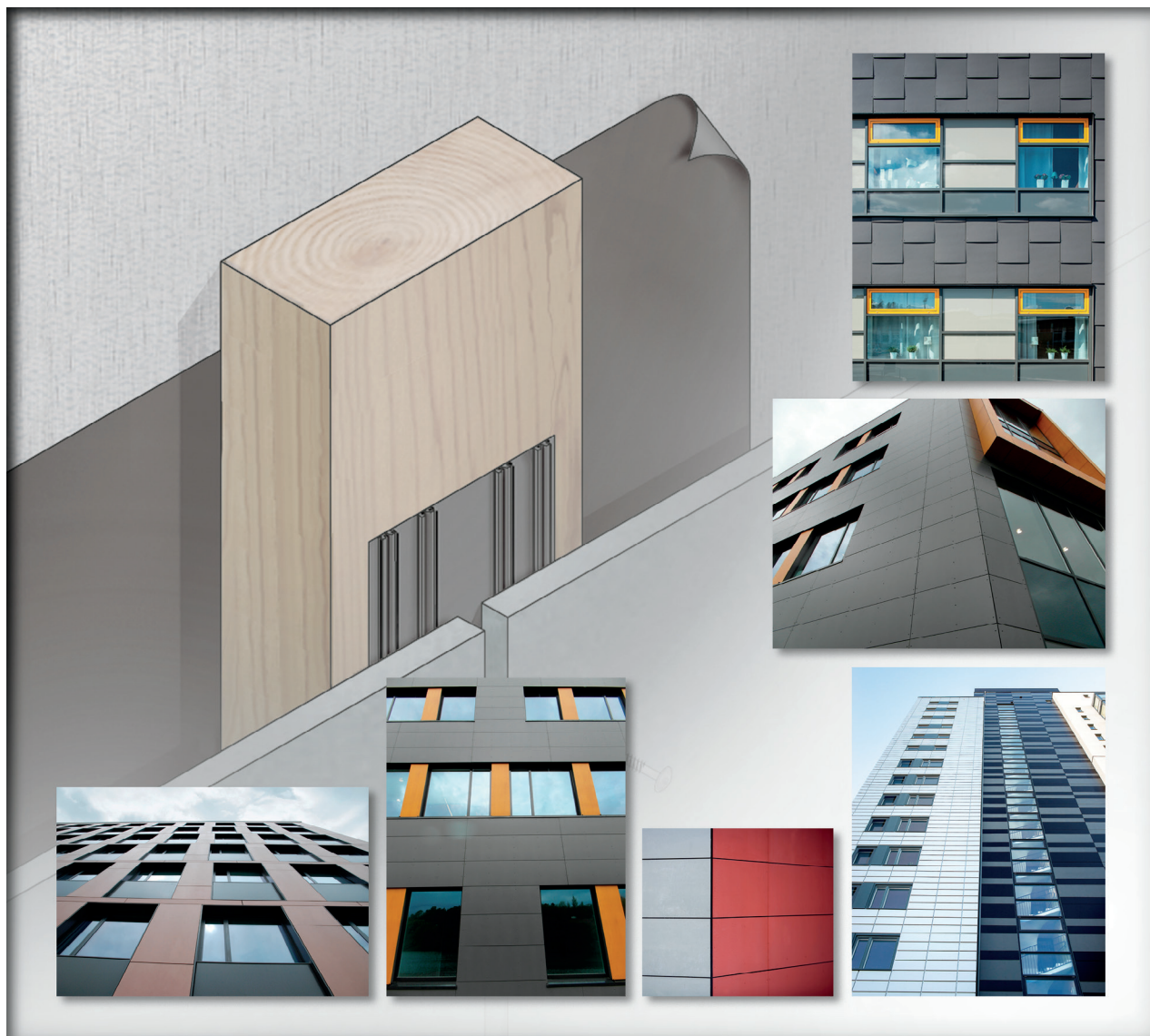


Standard Installation Guidelines¹

Wood Profiles with Screws

Rain Screen Application — 8 mm Panels

For **ASHRAE 90.1 Continuous Insulation**,
see **R-TEC[®] SYSTEM** Guidelines



**American Fiber
Cement Corporation**

CEMBRIT

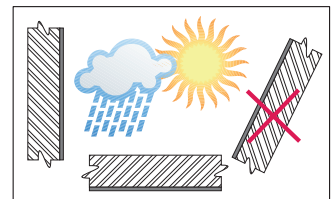


¹ These guidelines represent an **abbreviated illustration** for proper installation of Cembrit Cover, Patina, Solid and Transparent architectural panels in a ventilated rain screen application. Additional guidelines and procedures can be found in an accompanying instruction brochure: Cladding Installation – Application Instructions. Special Instructions are necessary for buildings over 150 ft high, or for buildings in high wind areas. Check with your AFC Cladding representative.

