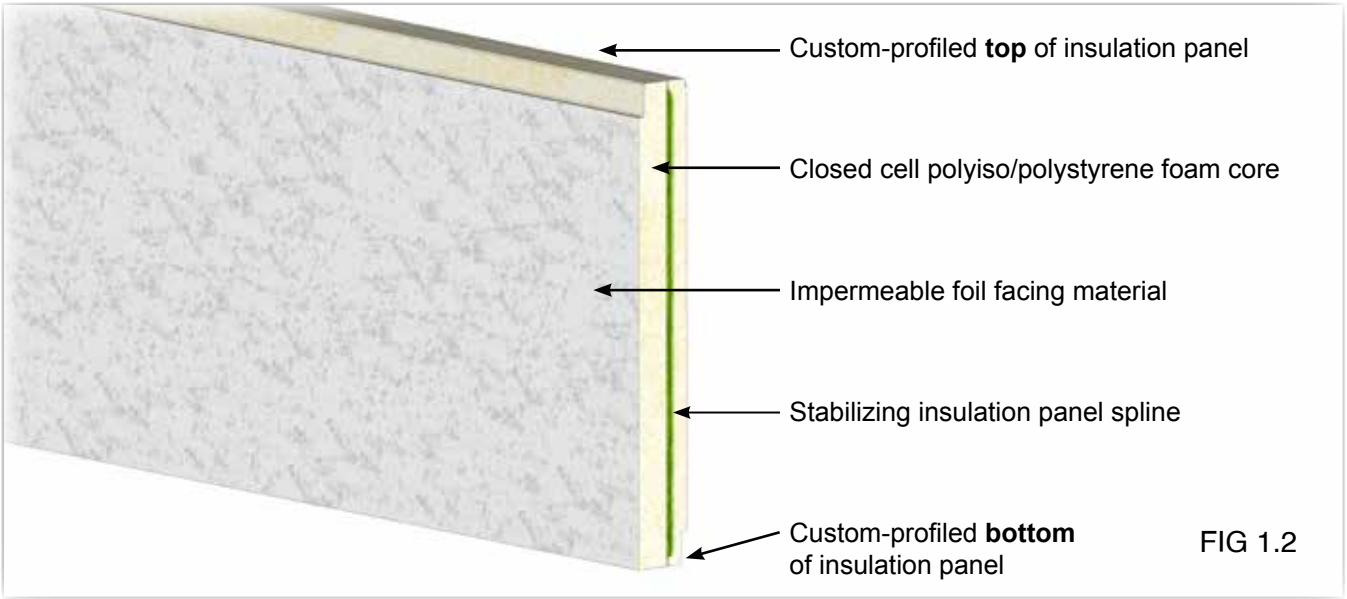


FIG 1.2

Typical rigid, closed-cell polyisocyanurate insulation panel, shown with spline inserted, not to scale.

1. System Diagrams – Continued

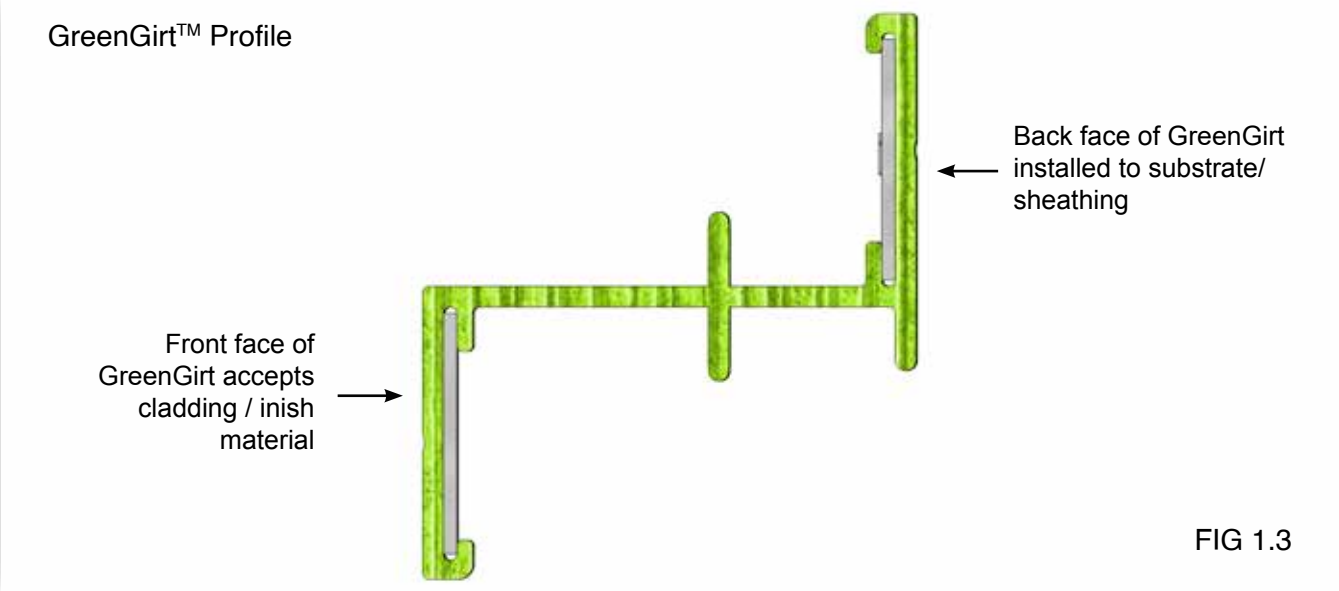


FIG 1.3

GreenGirt profile is shown, not to scale, indicating the orientation related to the building substrate.

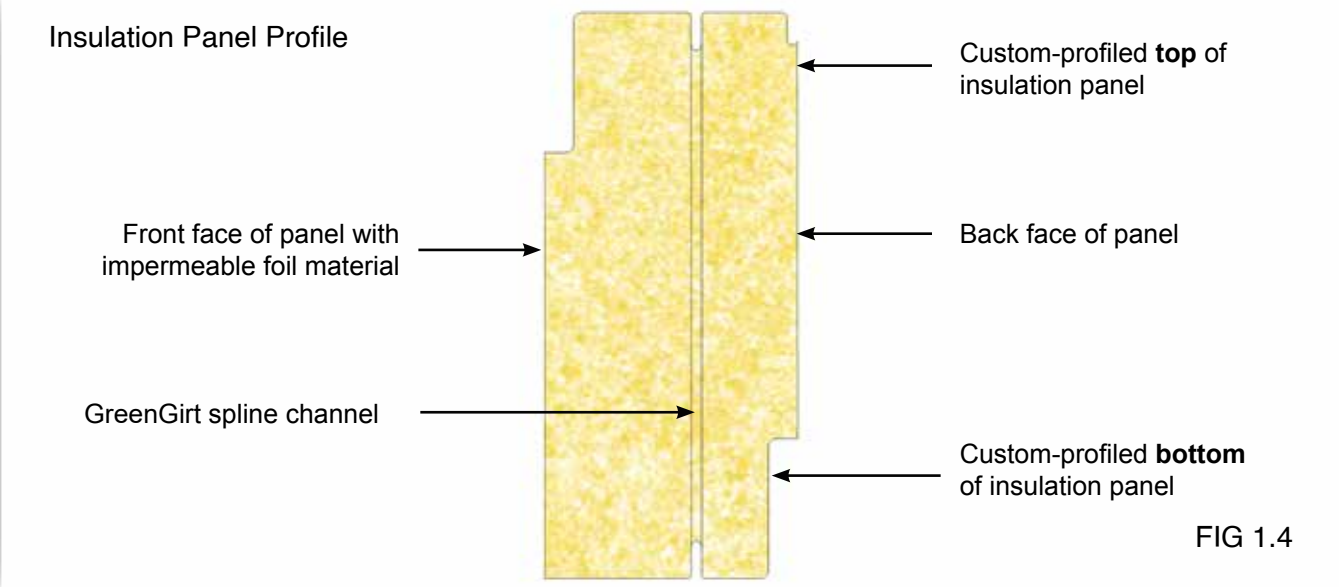


FIG 1.4

Typical rigid, closed-cell polyisocyanurate insulation panel profile is shown, not to scale, indicating the orientation related to the building substrate. The top of the panel is identified by the two routed edge profile, while the bottom of the panel is identified by only a single routed edge profile.

1A. Description and Uses

- **SMARTci™ is an innovative, complete insulation solution. Engineered as a continuous insulation system, SMARTci includes composite girt/attachment members (called GreenGirt™), insulation, an engineered installation package, and optional accessories.**

- **GreenGirt joins the building cladding and insulation to a building structure. It's an insulated composite sub-framing component inside the SMARTci assembly that can be installed horizontally and vertically.**

2. Technical Information

2.1 Performance & Quality

Please note, failure to follow the precise procedures outlined in this Installation Guide, all applicable laws, ordinances and codes, and/or accepted industry safety procedures will render any and all warranties null and void. A2P will not be responsible in any way for merchandise, installed or not, that is damaged or defective as a result of negligible practices and/or a failure to follow these guidelines, deficiencies in workmanship or construction, or dangerous site conditions.

Warranties and other product information are available from A2P. For information regarding general and product-specific warranties, please contact A2P at (269) 355-1818.

3. Inspection Upon Delivery

SMARTci insulation panels and GreenGirt are professionally packaged, wrapped and carefully shipped on flat bed trailers to the construction site. When a shipment is received, check all items against the shipping document for quantities, dimensions, colors, transit damage, etc. Document any shortage of panels, girts and accessories or any damage on the bill of lading and have it signed by the driver. It is the receiver's responsibility to make any damage claims immediately. Please note that although every effort is made to prevent shipping damage, A2P is not responsible for damage which may occur during transportation, delivery, storage or on-site handling.

4. System Handling

4.1 Pallets Handled by Forklift

Inspect travel route to assure a reasonable level and compacted surface free of ruts and excavations.

The recommended loading/unloading method for bundles less than or equal to 8 feet is to use a single forklift with appropriately-spaced forks placed under the center of the bundle, transporting only one at a time.

Extreme caution is suggested when moving pallets of SMARTci insulation panels, as the corners and edges are ***VERY FRAGILE***, and damage could render them unusable.

4.2 Pallets Handled by Crane

To prevent damage while lifting, carefully pick up bundles one at a time.

The recommended crane lifting method is to use nylon straps positioned at a minimum of two points along the length of the bundle. Suitable wood spreaders should be used and located at the top and bottom of the bundles at the strap positions to protect the edges.

Extreme care should be taken to avoid bumping and snatching of the bundles when lifting.

5. System Storage On Site

Site must have adequate storage space to receive and store SMARTci components. This space must be level, firm, clean and free from standing water. Components, especially insulation panels, should be stored in a dry condition, off of the ground, covered continuously when not in use. Avoid outdoor storing for longer than 45 days.

IMPORTANT

SMARTci insulation panels and GreenGirt packages are non-load bearing! Do NOT stack other objects on top of the bundles, such as bricks, metal, lumber, and other materials.

Panels should be inspected upon delivery for presence of moisture. If moisture is present, packaging should be opened immediately to allow ventilation and drainage. Do not store insulation panels in direct sun.

If SMARTci is to be used immediately, bundles should be placed at preplanned strategic locations around the building perimeter, as close as possible to the specific work areas. Review installation shop drawings to determine the best locations.

Insulation panels in opened bundles should be covered by a plastic sheet or tarp at the end of the working day. The covering and bundles must be securely fastened to prevent wind damage.

When handling SMARTci, ropes, steel cables or chains must not be used. Insulation panel pallets should not be stacked more than two high in the field.

6. Handling and Storage of Auxiliary Accessories

Care should be taken during unloading and storage to prevent damage to small items, such as; GreenGirt™, clips, tape, fasteners, sealants, etc.

Cover all pallet crates or boxes to protect materials from weather but allow for ventilation to prevent condensation. Temperature sensitive items such as butyl tapes and sealants should be stored under controlled conditions to maintain suitable application characteristics.

7. Structural Alignment

Review shop drawings prior to installation to verify that structural members are in the correct location.

Installer must examine the alignment of the structural steel before installation of SMARTci. The substrate must be square, and support members to which panels are attached must be in the same plane, flat and free of obstructions such as weld marks, bolts or screw heads.

Support members shall be installed within the following tolerances of plus or minus 1/8" (3.17 mm) in 10 feet (3048 mm) in any direction along plane of framing, with non-accumulative spaces.

Any variance from tolerances can affect both performance and aesthetics and must be reported to the architect and general contractor, and corrected by the responsible party before installation begins.

8. Installation & Surface Preparation

Before installing GreenGirt™ or SMARTci insulation panels, ensure that the substrate is dry, clean, sound and free of any debris, residue and any other surface contaminants.

8.1 Installer Selection

A2P recommends that SMARTci is only installed under the direct supervision of an experienced craftsperson, trained in the proper application of its diverse offering of products and services. Please call (269) 355-1818 for information regarding authorized installer selection and training programs.

8.2 Masonry & Concrete

Remove high spots and fill in low spots prior to attaching GreenGirt to concrete or masonry substrate. Remove any extra materials protruding on surface of walls, such as chunks of mortar or concrete, and even wall surface to within 1/4" per 8 feet. All high and low spots should be leveled to provide an even wall surface.

8.3 Steel & Wood Stud

Verify the substrate is flat, without steps or voids greater than 1/4".

9. Structural Alignment

The SMARTci system is installed horizontally or vertically from the bottom up, starting at a transition/ termination point. Depending on the starting location, refer to general and/or project specific construction details to determine how to begin the installation. Please refer to the Construction Details section starting on pg. 21.

1. Recommended: Close outside corners with 16 gauge strap angles (attached at every GreenGirt).

2. Correctly size to length the pre-cut bottom starter insulation panels and add 1" of approved sealant along the top edge, roughly every 24" O.C. (recommended).

3. Press the starter GreenGirt into the starter insulation panel gently, ensuring a tight fit, and tamping with a rubber mallet and notched block as needed. Apply the GreenGirt to the substrate with approved fasteners per directions. Allow for ½" gap between the panel and base (if applicable) for approved expandable sealant.

4. Install the first row of insulation panels above the starter row of GreenGirt per installation guidelines.

5. Install the next row of GreenGirt by gently tamping it down in place along the length of the panel. Ensure that the Compression Air Seal of the GreenGirt aligns with the coordinating channel at the top of the insulation panel to prevent damage before tamping.

6. Apply approved, expandable spray foam in all gaps greater than 1/8".

7. (Optional) Install strapping clips (if required) at parapet transitions at a minimum of 24" on center.

CAUTION!

GreenGirt must NOT be cut with a plywood or toothed saw blades, as it is composed of metal, resin, and glass fiber. Use ONLY abrasive chop saw/hand blades. Do NOT use actuated fasteners, impact hammers/impact drivers or reciprocating saws!

10. System Installation: GreenGirt™

10.1 General Notes

With approved engineering, GreenGirt is designed to be installed either vertically or horizontally, spanning 16", 24" or 48" apart, with fasteners attaching them to the substrate at 16" or 24" centers. This spacing is determined by the type and size of insulation used, the material and scale of the final cladding, or both.

When attaching fasteners to GreenGirt, the following general guidelines are to be observed (FIG: 10.1.1):

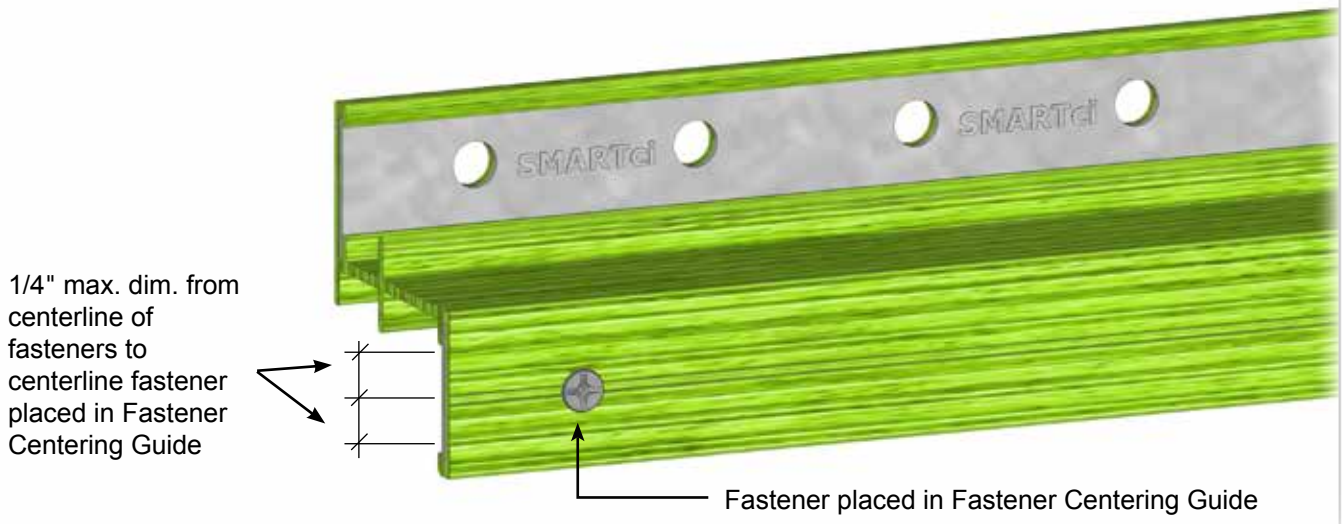
1. The edge distance of any fastener-hole shall be a minimum of 1/2" from the edge of the profile to the closest side of the fastener-hole.

2. The minimum clear distance between holes is 5x diameter.

3. The minimum edge (edge of profile to edge of hole) distance in the longitudinal direction is 3x diameter.

4. The minimum edge (edge of profile to edge of hole) distance in the transversal direction is 2x diameter.

FIG 10.1.1



When attaching any sheathing (plywood, fiberglass gypsum, etc.) to GreenGirts, the ideal location for approved fasteners is in alignment with the Fastening Center Guide. A maximum deviation of 1/4" from the centerline of the fastener to the centerline of the guide is also acceptable.

10.2 Steel Fastening

Fastening GreenGirt™ to steel framing can be performed with self-drilling fasteners of sufficient diameter and loading capacity for the application, utilizing the pre-drilled holes in the metal retention plates.

10.3 Concrete Fastening

Fastening GreenGirt to a concrete or CMU substrate can be accomplished by using threaded concrete fasteners of sufficient design to accommodate the design load. Pre-drill the GreenGirt metal substrate insert as needed. Refer to specific project documents for fastener types and sizes.

10.4 GreenGirt Attachment

It is essential that the starting row of GreenGirt be properly secured to the substrate, and is level and true. The height of the first GreenGirt row above the base is generally determined by project-specific factors, such as type of insulation used, size and scale of exterior cladding material, and/or substrate-specific conditions. Generally, SMARTci should begin at a transition/termination point. See Construction Details for more information.

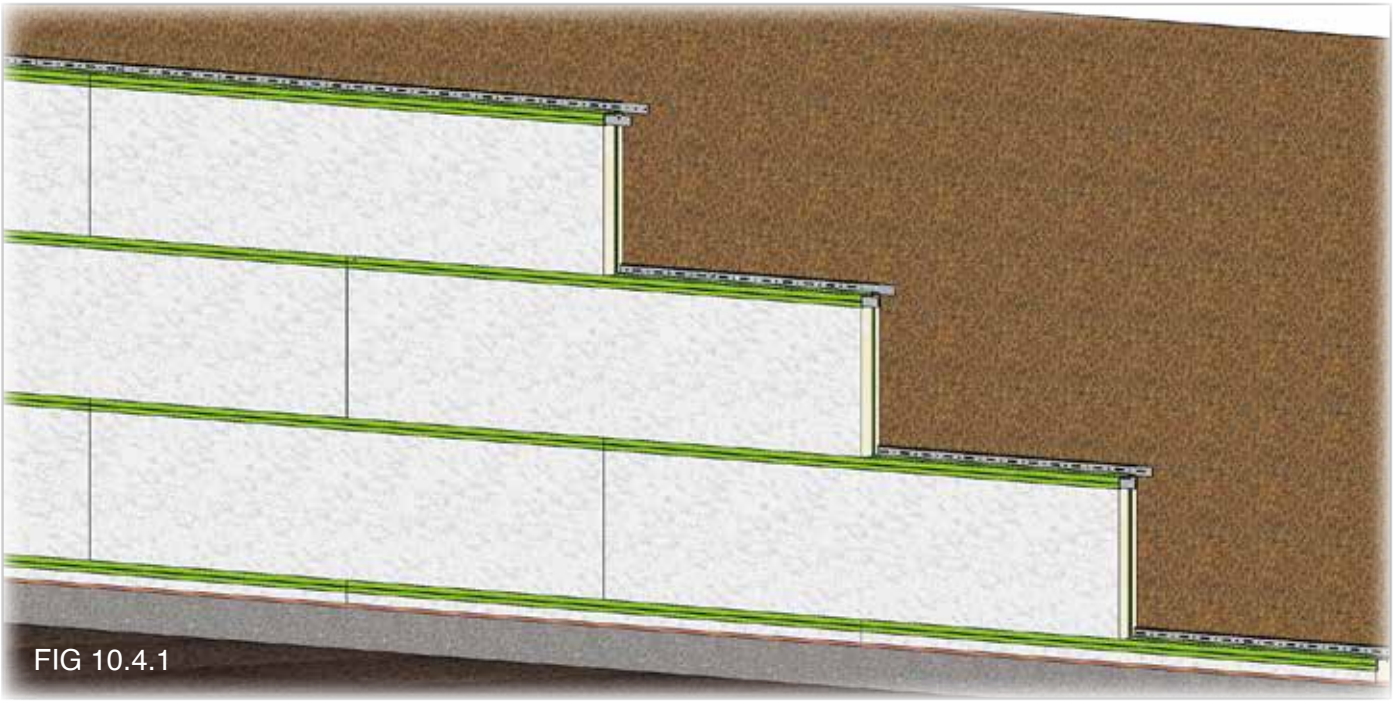


FIG 10.4.1

GreenGirt shown on solid substrate construction, installed horizontally, with staggered joints. Refer to project-specific conditions, architectural and engineering documents to determine proper starting and spacing.

10. System Installation: GreenGirt™ - Continued

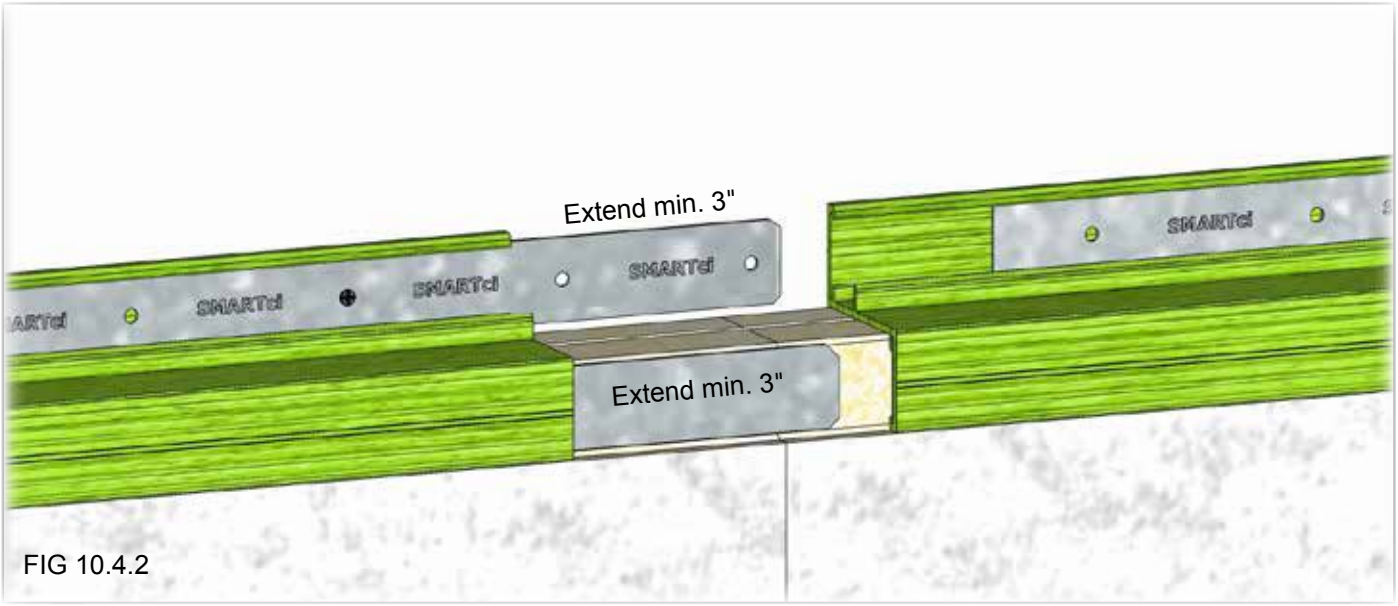


FIG 10.4.2

STEP 1: GreenGirt galvanized metal inserts fit into new GreenGirt, with a minimum of 3" overlap.

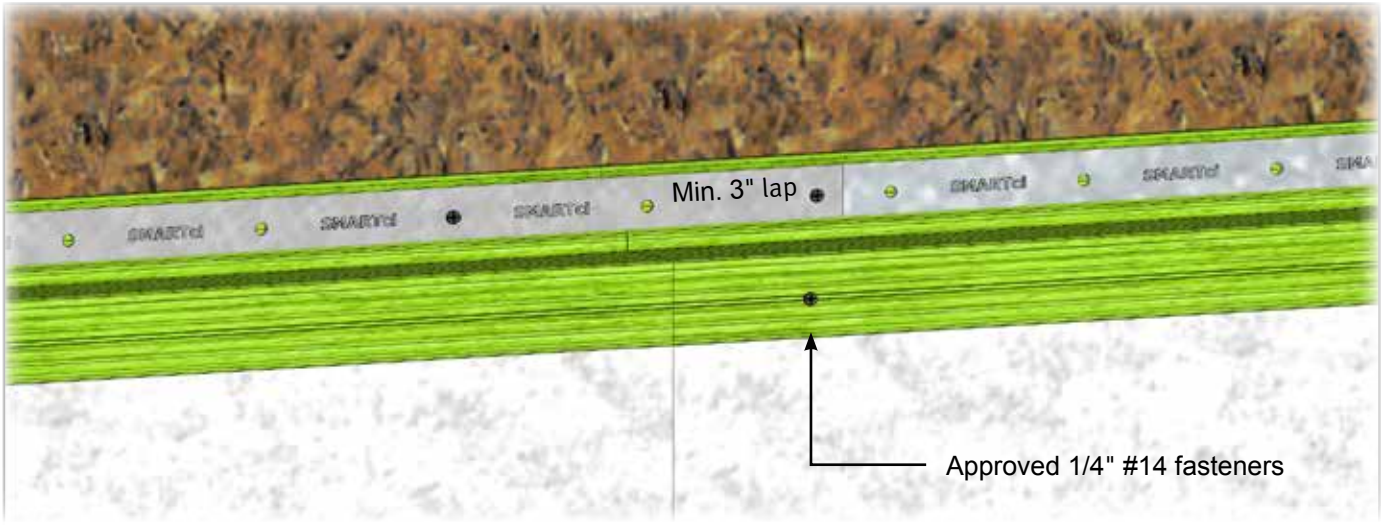


FIG 10.4.3

STEP 2: The GreenGirt pieces are connected with galvanized metal inserts lapped at least 3” and with fasteners through the laps.

10.5 GreenGirt™ Connections

When connecting two pieces of GreenGirt, these steps ***must be followed***:

1. Carefully slide the extended galvanized metal substrate insert and cladding insert into the corresponding channels of the receiving GreenGirt with a 1/16" gap and minimum of 3" overlap, FIG. 10.4.2.

2. Fasten the GreenGirt through the overlapped galvanized metal inserts into the substrate with approved fasteners, FIG. 10.4.3.

3. Remove any debris or moisture from the installed GreenGirt before continuing to add sealants or insulation panels.

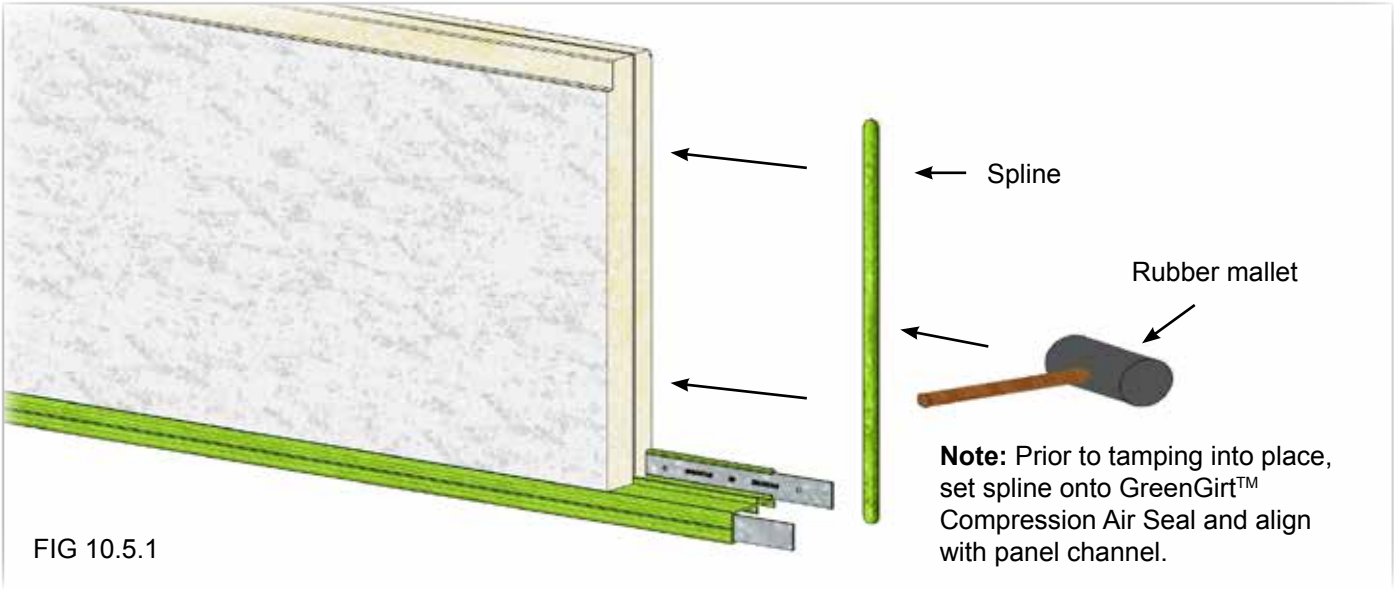


FIG 10.5.1

STEP 3: After cleaning all debris and any moisture from the GreenGirt, place the SMARTci insulation panel firmly into the starting GreenGirt member; align the Compression Air Seal into the groove properly. Insert the GreenGirt spline into the end vertical channel with a rubber mallet, gently tamping to ensure a snug fit.

10. System Installation: GreenGirt™ - Continued

10.6 General Notes

Sequencing the installation of the SMARTci system is laid out in this guide and using only supplied/approved auxiliary materials/accessories, is vital for the function and longevity of the system's performance and integrity.

SMARTci should not be installed in applications below grade, or to damp and/or frozen surfaces. Insulation panels are not intended to be slid into place, Fig. 10.5.3.

10.7 Installation

- Protect surrounding areas and surfaces from damage.
- Do not apply SMARTci insulation panels over walls while they are vulnerable to water intrusion from above or behind.
- Do not block flashing, weeps or other drainage paths with panels.
- SMARTc insulation panels should be applied in a running bond pattern using maximum board lengths to minimize number of joints.
- Honor expansion joints as indicated on the drawings. Do not span expansion joints.
- Verify all materials are installed in accordance with current, published literature and local code requirements.

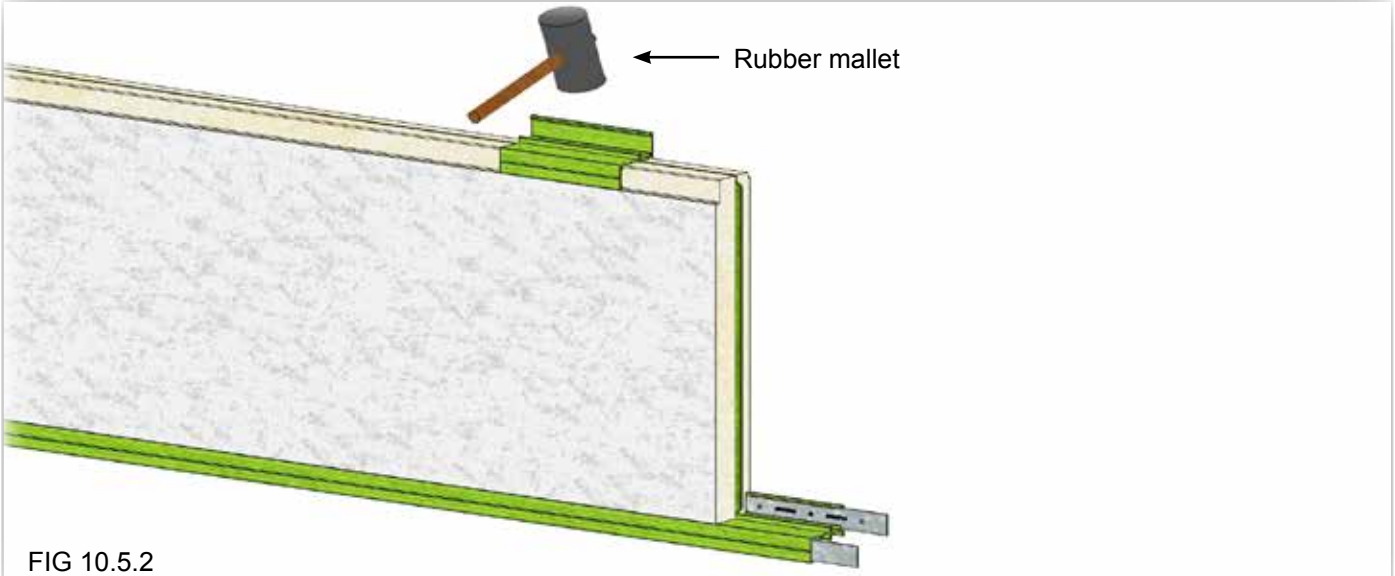


FIG 10.5.2

STEP 4: Using a spare piece of GreenGirt as a buffer, gently tamp down onto the installed insulation panel with a rubber mallet, ensuring a firm bond, and that no damage is done to the insulation panel.

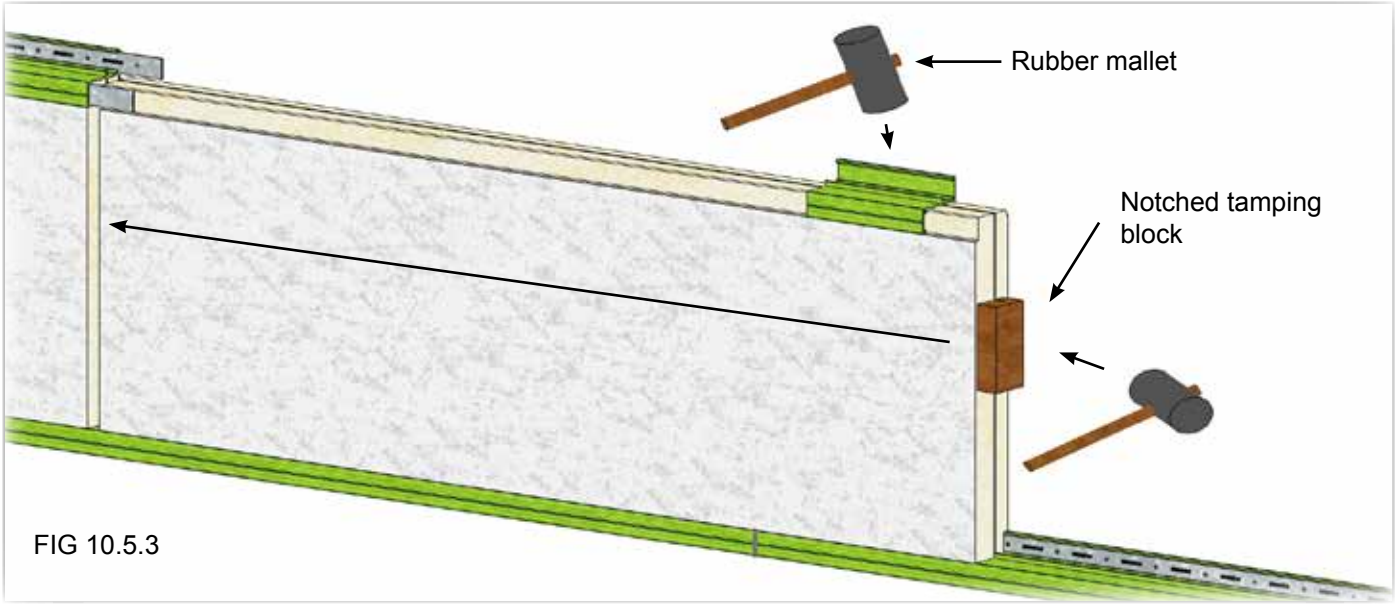


FIG 10.5.3

STEP 5: When installing the next adjacent insulation panel, do not slide the panel into place. Use the spare piece of GreenGirt to gently tamp it into place along the length of the top. Continue installing SMARTci insulation panels in this way, bottom to top. Ensure that joints are staggered, and that secure, flush bonds are achieved between full panels.

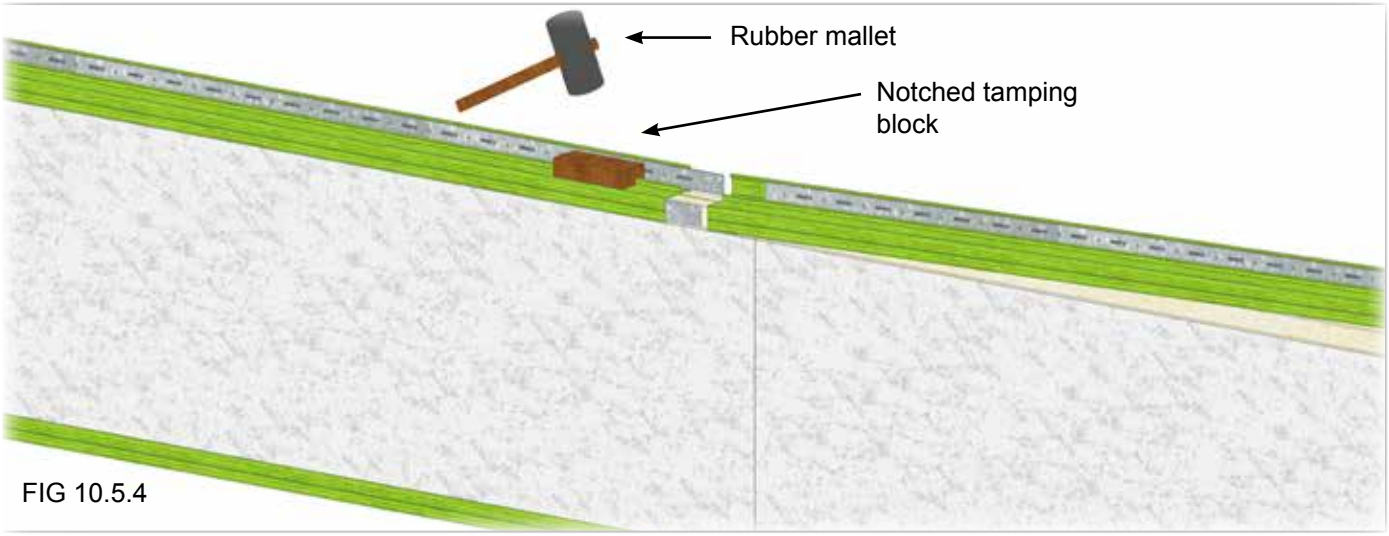


FIG 10.5.4

STEP 6: Continue installing the next course of GreenGirt™ above the previously installed insulation panels. Using the notched tamping block and a rubber mallet, gently tamp down onto the new girt to ensure a firm bond. The next adjacent piece of GreenGirt will be connected at a slight angle above the previously installed insulation panel. Insert fasteners through lap at back flange and front flange.

11. System Installation: Insulation Panel Cutting & Routing

11.1 Custom Panel Cutting

There is a specific sequence to cutting SMARTci insulation panels to custom sizes. Once the length, width or both have been determined for the panel, the first step is a standard, straight cut. For installation at foundations, openings, corners, angled roofs or other typical construction details, these flat panel faces need no further routing to be installed correctly.

When cutting panels, do not use knives, razor blades, or hand/reciprocating/jig saws. Use a circular saw with a toothed, plywood-type blade only, and a square to ensure straight, flush cuts of the material. Clean edges of any loose foil pieces before installing the panels as outlined in this guide.

11.2 Custom Panel Routing

The second step in installing custom-sized panels is necessary when the newly-sized panel is connecting to another panel or into a GreenGirt. Using the provided SMARTci Spline Router and SMARTci Edge Router profiling attachments, follow the procedures as indicated in Ref. FIG 11.1.2.

FIG 11.1.1

Step 1: To cut panels to a custom length or width, use a sturdy, raised surface to support it. Do not cut the panel on the ground, while supported by anything unstable, or individuals. Using a chalk line and square will ensure a clean, straight cut.

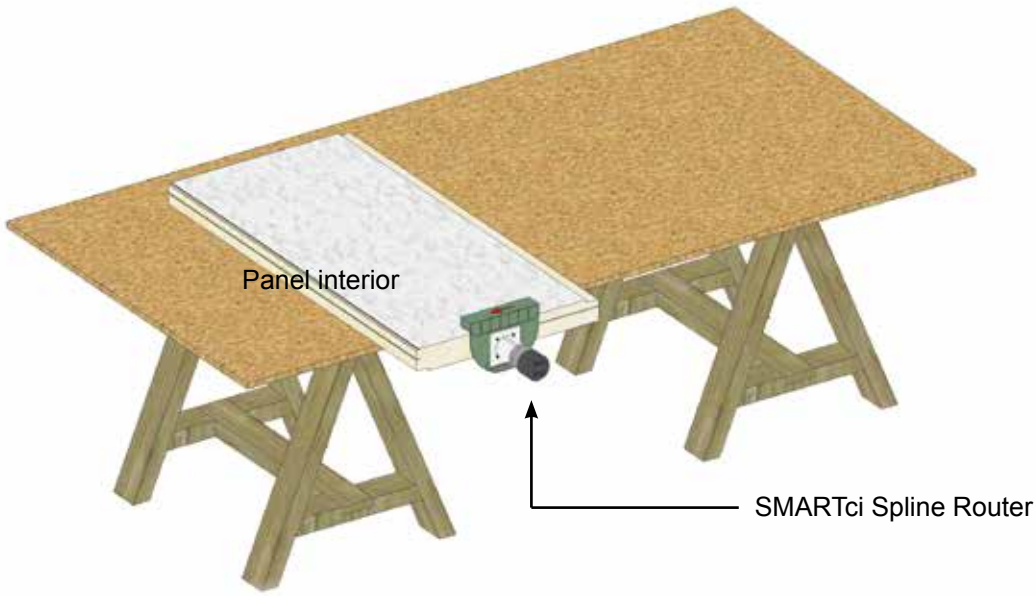


FIG 11.1.2

STEP 2: If the newly-sized panel is to be connected to another panel along the end(s), run the appropriately-sized SMARTci Spline Router squarely along the outside end edge(s) of the insulation panel, in the direction of the arrows located on the router's base, to add the channel for the GreenGirt™ Compression Air Seal(s) and spline(s).

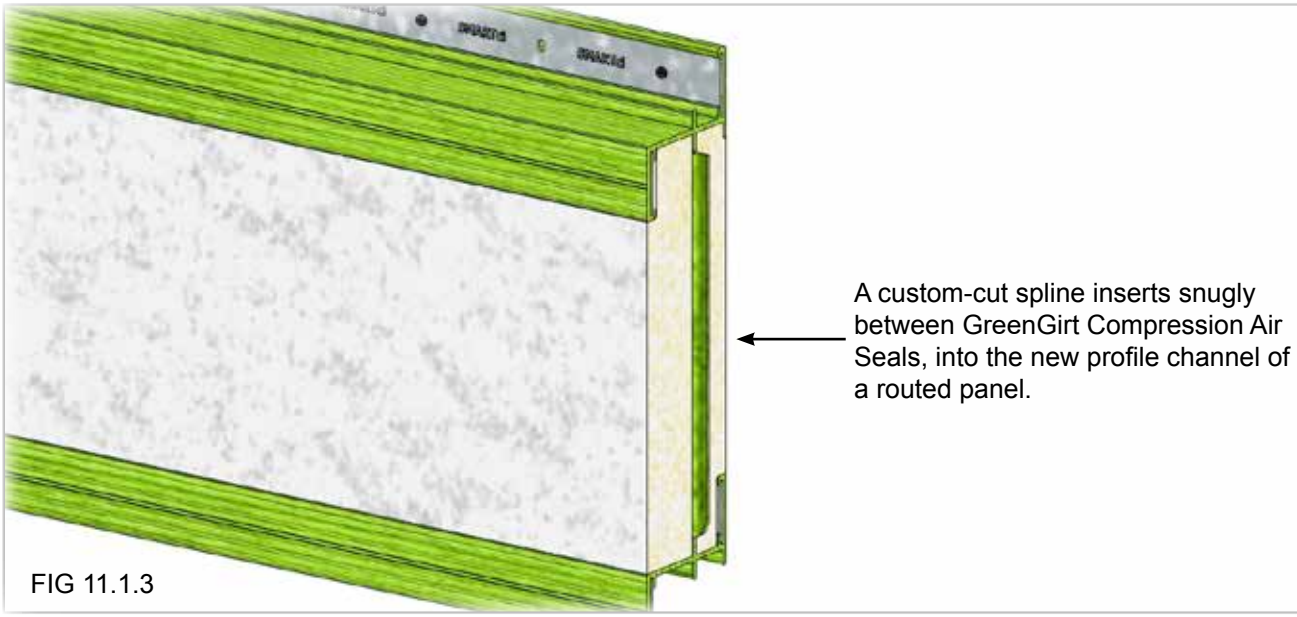


FIG 11.1.3

STEP 3: In the end(s) of the custom cut panel where it is to be connected to another panel, a custom-cut spline must be sized to fit snugly into the newly-routed channel. The spline should fit tightly against the bottom and top Compression Air Seals of the GreenGirts.

11. System Installation: Insulation Panel Cutting & Routing - Continued

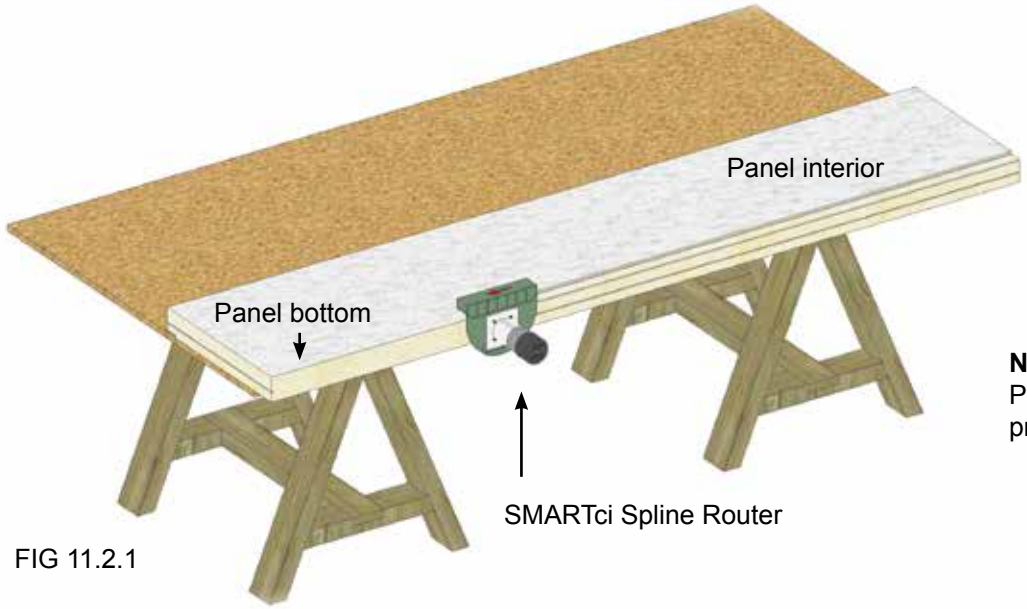


FIG 11.2.1

Note: Refer to Insulation Panel Profile p.18 for proper panel orientation.

STEP 4: For a custom-cut panel width, first run the appropriately-sized SMARTci Spline Router squarely along the bottom of the insulation panel, in the direction of the arrows located on the router's base, to create the profile for GreenGirt™ Compression Air Seal.

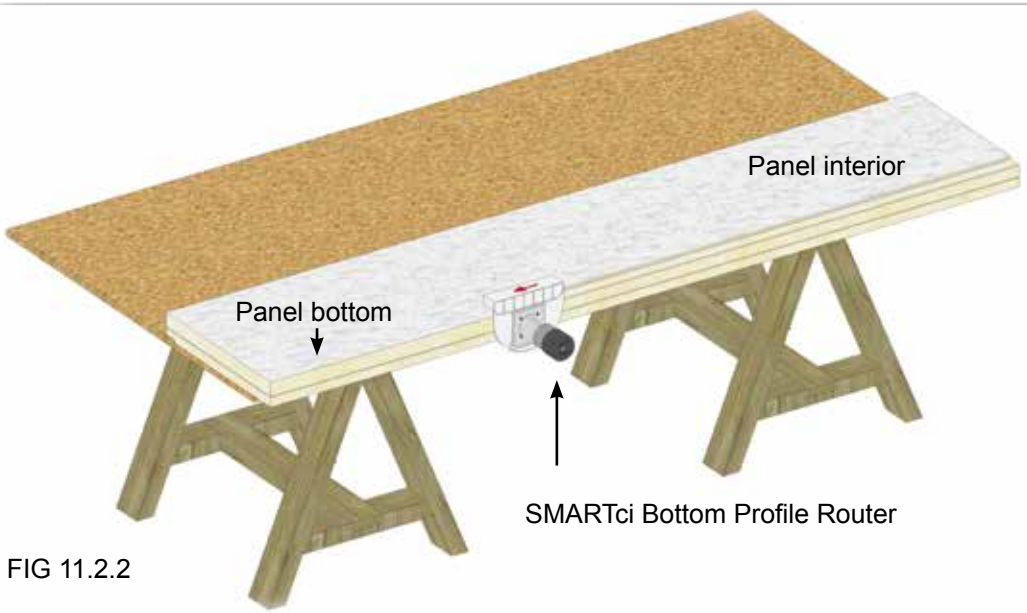
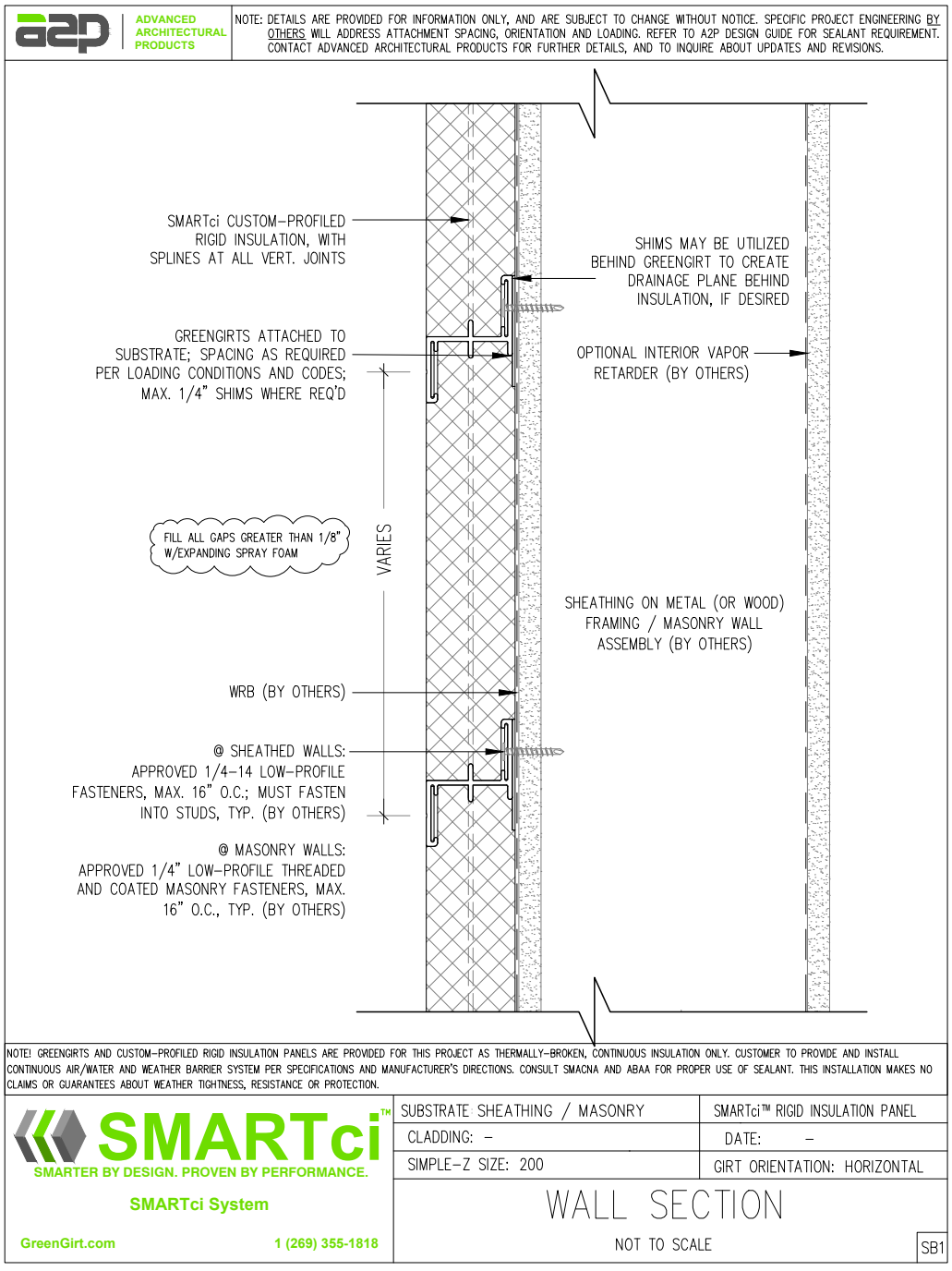


FIG 11.2.2

Note: Refer to Insulation Panel Profile p.18 for proper panel orientation.

STEP 5: Second, follow in the same way with the appropriately-sized SMARTci Bottom Profile Router. Ensure that only the bottom of the panel is cut to create a custom-size, as this is the profile created by the supplied router.

12. Construction Details



13. Construction Details – Continued

ADVANCED ARCHITECTURAL PRODUCTS

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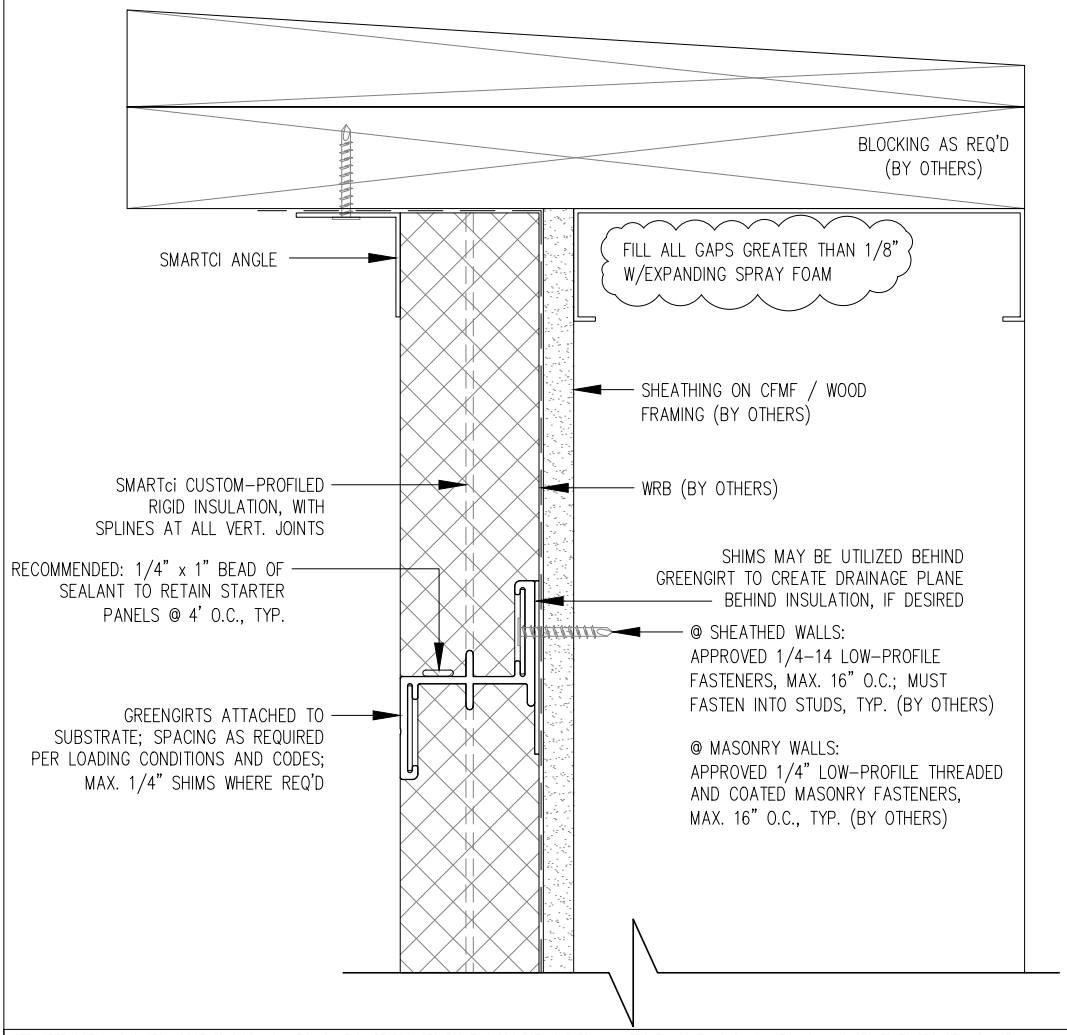

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SIMPLE-Z SIZE: 200	GIRT ORIENTATION: HORIZONTAL

PARAPET DETAIL

NOT TO SCALE

SB2

ADVANCED ARCHITECTURAL PRODUCTS

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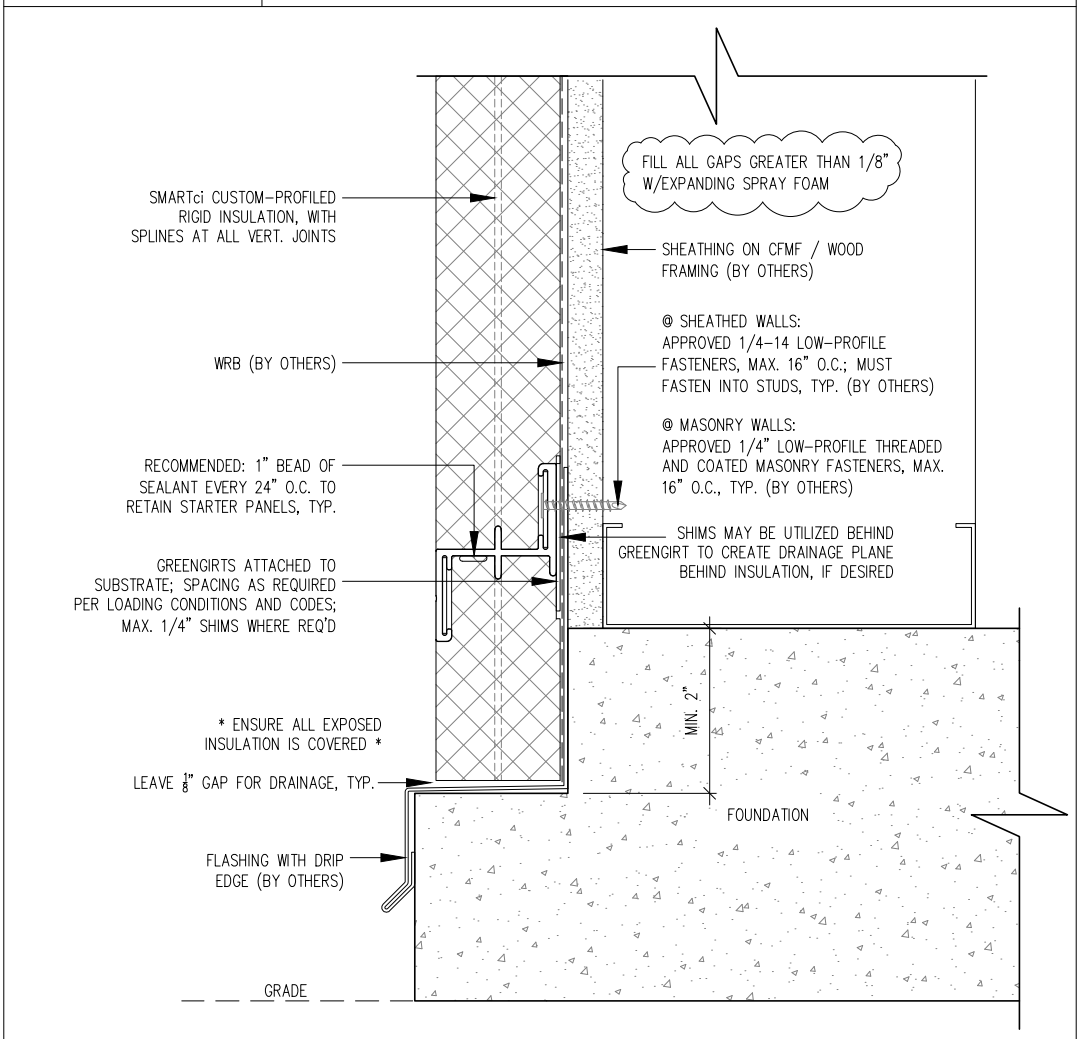

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SIMPLE-Z SIZE: 200	GIRT ORIENTATION: HORIZONTAL

FOUNDATION NOTCH DETAIL

NOT TO SCALE

SB3

ADVANCED ARCHITECTURAL PRODUCTS

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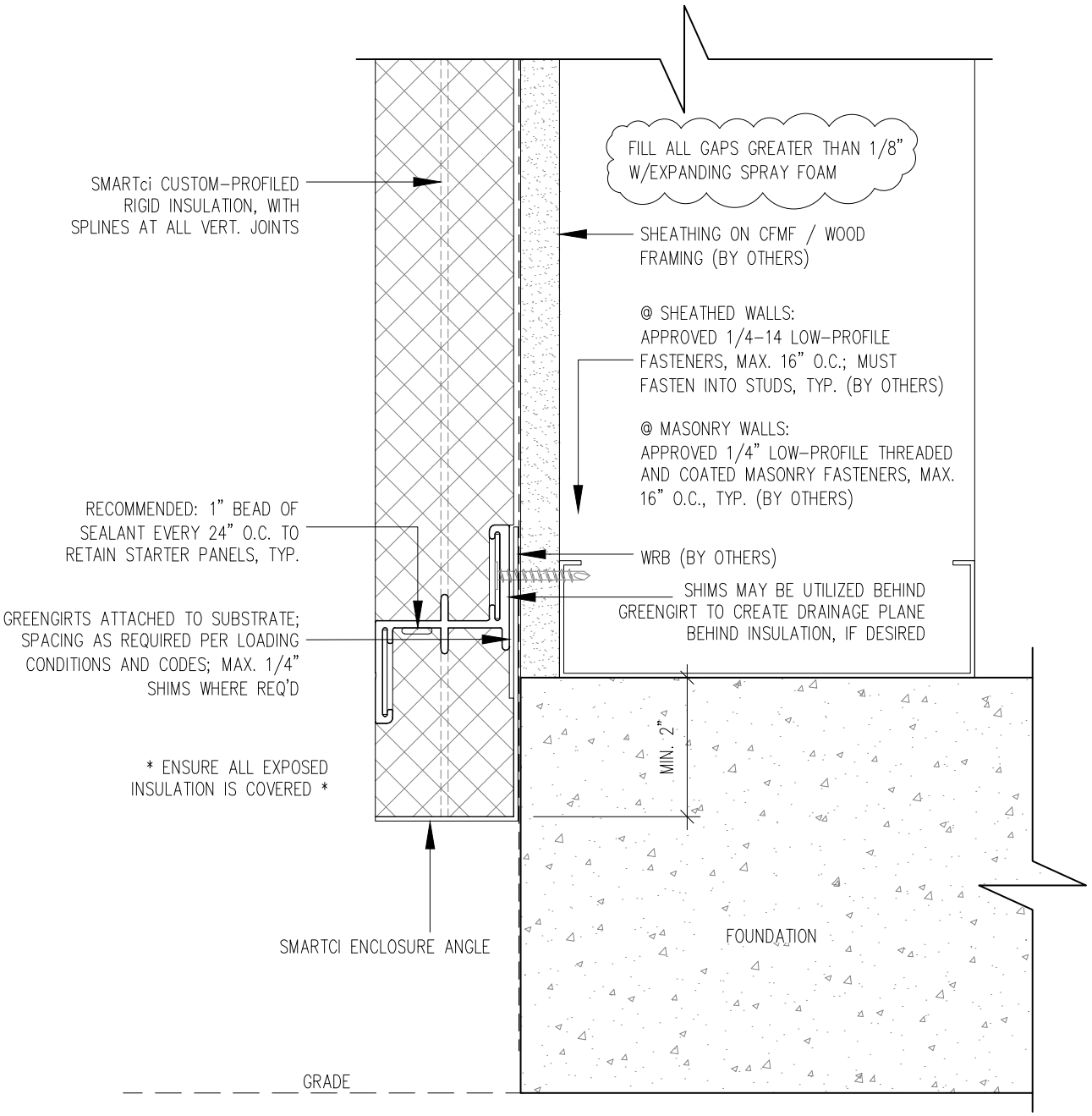

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FOUNDATION FLUSH DETAIL

NOT TO SCALE

SB4

ADVANCED ARCHITECTURAL PRODUCTS

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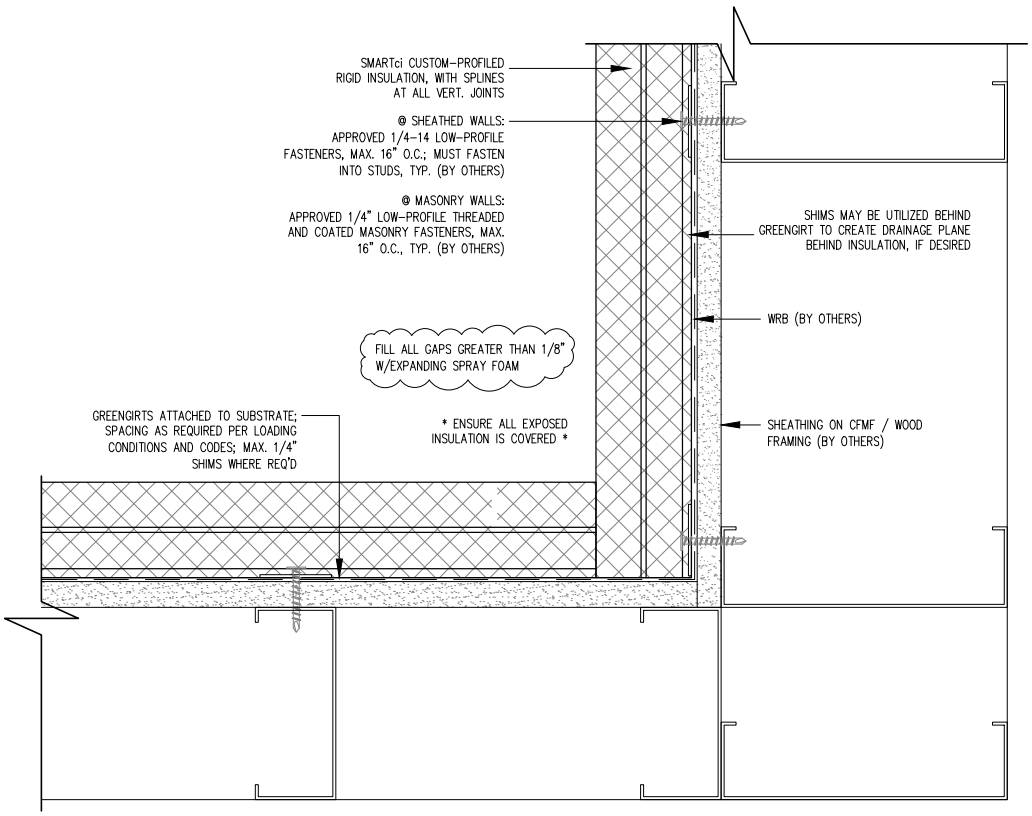

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INSIDE CORNER DETAIL

NOT TO SCALE

SB5

ADVANCED ARCHITECTURAL PRODUCTS

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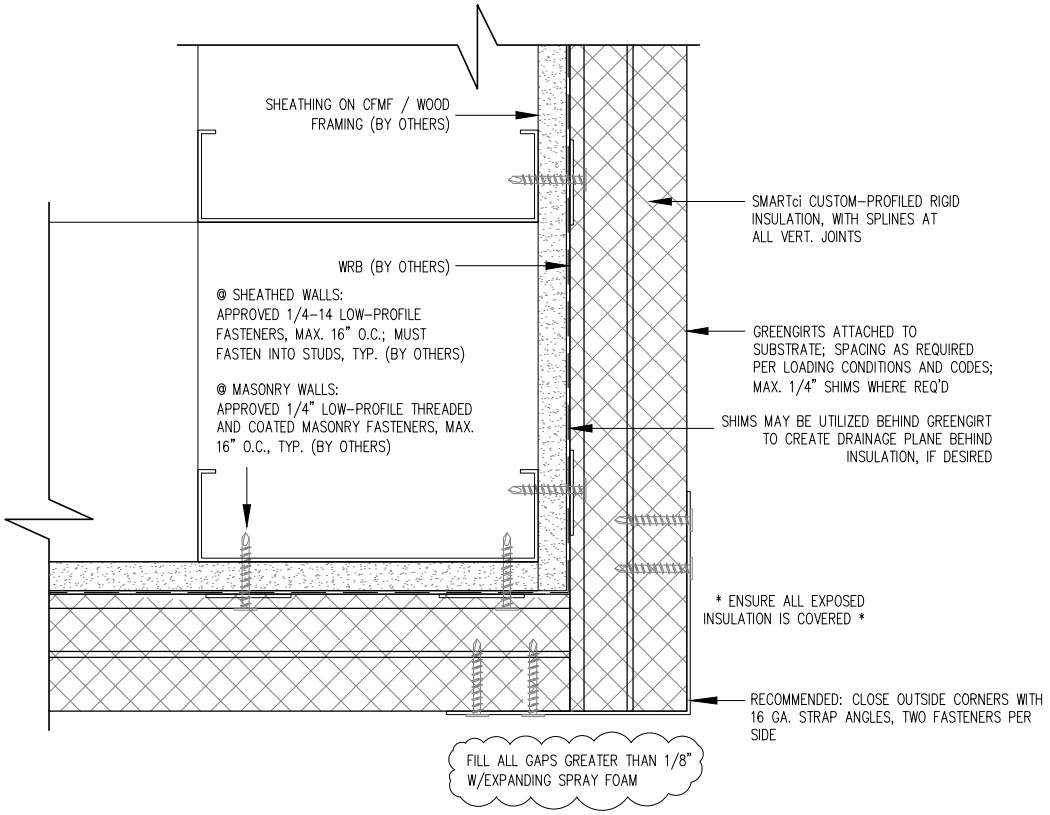

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OUTSIDE CORNER DETAIL

NOT TO SCALE

SB6

ADVANCED ARCHITECTURAL PRODUCTS

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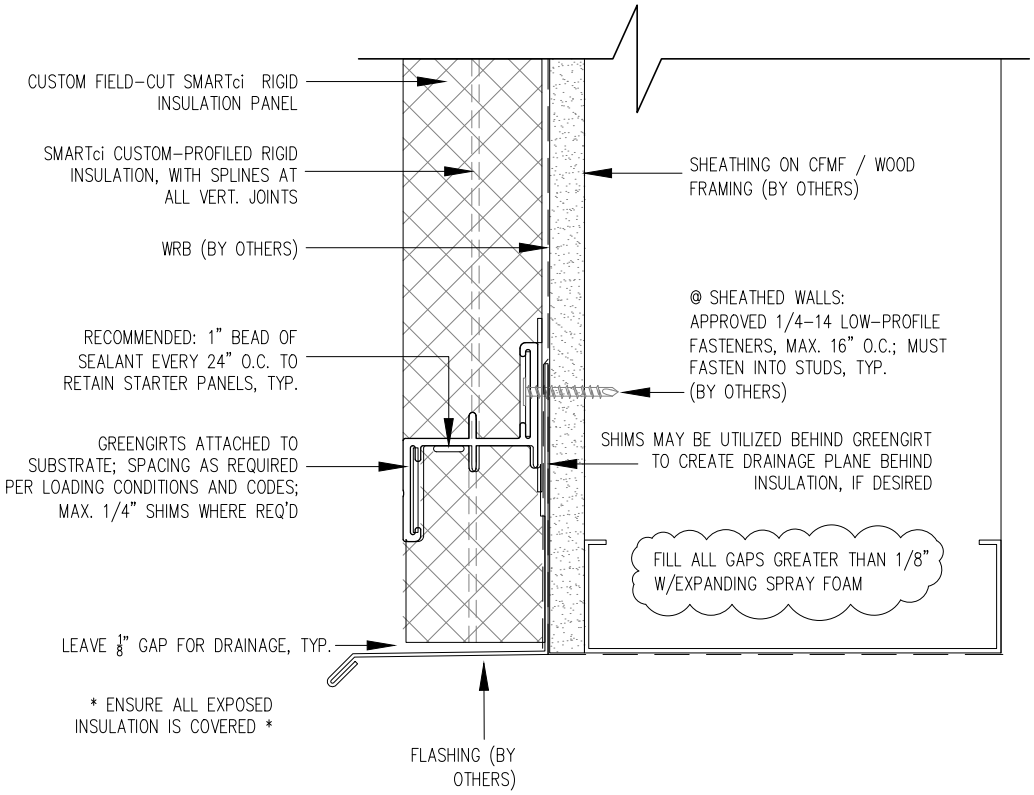

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HEADER DETAIL

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SB7

ADVANCED ARCHITECTURAL PRODUCTS

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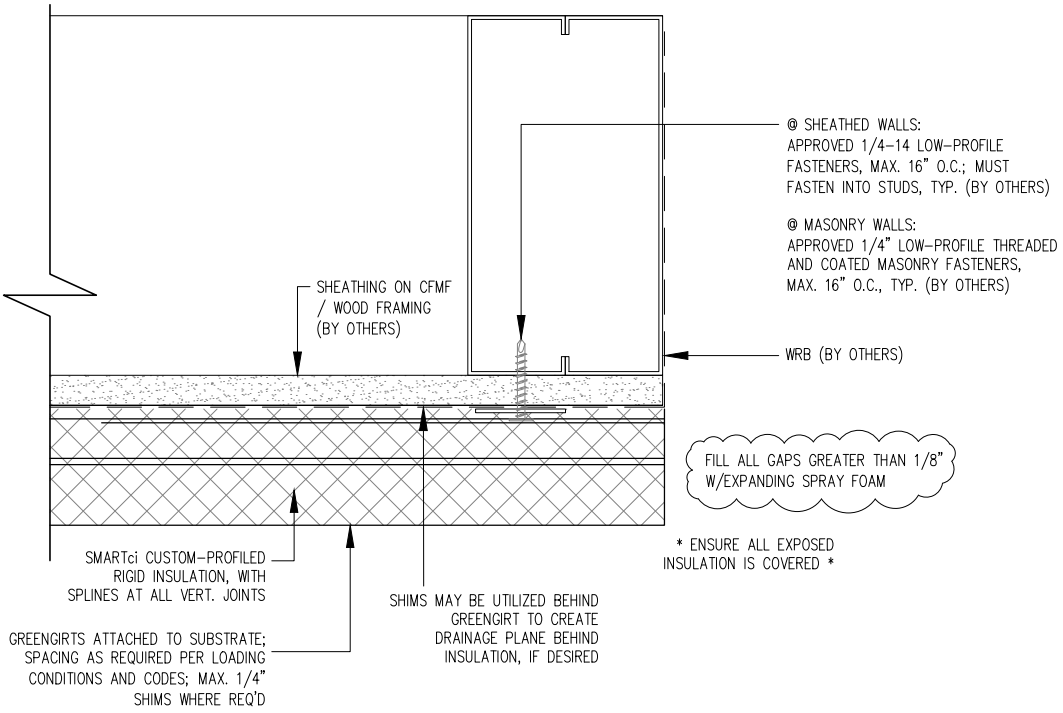

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JAMB DETAIL

NOT TO SCALE

SB8

ADVANCED ARCHITECTURAL PRODUCTS

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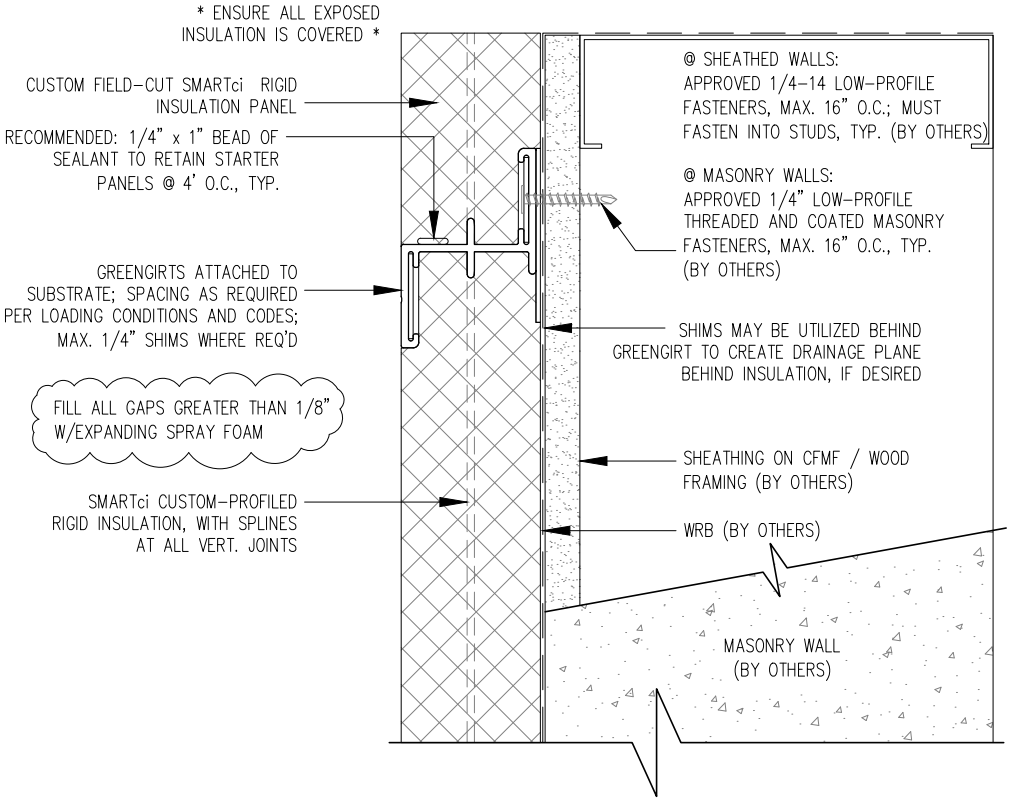

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SILL DETAIL

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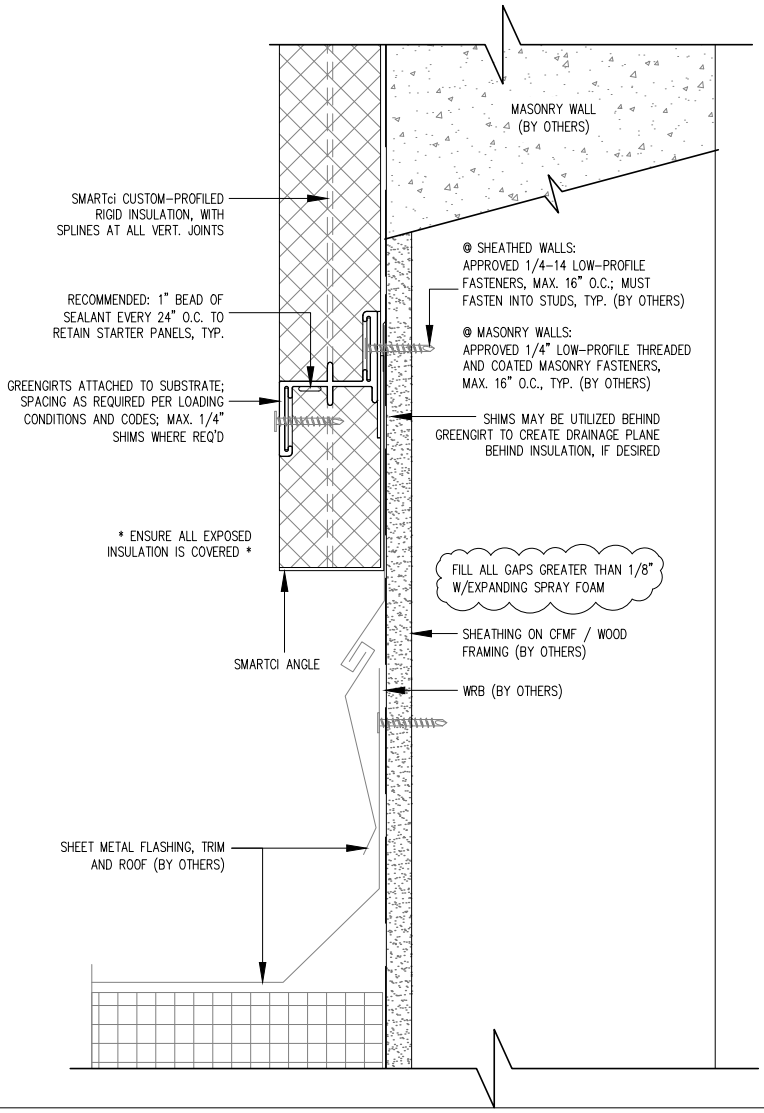

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BASE AT ROOF–1

NOT TO SCALE

SB10

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