Best Practices–Installation Guide
Siding and Trim Products

Version 5.0 – January 2010

HZ5®
Engineered for Climate™

HardiePlank®
HardieShingle®
HardiePanel®
HardieTrim®
HardieSoffit®
HardieWrap®

JamesHardie®

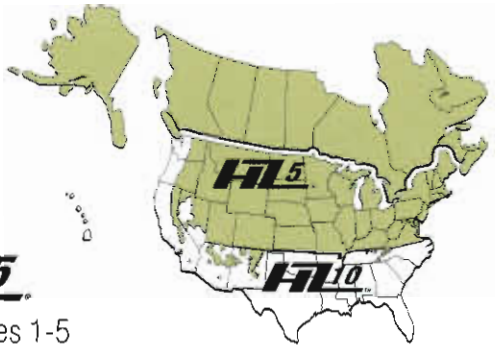
ColorPlus® Technology

HardieZone™ – Engineered for Climate™

James Hardie, the undisputed leader in fiber cement has always made the world's most resilient siding, and now we have made it even better. For the first time, siding has been Engineered for Climate™. So you get the right board for the right climate. We call it the HardieZone™ System.

We took the 8 climatic variables – that affect long term performance of the exterior into account and by combining them determined climate zones throughout North America. We found common variables between certain zones which led us to engineer James Hardie siding products for specific climates.

The development of these two products is a result of a heavy investment in R&D, our proprietary technology and manufacturing processes that culminates in the evolution of 7th generation fiber cement – Engineered for Climate.



HZ5
For climate zones 1-5

HZ10
For climate zones 6-10

The HZ5™ product is engineered to perform in climates with seasonal temperature variations, freezing temperatures, snow and ice.

The HZ10™ products are specifically engineered to perform in climates with high humidity, hot dry conditions, and high levels of rainfall.

This guide provides the best practice guidelines for installing the HardieZone product for your zone. Specific details and helpful hints that pertain to your zones are included in order to facilitate your installation process. If you are unsure about which zone your job is located in or which HardieZone product and installation instructions to use, then please visit our website at www.jameshardie.com for the zip code tool.

JamesHardie

WARNING: AVOID BREATHING SILICA DUST

James Hardie® products contain respirable crystalline silica, which is known to the State of California to cause cancer and is considered by IARC and NIOSH to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) use fiber cement shears for cutting or, where not feasible, use a HardieBlade® saw blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area; (4) wear a properly-fitted, NIOSH-approved dust mask or respirator (e.g. N-95) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods-never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheet available at www.jameshardie.com or by calling 1-800-9HARDIE (1-800-942-7343). FAILURE TO ADHERE TO OUR WARNINGS, MSDS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

SD050905

To View a Video of Proper Cutting Practices go to www.jameshardie.com

James Hardie® Products

Installation Guide

FOREWORD

James Hardie, the world leader in the manufacturing and development of fiber-cement building products, has produced this Installation Guide to help builders and contractors with the installation of James Hardie® siding and trim products, including James Hardie products with ColorPlus® Technology.

The first sections of this manual provide a general product description and information about sate practices, and proper tools for working with James Hardie siding and trim products. Sections that follow describe design and general installation information for specific James Hardie products. The appendix addresses the installation of James Hardie siding products in less common construction practices (e.g. concrete construction).

This manual must be read in conjunction with project drawings and specifications, applicable building codes, and relevant compliance documents (e.g. ICC-ES Legacy Report NER-405). The details in this manual provide guidance on how to comply with James Hardie's installation requirements and need to be reviewed by all parties who are responsible for installing James Hardie products on a project.

This manual is subject to periodic re-examination and revision. For information on the current status of these documents please check the James Hardie website, www.jameshardie.com. The reader is responsible for ensuring that they are using the most up-to-date information.

TELEPHONE DIRECTORY

Technical Services 800-942-7343

Tech Barn for Samples and Literature 866-975-8822

Warranty 866-375-8603

JamesHardie®

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HardieSoffit®

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General Product Information

JOBSITE STORAGE OF JAMES HARDIE® PRODUCTS

The James Hardie family of siding and trim products, including James Hardie® products with ColorPlus® Technology, should be stored in their original packaging in a garage, shed, or in some other covered area protected from weather whenever possible. These products must be kept covered on a pallet off of the ground; they must never be stored in direct contact with the ground.

James Hardie products stored in their original packaging.

If James Hardie products are stored outside they should be protected with an additional waterproof covering. All scrap siding and trim pieces, cutoffs or material left on scaffolding must be covered and protected from the elements. If James Hardie products become saturated, they must be laid on a flat surface and allowed to dry completely prior to installation.

If stored outside protect with an additional waterproof covering.

James Hardie products should not be rolled-off or dumped-off of the truck during delivery to the jobsite. James Hardie recommends using a fork lift to off load material or unloading by hand.

IMPORTANCE OF KEEPING JAMES HARDIE PRODUCTS DRY

James Hardie siding and trim products must be kept dry at all times prior to installation. If products become saturated before they are installed, the following problems may occur:

OPEN JOINTS DUE TO SHRINKAGE

If installed wet, joints between planks may open up requiring repair or replacement. However, shrinkage of fiber-cement is significant only if the product becomes saturated prior to installation. Under normal environmental conditions fiber cement has significantly greater dimensional stability than wood or vinyl-based exterior products.

DIFFICULTY IN HANDLING

Saturation increases the weight and flexibility of fiber-cement products, making them difficult to handle.

STAINING

Staining is a deposit of soluble salts, usually white in color, which sometimes appears on the surface of masonry or concrete construction.

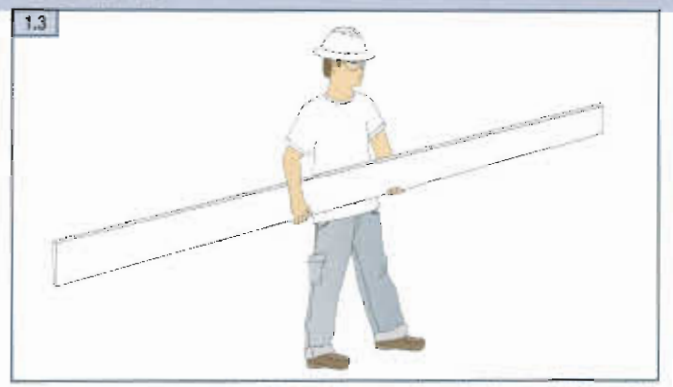
James Hardie is not responsible for damage due to improper storage and handling of its products.

PROPER HANDLING OF JAMES HARDIE® PRODUCTS

To help avoid injury and product damage, lap siding, trim, and soffit material should always be carried on edge. James Hardie recommends that these products be carried by two people whenever possible with each person positioned near the end of the load. To carry a plank solo, a person should hold it on edge in the middle with arms spread apart for maximum support of the product. Lifting or carrying lap siding or trim flat may break or bend the product.

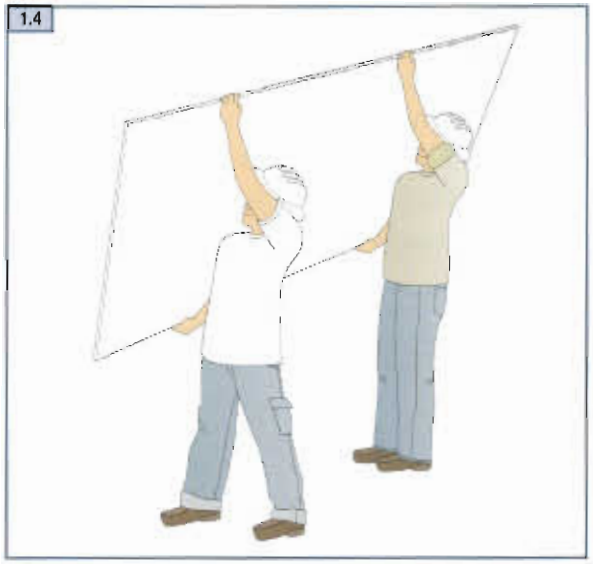
James Hardie recommends that two people always carry panel products. Workers should hold the panel near each end and on edge. Because of reduced visibility when handling panel products, take extra care to avoid damaging the corners and edges of the panel.

1.3



One person should hold planks on edge in the middle with arms spread apart for maximum support of the product

1.4

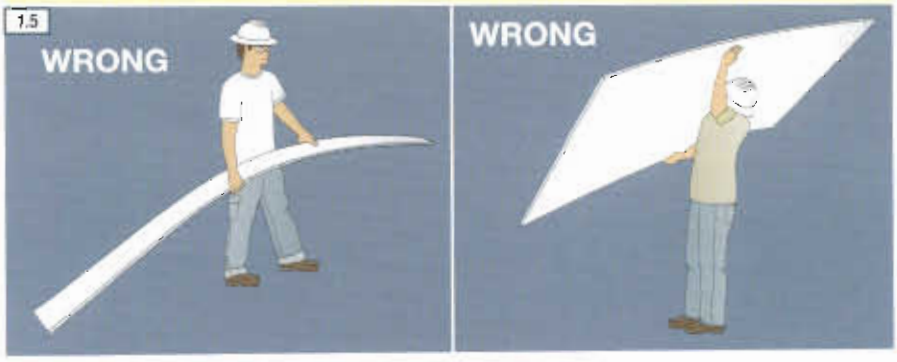


Two people should always carry panel products.

TIP: When handling panel products, manufactured panel carriers or caddies can give workers better control.

Carrying James Hardie® siding products with ColorPlus® Technology flat may cause excessive bending, which can damage the finish.

1.5



Tools for Cutting and Fastening Fiber-Cement Products

NAIL & PIN GUNS

Pneumatic nail guns can be used to attach James Hardie products to wood, steel or masonry substrates. Finish nail guns can be used for HardieTrim® board only. Refer to the product specific installation instructions for fastener choices. Below are examples of commonly used nail guns.

Hitachi *(www.hitachipowertools.com)**
(NT65A2) 2½" 16 guage Finish Nailer
(NV65AH) 2½" Siding Nailer
(NV45AB2(S)) 1¾" Coil Roofing Nailer
(NV75AG) 3" Coil Nailer

Dewalt *(www.dewalt.com)**
(D51257K) 1-1/4" - 2-1/2" 16 Gauge Straight Finish Nailer Kit

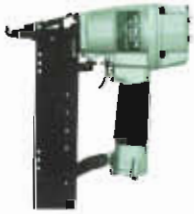
ET&F Fastening Systems *(www.etf-fastening.com)**
(500) Nailer to Steel Studs
(510) Nailer to Steel Studs
(610) Nailer to Steel Studs
(110) Finish Nailer to Steel Studs

Duo-Fast *(www.duo-fast.com)**
(P275C) Siding Coil Nailer

Porter Cable *(www.deltaportercable.com)**
(COIL250) 2½" Coil Nailer

Aerosmith *(www.AerosmithFastening.com)*
(ST4100/ST4200) Nailer to Steel Studs
(HN120) Nailer to Masonry
Requires special high pressure air compressor model number AKHL1050E


NV65AH


NT65A2


NV45AB2(S)


NV75AG


DC616KA†


P275C


ET&F 510


610 ET&F


110 ET&F


ST4100/ ST4200

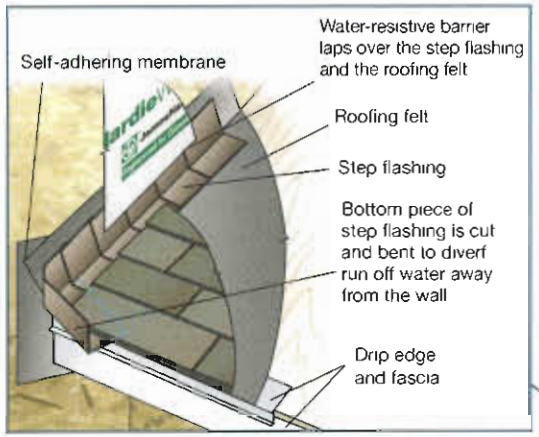

HN120

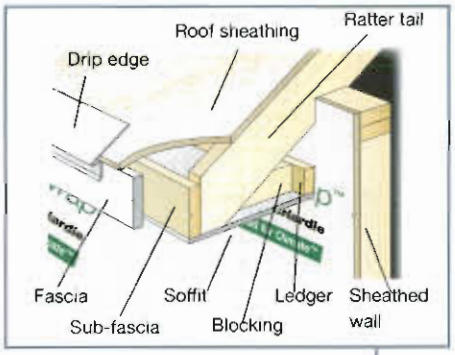
USEFUL HAND TOOLS

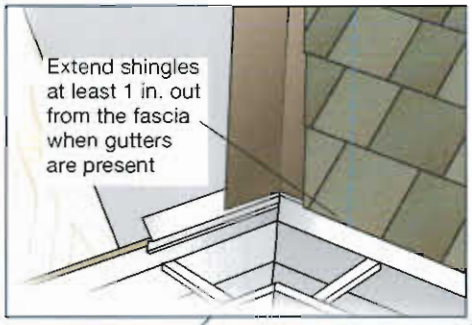
In addition to the power tools listed above, certain hand tools are necessary for the installation of James Hardie® siding and trim products.
These include:

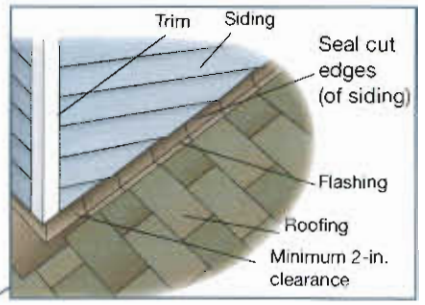
- 25-ft. contractors tape measure
- Torpedo level
- Pencil or pen
- Smooth-faced hammer
- Speed square
- 4-ft. or longer level

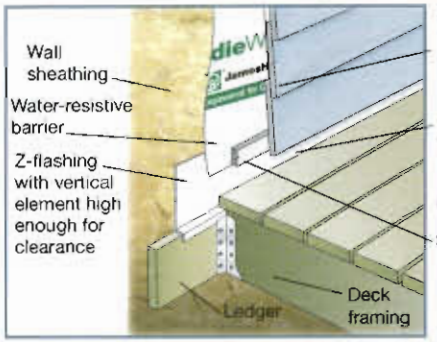
TIP: ***If hand nailing, use a smooth faced hammer to avoid marking the product. Waffle-headed hammers should not be used when hand nailing James Hardie siding and trim products.***


Self-adhering membrane
Water-resistive barrier laps over the step flashing and the roofing felt
Roofing felt
Step flashing
Bottom piece of step flashing is cut and bent to divert run off water away from the wall
Drip edge and fascia

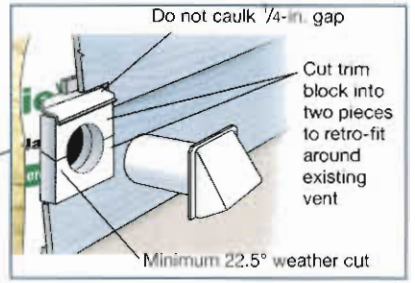

Roof sheathing
Ratter tail
Drip edge
Fascia
Sub-fascia
Soffit
Blocking
Ledger
Sheathed wall

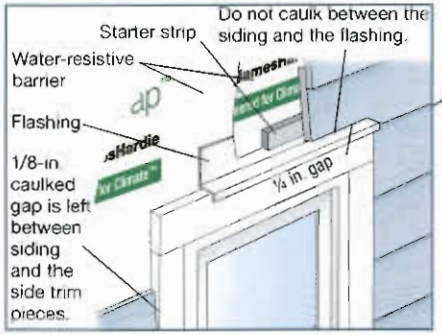

Extend shingles at least 1 in. out from the fascia when gutters are present

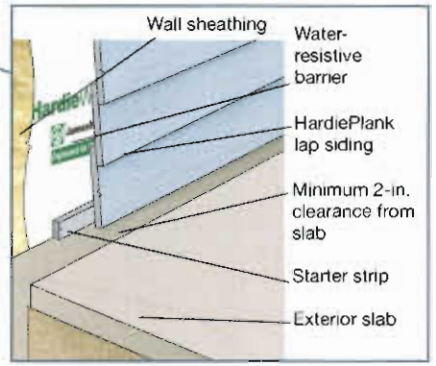

Trim
Siding
Seal cut edges (of siding)
Flashing
Roofing
Minimum 2-in. clearance

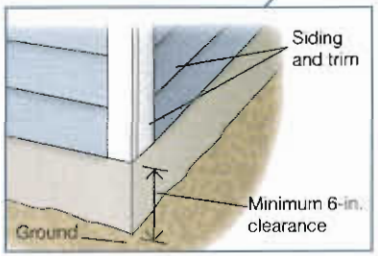

Wall sheathing
Water-resistive barrier
Z-flashing with vertical element high enough for clearance
HardiePlank lap siding
Minimum 2-in. clearance from highest point of decking
Starter strip
Ledger
Deck framing

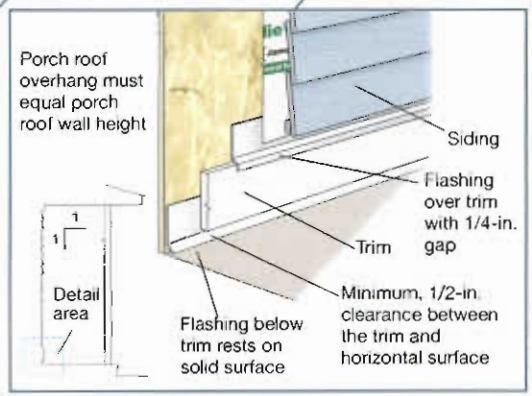

Gutter and end cap should end a minimum 1 in. from siding

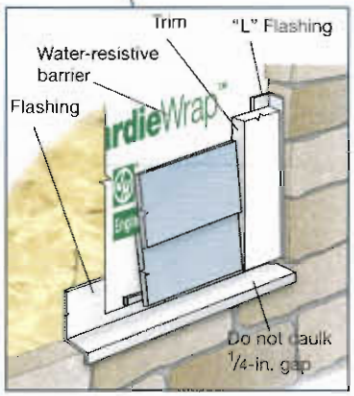

Do not caulk 1/4-in. gap
Cut trim block into two pieces to retro-fit around existing vent
Minimum 22.5° weather cut


Starter strip
Do not caulk between the siding and the flashing.
Water-resistive barrier
Flashing
1/8-in. caulked gap is left between siding and the side trim pieces.
1/4 in. gap


Wall sheathing
Water-resistive barrier
HardiePlank lap siding
Minimum 2-in. clearance from slab
Starter strip
Exterior slab


Siding and trim
Minimum 6-in. clearance
Ground


Porch roof overhang must equal porch roof wall height
Detail area
Siding
Flashing over trim with 1/4-in. gap
Trim
Minimum, 1/2-in. clearance between the trim and horizontal surface
Flashing below trim rests on solid surface


Trim
"L" Flashing
Water-resistive barrier
Flashing
Do not caulk 1/4-in. gap

General Installation Requirements (continued)

FRAMING AND SHEATHING

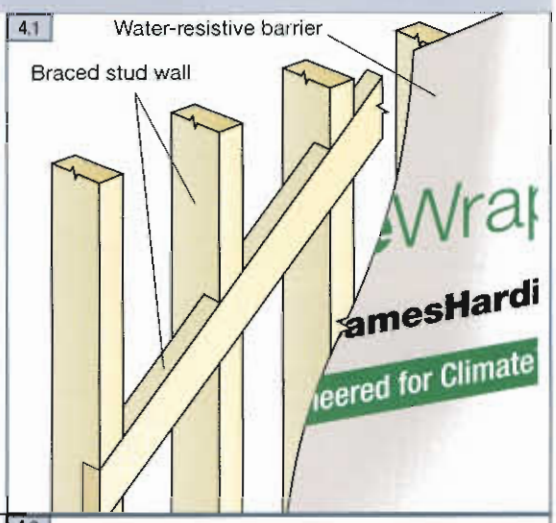
Refer to the appendix for more information on rigid foam insulation.

James Hardie® siding and trim products can be installed over braced wood or steel studs spaced at a maximum of 24 in. on center or directly to 7/16-in. thick OSB or equivalent sheathing. These products can also be installed over solid-foam insulation board up to 1-in. thick.

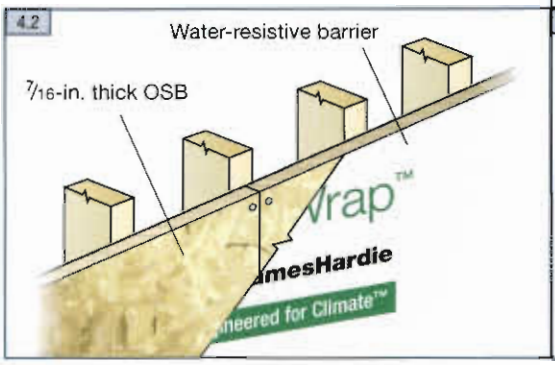
Irregularities and unevenness in framing, sheathing, foam and other wall assembly components, including under driven nails, can telegraph through to the finished siding and trim. These irregularities should be corrected before the siding is installed.

When installing James Hardie siding and trim products over steel studs James Hardie requires a minimum 20 gauge and recommends a maximum of 16 gauge. Steel framing that is outside of this range may be too flimsy to provide adequate holding power or too heavy for some fastening systems.

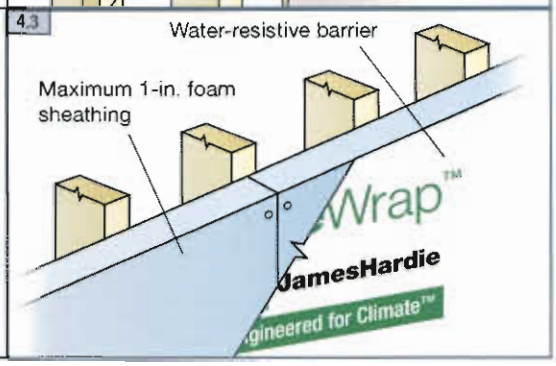
4.1



4.2

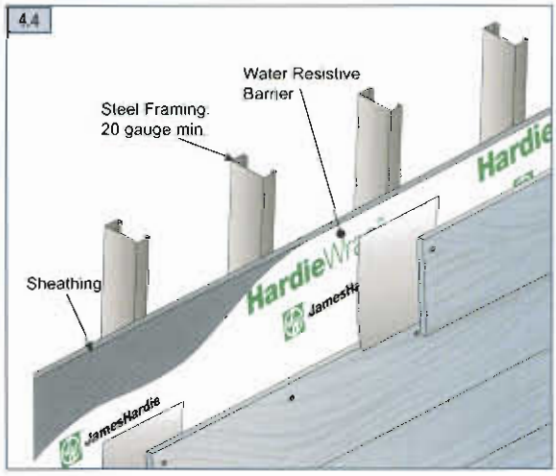


4.3



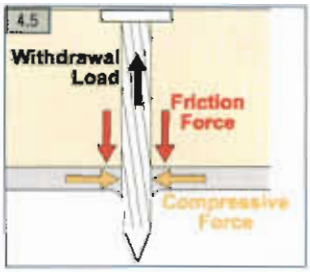
When using pins to attach siding products to steel, it is important to hold the material tight to the steel framing when driving the pin as the pin will not pull the material tight to the framing the same as a nail into wood will. Once the pin has been driven into the steel stud it is also important to not set or hit the nail a second time with a hammer. When driven into steel, the ballistic-shaped point uniformly pierces the steel instead of drilling it out or tearing the steel. The displaced steel rebounds around the pin to create a strong compressive force on the shank of the pin. When the pin is hit with a hammer it disrupts the compressive and frictional forces holding the pin and significantly reduces the overall holding capacity of the pin. If the pin does is not set properly during the first attempt, the pin should be removed and replaced with a second pin.

4.4



When using a screw to attach James Hardie products to steel, a screw with a self tapping point should be used. A self tapping screw functions by having a cutting edge which drills away the material, making a tiny hole for the screw to go into. Some self tapping screws may be wing tipped which are intended to bore out the fiber cement (creating a pilot hole), and will break off as the screw goes into the steel. Either type of screw is acceptable for use.

4.5



Refer to the correct code compliance reports when selecting a fastener for steel applications and choose the corresponding tools from the tool section of this guide.

WATER-RESISTIVE BARRIER

Prior to siding, make sure the water-resistive barrier is properly installed according to the manufacturers' instructions.

Refer to page #30 for more information on HardieWrap® weather barrier including complete installation requirements.

IBC Code Reference: "1403.2 Weather protection. Exterior walls shall provide the building with a weather-resistant exterior wall envelope. The exterior wall envelope shall include flashing, as described in Section 1405.3. The exterior wall envelope shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a water-resistive barrier behind the exterior veneer, as described in Section 1404.2, and a means for draining water that enters the assembly to the exterior. Protection against condensation in the exterior wall assembly shall be provided in accordance with the International Energy Conservation Code.

Exceptions:

1. A weather-resistant exterior wall envelope shall not be required over concrete or masonry walls designed in accordance with Chapters 19 and 21, respectively.

2. Compliance with the requirements for a means of drainage, and the requirements of Sections 1404.2 and 1405.3, shall not be required for an exterior wall envelope that has been demonstrated through testing to resist wind-driven rain, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTM E 331 under the following conditions..."

STAGING

Heavy building products and components such as roofing, drywall and floor coverings should be stored throughout the structure prior to the installation of the siding. Distributing the weight in this manner will reduce the possibility of floor plate compression on two or more story homes.

FLASHING

When using James Hardie siding, trim, and weather barrier products, make sure that roof flashing, water table flashing, window and door flashing, and flashing for other building envelope penetrations are properly installed and lapped so that moisture drains down and to the exterior. Note: The successful installation of flashing requires thorough planning before installation of roofing or siding. Scheduling and sequencing are important factors as well as having the correct flashings available on site at the correct time. James Hardie does not recommend the use of mill finished, raw aluminum flashing or any other product that may bleed or adversely react with cement products. Painted or coated aluminum flashings are recommended.

IBC Code Reference: "1405.3 Flashing. Flashing shall be installed in such a manner so as to prevent moisture from entering the wall or to redirect it to the exterior. Flashing shall be installed at the perimeters of exterior door and window assemblies, penetrations and terminations of exterior wall assemblies. exterior wall intersections with roofs, chimneys, porches, decks, balconies and similar projections and at built-in gutters and similar locations where moisture could enter the wall. Flashing with projecting flanges shall be installed on both sides and the ends of copings, under sills and continuously above projecting trim."

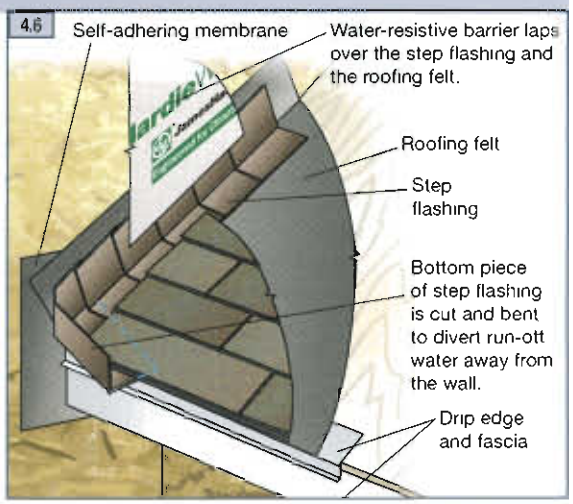
General Installation Requirements (continued)

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-resistive 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 manufactures installation instructions.



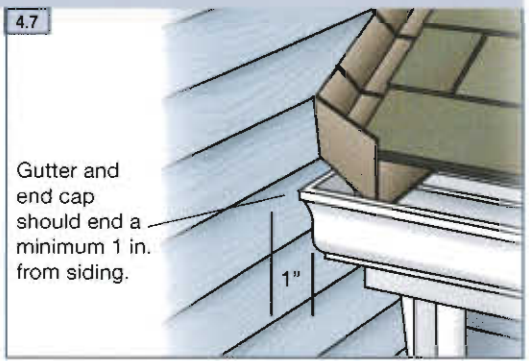
TIP: ***The kickout flashing should be large enough and shaped in such a way that effectively deflects water away from the siding. James Hardie recommends that the kickout flashing is at least 2 inches high and projects from the wall 3-4 inches.***

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.

4.7



***TIP:** James Hardie recommends the use of rain gutters whenever possible.*

IBC Code Reference: "1503.2.1 Locations. Flashing shall be installed at wall and roof intersections, at gutters, wherever there is a change in roof slope or direction and around roof openings..."

VALLEY FLASHING

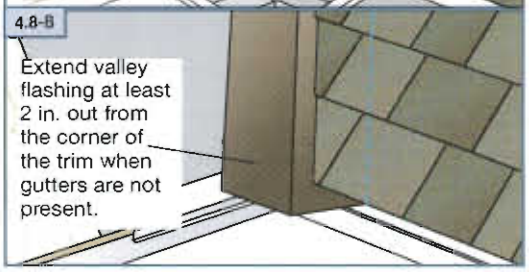
For added protection at roof valleys, James Hardie requires one of the following options:

1) **If rain gutters *are* present:** As the roof is being shingled, have the roofer extend the shingles at least 1 in. out from the fascia to direct water directly into the gutters (figure 3.V-A).
2) **If rain gutters *not* present:** When rain gutters are not present, have the roofer extend the valley flashing at least 2 in. out from the corner to direct water further away from the building (figure 3.V-B).
3) If the roof is already flashed and shingled, add a short piece of flashing to extend the valley in compliance with figure 3.V-B.

The above requirement also applies to roof valley's at any other locations where the fascia runs into a roof line such as dormer valleys and roof-to-roof intersections.

4.8-A

4.8-B



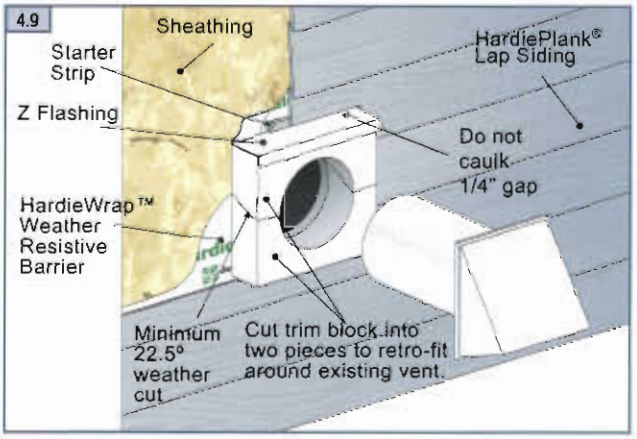
General Installation Requirements (continued)

PENETRATIONS

For penetrations in the building envelope such as hose bibs and holes 1 1/2" diameter or larger, such as dryer vents, a block of HardieTrim® 5/4, 4/4 boards should be installed around the point of 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 manufactures installation instructions.



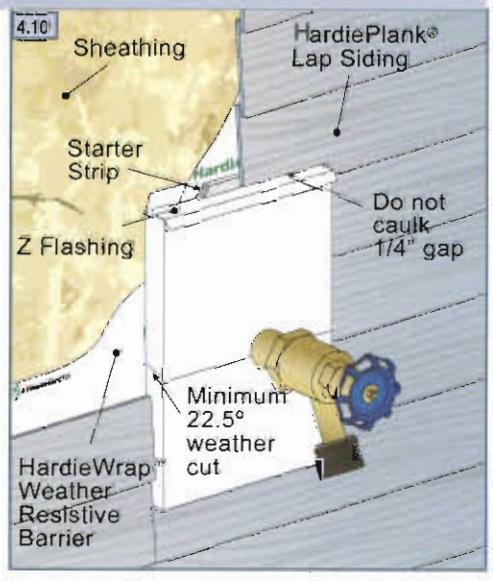
SturdiMount.

***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.*

HOSE BIBS

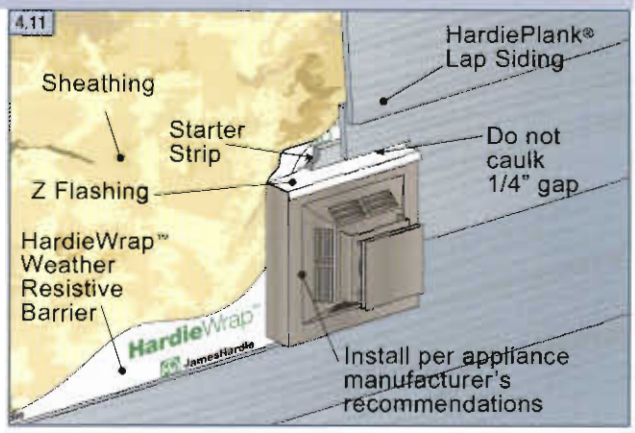
Hose bibs are a source of water which increases the likelihood of moisture related problems. The goal is to keep the water outside of the building and the best way to do this is keep the water off the walls. A good preventative measure is to extend the hose bib further from the wall. A downward slope 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 ½" 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.



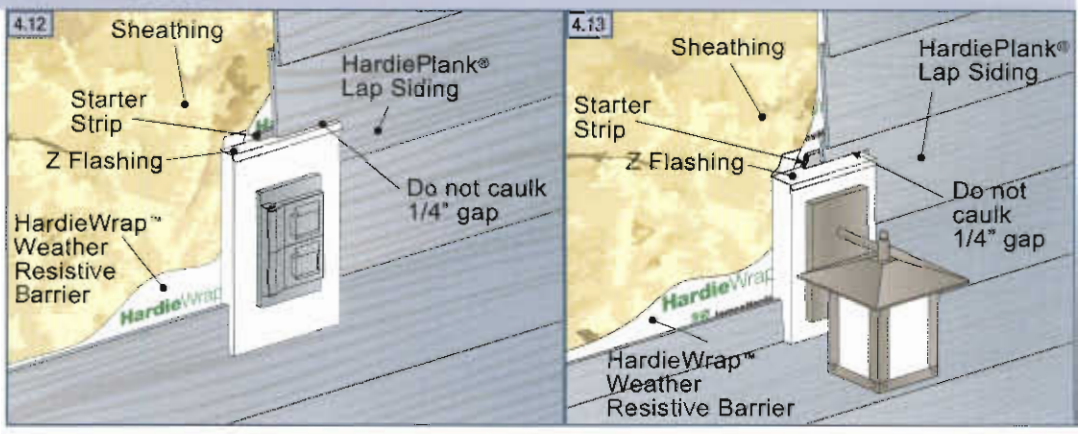
For dryer vents, avoid placement too low to the ground where debris could easily impede air flow, trapping heat and moisture. Some types of high efficiency furnaces can be vented out through the walls. In these cases, avoid locating the vent too close to the roof or eaves where heat and moisture will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

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.



General Installation Requirements (continued)

WIRES, CONDUIT OR OTHER FIXED PIPES

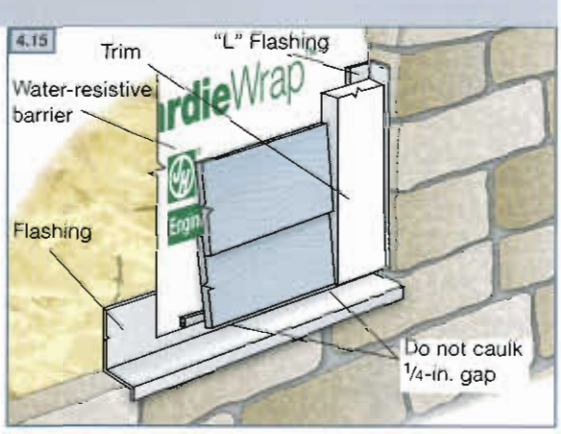
For small penetrations such as wires, electrical conduit, and pipes less than 1 ½ " in diameter (excluding hose bibs) no blocking is necessary. The circumference of pipe or wire should be sealed with a barrier foam and/or caulked.

AIR CONDITIONERS, SERVICE PANELS, AND OTHER WALL MOUNTED DEVICES

Wall mounted devices and air conditioners represent large penetrations into the building envelope and structure. Before installing a unit, please consult the architect or structural engineer to determine if additional bracing is necessary. The device should be installed per manufacture's instructions and flashed properly. Any condensate drains should extend out 4" from the wall, and angle down.

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.



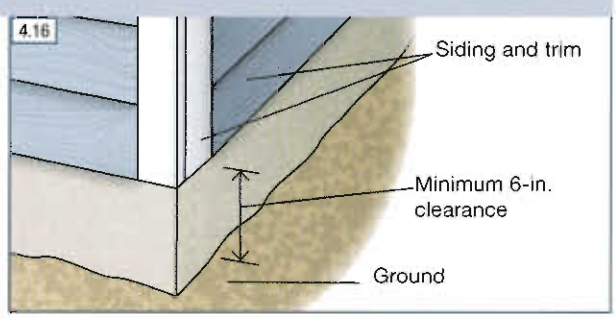
CLEARANCES

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 ot the building system, violate building codes or James Hardie requirements, and may void any warranty on the products.

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.

4.16



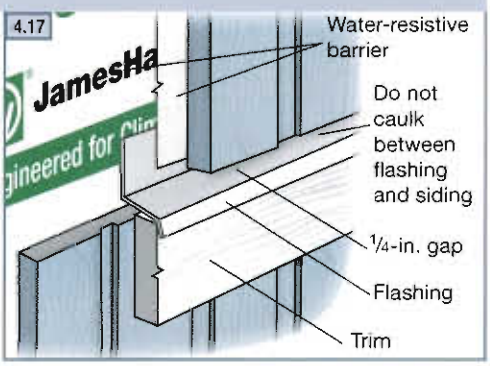
IBC Code Reference: "1803.3 Site grading. The ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than one unit vertical in 20 units horizontal (5-percent slope) for a minimum distance of 10 feet (3048 mm) measured perpendicular to the face of the wall..."

SIDING TO FLASHING CLEARANCE

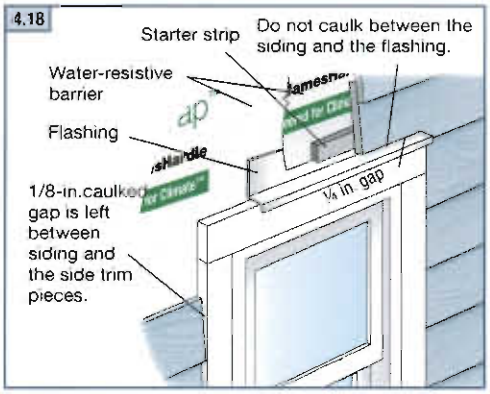
A 1/4-in. clearance must be maintained between James Hardie® siding and trim products and any horizontal flashing.

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.

4.17



4.18

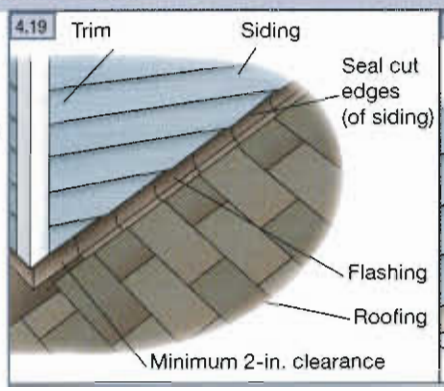


General Installation Requirements (continued)

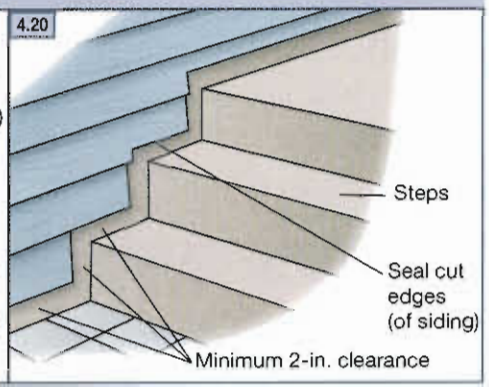
SIDING AND TRIM TO SOLID SURFACES

A clearance of 2 in. must be maintained between James Hardie siding and trim products where they meet roofs, decks, paths, steps, driveways or any other solid surfaces.

4.19



4.20

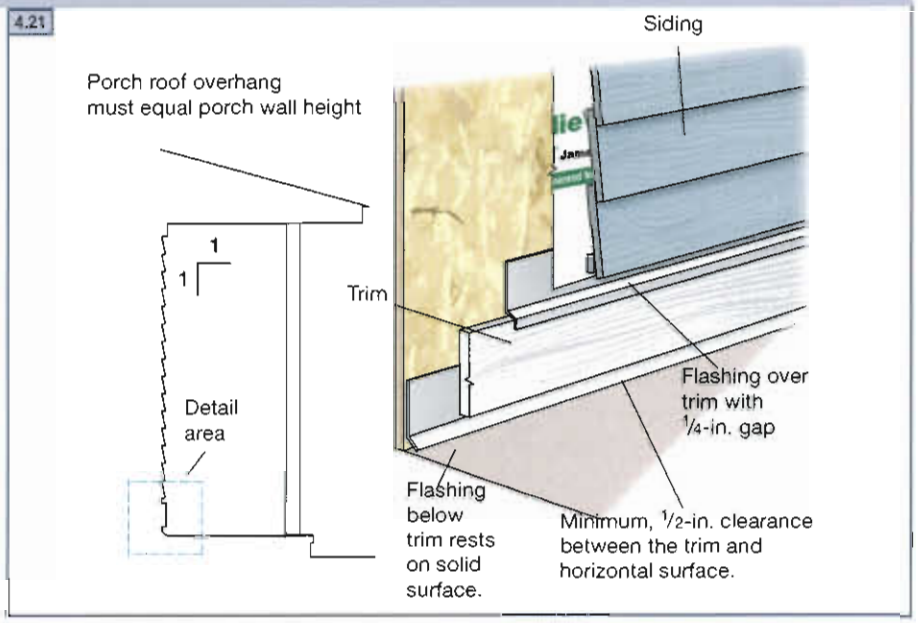


IBC Code Reference: "1503.2.1 Locations. Flashing shall be installed at wall and roof intersections, at gutters, wherever there is a change in roof slope or direction and around roof openings..."

CLEARANCES FOR SHELTERED AREAS

Porches or other structures that maintain a minimum 1:1 ratio of the wall height to the overhang length provide extra protection, which keeps rain and other weather elements away from the siding. These areas may be designated as Sheltered Areas. In these areas, a minimum 1/2-in. clearance is required with appropriate flashing between the bottom of James Hardie trim or siding and solid horizontal surfaces.

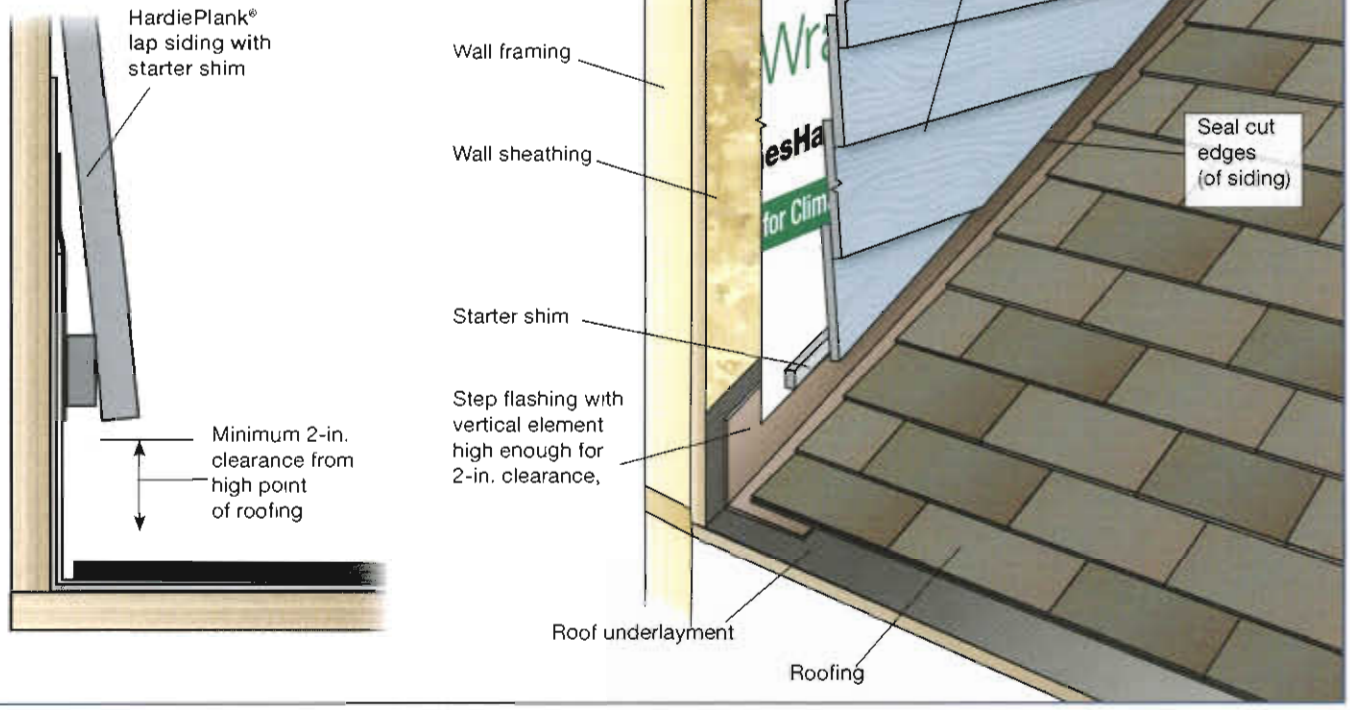
4.21



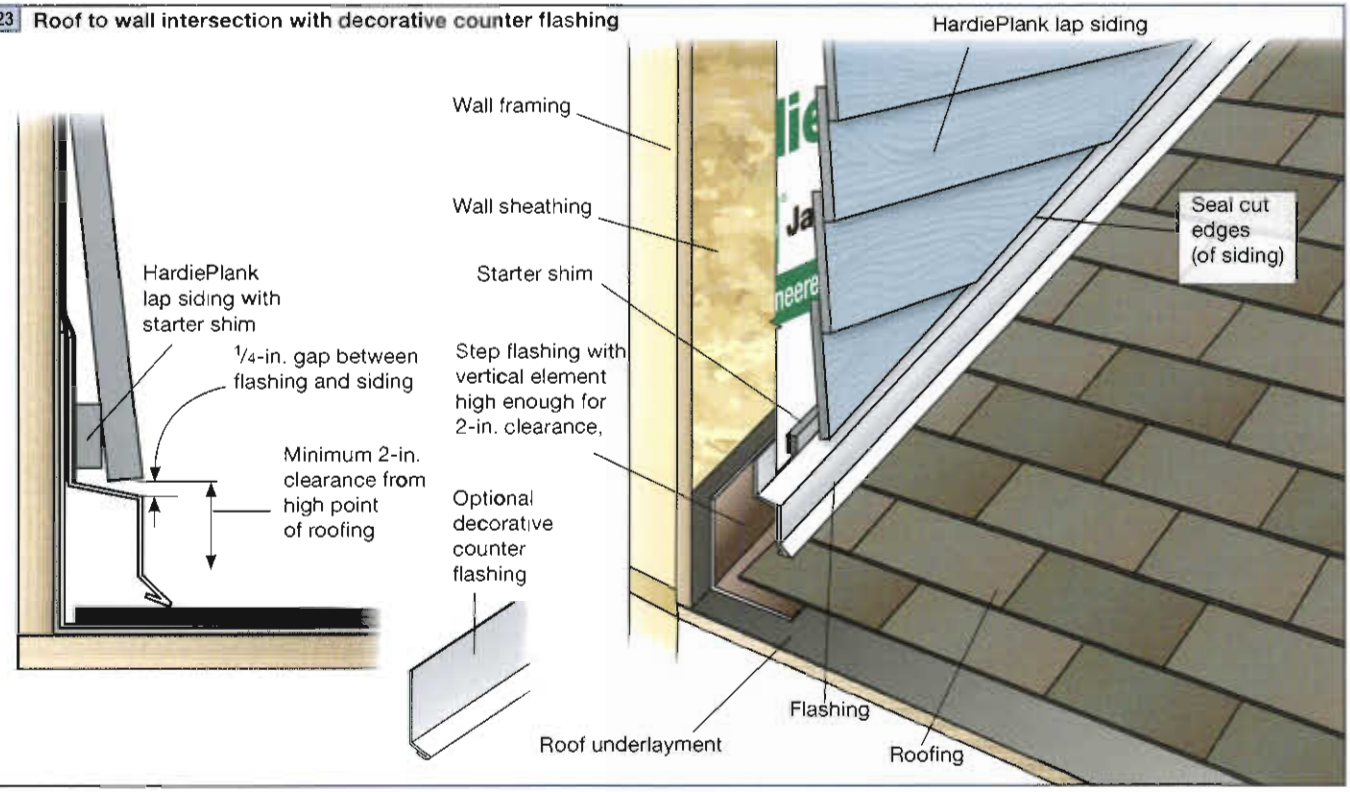
James Hardie siding and trim products must not be installed such that they remain in contact with standing water.

Here are examples of details that can help improve the aesthetics of clearance requirements. Check with a design professional and local building officials to ensure that the chosen details are correct for their intended purpose and location.