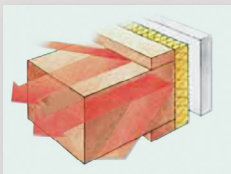
Construction Practices

1. Air space at top and bottom of building to be 20 mm ($\frac{3}{4}$ ") to facilitate airflow from out behind the panels. Do not block vertical airflow at windows, doors, eaves, or at the base of the building. Airflow needs to be continuous from bottom to top so there is movement behind each panel. For walls over 60 feet high, the ventilated cavity between rear of panels and exterior wall should be increased to 30 mm ($1\frac{1}{4}$ "). Air flow behind the cement fiber panels is a critical necessity in rain screen constructions.
2. A metal drip edge may be used at window heads, door heads, and the panel base but it must not restrict airflow ($\frac{3}{4}$ ").
3. Install panels from top of building to bottom.
4. For straight walls, start panel installation in center and work outward.
5. For walls with inside corners, start installation there and work across wall.
6. Jobsite storage:
 - Keep material dry and covered with a waterproof tarp.
 - Do not use pallets or crates of material as a work surface, and keep dust free.
 - Brush off any material dust generated by drilling or cutting prior to installation. This prevents the panel from discoloration due to abrasion or chemical reaction.
 - Transport material on edge.
7. For field cuts and drilling, use carbide or diamond blades/bits and slower turning/feed rates.
8. All Solid, Cover and Transparent field-cut edges must be sealed with Cembrit Edge Sealer. See edge sealer application instructions for more information.

Panels exposed to weather (rain, sun) may only be assembled vertically. Soffit applications not exposed to weather are allowed.

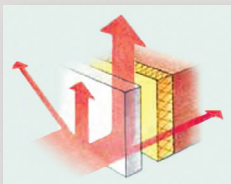


Rain Screen Cladding



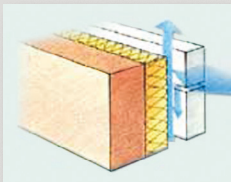
Preventing thermal bridges

As the insulating material is on the outside of the structural wall, it can easily be mounted without interruptions caused by floor slabs. In this way, any thermal bridges that occur at each floor slab can be prevented. These thermal bridges are also the cause of surface condensation that may result in fungus growth.



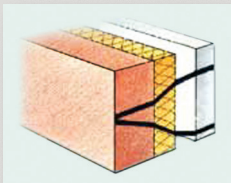
Dissipating heat from the sun

The ventilated rainscreen cladding system has a cooling effect when temperatures outside are high. Most of the sun's rays are reflected away from the building. Heat passing through the exterior wall panel is partially dissipated by the ventilating effect of the air space between the exterior cladding panel and the structural wall. Any residual heat managing to penetrate buildings is very minor.



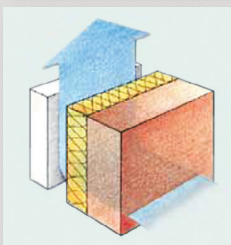
Rainscreen

Architectural wall-cladding panels act as a rainscreen on the outside of the building and keep the structural wall absolutely dry. The air space connected to the outside air evacuates water and humidity that might have penetrated behind the wall-cladding panels through its horizontal or vertical joints. This water will never reach the load bearing wall and/or the thermal insulation.



Protecting the basic structure and load-bearing wall against temperature variations

In view of the fact that the insulation material is applied to the outside of the building, changes in temperature are very minor compared with those found in conventional constructions where insulation is applied on the interior. This principle works in summer and winter in both hot and cold climates.



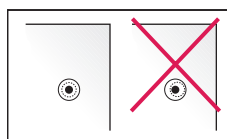
Prevention of internal condensation

Insulation material can be applied to the outside of the structural wall because it is protected effectively by the architectural exterior wall panel. Because of differences in vapour pressure and temperature passing through the wall, condensation has been shown to occur close to the ventilated area and not in the structural wall itself. As a result, the ventilating effect is easily sufficient to dry out the thermal insulating material.

