

Fiber-Cement Siding – Common Defects

Fiber-Cement siding products are a very durable and long lasting siding – when installed properly. Fiber cement is a relatively new siding material introduced to the market about 35 years ago.

History: Austrian Ludwig Hatschek patented the original fiber cement in 1901 under the name "Eternit," which consisted of cement mixed with asbestos fibers. But as the health risks of asbestos exposure became widespread knowledge in the 1970s, the U.S. government passed legislation limiting asbestos. So in the mid-1980s, building materials company James Hardie® developed a new formulation of fiber cement that replaced asbestos fibers with wood pulp.

I have been inspecting Fiber-Cement siding since it first hit the market in the 1980's, and the product has evolved into a respectable and long lived siding product. The issues we see are almost always with improper installation by the siding installer, and the most common issues we see are illustrated below:

(Note: While excerpts from a James Hardie® manual are shown here, these apply to ALL fiber cement siding.)

COMMON FIBER-CEMENT INSTALLATION DEFECTS

- **NOT SEALING THE CUT EDGES OR SEALING DAMAGE/SCRATCHES/CHIPS.**

The manufacturer **REQUIRES** that all cut edges, damaged surfaces, or chips on their masonry siding product be sealed with an approved sealant. This is to prevent water from absorbing into the siding product and damaging it (*It WILL absorb water if not sealed*). **NOT SEALING EVERY EDGE/SCRATCH TYPICALLY VOIDS THE WARRANTY.** Manufacturer's representatives – as well as their written installation requirements indicate this is **MANDATORY** and **NOT OPTIONAL**. Here are some pictures of unsealed areas:

ALL cuts MUST be fully sealed. If you can see the rough edge of a cut piece of siding, IT NEEDS SEALING



Fiber-Cement Siding – Common Defects

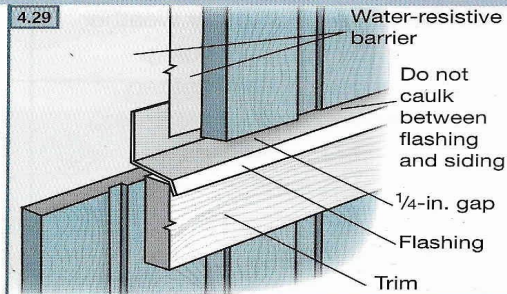
● MISSING ¼ INCH GAP BETWEEN SIDING AND FLASHINGS.

ALL flashings need to have the siding spaced a MINIMUM ¼ inch away. This helps prevent water “wicking” up into the siding and damaging/delaminating it. THE WARRANTY IS TYPICALLY VOIDED IF THIS GAP IS MISSING. Any siding installed without the ¼ inch gap should be removed/properly cut and sealed, and re-installed to prevent future damage.

SIDING TO FLASHING CLEARANCE

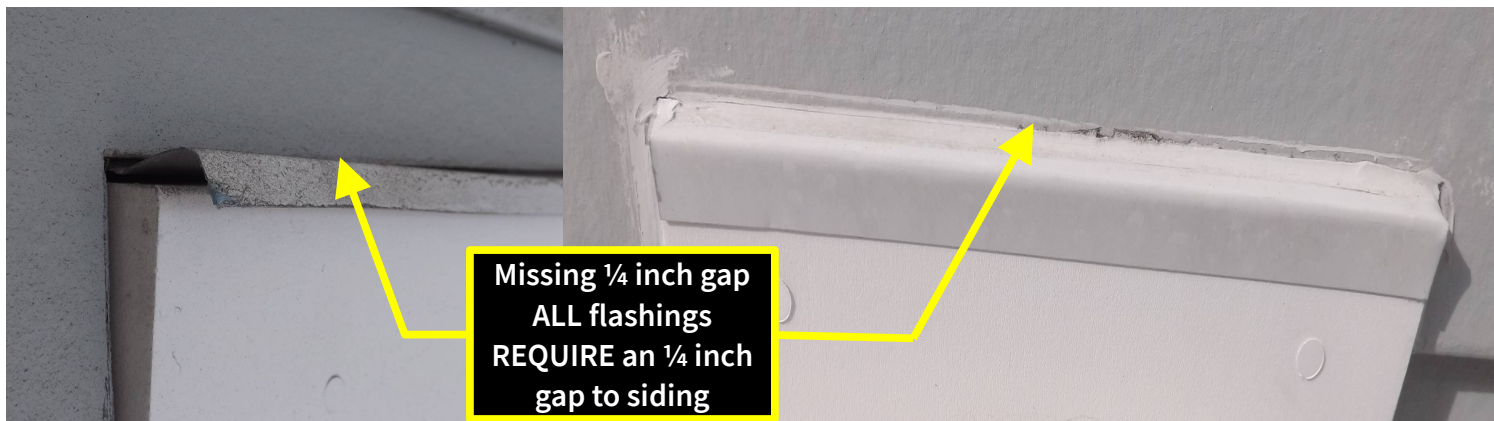
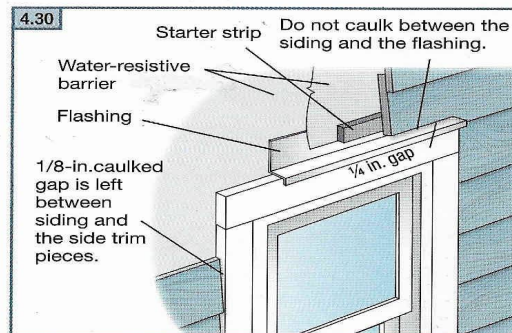
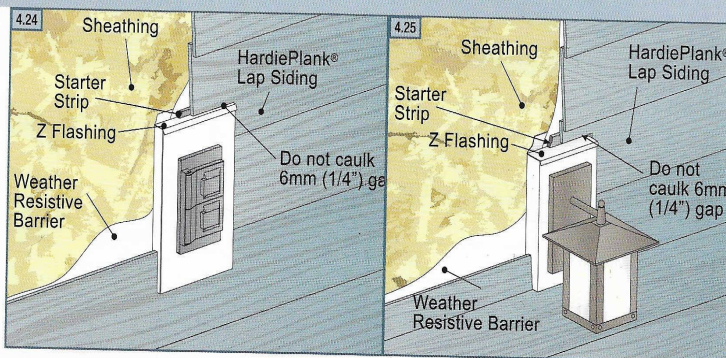
A ¼-in. clearance must be maintained between James Hardie® siding and trim products and any horizontal flashing.

All horizontal flashing should be installed with a positive slope in such a way that it promotes proper drainage and does not allow moisture to pool on top of the flashing.



LIGHTS AND ELECTRICAL OUTLETS

Lights and Electrical boxes should have the same flashing and blocking as other large penetrations such as vents. Many lights utilize square electrical boxes. Blocking a square object should still incorporate the best practices of an angled weather cut, when necessary.



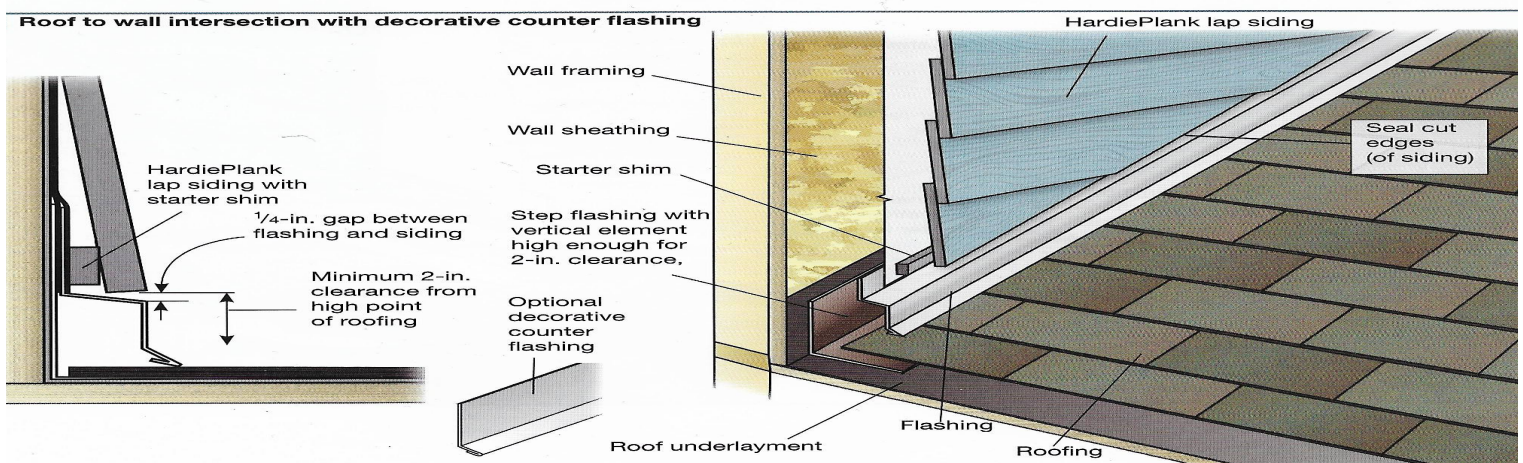
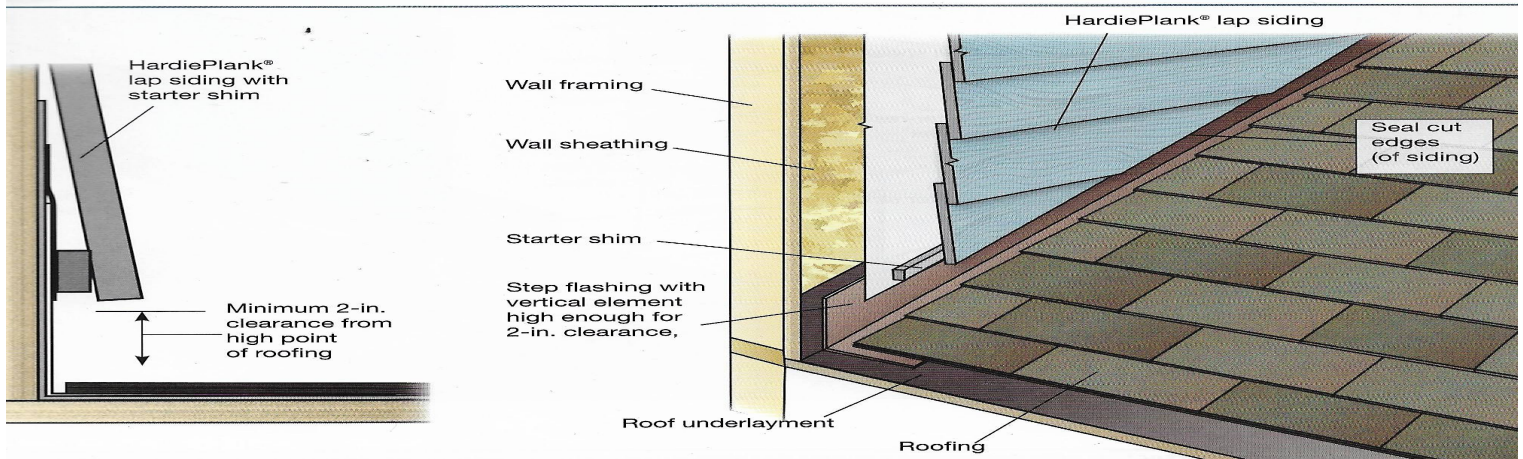
SIDING WITHOUT THE REQUIRED ¼ INCH GAP WILL ABSORB MOISTURE AND DETERIORATE



Fiber-Cement Siding – Common Defects

MISSING 2 INCH GAP TO ROOFING.

All fiber-cement Siding and Trim **MUST** be spaced a **MINIMUM** of 2 inches away from roofing. Roof areas have significant water moving across them, and the 2 inch gap helps prevent water from entering/damaging the siding. **FIBER-CEMENT SIDING/TRIM INSTALLED WITHOUT THE MINIMUM 2 INCH GAP TYPICALLY HAS A VOIDED WARRANTY.** Any areas where fiber-cement siding/trim is too close to roofing needs removal and re-installation with the required spacing.



Fiber-Cement Siding – Common Defects

MISSING FLASHED AND SEALED MOUNTING BLOCKS.

EVERY item mounted on fiber-cement siding REQUIRES a proper flashed and sealed mounting block to help prevent water entry and resulting damage. (You cannot just screw something to this type of siding and caulk it.) SIDING WITH MISSING MOUNTING BLOCKS TYPICALLY HAS A VOIDED WARRANTY. All items mounted on the siding without mounting blocks should be removed and properly re-mounted with proper flashed and sealed mounting blocks. There are many examples in the James Hardie® Installation manual – I've included several examples on this page and the next.

LIGHTS AND ELECTRICAL OUTLETS

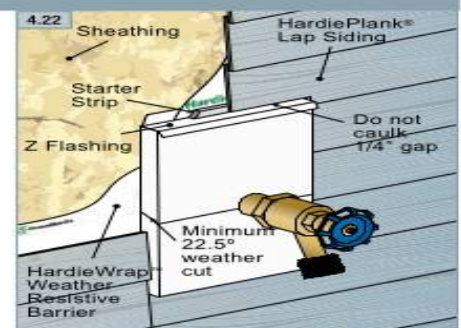
Lights and Electrical boxes should have the same flashing and blocking as other large penetrations such as vents. Many lights utilize square electrical boxes. Blocking a square object should still incorporate the best practices of an angled weather cut.



HOSE BIBS

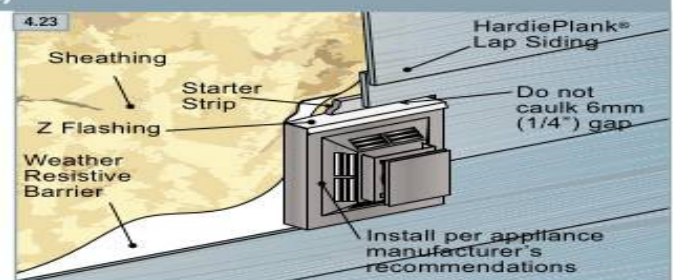
Hose bibs are a source of water which increases the likelihood of moisture related problems. The goal is to keep the water outside of the building and the best way to do this is keep the water off the walls. A good preventative measure is to extend the hose bib further from the wall. A downward slope on the water pipe as it leaves the building will also encourage any slow leaks to fall away from the home.

Large piping over 1 1/2 in. diameter is required to have blocking and flashing at the penetration. A block of HardieTrim® 5/4, 4/4 boards should be installed around the point of penetration. To install a block around an existing pipe, it may be necessary to cut the block into two pieces. In this case, weather-cut the trim to fit it into place. Install flashing over the top of the trim block.



HOT AIR VENTS (Dryer, Stove, Furnace, Heater, Etc.)

For hot air vents including dryer vents, stove vents, and furnace and heater exhaust, it is important to move the air away from the building envelope. As the vent is installed, a path for that moisture to leave the area should be identified. Consider what is being vented and where it is going before installing the vent. For instance, a dryer vent directly under an eave is going to force hot, moist air to rise and collect at the soffit. A good preventative measure for many vents is to increase the distance they extend from the wall to help expel moisture from the building.



For dryer vents, avoid placement too low to the ground where debris could easily impede air flow, trapping heat and moisture. Some types of high efficiency furnaces can be vented out through the walls. In these cases, avoid locating the vent too close to the roof or eaves where heat and moisture will be trapped.

TIP: Consider location of the vent prior to installation and consider extending the vent further from the wall.

Any vent piping is required to have blocking and flashing at the penetration. A block of HardieTrim® 5/4, 4/4 boards should be installed around the point of penetration. The blocking should extend 3-4 in. along the wall from the edge of the vent. To install a block around an existing vent, it may be necessary to cut several blocks, with weather-cuts on each piece. Flashing must be installed over the top of the trim block.

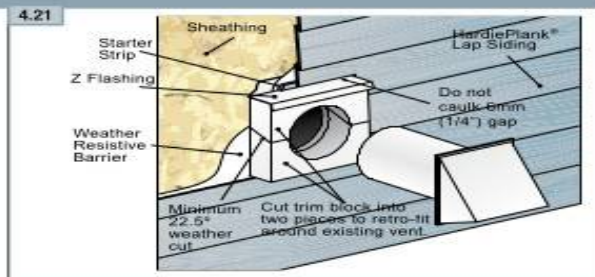
Fiber-Cement Siding – Common Defects

PENETRATIONS *Recommended in HZ10*

For penetrations in the building envelope such as hose bibs and holes 1½ in diameter or larger, such as dryer vents, a block of HardieTrim® 5/4, 4/4 boards shall be installed around the point of penetration. Blocking **should** be a minimum 3 in radius greater than the radius of the penetration. To install a block around an existing vent pipe, it may be necessary to cut the block into two pieces. In this case, weather-cut the trim to fit it into place. Install flashing over the top of the trim block.

Penetrations through a building envelope are made to accommodate needs such as hose bibs, dryer and furnace vents, electrical conduit, etc. It is important to restore the weather-resistant barrier of the home after cutting a hole for the penetration.

There are several pre-made blocking and flashing products available that can simplify the installation of a penetration. One such example is Sturdimount®. Be sure to follow all manufacturers installation instructions.



SturdiMount

TIP: As most penetrations will require blocking and flashing, some planning is required. As the trim is ordered for the home, don't forget to order some extra to serve as blocking.



**MOUNTING BLOCKS CANNOT BE SURFACE MOUNTED
THEY MUST BE FLASHED AND SEALED**



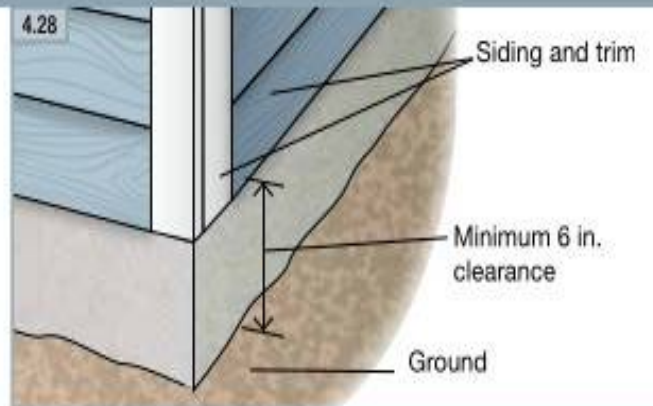
Fiber-Cement Siding – Common Defects

● FIBER-CEMENT SIDING/TRIM INSTALLED TOO CLOSE TO OR IN GRADE.

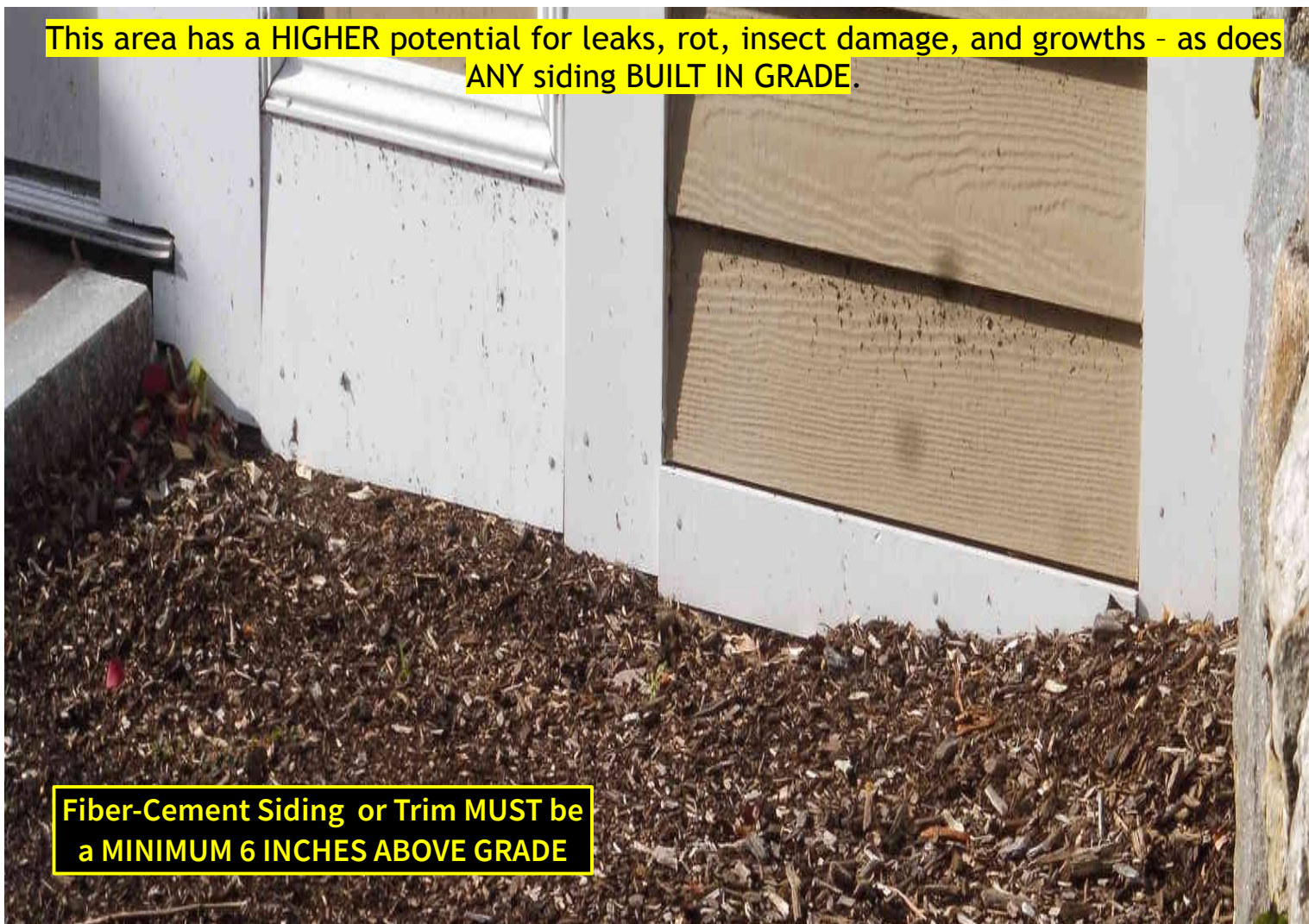
ALL fiber-cement siding and trim **MUST** be installed a **MINIMUM 6 inches** above grade. **INSTALLING FIBER-CEMENT SIDING PRODUCTS TOO CLOSE TO OR IN DIRECT GRADE CONTACT WILL TYPICALLY VOID THE WARRANTY.** The correction for this is to either re-grade, or change the design so no fiber-cement products are installed improperly low.

SIDING TO GROUND CLEARANCE

James Hardie products must be installed with a minimum of 6 in. clearance to the ground on the exterior of the building. Clearances greater than 6 in. may be required in accordance with local building codes. Foundations are typically required to extend above the adjacent finished grade a minimum of 6 in. or as required by local building codes.



This area has a **HIGHER** potential for leaks, rot, insect damage, and growths - as does **ANY** siding **BUILT IN GRADE.**

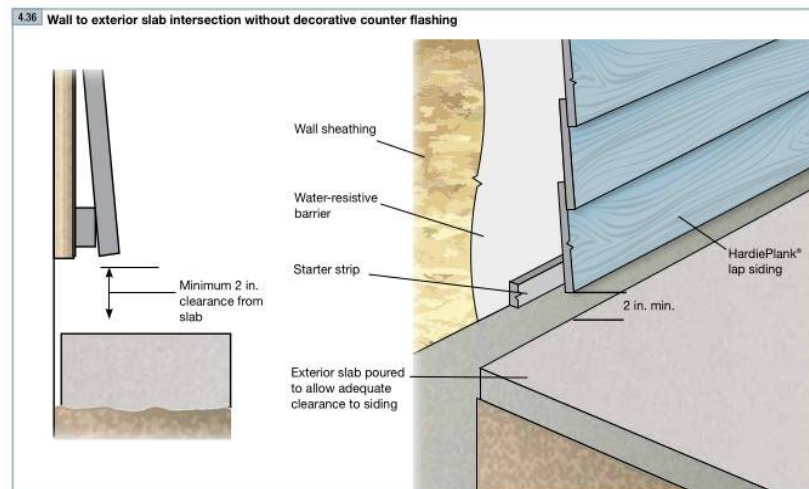
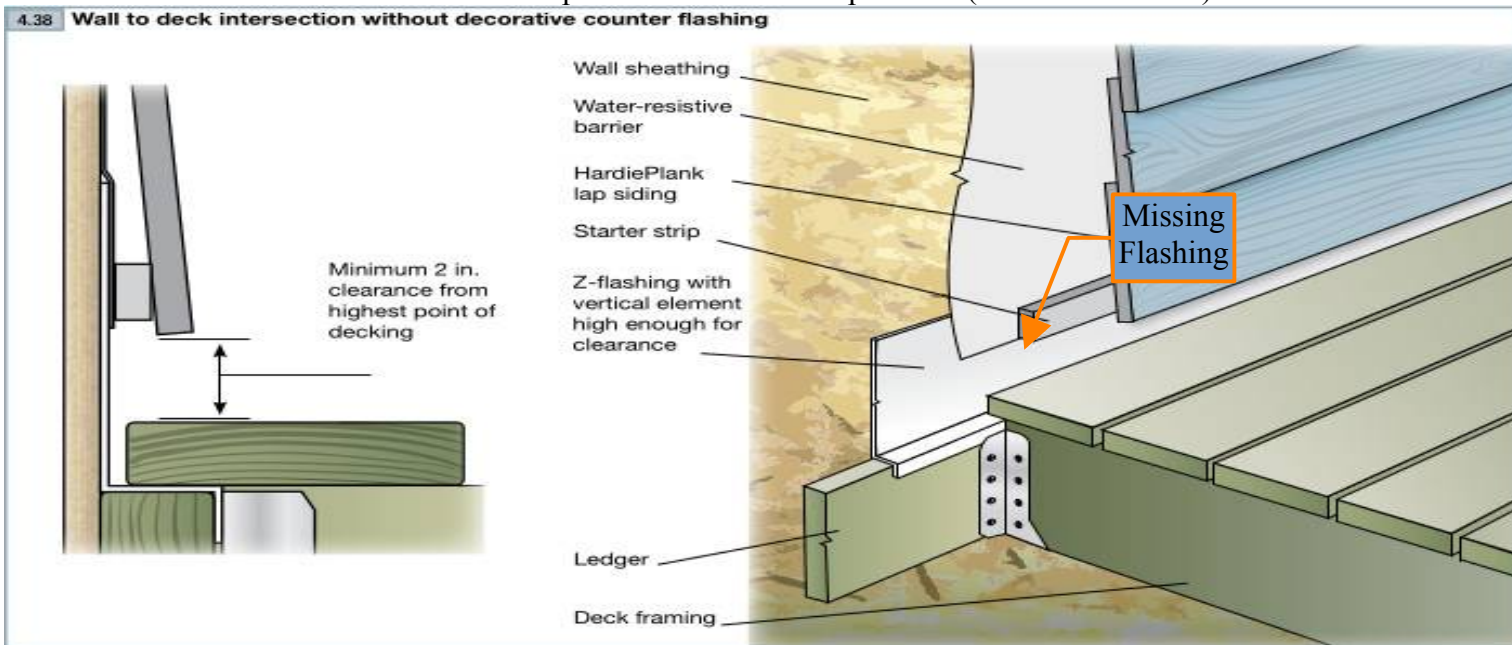


Fiber-Cement Siding or Trim MUST be a MINIMUM 6 INCHES ABOVE GRADE

Fiber-Cement Siding – Common Defects

● FIBER-CEMENT SIDING/TRIM INSTALLED TOO CLOSE TO DECKS/SLABS.

ALL fiber-cement siding and trim MUST be installed a MINIMUM 2 inches above the slab or deck (or other flat surface). FIBER-CEMENT SIDING OR TRIM INSTALLED TOO CLOSE TO FLAT SURFACES WILL TYPICALLY HAVE A VOIDED WARRANTY. The correction for this is to remove any fiber-cement products too close to such flat surfaces and replace them with other products (such as PVC trim).



BUTTING TO MORTAR OR MASONRY

James Hardie® siding and trim products should not be butted directly against mortar or masonry, including stone, brick, or concrete block. In these situations, a flashing should be installed to isolate the trim or siding from the mortar or masonry.



CLEARANCES

James Hardie specifies clearances to ensure the long-term durability of their products and the buildings on which they are installed. Failure to provide the proper clearances, as specified below, may affect performance of the building system, violate building codes or James Hardie requirements, and may void any warranty on the products.

Fiber-Cement Siding – Common Defects

● IMPROPERLY SEALED PENETRATIONS (UNDER 1½ INCH DIAMETER) AND FASTENERS.

Any penetration through fiber-cement siding that is less than 1½ inch in diameter must be properly sealed with approved caulking. Wires, small conduit and pipes, and other items can penetrate the siding sealed with caulking – but must penetrate through a single piece (The hole should not lap over multiple siding pieces). Penetrations that go through more than one piece of siding require a flashed and sealed mounting block (see previous illustrations). UNSEALED OR IMPROPER PENETRATIONS THROUGH FIBER CEMENT SIDING WILL TYPICALLY VOID THE SIDING WARRANTY. Corrections for this include sealing with approved caulking or adding flashed and sealed mounting blocks where needed. When face-nailing is needed, all fasteners must be caulked and sealed.



WIRES, CONDUIT OR OTHER FIXED PIPES

For small penetrations such as wires, electrical conduit, and pipes less than 1½ in. in diameter (excluding hose bibs) no blocking is necessary. The circumference of pipe or wire should be sealed with a barrier foam and/or caulked.



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● FIBER-CEMENT SIDING BUTT JOINTS MISSING JOINT FLASHING.

While not always required, flashing should be installed under every “butt joint” to help prevent water entry and resulting siding damage. A high quality installation ALWAYS has all butt joints in the siding flashed (*Caulking the joints will require eventual caulking maintenance – flashing is permanent*).

JOINT FLASHING

One or more of the following joint treatment options are required by code (as referenced 2009 IRC R703.10.2)

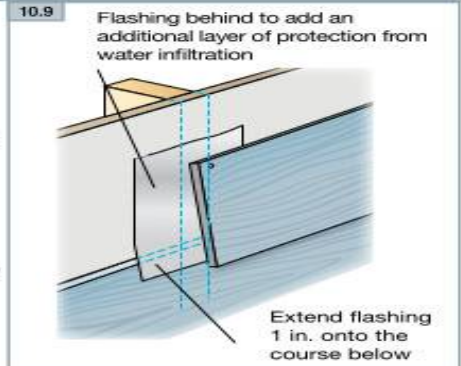
- A. Joint Flashing (James Hardie recommended)
- B. Caulking* (Caulking is not recommended for ColorPlus for aesthetic reasons as the Caulking and ColorPlus will weather differently. For the same reason, do not caulk nail heads on ColorPlus products.)
- C. “H” jointer cover

Flashing behind butt joints provides an extra level of protection against the entry of water at the joint. James Hardie recommends 6 in. wide flashing that overlaps the course below by 1 in. Some local building codes may require different size flashing.

Joint-flashing material must be durable, waterproof materials that do not react with cement products. Examples of suitable material include finished coil stock and code compliant water-resistant barriers. Other products may also be suitable.

TIP: Joint flashing can be quickly and easily made by cutting a 6 in. wide section off a roll of housewrap. Tape the roll tightly at the cut mark and cut the section off using a miter saw with a carbide blade. Individual sheets then can be cut to length with a utility knife.

TIP: Use light-colored joint flashing when using light-colored ColorPlus lap siding or other siding with a light-colored finish. Dark-color joint flashings should be used on siding with dark finishes.



Caulking at HardiePlank lap siding butt joints is not recommended for ColorPlus for aesthetic reasons as the caulking and ColorPlus will weather differently. For the same reason, do not caulk exposed nail heads. Refer to the ColorPlus touch-up section for details



Fiber-Cement Siding – Common Defects

MISSING “KICK-OUT” FLASHING AT ROOF EDGE.

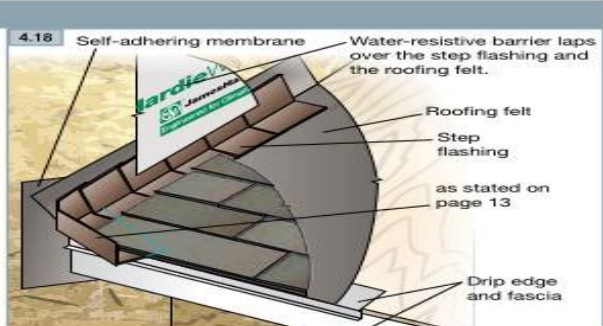
When a roof-line ends on a side wall, Kick-Out flashing is required. This flashing directs all roof water away from the sidewall – helping to prevent damage and water entry. **MISSING KICK-OUT FLASHING CAN POTENTIALLY VOID THE SIDING WARRANTY.** When missing, kick-out flashings can be installed after the fact relatively easily.

ROOF-TO-WALL FLASHING

Due to the volume of water that can run down a sloped roof, one of the most critical flashing details is where a roof intersects with a sidewall. Install a self-healing adhesive-backed membrane along the roof/wall intersection before flashing. The membrane on the wall should extend behind the eaves framing and should be installed before the sub-fascia or trim goes on.

The roof should then be flashed to the wall with step flashing positioned at every shingle course. Where the roof begins at its lowest point, install a kickout flashing to deflect water away from the siding. Kickout flashing can be made by cutting and bending a piece of step flashing at an angle. The water-resistant barrier on the wall should then lap over the step flashing.

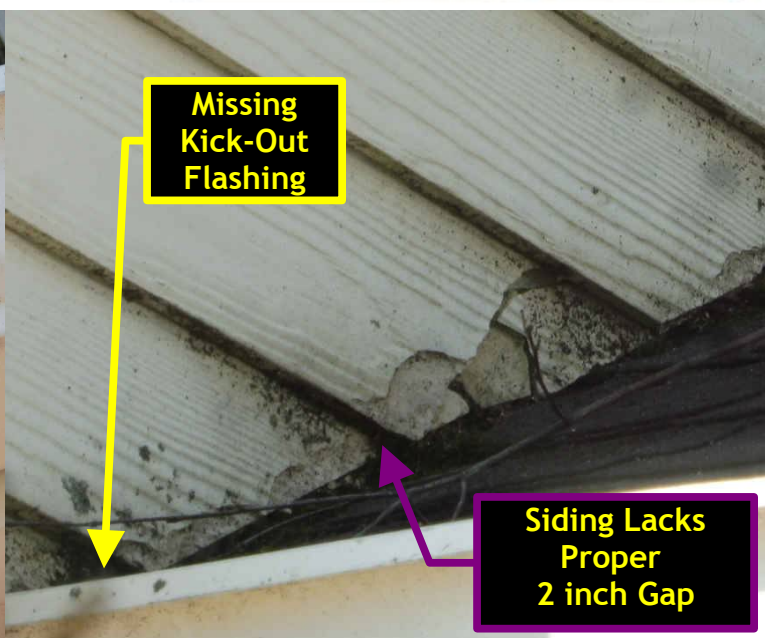
There are several companies that sell pre-made kickout flashings that are designed to divert water away from the wall. Below is an example of a preformed polypropylene kickout. Be sure to follow all manufacturer's installation instructions.



GUTTERS

If gutters are installed, they should not terminate against siding or trim. Maintain a 1 in. clearance between the siding and the gutter end-cap. Kickout flashings should be installed on the roof above to divert roof runoff into the gutters and away from the 1 in. gap.

The amount of water that can be generated from a rain shower or storm can be substantial. Managing the collection and distribution of this water is important over the life of a home.



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This is only a small list of the most common installation issues we see in fiber-cement siding.

We STRONGLY recommend downloading the FULL manual from James Hardie® at:
[Best Practices – Installation Guide Siding and Trim Products - Version 9.1](#)

CLEARANCE AND FLASHING REQUIREMENTS

Figure 3
Roof to Wall

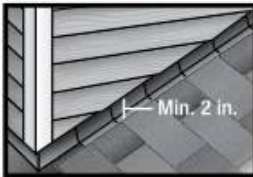


Figure 4
Horizontal Flashing



Figure 5
Kickout Flashing

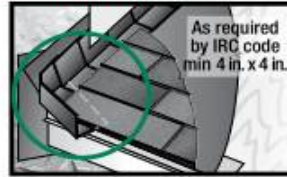


Figure 6
Slabs, Path, Steps to Siding

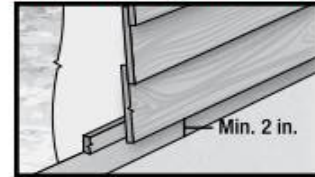


Figure 7
Deck to Wall

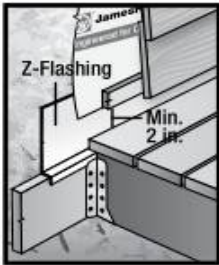


Figure 8
Ground to Siding

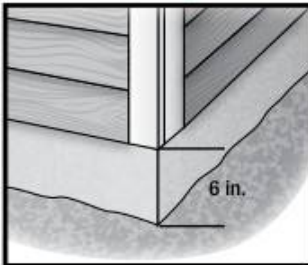


Figure 9
Gutter to Siding



Figure 10
Sheltered Areas

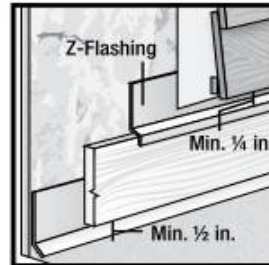


Figure 11
Mortar/Masonry

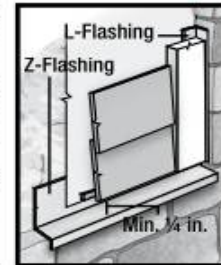


Figure 12
Drip Edge

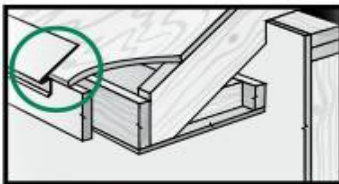


Figure 13
Block Penetration

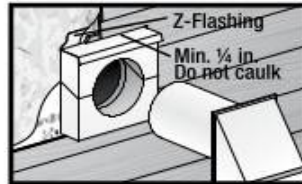


Figure 14
Valley/Shingle Extension



FASTENER REQUIREMENTS*

Refer to the applicable ESR report online to determine which fastener meets your wind load design criteria.

Blind Nailing is the preferred method of installation for HardiePlank® lap siding products. Face nailing should only be used where required by code for high wind areas and must not be used in conjunction with Blind nailing (Please see JH Tech bulletin 17 for exemption when doing a repair).

BLIND NAILING

Nails - Wood Framing

- Siding nail (0.09 in. shank x 0.221 in. HD x 2 in. long)
- 11ga. roofing nail (0.121 in. shank x 0.371 in. HD x 1.25 in. long)

Screws - Steel Framing

- Ribbed Wafer-head or equivalent (No. 8 x 1 1/4 in. long x 0.375 in. HD) Screws must penetrate 3 threads into metal framing.

Nails - Steel Framing

- ET & F Panelfast® nails or equivalent (0.10 in. shank x 0.313 in. HD x 1-1/2 in. long) Nails must penetrate minimum 1/4 in. into metal framing.

OSB minimum 7/16 in.

- Siding nail (0.09 in. shank x 0.215 in. HD x 1-1/2 in. long)
- Ribbed Wafer-head or equivalent (No. 8 x 1 5/8 in. long x 0.375 in. HD).

FACE NAILING

Nails - Wood Framing

- 6d (0.113 in. shank x 0.267 in. HD x 2 in. long)
- Siding nail (0.09" shank x 0.221" HD x 2" long)

Screws - Steel Framing

- Ribbed Bugle-head or equivalent (No. 8-18 x 1-5/8 in. long x 0.323 in. HD) Screws must penetrate 3 threads into metal framing.

Nails - Steel Framing

- ET & F pin or equivalent (0.10 in. shank x 0.25 in. HD x 1-1/2 in. long) Nails must penetrate minimum 1/4 in. into metal framing.

OSB minimum 7/16 in.

- Siding nail (0.09 in. shank x 0.221 in. HD x 1-1/2 in. long)

*Also see General Fastening Requirements; and when considering alternative fastening options refer to James Hardie's Technical Bulletin USTB 5 - Fastening Tips for HardiePlank Lap Siding.

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