4.22

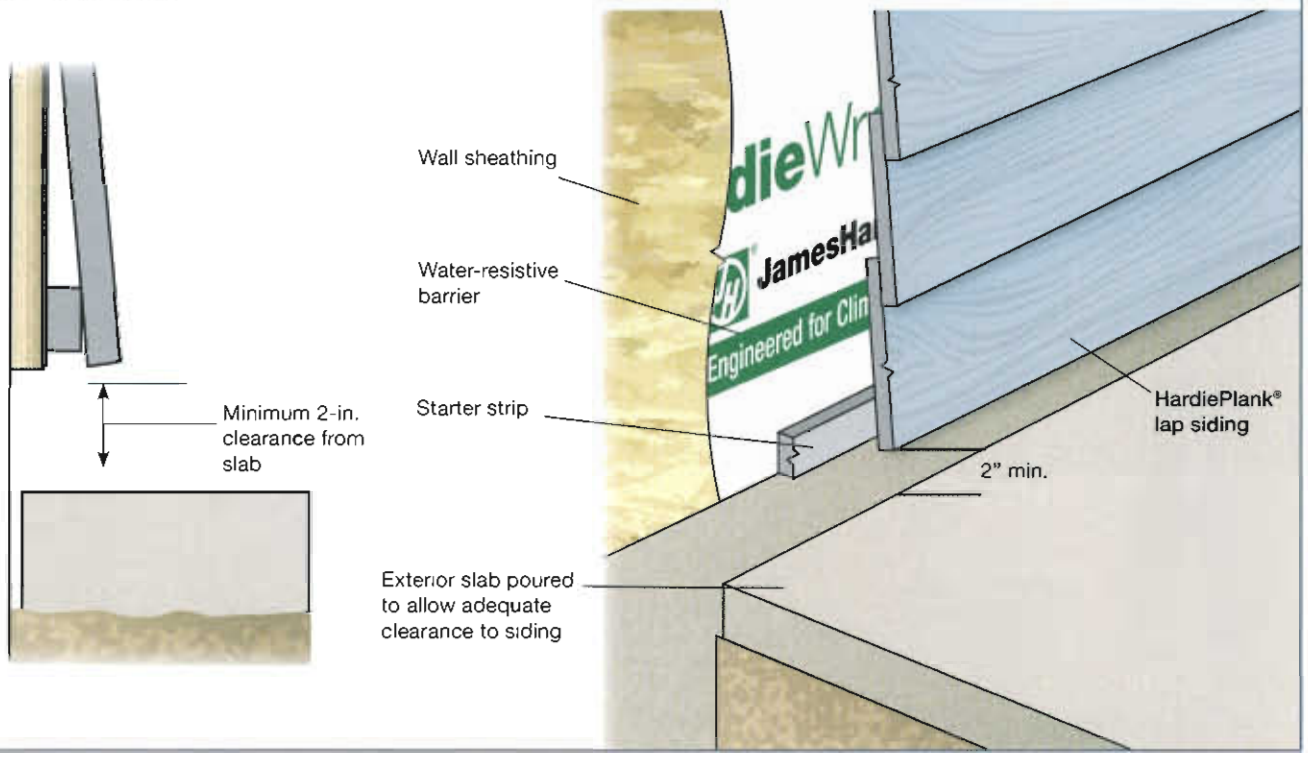


4.23 **Roof to wall intersection with decorative counter flashing**

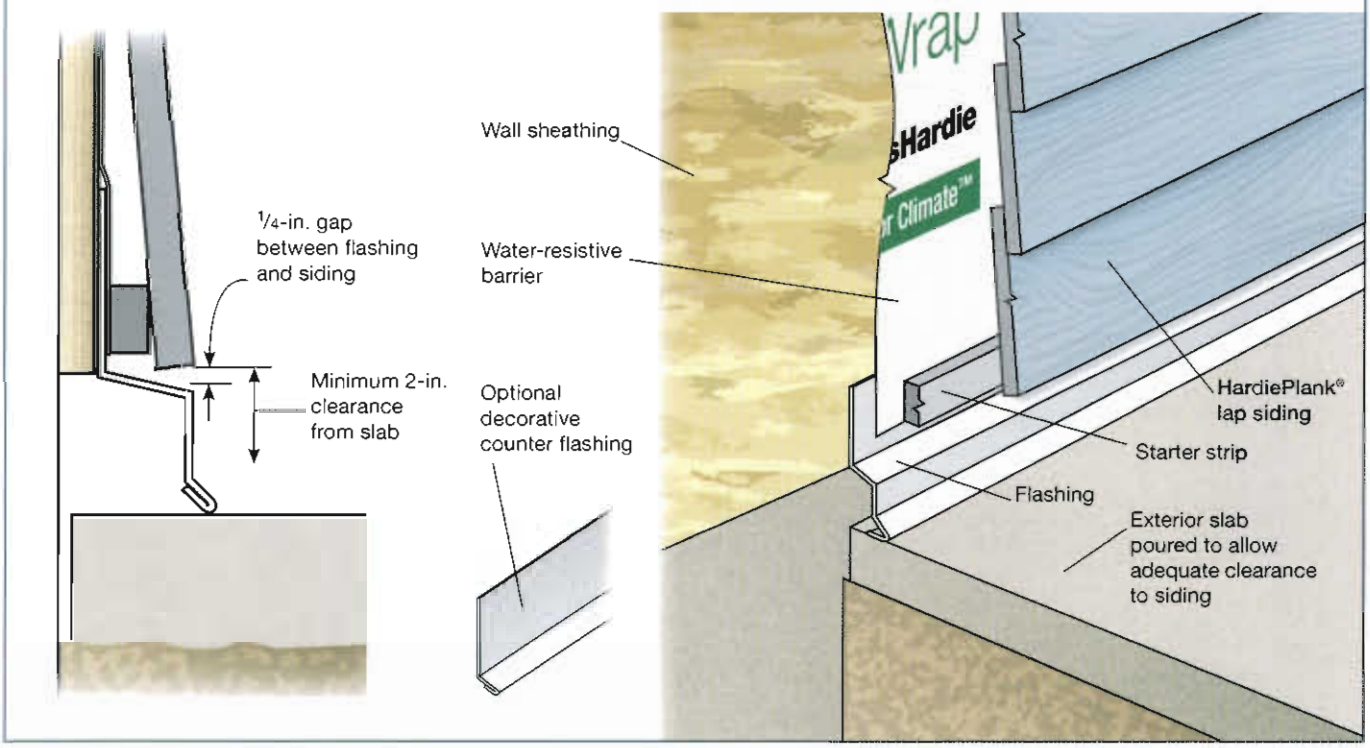


General Installation Requirements (continued)

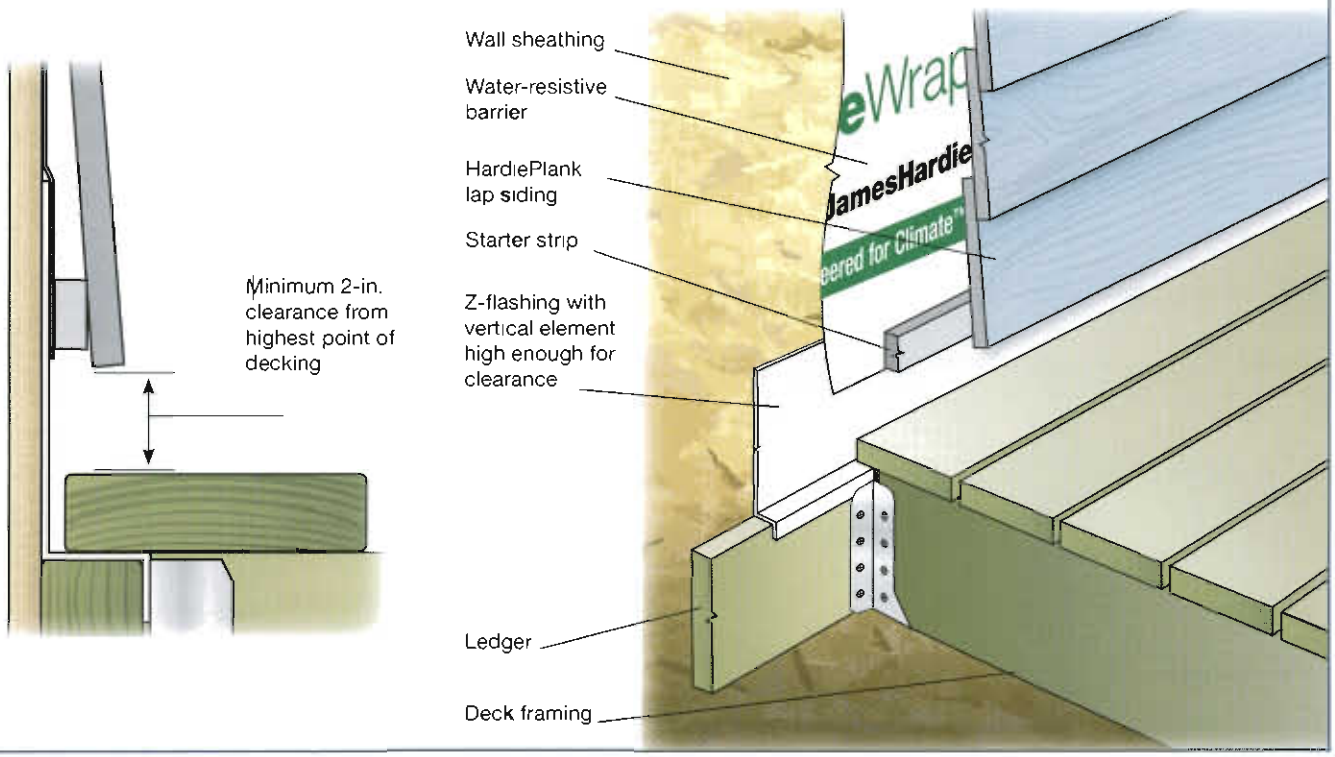
4.24 Wall to exterior slab intersection without decorative counter flashing



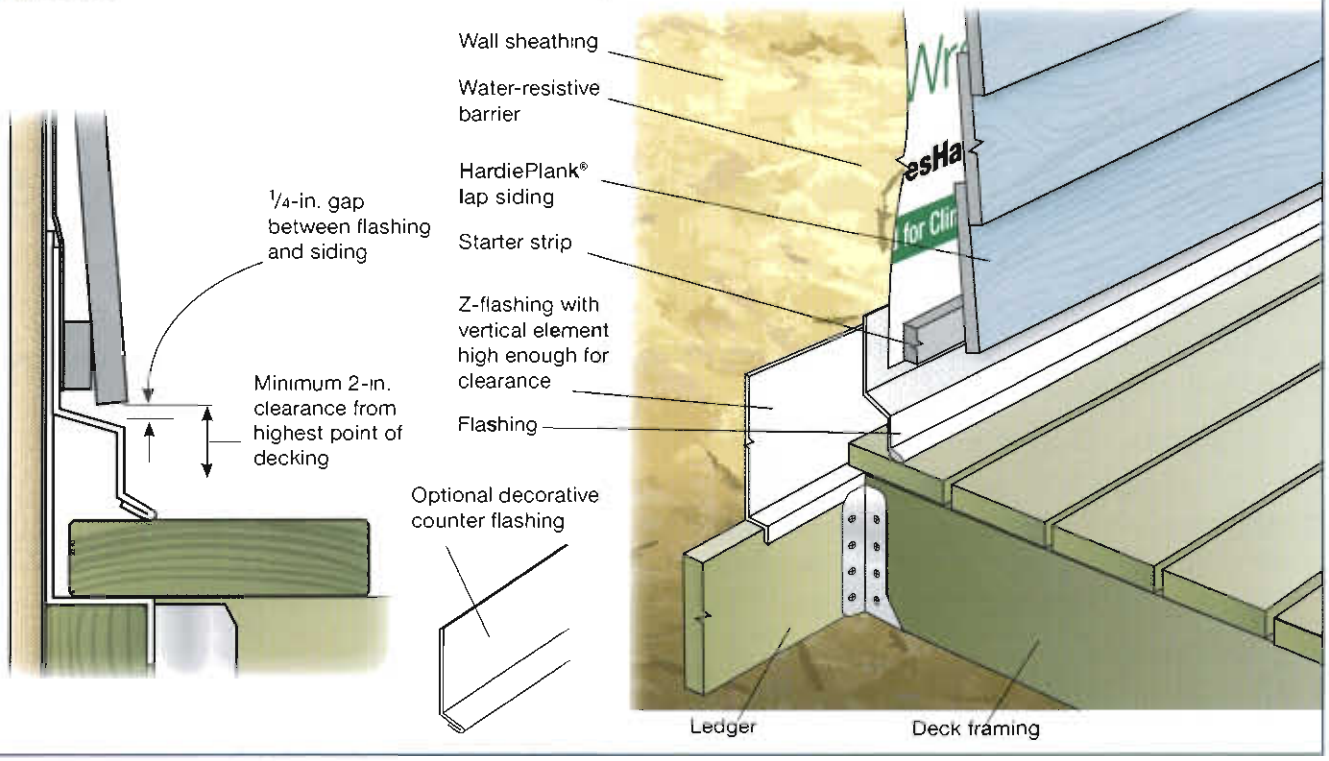
4.25 Wall to exterior slab intersection with decorative counter flashing



4.26 Wall to deck intersection without decorative counter flashing



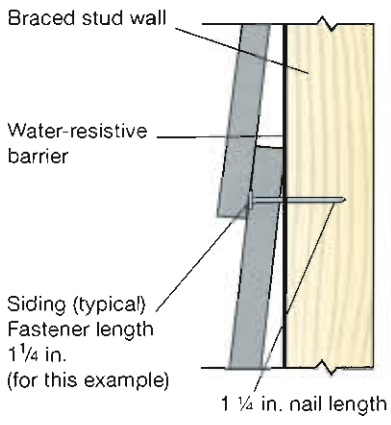
4.27 Wall to deck intersection with decorative counter flashing



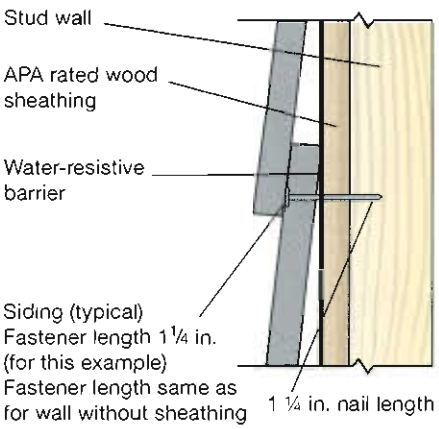
General Fastener Requirements

Each product section of the James Hardie Installation Guide contains fastener requirements for that specific product. In general if siding is to be installed over a non-structural sheathing such as foam, gypsum, or builder board, increase the length of the fastener by the thickness of the non-structural sheathing. For example, if a 1¼-in. fastener would normally be required for an application, but the siding is being installed over ½-in. foam sheathing, increase the fastener length by ½-in. to a 1¾ fastener length. For siding installation over a framed wall with structural sheathing such as plywood or OSB, the fastener length does not need to be increased.

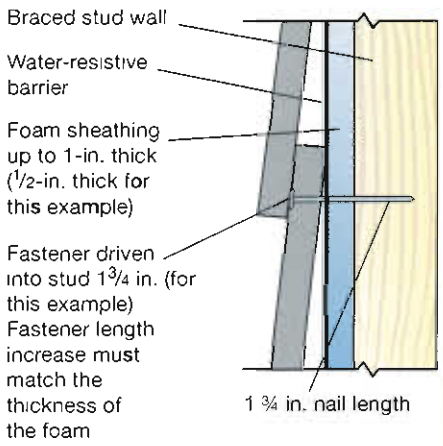
4.28 **Stud wall without sheathing**



4.29 **Stud wall with APA rated wood sheathing**



4.30 **Stud wall with foam sheathing**



When installing siding over foam sheathing, care must be taken not to overdrive the nails and compress the foam. The resulting unevenness in the wall could distort the siding and give the wall an unsightly wavy appearance.

PNEUMATIC FASTENING

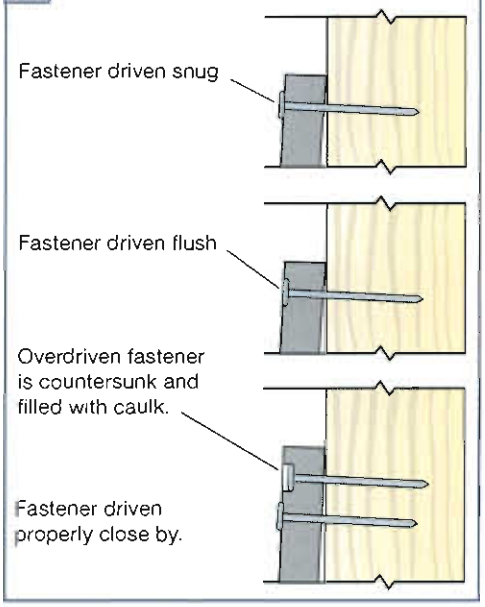
James Hardie® siding and trim products can be hand-nailed or fastened pneumatically. However, fastening with a pneumatic nailer is recommended for speed and consistency. Nails should be driven snug or flush with the surface of the siding.

For pneumatic nailing, set the air pressure so that the nails are driven to the proper depth. A flush mount attachment on the head of the nailer is recommended. If setting the nail depth proves difficult, choose a setting that slightly under-drives the nails. Then drive any under-driven nails snug to the surface with a smooth-faced hammer.

If nails are driven too deep, countersink them with a nail set, fill the space above the nail head with caulk, and drive another nail near by to the proper depth. Never use staples to attach James Hardie products.

***TIP:** Stainless steel fasteners are recommended when installing James Hardie products.*

4.31



Finishing

FINISHING JAMES HARDIE® SIDING AND TRIM PRODUCTS

For best results when painting factory-primed James Hardie® siding and trim products, use high-quality exterior-grade acrylic topcoats. For best results with unprimed James Hardie siding and trim products, prime first with exterior-grade acrylic primer, and then finish with high-quality exterior-grade acrylic topcoats. Two finish coats of paint are recommended.

Use primers and topcoats that are designed and recommended for cement-based building materials such as fiber-cement, masonry, brick or stucco.

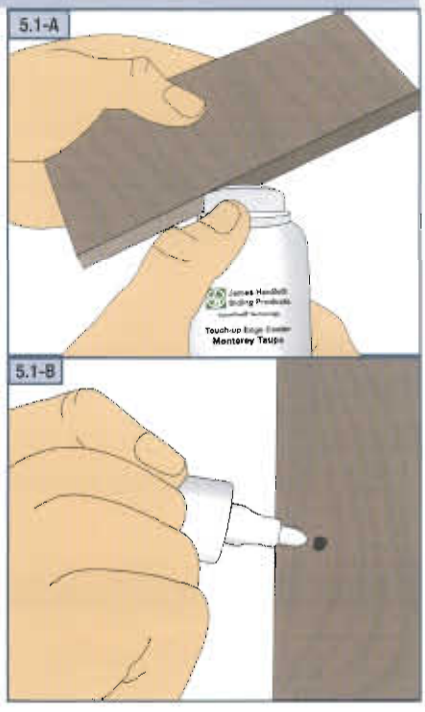
- Finish factory primed James Hardie siding and trim products within 180 days of installation. Finish unprimed James Hardie siding products within 90 days of installation.
- The use of oil-based paints on unprimed fiber cement could result in increased surface roughness, loss of adhesion, cracking or excessive chalking.
- Do not use stain on James Hardie products.
- Never apply paint to saturated product.

COLORPLUS® TOUCH-UP

Nicks, scrapes and nail holes may occur during the installation of James Hardie siding and trim products with ColorPlus® Technology. Touch-up pens and edge coaters with matching colors are available at ColorPlus product dealers.

Touch-up pens should be used sparingly. If any area larger than a dime requires touch-up, replace the damaged siding with a new section of ColorPlus plank or panel.

Edge coating is required for any cuts made in ColorPlus products. Edge coating seals the cut edges of the board as well as making joints and seams in the boards less visible. ColorPlus edge finishes can be applied with the James Hardie Edge Coater.



***Note:** Edge Coaters or Touch-up Pens should not be used to touch-up any area that is larger than a dime.*

Do not allow ColorPlus touch-up paint to freeze. Apply touch-up paint when temperature of the air and the siding products is above 50°F (10°C).

Finishing (continued)

COLORPLUS® PRODUCTS WITH PROTECTIVE LAMINATE SHEET

When installing 5/4, 4/4 HardieTrim® boards with ColorPlus® Technology, leave the protective laminate sheet on the board during cutting and installation. To install 5/4, 4/4 HardieTrim boards with ColorPlus® Technology, first fasten the trim using a finish nailer with the nails driven through the laminate sheet. Using a touch-up pen that matches the color of the trim, cover up the nail heads through the laminate sheet at the point of entry. After the nailing and touch-up are complete, remove the protective laminate sheet.

When installing other products such as HardiePlank® Lap Siding and HardiePanel® Vertical Siding with ColorPlus® Technology, leave the protective laminate sheet on the board during cutting and installation. Once the product is installed the laminate sheet should be removed.

CAULK

James Hardie recommends the use of caulks and sealants that remain permanently flexible. Look for the words "permanently flexible" written clearly on the label or in the accompanying literature.

For best results, use an Elastomeric Joint Sealant complying with ASTM C920 Grade NS, Class 25 or higher, or a Latex Joint Sealant complying with ASTM C834. Caulking/sealant must be applied in accordance with the caulking/sealant manufacturer's written instructions or ASTM C1193.

James Hardie does not warrant and does not accept liability for the appearance or the performance of field-applied caulks and sealants.

REPAIR PATCHING

Dents, chips, cracks and other minor surface damage in James Hardie primed siding and trim products can be filled with cementitious patching compound except on ColorPlus.

BACK PRIMING/BACK SEALING

James Hardie does not require any of its siding products to be back sealed or back primed prior to installation in the field.

MAINTENANCE

The extent and nature of maintenance will depend on the geographical location and exposure of the building. As a guide, it is recommended that normal maintenance tasks shall include but not be limited to:

- Washing down the exterior surfaces every 6 to 12 months with a garden hose or low pressure water spray to dirt and debris.*
- Re-applying of exterior finishes.*
- Maintaining the exterior envelope and connections including joints, penetrations, flashings, and sealants (caulking) that may provide a means of moisture entry beyond the exterior cladding.
- Cleaning out gutters, blocked pipes, and overflows as required.
- Pruning back vegetation that is touching the building. Clearance between the siding and shrubs is recommended.
- Ensuring required external ground clearances and drainage slopes are maintained.

High pressure water blasts (e.g. pressure washers) and sand blasting will damage the surface of fiber-cement. James Hardie does not recommend these methods of cleaning. Low pressure water spray, or a medium bristle (nonmetal) brush are more suitable for cleaning fiber cement products.

*Refer to your paint manufacturer for washing and recoating requirements related to paint performance. James Hardie Products with ColorPlus Technology can be cleaned using water and a soft brush or rag. For stubborn dirt or stains, a mild detergent and a soft brush may be used.

HardieWrap® Products Description

HARDIEWRAP® WEATHER BARRIER

HardieWrap® weather barrier is a non-woven, non-perforated polyolefin water-resistive barrier, as per AC38. HardieWrap weather barrier provides a balance of water resistance and breathability to protect homes from the elements of weather that can get behind the exterior cladding. HardieWrap® Flashing and HardieWrap® Seam Tape are recommended in conjunction with HardieWrap weather barrier to complete the HardieWrap weather barrier solution.

HARDIEWRAP® PRO-FLASHING AND FLEX FLASHING

HardieWrap® Pro-Flashing and HardieWrap® Flex Flashing are high-performance, self-adhering, self-sealing, butyl material on tear-resistant top sheets that are applied around windows and doors to manage water and air intrusion. HardieWrap® Pro-Flashing has a release liner for peel-and-stick installation and has no asphalt, VOCs or solvents.

HardieWrap® Flex Flashing is designed to easily stretch and seal around doors and windows, as well as custom shapes to protect against water intrusion, and is supplied in a convenient dispenser box.

Together with HardieWrap weather barrier and HardieWrap® Seam Tape, HardieWrap Pro-Flashing and HardieWrap Flex Flashing provide the James Hardie® weather barrier solution to manage water drainage, and prevent water damage and energy loss.

HardieWrap® Weather Barrier

HardieWrap® Pro-Flashing

HardieWrap® Flex Flashing

HardieWrap® Seam Tape

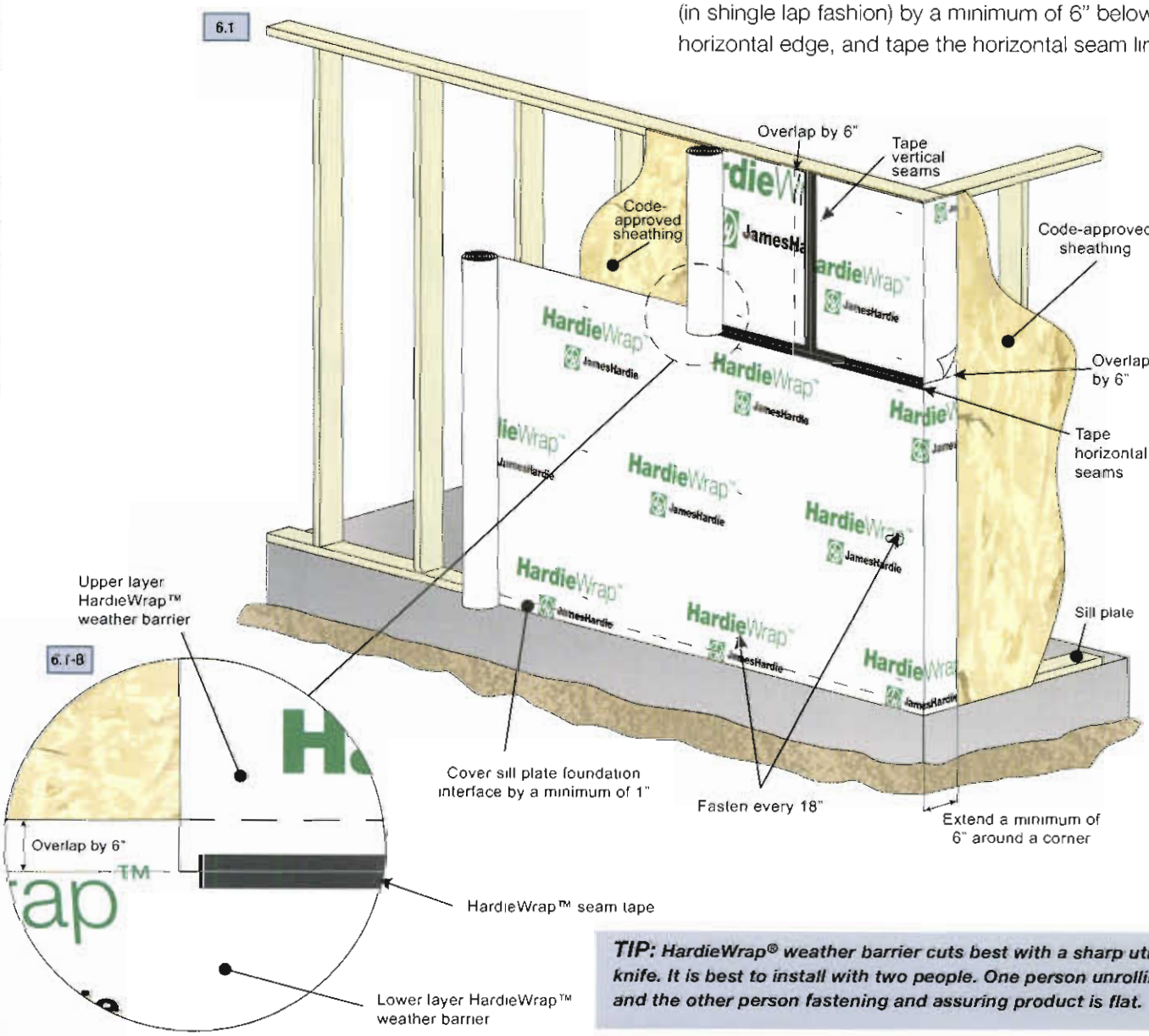
Installation of HardieWrap® Weather Barrier

INSTALLATION OF HARDIE WRAPS

HardieWrap® weather barrier should be installed before window and door installation. Do not install on saturated sheathing. HardieWrap weather barrier can become slippery and should not be used in any application where it may be walked on.

1) Begin by affixing the weather barrier, at least 6" around a building corner (fig. 6.1). Unroll horizontally (with print side facing out) around the building, covering rough window and door openings.
2) Fasten to studs or nailable sheathing material with galvanized construction grade staples a maximum of 18" in the vertical and horizontal directions. (Tip: HardieWrap is fastened by staples or roofing nails only)
3) Attach weather barrier so that it is taut and flat. The vertical overlap must have a minimum of 6" and the vertical seam must be taped.
4) HardieWrap Seam Tape is strongly recommended, but do not clog or interfere with the use of weep holes or similar drainage details.
5) Ensure that the bottom edge of the weather barrier extends over the sill plate and foundation interface by at least 1". Overlap upper layers of weather barrier (in shingle lap fashion) by a minimum of 6" below the horizontal edge, and tape the horizontal seam line.

6.1



6.1-B

***TIP:** HardieWrap® weather barrier cuts best with a sharp utility knife. It is best to install with two people. One person unrolling, and the other person fastening and assuring product is flat.*

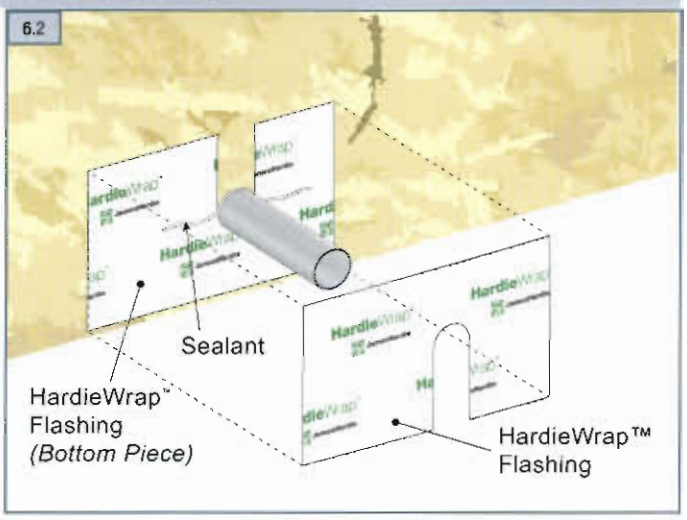
Installation of HardieWrap® Weather Barrier (continued)

HARDIEWRAP® FLASHING GUIDE FOR TYPICAL PENETRATION

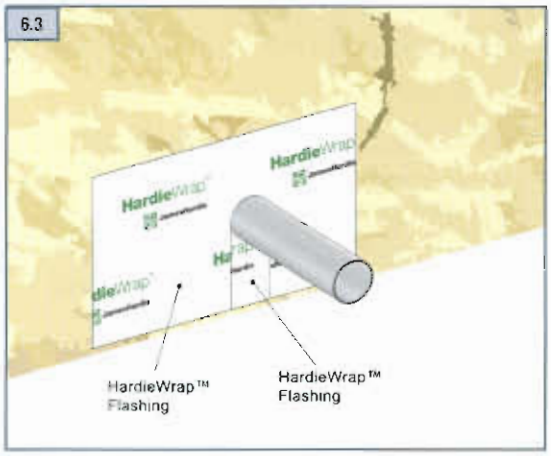
For rough electrical or plumbing penetrations, seal with flashing. Install the top piece over the bottom piece. HardieWrap® Pro-Flashing can be used for this application.

Make sure all penetrations are taped to shed water and prevent air infiltration.

6.2



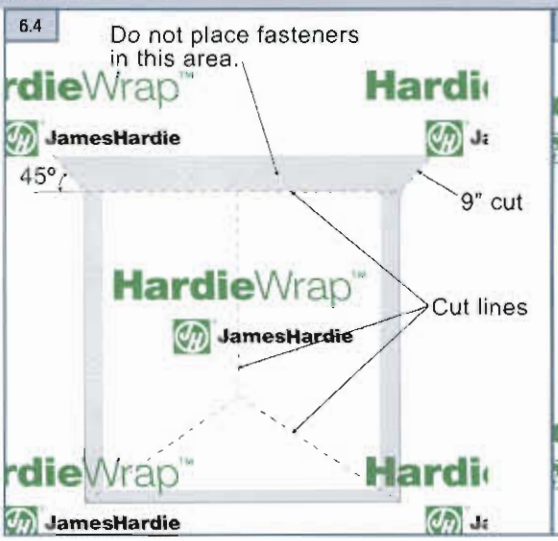
6.3



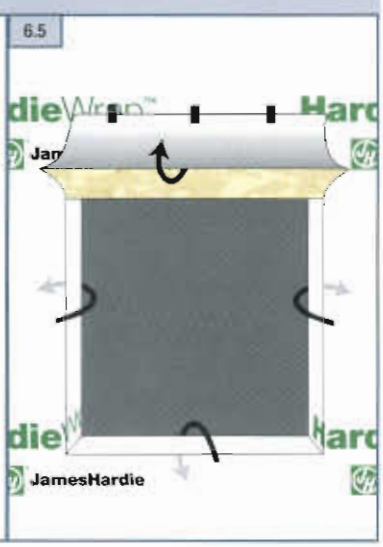
HARDIEWRAP® PRO-FLASHING GUIDE FOR WINDOWS

Use the inverted "Y" cut at rough window and door openings. Do not place fasteners within 9" of the rough opening, door or window heads. This area should not be fastened to allow for proper flashing installation. At the top corners of the rough opening, cut the weather barrier at 45° to extend 9" past the joint. Fold the top flap up and out of the way and fasten temporarily and fold the remaining three flaps in through the opening, fastening them inside with staples.

6.4



6.5



HardieWrap® Flex Flashing should be applied over the water-resistive barrier after it has been cut and set into and around the window rough opening. Refer to installation of HardieWrap® Pro-Flashing and Flex Flashing for flashing guidelines.

Installation of HardieWrap® Pro-Flashing & Flex Flashing

STORAGE

For optimal performance, store in original sealed packaging at temperatures of 5° - 32°C (41° - 90°F) while at moisture-free conditions. James Hardie requires that HardieWrap® Flashing and HardieWrap® Flex Flashing be covered within 180 days of installation.

IMPORTANT TO NOTE

This recommendation refers to the most commonly used types of windows (surface-mounted). For other types of frames, special attention should be paid to the window manufacturer's instructions.

Check your local building code for construction requirements and follow the manufacturer's recommended installation instructions; or utilize standard practices for the installation of exterior windows and doors as referenced in ASTM E2112-01 or AAMA 2400-2 (CAWM 400-95). Consult with the architect or specifier regarding the methods to be utilized.

GENERAL REQUIREMENT

The installation guidelines herein are informational in nature only and may not be appropriate for use in all applications. It is the sole responsibility of the architect or specifier to identify moisture-related risks associated with any particular building design, and to make any appropriate adjustments or modifications to the installation guidelines herein. Wall-construction design must effectively manage moisture, considering both the interior and exterior environment of the building, particularly in buildings that have a higher risk of wind-driven rain penetration and conditioned spaces. Wall openings, penetrations, junctions, connections, window sills, headers and jambs must incorporate appropriately installed HardieWrap® Pro-Flashing and HardieWrap® Flex Flashing, or other flashing or flashing details, as recommended by the manufacturer, architect or specifier.

HardieWrap® Pro-Flashing

HardieWrap® Flex Flashing

HardieWrap® Seam Tape

Installation of HardieWrap® Pro-Flashing & Flex Flashing (continued)

HARDIEWRAP® FLEX FLASHING STRETCHABLE SILL FLASHING

Prepare sill flashing by cutting HardieWrap® Flex Flashing at least 12" longer than the width of the rough opening. Install sill flashing by removing the release paper, centering sill flashing on sill framing stud and adhering into rough opening. The back edge of HardieWrap® Flex Flashing should extend to the inside edge of the sill framing stud and at least 6" up each jamb framing stud. (Note: Sill flashing should not wrap onto the inside of the wall.) DO NOT STRETCH MATERIAL ALONG THE SILL OF JAMB. HardieWrap® Flex Flashing should be applied over the water-resistive barrier after it has been cut and set into and around the window rough opening.

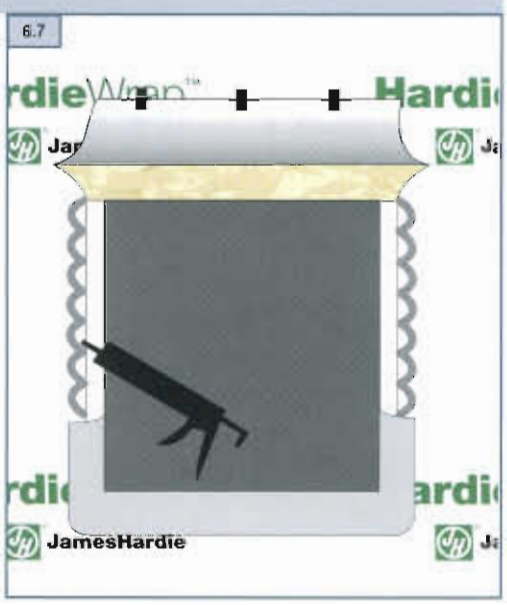
Note: If a water-resistive barrier is to be applied after the window and flashing have already been installed, be sure not to fasten the lower edge of the flashing so that the water-resistive barrier may be slipped underneath the flashing in weather-board or shingle-lap (top layer overlapping bottom layer) fashion.

WINDOW INSTALLATION

Before installing the window:

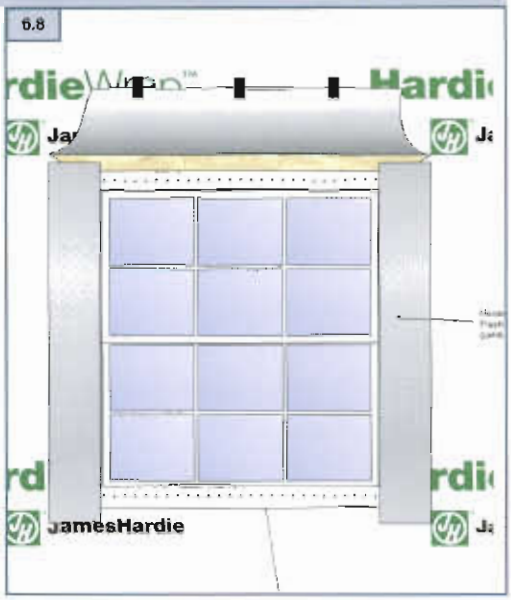
- Apply a continuous bead of sealant to the backside (interior) of the window's mounting flange on the outer edge; or
- Apply a continuous seal to the rough opening to ensure contact with the backside (interior) of the window's mounting flange (do not caulk along bottom).

Install window according to the manufacturer's installation procedures.



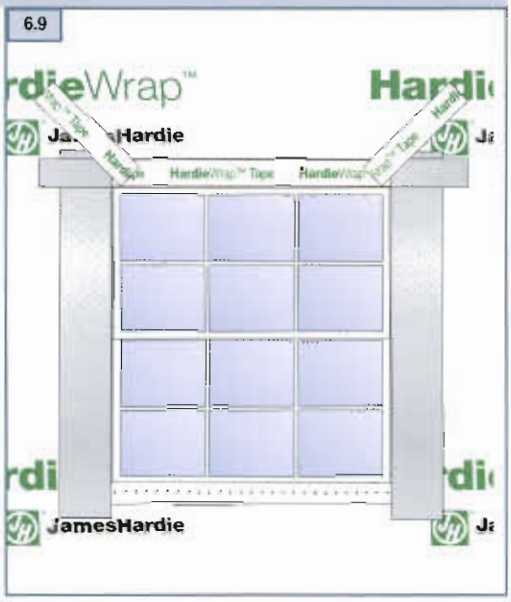
SIDE JAMB FLASHING

Apply HardieWrap® Flashing along the vertical sides of the opening. Flash over the side window mounting flanges. Extend the flashing by a minimum of 3" beyond the sill flashing (HardieWrap® Flex Flashing) already in place and extend the flashing to a minimum of 3" beyond the top of the opening, so that it projects beyond the head flashing that is to be applied later.



HEAD FLASHING

Affix HardieWrap® Flashing over the window's mounting flange along the header opening. Be sure to extend the flashing beyond each jamb flashing by 3". Secure flashing in place by applying pressure. Detach weather barrier flap (top) and apply over head flashing as shown. Tape all seams and joints.



Installation of HardieWrap® Pro-Flashing & Flex Flashing (continued)

CIRCULAR WINDOWS

Install circular top windows according to window manufacturer's installation guidelines, and then follow instructions as illustrated in figures 8–11 to complete the process.

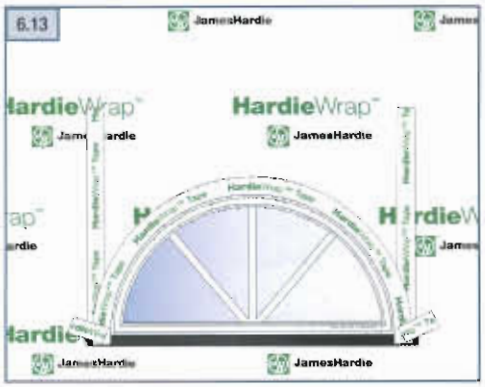
1) Measure the circular portion of the window and add 12" to this number. Cut HardieWrap® Flex Flashing to this length for the head flashing.

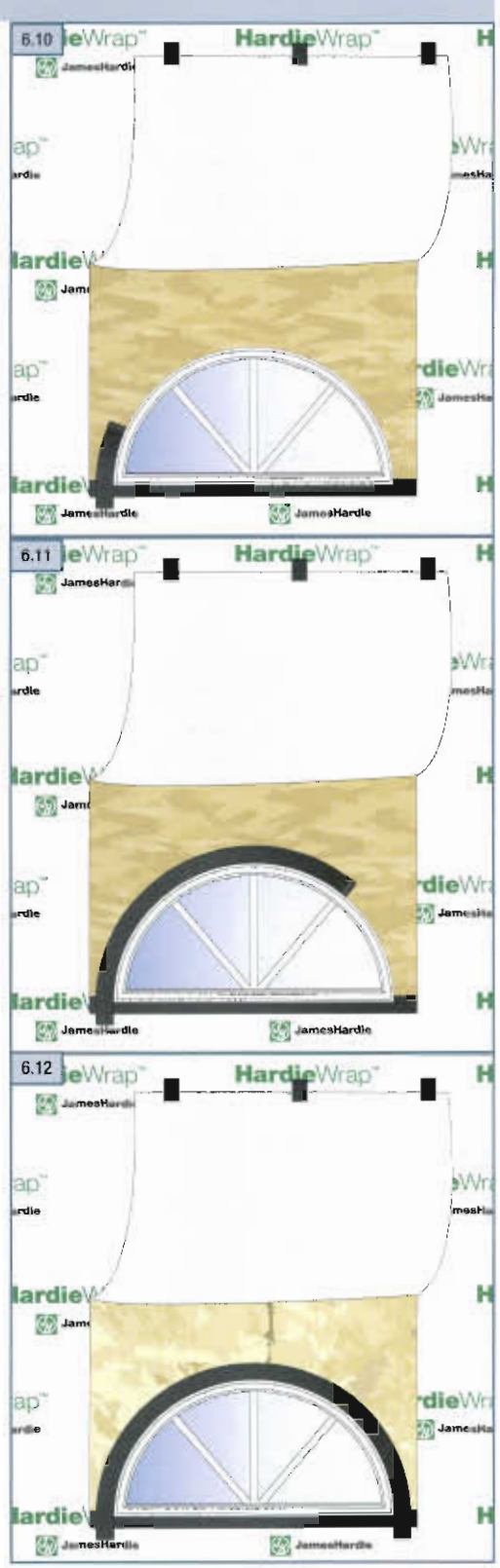
2) Remove approximately 20" of release paper and position HardieWrap® Flex Flashing tightly along the first edge of the round window. Press firmly into place (figs. 8 and 9).

3) Continue removing release paper and conform HardieWrap® Flex Flashing to entire circular portion of the window (fig. 10).

4) Use HardieWrap® Seam Tape or mechanical fasteners (i.e., nails, staples or screws) to temporarily hold top edge of head flashing to the wall.

5) HardieWrap® Flex Flashing adhesive bond will strengthen over time. Both ends of the head flashing should overlap the sill flashings by at least 6".





IMPORTANT TO NOTE

These recommendations refer to the most commonly used types of windows (surface-mounted). For other types of frames, special attention should be paid to the window manufacturer's instructions.

A spray adhesive, such as Nashua 357, is recommended when HardieWrap® Flex Flashing is applied directly to Oriented Strand Board (OSB) or other surfaces where additional adhesion is needed or required.

HardieWrap™

HardieWrap™ Weather Barrier and HardieWrap™ Pro Flashing

INSTALLATION REQUIREMENTS

JamesHardie

EFFECTIVE APRIL 2009

VISIT WWW.HARDIEWRAP.COM FOR THE MOST RECENT VERSION

IMPORTANT: FAILURE TO INSTALL THIS PRODUCT IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND WITH JAMES HARDIE WRITTEN APPLICATION INSTRUCTIONS MAY LEAD TO PERSONAL INJURY, AFFECT PERFORMANCE, VIOLATE LOCAL BUILDING CODES, AND VOID THE PRODUCT-ONLY WARRANTY.

HARDIEWRAP™ WEATHER BARRIER PRODUCT DESCRIPTION

HardieWrap™ weather barrier is a non-woven, non-perforated polyolefin water-resistive barrier, as per AC38, manufactured by James Hardie Building Products. HardieWrap weather barrier provides a balance of water resistance and breathability to protect homes from the elements of weather that can get behind the exterior wall cladding. HardieWrap™ Pro Flashing and HardieWrap™ Seam Tape are recommended in conjunction with HardieWrap weather barrier to complete the HardieWrap weather barrier solution.*

A water-resistive barrier is required in accordance with local building code requirements. The water-resistive barrier must be installed with penetration and junction flashing, in strict accordance with local building code requirements.

STORAGE

HardieWrap weather barrier should be stored in a covered area. Do not store in direct sunlight and do not expose to building site chemicals.

GENERAL REQUIREMENT—DESIGN†

The installation guidelines herein are informational in nature only and may not be appropriate for use in all applications. It is the sole responsibility of the architect or specifier to identify moisture-related risks associated with any particular building design, and to make any appropriate adjustments or modifications to the installation guidelines herein. Wall-construction design must effectively manage moisture, considering both the interior and exterior environment of the building, particularly in buildings that have higher risks of wind-driven rain penetration and conditioned spaces. HardieWrap weather barrier may be installed on vertical wall applications only. James Hardie requires that HardieWrap weather barrier be covered within 180 days of installation. Wall openings, penetrations, junctions, connections, window sills, headers and jambs must incorporate appropriately installed HardieWrap Pro Flashing and HardieWrap Flex Flashing, or other flashing or flashing details, as recommended by the architect or specifier.

INSTALLATION OF HARDIEWRAP™ WEATHER BARRIER

HardieWrap weather barrier should be installed before window and door installation. It is not recommended to install HardieWrap weather barrier on saturated sheathing. HardieWrap weather barrier can become slippery and should not be used in any application where it may be walked on.

Begin by affixing weather barrier, extending at least 6" around a building corner (fig. 1). Unroll horizontally (with print side facing out) around the building, covering rough window and door openings. Fasten to studs or nailable sheathing material with galvanized construction-grade staples a maximum of 18" in the vertical and horizontal directions.

Attach weather barrier so that it is taut and flat. The vertical overlap must be a minimum of 6" and the vertical seam must be taped. HardieWrap Seam Tape is strongly recommended. Do not clog or interfere with the use of weep holes or similar drainage details.

Ensure that the bottom edge of the weather barrier extends over the sill plate and foundation interface by at least 1".

Overlap upper layers of weather barrier (in shingle lap fashion) by a minimum of 6" below the horizontal edge, and tape the horizontal seam line (fig. 1A).

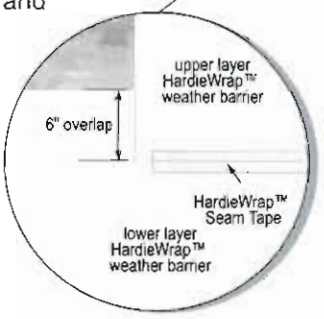


figure 1A

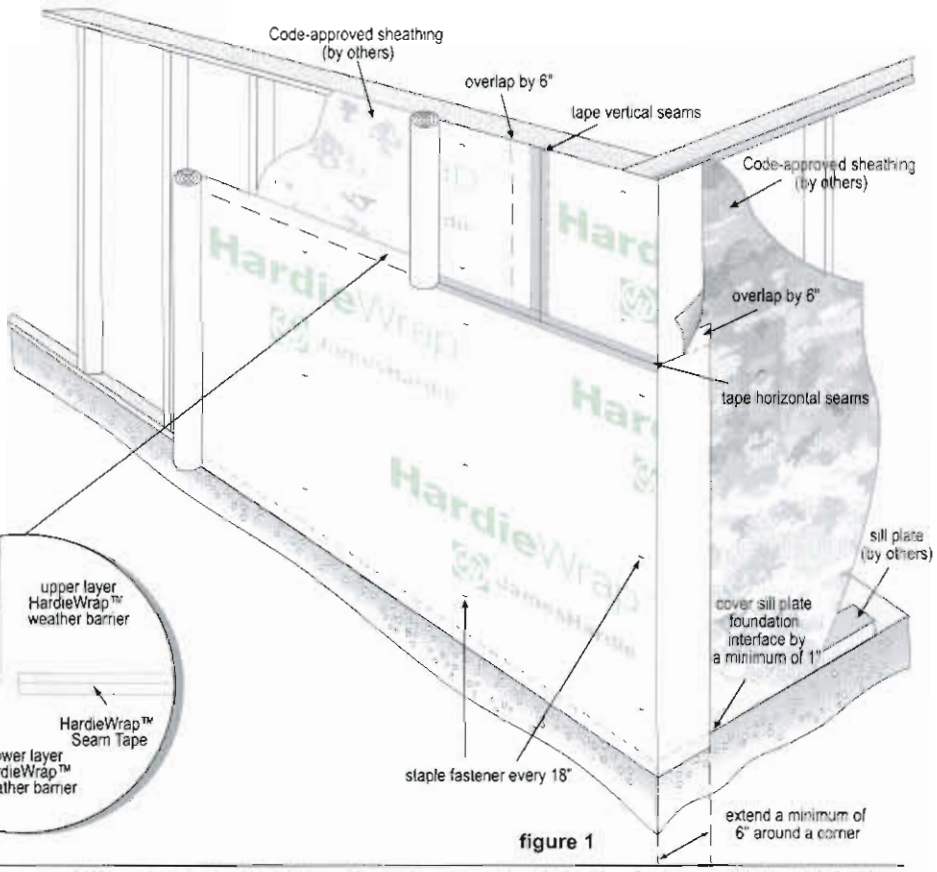


figure 1

*The HardieWrap weather barrier solution is based on methods of installation from the AAMA and ASTM E2112. HardieWrap weather barrier helps to reduce the intrusion of moisture or air, but is not designed nor guaranteed to prevent the intrusion of all moisture or air

†HardieWrap weather barrier is limited to buildings of Type V-B (IBC) construction [Type 5 (BNBC), Type VI (SBC), Type V (UBC)] and to construction under IRC.

INSTALLATION OF HARDIEWRAP™ WEATHER BARRIER (CONT.)

At roof-to-wall intersection (or wall-to-deck), affix wrap to the wall such that it overlaps any step flashing already on the wall by at least 2" (fig. 2).

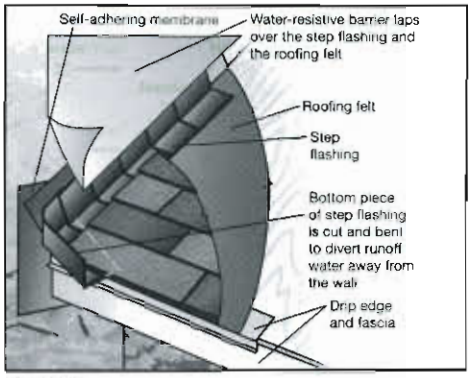


figure 2

PRO FLASHING INSTALLATION

Pro Flashing is typically utilized at windows, doors, junctions and penetrations, and must be installed in conjunction with HardieWrap™ weather barrier. Consult with the architect or specifier regarding the type and method of flashing to be utilized.

Check your local Building Code for construction requirements and follow the manufacturer's recommended installation instructions; or utilize standard practices for the installation of exterior windows and doors as referenced in ASTM E2112-01 or AAMA 2400-2 (CAWM 400-95). For specific flashing details and options, reference James Hardie's HardieWrap Pro Flashing Guide.

WINDOWS AND OTHER PENETRATIONS

TYPICAL WINDOW INSTALLATION METHODS

HardieWrap weather barrier is not designed nor guaranteed to prevent moisture or air from intruding behind the weather barrier. Ensure that appropriate flashing has previously been installed around all windows and door openings.

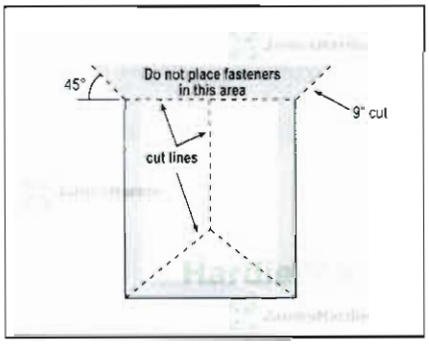


figure 3

Step 1: Use the inverted "Y" cut at rough window and door openings. Do not place fasteners within 9" of the rough opening, door or window heads. This area should not be fastened to allow for proper flashing installation. At the top corners of the rough opening, cut the weather barrier at 45° to extend 9" past the joint (fig. 3).

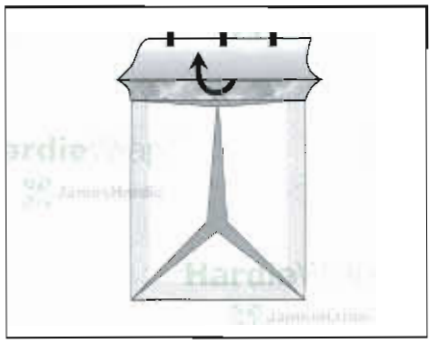


figure 4

Step 2: Fold the top flap up and out of the way and fasten temporarily (fig. 4).

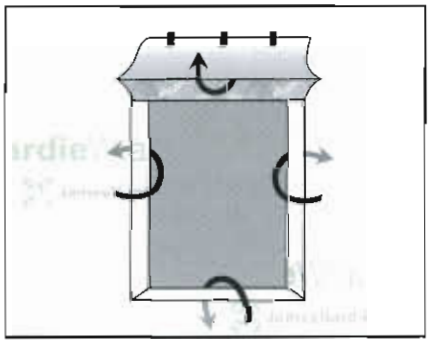


figure 5

Step 3: Fold the remaining three flaps in through the opening, fastening them inside with staples (fig. 5).

TYPICAL PENETRATION FLASHING METHODS

For rough electrical or plumbing penetrations, seal with flashing. Install the top piece over the bottom piece (figs. 7 and 8). HardieWrap Pro Flashing can be used for this application.

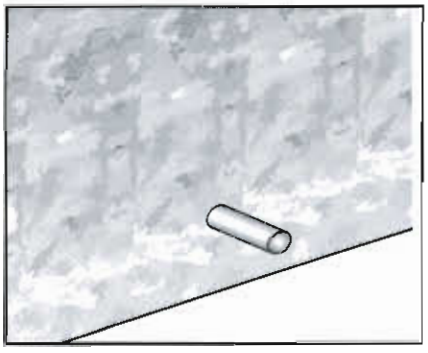


figure 6

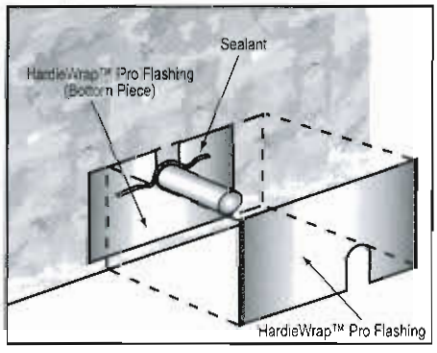


figure 7

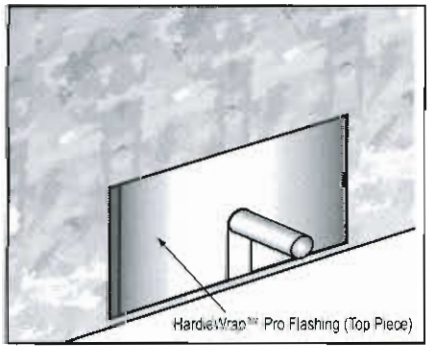


figure 8

The penetration detailed in figures 7 and 8 as found in the EEBA Water Management Guide.

FASTENERS

Staples are the preferred and recommended fastening method. Fasten HardieWrap™ weather barrier in such a way that ensures the wrap is secured to the wall with staples a maximum of 18" O.C. (on center) in the vertical and horizontal direction. Staples should be construction-grade and must be galvanized.

When installing over insulation boards, use galvanized roofing nails long enough to penetrate insulation and framing studs or sheathing.

Consult with the architect or specifier regarding the need to seal any punctures caused by staples, nails or other items.

REPAIRS

For minor punctures or tears less than 3", cover and completely seal with HardieWrap Seam Tape (fig. 9). For larger holes greater than 3", use slit-flashing technique. Slit-flashing requires making a horizontal slit above the damaged area and placing a cut piece of HardieWrap weather barrier into the slit, covering the damaged area. Tape the perimeter of the patched area (fig. 10).

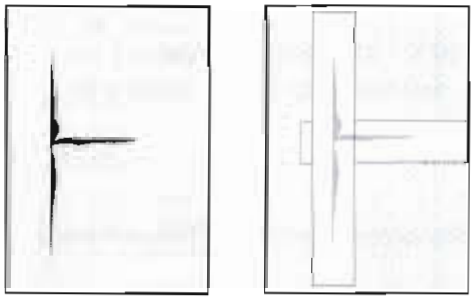


figure 9

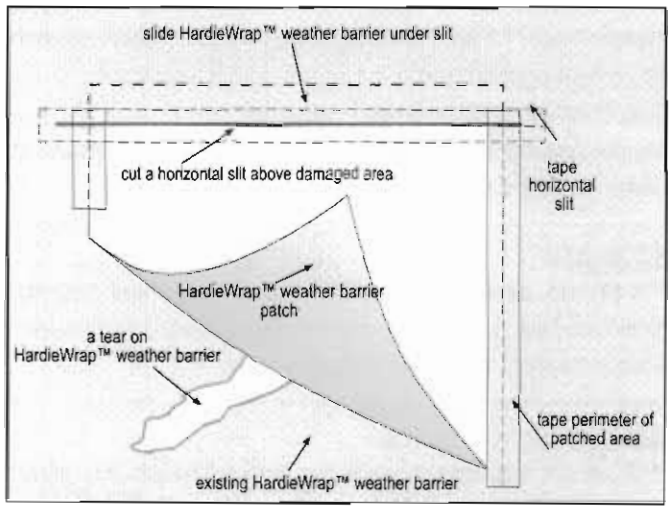


figure 10

GENERAL REQUIREMENT CHECKLIST

- ☑ Do not store HardieWrap weather barrier in direct sunlight.
- ☑ It is recommended that weather barrier be installed over dry framing and sheathing.
- ☑ Tape all vertical and horizontal seams.
- ☑ Overlap subsequent weather barrier layers in shingle lap fashion with seams overlapping by at least 6".
- ☑ Be sure that all penetrations are addressed.
- ☑ Fasten with construction-grade galvanized staples a maximum of 18" in the vertical and horizontal directions.
- ☑ Repair punctures or tears, by the recommended practices.
- ☑ Do not use HardieWrap weather barrier in applications where it may be walked on.
- ☑ James Hardie requires that HardieWrap weather barrier be covered within 180 days of installation.

For further information, consult James Hardie at 1-866-4HARDIE or www.hardiewrap.com.

HARDIEWRAP™ PRO FLASHING GUIDE

HARDIEWRAP™ PRO FLASHING PRODUCT DESCRIPTION

HardieWrap™ Pro Flashing and HardieWrap™ Flex Flashing are high-performance, self-adhering, self-sealing, butylmaterial on tear-resistant top sheets that are applied around windows and doors to manage water and air intrusion. HardieWrap™ Pro Flashing has a release liner for peel-and-stick installation and has no asphalt, VOCs or solvents. HardieWrap™ Flex Flashing is designed to easily stretch and seal around doors and windows, as well as custom shapes to protect against water intrusion, and is supplied in a convenient dispenser box.
Together with HardieWrap™ weather barrier and HardieWrap™ Seam Tape, HardieWrap™ Pro Flashing and HardieWrap™ Flex Flashing provide the James Hardie™ weather barrier solution to manage water drainage, and prevent water damage and energy loss.

STORAGE

For optimal performance, store in original sealed packaging at temperatures of 5° - 32°C (41° - 90°F) while at moisture-free conditions. James Hardie requires that HardieWrap™ Pro Flashing and HardieWrap™ Flex Flashing be covered within 180 days of installation.

IMPORTANT TO NOTE

This recommendation refers to the most commonly used types of windows (surface-mounted). For other types of frames, special attention should be paid to the window manufacturer's instructions.

Check your local building code for construction requirements and follow the manufacturer's recommended installation instructions; or utilize standard practices for the installation of exterior windows and doors as referenced in ASTM E2112-01 or AAMA 2400-2 (CAWM 400-95). Consult with the architect or specifier regarding the methods to be utilized.

GENERAL REQUIREMENT

The installation guidelines herein are informational in nature only and may not be appropriate for use in all applications.It is the sole responsibility of the architect or specifier to identify moisture-related risks associated with any particularbuilding design, and to make any appropriate adjustments or modifications to the installation guidelines herein. Wall-construction design must effectively manage moisture, considering both the interior and exterior environment of the building, particularly in buildings that have a higher risk of wind-driven rain penetration and conditioned spaces. Wall openings, penetrations, junctions, connections, window sills, headers and jambs must incorporate appropriately installed HardieWrap™ Pro Flashing and HardieWrap™ Flex Flashing, or other flashing or flashing details, as recommended by the manufacturer, architect or specifier.

HardieWrap™ Pro Flashing

HardieWrap™ Flex Flashing

HardieWrap™ Seam Tape

HARDIEWRAP™ FLEX FLASHING STRETCHABLE SILL FLASHING

Prepare sill flashing by cutting HardieWrap™ Flex Flashing at least 12" longer than the width of the rough opening. Install sill flashing by removing the release paper, centering sill flashing on sill framing stud and adhering into rough opening. The back edge of HardieWrap™ Flex Flashing should extend to the inside edge of sill framing stud and at least 6" up each jamb framing stud. (Note: Sill flashing should not wrap onto the inside of wall.) DO NOT STRETCH MATERIAL ALONG THE SILL OF JAMB. HardieWrap™ Flex Flashing should be applied over the water-resistive barrier after it has been cut and set into and around the window rough opening.