Building/Structure

1. **Architect/Engineer/Contractor to design and build structurally sound, water-tight exterior wall. Special care should be given to building location, building height, and maximum actual wind loads.**
2. **Attach wood profiles to exterior walls. Structural engineer to determine fastening specification,** i.e. quantity and type of attachment and fasteners, as well as the dimensions and species of wood profiles compatible with exterior wall construction (FIG. D-1). Attachment must be sufficient to support 3.2 lbs/ft² (8mm panel) dead load plus design wind loads.
3. The quality of the wood must be consistent with prevailing standards in the area. Fungi-resistant woods are required, but must not be treated with agents that are corrosive to stainless steel screws.
4. Wood profiles for affixing panels need to provide a 25 mm–30 mm (1"–1¼") airspace (between back panel and exterior wall), the greater being for buildings over 60 feet high, up to a maximum height of 150 feet. For buildings over 150 feet high, special provisions are required; check with your AFC Cladding representative.
5. Profile width at vertical joints to be ≥ 90 mm (3½") minimum, and interior profile width to be ≥ 45 mm (1¾") or greater, to allow tolerances in alignment. Maximum length of wood profile ≤ 12 feet. Minimum screw depth in wood profile is 25 mm (1").
6. Profiles to be straight, plumb, level and aligned correctly on the building. For walls with no exterior insulation, affix wood furring directly to exterior wall.
7. **It is recommended to take field measurements before panels are cut or drilled.**
Field measurements verify print dimensions to ensure proper fit.

FIG. B-1



8. Joints between vertical wood profiles to be ≥ 10 mm ($\frac{3}{8}$ "). A joint between the vertical profiles must **always** coincide with a joint between the panels (FIG. A). The joint is preferably continued at the same horizontal height among adjacent profiles (reduces stress in panel).
9. For structures with **exterior insulation**, follow the insulation manufacturer's installation instructions. Horizontal wood profiles (the same depth as the exterior insulation) can be attached to the exterior wall. Vertical wood profiles are then attached to the horizontal profiles (FIG. D-2).

Prepare Profile

1. Typical vertical and horizontal joints are left open and have a black background (use a black building wrap). Other reveal colors are possible if desired.
2. At the vertical joints, the wood profile is covered with a 90 mm (3½") UV-resistant black EPDM rubber joint sealing strip with ribs (FIG. H).
3. The joint sealing strip can be applied with a chemically compatible spray adhesive or double-sided tape until panels are affixed with screws. The screws must be positioned between the ribs to permit penetrated water to run off.
4. At interior wood profiles, a 45 mm (1¾") UV-resistant black EPDM rubber sealing strip with ribs is applied. Spray adhesive or double-sided tape can be employed to hold strip until screws are fastened.

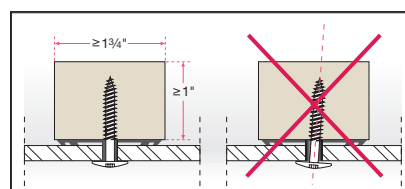
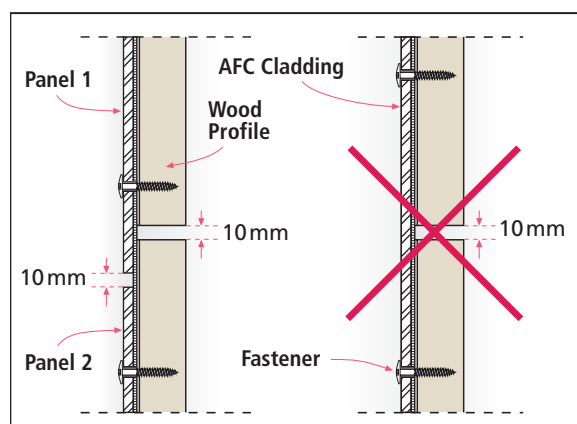
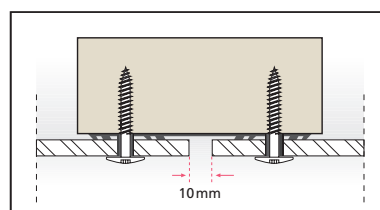


FIG. B-2 —
Interior profile

FIG. A



A Typical Vertical Joint

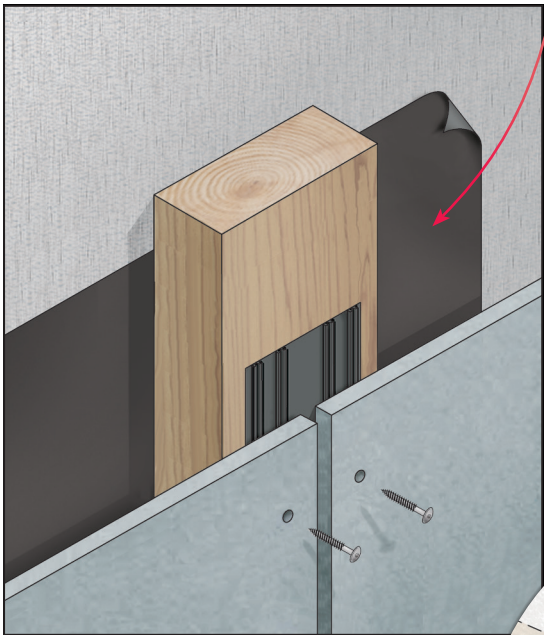


See **Detail – Typical Vertical Panel Joint** for alternative treatment using two wood profiles.

