TCE & Associates, Inc. Consulting Structural Engineers
Preserving Your Past, Building Your Future®

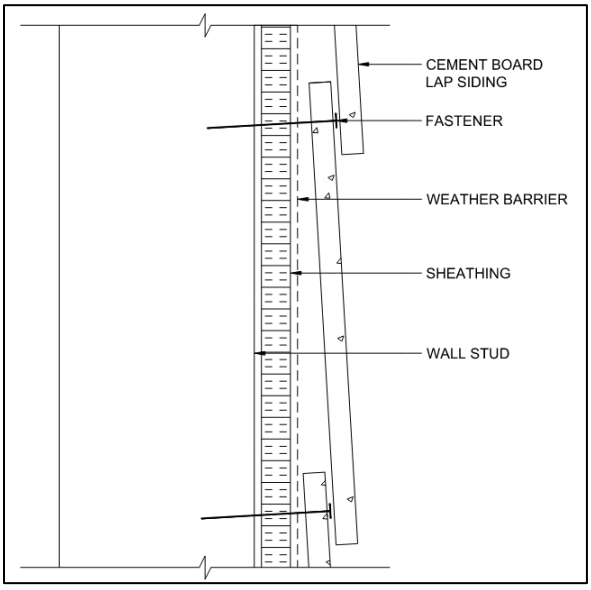
INTRODUCTION TO FIBER CEMENT BOARD SIDING

Fiber cement board siding (e.g., Hardiepanel vertical siding and Hardieplank lap siding) is a façade composite building material made of cement reinforced with cellulose fibers. Fiber cement board can resemble wood and can be applied in many different colors. It provides many advantages over other facade systems due to its aesthetic value, fire resistance, easy maintenance, and durability. It is an increasingly popular choice as a facade material due to the low installation cost. Compared to wood siding, it is not susceptible to termites or rot.

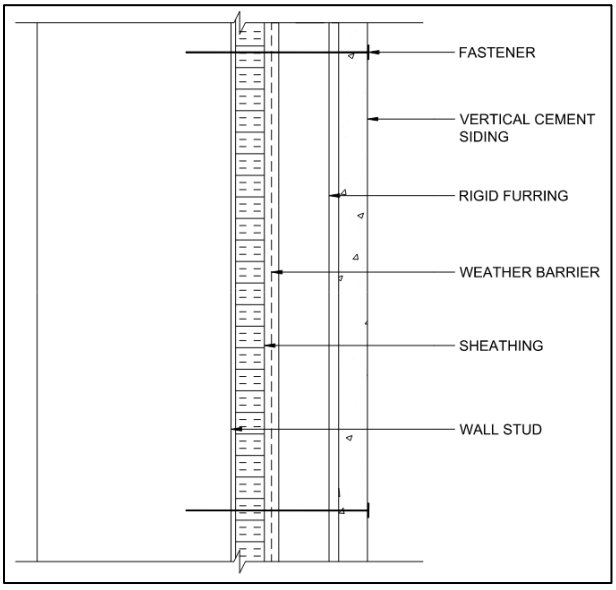
However, there can be severe facade and building envelope issues if fiber cement board siding is installed improperly. Owners should be informed and approach the siding project cautiously rather than accepting a low bidder to perform the installation.

INSTALLATION OF FIBER CEMENT BOARD SIDING

Fiber cement board siding is usually attached to wood studs with galvanized nails or to steel studs with galvanized screws. Rigid furring may be installed between the studs and the siding, and is typically required for large vertical panel siding for drainage. A weather resistant barrier is required behind the fiber cement board siding and is typically attached to sheathing in front of the studs. The fiber cement board siding must be painted, but this can be done at the factory or in the field.



Lap siding



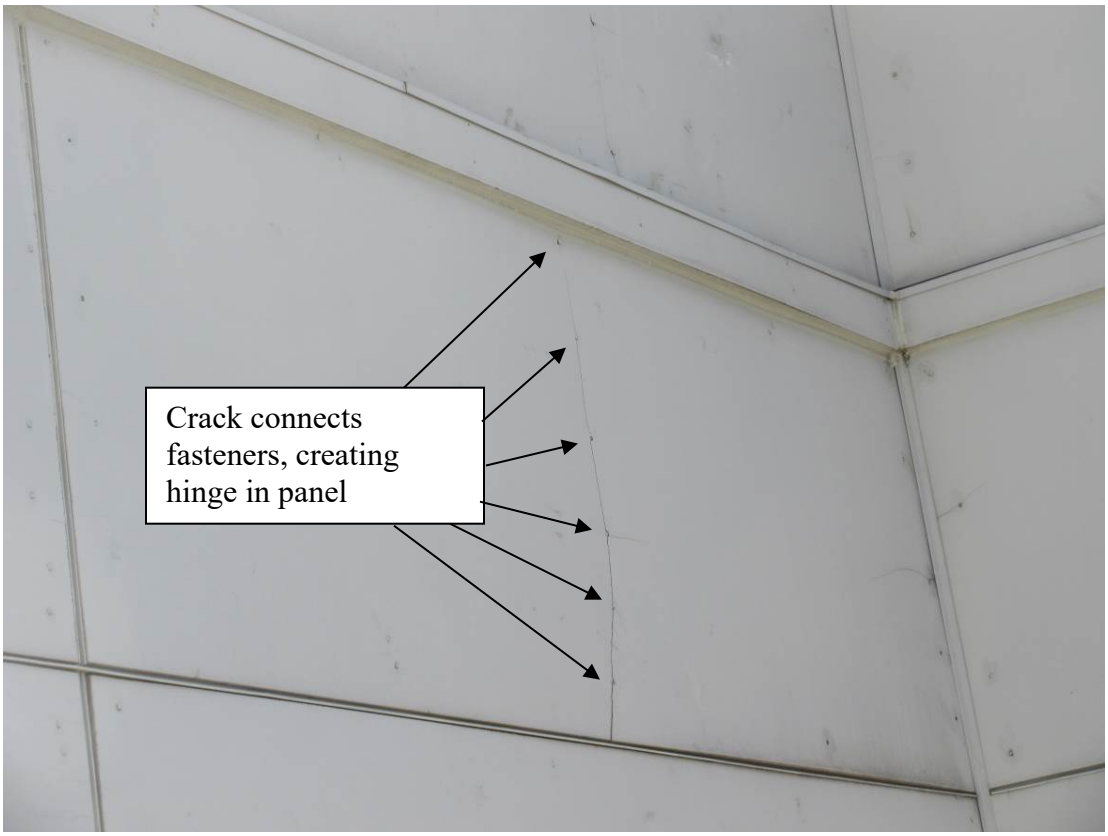
Vertical Panel Siding

TYPICAL PROBLEMS WITH FIBER CEMENT BOARD SIDING

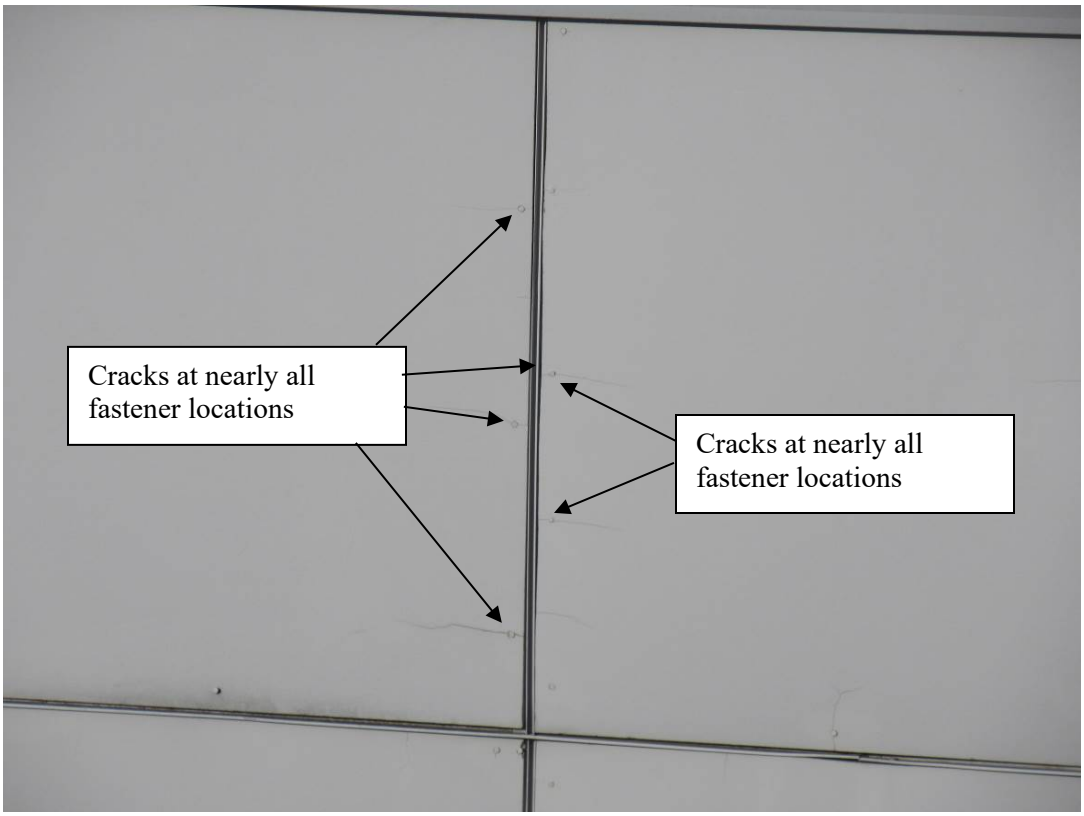
Cracking is a typical problem with fiber cement board siding. Cracking can lead to panels falling from the building. Cracking can be caused by:

1. Use of siding in a higher wind zone than allowed by manufacturer
2. Fasteners installed at spacing higher than that allowed by manufacturer
3. Fasteners installed that miss framing members
4. Overdriven fasteners
5. Fasteners installed too close to the edge of siding

Conditions #1 and #2 lead to increased load on each of the fasteners, which then cracks the siding when the loads are more than the siding can allow. Conditions #3 and #4 reduce the number of effective fasteners, which leads to increased load on each of the fasteners, which then cracks the siding when loads are more than the siding can allow. Condition #5 leads to cracking because there is insufficient fiber cement material surrounding the fastener to resist cracking.



Cracking of fiber cement siding

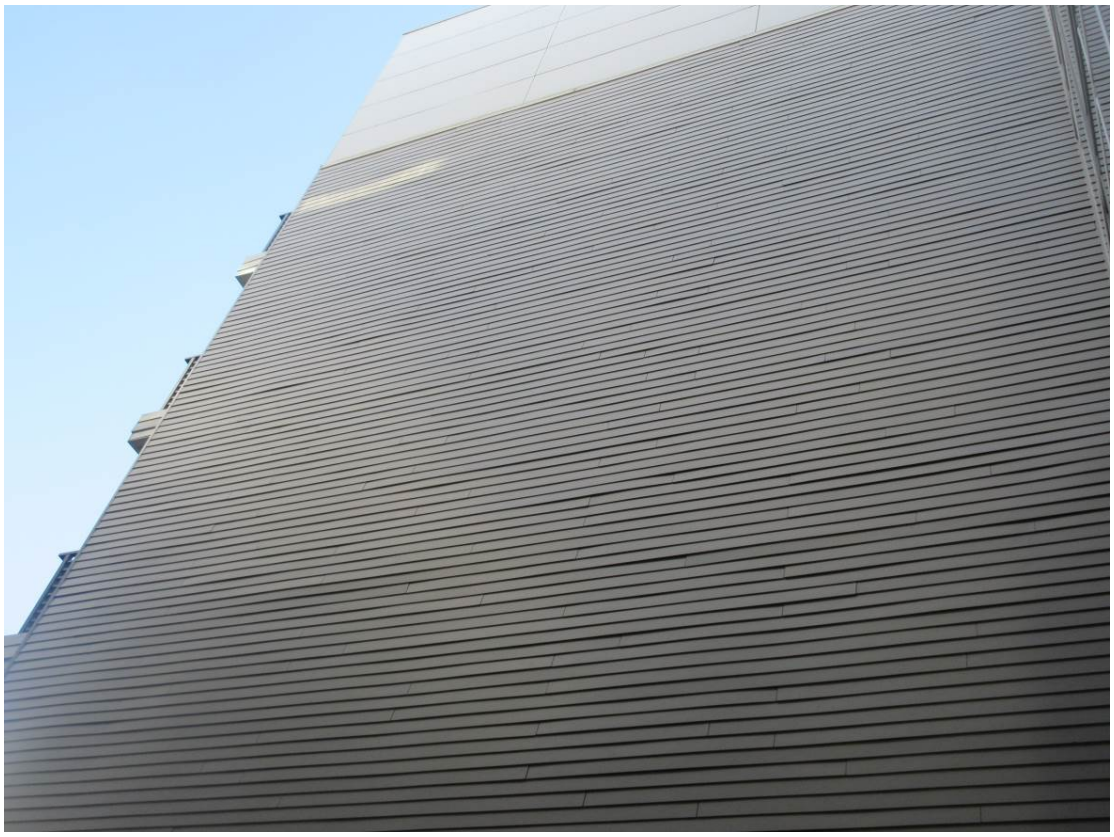


Cracks in fiber cement panel siding

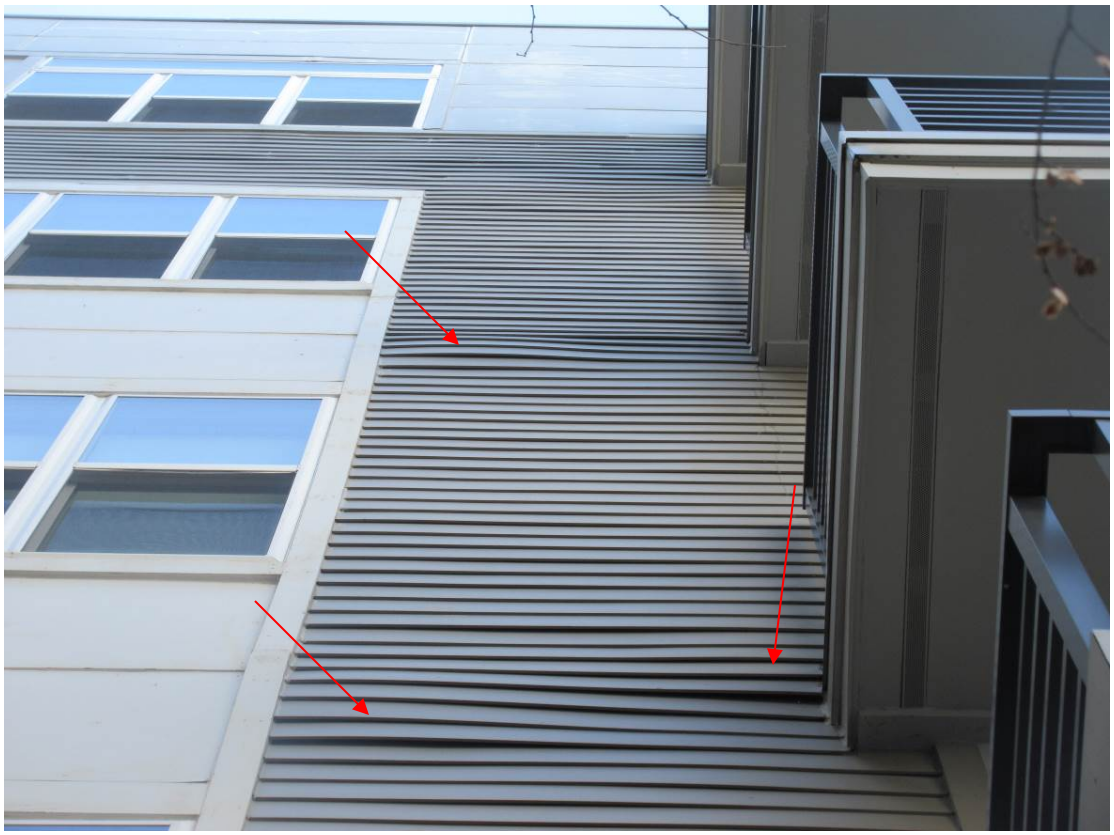
Typical overdriven fastener

Waviness and bulging of fiber cement siding is another common problem. Waviness and bulging can be caused by:

- Installation of a compressible drainage mat behind the siding in lieu of rigid furring
- Failed fasteners
- Fasteners installed at excessive spacing
- Fasteners installed that miss framing members
- Rot of sheathing behind siding
- Inadequate joints at edges of siding to allow for expansion



Waviness of fiber cement lap siding



Significant bulging of fiber cement lap siding

Cracking, waviness, and bulging are conditions that can be observed from the exterior, but there are other common problems with fiber cement board siding that may be hidden from view such as:

- Use of fasteners that are not protected against corrosion
- Improper installation of weather barrier and/or flashing behind the fiber cement board.

The hidden elements listed above are critical for the long term performance of the fiber cement board facade. If they are not addressed properly, it can lead to siding with compromised pull off resistance, wood rot of structural members behind the siding, mold growth, and damage to interior finishes.

Chapter 14 of the International Building Code (IBC) governs the installation of fiber cement board siding, and it states that fiber cement board siding be installed in accordance with the manufacturer installation instructions. Therefore, if the fiber cement siding is not installed in accordance with the manufacturer's instructions, then the facade does not meet Code. TCE recommends that appropriate inspections are performed while the fiber cement is installed to provide the Owner with assurance that it is being installed according to manufacturer instructions. Prior to installation, a design professional should check the maximum wind pressure allowed by the manufacturer to ensure the system meets required wind loads.

In addition, maintenance and upkeep is vital for continued service and longevity of fiber cement board facades. Deterioration of fiber cement board facades can result in leaks inside the building and can create life safety issues due to falling panels. Building owners should have fiber cement

board facades examined periodically by a consultant qualified in facade repair. The condition survey will assess the condition of the fiber cement board facade and water resisting elements, make recommendations for repair and maintenance, and help owners prepare budgets accordingly.

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