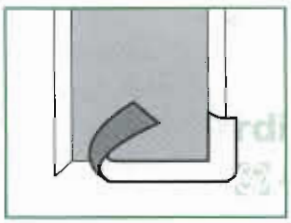


figure 1

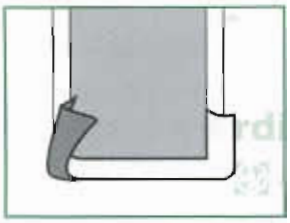


figure 2

Note: If a water-resistive barrier is to be applied after the window and flashing have already been installed, be sure not to fasten the lower edge of the flashing so that the water-resistive barrier may be slipped underneath the flashing in weather-board or shingle-lap (top layer overlapping bottom layer) fashion.

WINDOW INSTALLATION

Before installing the window, (a) apply a continuous bead of sealant to the backside (interior) of the window's mounting flange on the outer edge; or (b) apply a continuous seal to the rough opening to ensure contact with the backside (interior) of the window's mounting flange (do not caulk along bottom). Install window according to the manufacturer's installation procedures.

figure 3

figure 4

SIDE JAMB FLASHING

Apply HardieWrap™ Pro Flashing along the vertical sides of the opening. Flash over the side window mounting flanges. Extend the flashing by a minimum of 3" beyond the sill flashing (HardieWrap™ Flex Flashing) already in place and extend the flashing to a minimum of 3" beyond the top of the opening, so that it projects beyond the head flashing that is to be applied later.

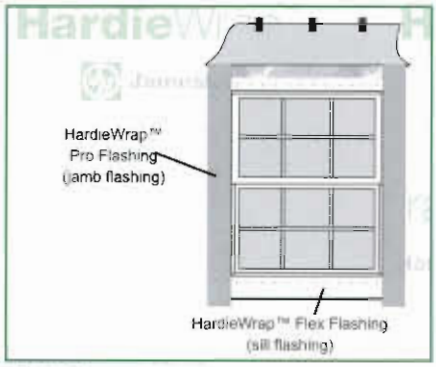


figure 5

HEAD FLASHING

Affix HardieWrap™ Pro Flashing over the window's mounting flange along the header opening. Be sure to extend the flashing beyond each jamb flashing by 3". Secure flashing in place by applying pressure. Detach weather barrier flap (top) and apply over head flashing as shown. Tape all seams and joints.

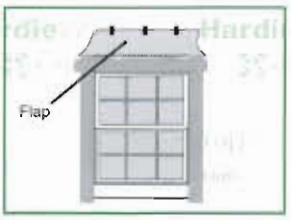


figure 6

figure 7

CIRCULAR WINDOWS

Follow previous instructions for proper installation prior tohead flashing installation. Install circular top windows according to window manufacturer's installation guidelines, and then follow instructions as illustrated in figures 8–11 to completethe process.

Measure the circular portion of the window and add 12" to this number. Cut HardieWrap™ Flex Flashing to this length for the head flashing. Remove approximately 20" of release paper and position HardieWrap™ Flex Flashing tightly along the first edge of round window. Press firmly into place (figs. 8 and 9). Continue removing release paper and conform HardieWrap™ Flex Flashing to entire circular portion of window (fig. 10). Use HardieWrap™ Seam Tape or mechanical fasteners (i.e., nails, staples or screws) to temporarily hold top edge of head flashing to wall. HardieWrap™ Flex Flashing adhesive bond will strengthen over time. Both ends of head flashing should overlap sill flashings by at least 6".

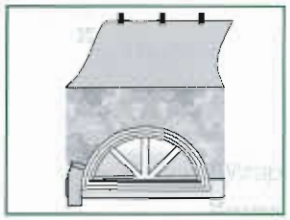


figure 8

figure 9

figure 10

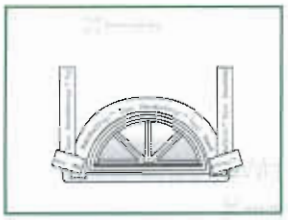


figure 11

IMPORTANT TO NOTE

This recommendation refers to the most commonly used types of windows (surface-mounted). For other types of frames, special attention should be paid to window manufacturer's instructions.

A spray adhesive, such as Nashua 357, is recommended when HardieWrap™ Flex Flashing is applied directly to Oriented Strand Board (OSB) or other surfaces where additional adhesion is needed or required.

For further information, consult James Hardie at 1-866-4HARDIE or www.hardiewrap.com.

HardieTrim® Boards Products Description

HardieTrim® boards come finished with either the PrimePlus® factory primer and sealer or with ColorPlus® Technology. The ColorPlus® coating is a factory-applied, oven-baked finish available on a variety of James Hardie® siding and trim products. See your local dealer for details and availability of products, colors, and accessories.

HARDIETRIM® 5/4, 4/4 BOARDS

HardieTrim® 5/4, 4/4 board is a decorative non-load bearing trim product. HardieTrim 5/4 board is 1-in. thick, HardieTrim 4/4 board is 3/4 in. thick, and both can be purchased in 10-ft. and 12-ft. lengths, based on local availability. In addition to frieze, rake, window, door, and corner details, HardieTrim 5/4, 4/4 boards may be used to construct light blocks, column wraps and decorative scroll work. Available in commonly-used nominal widths from 4 in. to 12 in.

HARDIETRIM® BATTEN BOARDS

HardieTrim® Batten Boards are a decorative non-load bearing trim product. HardieTrim® Batten Boards are ¾" thick, 2½" wide, and come on 12' lengths. See your local dealer for details and availability of product colors and accessories.

HardieTrim 5/4, 4/4 board - Smooth

HardieTrim Batten board - Rustic and Smooth (not shown)

HardiePanel vertical siding with HardieTrim Batten board for the Board & Batten look.

A Complete James Hardie Exterior – Close-up on trim products.

***ColorPlus** TIP: HardieTrim 5/4, 4/4 boards with ColorPlus Technology is shipped with a protective laminate slip sheet. James Hardie recommends keeping the protective sheet in place during cutting and fastening to reduce damage to the boards. Remove the protective sheet only after installing the boards and filling the nail holes with a colored touch-up pen.*

Installation of HardieTrim® 5/4, 4/4 boards

OUTSIDE CORNERS

Corners made from HardieTrim® 5/4, 4/4 boards can be pre-assembled before they're installed. Pre-assembled corners look better and generally make the installation go more quickly. To join two pieces of HardieTrim 5/4, 4/4 boards for a corner, drive 2-in. 16 ga. corrosion-resistant finish nails ½ in. from the edge and spaced 16-in. apart along the edge.

To fasten 4-in. corners to the wall, drive a pair of finish nails or siding nails, (one nail into each face of the corner) with the nails spaced 16 in. apart. For 6-in. corners, drive a pair of finish nails or siding nails into each face spaced 16 in. apart. Nails should be kept ¾ in. from the edges of the board and 1-in. from the ends.

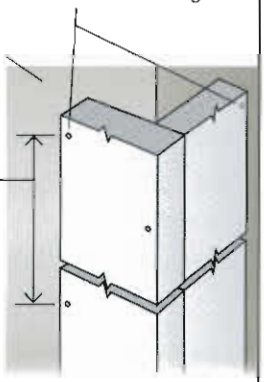
When walls are more than 10 ft. high, splice corner boards together using weather cuts of at least a 22.5° angle. The angle of the weather cut must slope downward and away from the building. Then nail both boards to the building with the same attachment schedule as for pre-assembled corners, except that 4-in. HardieTrim 5/4, 4/4 boards that should get two nails per side every 16 in.

Use only 2-in. 16-ga. finish nails to pre-assemble HardieTrim 5/4, 4/4 board corners.

7.1

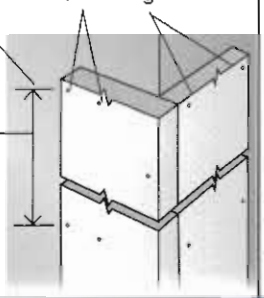
Pre-built corner installation 4-in boards

A pair of nails (one in each face) attach the corner to the building.



Pre-built corner installation 6-in boards

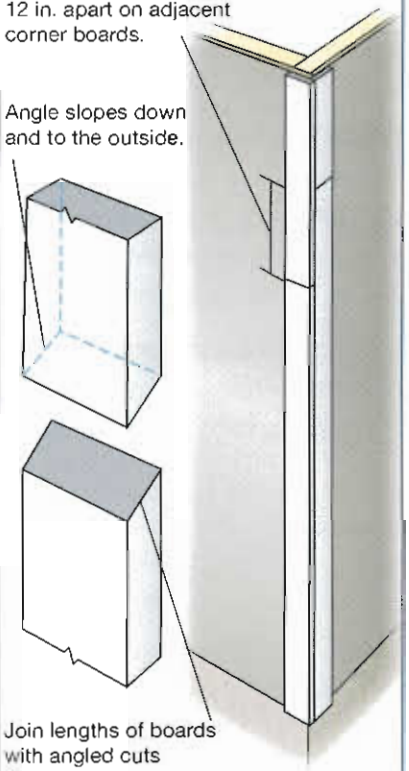
Two nails in each face attach the corner to the building.



7.2

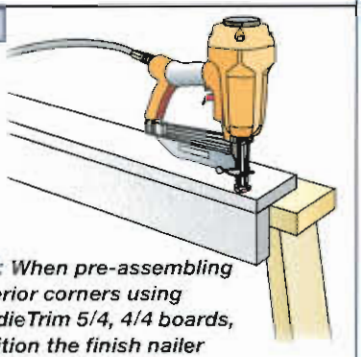
Weather cuts

Keep weather cuts at least 12 in. apart on adjacent corner boards.



NOTE: All weather cut joints should be touched up prior to installation.

7.3

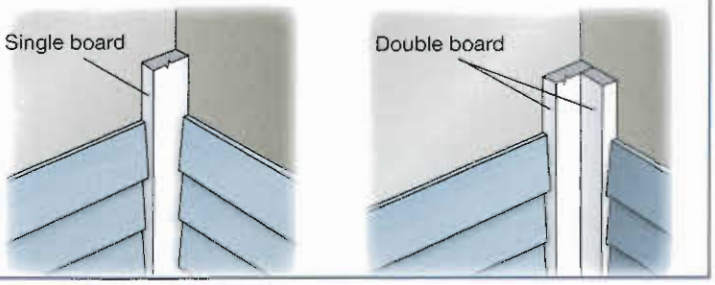


TIP: When pre-assembling exterior corners using HardieTrim 5/4, 4/4 boards, position the finish nailer parallel with the trim

INSIDE CORNERS

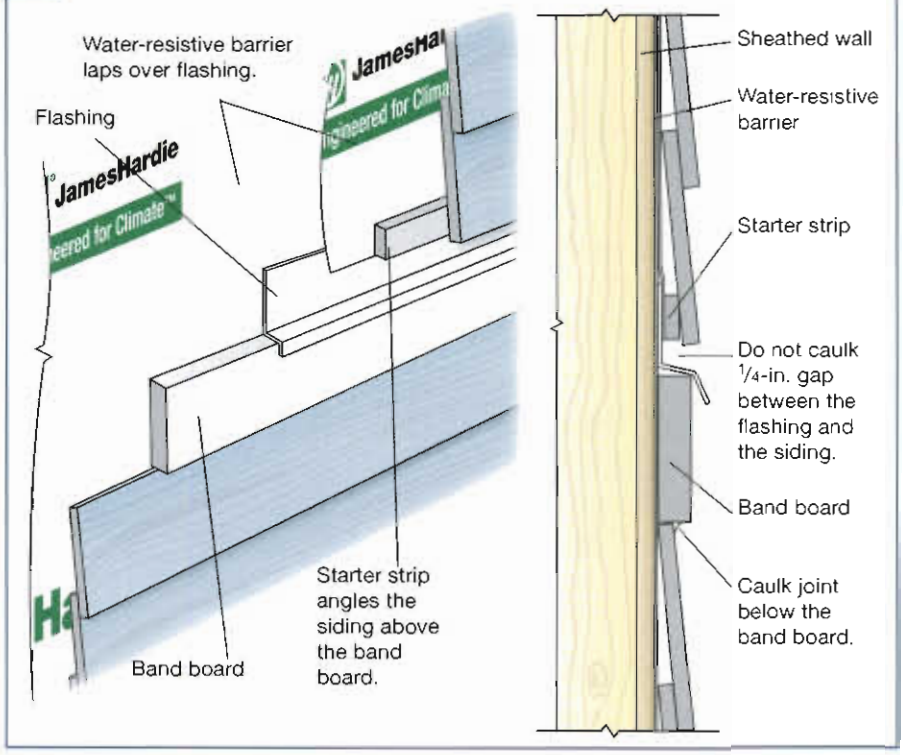
Inside corners can be made with either a single HardieTrim 5/4, 4/4 board in the corner, or with one board on each wall depending on the desired look.

7.4



BAND BOARD

7.5



A Band board is a decorative horizontal trim used to break up the field of siding on a building. Any width of HardieTrim® 5/4, 4/4 boards can be used for band board depending on the type of detail desired. If installing a band board, pay special attention to flashing details and allow for potential shrinkage of solid rim joists in the walls that the band board may be attached to.

Caulk between the underside of the band board and the siding below. Do not caulk between the flashing and siding above the band board, and maintain a 1/4-in. gap between the two. Also make sure that the water-resistive barrier laps over the flashing for a continuous drainage plane. If running lap siding or shingle siding above the band board, a starter strip should be installed first to maintain the correct siding angle. Small Periodic gaps should be left in the starter strip to provide an escape route for excess moisture that may drain down behind the siding.

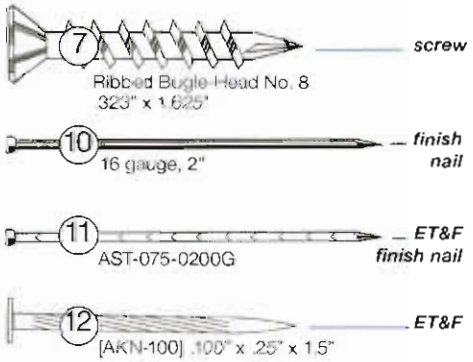
Use bevel-cut splice joints of at least 22.5° to join long lengths of HardieTrim 5/4, 4/4 boards. To attach band board to the building, drive two recommended fasteners every 16 in. for 4-in. and 6-in. boards. For 8-in. boards, use three fasteners every 16 in., and use four fasteners every 16 in. for 12-in. boards.

● *indicates recommended fasteners*

HARDIETRIM 5/4, 4/4 BOARDS FASTENER SPECIFICATIONS

Fastening Substrate	Approved Fastener
wood studs	● 10
over minimum 7/16" OSB	● 10
steel studs	○ 7 ○ 12 ● 11
Pre-built corners	● 10

Fastening Types



Nailing Patterns

Pre-built corners	4-in	1 nail every 16" to attach boards together
		1 nail every 16" for each board
	6-in	1 nail every 16" to attach boards together
		2 nails every 16" for each board
Site-built corners & other areas (eg. windows, etc.)	4-in & 6-in	2 nails every 16"
	8-in	3 nails every 16"
	12-in	4 nails every 16"

TIP: *James Hardie recommends using stainless steel finish nails when installing HardieTrim (Trim, Battens, Fascia, etc.) products.*

Installation of HardieTrim® 5/4, 4/4 boards (continued)

WINDOW AND DOOR TRIM

Windows and doors must be installed per the manufacturer's instructions. Window flanges or flashings must be properly installed and lapped correctly under the water-resistive barrier prior to the installation of HardieTrim® 5/4, 4/4 boards. Once the HardieTrim 5/4, 4/4 boards is put on, proper flashing must be installed above the trim and lapped under the water-resistive barrier correctly.

Install HardieTrim 5/4, 4/4 boards around doors and windows using the "cap over" method, which means that the header or horizontal top piece of the trim extends and caps over the vertical jamb pieces on both sides. For windows, the bottom trim piece or sill trim fits in between the jambs.

For cap-over trim installation:

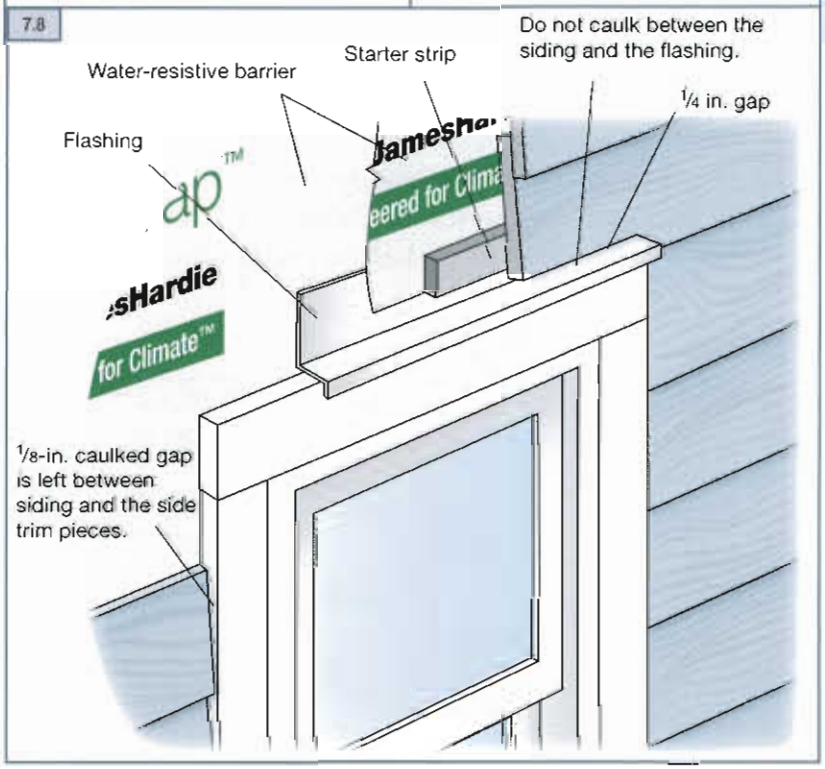
1) Start by measuring the length of the bottom edge of the window, not including the flange.
2) Cut a piece of trim to that length and install it.
3) Next measure from the bottom of the installed trim to the top of the window.
4) Cut two pieces of trim to that length and install them on either side of the window.
5) For the cap, measure the distance between the outside edges of the side trim pieces. Cut a piece of trim to length and install it.

For doors the process is the same except that it starts with the side pieces, step three.

7.6 Window and door trim

7.7

7.8



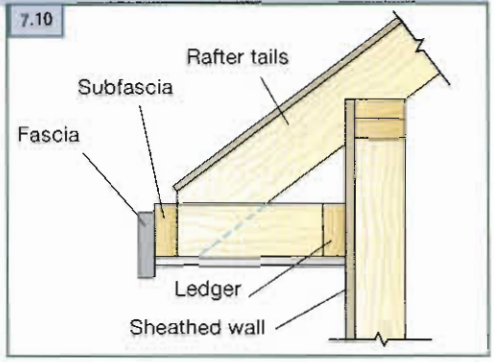
7.9

***TIP:** For trimming around windows and doors with attachment flanges, install a shim strip to build out the wall even with the flange. This strip lets the trim sit flat and parallel with the wall.*

INSTALLING RAKE AND FASCIA BOARD

For fascia and rake board applications, James Hardie requires that all HardieTrim® products be nailed over a wood or steel subfascia. James Hardie recommends that the fascia be no more than 2 in. larger than the subfascia, e.g. over a nominal 2x6 subfascia, install an 8-in. fascia board (7 1/4-in. actual) fascia. On longer fascia runs, join HardieTrim boards with weather/bevel cuts.

7.10

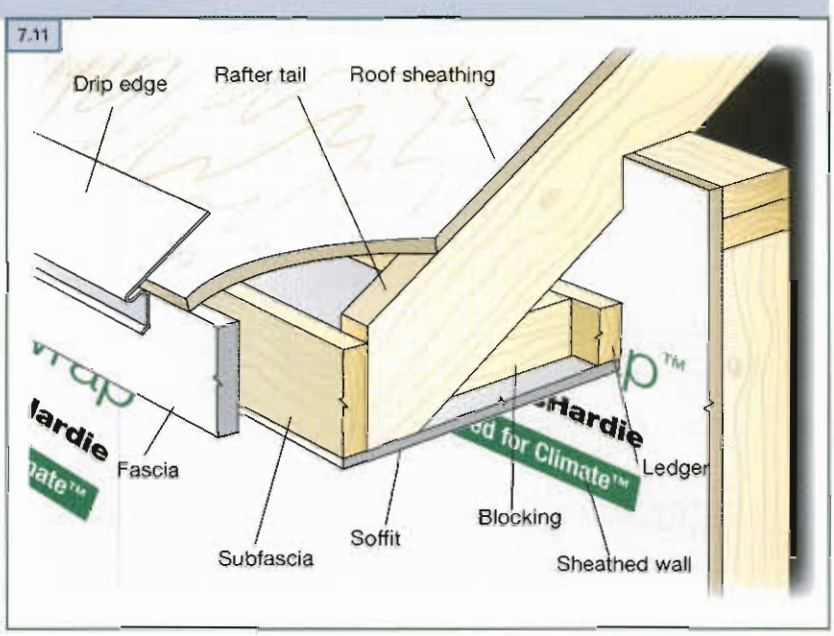


HardiePlank® boards should not be used in fascia or trim applications.

DRIP EDGE

After the fascia is installed, a vinyl, coated aluminum or galvanized drip-edge flashing must be installed to the roof sheathing overlapping the fascia board. The drip edge helps protect the top edge of the fascia board and it minimizes water ingress into the soffit and/or cornice cavity. Choose a drip edge design that effectively channels water away from the face of the fascia and into gutters if present.

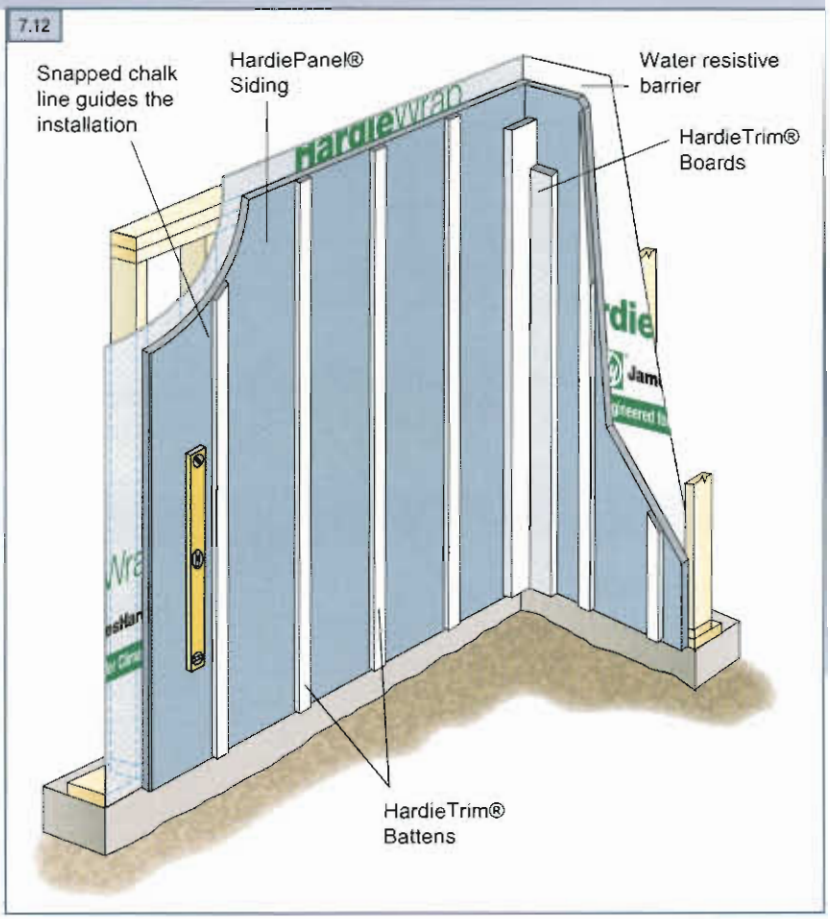
7.11



Installation of HardieTrim® Battens

GETTING STARTED

HardieTrim® Battens are intended to be used with HardiePanel® vertical siding to achieve a board and batten look. HardieTrim Battens must be attached to wood or steel backing using an approved fastener from the table below. When installing HardieTrim Battens, determine layout and mark where battens will be attached. To ensure that HardieTrim Battens are installed vertically and parallel to each other, either snap chalk lines or use a level. When attaching battens ensure that fasteners are a minimum of 3/4" from edges, 1" from ends, and a maximum of 16" o.c.



● *Indicates recommended fasteners. Required for ColorPlus® Products.*

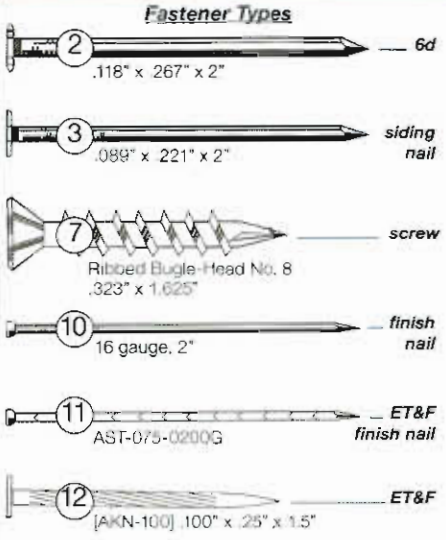
ColorPlus® TIP:

HardieTrim® Battens with ColorPlus® Technology are shipped with a protective laminate slip sheet. James Hardie recommends keeping the protective sheet in place during cutting and fastening to reduce damage to the boards. Remove the protective sheet only after installing the boards and filling the nail holes with a colored touch-up pen. Finish nails are required for ColorPlus products.

HARDIETRIM BATTENS FASTENER SPECIFICATIONS

Fastening Substrate	*Approved Fastener*
wood studs	② ③ ●
over minimum 7/16" OSB	③ ●
steel studs	⑦ ⑫ ●

Fastener Types

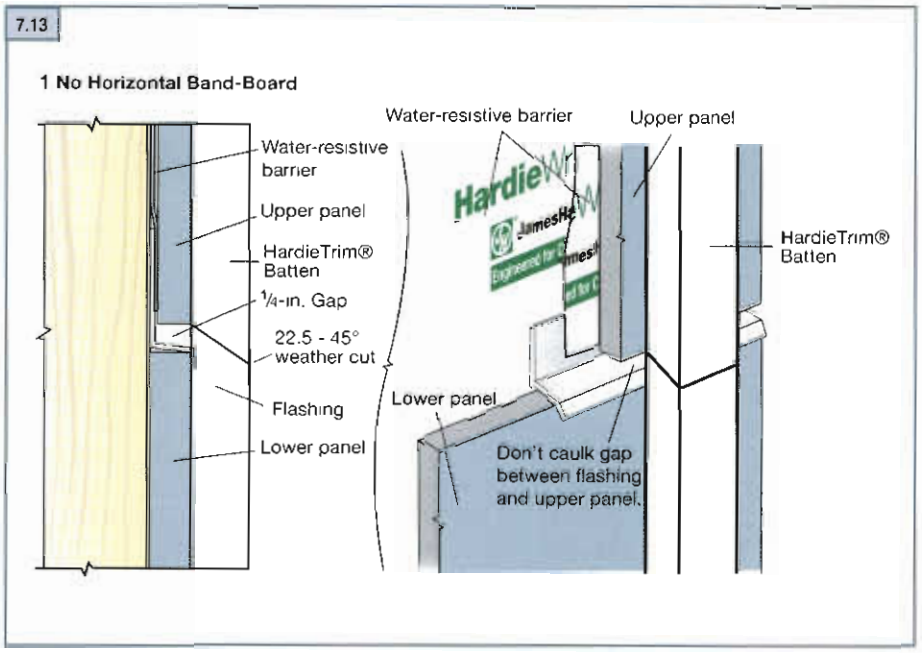


***TIP:** James Hardie recommends using stainless steel finish nails when installing HardieTrim (Trim, Battens, Fascia, etc.) products.*

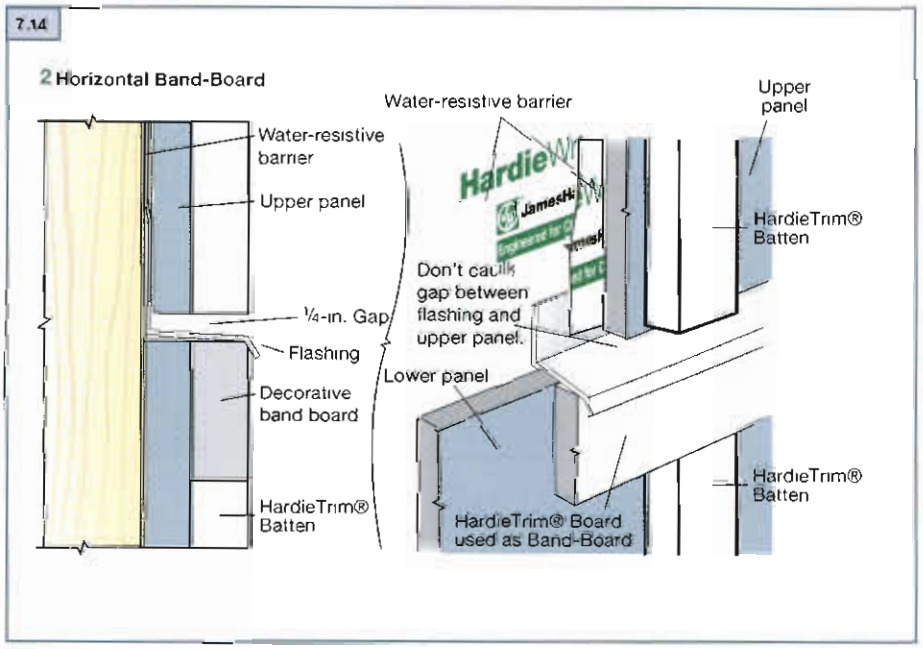
HORIZONTAL JOINT TREATMENT

Horizontal HardieTrim® Batten joints must occur at the same location as horizontal joints in HardiePanel® siding. Install horizontal HardieTrim Batten joints by using one of the following options:

1) If HardieTrim Battens are going to be installed over horizontal panel joints without the use of a horizontal band board, follow the procedure as illustrated in fig. 7.13. Start installing HardieTrim Battens by creating a weather-cut of at least a 22.5° angle, making a joint at the same location as the panel joint. Attach the bottom batten. Make sure the top batten has a matching weather-cut and then install top batten.



2) If HardieTrim Battens are to be installed over horizontal panel joints with the use of a horizontal band board, follow the procedure as illustrated in fig. 7.14. If HardieTrim Battens are to be installed horizontally, they must be installed in the same manner as in fig. 7.14. Make sure the horizontal Z-flashing is installed over both the lower panel and the horizontal band board. Attach the bottom batten tight to the bottom edge of the band board. Next, leaving a minimum 1/4" gap above the horizontal Z-flashing, install the top batten.



WARNING:
Do not bridge floors with HardieTrim Battens and/or HardiePanel Siding. A horizontal joint should always be created between floors.

4/4 & 5/4 HardieTrim® HZ5™ Boards

INSTALLATION REQUIREMENTS - PRIMED & COLORPLUS® PRODUCTS

JamesHardie

EFFECTIVE DECEMBER 2010

Visit www.jameshardie.com for the most recent version.

These instructions are to be used for HardieTrim® HZ5™ Boards **ONLY** and are **NOT VALID** in the following states: AK, WA, OR, CA, HI, NV, UT, ID, CO, WY, MT , AZ, NM.

IMPORTANT: FAILURE TO INSTALL AND FINISH THIS PRODUCT IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND JAMES HARDIE WRITTEN APPLICATION INSTRUCTIONS MAY LEAD TO PERSONAL INJURY, AFFECT SYSTEM PERFORMANCE, VIOLATE LOCAL BUILDING CODES, AND VOID THE PRODUCT ONLY WARRANTY. BEFORE INSTALLATION, CONFIRM THAT YOU ARE USING THE CORRECT HARDIEZONE INSTRUCTIONS. TO DETERMINE WHICH HARDIEZONE APPLIES TO YOUR LOCATION, VISIT WWW.HARDIEZONE.COM OR CALL 1-866-942-7343 (866 9HARDIE)

STORAGE & HANDLING:

Store flat and keep dry and covered prior to installation. Installing siding wet or saturated may result in shrinkage at butt joints. Carry boards on edge. Protect edges and corners from breakage. James Hardie is not responsible for damage caused by improper storage and handling of the product.

⚠ CUTTING INSTRUCTIONS

OUTDOORS

1. Position cutting station so that wind will blow dust away from user and others in working area.
2. Use one of the following methods:
   - a. Better: i. Dust reducing circular saw equipped with a HardieBlade™ saw blade and HEPA vacuum extraction
   - b. Good: i. Dust reducing circular saw with a HardieBlade saw blade (only use for low to moderate cutting)

INDOORS

- NEVER use a power saw indoors
- NEVER use a circular saw blade that does not carry the HardieBlade saw blade trademark
- NEVER dry sweep – Use wet suppression or HEPA Vacuum

Important Note: For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best"-level cutting methods where feasible.

NIOSH-approved respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.com to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

HardieTrim® board is a decorative non-load bearing trim product.

GENERAL REQUIREMENTS:

- Wood or steel backing must be provided for attaching HardieTrim boards.
- A water-resistive barrier is required in accordance with local building code requirements. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements. James Hardie will assume no responsibility for water infiltration. James Hardie does manufacture HardieWrap™ Weather Barrier, a non-woven non-perforated housewrap[1], which complies with building code requirements.
- Flashing is required over all horizontal protruding and exposed trim
- When installing James Hardie products all clearance details in figs 4,5,6,7,8,9, & 10 must be followed.
- Adjacent finished grade must slope away from the building in accordance with local building codes - typically a minimum of 6" in the first 10'.
- Do not install James Hardie products such that they may remain in contact with standing water.
- DO NOT use stain on James Hardie products.

INSTALLATION

Fastener Requirements

Use 2" minimum 16 ga finish nails to attach HardieTrim boards to wood frame construction. ET&F or equivalent fasteners or screws may be used to attach HardieTrim boards to steel frame construction.

Fastening instructions are similar for all applications. Position finish nails no closer than 1/2" from the edges of the trim. Fasteners must be no closer than 1" from ends of trim and spaced a maximum of 16" o.c. Ensure trim is adequately fastened.

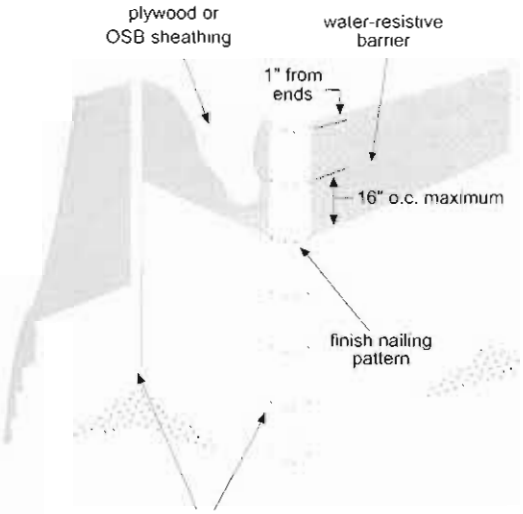
James Hardie recommends using stainless steel finish nails when installing HardieTrim (trim, battens, fascia, etc.) products.

HardieTrim boards with ColorPlus® Technology: A finish nail is required for installing HardieTrim boards. Remove laminate sheet as soon as possible after nailing. Nail head touch up can be done before or after removal of the laminate sheet when using finish nails. The preferred method is to touch-up while the laminate sheet is in place. Remove the laminate sheet before paint dries.

Minimum fastener guide for finish nailing:

	Pre-built corner	Site Built Corners	Other areas (e.g. window trim, band boards and fascia)
4"	1 nail every 16" to attach boards together + 1 nail every 16" each board	2 nails every 16"	2 nails every 16"
6"	1 nail every 16" to attach boards together + 2 nails every 16" each board		
8"	-	3 nails every 16"	3 nails every 16"
12"	-	4 nails every 16"	3 nails every 16"

Figure 1



Leave a minimum 1/8" gap between the siding and trim, then caulk.

[1]For additional information on HardieWrap™ Weather Barrier, consult James Hardie at 1-866-4Hardie or www.hardiewrap.com

WARNING: AVOID BREATHING SILICA DUST

James Hardie® products contain respirable crystalline silica, which is known to the State of California to cause cancer and is considered by IARC and NIOSH to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) use fiber cement shears for cutting or, where not feasible, use a HardieBlade™ saw blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area; (4) wear a properly-fitted, NIOSH-approved dust mask or respirator (e.g. N-95) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods - never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheet available at www.jameshardie.com or by calling 1-800-9HARDIE (1-800-942-7343). FAILURE TO ADHERE TO OUR WARNINGS, MSDS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

TRIMMING CORNERS

When installing corners or other vertical trim, position boards on the wall and attach (fig. 2). Use weather cuts sloped away from the wall to join (fig 4). Alternatively corners can be pre-built (fig. 3).

Pre-Built Corners (not allowed for 7/16)

Corners can be pre-built off the wall using 2" finishing nails. Each side of the pre-built corner must be secured to the wall (fig. 3).

Figure 2

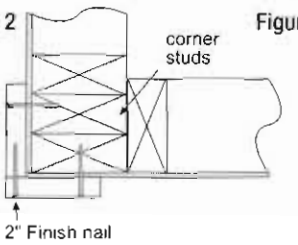


Figure 3

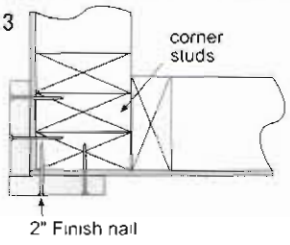
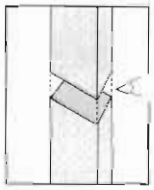


Figure 4



CLEARANCES

Install siding and trim products in compliance with local building code requirements for clearance between the bottom edge of the siding and the adjacent finished grade.

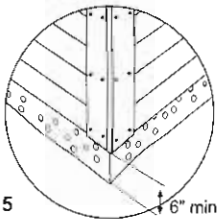
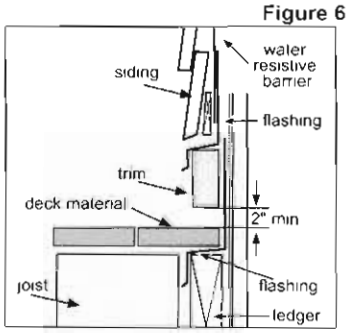


Figure 5

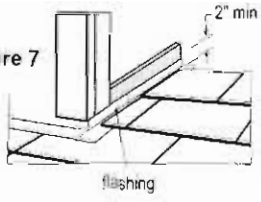
Maintain a minimum 2" clearance between James Hardie® trim products and decks, paths, steps and driveways.

Figure 6



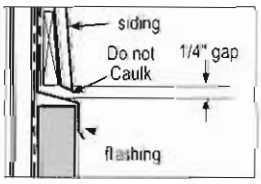
At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be installed per the roofing manufacturer's instructions. Provide a 2" clearance between the roofing and the bottom edge of the trim

Figure 7



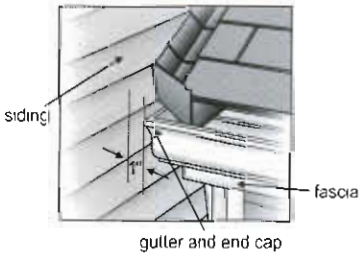
Maintain a 1/4" clearance between the bottom of James Hardie® products and horizontal flashing. Do not caulk gap.

Figure 8



Maintain a minimum 1" gap between gutter end caps and siding & trim.

Figure 9



VALLEY FLASHING

The valley flashing must extend a minimum 2" past the HardieTrim® Fascia and 6" to either side. If the valley flashing has been cut flush with the roofing, an additional valley flashing extension must be installed. If rain gutter is present and roof shingles extend 1" past fascia, a valley flashing extension is not required.

Figure 10

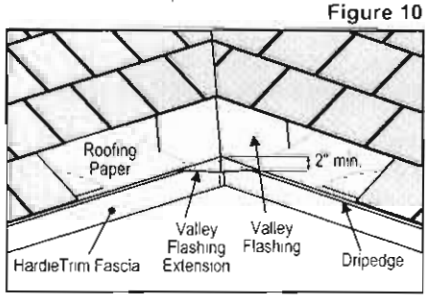
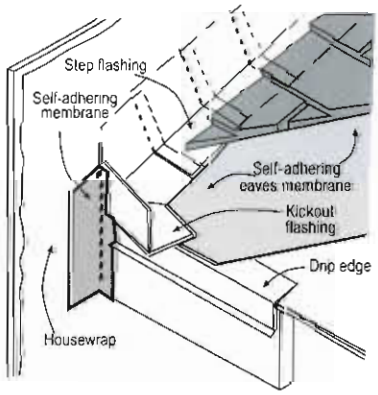


Figure 11



KICKOUT FLASHING

Because of the volume of water that can pour down a sloped roof, one of the most critical flashing details occurs where a roof intersects a sidewall. The roof must be flashed with step flashing. Where the roof terminates, install a kickout to deflect water away from the siding.

It is best to install a self-adhering membrane on the wall before the subfascia and trim boards are nailed in place, and then come back to install the kickout.

Figure 11, Kickout Flashing† To prevent water from dumping behind the siding and the end of the roof intersection, install a "kickout" of sufficient length and angle to direct the water running down the roof away from the siding.

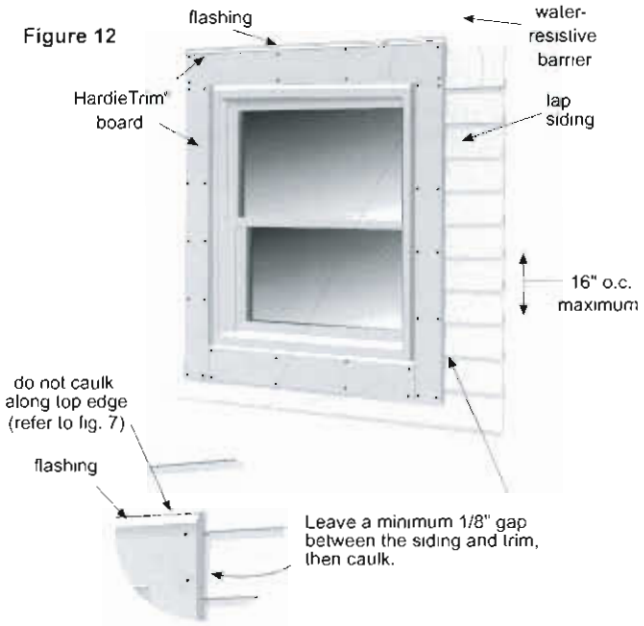
† The illustration (figure 11) was reprinted with permission of THE JOURNAL OF LIGHT CONSTRUCTION. For subscription information, visit www.jlconline.com

TRIM APPLICATION FOR WINDOWS, DOORS & OTHER OPENINGS

Trim the opening prior to the installation of the siding (fig. 12)

NOTE: Follow your window/door manufacturers installation instructions

Figure 12



BAND BOARDS, FRIEZE BOARDS, RAKE TRIM & FASCIA

HardieTrim® 5/4 boards may also be used as band boards, frieze boards, rake trim or fascia (fig. 13).

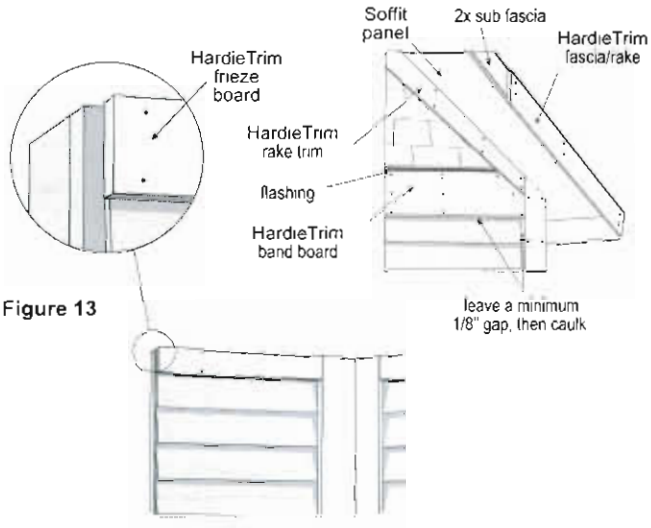


Figure 13

FASCIA

For fascia applications, a flashing is required over top of the fascia (fig. 14)

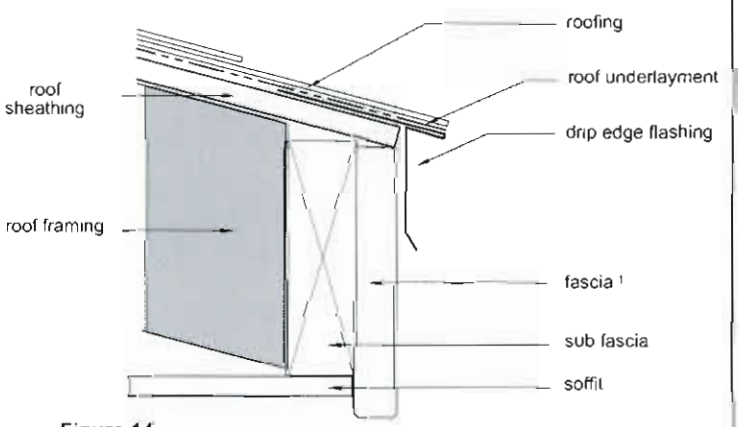


Figure 14

[1] Ensure adequate fastening of fascia

BAND BOARD

A flashing is required over the trim (fig 15)

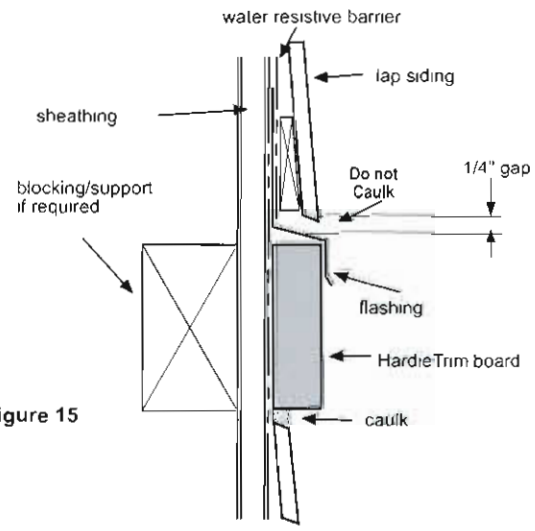


Figure 15

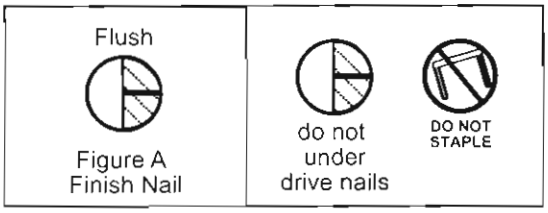
GENERAL FASTENING REQUIREMENTS

Fasteners must be corrosion resistant, galvanized, or stainless steel. Electro-galvanized are acceptable but may exhibit premature corrosion. James Hardie recommends the use of quality, hot-dipped galvanized nails James Hardie is not responsible for the corrosion resistance of fasteners Stainless steel fasteners are recommended when installing James Hardie® products near the ocean, large bodies of water, or very humid climates.

PNEUMATIC FASTENING:

HardieTrim® boards can be hand nailed or fastened with a pneumatic tool. Pneumatic fastening is highly recommended. Finish nails should be driven flush to the trim (fig A). A flush mount attachment on the pneumatic tool is recommended. This will help control the depth the nail is driven. If setting the nail depth proves difficult, choose a setting that under drives the nail. (Drive under driven nails snug with a smooth faced hammer - Does not apply for installation to steel framing).

- Drive fasteners perpendicular to the trim and framing
- Do not drive nails at an angle.
- For wood framing, under driven nails should be hit flush to the trim with a hammer (for steel framing, remove and replace nail)
- **Do not use aluminum fasteners, staples, or clipped head nails.**



CUT EDGE TREATMENT

Caulk, paint or prime all field cut edges.

CAULKING

For best results use an Elastomeric Joint Sealant complying with ASTM C920 Grade NS, Class 25 or higher or a Latex Joint Sealant complying with ASTM C834. Caulking/Sealant must be applied in accordance with the caulking/sealant manufacturer's written instructions or ASTM C1193.

PAINTING

DO NOT use stain on James Hardie® products James Hardie products must be painted within 180 days for primed product and 90 days for unprimed.
100% acrylic topcoats are recommended
Do not paint when wet. For application rates refer to paint manufacturers specifications.
Back-rolling is recommended if the siding is sprayed.

COLORPLUS® TECHNOLOGY CAULKING, TOUCH-UP & LAMINATE

- Touch up nicks, scrapes and nail heads using the ColorPlus® Technology touch-up applicator. Touch-up paint should be used sparingly. If large areas require touch-up, replace the damaged area with new HardieTrim board with ColorPlus Technology
- Laminate sheet must be removed immediately after installation of each trim board.
- Terminate non-factory cut edges into trim where possible, and caulk Color matched caulks are available from your ColorPlus® product dealer.
- Treat all other non-factory cut edges using the ColorPlus Technology edge coaters, available from your ColorPlus product dealer.

PAINTING JAMES HARDIE® SIDING AND TRIM PRODUCTS WITH COLORPLUS® TECHNOLOGY

When repainting ColorPlus® products, James Hardie recommends the following regarding surface preparation and topcoat application:

- Ensure the surface is clean, dry, and free of any dust, dirt, or mildew
- Repriming is normally not necessary
- 100% acrylic topcoats are recommended
- DO NOT use stain or oil/alkyd based paints
- Apply finish coat in accordance with paint manufacturers written instructions regarding coverage, application methods, and application temperature

RECOGNITION: HardieTrim boards may be installed as an equal alternative to conventional trim permitted for use in, the 1997 Uniform Building Code, Section 601 5 5, the 1997 Standard Building Code, Section 1404.1, the 1999 BOCA National Building Code, Section 1407 2.2; 2003 International Building Code, Section 1402 1, the 2003 International Residence Code for One - and Two - Family - Dwellings, Section R703.1 the 2003 International Residence Code for One - and Two - Family - Dwellings, Section R703 1 and the 1998 International One-and -Two -Family Dwelling Code,Section 601.1

Additional Installation Information, Warranties, and Warnings are available at www.jameshardie.com

JamesHardie

4/4 & 5/4 HardieTrim® HZ™ Boards

HZ Trim Map

JamesHardie

EFFECTIVE DECEMBER 2009

INSTALLATION REQUIREMENTS - PRIMED & COLORPLUS® PRODUCTS

Visit www.jameshardie.com for the most recent version.

These instructions are to be used for HardieTrim® HZ™ Boards ONLY and are ONLY valid in the following states: AK, WA, OR, CA, HI, NV, UT, ID, CO, WY, MT , AZ, NM.

IMPORTANT: FAILURE TO INSTALL AND FINISH THIS PRODUCT IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND JAMES HARDIE WRITTEN APPLICATION INSTRUCTIONS MAY LEAD TO PERSONAL INJURY, AFFECT SYSTEM PERFORMANCE, VIOLATE LOCAL BUILDING CODES, AND VOID THE PRODUCT ONLY WARRANTY. BEFORE INSTALLATION, CONFIRM THAT YOU ARE USING THE CORRECT HARDIEZONE INSTRUCTIONS. TO DETERMINE WHICH HARDIEZONE APPLIES TO YOUR LOCATION, VISIT WWW.HARDIEZONE.COM OR CALL 1-866-942-7343 (866 9HARDIE)

STORAGE & HANDLING:

Store flat and keep dry and covered prior to installation. Installing siding wet or saturated may result in shrinkage at butt joints. Carry boards on edge. Protect edges and corners from breakage. James Hardie is not responsible for damage caused by improper storage and handling of the product.

⚠ CUTTING INSTRUCTIONS

OUTDOORS

1. Position cutting station so that wind will blow dust away from user and others in working area.
2. Use one of the following methods:
   - A. Better: i. Dust reducing circular saw equipped with a HardieBlade® saw blade and HEPA vacuum extraction
   - B. Good: i. Dust reducing circular saw with a HardieBlade saw blade (only use for low to moderate cutting)

INDOORS

- NEVER use a power saw indoors
- NEVER use a circular saw blade that does not carry the HardieBlade saw blade trademark
- NEVER dry sweep – Use wet suppression or HEPA Vacuum

Important Note: For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best"-level cutting methods where feasible.

NIOSH-approved respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.com to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

HardieTrim® board is a decorative non-load bearing trim product. Do not use as fascia in HZ™ zones

GENERAL REQUIREMENTS:

- Wood or steel backing must be provided for attaching HardieTrim boards.
- A water-resistive barrier is required in accordance with local building code requirements. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements. James Hardie will assume no responsibility for water infiltration. James Hardie does manufacture HardieWrap™ Weather Barrier, a non-woven non-perforated housewrap[1], which complies with building code requirements.
- When installing James Hardie products all clearance details in figs. 3,4,5,6,7,8,& 9 must be followed in accordance to your HardieZone.
- Flashing is required over all horizontal protruding and exposed trim.
- Adjacent finished grade must slope away from the building in accordance with local building codes - typically a minimum of 6" in the first 10'.
- Do not install James Hardie products such that they may remain in contact with standing water.
- DO NOT use stain on James Hardie products.

INSTALLATION

Fastener Requirements

Use 2" minimum 16 ga. finish nails to attach HardieTrim 4/4 & 5/4 boards to wood frame construction. ET&F or equivalent fasteners or screws may be used to attach HardieTrim 4/4 & 5/4 boards to steel frame construction.

Fastening instructions are similar for all applications. Position finish nails no closer than 1/2" from the edges of the trim. Fasteners must be no closer than 1" from ends of trim and spaced a maximum of 16" o.c. Ensure trim is adequately fastened.

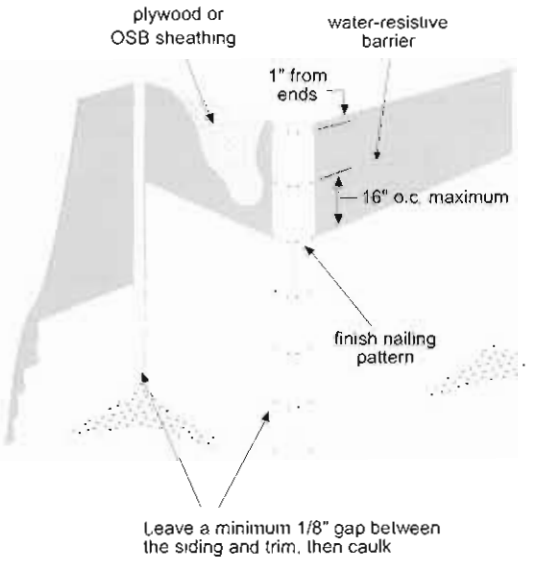
James Hardie recommends using stainless steel finish nails when installing HardieTrim products.

HardieTrim 4/4 & 5/4 boards with ColorPlus® Technology: A finish nail is required for installing HardieTrim 4/4 & 5/4 boards. Remove laminate sheet as soon as possible after nailing. Nail head touch up can be done before or after removal of the laminate sheet when using finish nails. The preferred method is to touch-up while the laminate sheet is in place. Remove the laminate sheet before paint dries.

Minimum fastener guide for finish nailing:

	Pre-built corner	Site Built Corners	Other areas (e.g. window trim, band boards and fascia)
4"	1 nail every 16" to attach boards together + 1 nail every 16" each board	2 nails every 16"	2 nails every 16"
6"	1 nail every 16" to attach boards together + 2 nails every 16" each board		
8"	-	3 nails every 16"	3 nails every 16"
12"	-	4 nails every 16"	3 nails every 16"

Figure 1



[1]For additional information on HardieWrap™ Weather Barrier, consult James Hardie at 1-866-4Hardie or www.hardiewrap.com

WARNING: AVOID BREATHING SILICA DUST

James Hardie® products contain respirable crystalline silica, which is known to the State of California to cause cancer and is considered by IARC and NIOSH to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation, (2) use fiber cement shears for cutting or, where not feasible, use a HardieBlade® saw blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area, (4) wear a properly-fitted, NIOSH-approved dust mask or respirator (e.g. N-95) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods - never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheet available at www.jameshardie.com or by calling 1-800-9HARDIE (1-800-942-7343). FAILURE TO ADHERE TO OUR WARNINGS, MSDS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

TRIMMING CORNERS

When installing corners or other vertical trim, position boards on the wall and attach (fig. 2b). Use weather cuts sloped away from the wall to join (fig. 3). Alternatively corners can be pre-built (fig. 2a)

Pre-Built Corners

Corners can be pre-built off the wall using 2" finishing nails. Each side of the pre-built corner must be secured to the wall (fig. 2a)

Figure 2a

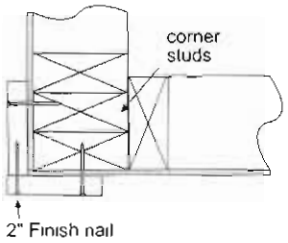


Figure 2b

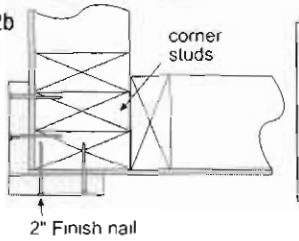
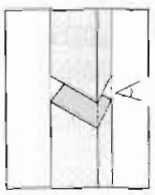


Figure 3

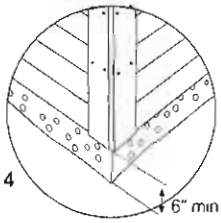


CLEARANCES: Refer to your HardieZone™ for proper clearance requirements

Note: HZ5™ = minimum 2" / HZ10™ = minimum 1" - 2"

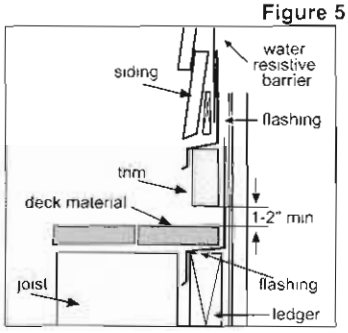
Install siding and trim products in compliance with local building code requirements for clearance between the bottom edge of the siding and the adjacent finished grade.

Figure 4



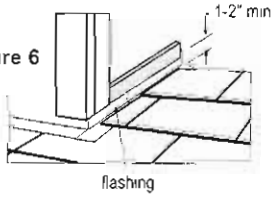
Maintain a minimum 1-2" clearance between James Hardie® trim products and decks, paths, steps and driveways.

Figure 5



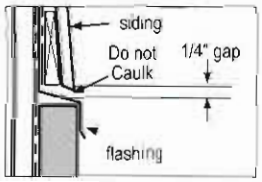
At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be installed per the roofing manufacturer's instructions. Provide a 1-2" clearance between the roofing and the bottom edge of the trim.

Figure 6



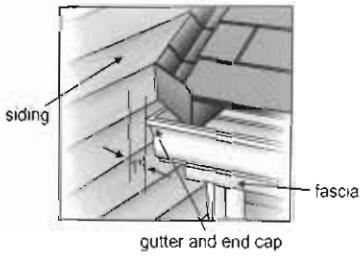
Maintain a 1/4" clearance between the bottom of James Hardie® products and horizontal flashing. Do not caulk gap.

Figure 7



Maintain a minimum 1" gap between gutter end caps and siding & trim.

Figure 8



VALLEY FLASHING

The valley flashing must extend a minimum 1-2" past the HardieTrim® Fascia and 6" to either side. If the valley flashing has been cut flush with the roofing, an additional valley flashing extension must be installed. If rain gutter is present and roof shingles extend 1" past fascia, a valley flashing extension is not required.

Figure 9

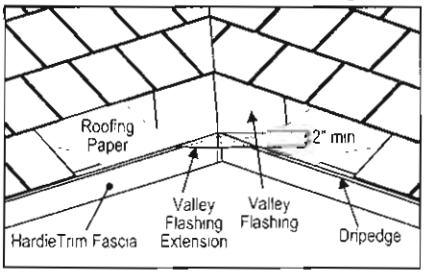
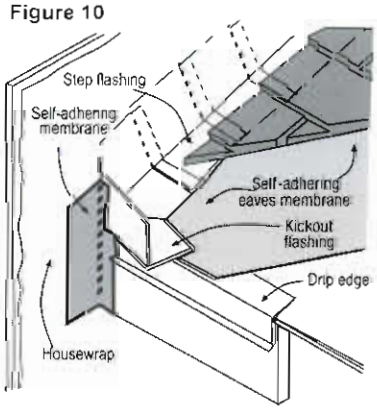


Figure 10



KICKOUT FLASHING

Because of the volume of water that can pour down a sloped roof, one of the most critical flashing details occurs where a roof intersects a sidewall. The roof must be flashed with step flashing. Where the roof terminates, install a kickout to deflect water away from the siding.

It is best to install a self-adhering membrane on the wall before the subfascia and trim boards are nailed in place, and then come back to install the kickout.

Figure 10, Kickout Flashing† To prevent water from dumping behind the siding and the end of the roof intersection, install a "kickout" of sufficient length and angle to direct the water running down the roof away from the siding.

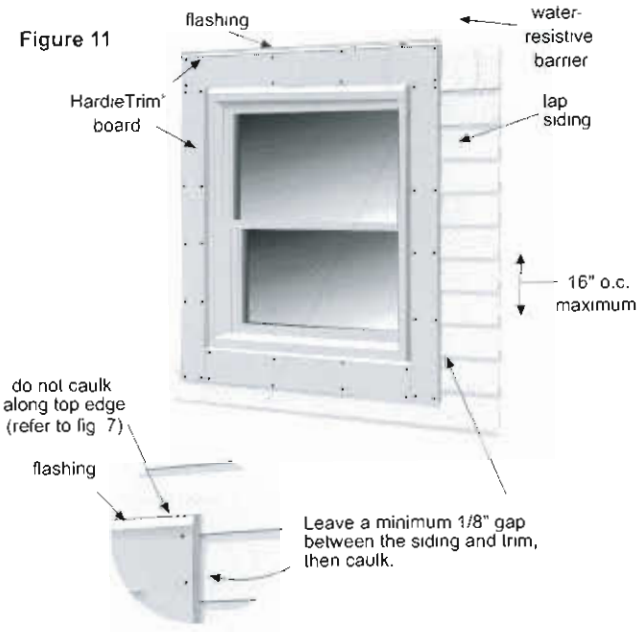
† The illustration (figure 10) was reprinted with permission of THE JOURNAL OF LIGHT CONSTRUCTION For subscription information, visit www.jlconline.com

TRIM APPLICATION FOR WINDOWS, DOORS & OTHER OPENINGS

Trim the opening prior to the installation of the siding (fig. 11)

NOTE: Follow your window/door manufacturers installation instructions.

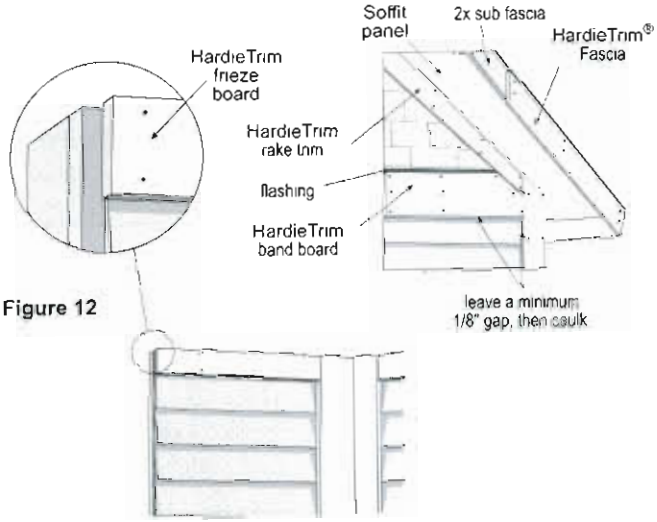
Figure 11



BAND BOARDS, FRIEZE BOARDS, & RAKE TRIM DO NOT USE AS FASCIA

HardieTrim® 4/4 & 5/4 boards may also be used as band boards, frieze boards, or rake trim (fig. 12). For fascia use HardieTrim® Fascia Boards.

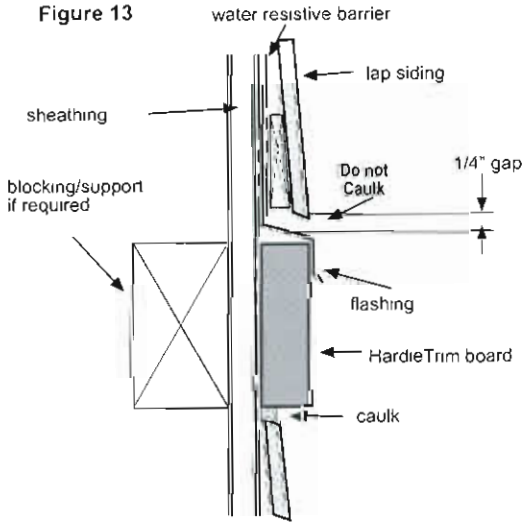
Figure 12



BAND BOARD

A flashing is required over the trim (fig. 13).

Figure 13



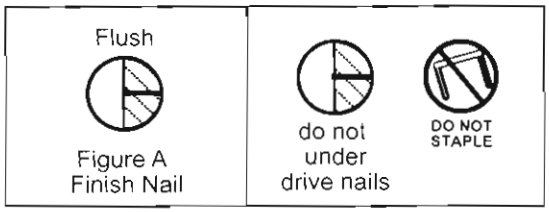
GENERAL FASTENING REQUIREMENTS

Fasteners must be corrosion resistant, galvanized, or stainless steel. Electro-galvanized are acceptable but may exhibit premature corrosion. James Hardie recommends the use of quality, hot-dipped galvanized nails. James Hardie is not responsible for the corrosion resistance of fasteners. Stainless steel fasteners are recommended when installing James Hardie® products near the ocean, large bodies of water, or very humid climates

PNEUMATIC FASTENING:

HardieTrim® 4/4 & 5/4 boards can be hand nailed or fastened with a pneumatic tool. Pneumatic fastening is highly recommended. Finish nails should be driven flush to the trim (fig. A). A flush mount attachment on the pneumatic tool is recommended. This will help control the depth the nail is driven. If setting the nail depth proves difficult, choose a setting that under drives the nail. (Drive under driven nails snug with a smooth faced hammer - Does not apply for installation to steel framing).

- Drive fasteners perpendicular to the trim and framing
- Do not drive nails at an angle.
- For wood framing, under driven nails should be hit flush to the trim with a hammer (for steel framing, remove and replace nail).
- Do not use aluminum fasteners, staples, or clipped head nails.



CUT EDGE TREATMENT

Caulk, paint or prime all field cut edges

CAULKING

For best results use an Elastomeric Joint Sealant complying with ASTM C920 Grade NS, Class 25 or higher or a Latex Joint Sealant complying with ASTM C834. Caulking/Sealant must be applied in accordance with the caulking/sealant manufacturer's written instructions or ASTM C1193.

PAINTING

DO NOT use stain on James Hardie® products. James Hardie products must be painted within 180 days for primed product and 90 days for unprimed.
100% acrylic topcoats are recommended.
Do not paint when wet. For application rates refer to paint manufacturers specifications.
Back-rolling is recommended if the siding is sprayed.

COLORPLUS® TECHNOLOGY CAULKING, TOUCH-UP & LAMINATE

- Touch up nicks, scrapes and nail heads using the ColorPlus® Technology touch-up applicator. Touch-up paint should be used sparingly. If large areas require touch-up, replace the damaged area with new HardieTrim board with ColorPlus Technology.
- Laminate sheet must be removed immediately after installation of each trim board.
- Terminate non-factory cut edges into trim where possible, and caulk. Color matched caulks are available from your ColorPlus® product dealer
- Treat all other non-factory cut edges using the ColorPlus Technology edge coaters, available from your ColorPlus product dealer.

PAINTING JAMES HARDIE® SIDING AND TRIM PRODUCTS WITH COLORPLUS® TECHNOLOGY

When repainting ColorPlus® products, James Hardie recommends the following regarding surface preparation and topcoat application:

- Ensure the surface is clean, dry, and free of any dust, dirt, or mildew
- Repriming is normally not necessary
- 100% acrylic topcoats are recommended
- DO NOT use stain or oil/alkyd based paints
- Apply finish coat in accordance with paint manufacturers written instructions regarding coverage, application methods, and application temperature

RECOGNITION: HardieTrim boards may be installed as an equal alternative to conventional trim permitted for use in, the 1997 Uniform Building Code, Section 601 5.5, the 1997 Standard Building Code, Section 1404.1, the 1999 BOCA National Building Code, Section 1407 2.2; 2003 International Building Code, Section 1402.1, the 2003 International Residence Code for One - and Two - Family - Dwellings, Section R703 1 the 2003 International Residence Code for One - and Two - Family - Dwellings, Section R703 1 and the 1998 International One-and -Two -Family Dwelling Code,Section 601 1

Additional Installation Information, Warranties, and Warnings are available at www.jameshardie.com

JamesHardie

HardieTrim® HZ5™ Batten Boards

INSTALLATION REQUIREMENTS - PRIMED & COLORPLUS® PRODUCTS

JamesHardie®

EFFECTIVE DECEMBER 2009

Visit www.jameshardie.com for the most recent version.

These instructions are to be used for HardieTrim® HZ5™ Boards **ONLY** and are **NOT VALID** in the following states: AK, WA, OR, CA, HI, NV, UT, ID, CO, WY, MT , AZ, NM.

IMPORTANT: FAILURE TO INSTALL AND FINISH THIS PRODUCT IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND JAMES HARDIE WRITTEN APPLICATION INSTRUCTIONS MAY LEAD TO PERSONAL INJURY, AFFECT SYSTEM PERFORMANCE, VIOLATE LOCAL BUILDING CODES, AND VOID THE PRODUCT ONLY WARRANTY. BEFORE INSTALLATION, CONFIRM THAT YOU ARE USING THE CORRECT HARDIEZONE INSTRUCTIONS. TO DETERMINE WHICH HARDIEZONE APPLIES TO YOUR LOCATION, VISIT WWW.HARDIEZONE.COM OR CALL 1-866-942-7343 (866 9HARDIE)

STORAGE & HANDLING:

Store flat and keep dry and covered prior to installation. Installing siding wet or saturated may result in shrinkage at butt joints. Carry boards on edge. Protect edges and corners from breakage. James Hardie is not responsible for damage caused by improper storage and handling of the product.

⚠ CUTTING INSTRUCTIONS

OUTDOORS

1. Position cutting station so that wind will blow dust away from user and others in working area.
2. Use one of the following methods:

b. Better: i. Dust reducing circular saw equipped with a HardieBlade™ saw blade and HEPA vacuum extraction

c. Good: i. Dust reducing circular saw with a HardieBlade saw blade (only use for low to moderate cutting)

INDOORS

- NEVER use a power saw indoors
- NEVER use a circular saw blade that does not carry the HardieBlade saw blade trademark
- NEVER dry sweep – Use wet suppression or HEPA Vacuum

Important Note: For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best"-level cutting methods where feasible

NIOSH-approved respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.com to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

HardieTrim® Batten boards are a decorative non-load bearing vertical trim product.

GENERAL REQUIREMENTS:

- Wood or steel backing must be provided for attaching HardieTrim® Battens.
- A water-resistive barrier is required in accordance with local building code requirements. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements. James Hardie will assume no responsibility for water infiltration. James Hardie does manufacture HardieWrap™ Weather Barrier, a non-woven non-perforated housewrap[1], which complies with building code requirements.
- Flashing is required over all horizontal protruding and exposed trim.
- When installing James Hardie products all clearance details in figs. 2,3,4,5,6,7,&8 must be followed.
- Adjacent finished grade must slope away from the building in accordance with local building codes - typically a minimum of 6" in the first 10'.
- DO NOT install HardieTrim Battens, such that they may remain in contact with standing water.
- DO NOT use stain on James Hardie® products.

INSTALLATION

Fastener Requirements

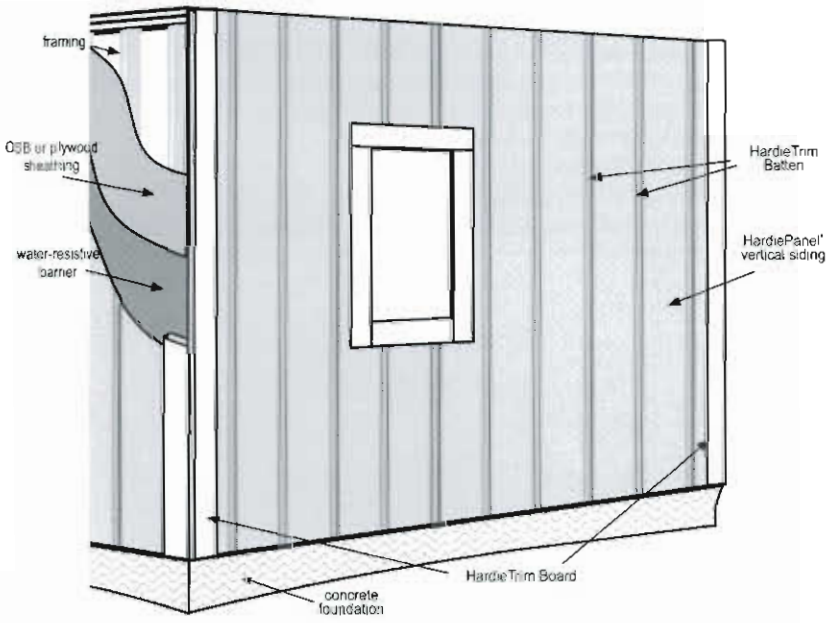
A finish nail is required for installing HardieTrim Battens with ColorPlus® Technology. 2" minimum 16 ga. finish nails or smooth shank siding nails may be used to attach HardieTrim Battens to wood frame construction. ET&F or equivalent fasteners or screws may be used to attach HardieTrim Battens to steel frame construction.

James Hardie recommends using stainless steel finish nails when installing HardieTrim (trim, battens, fascia, etc.) products.

Fastening instructions are similar for all applications. Position nails no closer than 3/4" from the edges of the HardieTrim Battens. Fasteners must be no closer than 1" from ends of HardieTrim Battens and spaced a maximum of 16" o.c. (fig 1). Ensure HardieTrim Batten is adequately fastened.

[1]For additional information on HardieWrap™ Weather Barrier, consult James Hardie at 1-866-4Hardie or www.hardiewrap.com

Figure 1



WARNING: AVOID BREATHING SILICA DUST

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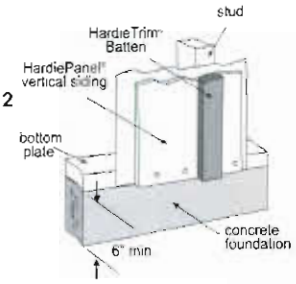
CLEARANCES

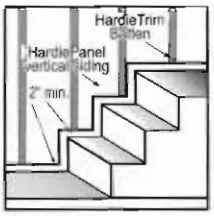
Install siding and trim products in compliance with local building code requirements for clearance between the bottom edge of the siding and the adjacent finished grade

Figure 2



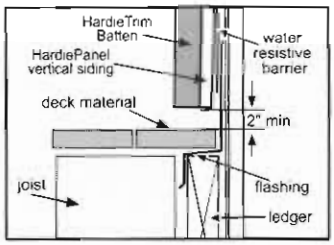
Maintain a 2" minimum clearance between James Hardie® products and paths, steps and driveways

Figure 3



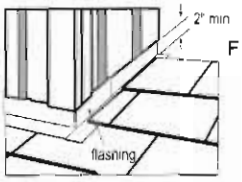
Maintain a 2" minimum clearance between James Hardie products and decking material

Figure 4



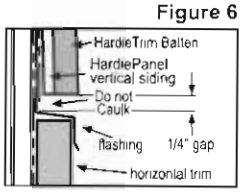
At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be installed per the roofing manufacturer's instructions. Provide a 2" minimum clearance between the roofing and the bottom edge of the siding and trim

Figure 5



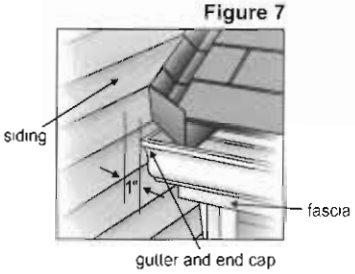
Maintain a 1/4" clearance between the bottom of James Hardie products and horizontal flashing. Do not caulk gap.

Figure 6



Maintain a minimum 1" gap between gutter end caps and siding & trim.

Figure 7



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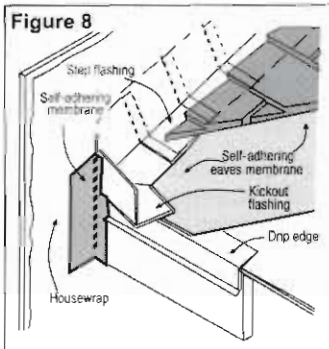


KICKOUT FLASHING

Because of the volume of water that can pour down a sloped roof, one of the most critical flashing details occurs where a roof intersects a sidewall. The roof must be flashed with step flashing. Where the roof terminates, install a kickout to deflect water away from the siding.

It is best to install a self-adhering membrane on the wall before the subfascia and trim boards are nailed in place, and then come back to install the kickout.

Figure 8, Kickout Flashing. To prevent water from dumping behind the siding and the end of the roof intersection, install a "kickout" of sufficient length and angle to direct the water running down the roof away from the siding

Horizontal Panel Joints - At horizontal panel joints HardieTrim® battens must be installed according to option 1 or 2 below. When installing HardieTrim Battens horizontally, they must be installed as a panel joint according to option 2.

Option 1

Figure 9 - No horizontal band board - Make a 22.5- 45 degree weather cut, in the HardieTrim batten, just above the 1/4" clearance between panels.

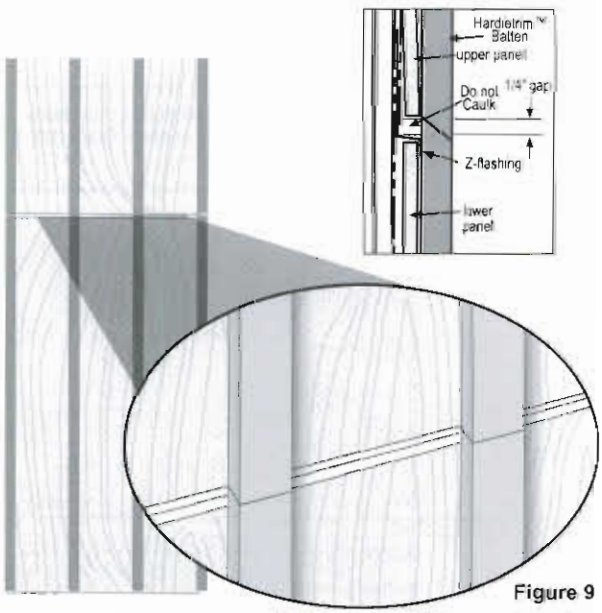


Figure 9

Option 2

Figure 10 - Horizontal Band Board - Install a horizontal band board at the top of the bottom panel. Butt the lower batten to the band board and start the top batten at the bottom edge of the top panel. Maintain a 1/4" clearance above horizontal flashing

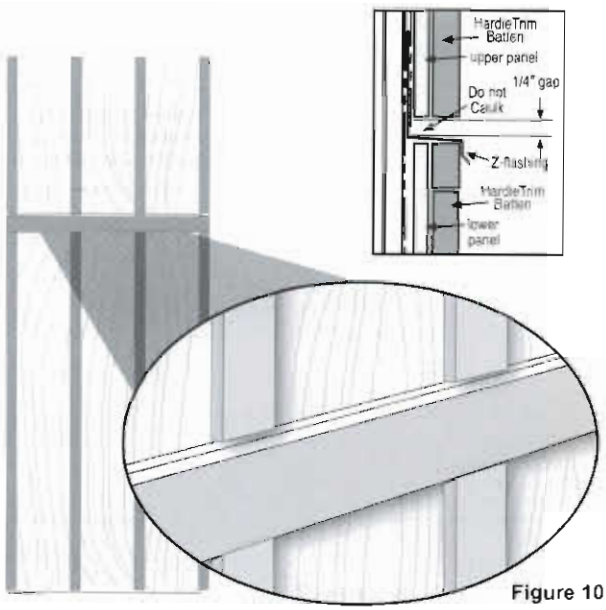


Figure 10

* The illustration (figure 8) was reprinted with permission of THE JOURNAL OF LIGHT CONSTRUCTION. For subscription information, visit www.jlconline.com.

GENERAL FASTENING REQUIREMENTS

Fasteners must be corrosion resistant, galvanized, or stainless steel Electro-galvanized are acceptable but may exhibit premature corrosion James Hardie recommends the use of quality, hot-dipped galvanized nails. James Hardie is not responsible for the corrosion resistance of fasteners. Stainless steel fasteners are recommended when installing James Hardie® products near the ocean, large bodies of water, or in very humid climates.

- Drive fasteners perpendicular to siding and framing
- Fastener heads should fit snug against siding (no air space). (fig. A)
- Do not over-drive nail heads or drive nails at an angle.
- If nail is countersunk, caulk nail hole and add a nail. (fig. B)
- For wood framing, under driven nails should be hit flush to the trim with a hammer (For steel framing, remove and replace nail).
- Do not use aluminum fasteners, staples, or clipped head nails.

PNEUMATIC FASTENING

James Hardie products can be hand nailed or fastened with a pneumatic tool Pneumatic fastening is highly recommended. Set air pressure so that the fastener is driven snug with the surface of the siding. A flush mount attachment on the pneumatic tool is recommended. This will help control the depth the nail is driven. If setting the nail depth proves difficult, choose a setting that under drives the nail. (Drive under driven nails snug with a smooth faced hammer - Does not apply for installation to steel framing).

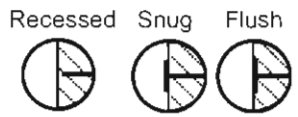


Figure A

Figure B

CUT EDGE TREATMENT

Caulk, paint or prime all field cut edges

CAULKING

For best results use an Elastomeric Joint Sealant complying with ASTM C920 Grade NS, Class 25 or higher or a Latex Joint Sealant complying with ASTM C834. Caulking/Sealant must be applied in accordance with the caulking/sealant manufacturer's written instructions or ASTM C1193.

PAINTING

DO NOT stain James Hardie® products
James Hardie products must be painted within 180 days for primed product and 90 days for unprimed.
100% acrylic topcoats are recommended
Do not paint when wet. For application rates refer to paint manufacturers specifications.
Back-rolling is recommended if the siding is sprayed.

COLORPLUS® TECHNOLOGY CAULKING, TOUCH-UP & LAMINATE

- Touch up nicks, scrapes and nail heads using the ColorPlus® Technology touch-up applicator. Touch-up paint should be used sparingly. If large areas require touch-up, replace the damaged area with new HardieTrim® batten board with ColorPlus Technology
- Laminate sheet must be removed immediately after installation
- Terminate non-factory cut edges into trim where possible, and caulk. Color matched caulks are available from your ColorPlus® product dealer
- Treat all other non-factory cut edges using the ColorPlus Technology edge coaters, available from your ColorPlus product dealer.

PAINTING JAMES HARDIE® SIDING AND TRIM PRODUCTS WITH COLORPLUS TECHNOLOGY

When repainting ColorPlus products, James Hardie recommends the following regarding surface preparation and topcoat application:

- Ensure the surface is clean, dry, and free of any dust, dirt, or mildew
- Repriming is normally not necessary
- 100% acrylic topcoats are recommended
- DO NOT use stain or oil/alkyd base paints on James Hardie® products
- Apply finish coat in accordance with paint manufacturers written instructions regarding coverage, application methods, and application temperature

RECOGNITION HardieTrim® Battens may be installed as an equal alternative to conventional trim permitted for use in; the 1997 Uniform Building Code, Section 601 5.5, the 1997 Standard Building Code, Section 1404.1; the 1999 BOCA National Building Code, Section 1407 2.2, 2003 International Building Code, Section 1402 1, the 2003 International Residence Code for One - and Two - Family - Dwellings, Section R703 1, the 2003 International Residence Code for One - and Two - Family - Dwellings, Section R703 1 and the 1998 International One-and -Two -Family Dwelling Code,Section 601.1

Additional Installation Information, Warranties, and Warnings are available at www.jameshardie.com

JamesHardie

HardieTrim® HZ™ Batten Boards

INSTALLATION REQUIREMENTS - PRIMED & COLORPLUS® PRODUCTS

Trim Map

JamesHardie

EFFECTIVE DECEMBER 2009

Visit www.jameshardie.com for the most recent version

These instructions are to be used for HardieTrim® HZ™ Boards ONLY and are ONLY valid in the following states: AK, WA, OR, CA, HI, NV, UT, ID, CO, WY, MT, AZ, NM.

IMPORTANT: FAILURE TO INSTALL AND FINISH THIS PRODUCT IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND JAMES HARDIE WRITTEN APPLICATION INSTRUCTIONS MAY LEAD TO PERSONAL INJURY, AFFECT SYSTEM PERFORMANCE, VIOLATE LOCAL BUILDING CODES, AND VOID THE PRODUCT ONLY WARRANTY. BEFORE INSTALLATION, CONFIRM THAT YOU ARE USING THE CORRECT HARDIEZONE INSTRUCTIONS. TO DETERMINE WHICH HARDIEZONE APPLIES TO YOUR LOCATION, VISIT WWW.HARDIEZONE.COM OR CALL 1-866-942-7343 (866 9HARDIE)

STORAGE & HANDLING:

Store flat and keep dry and covered prior to installation. Installing siding wet or saturated may result in shrinkage at butt joints. Carry boards on edge. Protect edges and corners from breakage. James Hardie is not responsible for damage caused by improper storage and handling of the product.

⚠ CUTTING INSTRUCTIONS

OUTDOORS

1. Position cutting station so that wind will blow dust away from user and others in working area.
2. Use one of the following methods:

b. Better: i. Dust reducing circular saw equipped with a HardieBlade™ saw blade and HEPA vacuum extraction

c. Good: i. Dust reducing circular saw with a HardieBlade saw blade (only use for low to moderate cutting)

INDOORS

- NEVER use a power saw indoors
- NEVER use a circular saw blade that does not carry the HardieBlade saw blade trademark
- NEVER dry sweep – Use wet suppression or HEPA Vacuum

Important Note: For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best"-level cutting methods where feasible.

NIOSH-approved respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.com to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

SDS63116

HardieTrim® Batten boards are a decorative non-load bearing vertical trim product.

GENERAL REQUIREMENTS:

- Wood or steel backing must be provided for attaching HardieTrim® Battens.
- A water-resistive barrier is required in accordance with local building code requirements. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements. James Hardie will assume no responsibility for water infiltration. James Hardie does manufacture HardieWrap™ Weather Barrier, a non-woven non-perforated housewrap[1], which complies with building code requirements.
- When installing James Hardie products all clearance details in figs. 2,3,4,5,6,7,&8 must be followed.
- Flashing is required over all horizontal protruding and exposed trim.
- Adjacent finished grade must slope away from the building in accordance with local building codes - typically a minimum of 6" in the first 10'
- DO NOT install HardieTrim Battens, such that they may remain in contact with standing water.
- DO NOT use stain on James Hardie® products.

INSTALLATION

Fastener Requirements

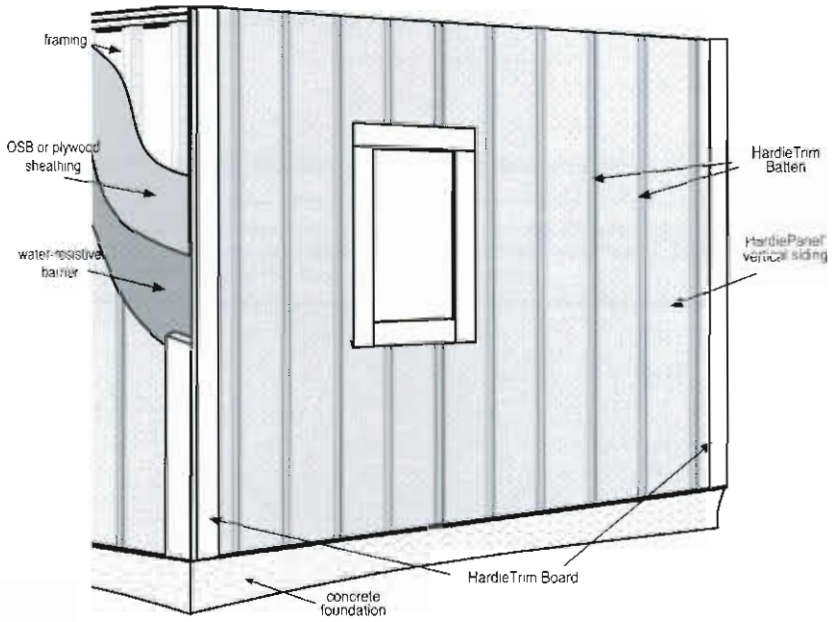
A finish nail is required for installing HardieTrim Battens with ColorPlus® Technology. 2" minimum 16 ga. finish nails or smooth shank siding nails may be used to attach HardieTrim Battens to wood frame construction. ET&F or equivalent fasteners or screws may be used to attach HardieTrim Battens to steel frame construction.

James Hardie recommends using stainless steel finish nails when installing HardieTrim (trim, battens, fascia, etc.) products.

Fastening instructions are similar for all applications. Position nails no closer than 3/4" from the edges of the HardieTrim Battens. Fasteners must be no closer than 1" from ends of HardieTrim Battens and spaced a maximum of 16" o.c. (fig 1). Ensure HardieTrim Batten is adequately fastened.

[1]For additional information on HardieWrap™ Weather Barrier, consult James Hardie at 1-866-4Hardie or www.hardiewrap.com

Figure 1



WARNING: AVOID BREATHING SILICA DUST

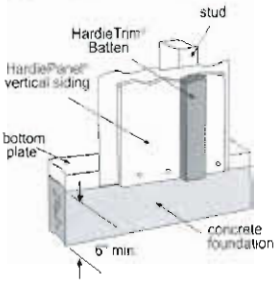
James Hardie® products contain respirable crystalline silica, which is known to the State of California to cause cancer and is considered by IARC and NIOSH to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) use fiber cement shears for cutting or, where not feasible, use a HardieBlade saw blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area; (4) wear a properly-fitted, NIOSH-approved dust mask or respirator (e.g. N-95) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods - never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheet available at www.jameshardie.com or by calling 1-800-9HARDIE (1-800-942-7343). FAILURE TO ADHERE TO OUR WARNINGS, MSDS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH

SDS63116

CLEARANCES: *Refer to your HardieZone™ for proper clearance requirements (Note: HZ5™ = min. 2" / HZ10™ = min. 1"-2")*

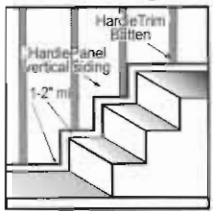
Install siding and trim products in compliance with local building code requirements for clearance between the bottom edge of the siding and the adjacent finished grade.

Figure 2



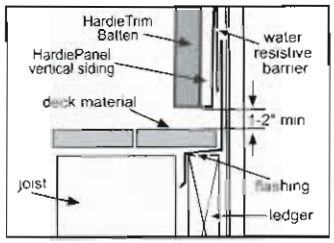
Maintain a 1-2" minimum clearance between James Hardie® products and paths, steps and driveways.

Figure 3



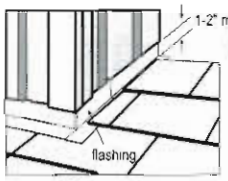
Maintain a 1-2" minimum clearance between James Hardie products and decking material

Figure 4



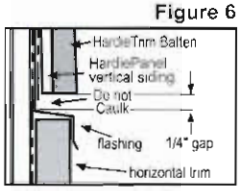
At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be installed per the roofing manufacturer's instructions. Provide a 1-2" minimum clearance between the roofing and the bottom edge of the siding and trim.

Figure 5



Maintain a 1/4" clearance between the bottom of James Hardie products and horizontal flashing. Do not caulk gap

Figure 6



Maintain a minimum 1" gap between gutter end caps and siding & trim.

Figure 7

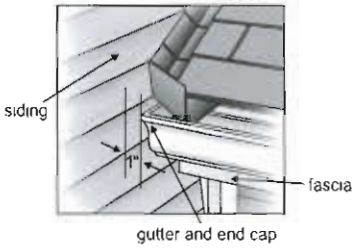
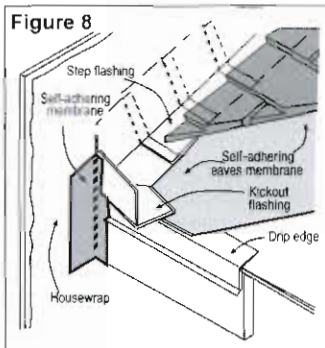


Figure 8



KICKOUT FLASHING

Because of the volume of water that can pour down a sloped roof, one of the most critical flashing details occurs where a roof intersects a sidewall. The roof must be flashed with step flashing. Where the roof terminates, install a kickout to deflect water away from the siding

It is best to install a self-adhering membrane on the wall before the subfascia and trim boards are nailed in place, and then come back to install the kickout.

Figure 8, Kickout Flashing To prevent water from dumping behind the siding and the end of the roof intersection, install a "kickout" of sufficient length and angle to direct the water running down the roof away from the siding

Horizontal Panel Joints - At horizontal panel joints HardieTrim® battens must be installed according to option 1 or 2 below. When installing HardieTrim Battens horizontally, they must be installed as a panel joint according to option 2.

Option 1

Figure 9 - No horizontal band board - Make a 22 5- 45 degree weather cut, in the HardieTrim batten, just above the 1/4" clearance between panels

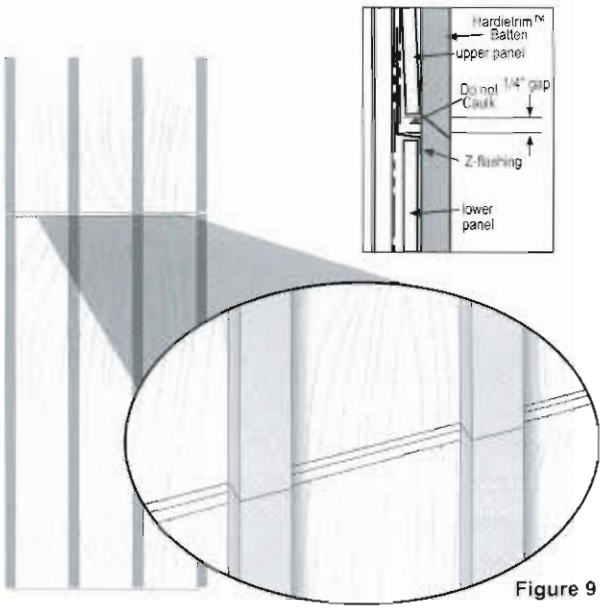


Figure 9

Option 2

Figure 10 - Horizontal Band Board - Install a horizontal band board at the top of the bottom panel. Butt the lower batten to the band board and start the top batten at the bottom edge of the top panel. Maintain a 1/4" clearance above horizontal flashing

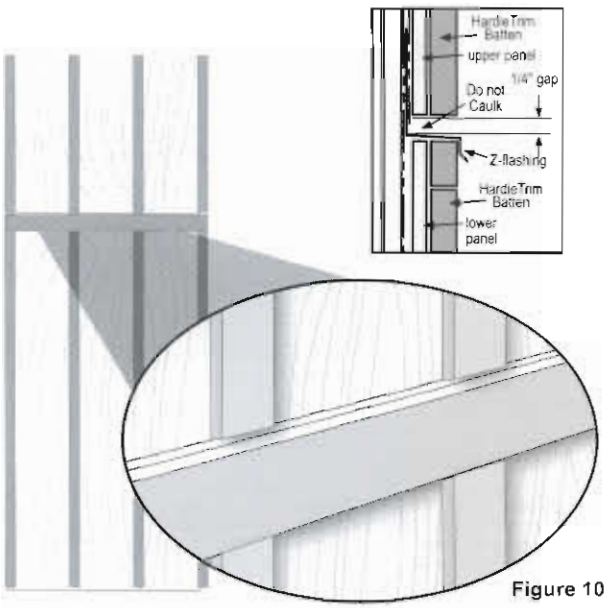


Figure 10

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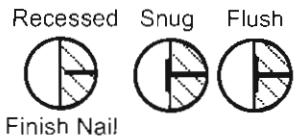

Figure A

Figure B

CUT EDGE TREATMENT

Caulk, paint or prime all field cut edges

CAULKING

For best results use an Elastomeric Joint Sealant complying with ASTM C920 Grade NS, Class 25 or higher or a Latex Joint Sealant complying with ASTM C834. Caulking/Sealant must be applied in accordance with the caulking/sealant manufacturer's written instructions or ASTM C1193.

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COLORPLUS® TECHNOLOGY CAULKING, TOUCH-UP & LAMINATE

- Touch up nicks, scrapes and nail heads using the ColorPlus® Technology touch-up applicator. Touch-up paint should be used sparingly. If large areas require touch-up, replace the damaged area with new HardieTrim® batten board with ColorPlus Technology.
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PAINTING JAMES HARDIE® SIDING AND TRIM PRODUCTS WITH COLORPLUS TECHNOLOGY

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Additional Installation Information, Warranties, and Warnings are available at www.jameshardie.com

JamesHardie

HardieSoffit® Panel Products Description

HARDIESOFFIT® PANELS

HardieSoffit® panels are 8-ft. and 12-ft. long, ¼-in. thick factory-primed fiber-cement panels designed to be used on the underside of eaves as soffit material. HardieSoffit panels are available as vented or non-vented boards. Vented HardieSoffit panels provide 5 sq. in. of net free ventilation per lineal foot of soffit.

James Hardie offers HardieSoffit panels in a range of time-saving pre-cut widths common to rake and eave applications. HardieSoffit panels come in either a smooth finish or Select Cedarmill® textured finish. Check with your local dealer for product availability. HardieSoffit panels can be combined with HardieTrim® Fascia boards used for fascia rakes and frieze applications to complete the eaves detailing.

HardieSoffit panels are also available with ColorPlus® Technology. The ColorPlus® coating is a factory-applied, oven-baked finish available on a variety of James Hardie® siding and trim products. See your local dealer for details and availability of products, colors and accessories.

HARDIESOFFIT® BEADED PORCH PANEL

HardieSoffit Beaded Porch Panel is a decorative fiber cement panel to be used as ceiling on the underside of porches or eaves as exterior panel materials. HardieSoffit beaded porch panel is 1/4-in. thick, 4 ft. wide, 8 ft. in length, and has 2" OC beads, and comes with PrimePlus® factory primer and sealer. Must be finished with 100% acrylic paint. See your local dealer for details and availability of products, colors and accessories.

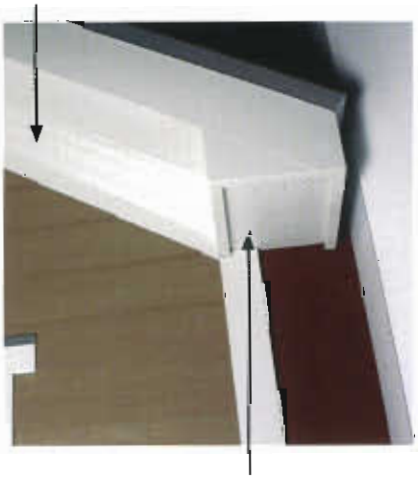
HardieSoffit Non-Vented – Smooth

HardieSoffit Vented – Cedarmill®

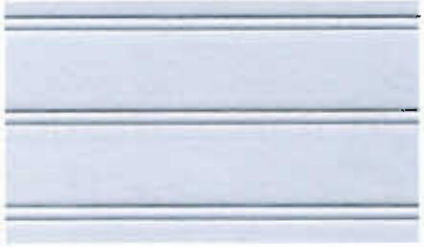
HardieSoffit Vented – Smooth

HardieSoffit Non-Vented – Cedarmill®

HardieSoffit Non-Vented – Smooth



HardieSoffit Vented – Smooth



HardieSoffit Beaded Porch Panel

HardieSoffit Beaded Porch Panel

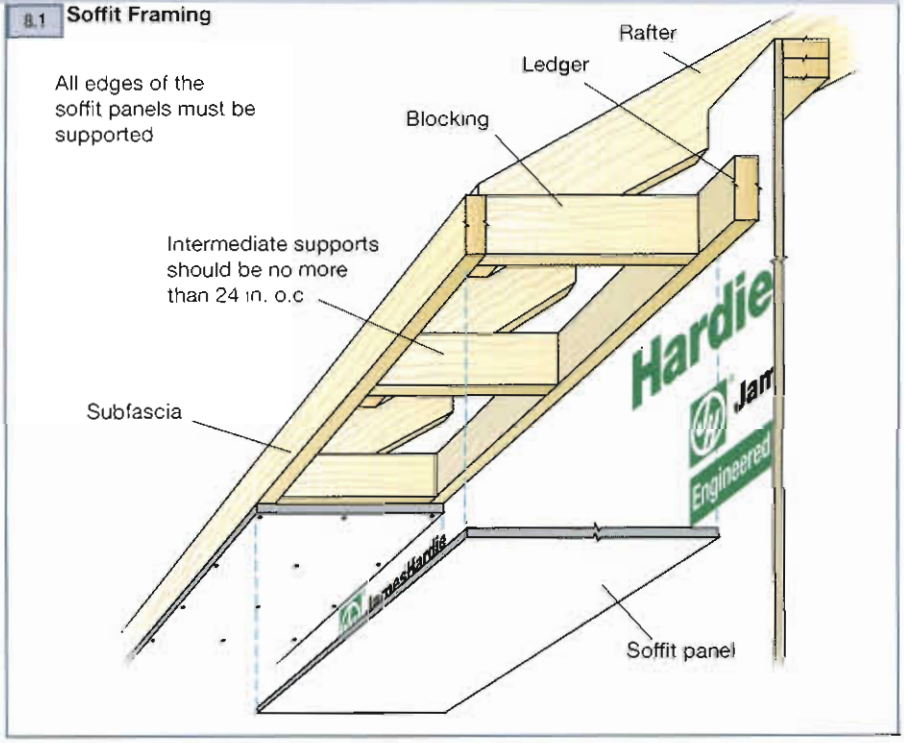
Installation of HardieSoffit® Panels

INSTALLATION OF HARDIESOFFIT® PANELS

HardieSoffit® panels must be attached to solid framing such as 2x4 supports spaced no more than 24 in. o.c. For eaves install HardieSoffit panels with the long edge of the panel perpendicular to the ends of the rafters or joists. Eaves framing must include a subfascia, blocking, and/or ledger board to provide solid nailing along the long dimension of the soffit. All panel edges must be supported.

For rake overhangs 2x "look outs" spaced a maximum of 24 in. o.c. should support a rake subfascia to provide adequate nailing for the rake soffit. Blocking between the lookouts provides support for the rake soffit along the building.

8.1 **Soffit Framing**

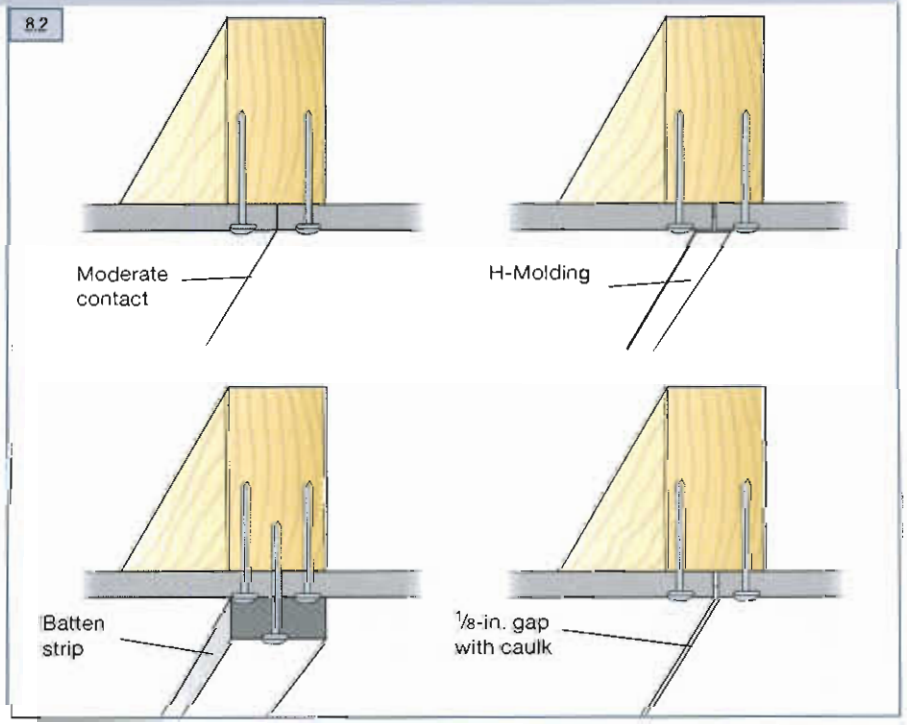


***TIP:** To aid in soffit panel installation, make a "deadman" or "third hand" post to help hold and position the soffit panel. Factory built tools such as those made for drywall installation are available, or they can be fabricated from lumber on the job-site.*

JOINT TREATMENT FOR HARDIESOFFIT PANELS

There are several ways to join the lengths of HardieSoffit panels. Panel ends may be lightly butted in moderate contact, the ends may be gapped 1/8 in. and caulked, joints can be covered with batten strips, or panels may be joined with PVC or metal H molding type connectors.

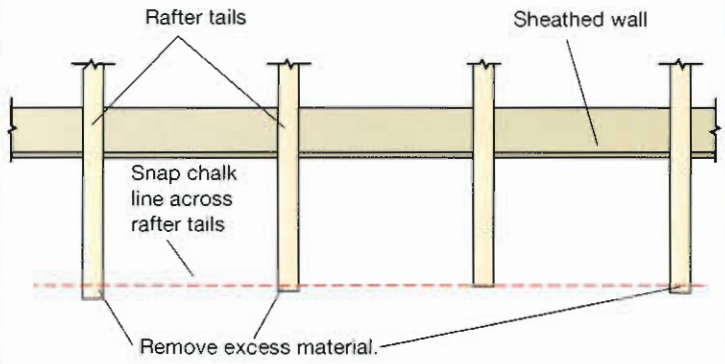
8.2



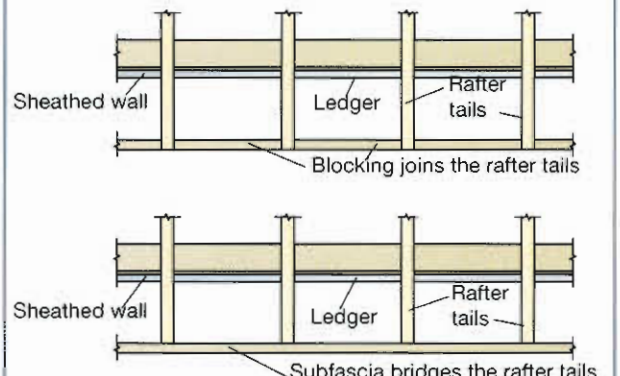
Installation of HardieSoffit® Panels (continued)

FRAMING PREP FOR SOFFIT PANELS

8.3



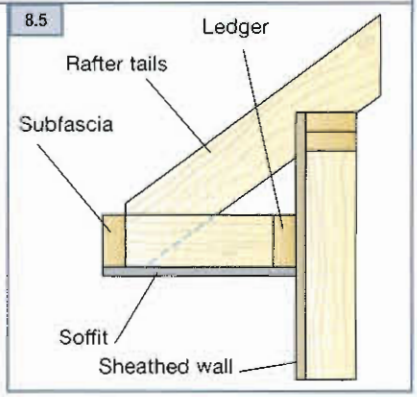
8.4



When installing the soffit:

1) Straighten the rafter tails by pulling and snapping a chalk line across the ends of the tails and then trimming them as necessary.
2) Install a solid wood sub-fascia on the ends of the rafter tails or install blocking between the rafter tails as needed.
3) If the soffit is to be installed level across its width, add nailers at every rafter or truss to provide support.
4) If the eaves are longer than 12 ft., measure and trim the first HardieSoffit® panel making sure that the end falls in the middle of a nailer.
5) Using the subfascia as a guide along the edge, carefully position the panel and secure with 4d common galvanized nails spaced no greater than 8 in. o.c. at all panel edges and on all intermediate framing members.
6) Continue with additional pieces until the run is complete.

8.5

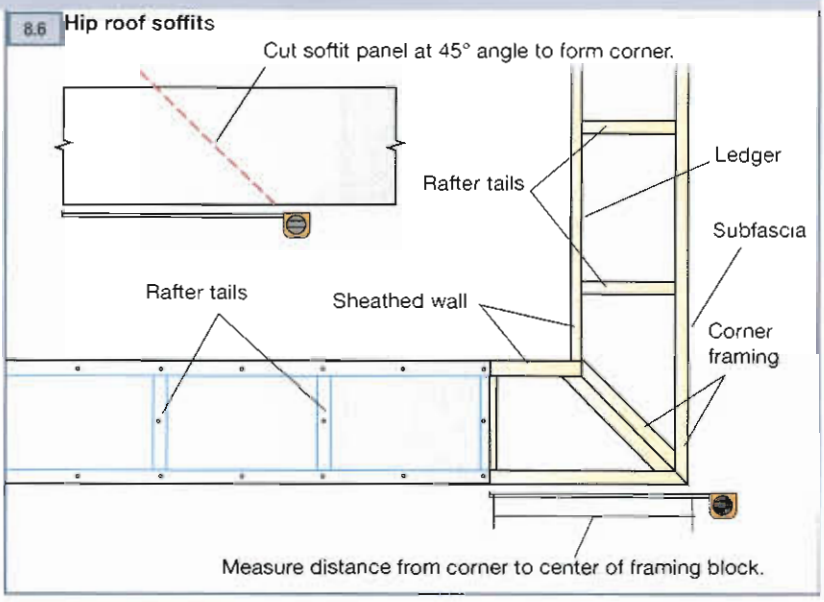


CUTTING 45° HIP ROOF SOFFITS

Hip roof soffits continue level around the corners of a house. The soffit panels should join at the corner with 45° angle cuts. To create these corners:

1) First measure from the corner to the perpendicular framing member closest to, but not over 12 ft.
2) Using that measurement and pulling from the factory cut end of the soffit panel, mark the outside edge of the soffit panel for the long point of the 45° cut.
3) After cutting the 45° angle, position the panel on the soffit framing and check the fit on both ends before fastening.
4) Begin nailing at the 45° cut end and work toward the factory end.

8.6 Hip roof soffits



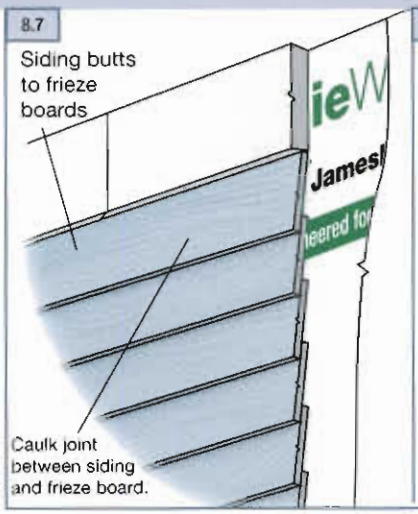
When using vented soffit, place the vented section of the panel toward the outside of the eave for optimum airflow.

INSTALLING FRIEZE BOARDS

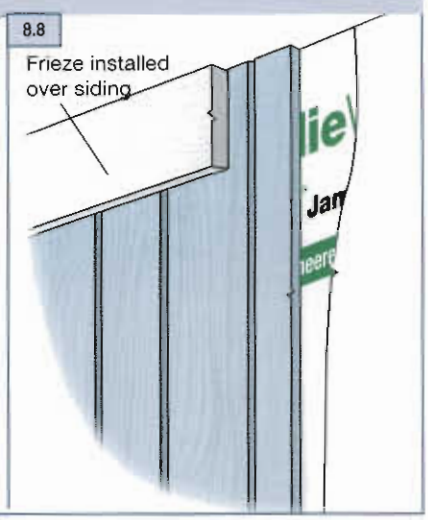
FRIEZE MADE FROM HARDIETRIM® 5/4, 4/4 BOARDS

When using lap and shingle sidings, install HardieTrim 5/4, 4/4 boards as a frieze board before putting in the siding. Then run courses of siding up to the frieze board and caulk the junction of the frieze board and siding. In a building sided with HardiePanel siding, the frieze board is commonly over the panel siding. If joints in the HardieTrim 5/4, 4/4 boards frieze are necessary for longer runs, join boards with a bevel cut. Nail the frieze board every 16 in. using finish or siding nails.

8.7



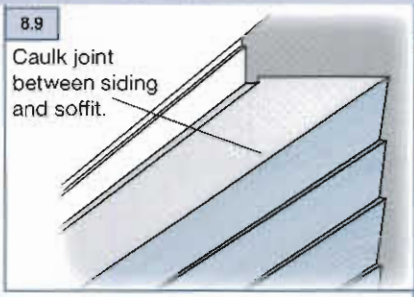
8.8



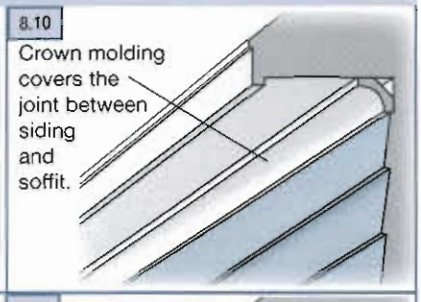
TREATMENT OPTIONS FOR THE SIDING/SOFFIT JUNCTURE

In addition to the frieze board treatments described above, there are several other options for finishing the juncture where the siding meets the soffit.

8.9



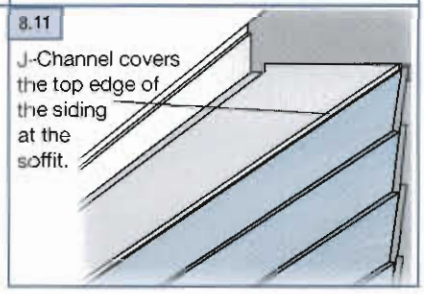
8.10



CAULK THE SIDING/SOFFIT JOINT

A fast and economical method of finishing the siding/soffit juncture is simply to run a bead of quality caulk along the top edge of the siding where it meets the soffit. A straight rip cut along the top edge of the siding ensures an aesthetically pleasing fit where it meets the soffit.

8.11



INSTALL CROWN MOLDING

Crown molding is another way of finishing and sealing the soffit/siding juncture. Install and finish the crown molding according to the manufacturer's specifications.

OVER THE TOP OF THE SIDING WITH 'J' CHANNEL

Once the soffit is in place, install a vinyl "J" channel upside down with the base of the "J" against the soffit. Then rip the final course of siding so that it fits inside the channel.

INSECT SCREEN

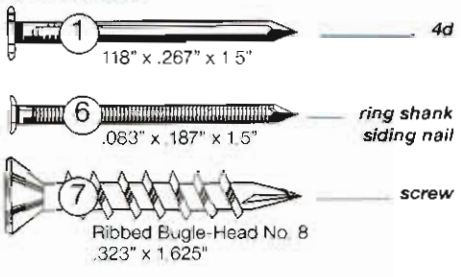
In areas where additional insect protection is desired, a screen may be applied to the back side of the panel prior to soffit installation. After the screen type and size is selected, cut the screen to fit so that it covers the vent holes and overlaps the non-vented area of the soffit by 1 in. to 2 in. Secure the screen to the backside of the soffit panel using a bead of construction adhesive.

***TIP:** Stainless steel fasteners are recommended when installing James Hardie® products.*

HARDIESOFFIT® PANEL FASTENER SPECIFICATIONS

Fastening Substrate		Approved Fastener
wood studs	16" o.c	1 6
	22.5" o.c.	6
	24" o.c.	1
steel studs	16" o.c.	7

Fastening Types

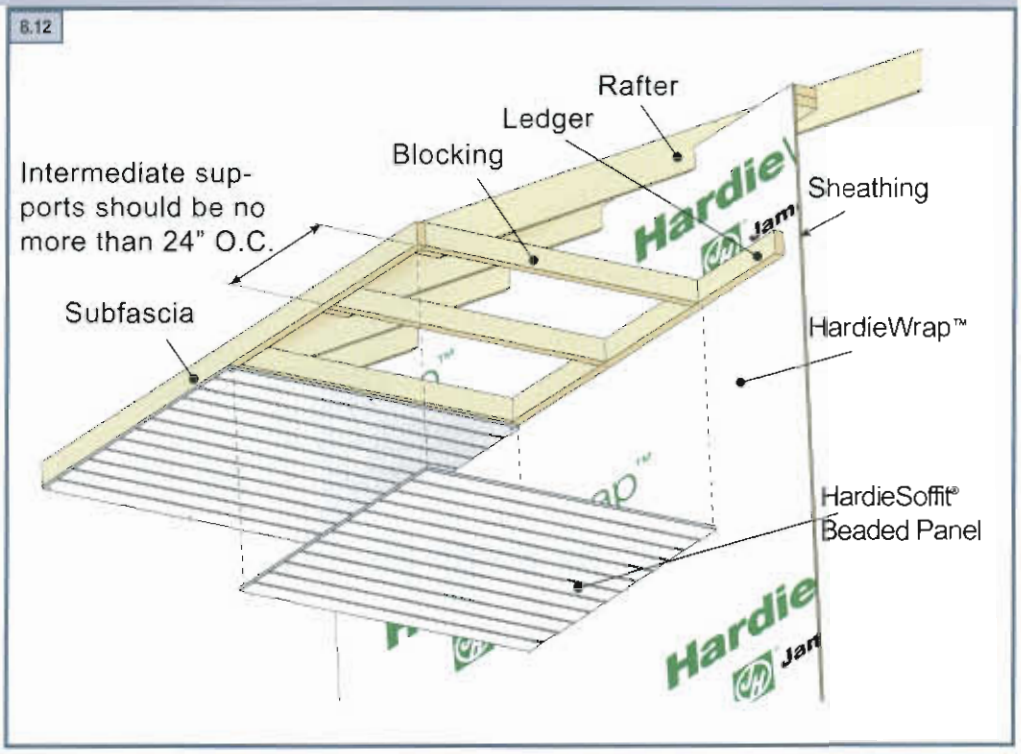


Please note that the addition of an insect screen reduces the total amount of vent area of the soffit depending on the size screen used.

Installation of HardieSoffit® Beaded Porch Panels

BEADED PORCH PANEL FRAMING

HardieSoffit Beaded Porch Panel must be attached to either steel or wood normal 2x4 framing members spaced a maximum 24 in on center. All edges must be supported by framing.

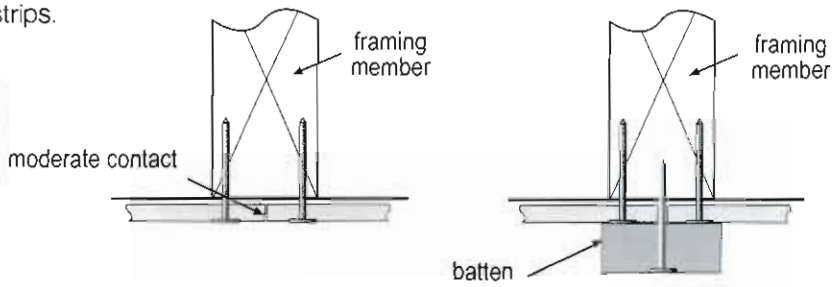


***TIP:** Stainless steel fasteners are recommended when installing James Hardie products near the ocean, large bodies of water, or in very humid climates.*

JOINT TREATMENT FOR BEADED PORCH PANEL

There are several ways to treat the joints of HardieSoffit beaded porch panels. The panel edges can be butted in moderate contact, leave a gap and caulk; or joints can be covered with Hardietrim batten strips.

***TIP:** Do not use finish nails for HardieSoffit beaded porch panel installation.*



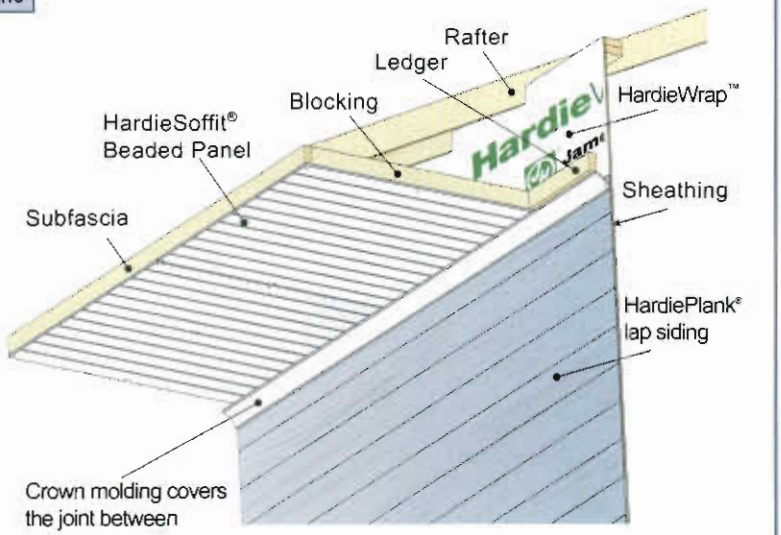
HANDLING DURING INSTALLATION

Special precautions may be needed for carrying the panel during installation because of its larger size. James Hardie recommends the use of a T shape frame to support the panel during installation.

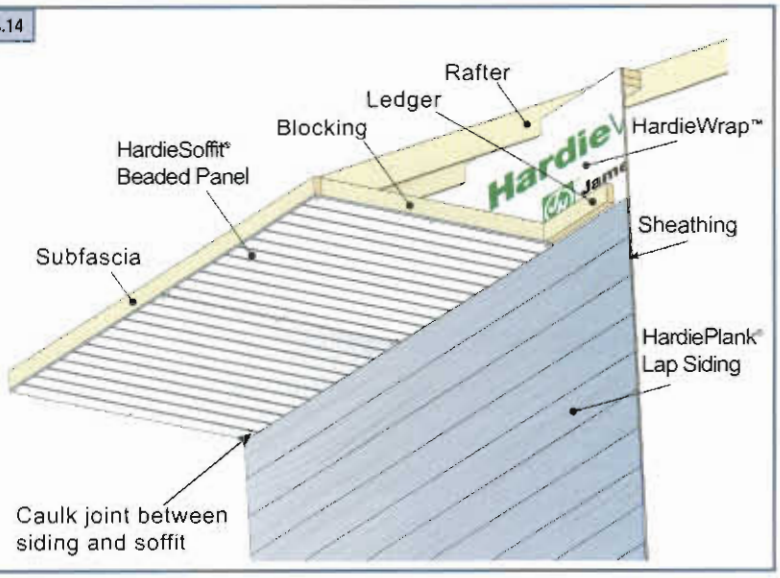
SIDING/BEADED PORCH PANEL JOINT

A fast and economical method of finishing the siding/porch panel juncture is simply to run a bead of quality caulk along the top edge of the siding where it meets the soffit. A straight rip cut along the top edge of the siding ensures an aesthetically pleasing fit where it meets the beaded porch panel.

8.13



8.14



HardieSoffit® Panels

HZ5™

JamesHardie®

EFFECTIVE APRIL 2009

INSTALLATION REQUIREMENTS - PRIMED & COLORPLUS® PRODUCTS

Visit www.jameshardie.com for the most recent version.

IMPORTANT: FAILURE TO INSTALL AND FINISH THIS PRODUCT IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND JAMES HARDIE WRITTEN APPLICATION INSTRUCTIONS MAY LEAD TO PERSONAL INJURY, AFFECT SYSTEM PERFORMANCE, VIOLATE LOCAL BUILDING CODES, AND VOID THE PRODUCT ONLY WARRANTY. BEFORE INSTALLATION, CONFIRM THAT YOU ARE USING THE CORRECT HARDIEZONE INSTRUCTIONS. TO DETERMINE WHICH HARDIEZONE APPLIES TO YOUR LOCATION, VISIT WWW.HARDIEZONE.COM OR CALL 1-866-942-7343 (866 9HARDIE)

STORAGE & HANDLING:

Store flat and keep dry and covered prior to installation. Installing siding wet or saturated may result in shrinkage at butt joints. Carry planks on edge. Protect edges and corners from breakage. James Hardie is not responsible for damage caused by improper storage and handling of the product.

⚠ CUTTING INSTRUCTIONS

OUTDOORS

1. Position cutting station so that wind will blow dust away from user and others in working area.
2. Use one of the following methods:
   - a. Best: i. Score and snap; ii. Shears (manual, electric or pneumatic)
   - b. Better: i. Dust reducing circular saw equipped with a HardieBlade™ saw blade and HEPA vacuum extraction
   - c. Good: i. Dust reducing circular saw with a HardieBlade saw blade (only use for low to moderate cutting)

INDOORS

1. Cut only using score and snap, or shears (manual, electric or pneumatic)
2. Position cutting station in well-ventilated area

- NEVER use a power saw indoors
- NEVER use a circular saw blade that does not carry the HardieBlade saw blade trademark
- NEVER dry sweep – Use wet suppression or HEPA Vacuum

Important Note: For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best"-level cutting methods where feasible.

NIOSH-approved respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.com to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

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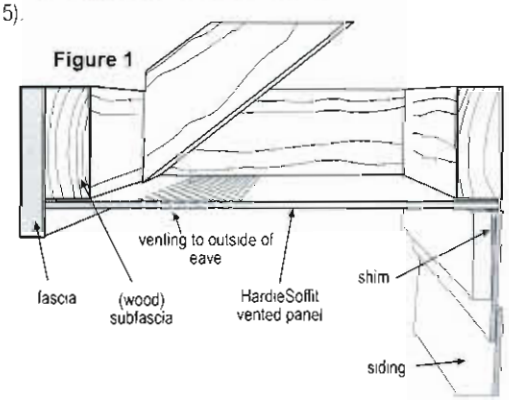
GENERAL REQUIREMENTS:

- HardieSoffit® panels may be installed over either steel or wood framing complying with the local building code. Install soffits to nominal 2 x 4 framing members spaced a maximum of 24 inches on center (fig 4),
- All edges must be supported by framing. (figs. 3 & 4)
- Install water barriers and air barriers as required by local building codes. James Hardie will assume no responsibility for moisture infiltration.
- Ensure gutters have end caps. Maintain a minimum 1" gap between end caps and siding & trim (fig 5).
- Install kickout flashing at roof-wall junctions. (fig 6.)
- DO NOT use stain on James Hardie® products.

INSTALLATION:

- HardieSoffit panels must be fastened to a solid, nailable substrate such as a wood 2x subfascia.
- Additional framing may be needed to ensure proper fastening.
- Soffits can be installed as shown in figure 1. Position the vent holes toward the outside of the eave for optimal airflow
- 12" to 24" wide Vented HardieSoffit panels, provide 5.0 square inches of net free ventilation per lineal foot.
- Alternatively vents can be installed into non-vented soffit.
- If necessary, an insect screen can be installed using construction adhesive. Note: net free ventilation will be reduced

Figure 1



Fastener Requirements

- Position fasteners 3/8" from panel edges and no closer than 2" away from corners when using soffit greater than 12" wide (fig. 4) and no closer than 1" away from corners when using soffit that is less than or equal to 12" wide (fig. 3)

Jointing Methods

- Install panels in moderate contact at ends, provide PVC or metal jointers, battens or leave appropriate gap and caulk (fig 2).

Figure 2

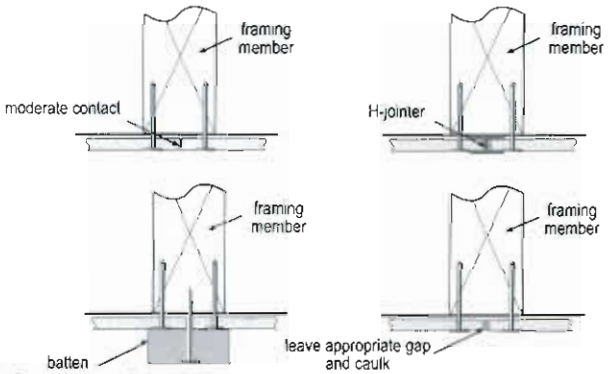


Figure 3

less than or equal to 12" Wide Soffit

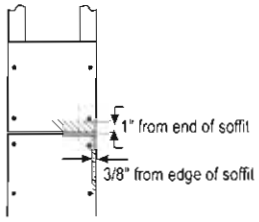
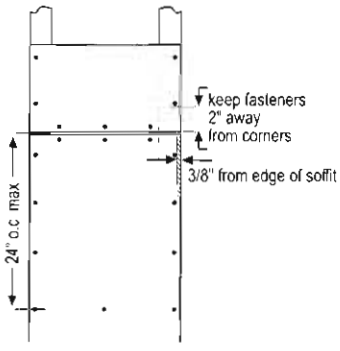


Figure 4

Greater than 12" Wide Soffit



For additional information on HardieWrap™ Weather Barrier, consult James Hardie at 1-866-4Hardie or www.hardiewrap.com

WARNING: AVOID BREATHING SILICA DUST

James Hardie® products contain respirable crystalline silica, which is known to the State of California to cause cancer and is considered by IARC and NIOSH to be a cause of cancer from some occupational sources. Breathing excessive amounts of respireble silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) use fiber cement shears for cutting or, where not feasible, use a HardieBlade saw blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area; (4) wear a properly-fitted, NIOSH-approved dust mask or respirator (e.g. N-95) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods - never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheet available at www.jameshardie.com or by calling 1-800-9HARDIE (1-800-942-7343). FAILURE TO ADHERE TO OUR WARNINGS, MSDS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

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Maintain a minimum 1" gap between gutter end caps and siding & trim.

Figure 5

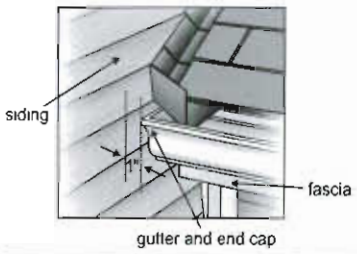
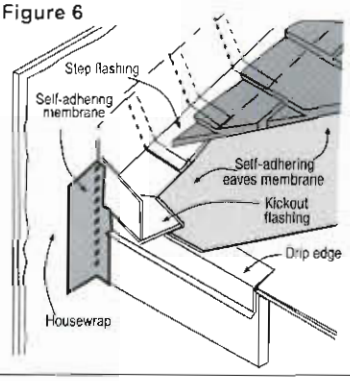


Figure 6



KICKOUT FLASHING

Because of the volume of water that can pour down a sloped roof, one of the most critical flashing details occurs where a roof intersects a sidewall. The roof must be flashed with step flashing. Where the roof terminates, install a kickout to deflect water away from the siding. It is best to install a self-adhering membrane on the wall before the subfascia and trim boards are nailed in place, and then come back to install the kickout

Figure 6, Kickout Flashing‡ To prevent water from dumping behind the siding and the end of the roof intersection, install a "kickout" of sufficient length and angle to direct the water running down the roof away from the siding

FASTENER REQUIREMENTS

- For wood frame construction a minimum 4d common nails spaced 8" o.c. at panel edges and intermediate framing members spaced up to 24" on center are suitable in most locations*
- For conventional 20ga steel frame construction a minimum No. 8-18 x 0.323" HD x 1" long ribbed bugle screws spaced 6" o.c. at panel edges and intermediate framing members spaced up to 24" on center are suitable in most locations**

**Minimum Basic Wind Speed differs by locality. Where specified levels of wind resistance are required, refer to applicable Building Code Compliance Reports.

GENERAL FASTENING REQUIREMENTS

Fasteners must be corrosion resistant, galvanized, or stainless steel. Electro-galvanized are acceptable but may exhibit premature corrosion. James Hardie recommends the use of quality, hot-dipped galvanized nails. James Hardie is not responsible for the corrosion resistance of fasteners. Stainless steel fasteners are recommended when installing James Hardie® products near the ocean, large bodies of water, or in very humid climates.

PNEUMATIC FASTENING

James Hardie products can be hand nailed or fastened with a pneumatic tool. Pneumatic fastening is highly recommended. Set air pressure so that the fastener is driven snug with the surface of the siding. A flush mount attachment on the pneumatic tool is recommended. This will help control the depth the nail is driven. If setting the nail depth proves difficult, choose a setting that under drives the nail. (Drive under driven nails snug with a smooth faced hammer - Does not apply for installation to steel framing).

- Consult applicable code compliance report for correct fasteners type and placement to achieve specified design wind loads.
- NOTE: Published wind loads may not be applicable to all areas where Local Building Codes have specific jurisdiction. Consult James Hardie Technical Services if you are unsure of applicable compliance documentation.
- Drive fasteners perpendicular to siding and framing.
- Fastener heads should fit snug against siding (no air space). (fig. A)
- Do not over-drive nail heads or drive nails at an angle
- If nail is countersunk, caulk nail hole and add a nail. (fig. B)
- For wood framing, under driven nails should be hit flush to the plank with a hammer (For steel framing, remove and replace nail).
- **Do not use aluminum fasteners, staples, or clipped head nails.**

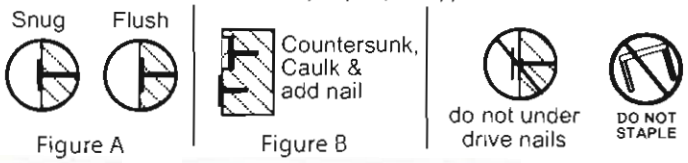


Figure A Figure B

CAULKING

For best results use an Elastomeric Joint Sealant complying with ASTM C920 Grade NS, Class 25 or higher or a Latex Joint Sealant complying with ASTM C834. Caulking/Sealant must be applied in accordance with the caulking/sealant manufacturer's written instructions or ASTM C1193.

PAINTING

DO NOT use stain on James Hardie® products. James Hardie products must be painted within 180 days for primed product and 90 days for unprimed. 100% acrylic topcoats are recommended. Do not paint when wet. For application rates refer to paint manufacturers specifications. Back-rolling is recommended if the siding is sprayed.

COLORPLUS® TECHNOLOGY CAULKING, TOUCH-UP & LAMINATE

- Touch up nicks, scrapes and nail heads using the ColorPlus® Technology touch-up applicator. Touch-up paint should be used sparingly. If large areas require touch-up, replace the damaged area with new HardieSoffit® panel with ColorPlus Technology.
- Laminate sheet must be removed immediately after installation of each course
- Terminate non-factory cut edges into trim where possible, and caulk. Color matched caulks are available from your ColorPlus dealer.
- Treat all other non-factory cut edges using the ColorPlus Technology edge coaters, available from your ColorPlus® product dealer.

PAINTING JAMES HARDIE® PRODUCTS WITH COLORPLUS® TECHNOLOGY

When repainting ColorPlus products, James Hardie recommends the following regarding surface preparation and topcoat application:

- Ensure the surface is clean, dry, and free of any dust, dirt, or mildew
- Repriming is normally not necessary
- 100% acrylic topcoats are recommended
- DO NOT use stain or oil/alkyd base paints on James Hardie® products
- Apply finish coat in accordance with paint manufacturers written instructions regarding coverage, application methods, and application temperature

‡ The illustration (figure 6) was reprinted with permission of THE JOURNAL OF LIGHT CONSTRUCTION. For subscription information, visit www.jlconline.com.

RECOGNITION: In accordance with ICC-ES Legacy Report NER-405, HardieSoffit panel is recognized as a suitable alternate to that specified in: the BOCA National Building Code/1999, the 1997 Standard Building Code, the 1997 Uniform Building Code, the 1998 International One- and Two-Family Dwelling Code, the 2003 International Building Code, and the 2003 International Residential Code for One-and Two-Family Dwellings. Hardiesoffit panel is also recognized for application in the following: City of Los Angeles Research Report No. 24862, State of Florida listing FL#889, Dade County, Florida NOA No. 02-0729.02, U.S. Dept. of HUD Materials Release 1263c, Texas Department of Insurance Product Evaluation EC-23, City of New York MEA 223-93-M, and California DSA PA-019. These documents should also be consulted for additional information concerning the suitability of this product for specific applications.

Please visit www.jameshardie.com for Additional Product Information and Availability, Installation Information, Warnings, and Warranties

JamesHardie®

HardieSoffit® HZ5™
Beaded Porch Panels

JamesHardie

EFFECTIVE APRIL 2009

INSTALLATION REQUIREMENTS - PRIMED & COLORPLUS® PRODUCTS

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   - b. Better: i. Dust reducing circular saw equipped with a HardieBlade® saw blade and HEPA vacuum extraction
   - c. Good: i. Dust reducing circular saw with a HardieBlade saw blade (only use for low to moderate cutting)

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2. Position cutting station in well-ventilated area

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- NEVER use a circular saw blade that does not carry the HardieBlade saw blade trademark
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NIOSH-approved respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.com to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

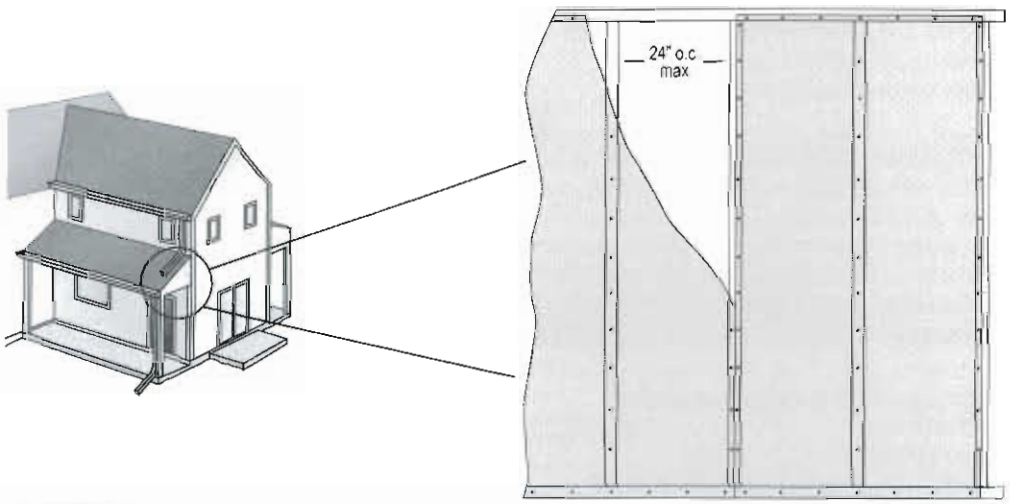
GENERAL REQUIREMENTS:

- HardieSoffit® beaded porch panels may be installed as a soffit or ceiling over either steel or wood framing complying with the local building code. Install soffits to nominal 2 x 4 framing members spaced a maximum of 24 inches on center (fig.1), with the long dimension perpendicular to the rafter or joist framing.
- All edges must be supported by framing. (fig. 1)
- Install water barriers and air barriers as required by local building codes. James Hardie will assume no responsibility for moisture infiltration.
- DO NOT use stain on James Hardie® products.
- Ensure gutters have end caps. Maintain a minimum 1" gap between end caps and siding & trim (fig.5).
- Install kickout flashing at roof-wall junctions. (fig 6.)
- DO NOT use finish nails

INSTALLATION:

- HardieSoffit beaded porch panels must be fastened to a solid, nailable substrate such as wood.
- Additional framing may be needed to ensure proper fastening.
- Panels can be installed as shown in figure 1.

Figure 1



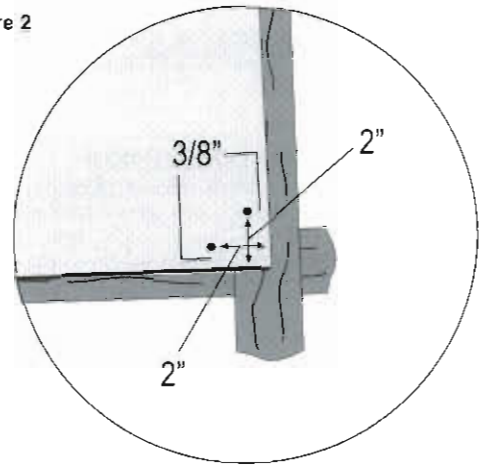
WARNING: AVOID BREATHING SILICA DUST

James Hardie® products contain respirable crystalline silica, which is known to the State of California to cause cancer and is considered by IARC and NIOSH to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) use fiber cement shears for cutting or, where not feasible, use a HardieBlade® saw blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area; (4) wear a properly-fitted, NIOSH-approved dust mask or respirator (e.g. N-95) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods - never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheet available at www.jameshardie.com or by calling 1-800-9HARDIE (1-800-942-7343). FAILURE TO ADHERE TO OUR WARNINGS, MSDS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

Fastener Requirements

- Position fasteners 3/8" from panel edges and and no closer than 2" away from corners (Figure 2).

Figure 2



Jointing Methods

- Panel ends are to be butted together as shown in Figure 3.
- Install panels in moderate contact at ends with or without battens (Figure 4).

Figure 3

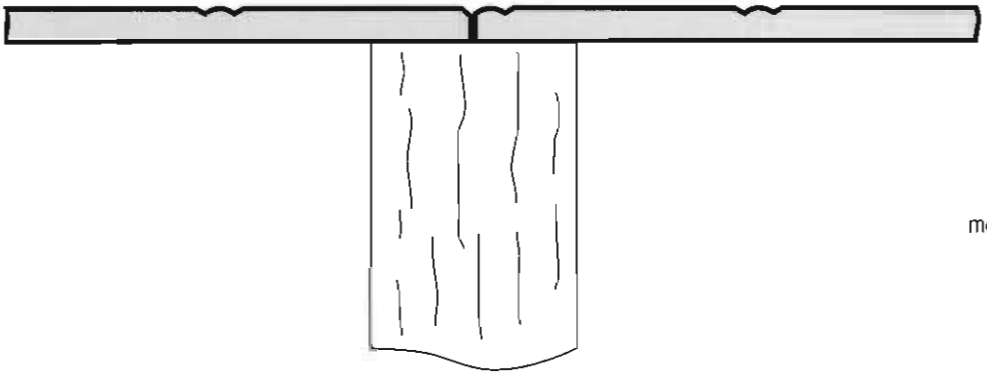
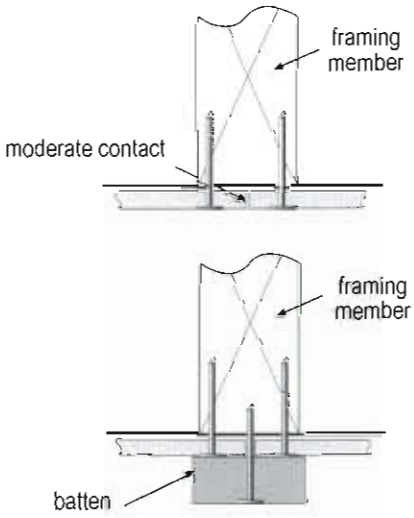


Figure 4



Maintain a minimum 1" gap between gutter end caps and siding & trim.

Figure 5

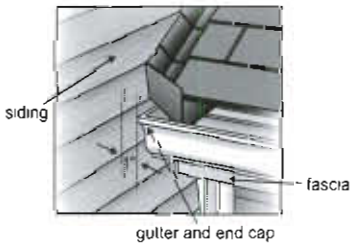
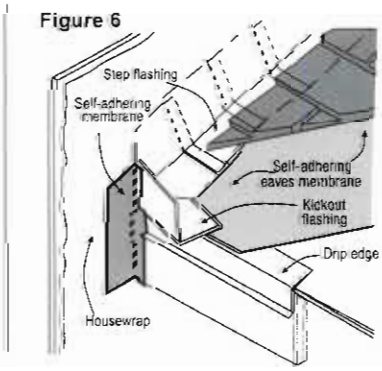


Figure 6



KICKOUT FLASHING

Because of the volume of water that can pour down a sloped roof, one of the most critical flashing details occurs where a roof intersects a sidewall. The roof must be flashed with step flashing. Where the roof terminates, install a kickout to deflect water away from the siding.

It is best to install a self-adhering membrane on the wall before the subfascia and trim boards are nailed in place, and then come back to install the kickout.

Figure 6, Kickout Flashing* To prevent water from dumping behind the siding and the end of the roof intersection, install a "kickout" of sufficient length and angle to direct the water running down the roof away from the siding.

*The illustration (figure 6) was reprinted with permission of THE JOURNAL OF LIGHT CONSTRUCTION. For subscription information, visit: www.jlconline.com.

FASTENER REQUIREMENTS

- For wood frame construction a minimum 4d common nails spaced 8" o.c. at panel edges and intermediate framing members spaced up to 24" on center are suitable in most locations**.
- For conventional 20ga steel frame construction a minimum No. 8-18 x 0.323" HD x 1" long ribbed bugle screws spaced 6" o.c. at panel edges and intermediate framing members spaced up to 24" on center are suitable in most locations**.

** Minimum Basic Wind Speed differs by locality. Where specified levels of wind resistance are required, refer to applicable Building Code Compliance Reports.

GENERAL FASTENING REQUIREMENTS

Fasteners must be corrosion resistant, galvanized, or stainless steel. Electro-galvanized are acceptable but may exhibit premature corrosion. James Hardie recommends the use of quality, hot-dipped galvanized nails. James Hardie is not responsible for the corrosion resistance of fasteners. Stainless steel fasteners are recommended when installing James Hardie® products near the ocean, large bodies of water, or in very humid climates.

PNEUMATIC FASTENING

James Hardie products can be hand nailed or fastened with a pneumatic tool. Pneumatic fastening is highly recommended. Set air pressure so that the fastener is driven snug with the surface of the siding. A flush mount attachment on the pneumatic tool is recommended. This will help control the depth the nail is driven. If setting the nail depth proves difficult, choose a setting that under drives the nail. (Drive under driven nails snug with a smooth faced hammer - Does not apply for installation to steel framing).

- Consult applicable code compliance report for correct fasteners type and placement to achieve specified design wind loads.
- NOTE: Published wind loads may not be applicable to all areas where Local Building Codes have specific jurisdiction. Consult James Hardie Technical Services if you are unsure of applicable compliance documentation.
- Drive fasteners perpendicular to siding and framing.
- Fastener heads should fit snug against siding (no air space). (fig. A)
- Do not over-drive nail heads or drive nails at an angle.
- If nail is countersunk, caulk nail hole and add a nail. (fig. B)
- For wood framing, under driven nails should be hit flush to the plank with a hammer (For steel framing, remove and replace nail).
- **Do not use aluminum fasteners, staples, or clipped head nails.**

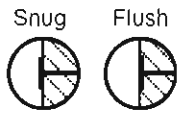


Figure A

Figure B

CAULKING

For best results use an Elastomeric Joint Sealant complying with ASTM C920 Grade NS, Class 25 or higher or a Latex Joint Sealant complying with ASTM C834. Caulking/Sealant must be applied in accordance with the caulking/sealant manufacturer's written instructions or ASTM C1193.

PAINTING

DO NOT use stain on James Hardie products.
James Hardie products must be painted within 180 days for primed product and 90 days for unprimed.
100% acrylic topcoats are recommended.
Do not paint when wet. For application rates refer to paint manufacturers specifications.
Back-rolling is recommended if the siding is sprayed.

COLORPLUS® TECHNOLOGY CAULKING, TOUCH-UP & LAMINATE

- Touch up nicks, scrapes and nail heads using the ColorPlus® Technology touch-up applicator. Touch-up paint should be used sparingly. If large areas require touch-up, replace the damaged area with new HardieSoffit® panel with ColorPlus Technology.
- Laminate sheet must be removed immediately after installation.
- Terminate non-factory cut edges into trim where possible, and caulk. Color matched caulks are available from your ColorPlus product dealer.
- Treat all other non-factory cut edges using the ColorPlus Technology edge coaters, available from your ColorPlus product dealer.

PAINTING JAMES HARDIE® PRODUCTS WITH COLORPLUS® TECHNOLOGY

When repainting ColorPlus products, James Hardie recommends the following regarding surface preparation and topcoat application:

- Ensure the surface is clean, dry, and free of any dust, dirt, or mildew.
- Repriming is normally not necessary.
- 100% acrylic topcoats are recommended.
- DO NOT use stain or oil/alkyd base paints on James Hardie products.
- Apply finish coat in accordance with paint manufacturers written instructions regarding coverage, application methods, and application temperature.

RECOGNITION In accordance with ICC-ES Legacy Report NER-405, HardieSoffit® panel is recognized as a suitable alternate to that specified in the BOCA National Building Code/1999, the 1997 Standard Building Code, the 1997 Uniform Building Code, the 1998 International One- and Two-Family Dwelling Code, the 2003 International Building Code, and the 2003 International Residential Code for One and Two Family Dwellings. HardieSoffit panel is also recognized for application in the following: City of Los Angeles Research Report No 24862, State of Florida listing FL#889, Dade County, Florida NOA No 02-0729 02, U S. Dept. of HUD Materials Release 1263c, Texas Department of Insurance Product Evaluation EC-23, City of New York MEA 223-93-M, and California DSA PA-019 These documents should also be consulted for additional information concerning the suitability of this product for specific applications

Please visit www.jameshardie.com for Additional Product Information and Availability, Installation Information, Warnings, and Warranties

JamesHardie

HardiePlank® Lap Siding Product Description

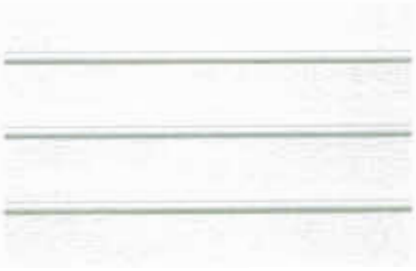
HardiePlank® lap siding is factory-primed fiber-cement lap siding available in a variety of styles and textures. Please see your local James Hardie® product dealer for product availability. HardiePlank lap siding comes in 12-ft. lengths. Nominal widths from 5 1/4 in. to 12 in. create a range of exposures from 4 in. to 10 3/4 in.

HardiePlank lap siding is also available with ColorPlus® Technology as one of James Hardie's prefinished products. ColorPlus® Technology is a factory applied, oven-baked finish available on a variety of James Hardie siding and trim products. See your local dealer for details and availability of products, colors, and accessories.

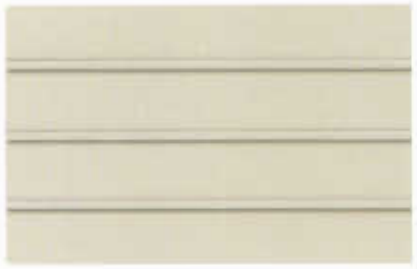
The HZ5™ product line is right at home in climates with freezing temperatures, seasonal temperature variations, snow and ice. HZ5™ boards are the result of our generational evolution of our time-tested products. We've evolved our substrate composition to be specifically designed to perform in conditions found in these climates. To ensure that its beauty matches its durability, we've engineered the surface for higher performance, giving it superior paint adhesion and moisture resistance. In addition, we've added a drip edge to the HardiePlank® HZ5™ lap siding product to provide improved water management in conditions specific to HZ5™ climates.

Cedarmill©

Smooth



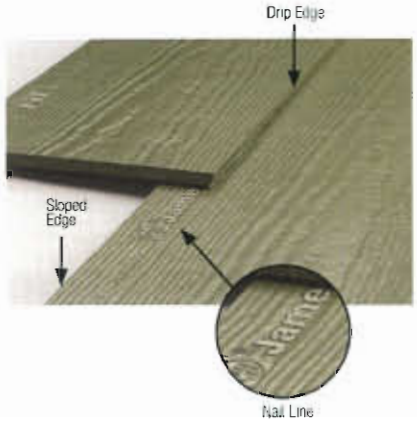
Beaded Cedarmill©



Beaded Smooth

Colonial Roughsawn

Colonial Smooth



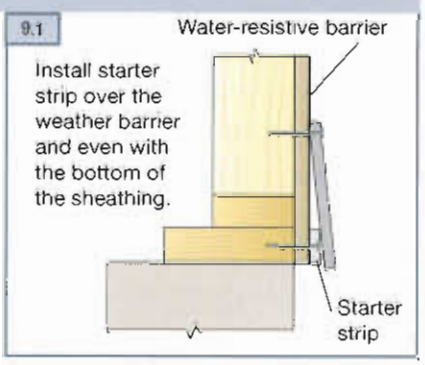
Installation of HardiePlank® Lap Siding

INSTALL A STARTER STRIP

HardiePlank® lap siding requires a starter strip beneath the first course to set it on the proper angle and to create a proper drip edge at the bottom of the siding. Starter strips are easily made by ripping 1¼-in. pieces of HardiePlank siding from full or partial planks.

The bottom of the starter strip should be installed even with the bottom of the mudsill or the bottom edge of the sheathing. The strip must be installed over the water-resistive barrier, but occasional gaps should be left in the starter strip to allow accumulated moisture behind the siding to drain away safely.

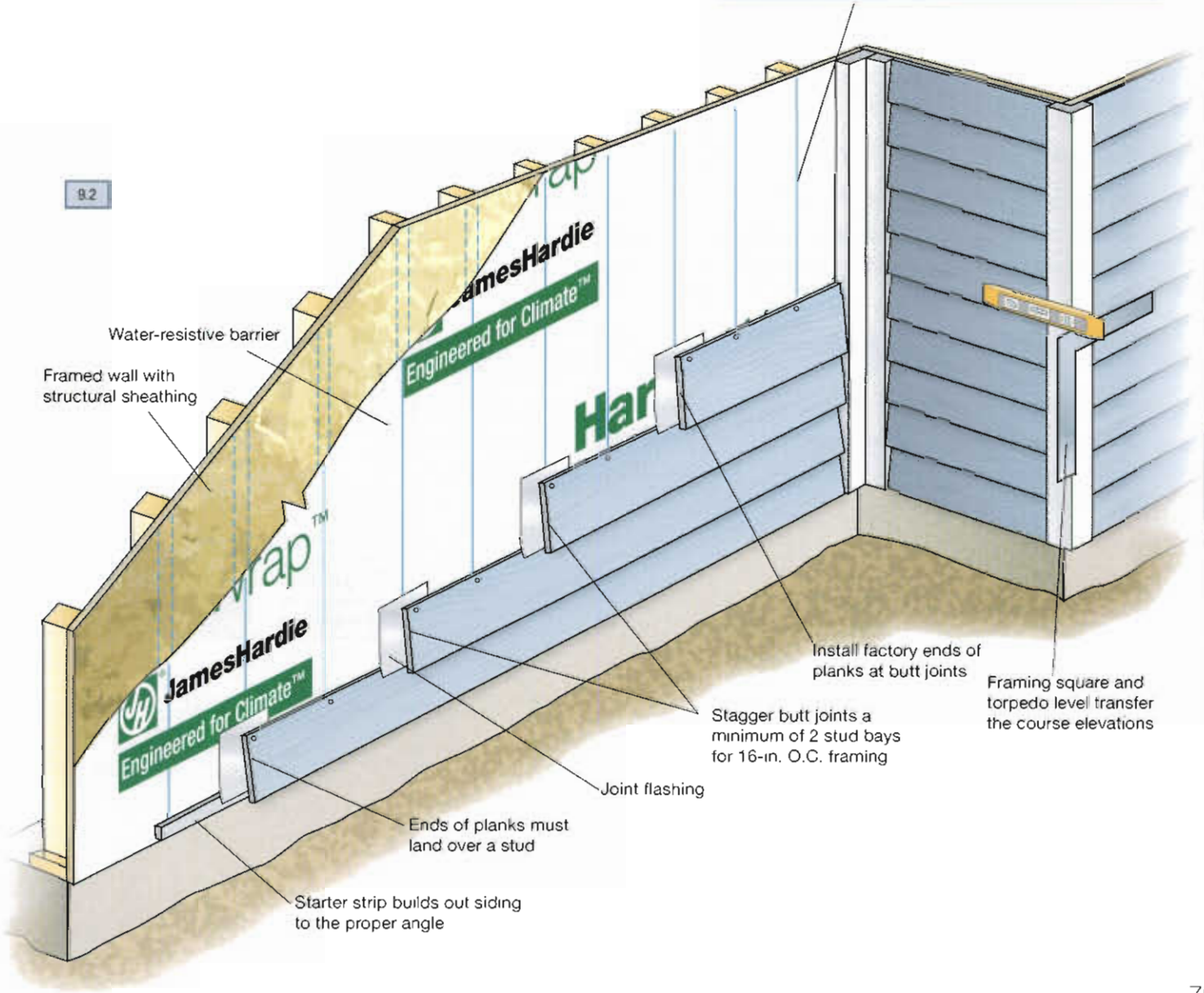
9.1



OVERVIEW OF HARDIEPLANK LAP SIDING

***TIP:** For accurate fastening, snap vertical chalk lines on the water-resistive barrier at the center of every stud location.*

9.2

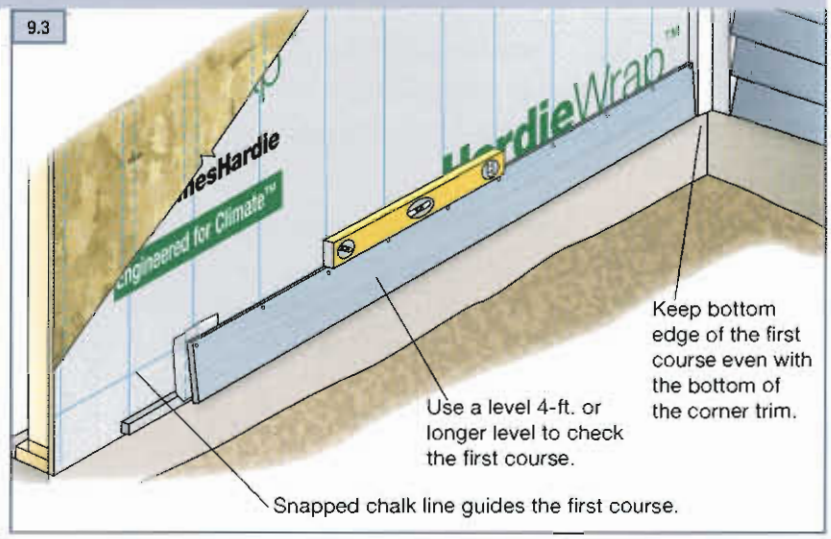


Installation of HardiePlank® Lap Siding (continued)

INSTALLING THE PLANKS

The first course of HardiePlank® siding is critical to the proper installation of the plank on the rest of the building. The first course should start at the lowest point of the house. Special attention should be made to ensure that it's straight and level. Attention should also be paid to staggering any butt joints in the planks so that the installation is attractive while making efficient use of material.

9.3



1) Use a level (4-ft. or longer) or chalked level line to be sure that the first course is level. As installation proceeds up the wall, periodically check the level and straightness of the courses. It is good practice to snap a chalk line every 3 to 5 courses to keep the planks straight and level.

2) Position the bottom edge of the first course of siding a minimum 1/4-in. below the edge of the starter strip and secure (check with local building codes).

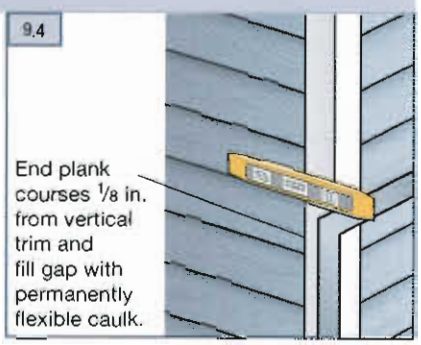
3) Run the siding to the HardieTrim® board leaving a 1/8-in. gap between the siding and trim.

The bottom of the siding should be kept even with the bottom of the trim, or if desired, the trim may extend below the bottom of the siding. But the siding should never hang below the trim. When installing the first course make sure ground clearances are in accordance with James Hardie requirements and those of local codes.

PLANK ALIGNMENT AT CORNERS

For the best looking installation, make sure that the heights of the plank courses match on both sides of a corner. Use a framing square, speed square or a level to match up the plank heights. Check every few courses to make sure proper heights are being maintained.

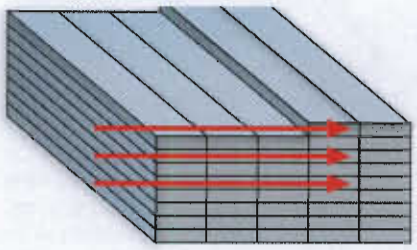
9.4



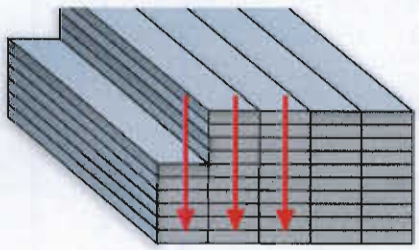
HANDLING

IMPORTANT: To prevent damage to the drip edge, extra care should be taken when removing planks from the pallet, while handling, and when installing with a lap gauge. Planks are interlocked together on the pallet, therefore they should be removed from the pallet horizontally (side to side) to allow planks to unlock themselves from one another.

Pull from across the stack



Do not go down the stack

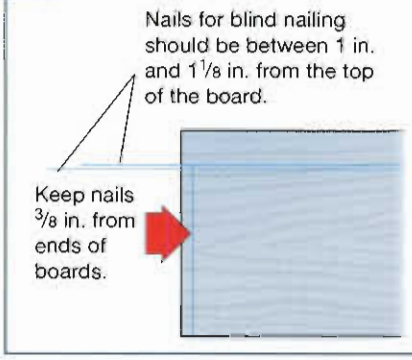


TIP: When taking planks from the pallet installation, avoid repeating the texture pattern by working across the pallet. Two to four planks can be removed from a stack at one time. But then material should be taken from adjacent stacks, again working across the pallet. Texture repeat is typically a concern on large walls with few breaks, such as windows or doors.

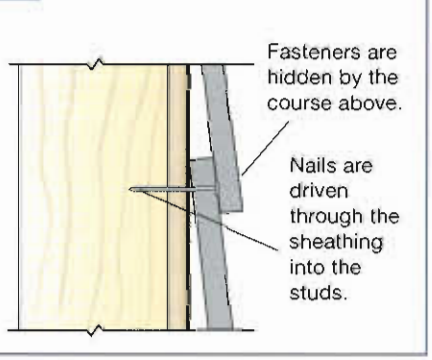
BLIND NAILING (nailing through top of plank)

Blind nailing is recommended for installing any type of HardiePlank® lap siding including ColorPlus® siding. With blind nailing, each course covers the fasteners on the course below, which provides a better looking installation.

9.5 **Blind nailing measurments**



9.6 **Blind nailing**



For blind nailing HardiePlank lap siding, James Hardie recommends driving fasteners 1⅛ in. from the top edge of the plank. Additionally fasteners should be placed no closer than ⅜ in. from the ends of the plank.

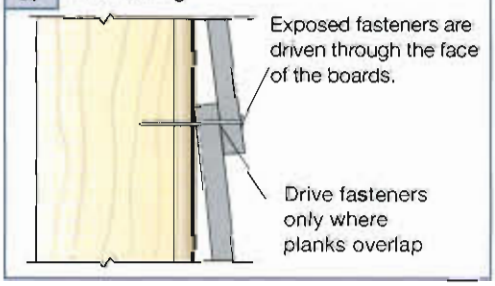
HardiePlank® HZ5™ Lap Siding is manufactured with a nail line that should be used as a guide for proper nail placement when blind nailing. This nail line should not be used as a lap line.

Avoid placing fasteners near the top edge of the plank. This practice, called "high nailing", may lead to loose planks, unwanted gaps or rattling. **Pinning of butt joints with a finish nail may be done for aesthetic purposes only. The finish nail should nailed flush to the surface (not countersunk), must be fully corrosion resistant (e.g. galvanized or stainless) and does not provide any structural support**.

FACE NAILING (nailing through the overlap at the bottom of the plank)

Although blind nailing is recommended by James Hardie, face nailing may be required for certain installations including: installations in high wind areas, fastening into OSB or equivalent sheathing without penetrating a stud, or when dictated by specific building codes . Refer to Appendix B for related code matters.

9.7 **Face nailing**



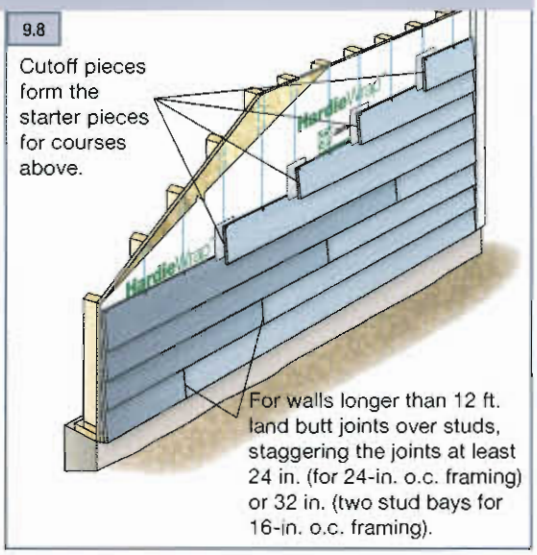
Installation of HardiePlank® Lap Siding (continued)

STAGGERING THE BUTT JOINTS

For walls longer than 12 ft., it is necessary to butt joint additional lengths of HardiePlank siding. These butt joints should be staggered to avoid noticeable patterns, which is determined by the placement of the first course. Butt joints between consecutive courses should be spaced apart by at least two stud bays for 16-in, o.c. framing or one bay for 24-in. o.c. framing.

While random placement of the planks is usually the most aesthetically pleasing, a progressive stagger pattern can make the job easier and faster without the pattern becoming too noticeable. With this strategy, the cut off piece for one course becomes the starter piece for a course above, making efficient use of materials and ensuring that all butt joints land on studs. The pattern can be modified for different stud placement.

9.8



JOINT FLASHING

The recommended method for butting factory-finish ends for all HardiePlank® lap siding is moderate contact over a piece of joint flashing. **This method is required for joining ColorPlus® lap siding products.**

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-resistive barriers. Other products may also be suitable.

***Refer to Appendix for more information.**

Summary of James Hardies position:

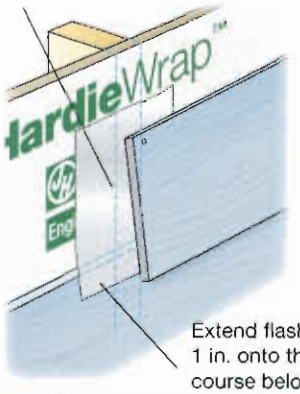
HardiePlank® Lap Siding with ColorPlus® Technology – Joint flashing behind field butt joints is required, the use of caulk will not be warranted.

HardiePlank® Lap Siding Primed – Recommend the use of joint flashing, but the use of caulk will not void the warranty.

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.

9.9



9.10

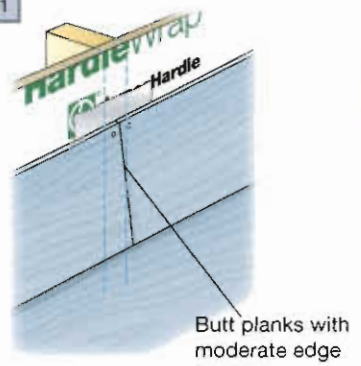

Do not use caulk on HardiePlank® lap siding with ColorPlus® technology

JOINT PLACEMENT AND TREATMENT

Butt joints in HardiePlank lap siding should always land on a stud. Butt joints between studs are not recommended and should be avoided. Whenever possible, factory-finished ends should be used at butt joints.

Place cut ends where the siding meets a corner, door, window trim, or other break in the wall where the joint is to be caulked. If cut ends are used in a butt joint between planks, James Hardie requires painting or priming cut ends for primed products. For ColorPlus products, use the color-matched edge coater to finish the cut end.

9.11



COLORPLUS® TIP: When installing HardiePlank lap siding with ColorPlus Technology, position the plank in the immediate area where the plank is to be fastened. Do not place the plank on the course below and slide into position. Doing so may scuff or scratch the ColorPlus finish on the installed piece.

Installation of HardiePlank® Lap Siding

CONTINUING THE INSTALLATION

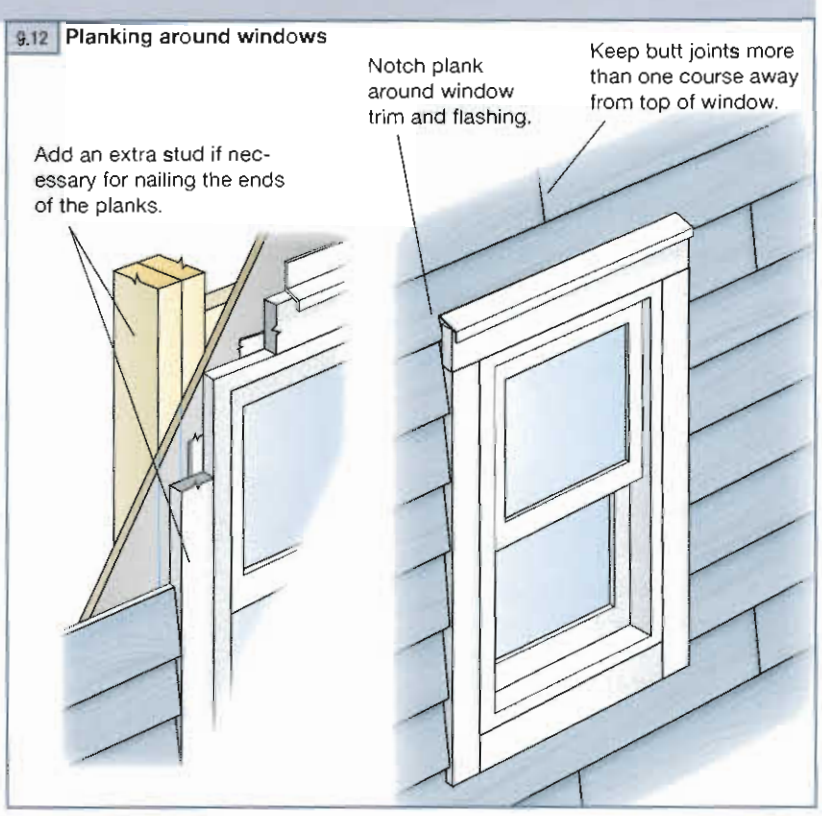
Once the initial course of HardiePlank® siding is fastened to the wall, continue installing successive courses with full 12-ft. pieces (follow the stagger pattern for longer walls), or until a window, door or other opening interrupts the course (fig 8.9). Notch planks as needed to fit around windows and doors. Again, be sure to paint or prime cut edges. Avoid placing butt joints directly above or below windows or above doors. Separate the joint from the opening by at least one course of siding.

Where butt joints land on a stud, make sure there is enough stud space for plank on both sides of the joint to land properly. Optimally both sides of a butt joint should land in the middle of a stud with 3/4 in. landing space for each side. The minimum stud space for a plank to land is 3/8 in.

Pay special attention to window, doors, and corners that have been trimmed before the siding goes on. Vertical trim boards may cover the king studs beside windows or doors, or they may cover up corner studs leaving no room for nailing the siding. In these places add extra studs as needed.

If corners are trimmed with HardieTrim® 5/4, 4/4 boards, it may be necessary to measure and cut the first pieces of siding to make sure the butt joints land on studs.

8.12 Planking around windows



COLORPLUS TIP: HardiePlank lap siding with ColorPlus Technology is shipped with a protective laminate slip sheet, which should be left in place during cutting and fastening to reduce marring and scratching. The sheet should be removed immediately after each plank is installed.

INSTALLING HARDIEPLANK® SIDING ON GABLE WALLS

Siding gable walls can be challenging, and some of the keys to siding gable walls efficiently are determining the angle or pitch of the roof, properly staging materials, and ensuring that the plank lengths are measured accurately.

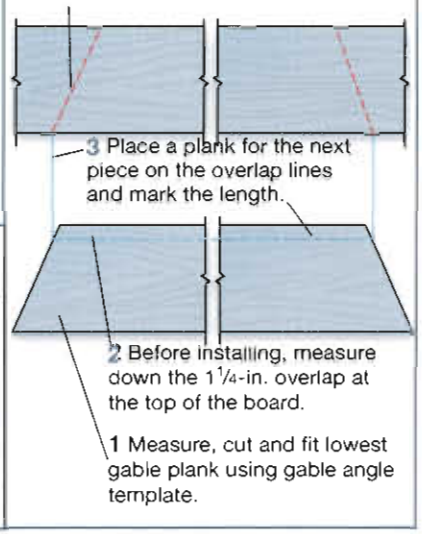
To estimate the amount of siding needed to complete a gable end, use the estimating tools located in Appendix C.

Stage enough material on the pump jacks or scaffolding to complete the gable end, but take care not to overload the staging. When possible, a cut table should be located on the pump jacks or scaffolding, which frees up crew members to work on other walls.

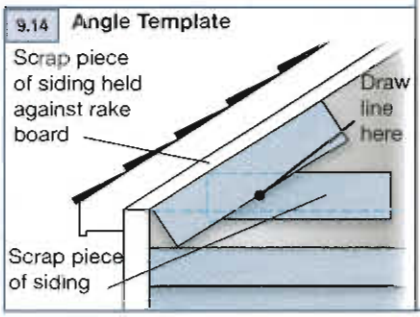
To cut planks for the gable:

1) Tack up a small scrap piece of siding where the first gable course is going.
2) Hold a second small piece of siding against the eave or rake board.
3) Trace the angle onto the scrap.
4) Cut that line and label the scrap as the template for the gable angle. The template can then be used to transfer the angle onto the larger pieces for cutting and installation.
5) Periodically check the angle as you progress up the wall.

9.13 Tip for fast gable installation



9.14 Angle Template



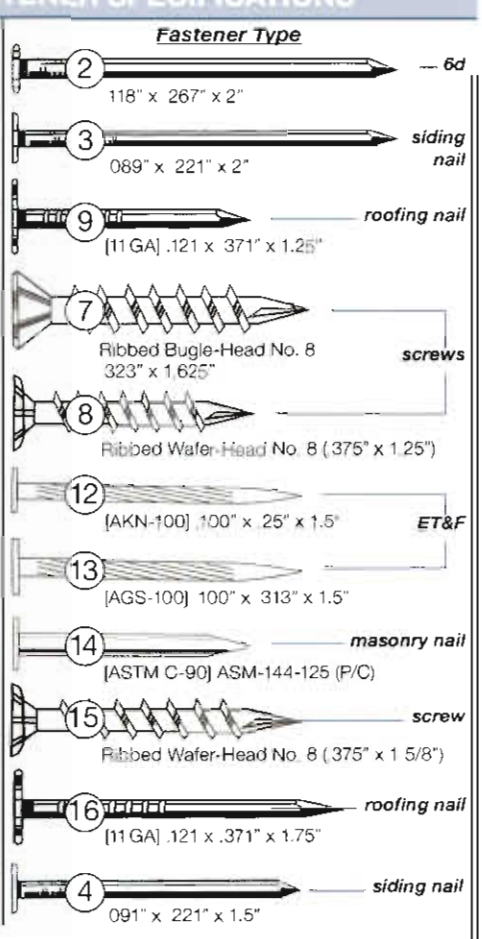
The quickest way to measure and cut consecutive courses of siding for a gable is to work off the previous piece.

1) Cut and fit the lowest course of siding.
2) Before installing, lay it flat and measure down 1¼-in. from the top edge of the plank for the course overlap. Make a mark on both ends.
3) Set a piece of uncut siding on top of the first piece, aligning the bottom edge with the overlap marks. Transfer the length directly to the uncut piece.
4) Draw the gable angle with the template, cut the angle and then repeat the process for the next course.

***TIP:** Stainless steel fasteners are recommended when installing James Hardie® products.*

HARDIEPLANK® SIDING FASTENER SPECIFICATIONS

Fastener Substrate			Approved Fastener
wood studs	blind nail	16" o.c.	3 9
		24" o.c.	
	face nail	16" o.c.	2 3
		24" o.c.	3
steel studs*	blind nail	16" o.c.	8 13
		24" o.c.	
	face nail	16" o.c.	7 12
		24" o.c.	
Direct to Masonry			14
7/16" OSB or equivalent (blind nailed)			15 16
7/16" OSB or equivalent (face nailed)			4



**When blind fastening 9.5" or wider product onto steel studs, use screws.*

● *indicates recommended fasteners*

HardiePlank® Lap Siding

HZ5™

JamesHardie

EFFECTIVE APRIL 2009

INSTALLATION REQUIREMENTS - PRIMED & COLORPLUS® PRODUCTS

Visit www.jameshardie.com for the most recent version

SELECT CEDARMILL© • SMOOTH • COLONIAL SMOOTH® • COLONIAL ROUGHSAWN® • BEADED CEDARMILL© BEADED SMOOTH • STRAIGHT-EDGE SHINGLE PLANK

MPORTANT: FAILURE TO INSTALL AND FINISH THIS PRODUCT IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND JAMES HARDIE WRITTEN APPLICATION INSTRUCTIONS MAY LEAD TO PERSONAL INJURY, AFFECT SYSTEM PERFORMANCE, VIOLATE LOCAL BUILDING CODES, AND VOID THE PRODUCT ONLY WARRANTY. BEFORE INSTALLATION, CONFIRM THAT YOU ARE USING THE CORRECT HARDIEZONE INSTRUCTIONS. TO DETERMINE WHICH HARDIEZONE APPLIES TO YOUR LOCATION, VISIT WWW.HARDIEZONE.COM OR CALL 1-866-942-7343 (866 9HARDIE)

STORAGE & HANDLING:

Store flat and keep dry and covered prior to installation. Installing siding wet or saturated may result in shrinkage at butt joints. Carry planks on edge. Protect edges and corners from breakage. James Hardie is not responsible for damage caused by improper storage and handling of the product.

⚠ CUTTING INSTRUCTIONS

OUTDOORS
1. Position cutting station so that wind will blow dust away from user and others in working area.
2. Use one of the following methods:
   - a. Best: i. Score and snap; ii. Shears (manual, electric or pneumatic)
   - b. Better: i. Dust reducing circular saw equipped with a HardieBlade™ saw blade and HEPA vacuum extraction
   - c. Good: i. Dust reducing circular saw with a HardieBlade saw blade (only use for low to moderate cutting)

INDOORS
1. Cut only using score and snap, or shears (manual, electric or pneumatic).
2. Position cutting station in well-ventilated area

- NEVER use a power saw indoors
- NEVER use a circular saw blade that does not carry the HardieBlade saw blade trademark
- NEVER dry sweep – Use wet suppression or HEPA Vacuum

Important Note: For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best"-level cutting methods where feasible.

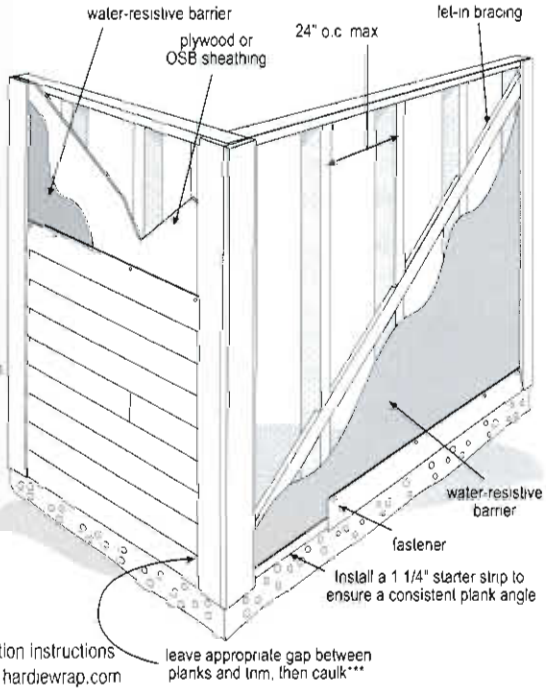
NIOSH-approved respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.com to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

IMPORTANT: To prevent damage to the drip edge, extra care should be taken when removing planks from the pallet, while handling, and when installing with a lap gauge. Please see additional handling requirements on page 4.

GENERAL REQUIREMENTS:

- HardiePlank® lap siding can be installed over braced wood or steel studs spaced a maximum of 24" o.c. or directly to minimum 7/16" thick OSB sheathing. Irregularities in framing and sheathing can mirror through the finished application.
- HardiePlank lap siding can also be installed over foam insulation/sheathing up to 1" thick. When using foam insulation/sheathing, avoid over-driving nails (fasteners), which can result in dimpling of the siding due to the compressible nature of the foam insulation/sheathing. Extra caution is necessary if power-driven nails (fasteners) are used for attaching siding over foam insulation/sheathing.
- A water-resistive barrier is required in accordance with local building code requirements. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements. James Hardie will assume no responsibility for water infiltration. James Hardie does manufacture HardieWrap™ Weather Barrier, a non-woven non-perforated housewrap[1], which complies with building code requirements.
- When installing James Hardie products all clearance details in figs. 3,4,5,6,7,8,& 9 must be followed.
- Adjacent finished grade must slope away from the building in accordance with local building codes - typically a minimum of 6" in the first 10'.
- Do not use HardiePlank lap siding in Fascia or Trim applications.
- Do not install James Hardie products, such that they may remain in contact with standing water.
- HardiePlank lap siding may be installed on flat vertical wall applications only
- DO NOT use stain on James Hardie® products.
- For larger projects, including commercial and multi-family projects, where the span of the wall is significant in length, the designer and/or architect should take into consideration the coefficient of thermal expansion and moisture movement of the product in their design. These values can be found in the Technical Bulletin "Expansion Characteristics of James Hardie® Siding Products" at www.JamesHardie.com.

Figure 1 Double Wall Construction / Single Wall Construction

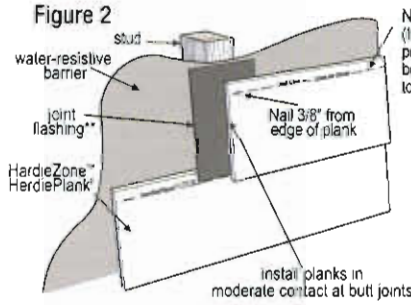


INSTALLATION:

JOINT TREATMENT†

(Required for ColorPlus® Finish, Recommended for Primed product) James Hardie does not recommend the use of caulk at field butt joints. Install factory finished edges together at butt joints

Figure 2



*For other jointing options, refer to local building code or NER 405

**As required by local building code ***Apply caulk in accordance with caulk manufacturers written application instructions

†For additional information on HardieWrap™ Weather Barrier, consult James Hardie at 1-866-4Hardie or www.hardiewrap.com

WARNING: AVOID BREATHING SILICA DUST

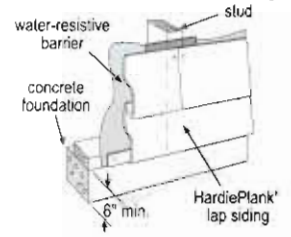
James Hardie® products contain respirable crystalline silica, which is known to the State of California to cause cancer and is considered by IARC and NIOSH to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation, (2) use fiber cement shears for cutting or, where not feasible, use a HardieBlade saw blade and dust-reducing circular saw attached to a HEPA vacuum, (3) warn others in the immediate area, (4) wear a properly-fitted, NIOSH-approved dust mask or respirator (e.g. N-95) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods - never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheet available at www.jameshardie.com or by calling 1-800-9HARDIE (1-800-942-7343). FAILURE TO ADHERE TO OUR WARNINGS, MSDS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH

HS0914-P1/4 1/10

CLEARANCES

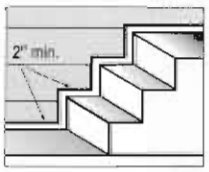
Install siding and trim products in compliance with local building code requirements for clearance between the bottom edge of the siding and the adjacent finished grade.

Figure 3



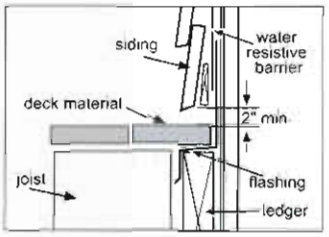
Maintain a 2" minimum clearance between James Hardie® products and paths, steps and driveways.

Figure 4



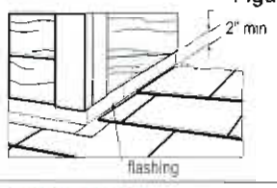
Maintain a 2" minimum clearance between James Hardie products and decking material.

Figure 5



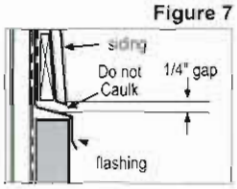
At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be installed per the roofing manufacturer's instructions. Provide a 2" minimum clearance between the roofing and the bottom edge of the siding and trim.

Figure 6



Maintain a 1/4" clearance between the bottom of James Hardie products and horizontal flashing. Do not caulk gap.

Figure 7



Maintain a minimum 1" gap between gutter end caps and siding & trim

Figure 8

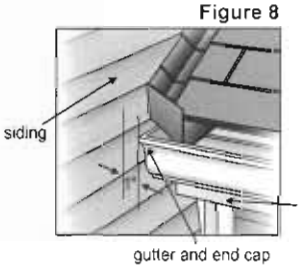
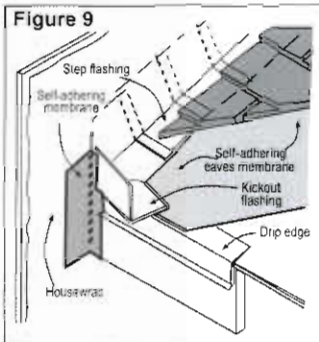


Figure 9



KICKOUT FLASHING

Because of the volume of water that can pour down a sloped roof, one of the most critical flashing details occurs where a roof intersects a sidewall. The roof must be flashed with step flashing. Where the roof terminates, install a kickout to deflect water away from the siding.

It is best to install a self-adhering membrane on the wall before the subfascia and trim boards are nailed in place, and then come back to install the kickout.

Figure 9, Kickout Flashing† To prevent water from dumping behind the siding and the end of the roof intersection, install a "kickout" of sufficient length and angle to direct the water running down the roof away from the siding.

FASTENER REQUIREMENTS **

Blind Nailing is the preferred method of installation for all HardiePlank® lap siding products

BLIND NAILING

Nails - Wood Framing
- Siding nail (0.09" shank x 0.221" HD x 2" long)
- 11ga. roofing nail (0.121" shank x 0.371" HD x 1.25" long)

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

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

OSB minimum 7/16"
- 11ga. roofing nail (0.121" shank x 0.371" HD x 1.75" long)
- Ribbed Wafer-head or equivalent (No. 8 x 1 5/8" long x 0.375" HD).

Face Nailing should only be used where required for high wind areas and must not be used in conjunction with Blind Nailing

FACE NAILING

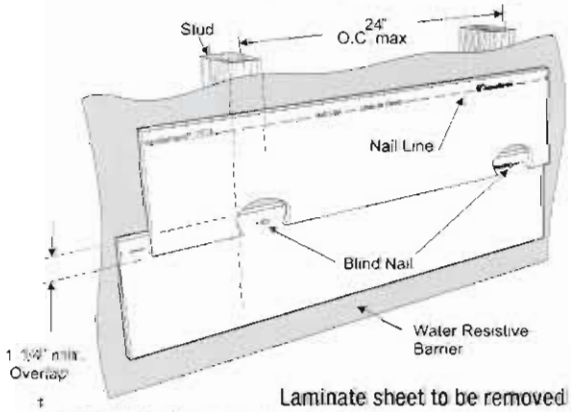
Nails - Wood Framing
- 6d (0.113" shank x 0.267" HD x 2" long)
- Siding nail (0.09" shank x 0.221" HD x 2" long)

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

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

OSB minimum 7/16"
- Siding nail (0.09" shank x 0.221" HD x 1-1/2" long)*

Figure 10



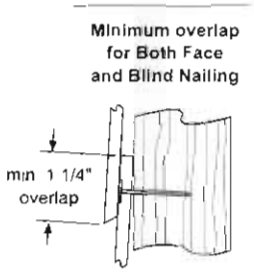
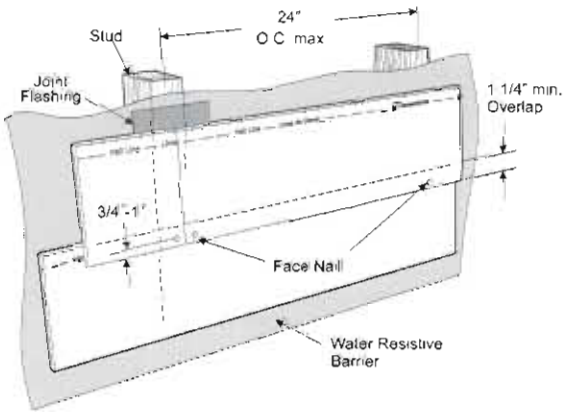


Figure 11



Laminate sheet to be removed immediately after installation of each course for ColorPlus® products.

† The illustration (figure 9) and associated text was reprinted with permission of THE JOURNAL OF LIGHT CONSTRUCTION. For subscription information, visit www.jlconline.com

* When face nailing to OSB, planks must be no greater than 9 1/4" wide and fasteners must be 12" o.c. or less

** Also see General Fastening Requirements

GENERAL FASTENING REQUIREMENTS

Fasteners must be corrosion resistant, galvanized, or stainless steel. Electro-galvanized are acceptable but may exhibit premature corrosion. James Hardie recommends the use of quality, hot-dipped galvanized nails. James Hardie is not responsible for the corrosion resistance of fasteners. Stainless steel fasteners are recommended when installing James Hardie® products near the ocean, large bodies of water, or in very humid climates.

PNEUMATIC FASTENING

James Hardie products can be hand nailed or fastened with a pneumatic tool. Pneumatic fastening is highly recommended. Set air pressure so that the fastener is driven snug with the surface of the siding. A flush mount attachment on the pneumatic tool is recommended. This will help control the depth the nail is driven If setting the nail depth proves difficult, choose a setting that under drives the nail. (Drive under driven nails snug with a smooth faced hammer - Does not apply for installation to steel framing).

- Consult applicable code compliance report for correct fasteners type and placement to achieve specified design wind loads.
- NOTE: Published wind loads may not be applicable to all areas where Local Building Codes have specific jurisdiction. Consult James Hardie Technical Services if you are unsure of applicable compliance documentation.
- Drive fasteners perpendicular to siding and framing.
- Fastener heads should fit snug against siding (no air space). (fig. A)
- Do not over-drive nail heads or drive nails at an angle.
- If nail is countersunk, caulk nail hole and add a nail. (fig. B)
- For wood framing, under driven nails should be hit flush to the plank with a hammer (For steel framing, remove and replace nail).
- **Do not use aluminum fasteners, staples, or clipped head nails.**

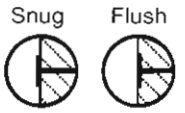


Figure A

Figure B

CUT EDGE TREATMENT

Caulk, paint or prime all field cut edges.

CAULKING

For best results use an Elastomeric Joint Sealant complying with ASTM C920 Grade NS, Class 25 or higher or a Latex Joint Sealant complying with ASTM C834. Caulking/Sealant must be applied in accordance with the caulking/sealant manufacturer's written instructions or ASTM C1193.

PAINTING

DO NOT use stain on James Hardie® products.
James Hardie products must be painted within 180 days for primed product and 90 days for unprimed.
100% acrylic topcoats are recommended.
Do not paint when wet. For application rates refer to paint manufacturers specifications.
Back-rolling is recommended if the siding is sprayed.

COLORPLUS® TECHNOLOGY CAULKING, TOUCH-UP & LAMINATE

- Touch up nicks, scrapes and nail heads using the ColorPlus® Technology touch-up applicator. Touch-up paint should be used sparingly. If large areas require touch-up, replace the damaged area with new HardiePlank® lap siding with ColorPlus® Technology.
- Laminate sheet must be removed immediately after installation of each course.
- Terminate non-factory cut edges into trim where possible, and caulk. Color matched caulks are available from your ColorPlus® product dealer.
- Treat all other non-factory cut edges using the ColorPlus Technology edge coaters, available from your ColorPlus product dealer.

PAINTING JAMES HARDIE® SIDING AND TRIM PRODUCTS WITH COLORPLUS® TECHNOLOGY

When repainting ColorPlus products, James Hardie recommends the following regarding surface preparation and topcoat application:

- Ensure the surface is clean, dry, and free of any dust, dirt, or mildew
- Repriming is normally not necessary
- 100% acrylic topcoats are recommended
- DO NOT use stain or oil/alkyd base paints on James Hardie® products
- Apply finish coat in accordance with paint manufacturers written instructions regarding coverage, application methods, and application temperature

COVERAGE CHART/ESTIMATING GUIDE

Number of 12' planks, does not include waste

COVERAGE AREA LESS OPENINGS SQ (1 SQ = 100 sq.ft.)	HARDIEPLANK LAP SIDING WIDTH								
	(exposure)	5 1/4 4	6 1/4 5	7 1/4 6	7 1/2 6 1/4	8 6 3/4	8 1/4 7	9 1/4 8	9 1/2 8 1/4	12 10 3/4
1		25	20	17	16	15	14	13	13	9
2		50	40	33	32	30	29	25	25	19
3		75	60	50	48	44	43	38	38	28
4		100	80	67	64	59	57	50	50	37
5		125	100	83	80	74	71	63	63	47
6		150	120	100	96	89	86	75	75	56
7		175	140	117	112	104	100	88	88	65
8		200	160	133	128	119	114	100	100	74
9		225	180	150	144	133	129	113	113	84
10		250	200	167	160	148	143	125	125	93
11		275	220	183	176	163	157	138	138	102
12		300	240	200	192	178	171	150	150	112
13		325	260	217	208	193	186	163	163	121
14		350	280	233	224	207	200	175	175	130
15		375	300	250	240	222	214	188	188	140
16		400	320	267	256	237	229	200	200	149
17		425	340	283	272	252	243	213	213	158
18		450	360	300	288	267	257	225	225	167
19		475	380	317	304	281	271	238	238	177
20		500	400	333	320	296	286	250	250	186

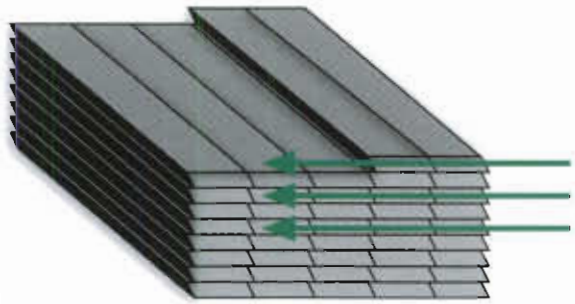
This coverage chart is meant as a guide. Actual usage is subject to variables such as building design. James Hardie does not assume responsibility for over or under ordering of product.

RECOGNITION. In accordance with ICC-ES Legacy Report NER-405, HardiePlank lap siding is recognized as a suitable alternate to that specified in the BOCA National Building Code/1999, the 1997 Standard Building Code, the 1997 Uniform Building Code, the 1998 International One- and Two-Family Dwelling Code, the 2003 International Building Code, and the 2003 International Residential Code for One-and Two-Family Dwellings. HardiePlank lap siding is also recognized for application in the following: City of Los Angeles Research Report No. 24862, State of Florida listing FL#889, Dade County, Florida NOA No. 02-0729.02, U.S. Dept. of HUD Materials Release 1263c, Texas Department of Insurance Product Evaluation EC-23, City of New York MEA 223-93-M, and California DSA PA-019. These documents should also be consulted for additional information concerning the suitability of this product for specific applications.

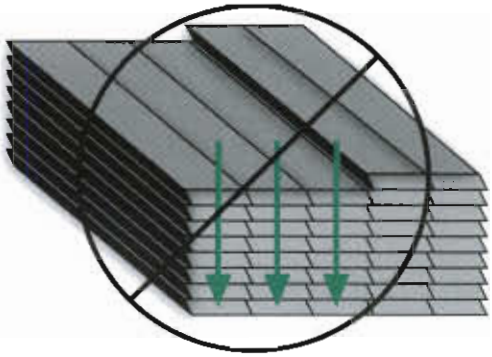
ADDITIONAL HANDLING REQUIREMENTS

IMPORTANT: To prevent damage to the drip edge, extra care should be taken when removing planks from the pallet, while handling, and when installing with a lap gauge. Planks are interlocked together on the pallet, therefore they should be removed from the pallet horizontally (side to side) to allow planks to unlock themselves from one another.

Pull from across the stack



Do not go down the stack



Additional Installation Information, Warranties, and Warnings are available at www.jameshardie.com

JamesHardie

HardieShingle® Siding Product Description

HardieShingle® siding is fiber-cement shingle siding for sidewall applications. HardieShingle siding is available as straight-edge panels or staggered-edge panels 48-in. long by 16-in. high. HardieShingle panels also come as decorative half-round shingles. For smaller coverage areas, individual shingles are also available in 6-in. 8-in. and 12-in. widths. Please see your James Hardie dealer for local availability of these products.

HardieShingle siding is available as a prefinished James Hardie product with ColorPlus® Technology. The ColorPlus coating is a factory applied, oven-baked finish available on a variety of James Hardie siding and trim products. See your local dealer for details and availability of products, colors and accessories.

Half-Round

Staggered Edge Notched Panel

Straight Edge Notched Panel

Individual Shingles

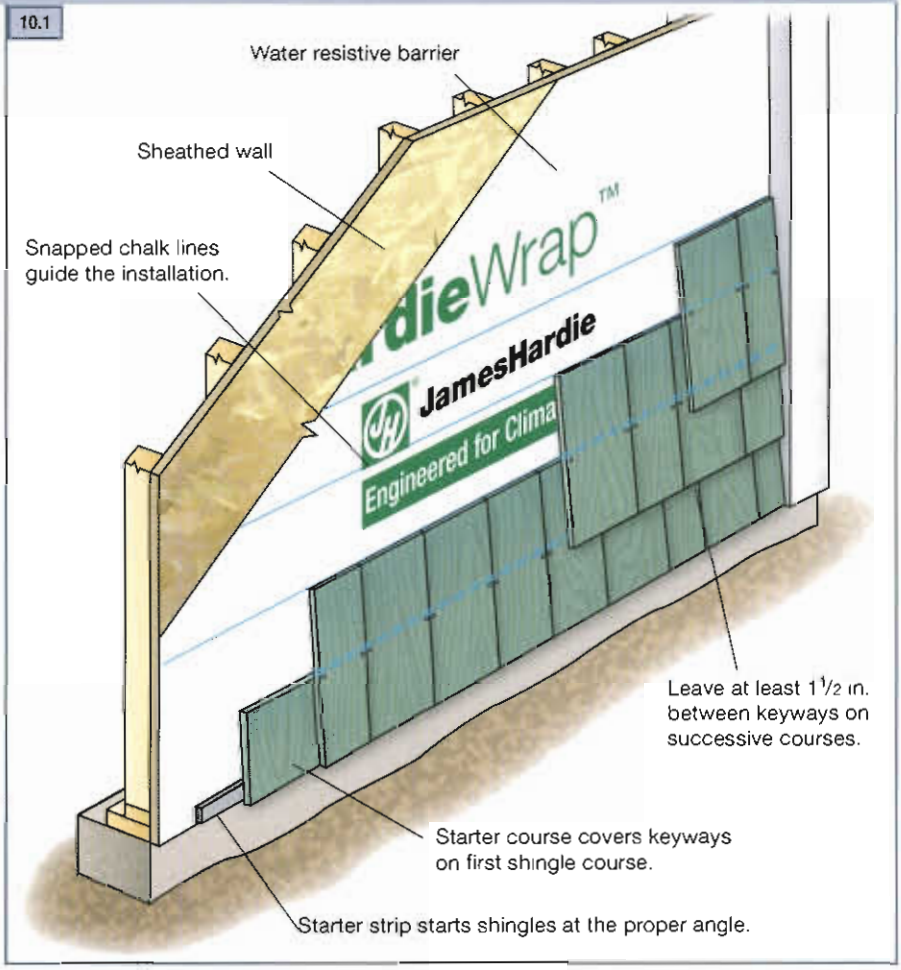
Installation of HardieShingle® Siding

INDIVIDUAL SHINGLES

Like conventional wood-shingle siding, HardieShingle® siding requires the use of a starter strip and a starter course before installing the first full course of shingle panels or individual shingles. The starter strip sets the initial shingles at the proper angle and the starter course provides solid backing and keyway coverage for the first shingle course.

1) The starter strip should be installed over the water-resistive barrier. Starter strips can be made by ripping 1 1/4-in. lengths from full or partial planks of HardiePlank® siding.
2) Use HardiePlank 8 1/4-in. or 9 1/4-in. lap siding for the starter course.
3) Snap a level chalk line 8 1/4 in. or 9 1/4 in. up from the bottom edge of the starter strip.
4) Position the top of the starter course along the chalk line.
5) The first course of shingle siding is then installed even with bottom edge of the starter course.

10.1



When installing individual HardieShingles®, be sure to space shingles no more than 1/4 in. apart. Spaces between shingles should not be within 1 1/2 in. of the spaces in the courses above and below.

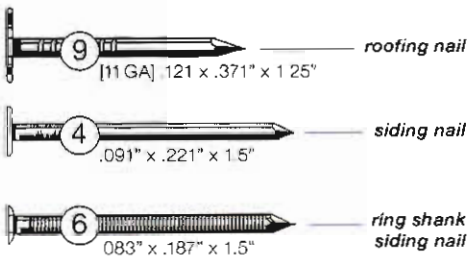
***TIP:** For the best appearance, apply shingle widths in a random manner to avoid creating a repeat pattern. Pre-planning of each course is recommended to aid appearance and to avoid stacked seams.*

***TIP:** Stainless steel fasteners are recommended when installing James Hardie products.*

HARDIESHINGLE SIDING FASTENER SPECIFICATIONS

Fastening Substrate		Approved Fastener
Individual Shingles	Minimum 15/32" thick plywood	9
	Minimum 7/16" thick plywood	4
HardieShingle Panels	16" or 24" O.C. wood studs	6
	Directly to minimum 7/16" thick OSB	6

Fastening Types

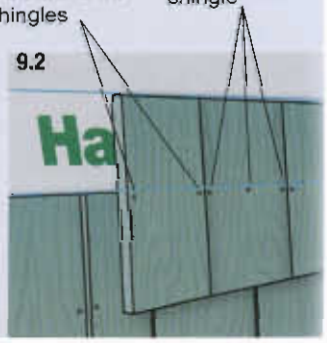


Corrosion-resistant siding nails 1 1/4-in. long should be used to apply individual HardieShingles® to minimum 7/16-in. OSB rated sheathing. Position nails 1/2 in. to 1 in. from the side edges of the shingles and 8 1/2 in. to 9 in. up from the bottom edge of the shingle.

2 nails per shingle on both 6-in. and 8-in. shingles

3 nails (with one centered) on each 12-in. shingle

9.2



Installation of HardieShingle® Siding (continued)

HARDIESHINGLE® PANELS

For HardieShingle® panels start at one end and work across the wall.

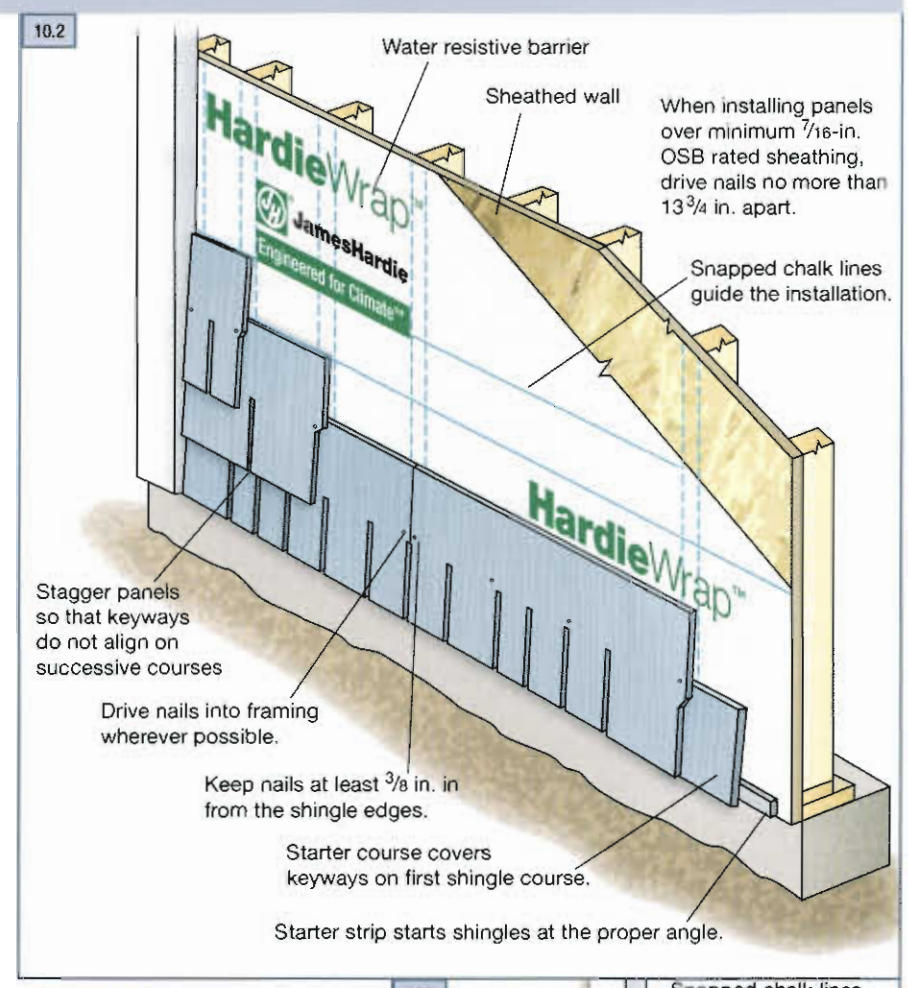
1) Measure and trim the first panel to make sure the end of the panel falls over framing.

2) Using the chalk line as a guide along the panel top edge, carefully position the panels and secure with suitable fasteners and spacing for your particular application as noted in the NER-405.

3) Align the bottom edges of the trim and the siding for the best appearance. Where the panel begins at a corner board or at door or window casings, cut the upper portion of the panel back even with the edge of the keyway.

4) Where the siding meets the HardieTrim® board, leave a 1/8-in. gap between the siding and trim. Install HardieShingle panels with joints in moderate contact.

10.2

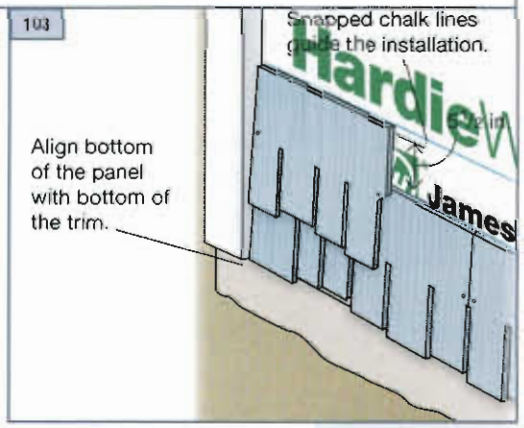


5) Measure and cut the first panel for the second course of HardieShingle panel so that it lands on the stud before the panel on the first course. Use the cut end to abut the trim.

6) Start the third course with the end of the panel landing on the stud before the second course. Save the cut pieces to use on the other end of the wall.

7) Continue alternating these three lengths up the wall to establish proper positioning of the shingle keyways.

10.3



When installing HardieShingle Staggered Edge panel, measure up 51/2 in. from the top of the installed panel and make a mark. Make another mark at an equal height on the opposite end of the wall and snap a chalk line between the marks. Align the top of the next course of panel with the chalk line to maintain proper exposures.

TIP: A straight edge panel can be used on the bottom course if desired

Keep the bottom of the siding even with the bottom of the trim. If desired, the trim may extend below the bottom of the siding, but the siding should not hang below the trim. Make sure that clearances above the ground, roof lines and hard surfaces are in accordance with the General Requirements on pages 13-26.

James Hardie recommends installing HardieShingle panel over rated wood sheathing.

HALF-ROUND DECORATIVE SHINGLE PANELS

Half-round shingles are often used for a decorative note above regular shingles, especially in gables.

1) Start the first course from the middle of the run so that half round sections at either end are cut equally.

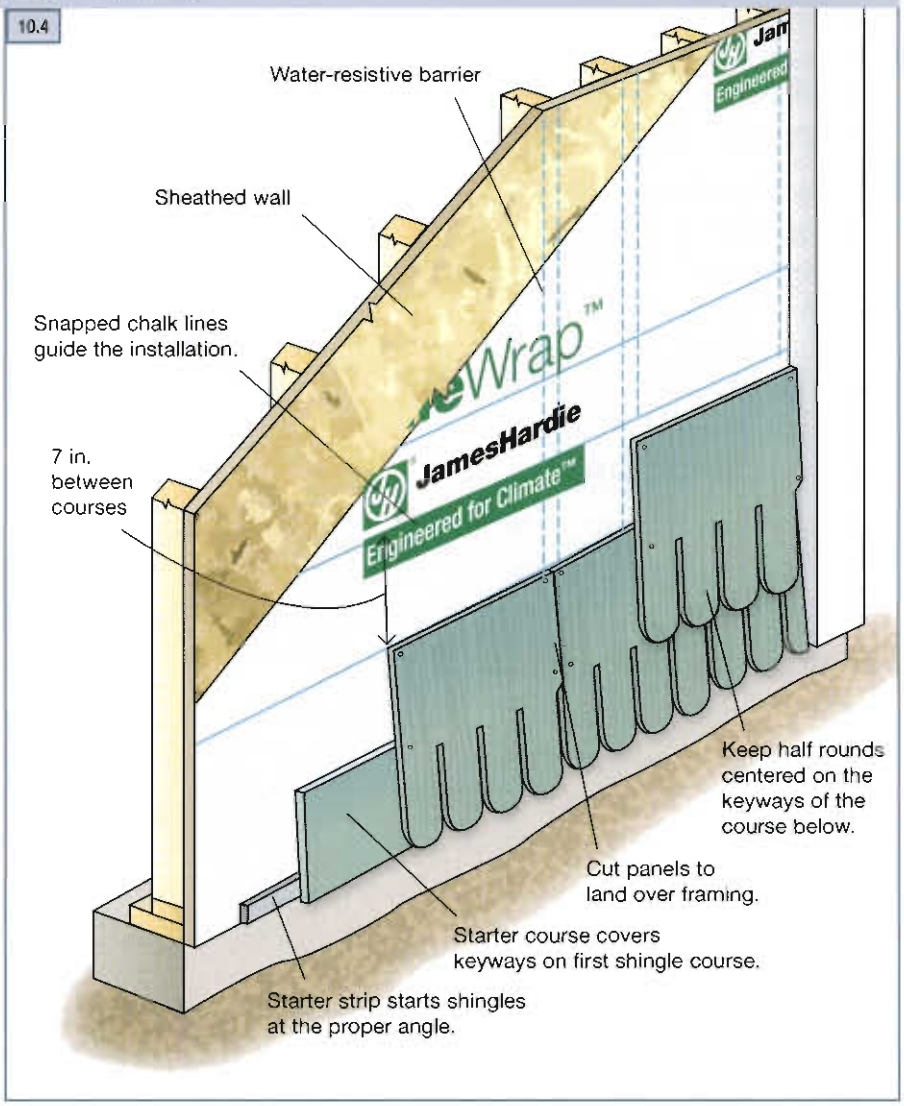
2) Then start the second course from the trim at one end and cut it so that it lands on the framing one stud away from the course below.

3) Cut the panel to abut the trim at the other end of the course. Make sure keyways are located over the midpoints of the half rounds in the lower course for correct alignment.

4) At the top of the wall, install a frieze board and install shingles up to the bottom edge of the frieze.

5) Top rows of shingles may have to be cut to an appropriate height to maintain consistent exposure top to bottom.

10.4



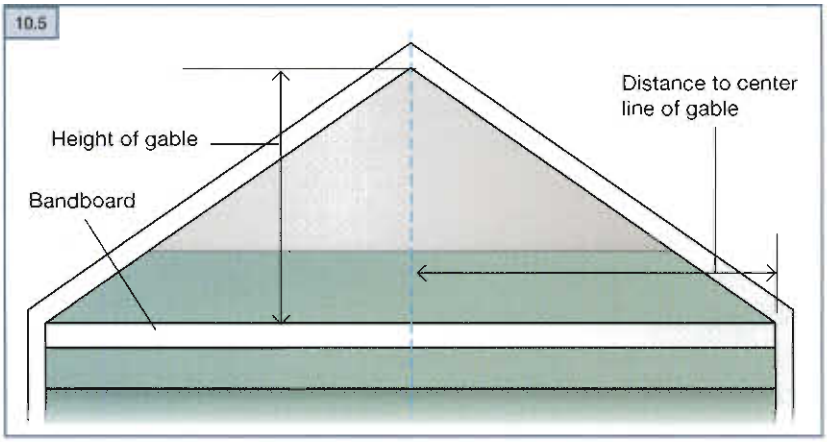
All HardieShingle® siding products can be applied to the gable end of a building following their specific installation instructions. But special care should be taken when installing half-round panels due to their symmetrical nature.

For best appearance, half-round shingle panel installations on gable ends should end with a single round shingle at the gable peak. To make this happen, calculation of the actual number of courses is necessary. Follow the simple steps below to achieve this effect.

1) Measure the horizontal width of the gable being sided and locate the center of the gable. Using a level or chalk line, draw a line from the gable peak to the center mark.

2) Measure the entire height of the gable area to be sided above the bandboard.

10.5



Installation of HardieShingle® Siding (continued)

3) Divide the total height of the gable by 7. (Half round shingles have an exposure of 7 in. and this figure is the number of courses to be installed.

4) If the answer is an even number (example: 70 in. divided by 7 = 10 courses), center the first panel course on a keyway on the vertical center line *(fig. 9.7)*. If the answer is an odd number, (example: 77 in. divided by 7 = 11 courses) center the first course on the center of a half-round shingle *(fig. 9.8)*.

5) Using this planning method, the final piece at the peak should be a centered shingle.

To install the first course of half-round panel in a gable:

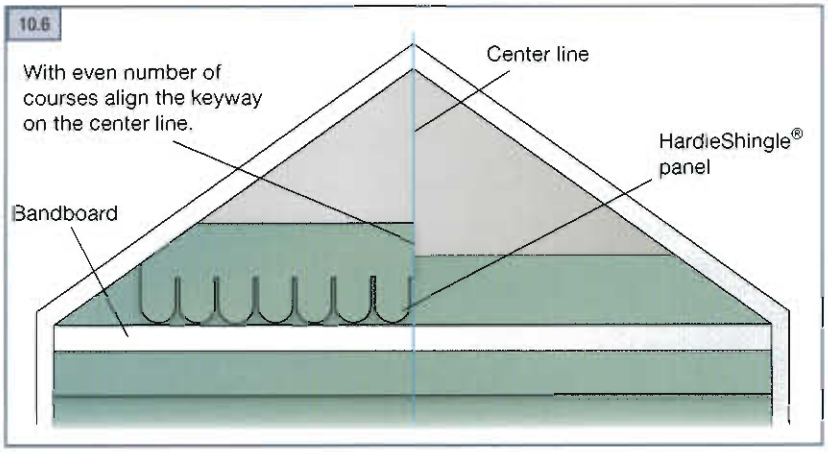
1) position the first piece of panel on the gable centerline marked earlier. The panel may be moved left or right to make the edge lands on a stud as long as the shingle face or keyway is centered (depending on the number of courses needed as discussed above).

2) Drive nails approximately 1/4 in. above the top of every other keyway. Avoid driving nails between the keyways because the heads may be visible through the keyways of subsequent courses.

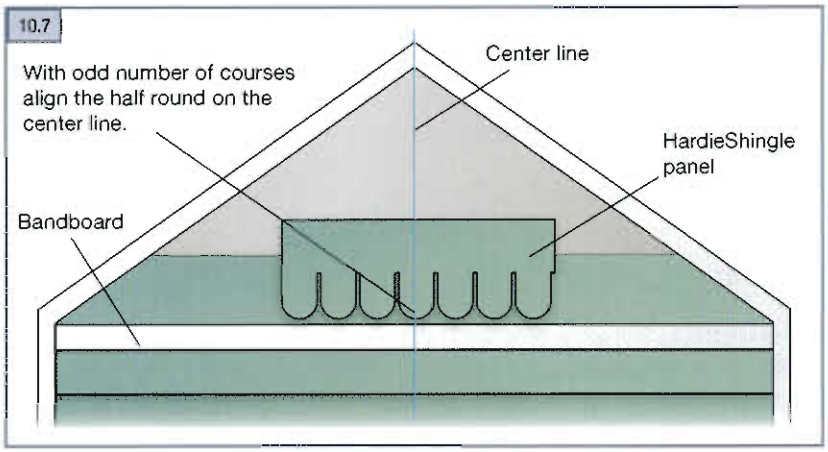
3) Complete the installation on the left and right sides using the rake-angle template to cut the proper rake angle. Leave a 1/8-in. gap between the siding and trim boards.

4) Use the rake angle template to trim back the start panel for the 2nd course. Install the 2nd and following courses the same way. At the peak of the gable, face nail the final piece with a finish nailer.

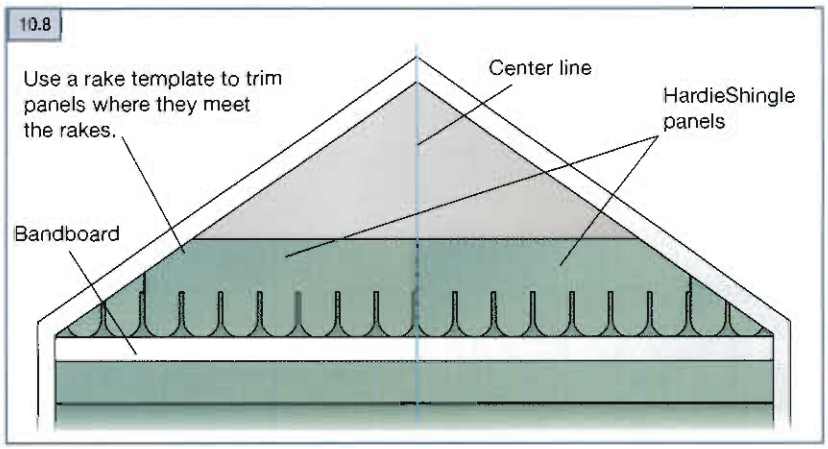
10.6



10.7



10.8



HardieShingle® HZ5™ Siding

JamesHardie

STRAIGHT EDGE, STAGGERED EDGE NOTCHED, HALF-ROUND PANELS & INDIVIDUAL SHINGLES

EFFECTIVE APRIL 2009

INSTALLATION REQUIREMENTS - PRIMED & COLORPLUS® PRODUCTS

Visit www.jameshardie.com for the most recent version.

MPORTANT: FAILURE TO INSTALL AND FINISH THIS PRODUCT IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND JAMES HARDIE WRITTEN APPLICATION INSTRUCTIONS MAY LEAD TO PERSONAL INJURY, AFFECT SYSTEM PERFORMANCE, VIOLATE LOCAL BUILDING CODES, AND VOID THE PRODUCT ONLY WARRANTY. BEFORE INSTALLATION, CONFIRM THAT YOU ARE USING THE CORRECT HARDIEZONE INSTRUCTIONS. TO DETERMINE WHICH HARDIEZONE APPLIES TO YOUR LOCATION, VISIT WWW.HARDIEZONE.COM OR CALL 1-866-942-7343 (866 9HARDIE)

STORAGE & HANDLING:

Store flat and keep dry and covered prior to installation. Installing siding wet or saturated may result in shrinkage at butt joints. Carry product on edge. Protect edges and corners from breakage. James Hardie is not responsible for damage caused by improper storage and handling of the product.

⚠ CUTTING INSTRUCTIONS

OUTDOORS

1. Position cutting station so that wind will blow dust away from user and others in working area.
2. Use one of the following methods:
   - a. Best: i. Score and snap; ii. Shears (manual, electric or pneumatic)
   - b. Better: i. Dust reducing circular saw equipped with a HardieBlade® saw blade and HEPA vacuum extraction
   - c. Good: i. Dust reducing circular saw with a HardieBlade saw blade (only use for low to moderate cutting)

INDOORS

1. Cut only using score and snap, or shears (manual, electric or pneumatic).
2. Position cutting station in well-ventilated area

- NEVER use a power saw indoors
- NEVER use a circular saw blade that does not carry the HardieBlade saw blade trademark
- NEVER dry sweep – Use wet suppression or HEPA Vacuum

Important Note: For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best"-level cutting methods where feasible.

NIOSH-approved respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.com to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

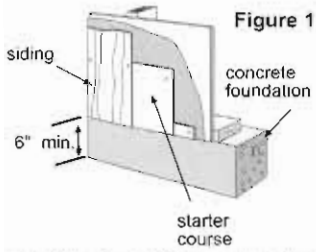
GENERAL REQUIREMENTS:

- HardieShingle® panels can be installed over braced wood or steel studs spaced a maximum of 24" o.c. or directly to minimum 7/16" thick sheathing.
- HardieShingle panels can also be installed over foam insulation/sheathing up to 1" thick. When using foam insulation/sheathing, avoid over-driving nails (fasteners),which can result in dimpling of the siding due to the compressible nature of the foam insulation/sheathing. Extra caution is necessary if power-driven nails (fasteners) are used for attaching siding over foam insulation/sheathing
- A water-resistive barrier is required in accordance with local building code requirements. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements. James Hardie will assume no responsibility for water infiltration. James Hardie does manufacture HardieWrap™ Weather Barrier, a non-woven non-perforated housewrap[1], which complies with building code requirements.
- When installing James Hardie products all clearance details in figs. 1,2,3,4,5,6 &7 must be followed
- Adjacent finished grade must slope away from the building in accordance with local building codes - typically a minimum of 6" in the first 10'
- Do not install James Hardie products, such that they may remain in contact with standing water
- HardieShingle lap siding may be installed on vertical wall applications only
- DO NOT use stain on James Hardie® products.

CLEARANCES

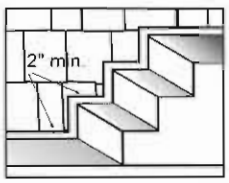
Install siding and trim products in compliance with local building code requirements for clearance between the bottom edge of the siding and the adjacent finished grade.

Figure 1



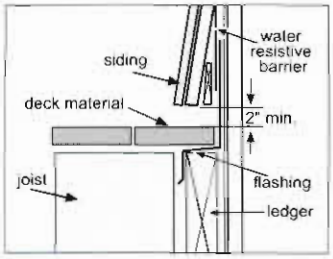
Maintain a minimum 2" clearance between James Hardie® products and paths, steps and driveways.

Figure 2



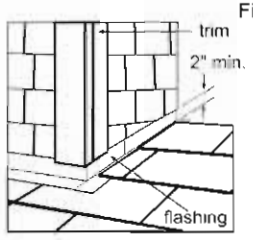
Maintain a minimum 2" clearance between James Hardie products and decking material.

Figure 3



At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be installed per the roofing manufacturer's instructions. Provide a minimum 2" clearance between the roofing and the bottom edge of the siding and trim.

Figure 4



[1]For additional information on HardieWrap™ Weather Barrier, consult James Hardie at 1-866-4Hardie or www.hardiewrap.com

WARNING: AVOID BREATHING SILICA DUST

James Hardie® products contain respirable crystalline silica, which is known to the State of California to cause cancer and is considered by IARC and NIOSH to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation, (2) use fiber cement shears for cutting or, where not feasible, use a HardieBlade® saw blade and dust-reducing circular saw attached to a HEPA vacuum, (3) warn others in the immediate area, (4) wear a properly-fitted, NIOSH-approved dust mask or respirator (e.g. N-95) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods - never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheet available at www.jameshardie.com or by calling 1-800-9HARDIE (1-800-942-7343). FAILURE TO ADHERE TO OUR WARNINGS, MSDS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

Maintain a 1/4" clearance between the bottom of James Hardie® products and horizontal flashing Do not caulk gap.

Maintain a minimum 1" gap between gutter end caps and siding & trim.

Figure 5

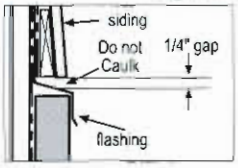


Figure 6

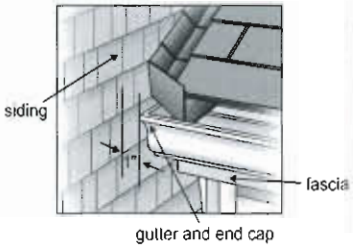
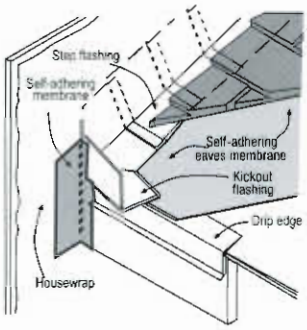


Figure 7



KICKOUT FLASHING

Because of the volume of water that can pour down a sloped roof, one of the most critical flashing details occurs where a roof intersects a sidewall The roof must be flashed with step flashing. Where the roof terminates, install a kickout to deflect water away from the siding

It is best to install a self-adhering membrane on the wall before the subfascia and trim boards are nailed in place, and then come back to install the kickout.

Figure 7, Kickout Flashing‡ To prevent water from dumping behind the siding and the end of the roof intersection, install a "kickout" of sufficient length and angle to direct the water running down the roof away from the siding

STAGGERED EDGE NOTCHED PANELS

INSTALLATION

Fastener Requirements

0.083" x 0.187" HD x 1 1/2" long ringshank nails are used for fastening HardieShingle® Staggered Edge Notched Panels to both framing and to 7/16" thick APA rated sheathing.

HardieShingle Staggered Edge Notched Panel Installation

Install HardieShingle notched panels with joints butted in moderate contact. Due to overlapping of the joints, caulk is not required except where panels abut trim boards. (fig. 8 & 10). Ensure keyways do not line up on subsequent courses

1) Install a 1-1/4" starter strip, and a 8 1/4" or 9 1/4" wide HardiePlank® lap siding starter course.
2) Trim the first panel from the end abutting trim (the left side in figures 8 & 10) to hit the furthest stud. When installing over a band board, trim the bottom of the panel to create a straight edge, leave 1/4" gap between bottom of siding and flashing (fig. 9).
3) Secure panel, leaving 1/8" gap for caulk at trim and continue the course along the wall.
4) Start the second course, by removing the equivalent of one full stud cavity, again from the end abutting the trim. This is to prevent pattern repetition. Repeat step 3.
5) Start the third course, by removing the equivalent of two full stud cavities and repeat step 3.
6) Continue up the wall repeating steps 2 through 6 until desired height is reached.

Steps 1- 4

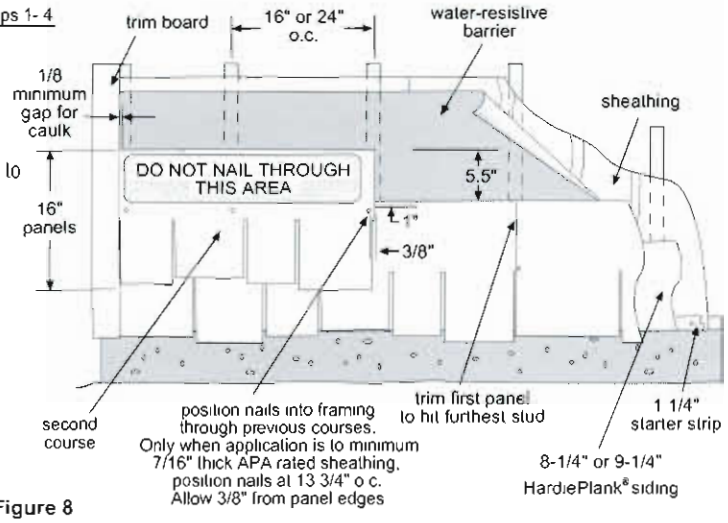


Figure 8

Steps 5 & 6

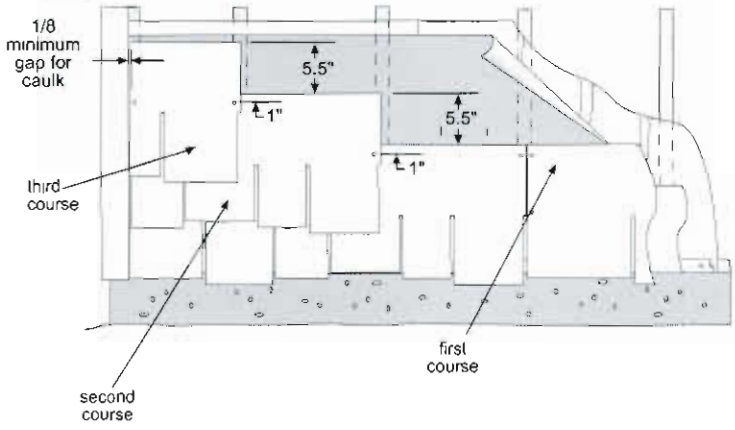
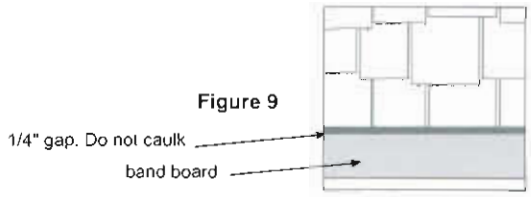


Figure 9



HARDIESHINGLE STAGGERED EDGE NOTCHED PANEL COVERAGE

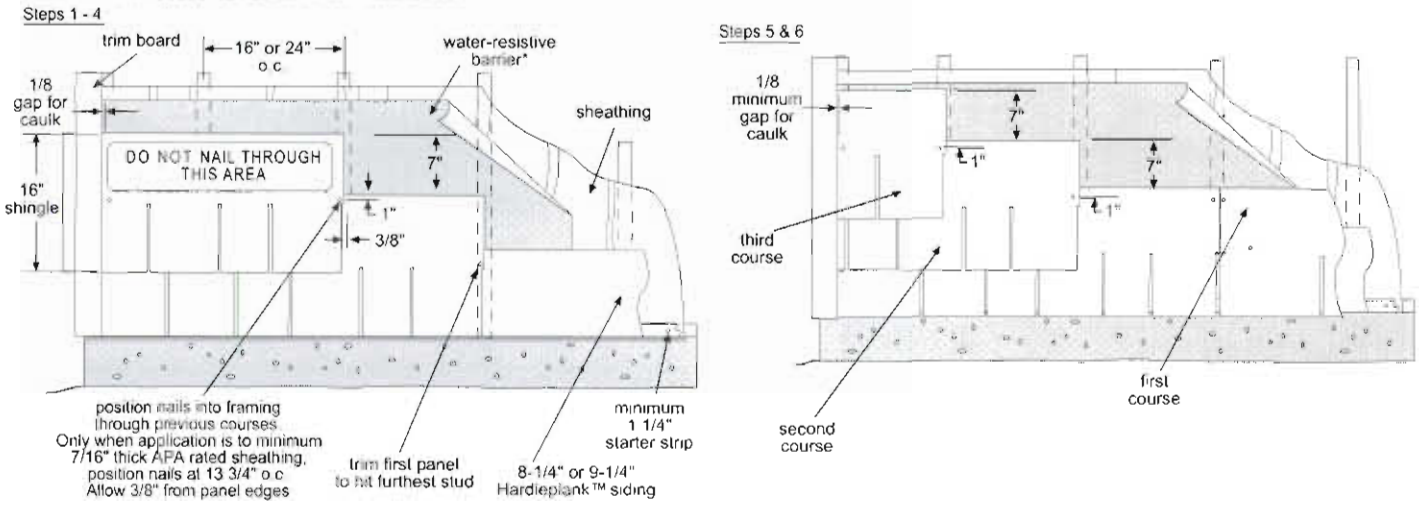
Panels for sidewall applications are available in 48" lengths. Pieces needed for one square (100sq.ft.) of product coverage = approximately 55, based on a maximum 5.5" exposure from the top edge of HardieShingle panels in subsequent courses (refer to Figure 8).

STRAIGHT EDGE NOTCHED PANELS INSTALLATION

Maximum Exposure of 7"

REFER TO STAGGERED EDGE INSTRUCTIONS ABOVE

Figure 10



HARDIESHINGLE® STRAIGHT EDGE NOTCHED PANEL COVERAGE

Panels for sidewall applications are available in 48" lengths. Pieces needed for one square (100sq.ft.) of product coverage = approximately 45, based on maximum 7" exposure.

INDIVIDUAL SHINGLE INSTALLATION

HardieShingle® Individual Shingles must be installed directly to minimum 7/16" thick sheathing.

Fastener Requirements

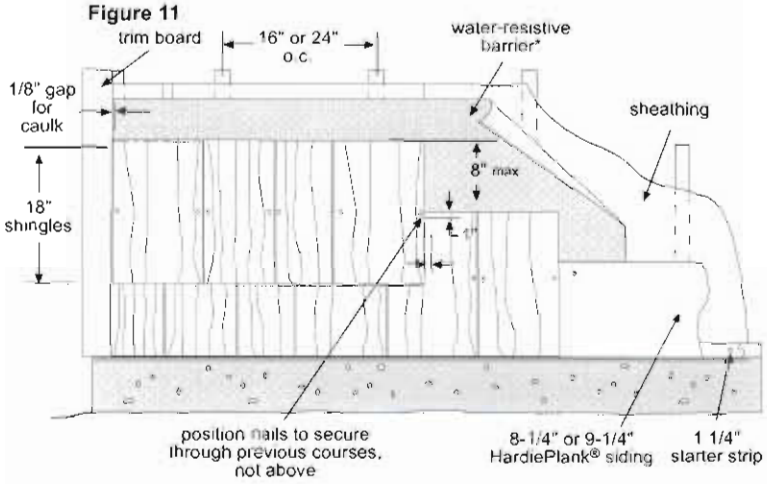
0.091" x 0.221" HD x 1 1/2" or 0.121" x 0.371" HD x 1 1/4" long corrosion resistant siding nails are used for fixing HardieShingle siding to 7/16" thick APA rated sheathing.

HardieShingle® Individual Shingle Installation

Due to overlapping of the joints, caulk is not required except where panels abut trim boards. Space shingles a maximum 1/4" apart and leave a minimum lap of 1 1/2" between successive courses (fig. 12).

1) Install 1 1/4" starter strip and a 8 1/4" or 9 1/4" wide HardiePlank® siding starter course.
2) Install first shingle from the end abutting trim (fig. 11).
3) Secure shingle, leaving a 1/8" gap for caulk at trim and continue the course along the wall.
4) Start the second course, leaving a minimum lap of 1 1/2" between successive courses, again from the end abutting the trim. Repeat step 3
5) Continue up the wall repeating steps 2 through 5 until desired height is reached.

Figure 11

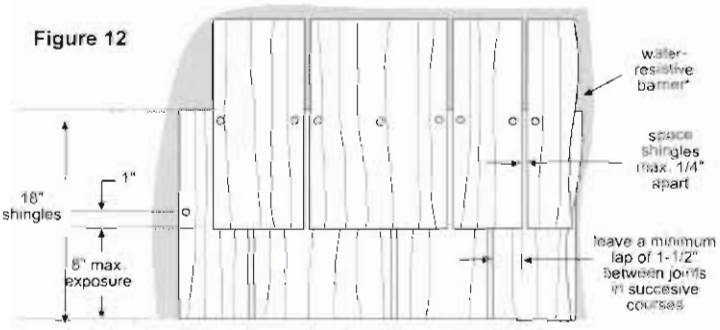


HARDIESHINGLE INDIVIDUAL SHINGLE COVERAGE

Shingles for sidewall applications are available in 6", 8", and 12" widths. Bundles needed for one square (100 sq. ft.) of product coverage:

Shingle Width	Number of Bundles	Pieces per Bundle
6"	6	11
8"	6	11
12"	6	11

Figure 12



HALF-ROUND NOTCHED PANELS

INSTALLATION

Fastener Requirements

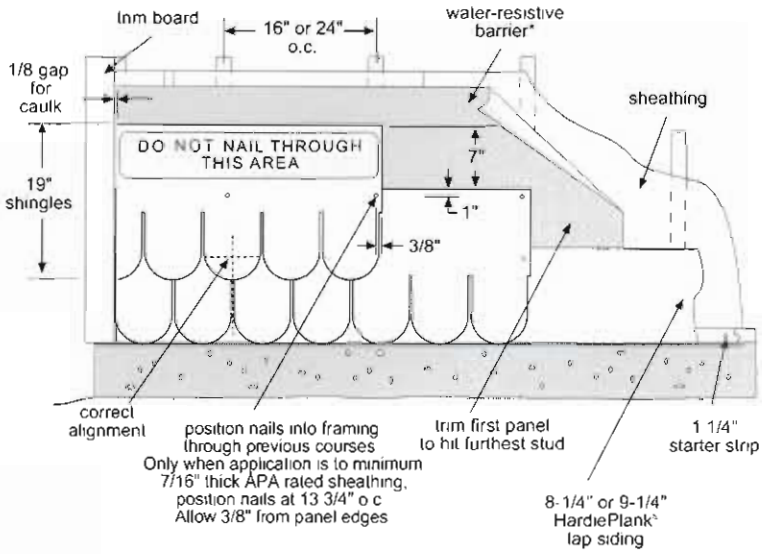
0.083" x 0.187" HD x 1 1/2" long ringshank nails are used for fastening HardieShingle® Half-Round Notched Panels to both framing and to 7/16" thick APA rated sheathing.

HardieShingle Half-Round Notched Panel Installation

Install HardieShingle notched panels with joints butted in moderate contact. Due to overlapping of the joints, caulk is not required except where panels abut trim boards (fig. 13).

1) Install a 1 1/4" starter starter strip, and a minimum a 8-1/4" or 9 1/4" wide HardiePlank® siding starter course.
2) Trim the first panel from the end abutting trim (the left side in fig. 13) to hit the furthest stud.
3) Secure panel, leaving 1/8" gap for caulk at trim and continue the course along the wall
4) Start the second course, by removing the equivalent of one full stud cavity, again from the end abutting the trim. Ensure the seam is located over the midpoint of the lower course for correct alignment (fig. 13).
5) Continue up the wall repeating steps 2 through 5 until desired height is reached.

Figure 13



HARDIESHINGLE HALF-ROUND NOTCHED PANEL COVERAGE

Panels for sidewall applications are available in 48" lengths. Pieces needed for one square (100 sq. ft.) of product coverage=43 pieces with 7" exposure.

GABLE INSTALLATION:

Installation over sheathing is recommended for gables.

1) Install a 1 1/4" starter strip and a 8-1/4" or 9-1/4" wide HardiePlank® lap siding starter course. (fig. 14)
2) Begin Notched Panel installation by first marking a plumb line down the center of the gable. Place either the edge or the center of panel along this line to ensure a symmetric finished appearance (fig. 14 & 15).
3) Start second course, by removing the equivalent of one full stud cavity and ensuring the seam is located over the midpoint of the lower course
4) Cut the edge of the panels to correspond with the rake angle of the gable leaving a 1/8" gap for caulk at the trim.
5) If the rake angle cuts through a keyway of a complete panel or significantly weakens the end of the panel, use face nails to secure the end pieces as shown (fig. 16)
6) Continue installation aligning courses as indicated. At the top of the gable, face nails will be required for the final pieces (fig. 17)

Figure 14

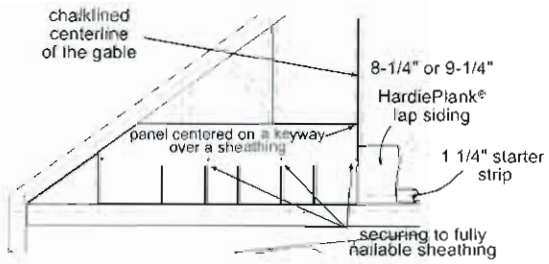


Figure 15

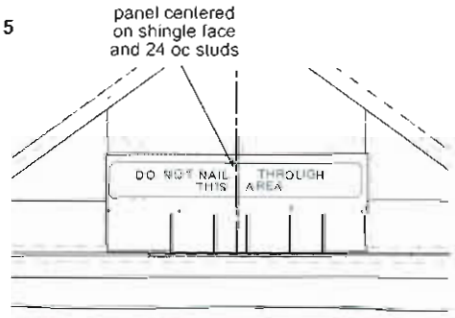


Figure 16

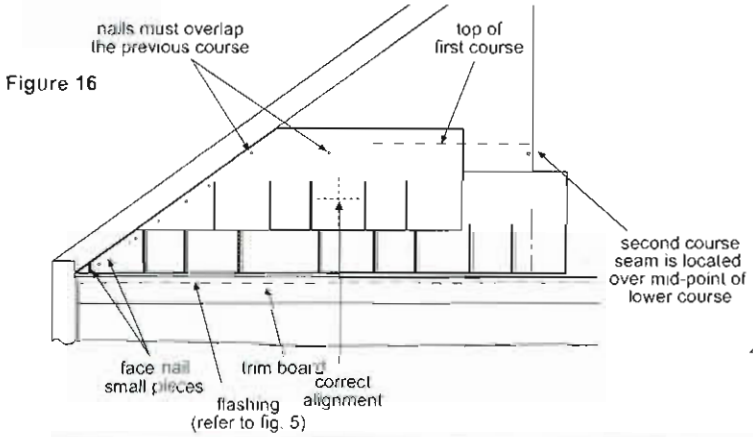
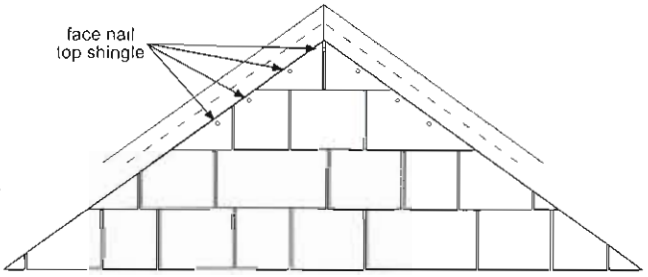


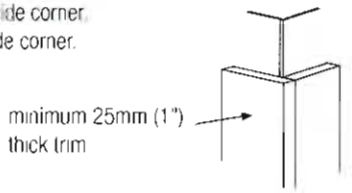
Figure 17

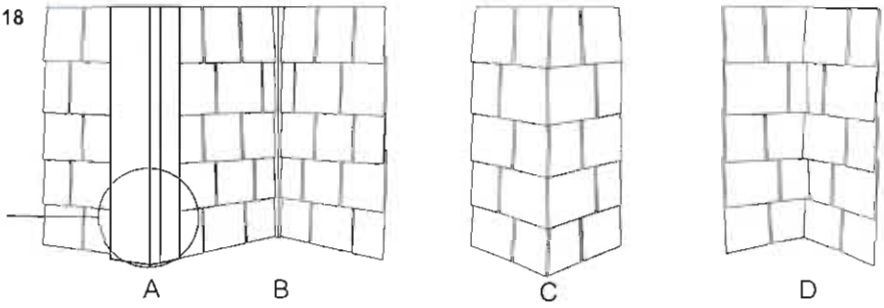


CORNER DETAILS

A. Panels butted against corner boards.
B. Panels butted against square wood strip on inside corner, flashing behind.
C. Laced outside corner.
D. Laced inside corner.

Figure 18





WINDOWS AND DOORS

Building wall components such as windows, doors and other exterior wall penetrations shall be installed in accordance with the component manufacturer's written installation instructions and local building codes. Where windows or doors are installed, continue the application of siding as if the wall is complete. Trimming for the opening and using the resulting piece may throw off the spacing above the break.

GENERAL FASTENING REQUIREMENTS

Fasteners must be corrosion resistant, galvanized, or stainless steel. Electro-galvanized are acceptable but may exhibit premature corrosion. James Hardie recommends the use of quality, hot-dipped galvanized nails. James Hardie is not responsible for the corrosion resistance of fasteners. Stainless steel fasteners are recommended when installing James Hardie® products near the ocean, large bodies of water, or in very humid climates.

PNEUMATIC FASTENING

James Hardie products can be hand nailed or fastened with a pneumatic tool. Pneumatic fastening is highly recommended. Set air pressure so that the fastener is driven snug with the surface of the siding. A flush mount attachment on the pneumatic tool is recommended. This will help control the depth the nail is driven. If setting the nail depth proves difficult, choose a setting that under drives the nail. (Drive under driven nails snug with a smooth faced hammer - Does not apply for installation to steel framing).

- Consult applicable code compliance report for correct fasteners type and placement to achieve specified design wind loads.
- NOTE: Published wind loads may not be applicable to all areas where Local Building Codes have specific jurisdiction. Consult James Hardie Technical Services if you are unsure of applicable compliance documentation.
- Drive fasteners perpendicular to siding and framing.
- Fastener heads should fit snug against siding (no air space). (fig. A)
- Do not over-drive nail heads or drive nails at an angle
- If nail is countersunk, caulk nail hole and add a nail. (fig. B)
- For wood framing, under driven nails should be hit flush to the plank with a hammer (For steel framing, remove and replace nail).
- Do not use aluminum fasteners, staples, or clipped head nails.

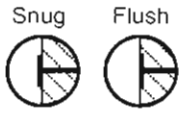


Figure A

Figure B

CUT EDGE TREATMENT

Caulk, paint or prime all field cut edges.

CAULKING

For best results use an Elastomeric Joint Sealant complying with ASTM C920 Grade NS, Class 25 or higher or a Latex Joint Sealant complying with ASTM C834. Caulking/Sealant must be applied in accordance with the caulking/sealant manufacturer's written instructions or ASTM C1193.

PRIMING & PAINTING

DO NOT use stain on James Hardie® products. James Hardie® products must be painted within 180 days for primed product and 90 days for unprimed. In addition non ColorPlus® product versions of HardieShingle® Siding require a field applied prime coat. 100% acrylic primers and topcoats are recommended. Do not paint when wet. For application rates refer to paint manufacturers specifications. Back rolling is recommended when paint is spray applied.

COLORPLUS® TECHNOLOGY CAULKING, TOUCH-UP & LAMINATE

- Touch up nicks, scrapes and nail heads using the ColorPlus® Technology touch up applicator. Touch-up paint should be used sparingly. If large areas require touch-up, replace the damaged area with new HardieShingle® siding with ColorPlus Technology
- Laminate sheet must be removed immediately after installation of each course
- Terminate non-factory cut edges into trim where possible, and caulk. Color matched caulks are available from your ColorPlus® product dealer.
- Treat all other non-factory cut edges using the ColorPlus Technology edge coaters, available from your ColorPlus product dealer.

PAINTING JAMES HARDIE® SIDING AND TRIM PRODUCTS WITH COLORPLUS® TECHNOLOGY

When repainting ColorPlus products, James Hardie recommends the following regarding surface preparation and topcoat application:

- Ensure the surface is clean, dry, and free of any dust, dirt, or mildew
- Repriming is normally not necessary
- 100% acrylic topcoats are recommended
- DO NOT use stain or oil/alkyd base paints on James Hardie® products
- Apply finish coat in accordance with paint manufacturers written instructions regarding coverage, application methods, and application temperature

RECOGNITION. In accordance with ICC-ES Legacy Report NER-405, HardieShingle® Staggered Edge Notched Panels are recognized as a suitable alternate to that specified in the BOCA National Building Code/1999, the 1997 Standard Building Code, the 1997 Uniform Building Code, the 1998 International One- and Two-Family Dwelling Code, the 2003 International Building Code, and the 2003 International Residential Code for One-and Two-Family Dwellings HardieShingle Staggered Edge Notched Panels are also recognized for application in the following City of Los Angeles Research Report No 24862, State of Florida listing FL#889, .02, U S Dept of HUD Materials Release 1263c, Texas Department of Insurance Product Evaluation EC-23, City of New York MEA 223-93-M, and California DSA PA-019. These documents should also be consulted for additional information concerning the suitability of this product for specific applications

Please visit www.jameshardie.com for Additional Product Information and Availability, Installation Information, Warnings, and Warranties

JamesHardie

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HardiePanel® Vertical Siding Product Description

HardiePanel® vertical siding is factory-primed fiber-cement vertical siding available in a variety of sizes and textures. Examples of these are shown below. Textures include smooth, stucco, Cedarmill© and Sierra 8. HardiePanel vertical siding is 5/16-in. thick and is available in 4x8, 4x9 and 4x10 sizes. Please see your local James Hardie dealer for texture and size availability.

HardiePanel vertical siding is available as a prefinished James Hardie® product with ColorPlus® Technology. The ColorPlus coating is a factory applied, oven baked finish available on a variety of James Hardie siding and trim products. See your local dealer for availability of products, color and accessories.

Stucco

Cedarmill©

Sierra 8

Smooth

Installation of HardiePanel® Vertical Siding (continued)

GETTING STARTED

First locate the lowest point of the sheathing or sill plate, and begin installation on that wall.

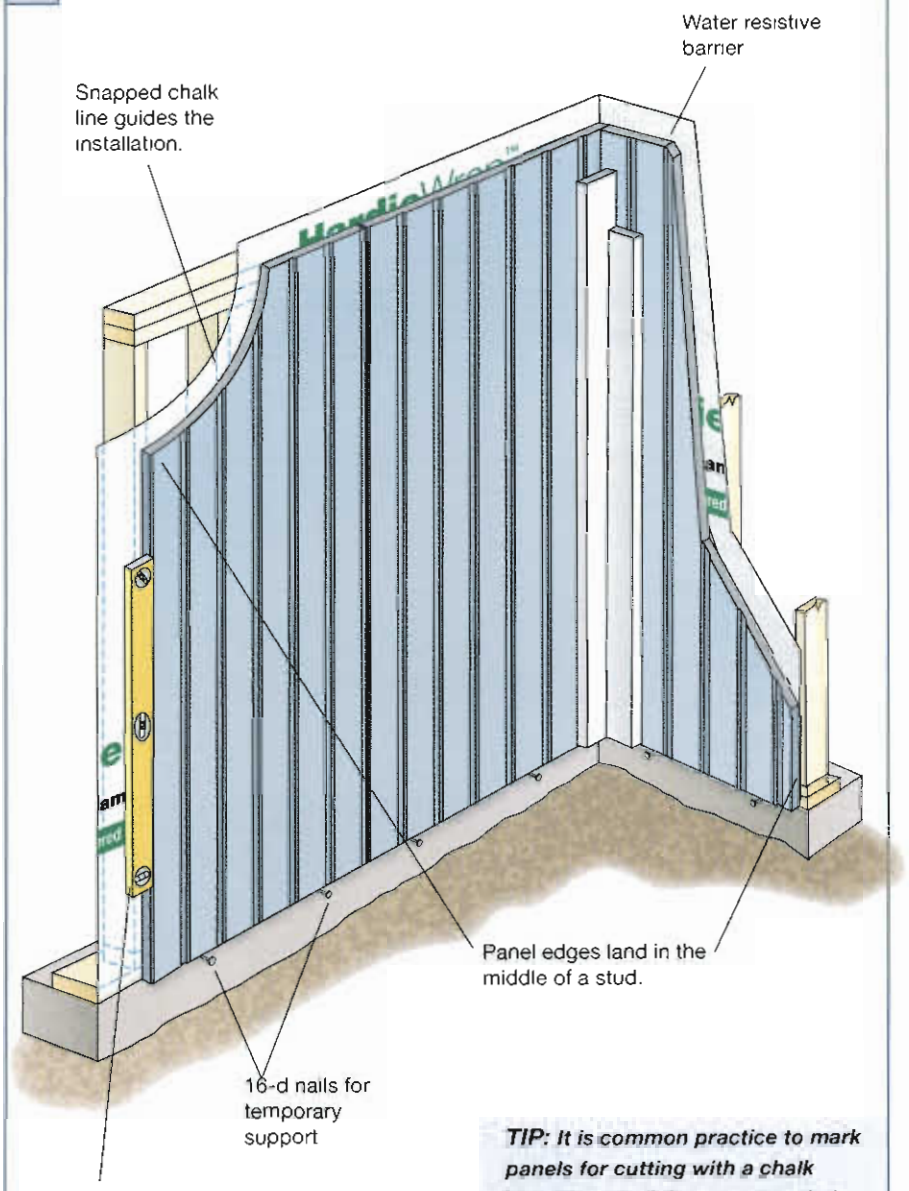
1) Measure up from the sill plate the height of the panels at either end of the wall and snap a straight, level chalk line between the marks as a reference line. That line is for guidance in positioning the top edge of the panels. Check the reference line with a 4-ft. level.

2) Starting on one end and working across the wall, measure and trim the first panel making sure that the edge falls in the middle of a stud.

3) Using the chalk line as a guide along the panel's top edge, carefully position the panel and secure it with suitable fasteners and fastener spacing for the particular application as noted in the NER-405.

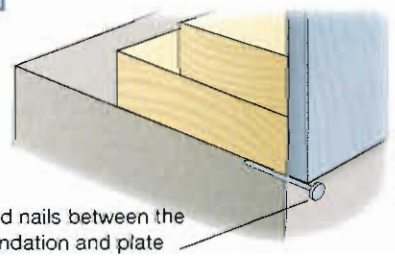
4) As installation continues, check the vertical edge of each panel with a 4-ft. level.

11.1



***TIP:** It is common practice to mark panels for cutting with a chalk line. Blue chalk is recommended because it washes off. Red chalk is considered permanent and may bleed through lighter colored paints.*

11.2



***TIP:** To give the installer more control while setting the first course of wall panels, rest the panels on a couple of large common nails inserted between the plate and the foundation.*

***TIP:** For Sierra 8 panels, double studs at each panel joint allows fasteners to be placed outside of panel grooves.*

VERTICAL JOINT TREATMENT

Treat vertical joints in HardiePanel® vertical siding by using one of the following four methods:

1) Install the panels in moderate contact.

2) Leave an appropriate gap between panels (1/8 in. is the most common), and caulk using a high-quality paintable caulk, that meets ASTM C-834 or C-920 requirements

Panels may be installed first with caulk applied in the joints after installation; or as an option, after the first panel is installed, apply a bead of caulk along the panel edge. When the next panel is installed against the first, the edge embeds in the applied caulk creating a thorough seal between the edges of the panels.

The caulk joint method is not recommended for the ColorPlus® products

3) Vertical joints may be covered with wood or fiber-cement batten strips. If James Hardie® siding or trim products are ripped and used as batten strips, paint or prime the cut edges. Batten strips should span the vertical joint by at least 3/4 in. on each side.

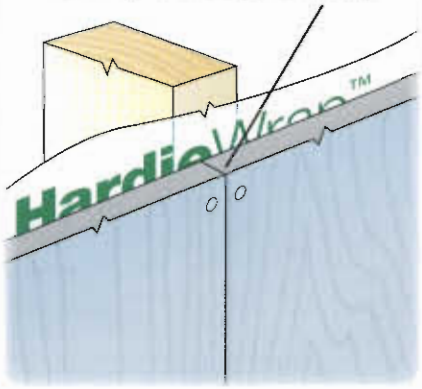
4 Metal or PVC "H" moldings can be used to join two sections of HardiePanel siding.

***TIP:** Stainless steel fasteners are recommended when installing James Hardie products.*

11.3

1 Moderate contact joint

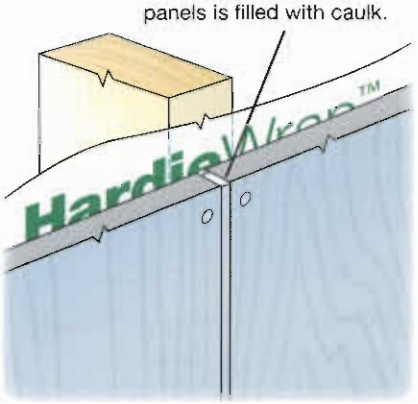
Panels are butted together lightly.



11.4

2 Caulked joint

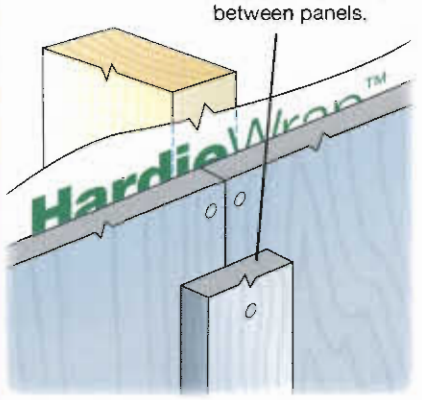
1/8-in. gap left between panels is filled with caulk.



11.5

3 Battened joint

HardieTrim® batten board covers the joint between panels.



11.6

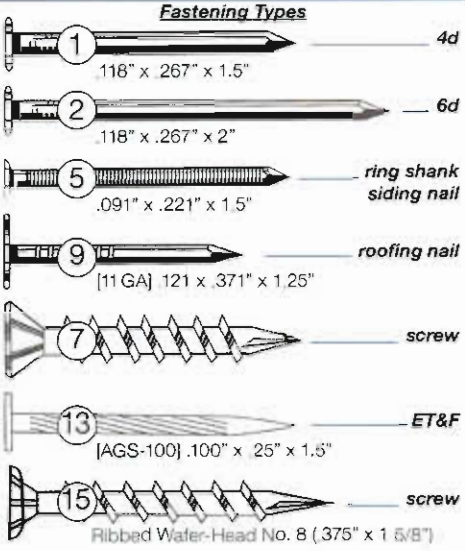
4 H-Channel joint

A manufactured H-channel captures the vertical edges of the panels.

HARDIEPANEL SIDING FASTENER SPECIFICATIONS

Fastening Substrate		Approved Fastener
wood studs	16" o.c.	1 2 5 9
	24" o.c.	1 2 9
steel studs	16" o.c or 24" o.c.	7 13
7/16" OSB or equivalent		2 15

Fastening Types



Installation of HardiePanel® Vertical Siding (continued)

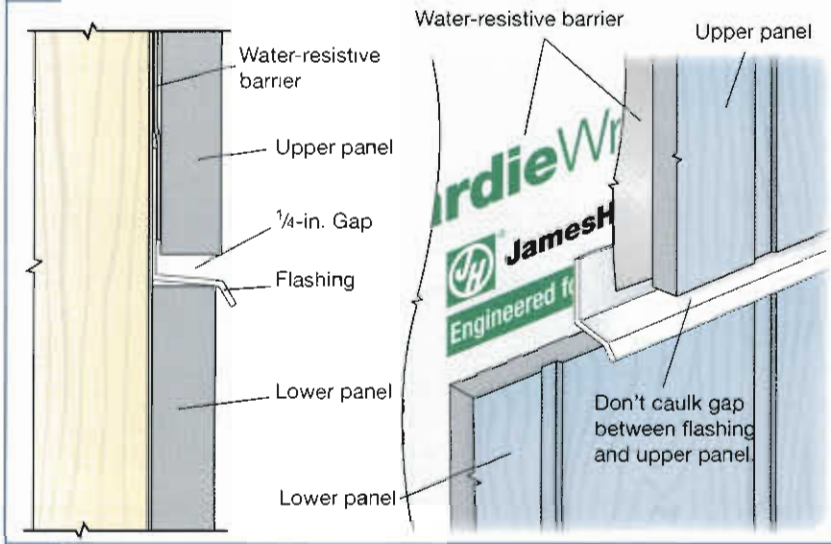
HORIZONTAL JOINT TREATMENT

In some applications such as multi-story structures or at gable ends, it may be necessary to stack HardiePanel® siding. The horizontal joints created between panels must be flashed properly to minimize water penetration. Treat horizontal panel joints by using one of the following methods:

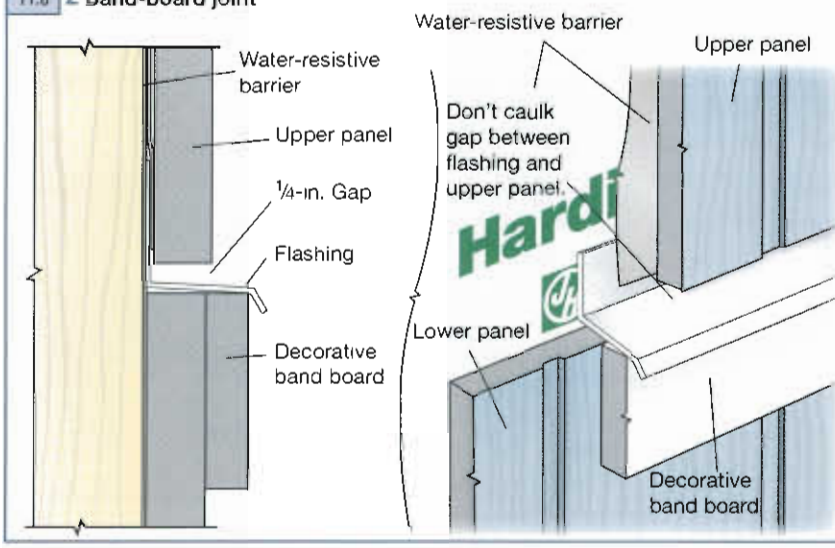
1) After installing the lower course of panel siding, install vinyl or coated aluminum "Z" flashing at the top edge of the panel. Make sure that the flashing is sloped away from the wall and does not rest flat on the top edge of the panel. Install the second level or gable panels leaving a ¼-in. minimum gap between the bottom of the panel and the Z flashing. This gap should never be caulked.

2) As an alternative, if a horizontal band board is used at the horizontal joint, flashing must extend over the panel edge and trim attachment. Flashing for both treatments must slip behind the water-resistive barrier.

11.7 1 Simple horizontal joint



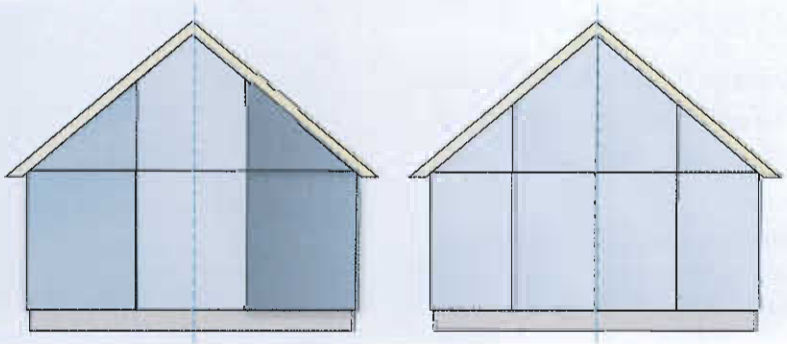
11.8 2 Band-board joint



TIP: For best looking installation of HardiePanel Select Sierra 8 siding, carefully align vertical panel grooves at 1st to 2nd story or gable junctures.

Do not bridge floors with panel siding. A horizontal joint should always be created between floors.

TIP: For the most symmetrical looking wall, plan the installation so that a full panel is centered on the wall or gable with equal-size panels cut for each end. As an alternative, plan the installation so that a full panel is located on either side of the wall center, again leaving equal-size panels on each end. These strategies might entail a centered framing layout. Choose the strategy that looks the best and uses material most efficiently.



WINDOWS, DOORS, AND OTHER WALL PENETRATIONS

In panel installations, trim is typically overlaid on top of the panel. Special attention needs to be paid to trim flashing at the tops of openings. Below is one method for properly flashing trim in a panel application:

1) After installing the window, cut and install a ¼-in. thick shim above the window. The shim should be the same width as the trim, and it should be as long as the top or header piece of trim.

2) Over the shim install flashing that is wide enough to allow for the thickness of the trim.

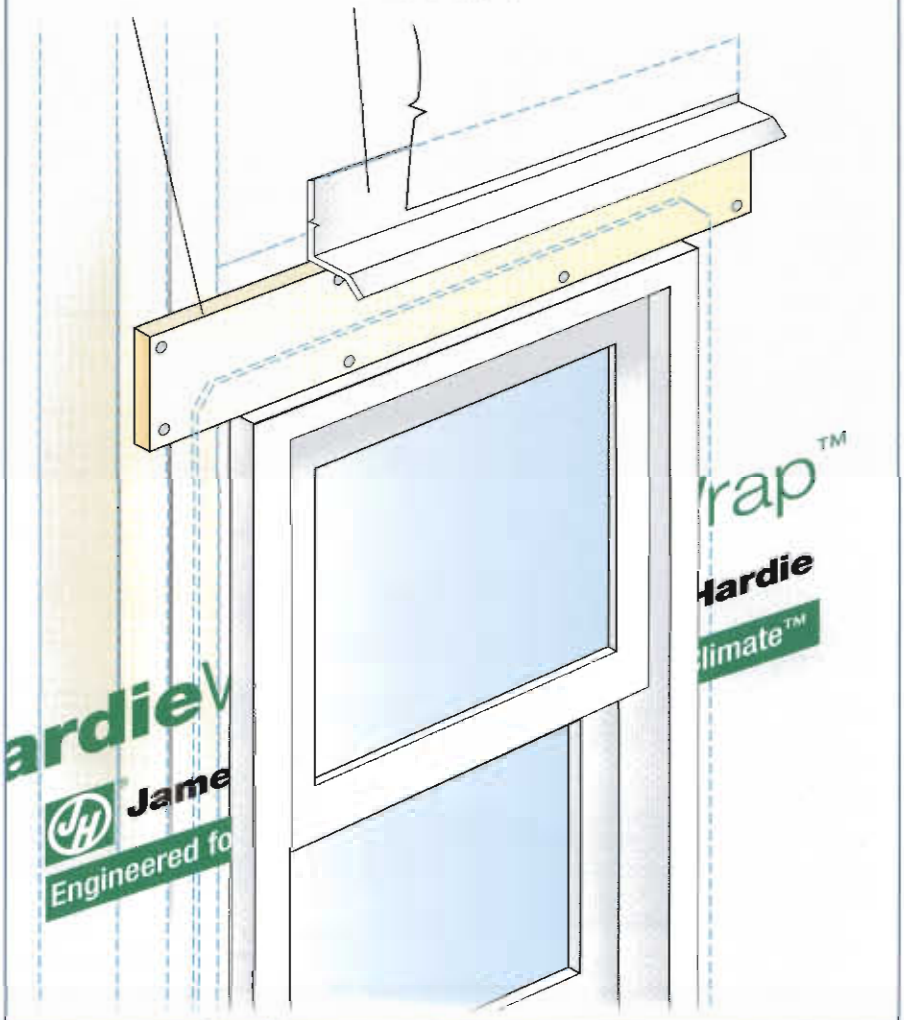
3) Install the panel to the window and around the shim taking care not to damage the flashing and leaving a ¼-in. gap between the panel and the horizontal part of the flashing.

4) Install the trim around the window, slipping the head piece under the installed flashing.

11.9

1 Install ¼-in. thick shim over the window.

2 Install flashing over the shim and under the water-resistive barrier.

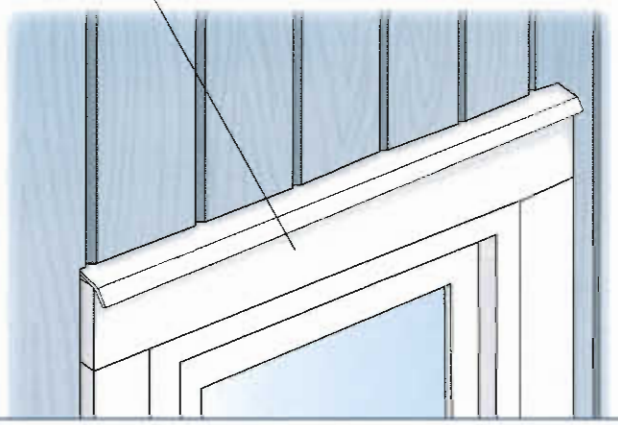


11.10

3 Cut and fit panel around the shim and flashing. Leave ¼-in. gap between the flashing and the upper panel.

11.11

4 Install window trim under the flashing.



HardiePanel® Vertical Siding

HZ5™

JamesHardie

EFFECTIVE APRIL 2009

INSTALLATION REQUIREMENTS - PRIMED & COLORPLUS® PRODUCTS

Visit www.jameshardie.com for the most recent version.

SMOOTH • CEDARMILL© • SELECT SIERRA 8 • STUCCO

IMPORTANT: FAILURE TO INSTALL AND FINISH THIS PRODUCT IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND JAMES HARDIE WRITTEN APPLICATION INSTRUCTIONS MAY LEAD TO PERSONAL INJURY, AFFECT SYSTEM PERFORMANCE, VIOLATE LOCAL BUILDING CODES, AND VOID THE PRODUCT ONLY WARRANTY. BEFORE INSTALLATION, CONFIRM THAT YOU ARE USING THE CORRECT HARDIEZONE INSTRUCTIONS. TO DETERMINE WHICH HARDIEZONE APPLIES TO YOUR LOCATION, VISIT WWW.HARDIEZONE.COM OR CALL 1-866-942-7343 (866 9HARDIE)

STORAGE & HANDLING:

Store flat and keep dry and covered prior to installation. Installing siding wet or saturated may result in shrinkage at butt joints. Carry planks on edge. Protect edges and corners from breakage. James Hardie is not responsible for damage caused by improper storage and handling of the product.

⚠ CUTTING INSTRUCTIONS

OUTDOORS

1. Position cutting station so that wind will blow dust away from user and others in working area.
2. Use one of the following methods:
   - a. Best: i. Score and snap; ii. Shears (manual, electric or pneumatic)
   - b. Better: i. Dust reducing circular saw equipped with a HardieBlade™ saw blade and HEPA vacuum extraction
   - c. Good: i. Dust reducing circular saw with a HardieBlade saw blade (only use for low to moderate cutting)

INDOORS

1. Cut only using score and snap, or shears (manual, electric or pneumatic).
2. Position cutting station in well-ventilated area.

- NEVER use a power saw indoors
- NEVER use a circular saw blade that does not carry the HardieBlade saw blade trademark
- NEVER dry sweep – Use wet suppression or HEPA vacuum

Important Note: For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best"-level cutting methods where feasible.

NIOSH-approved respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.com to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

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GENERAL REQUIREMENTS:

- HardiePanel® vertical siding can be installed over braced wood or steel studs spaced a maximum of 24" o.c. Irregularities in framing and sheathing can mirror through the finished application.
- HardiePanel vertical siding can also be installed over foam insulation/sheathing up to 1" thick. When using foam insulation/sheathing, avoid over-driving nails (fasteners),which can result in dimpling of the siding due to the compressible nature of the foam insulation/sheathing. Extra caution is necessary if power-driven nails (fasteners) are used for attaching siding over foam insulation/sheathing.
- A water-resistive barrier is required in accordance with local building code requirements. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements. James Hardie will assume no responsibility for water infiltration. James Hardie does manufacture HardieWrap™ Weather Barrier, a non-woven non-perforated housewrap[1], which complies with building code requirements.
- When installing James Hardie products all clearance details in figs. 3,5,6,7,8,9,10 &11 must be followed.
- Adjacent finished grade must slope away from the building in accordance with local building codes - typically a minimum of 6" in the first 10'.
- Do not install James Hardie products, such that they may remain in contact with standing water.
- HardiePanel vertical siding may be installed on vertical wall applications only.
- DO NOT use HardiePanel vertical siding in Fascia or Trim applications.
- DO NOT use stain on James Hardie® products.
- For larger projects, including commercial and multi-family projects, where the span of the wall is significant in length, the designer and/or architect should take into consideration the coefficient of thermal expansion and moisture movement of the product in their design. These values can be found in the Technical Bulletin "Expansion Characteristics of James Hardie® Siding Products" at www.JamesHardie.com.

INSTALLATION:

Fastener Requirements

Position fasteners 3/8" from panel edges and no closer than 2" away from corners. Do not nail into corners. HardiePanel Vertical Siding Installation

- Framing must be provided at horizontal and vertical edges for nailing.
- HardiePanel vertical siding must be joined on stud.
- Double stud may be required to maintain minimum edge nailing distances.

Joint Treatment

- Vertical Joints - Install panels in moderate contact (fig. 1), alternatively joints may also be covered with battens, PVC or metal jointers or caulked (Not applicable to ColorPlus® Finish) (fig. 2).
- Horizontal Joints - Provide Z-flashing at all horizontal joints (fig 3).

Figure 1

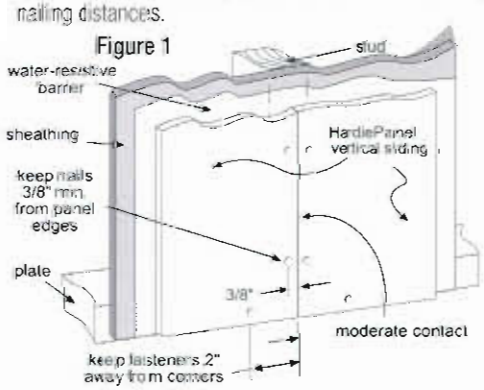


Figure 2

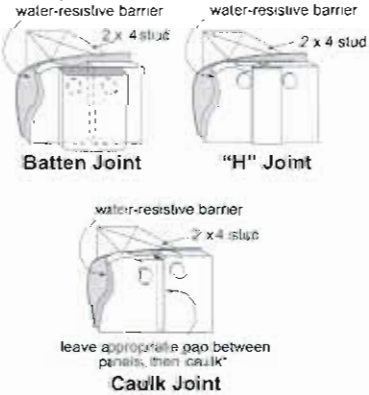


Figure 3

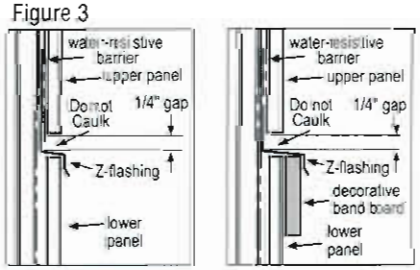
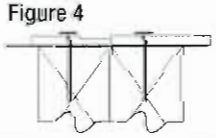


Figure 4



Recommendation: When installing Sierra 8, provide a double stud at panel joints to avoid nailing through grooves.

(Not applicable to ColorPlus® Finish)

*Apply caulk in accordance with caulk manufacturer's written application instructions.

[1]For additional information on HardieWrap™ Weather Barrier, consult James Hardie at 1-866-4Hardie or www.hardiewrap.com.

WARNING: AVOID BREATHING SILICA DUST

James Hardie® products contain respirable crystalline silica, which is known to the State of California to cause cancer and is considered by IARC and NIOSH to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation, (2) use fiber cement shears for cutting or, where not feasible, use a HardieBlade™ saw blade and dust-reducing circular saw attached to a HEPA vacuum, (3) warn others in the immediate area, (4) wear a properly-fitted, NIOSH-approved dust mask or respirator (e.g. N-95) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet clean-up methods - never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheet available at www.jameshardie.com or by calling 1-800-9HARDIE (1-800-942-7343). FAILURE TO ADHERE TO OUR WARNINGS, MSDS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

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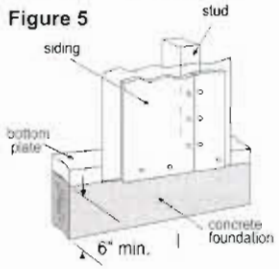
CLEARANCES

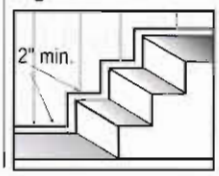
Install siding and trim products in compliance with local building code requirements for clearance between the bottom edge of the siding and the adjacent finished grade.

Figure 5



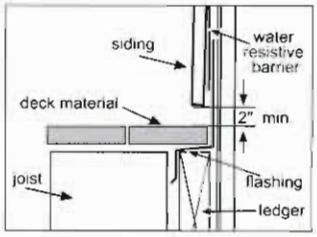
Maintain a minimum 2" clearance between James Hardie® products and paths, steps and driveways.

Figure 6



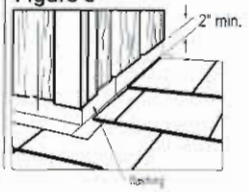
Maintain a minimum 2" clearance between James Hardie products and decking material.

Figure 7



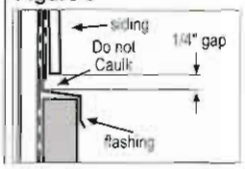
At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be installed per the roofing manufacturer's instructions. Provide a minimum 2" clearance between the roofing and the bottom edge of the siding and trim.

Figure 8



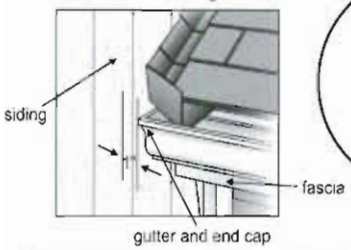
Maintain a 1/4" clearance between the bottom of James Hardie products and horizontal flashing. Do not caulk gap.

Figure 9



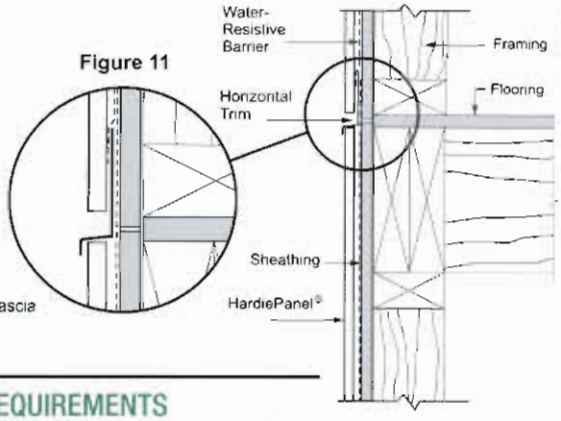
Maintain a minimum 1" gap between gutter end caps and siding & trim.

Figure 10



Do not bridge floors with HardiePanel® siding. Horizontal joints should always be created between floors (fig. 11)

Figure 11



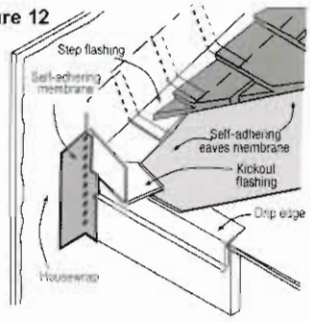
KICKOUT FLASHING

Because of the volume of water that can pour down a sloped roof, one of the most critical flashing details occurs where a roof intersects a sidewall. The roof must be flashed with step flashing. Where the roof terminates, install a kickout to deflect water away from the siding.

It is best to install a self-adhering membrane on the wall before the subfascia and trim boards are nailed in place, and then come back to install the kickout.

Figure 12, Kickout Flashing * To prevent water from dumping behind the siding and the end of the roof intersection, install a "kickout" of sufficient length and angle to direct the water running down the roof away from the siding

Figure 12



GENERAL FASTENING REQUIREMENTS

Fasteners must be corrosion resistant, galvanized, or stainless steel. Electro-galvanized are acceptable but may exhibit premature corrosion. James Hardie recommends the use of quality, hot-dipped galvanized nails. James Hardie is not responsible for the corrosion resistance of fasteners. Stainless steel fasteners are recommended when installing James Hardie products near the ocean, large bodies of water, or in very humid climates.

PNEUMATIC FASTENING

James Hardie products can be hand nailed or fastened with a pneumatic tool. Pneumatic fastening is highly recommended. Set air pressure so that the fastener is driven snug with the surface of the siding. A flush mount attachment on the pneumatic tool is recommended. This will help control the depth the nail is driven. If setting the nail depth proves difficult, choose a setting that under drives the nail. (Drive under driven nails snug with a smooth faced hammer - Does not apply for installation to steel framing).

- Consult applicable code compliance report for correct fastener type and placement to achieve specific design wind loads.
- NOTE: Published wind loads may not be applicable to all areas where Local Building Codes have specific jurisdiction. Consult James Hardie Technical Services if you are unsure of applicable compliance documentation.
- Drive fasteners perpendicular to siding and framing.
- Fastener heads should sit snug against siding (no air space). (fig. A)
- Do not over-drive nail heads or drive nails at an angle.
- If nail is countersunk, caulk nail hole and add a nail. (fig. B)
- For wood framing, under driven nails should be hit flush to the plank with a hammer (for steel framing, remove and replace nail).
- Do not use aluminum fasteners, staples, or clipped head nails.

CUT EDGE TREATMENT

Caulk, paint or prime all field cut edges.

CAULKING

For best results use an Elastomeric Joint Sealant complying with ASTM C920 Grade NS, Class 25 or higher or a Latex Joint Sealant complying with ASTM C834. Caulking/Sealant must be applied in accordance with the caulking/sealant manufacturer's written instructions or ASTM C1193.

PAINTING

DO NOT use stain on James Hardie® products. James Hardie products must be painted within 180 days for primed product and 90 days for unprimed. 100% acrylic topcoats are recommended. Do not paint when wet. For application rates refer to paint manufacturers specifications. Back-rolling is recommended if the siding is sprayed.

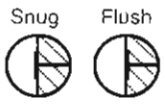


Figure A

Figure B

* The illustration (figure 11) was reprinted with permission of THE JOURNAL OF LIGHT CONSTRUCTION. For subscription information, visit www.jlconline.com.

RECOGNITION: In accordance with ICC-ES Legacy Report NER-405, HardiePanel® vertical siding is recognized as a suitable alternate to that specified in: the BOCA National Building Code/1999, the 1997 Standard Building Code, the 1997 Uniform Building Code, the 1998 International One- and Two-Family Dwelling Code, the 2003 International Building Code, and the 2003 International Residential Code for One-and Two-Family Dwellings. HardiePanel® vertical siding is also recognized for application in the following: City of Los Angeles Research Report No. 24862, State of Florida listing FL#889, Dade County, Florida NOA No. 02-0729.02, U.S Dept. of HUD Materials Release 1263c, Texas Department of Insurance Product Evaluation EC-23, City of New York MEA 223-93-M, and California DSA PA-019. These documents should also be consulted for additional information concerning the suitability of this product for specific applications.

Additional Installation Information, Warranties, and Warnings are available at www.jameshardie.com

JamesHardie®

Appendix A

Additional Information

RAINSCREENS

The Optional Use of Rain Screen Systems:
James Hardie will support the use of its exterior siding products with rainscreen systems, but does not take sole responsibility for the entire wall assembly or system. James Hardie expects the designer or builder using our components as part of the rainscreen system to:

- Adhere to all the installation requirements listed in the relevant product installation instructions.
- Provide adequate details for water management.
- Make the decision about the use of rainscreen.
- Understand the interaction between system components and how each of the components in the system interacts.
- Design of the building envelope accounting for both interior and exterior moisture control.

Installation Over Furring:
When installing James Hardie Siding products over furring the question arises what thickness of furring can be used as an alternate to normal metal or wood studs specified in the National Evaluation Services, Inc. NER 405 Report. General rule of thumb is, the specific NER-405 fastener must be installed into a material that has the same or better holding power than that specified in the NER-405 and with the same penetration as the NER-405 fastener.

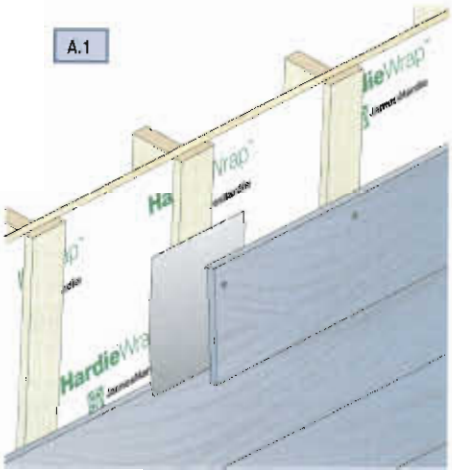
Note: The NER-405 is the primary code compliance document James Hardie utilizes, but for other common applications and/or products, additional code compliance documentation and/or fastener specifications may exist. For special circumstances out side the scope of the NER-405, please contact James Hardie's Technical Services.

When reviewing the following details for attaching to wood furring or framing, an important consideration is that the fastener chosen must be fully encompassed by a wood substrate - the furring may count as all or part of the necessary penetration if it has been proven that the furring and/or wood substrate has the same or better holding power as a timber stud.

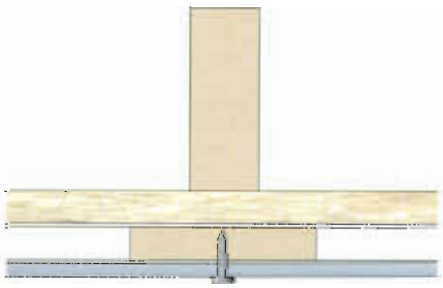
Design responsibility
In all cases it is the sole responsibility of the architect, envelope engineer or specifier to identify moisture related risks associated with any particular building design and to make any appropriate adjustments or modifications to the installation guidelines given by manufacturers. Wall construction and design must effectively manage moisture, considering both the interior and exterior environment of the building.

Attaching lap siding to wood furring:
When attaching lap siding products over wood furring, the typical fastener used is the 1-1/4" long No. 11 ga. roofing nail, blind nailed. This fastener is going to be the shortest fastener approved for fastening lap siding products, therefore the furring must be a minimum of 0.75" thick to achieve the same values as NER-405 Table 2 states for the 11 ga. 1-1/4" roofing nail given plank reveal, stud spacing, building height and exposure category.

A.1

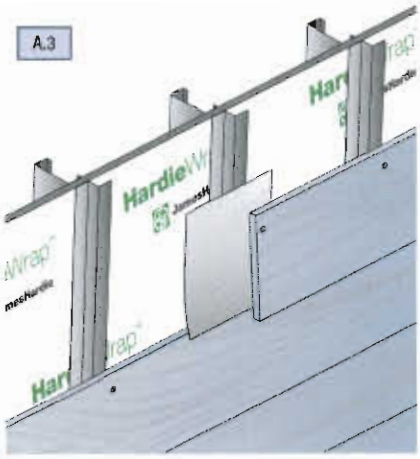


A.2

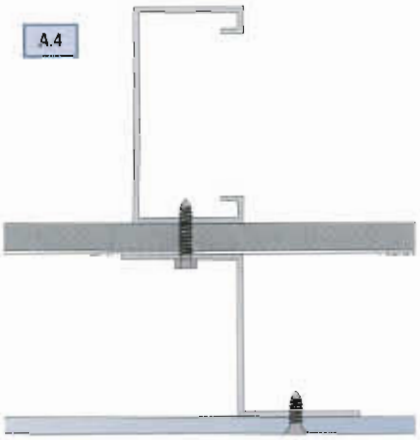


Attaching lap siding to steel furring:
When attaching lap siding products to metal furring, the steel furring must be a minimum 20 gauge steel. A fastener should be chosen out of the NER-405, which is approved for attaching to steel framing. Two general rules that should be considered when choosing a fastener is that a nail (pin) must penetrate steel furring ¼", and screws must penetrate steel furring 3 full threads. Therefore, if the rules for steel fastening are followed – given plank reveal, stud spacing, building height, and exposure category – the values are the same as NER-405 Table 2 states for the chosen fastener.

A.3

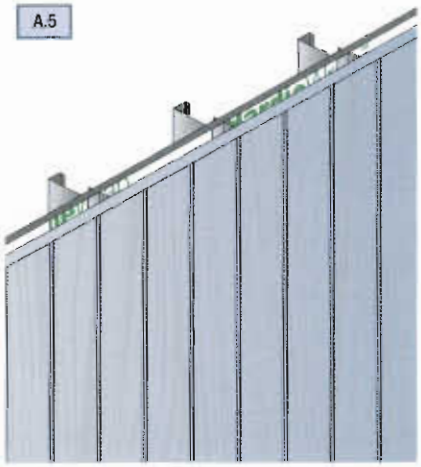


A.4

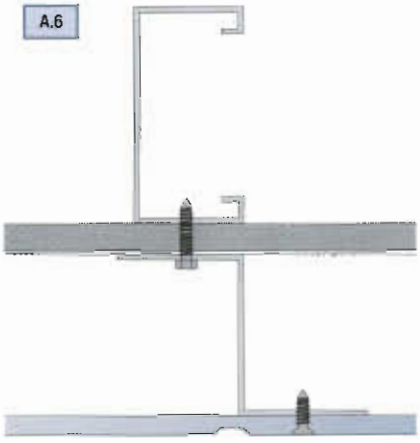


Attaching panel siding to steel furring:
When attaching panel siding products to metal furring, the steel furring must be a minimum 20 gauge steel. A fastener should be chosen out of the NER-405, which is approved tor attaching to steel framing. Two general rules that should be considered when choosing a fastener is that a nail (pin) must penetrate steel furring ¼", and screws must penetrate steel furring 3 full threads. Therefore, if the rules for steel fastening are followed – given stud spacing, building height, and exposure category – the values are the same as NER-405 Table 2 states for the chosen fastener.

A.5



A.6



Additional Information (continued)

Attaching panel siding to wood furring:

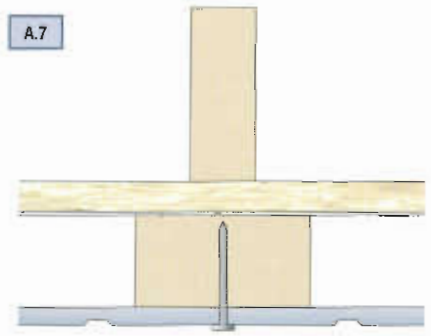
When attaching panel siding products over wood furring, the typical fastener used is the 6d common 2" long nail. This fastener is going to be the shortest fastener approved for fastening panel siding products into wood, therefore the furring must be a minimum of 1-11/16" thick to achieve the same values as NER-405 Table 2, given stud spacing, building height, and exposure category.

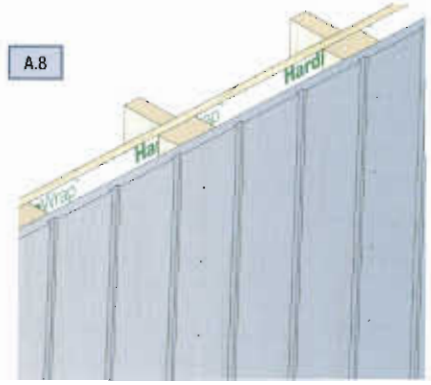
It is deemed an acceptable practice to not fasten along the top and bottom plates for the 5/16" HardiePanel configurations listed in the NER-405 using the following fastener type:

- 0.091" shank X 0.225" HD X 1.5" long ring shank nail
- 6d common 2" long nail
- Min. No. 8 X 0.311 HD X 1" ribbed bugle head screw
- 0.10 X 0.25" HD X 1.5" long ET&F pin or equivalent

Conditions of use:

- This practice is acceptable for transverse load only.
- This practice is not acceptable for racking shear values or in-plane forces other than perpendicular/normal wind forces.
- All vertical joints shall occur over framing.
- All other James Hardie Installation Requirements shall be followed.





ATTACHING JAMES HARDIE PRODUCTS TO INSULATED CONCRETE FORMS (ICF)

Considering the proprietary nature of Insulated Concrete Forms (ICF) and the number of ICF manufacturers currently selling product in the US and Canada, James Hardie Building Products cannot calculate or determine the proper fastener for each type of plastic or metal cross-tie flange being used in the field. James Hardie offers the following as a guide to determine the correct siding fastening to be used with the respective ICF system chosen for the project in question.

1. Determine the projects basic wind design, including basic wind speed, wind exposure category, and mean roof height.

2. Find the fastener and frame type within James Hardie's ICC-ES Product Evaluation Report (e.g. NER-405) that will meet the project's basic wind design.
   - **a.** Take note of the head diameter, shank diameter, and fastener length for the fastener.

Note: Fastener bearing area is equal to the head area less the shank area.

   - **b.** Take note of the frame type and frame spacing.

3. Go to the ICF system manufacturer and find a fastener that is similar in dimension to the fastener from step 2.1 above.

a. Basically, the bearing area under the ICF fastener head shall be the same as or greater than the bearing area under the James Hardie fastener head from step 2.

4. Since the James Hardie siding product has to be attached to a structural member, in this case the ICF cross-tie flange, the steps below shall be followed.

a. The onus is on the ICF system manufacturer to demonstrate that their ICF cross-tie flange holds fasteners, screws or nails, the same as wood or steel framing hold screws or nails.

b. ICF fastener allowable withdrawal load capacity (applicable factor of safety applied) may be found in an ICC-ES Product Evaluation for the given ICF manufacturer's products, OR

c. The ICF manufacturer may have testing that shows their fastener's allowable withdrawal load capacity (applicable factor of safety applied) from their cross-tie flange.

5. For the fastener from step 2, a registered design professional shall calculate the allowable withdrawal load (factor of safety applied) from the frame type noted in step 2.2.

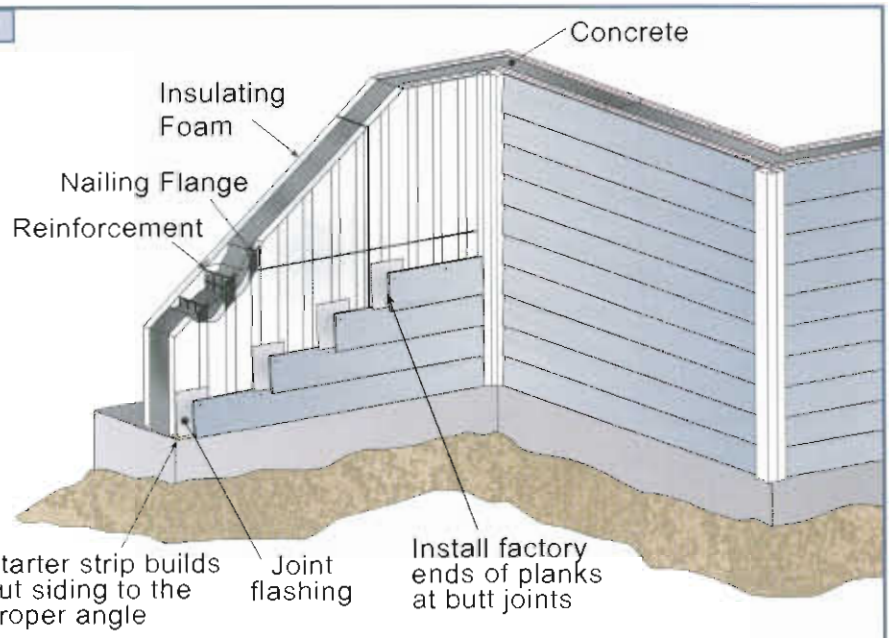
6. A registered design professional shall then make an equivalency statement comparing the ICF fastener withdrawal (step 4.1.1 or step 4.1.2) versus the fastener withdrawal from step 5.

7. When the ICF cross-tie flange spacing differs from the James Hardie frame spacing in step 2.2, a registered design professional shall calculate the maximum siding fastener spacing into the cross-tie flange needed to resist the applicable basic wind speeds published in James Hardie's ICC-ES Product Evaluation Report (e.g. NER-405) for the fastener and design from step 2.

8. When required by the code official and once in possession of the information gathered in the steps above it is the responsibility of the property owner, design professional, contractor, or installer to make his or her case to the Building Official[1].

[1] *The Building Official reserves the right to approve alternate materials, design and methods of construction, 2006 International Building Code® Section 104.11, 2006 International Residential Code® Section R104.11, and 1997 Uniform Building Code™ Section 104.2.8*

A.9



Refer to ICF Manufacturer for compliant fastening

Additional Information (continued)

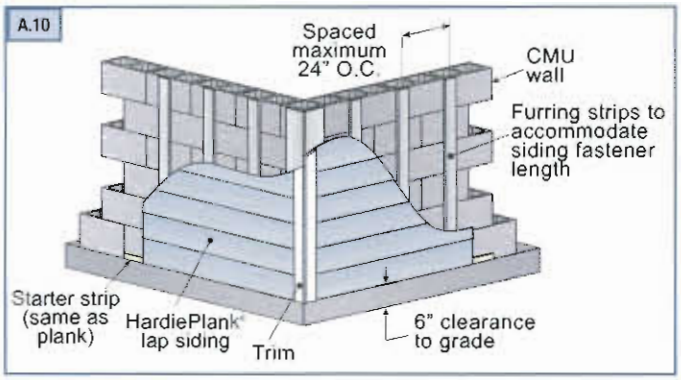
ATTACHING HARDIEPLANK® LAP SIDING AND HARDIETRIM® PRODUCTS TO CONCRETE MASONRY UNITS (CMU)

The application of HardiePlank® Lap Siding and HardieTrim® boards to masonry construction complying with local building codes using Concrete Masonry Units (CMU) complying to ASTM C 90 can be achieved by using one of the following two methods of attachment. All other product specific installation requirements which are not outlined below must be followed.

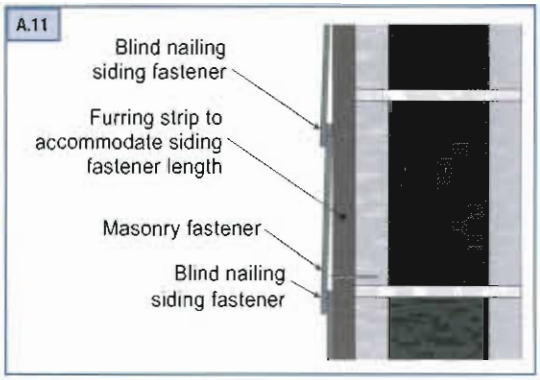
Method 1: Attachment Over Furring

Attach over furring with adequate thickness to allow attachment with approved fastening methods according to local building codes and code compliance documentation. Furring must be attached to ensure it can transfer the wind loads and other necessary forces back to the structure. The mechanical connection of the furring to the structure is the responsibility of the Licensed Design Professional. James Hardie Building Products has no comment on the load carrying capacity of the furring to framing connections.

A.10



A.11

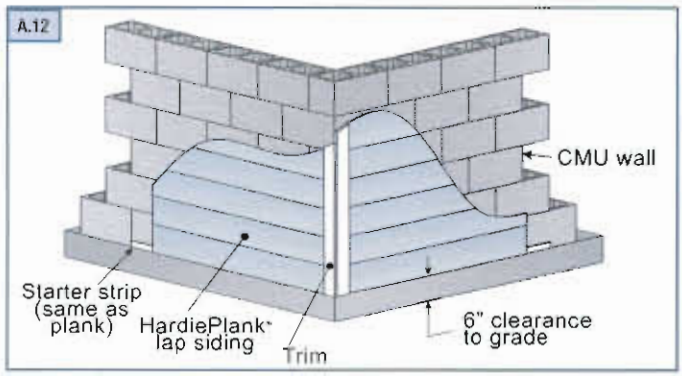


Method 2: Attachment Directly to CMU

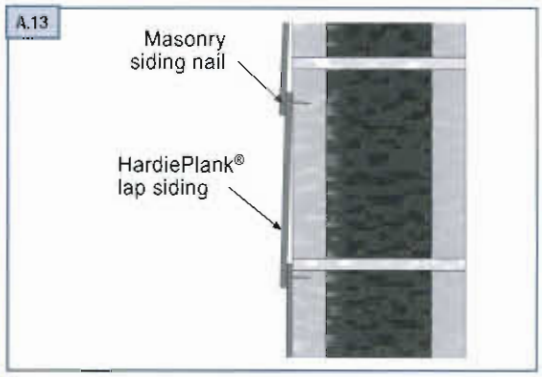
Attach directly to masonry with approved fastening method according to local building codes and code compliance documentation.

Refer to and follow local building codes for water resistive barrier requirements

A.12



A.13



Attachment of HardieTrim® boards

HardieTrim boards can be fastened using hardened finish nails designed for masonry construction. For more information refer to the HardieTrim section of this guide.

ICC – IBC® & IRC®/2006 – ALLOWABLE FASTENER SPACING (IN.)

HardiePlank® Lap Siding **fastened to ASTM C 90 Concrete Wall**

Basic Wind Speed	Building Height (feet)	<6½-inch wide			7¼- & 7½-inch wide			8- & 8¼-inch wide			9¼- & 9½-inch wide		
		Exposure			Exposure			Exposure			Exposure		
		B	C	D	B	C	D	B	C	D	B	C	D
100 mph	0-15	24	24	24	24	24	24	24	24	21	24	23	19
	20	24	24	24	24	24	23	24	24	20	24	21	18
	30	24	24	24	24	24	21	24	22	19	24	20	17
	40	24	24	23	24	24	20	24	21	18	24	19	16
	50	24	24	22	24	22	19	24	20	17	24	18	15
	60	24	24	22	24	22	19	24	19	17	23	17	15
110 mph	0-15	24	24	22	24	24	19	24	21	17	23	19	15
	20	24	24	21	24	22	18	24	20	16	23	18	15
	30	24	24	20	24	20	17	24	18	15	23	16	14
	40	24	22	19	24	19	16	23	17	15	21	15	13
	50	24	21	18	24	18	16	22	16	14	20	14	12
	60	24	20	18	23	18	15	21	16	14	19	14	12
120 mph	0-15	24	23	19	24	20	17	21	18	15	19	16	13
	20	24	22	18	24	19	16	21	17	14	19	15	12
	30	24	20	17	24	17	15	21	15	13	19	14	12
	40	24	19	16	22	16	14	20	14	12	18	13	11
	50	24	18	16	21	16	13	18	14	12	17	12	11
	60	23	17	15	20	15	13	18	13	11	16	12	10
130 mph	0-15	24	20	16	21	17	14	18	15	12	16	14	11
	20	24	19	15	21	16	13	18	14	12	16	13	11
	30	24	17	14	21	15	12	18	13	11	16	12	10
	40	22	16	14	19	14	12	17	12	11	15	11	9
	50	21	15	13	18	13	11	16	12	10	14	11	9
	60	20	15	13	17	13	11	15	11	10	13	10	9
140 mph	0-15	21	17	14	18	15	12	16	13	11	14	12	10
	20	21	16	13	18	14	12	16	12	10	14	11	9
	30	21	15	12	18	13	11	16	11	10	14	10	9
	40	19	14	12	16	12	10	15	11	9	13	9	8
	50	18	13	11	15	11	10	14	10	9	12	9	8
	60	17	13	11	15	11	10	13	10	9	12	9	8
150 mph	0-15	18	15	12	16	13	11	14	11	9	12	10	8
	20	18	14	12	16	12	10	14	11	9	12	10	8
	30	18	13	11	16	11	9	14	10	8	12	9	7
	40	16	12	10	14	10	9	13	9	8	11	8	7
	50	15	12	10	13	10	9	12	9	8	11	8	7
	60	15	11	10	13	10	8	11	8	7	10	8	7

Notes to Table:

1 *Fasteners shall be ET&F Fastening Systems, Inc ET&F block Nail (ET & F No. ASM-144-125, head dia = 0 30 in , shank dia = 0 14 in , length = 1 25-in. long) or Max System block Nail (CP-C 832 W7-ICC, head dia = 0 30 in,. shank dia = 0 15 in , length = 1 3 in).*

2 *Maximum basic wind speed shall be 150 mph.*

3 *Interpolation to address building height and other plank widths is permitted*

4 *The lap conceals the fasteners of the previous course (Blind Nailed)*

5 *1 inch = 25.4 mm, 1 foot = 305 mm, 1 mph = 0 44 m/s*

Additional Information (continued)

INSTALLING OVER RIGID FOAM INSULATION UP TO 1" THICK

James Hardie does support the use of its exterior siding products installed over rigid foam insulation, but does not take responsibility for the entire wall assembly or system. James Hardie expects the designer or builder using our components as part of the insulated wall assembly to:

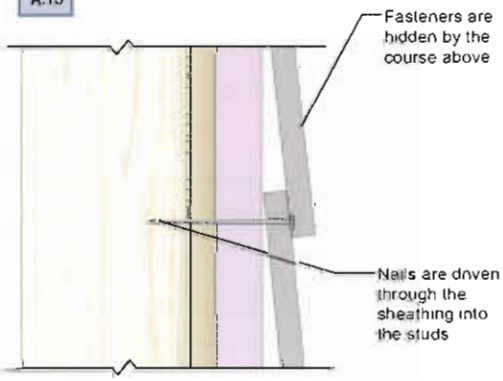
A.14

- Adhere to all the installation requirements listed in the relevant product installation instructions.
- Provide adequate details for water management.
- Make the decision about the use and type of rigid foam insulation.
- Understand the interaction between system components and how each of the components in the system interacts.
- Design the building envelope to account for both interior and exterior moisture control.

General requirements and installation guidelines:

- All James Hardie® product specific installation requirements must be followed.
- All national, state, and local building code requirements must be followed. Where they are more stringent than the James Hardie installation requirements, state and local requirements will take precedence.
- James Hardie siding and trim products can be installed over solid-foam insulation board up to 1-in. thick. Caution should be taken as irregularities and unevenness in framing, sheathing, foam and other wall assembly components, including under driven nails, can telegraph through to the finished siding and trim. These irregularities should be corrected before the siding is installed.
- When reviewing the following details for attaching over foam, an important consideration is that the fastener chosen must be adequately encompassed by a wood substrate. The foam will not count as part of the necessary penetration, there for the length of the chosen fastener must be extended by the thickness of the foam.

A.15



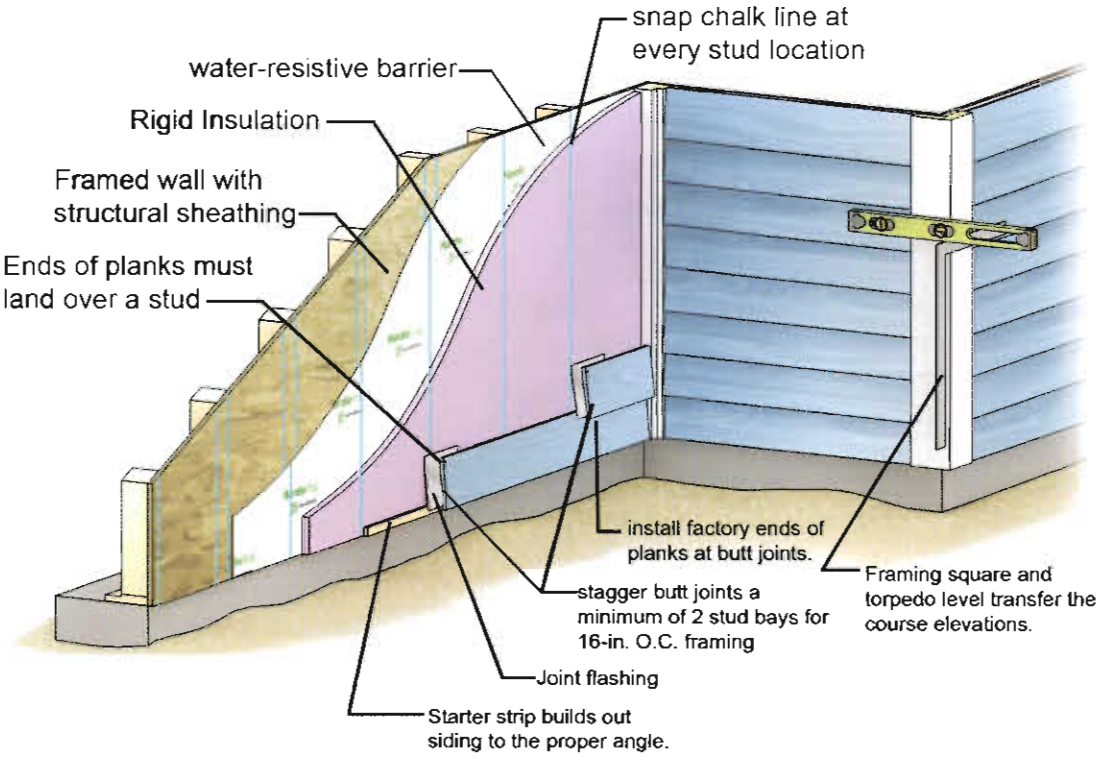
Fastener Selection:

- When attaching lap siding products over foam, the length of the chosen fastener must be extended in length by the thickness of the foam.

Normal Fastener	Fastener for an additional 1/2" of Foam
6d common 2" long	8d common 2½" long
11 ga. 1¼" long roofing nail	11 ga. 1¾" long roofing nail
8-18 x 1⅝" x .323" HD ribbed bugle head screw	8-18 x 2⅛" x .323" HD ribbed bugle head screw

Refer to the NER-405 or other code compliant documentation for proper fastener selection based on specific product, stud spacing, building height, and exposure category.

A.16



TIP: With some types of foam it is possible to use the rigid foam as the water resistive barrier by taping and sealing all of the joints. Refer to specific manufacturers installation requirements when considering this type of application.

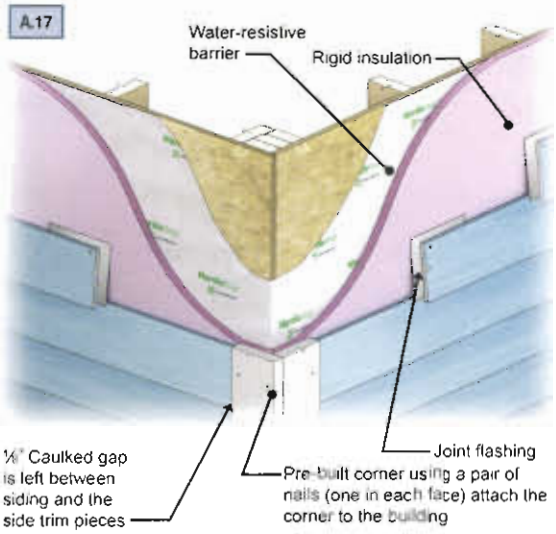
Note: When attaching lap siding products over foam the length of the chosen fastener must be extended by the thickness of the foam to achieve the same required holding power.

Additional Information (continued)

WEATHER BARRIER & RIGID FOAM

- When using a weather resistive barrier (WRB) in conjunction with rigid foam insulation, the WRB can be installed underneath the foam as shown, or over the top if more convenient
- Regardless of where the WRB is placed all flashings must be incorporated into the WRB and drainage plane.
- Some rigid foam insulation products are manufactured with tongue & groove or shiplap joints and can be used as the WRB when properly installed and sealed. When using rigid foam insulation as the WRB refer to manufacturers installation instructions.

A.17



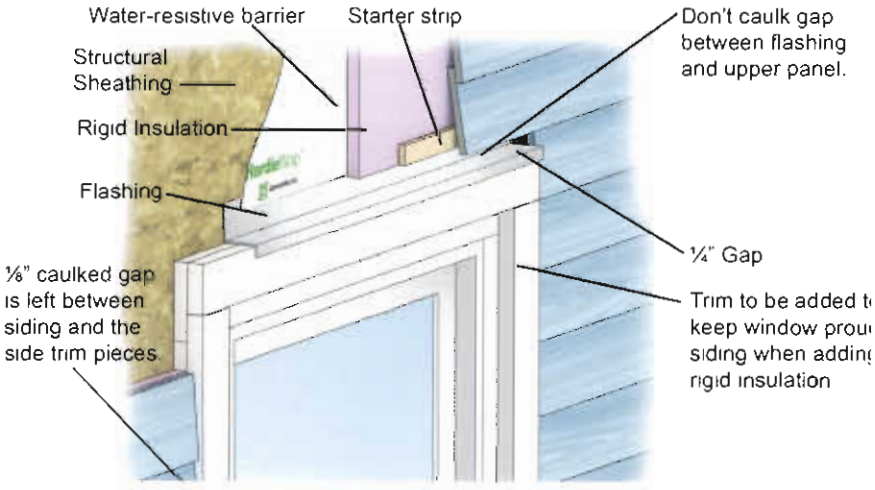
Trim

Depending upon the reveal around windows, doors, & penetrations, thickness of foam and the type and thickness of trim used there will be different techniques to install the siding and trim to ensure the foam is completely concealed.

Flashings

The Z flashing above all horizontal trim must be incorporated into the WRB regardless of WRB position. If the foam is being used per manufacturers instructions as the WRB, all flashings must be incorporated into the drainage plane such that it allows moisture to drain down and out.

A.18



Note: It is recommended to layout the rigid foam insulation such that vertical joints do not occur at the corners of window and door openings or over s if possible.

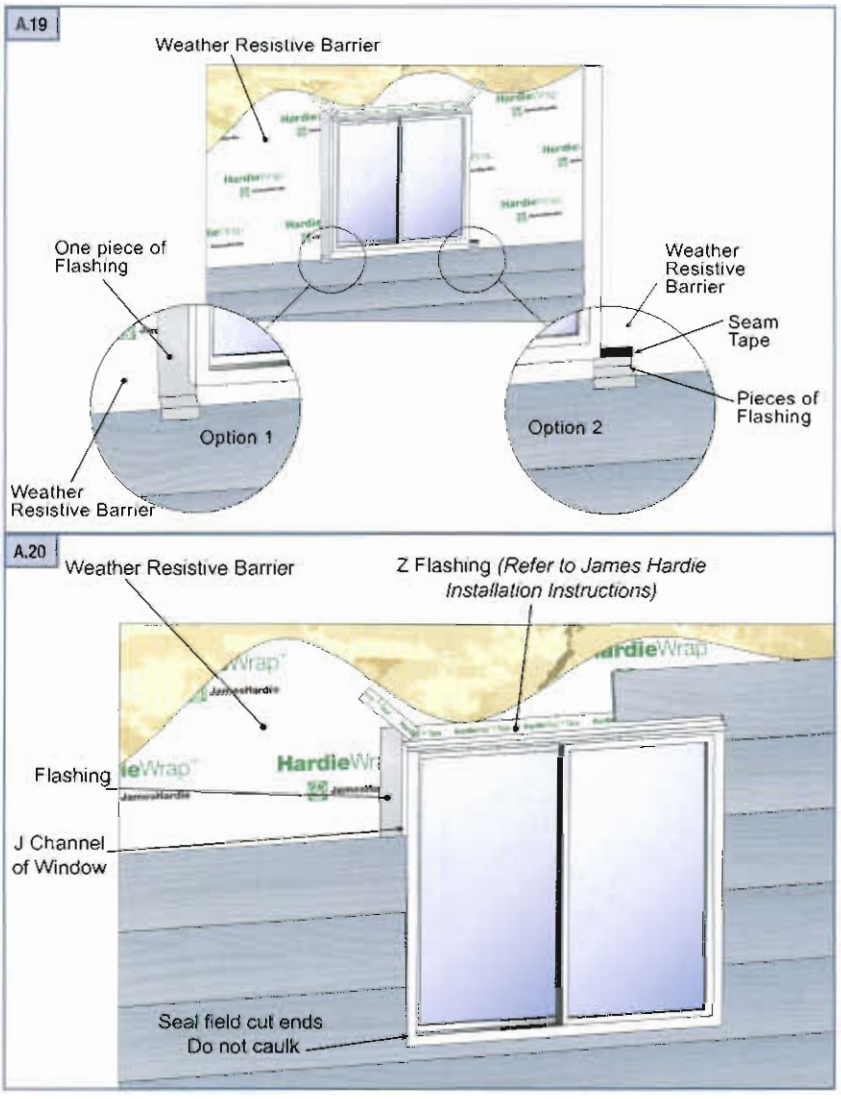
INSTALLING HARDIEPLANK® LAP SIDING AROUND WINDOWS WITH AN INTEGRATED J-CHANNEL

When installing fiber cement around a window with a "J" channel there are a few guidelines which should be followed to control water flow:

1. All windows must be installed per manufacturers installation instructions and must incorporate all necessary flashings.

2. At the bottom sides of the window, a flashing must be installed that will redirect any water that runs down the inside of the "J" channel out and away so that it does not run down the wall assembly and behind the plank below the window.
   a. This can be done by inserting a flashing that runs the entire length of the window (option 1) or by cutting the weather resistive barrier towards the bottom of the window and inserting a smaller flashing and taping with seam tape to reseal the weather resistive barrier (option 2).
   b. This flashing would then be lapped over the last plank at the bottom of the window, similar to a joint flashing, to direct water down and out to the front of the cladding.

3. A "z" flashing must be installed and integrated into the weather resistive barrier at the top of the window. The "z" flashing will allow water to be drained away from the window and wall, opposed to being captured in the "J" at the top of the window. (Refer to JamesHardie Installation Instructions for further "z" flashing details).



4. Seal all field cut non factory ends with an exterior grade paint, primer, or sealer.
   a. Insert ends of plank into the "J" channel of the window.
   b. Do not try to squeeze caulk into the "J" channel.

Typical "J" Channel Window

Additional Information (continued)

JOINT FLASHING WITH HARDIEPLANK® LAP SIDING

Joint Flashing at field butt joints

This Technical Bulletin is an explanation supporting the announcement made by James Hardie on September 8th, 2008 withdrawing its recommendation on the use of caulk at field butt joints for HardiePlank® lap siding. Below is an excerpt from that announcement:

> ***HardiePlank Lap Siding (Primed & ColorPlus Technology) – Caulk at Field Butt Joints***
> *Previously, there were two options for treating field butt joints for Primed HardiePlank lap siding (i.e. the use of caulk with a gap or the use of a joint flashing behind the joint). Effective immediately, James Hardie does not recommend the use of caulk at field butt joints for HardiePlank lap siding Primed or with ColorPlus® Technology. The use of a joint flashing behind field butt joints is the required joint treatment method for HardiePlank lap siding with ColorPlus technology and the preferred method for primed HardiePlank lap siding. The use of caulk at field butt joints is a maintenance item for the homeowner, aesthetically compromises the finish look and is recommended against by some caulk manufacturers. All HardiePlank lap siding must be installed in accordance with our installation details as outlined in the relevant installation instructions.*

Summary of James Hardie's position:

- HardiePlank lap siding with ColorPlus technology - Joint flashing behind field butt joints is required, the use of caulk will not be warranted.
- HardiePlank lap siding Primed - Recommend the use of joint flashing, but the use of caulk will not void the warranty.

The reasons for this announcement are:

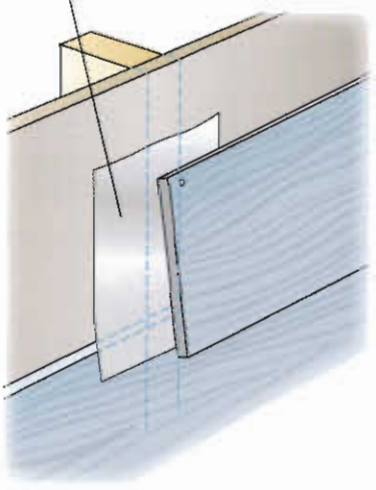
1. The use of joint flashing behind field butt joints is an approved joint treatment method as described in the 2006 International Building Code and is recognized by James Hardie and experts across the building industry to be a superior method.

> ***"1405.17.2 Horizontal lap siding.*** *Lap siding shall be lapped a minimum of 1 1/4 inches (32 mm) and shall have the ends sealed with caulking, covered with an Hsection joint cover or located over a strip of flashing."*

Experts across the industry recognize flashings as an effective and responsible method for draining a wall system:

> *"The fundamental principle of water management is to shed water by layering materials in such a way that water is directed downwards and outwards out of the building or away from the building. The key to this fundamental principle is drainage. The most elegant expression of this concept is a flashing. Flashings are the most under-rated building enclosure component and arguably the most important."*
>
> *EEBA (Energy & Environmental Building Association™) Water Management Guide By Joseph W. Lstriburek, Ph.D., P.eng. June 2004.*

A.21 Joint flashing



A.22

Do not use caulk on HardiePlank® lap siding with ColorPlus® technology

2. Reduced maintenance required by the home owner – It is recognized by James Hardie, several caulking manufacturers, experts across the industry, and experienced home owners that when caulking is used at field butt joints, maintenance will be required. Depending on the specific product and the application, caulked field butt joints will need to be maintained to guarantee continued performance over the life of the building. In addition, several sealant/caulking manufacturers recommend against using their products at butt joints in fiber cement siding for many of the reasons discussed here.

3. Improved appearance – When installed properly, flashing at a field butt joint can create a better looking joint. James Hardie recommends butting field joints together in moderate contact which achieves a more continuous looking joint. When utilizing a caulked butt joint, a gap specified by the caulk manufacturer must be left at the joint. Over time as the caulk ages, this joint can become pronounced on the wall and stand out.

James Hardie has been and will continue to be a leader in the building products industry, utilizing industry research and proven methods to drive better building practices.

If you have any questions regarding this matter please contact our Technical Services Desk at 1-800-942-7343.

Respectfully Sent on the Behalf of James Hardie® Technical Services.

JAMES HARDIE REQUIREMENTS FOR ALTERNATE FASTENERS AND METHODS OF FASTENING

The fastening requirements for each product are stated in one or more of the following technical documents and in some cases fastener products may be referenced. Below are the steps that can be used to demonstrate an alternate fastener's equivalency to the James Hardie published fastening requirements.

1) It is the responsibility of either the property owner, design professional, contractor, or installer to consult:
   a. The fastener Manufacturer for a Product Listing Specification or Code Compliance report that covers the installation method in question, or;
   b. A licensed Architect or Professional Engineer to make an equivalency statement linking the alternate fastener (or fastening method) to the fastening requirements published within the relevant James Hardie technical document;
2) Once in possession of the information gathered in step one it is the responsibility of the property owner, design professional, contractor, or installer to make his or her case to the Building Official[1]

[1] The Building Official reserves the right to approve alternate materials, design and methods of construction, 2006 International Building Code® Section 104.11, 2006 International Residential Code Section R104.11, and 1997 Uniform Building Code Section 104.2.8.

All national, state, and local building code requirements must be followed and where they are more stringent than the James Hardie installation requirements, state and local requirements will take precedence.

Appendix B

Estimating

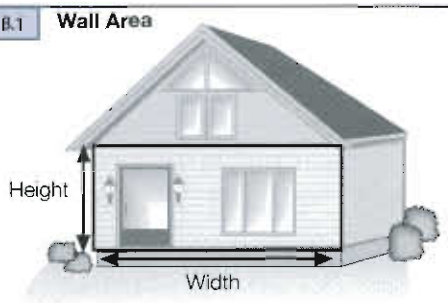
Siding

All houses can be broken down to triangles, rectangles, and squares. Using these simple shapes it is very easy to estimate the amount of siding required.

1. Break down the portions of the house to be sided into the simple shapes (squares, rectangles, triangles) Figures 12.1 - 12.4.
2. Determine the height and width of each shape.
3. Multiply height x width to determine square footage. For triangles divide the total by 2.
4. Add all of the square footage numbers together.
5. Subtract large items such as garage doors, large doors, large windows, and banks of windows from total.
   Do not remove small windows, doors, vents, or other small areas not being sided.
6. Total all numbers. This gives you the total covered area.
7. Use the coverage charts located in this section to determine the number needed.
8. Add a minimum of 5% for waste. If there are multiple (3 or more) gables, chases, bump outs, or dormers add 10%.*

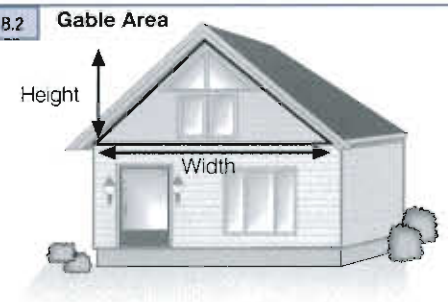
* *Material for starter strip is included in the calculation for waste.*

B.1 **Wall Area**



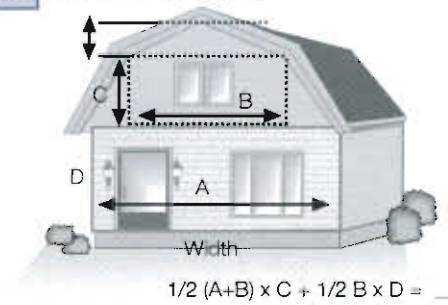
Height ____feet x width ____ feet = ____ square feet

B.2 **Gable Area**



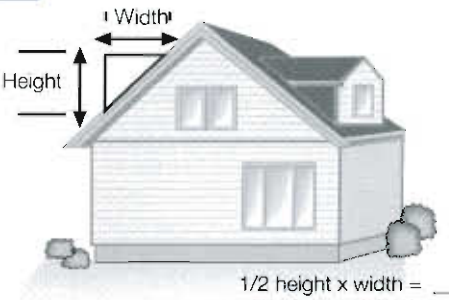
1/2 height x width = ____ area of gable (square feet)

B.3 **Gambrel Roof House**



1/2 (A+B) x C + 1/2 B x D = ____ total area of gable (square feet)

B.4 **Dormer Area**



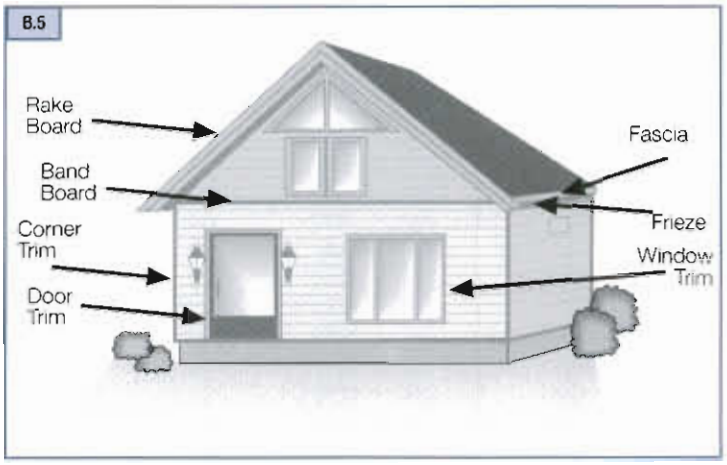
1/2 height x width = ____ area of dormer (square feet)

Trim

Number of HardieTrim® Boards:

HardieTrim 5/4, 4/4 boards

Trim is applied to corners and around doors and windows. Trim is also used for fascia board, rake board, band board, frieze board and other details.



1) Determine which areas are to be trimmed.

2) Measure all openings to be trimmed including doors, windows, vent openings, corners (inside and outside), and other areas.

3) Measure for fascia, rakes, and frieze boards.

4) Add the lengths for corners, fascia, rakes, and frieze and add 5% for waste.

5) Add the lengths for window and door trim and add 10% for waste.

6) Add the total from lines 4 and 5 to determine the amount of trim needed.

Disclaimer The estimation methods in this section are meant as a guide. James Hardie does not assume responsibility for over or under ordering of product

Estimating (continued)

HardiePlank® Lap Siding Coverage Chart* (number of planks)

Coverage Area	Plank Width (in.)					
(square feet)	Width (in.) 5.25	6.25	7.25	8.25	9.25	12
	Exposure (in.) 4	5	6	7	8	10.75
100	25	20	17	14	13	9
200	50	40	33	29	25	19
300	75	60	50	43	38	28
400	100	80	67	57	50	37
500	125	100	83	71	63	47
600	150	120	100	86	75	56
700	175	140	117	100	88	65
800	200	160	133	114	100	74
900	225	180	150	129	113	84
1000	250	200	167	143	125	93
1100	275	220	183	157	138	102
1200	300	240	200	171	150	112
1300	325	260	217	186	163	121
1400	350	280	233	200	175	130
1500	375	300	250	214	188	140
1600	400	320	267	229	200	149
1700	425	340	283	243	213	158
1800	450	360	300	257	225	167
1900	475	380	317	271	238	177
2000	500	400	333	286	250	186
2100	525	420	350	300	263	195
2200	550	440	367	314	275	205
2300	575	460	383	329	288	214
2400	600	480	400	343	300	223
2500	625	500	417	357	313	233
2600	650	520	433	371	325	242
2700	675	540	450	386	338	251
2800	700	560	467	400	350	260
2900	725	580	483	414	363	270
3000	750	600	500	429	375	279

Nail Coverage Chart** (number of nails)

Coverage Area	Plank Width (in.)					
(square feet)	Width (in.) 5.25	6.25	7.25	8.25	9.25	12
	Exposure (in.) 4	5	6	7	8	10.75
100	250	200	166	143	125	93
500	1250	1000	830	715	625	465
1000	2500	2000	1660	1430	1250	930

Disclaimer

The estimation methods in this section are meant as a guide. James Hardie does not assume responsibility for over or under ordering of product.

** Coverage chart does not include waste. ** Number of nails given are for building framed 16" o.c.*

HardiePanel® Vertical Siding Coverage Chart* (number of panels)

Coverage Area (square feet)	Panel Size (ft.) 4'x8' (32SF)	4'x9' (36SF)	4'x10' (40SF)
100	4	3	3
200	7	6	5
300	10	9	8
400	13	12	10
500	16	14	13
600	19	15	15
700	22	20	18
800	25	23	20
900	29	25	23
1000	32	28	25
1100	35	31	28
1200	38	34	30
1300	41	37	33
1400	44	39	35
1500	47	42	38
1600	50	45	40
1700	54	48	43
1800	57	50	45
1900	60	53	48
2000	63	56	50
2100	66	59	53
2200	69	62	55
2300	72	64	58
2400	75	67	60
2500	79	70	63
2600	82	73	65
2700	85	75	68
2800	88	78	70
2900	91	81	73
3000	94	84	75

Disclaimer

The estimation methods in this section are meant as a guide. James Hardie does not assume responsibility for over or under ordering of product. Chart reflects footages rounded up to next full panel.

** Coverage chart does not include waste*

Estimating (continued)

HardieShingle® Siding

HardieShingle Staggered Edge Notched Panel Coverage

Panels are available in 48" lengths. Pieces needed for one square (100 sq. ft.) of product coverage = approximately 45-55, (depending on ratio of length to height of wall) based on maximum exposure of 7".

HardieShingle Straight Edge Notched Panels Coverage

Panels are available in 48" lengths. Pieces needed for one square (100 sq. ft.) of product coverage = approximately 43, (depending on ratio of length to height of wall) based on maximum exposure of 7".

HardieShingle Half-round Notched Panel Coverage

Panels are available in 48" lengths. Pieces needed for one square (100 sq. ft.) of product coverage = approximately 43, based on a maximum exposure of 7".

HardieShingle Individual Shingle Coverage*

Shingles are available in 6", 8" and 12" widths, Bundles needed for one square (100 sq. ft.) of product coverage:

Shingle Width	Number of Bundles	Pieces per Bundle
6"	6	11
8"	6	11
12"	6	11

** Individual shingles are not available in all areas. Check you local dealer for availability.*

HardieSoffit® Panels

- For 12" and 16" width soffits: Divide total lineal footage of soffit and/or eaves by 12.
- For 24" width soffits: Divide total lineal footage of soffit and/or eaves by 8.

Appendix C

Glossary of Building Terms

Back Roll - To roll over a freshly spray painted surface with a roller.

Back Sealing/Priming - Back sealing and back priming are used interchangeably in the field and refer to the act of applying a sealer or primer to the back of a cladding material to minimize the potential for water absorption through the backside of the product.

Band Board - A decorative piece of trim placed between two floors along the rim joist.

Bevel Cut - See weather cut

Blind Nailing - The action of placing a fastener through the top edge of lap siding that will be covered by the next course of siding.

Bump Out - A built out protrusion from a building.

Butt Joint - To place materials end-to-end or end-to-edge without overlapping. Also known as a tield joint.

Caulk - A compound used to fill cracks, gaps, seams and joints.

Chase - A framed enclosed space around a flue pipe or a channel in a wall, or through a ceiling for something to lie in or pass through.

Course - A row of planks, one plank wide running the length of the house.

Dormer - A gabled extension built out from a sloping roof to accommodate a vertical window.

Drip Cap - A molding or metal flashing placed on the exterior topside of a door or window frame to cause water to drip beyond the outside of the frame.

Drip Edge - A metal or vinyl flashing placed on the top edge of the roof sheathing which directs water away from the structure to prevent seepage under or behind the exterior trim or fascia.

Eave - The lower part of the roof that projects over the exterior wall assembly.

Electro-Galvanized - Covered with zinc using a plating process.

Face - The side of the siding, trim, or soffit showing once the product has been installed.

Face Nailing - The action of placing a fastener through the overlap of a plank. The fastener will be visible.

Fascia Board - A trim board attached to the ends of the rafters.

Finished Grade - The level at which the ground surface meets the foundation of a building.

Flashing - A thin flat metal positioned under/behind roofing, windows, doors, corner posts, etc. to keep draining water from penetrating the house.

Frieze Board - A horizontal member connecting the top of the siding with the soffit

Furring/Furring Strip - Furring strips are long, thin strips of wood, metal or Fiber Cement used to make backing surfaces to support the finished surfaces.

Gable - The end of a wall that is created when a roof line is pitched and slopes in two directions.

Galvanized - Covered with zinc. Either hot-dipped or electro-plated.

Grade - The height of the ground on which something stands.

Horizontal - Parallel to the horizon; on a level.

Glossary of Building Terms (continued)

Joint Flashing - An additional weather resistive barrier placed behind a butt joint.

Lap - To over lap a course of siding with another course of siding.

Level - A position of measurement truly and exactly horizontal, 90° from a plumb surface.

Light Block - Decorative trim item placed under light fixtures and other exterior fixtures.

Miter - To make a diagonal cut, beveled to a specific angle 45° and 22 1/2 ° are common.

Mud Sill - A building member resting and normally attached to the foundation of a building running around the perimeter of the building. Also known as sill plate.

OSB - Oriented Strand Board. A common type of structural panel sheathing.

PEL - Personal Permissible Exposure Limit. The maximum daily exposure level to respirable silica. OSHA's Personal Exposure Limit is 0.1 mg/m3.

Plumb - A position of measurement truly and exactly vertical, 90° from a level surface.

Plunge Cut - The act of driving a saw into the body of a material.

Rafter Tail - The end of a rafter extending past the wall assembly.

Rain Screen Wall - Consists of an exterior cladding, a cavity behind the cladding typically created through the use of furring strips for the purpose of drainage and venting to the outside; an inner wall plane incorporating a weather resistive barrier.

Rake Board - Decorative trim placed at an angle.

Rigid Sheathing - Plywood or OSB.

Rim Joist - The board that the rest of the joists are nailed to. It runs the entire perimeter of the house.

Rip Cut - Cut along the grain, usually lengthwise on a board.

Scroll Work - Decorative trim work.

Sheathing - Sheets of plywood, gypsum board, or other material nailed to the outside face of studs as a base for exterior siding.

Shim - A building material, usually wood, used to even a surface.

Silica - Mineral that is composed of silicon dioxide, SiO2.

Speed Square - Triangle shaped measuring device used in a variety of framing and siding applications.

Stage - To deliver, stack, or store material in a specific location.

Starter Strip - An accessory used under the first course of siding to provide a consistent plank angle.

Sub-Fascia - Framing member attached to the rafter tails used to support the fascia or used to pad out the fascia.

T-Shed – A shed with a single vertical wall and a roof that hangs off that wall on either side. The cross section of the shed is shaped like a 'T'.

Vertical - Being or situated at right angles to the horizon; upright.

Weather Cut- 15° to 45° cut used to join two boards.

Weather-Resistive Barrier- A building paper that protects building materials from exterior water penetration.

Z-Flashing- A piece of flashing bent into the shape of a "z". Used over window trim, band boards, panel intersections, and other vertical surfaces.

Appendix D

Code References

Note: All building work must be in accordance with the applicable local building codes. The following is a list of the key code clauses. It is provided as a reference tool and not intended to be a substitute for proper design of approved construction. ASTM E1825 also provides guidance on the evaluation of materials, products and systems used in exterior wall construction.

Site and Foundations
2006 International Building Code
Chapter 18 Foundations and Retaining Walls
1803.3 Site grading

2003 International Residential Code for One- and Two- Family Dwellings
Chapter 4 Foundations
R401.3 Drainage
1997 Uniform Building Code
Chapter 18 Foundations and Retaining Walls
1804.7 Drainage

The BOCA National Building Code / 1999
Chapter 18 Foundations and Retaining Walls
1813.7 Site grading

SBCCI Standard Building Code 1997
Chapter 18 Foundations and Retaining Walls
Section 1804 Footings and Foundations; 1804.1 7

1998 International One- and Two- Family Dwelling Code 1998
Chapter 4 Foundations
R401.3 Drainage

Ground Clearances
2006 International Building Code
Chapter 18 Foundations and Retaining Walls
Chapter 23 Wood
2304.11.2.2 Framing

2003 International Residential Code for One- and Two- