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 for interior applications, hidden adhesive attachment, sealing, and weather barrier attachment can be found at www.americanfibercement.com.

Note: The online copy of the Installation Guidelines obtained at www.americanfibercement.com supersedes any printed copy.
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 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 vapor 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.
Profile Attachment — illustrated

For wall assemblies utilizing exterior sheathing with low screw-holding strength, a two-layer attachment system may be required.

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

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

**FIG. J** — Wood profiles: interior and vertical joint. (Vertical joints may also use two ≥ 38mm profiles in place of one ≥ 90mm profile.)

- **Building wrap** per AFCC. Weather and UV resistant. Check local codes for proper placement.
- **Dynamic Bond installation**
- **Dynamic Protect**
- **Glue bead**
- **Dynamic tape**

Options for building wrap placement

**Can be vertically affixed directly to wall if there is no exterior insulation, provided sheathing has adequate screw-holding strength; (3/4") plywood sheathing is recommended.**
Building/Structure

1. **Architect / Engineer / Contractor** to design and build structurally sound, water-tight exterior wall.
   - Substructure Horizontal Straightness Tolerance: ± 3.0 mm per 2 m (± 0.0625” per 42”)
   - Substructure Vertical Straightness Tolerance: ± 0.5 mm per 600 mm (± 0.0625” per 75”)

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 (8 mm panel) dead load, plus design wind loads.

3. The quality of the wood must be consistent with prevailing standards in the area. The wood should be pressure treated construction grade lumber with a smooth surface finish. 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 the following airspace depths between the back of the panel and the exterior wall:
   - 19 mm (3/4”) for panel runs 0–15 ft
   - 25 mm (1”) for panel runs 15–60 ft
   - 32 mm (1¼”) for panel runs 60–100 ft
   - 38 mm (1½”) for panel runs 100–150 ft
   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 (3 1/2”) minimum, and interior profile width to be ≥ 38 mm (1½”) or greater, to allow tolerances in alignment. Maximum length of wood profile ≤ 12 feet. Minimum screw depth in wood profile is 19 mm (3/4”).

6. Profiles to be straight, plumb, level and aligned correctly on the building.

7. **It is recommended to take field measurements** before panels are cut or drilled.

8. Joints between vertical wood profiles to be ≥ 10 mm (9/16”). 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 weather and UV resistant building wrap). Other reveal colors are possible if desired.

2. At the vertical joints, the wood profile is covered with a 90 mm (3 1/2”) 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, staples, 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 30 mm (1⅛”) UV-resistant black EPDM rubber sealing strip with ribs is applied. Spray adhesive, staples, or double-sided tape can be employed to hold up the strips until the panels are fastened.

Field measurements verify print dimensions to ensure proper fit.

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[FIG. A]

**A Typical Vertical Joint**

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

1. Panels to be Patina, Solid, Transparent or Cover.
2. Vertical and horizontal joints to be 10 mm (⅜”). 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 first affixing the two fixed point screws, work from the top of the panel to the bottom to avoid damage to the panel.

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, and panel/fastener location on building. Edge areas on facades and high wind load conditions require closer fixing distances. For soffit applications, the maximum fastener spacing is 16” on center in both directions.
3. Corner fasteners to be located at a minimum of 25 mm (1”) horizontally and a minimum of 70 mm (2¾”) down/up vertically from each corner of panel. (See FIG. C)
4. 15 mm (⅜”) 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).

The screws are inserted using an electric drill with a high quality bit suitable for the type of screw head. AFCC supplied screws have a Torx T20 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.
7. Aluminum joint closures can be installed (maximum thickness of finishing profile to be .8 mm or 21 gauge). Standard practice is to leave the joints open.

8. 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 using a microfiber cloth.

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

See AFCC Standard Details for detailing requirements in architectural drawing format.

**Typical Horizontal Panel Joint**

- **Exterior Wall Structure & Sheathing** (by others)
- **Fiber Cement Panel**
- **Fastener** (typical)
- **Wood Furring**
- **Building Wrap** (as approved by AFC Cladding)

Offset break in wood profile from each horizontal panel joint, or hold profile back from horizontal panel edge. See instructions about bridging wood furring gap with panel. Minimum ¾” gap between wood furring members.

**Typical Vertical Panel Joint**

- **Exterior Wall Structure & Sheathing** (by others)
- **Wood Furring**
- **Building Wrap** (as approved by AFC Cladding)

Vertical joints may incorporate one wide wood profile (Fig. J), or two narrower wood profiles at each panel edge. Panels can be cantilevered 1–1½” beyond profile.

**Typical Panel Base**

- **Exterior Wall Structure & Sheathing** (by others)
- **Wood Furring**
- **Building Wrap** (as approved by AFC Cladding)
- **Fastener** (typical)

Must not restrict airflow. ¼” opening. Metal drip edge may also be used.

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Additional notes:

- **Ventilated Rainscreen Application**

- **Details** (continued)

- **Fixing** (continued)

- **Figure G** — Screw (supplied by AFCC)

- **Figure H** — UV-resistant EPDM rubber joint sealing strip with ribs (supplied by AFCC)

- **FIG. G** — Screw (supplied by AFCC)

- **FIG. H** — UV-resistant EPDM rubber joint sealing strip with ribs (supplied by AFCC)
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 Rainscreen 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.

Warranty information available upon request.

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**Limited Warranty**

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