FIG. C

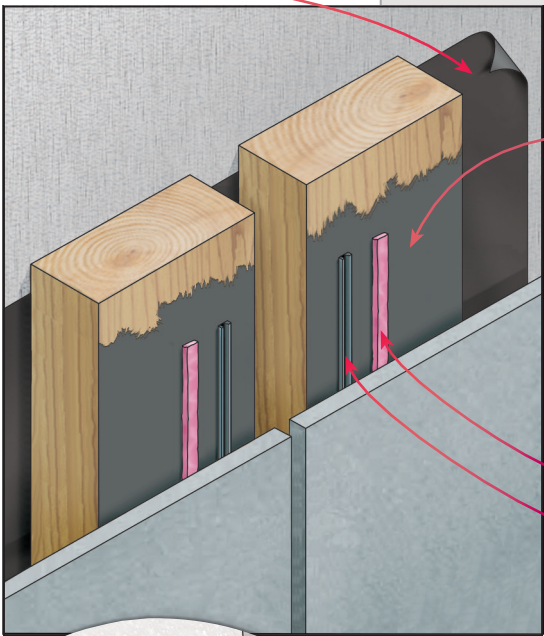
| | h |
|-----------|-------------------------------------------------------------------|
| mm | (in.) |
| h: 25–100 | (1–3 ¹⁵ / ₁₆) |
| v: 70–100 | (2 ³ / ₄ –3 ¹⁵ / ₁₆) |

FIG. D-1 —
Vertical profiles are attached using wood furring, without insulation.



Building wrap per AFCC.
(See "AFCC Building Wrap Spec Sheet")
Check local codes for proper placement.

Contact your AFCC representative for specific application instructions utilizing Dynamic Bond adhesive.



Dynamic Bond installation
Untreated pine must be protected all around. Pressure treated wood is pretreated on the bondable side with Dynamic Protect.

Glue bead
Dynamic tape

Options for building wrap placement

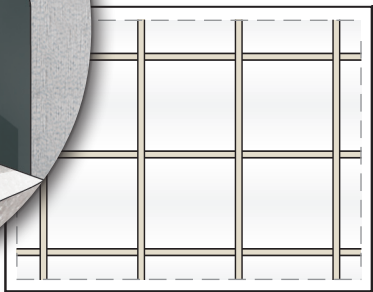
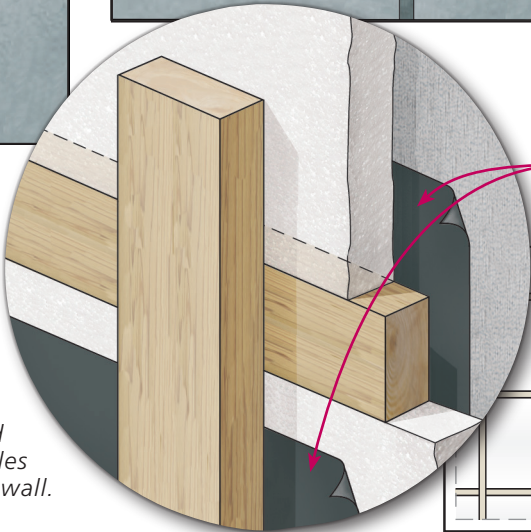
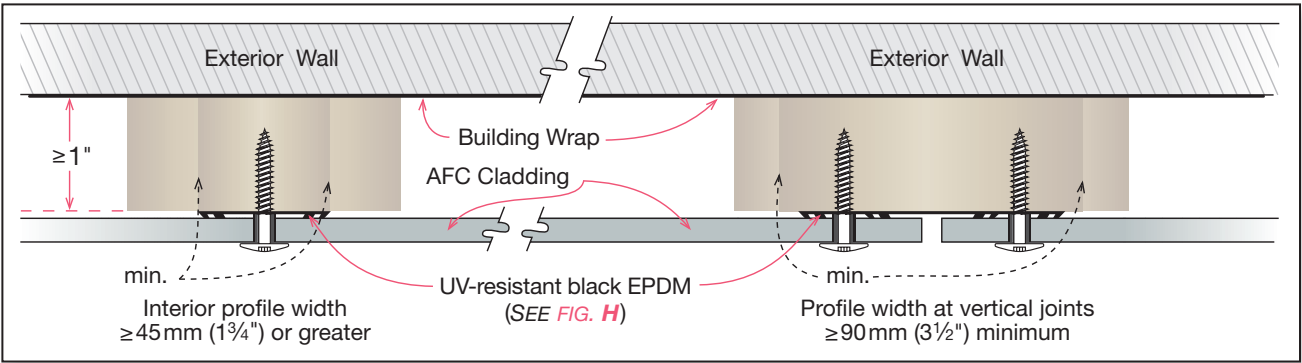


FIG. D-2 —
Exterior insulation, when vertical profiles are attached to horizontal profiles affixed to wall.

FIG. J — Wood profiles: interior and vertical joint.



Can be affixed vertically directly to wall if there is no exterior insulation.

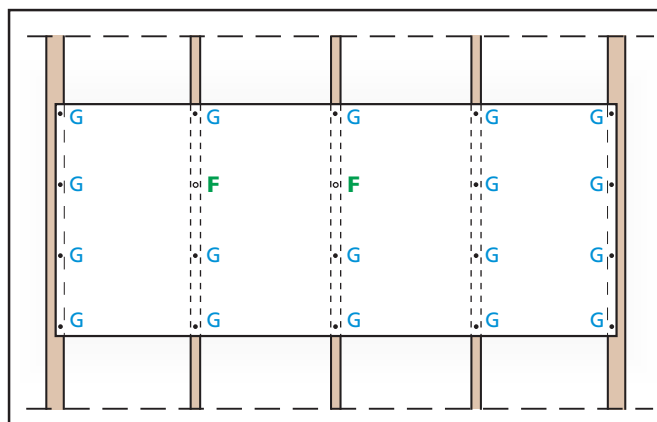
Panels

1. Panels to be Patina, Solid, Transparent or Cover.
2. Vertical and horizontal joints to be 10 mm ($\frac{3}{8}$ "). This is the minimum distance between the edges of two adjacent panels, or the distance from panel edge to metal trim extrusions or structural members. (See **FIG. A**)
3. Pre-drill **all** fixed and gliding point holes in panel so that there are: (See **FIG. E & F**)
 - Two (2) **fixed points** per panel (**F**).
 - The rest of the holes are to be **gliding points** (**G**). (See **FIG. E & F**)
 - See **Fixing** section (and **FIGS. E & F**) for determining location of fixed points in each panel.
4. Diameter of the fixed point hole is to be 5 mm — use #8 drill bit (5.05 mm).
5. Diameter of the gliding point hole is to be 8 mm — use #0 drill bit (8.02 mm).
6. Joints between profiles must coincide with joints in the panels. **Panels cannot bridge a break in the profiles.** (See **FIG. A**)
7. Patina panels have a sanding grain that must be accounted for when positioning panels. Rotating some panels 90° from the orientation of adjacent panels can result in the appearance of color shading.
8. After affixing the two fixed points, work from the top of the panel to the bottom.

Fixing

1. The screw specifications for Patina, Solid, Transparent or Cover must be respected. (See **FIG. G**)
2. Fixing pattern is typically either 16" or 24" on center horizontally (based upon wood profile spacing) and 16" to 24" on center vertically, depending upon building height, building location, design criteria/specifications,

*The screws are inserted using an electric drill with a high quality bit suitable for the type of screw head. The screws must be inserted perpendicular to the panel surface (**FIG. B-2**), and must not be over-tightened. Check torque setting frequently during installation of the panels. Overtightening will restrict the panels' freedom of movement that is necessary to accommodate changes in thermal and moisture conditions.*



and panel/fastener location on building. Edge areas on facades and high wind load conditions require closer fixing distances.

3. Corner fasteners to be located at a minimum of 25 mm (1") horizontally and a minimum of 70 mm (2 $\frac{3}{4}$ ") down/up vertically from each corner of panel. (See **FIG. C**)
4. 15 mm ($\frac{5}{8}$ ") clearance is required from the edge of wood profile to screw location.
5. Screws must be located in the center of each hole in the panel (**FIG. B-1**). They must be perpendicular to panel surface (**FIG. B-2**), and not be over-tightened, which would prevent the panel's normal movement.
6. Two **fixed points** are required per panel. (**FIGS. E & F**)

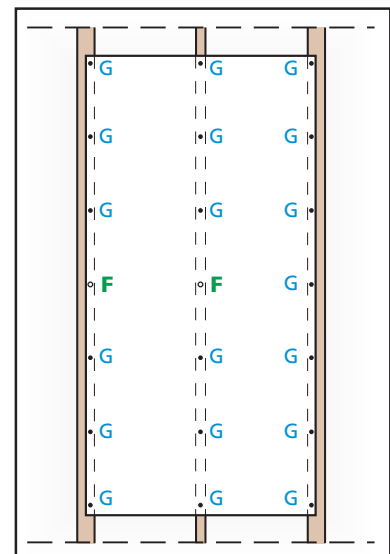
Fixed points (for attachment to vertical profiles) are:

- Always the same height in each panel.
- As close to center of panel as possible, and then either the next adjacent point to the left **or** right. Be consistent in panel-to-panel location (center and left **or** center and right, so fixed points are at the same level horizontally for attachment to vertical profiles).
- No two fixed points on one panel can be on the same profile, and no two fixed points on two adjacent panels can be on the same profile.
- For smaller panel sizes with only two rows of fasteners, fixed points to be top center and top left **or** top right (horizontal applications on vertical profiles). For vertical narrow panel applications on vertical profiles, vertical joints must incorporate two separate profiles (as illustrated in **DETAILS – TYPICAL VERTICAL PANEL JOINT**).

For attachment to horizontal wood profiles, check with the AFC Cladding Representative

► **FIG. E** — Vertical installation on vertical profiles

▼ **FIG. F** — Horizontal installation on vertical profiles



Ventilated Rain Screen Application

Fixing (continued)

- For attachment to horizontal profiles, check with the AFC Cladding Representative. A two-layer attachment is required and the fixed point/gliding point parameters are different.
- Aluminum joint closures and decorative corner profiles are available if required (maximum thickness of finishing profile to be .8 mm or 21 gauge). Standard practice is to normally leave joints open.
 - Remove residue from drilling fixed and gliding holes prior to installing screws. Prior to installation, brush off any dust on panel due to drilling residue.

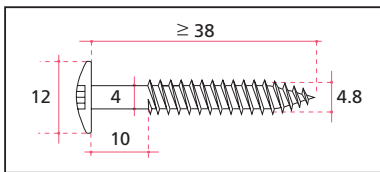


FIG. G —
Screw

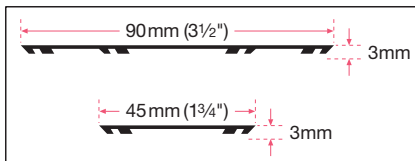
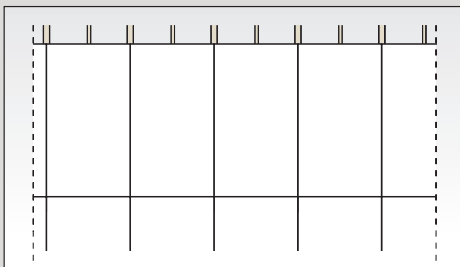


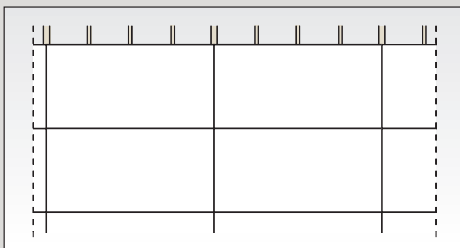
FIG. H —
UV-resistant EPDM
rubber joint sealing
strip with ribs

Typical Pattern Layout

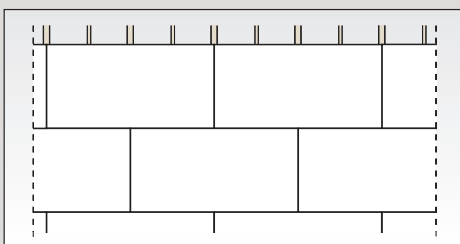
Panels can be used full size (4' x 8' or 4' x 10'), or fabricated to smaller dimensions.



*Straight
pattern
with
vertical
panels*



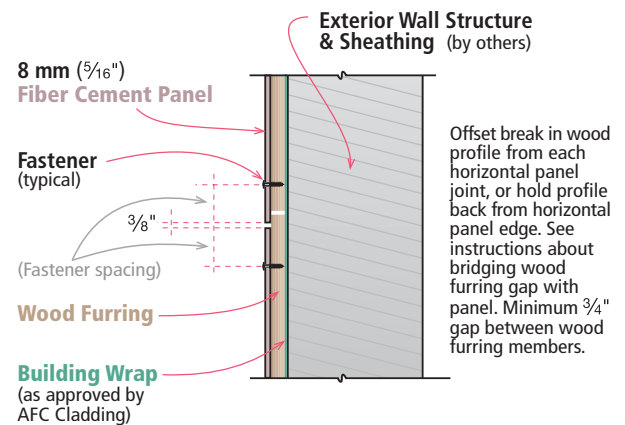
*Straight
pattern
with
horizontal
panels*



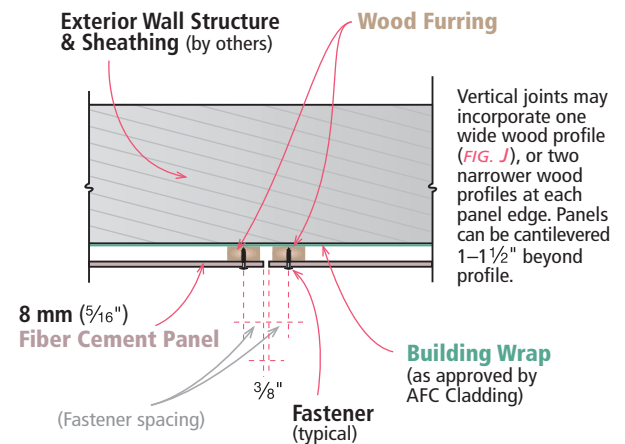
*Semi
pattern
with
horizontal
panels*

Details

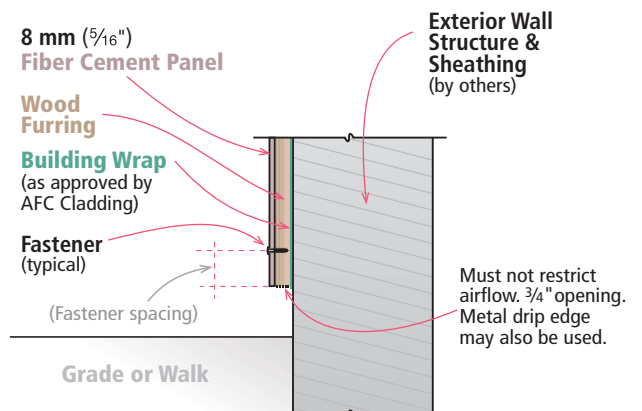
Typical Horizontal Panel Joint



Typical Vertical Panel Joint



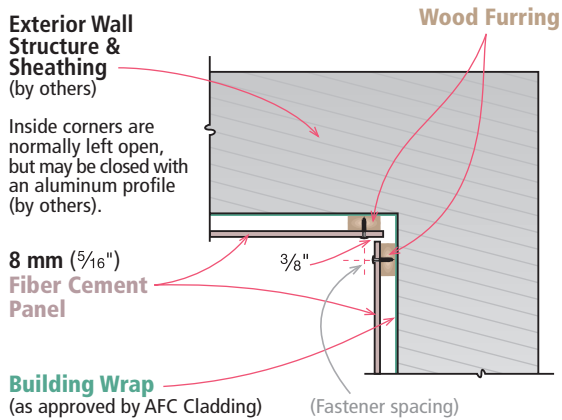
Typical Panel Base



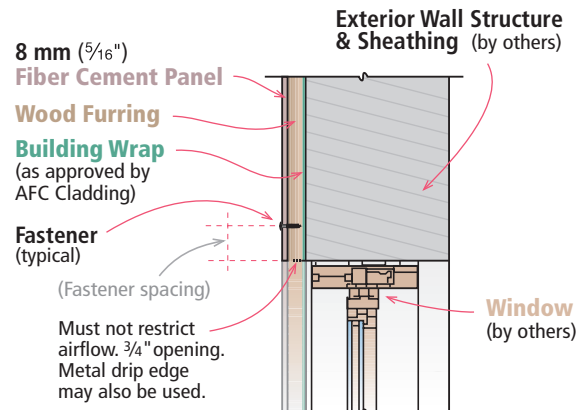
Ventilated Rain Screen Application

Details (continued)

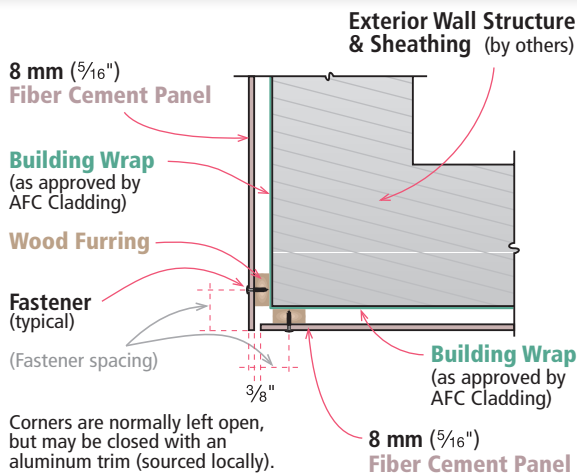
Typical Inside Corner – Plan View



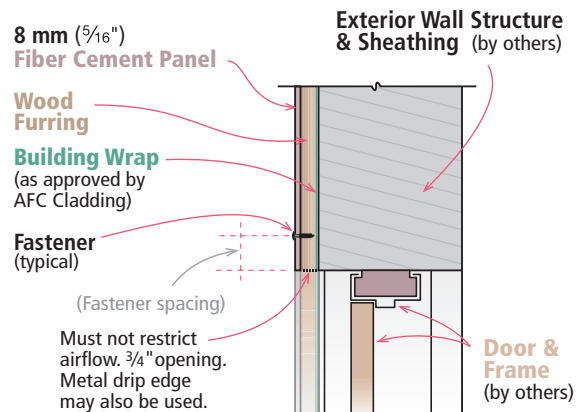
Typical Panel @ Window Head



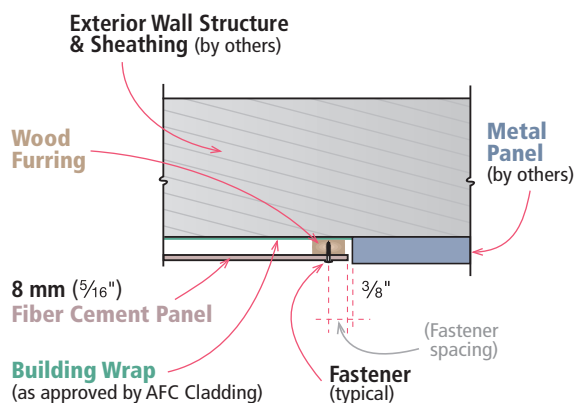
Typical Outside Corner – Plan View



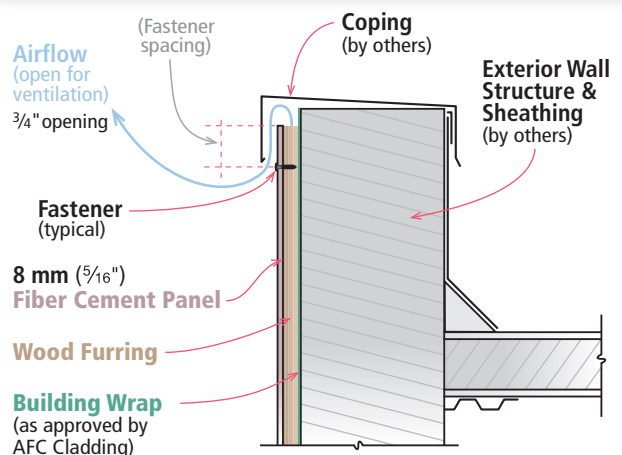
Typical Panel @ Door Head



Typical Panel End @ Metal Panel



Typical Panel @ Parapet



Product Sustainability Statement

AFC Cladding is committed to providing the highest quality high density compressed fiber cement panels to the U.S. building markets. In order to do this, we feel it necessary to provide not only high quality products, but sustainable products that can contribute to green (LEED) building projects, which in turn benefit the environment we all live in.

AFC Cladding products currently have a potential contribution to various LEED credits including but not limited to:

Direct Contribution

Materials and Resources:

- ◆ BPDO – Environmental Product Declarations

Indirect Contribution

Indoor Environmental Quality:

- ◆ Thermal Comfort

Energy and Atmosphere:

- ◆ Optimize Energy Performance

One of the most important sustainable attributes is the durability of AFC Cladding panels. With their long lifespan, virtually requiring no refurbishment, AFC Cladding panels can contribute to less replacement of materials and to drastically lower maintenance costs over the useful life of the building.

The Ventilated and Insulated Rain Screen Cladding (VIRSC) system, which is used to affix AFC Cladding panels to the exterior of a structure, offers many benefits and green attributes to the performance of the building envelope. Durability and resistance to moisture and mold build-up are noteworthy benefits. Equally important is its ability to accommodate external insulation.

In addition, AFC Cladding is dedicated to further research and analysis of our products to achieve additional LEED credits, and help further the cause of building sustainable and efficient buildings.

Limited Warranty

American Fiber Cement Corporation (AFCC) warrants that its products are manufactured in accordance with its applicable material specifications and are free from defects in materials and workmanship using AFCC's specifications as a standard. Only products which are installed and used in accordance with applicable AFCC instructions and specifications are in any way warranted by AFCC. This warranty is applicable only to claims made in writing and received by AFCC within thirty (30) days after the defect was discovered and within ten (10) years after the date of the shipment of the product by AFCC. All other claims are waived. If a claim is made, you must allow reasonable investigation of the product you claim is defective and you must supply samples that adequately demonstrate the problem you claim for testing by AFCC.

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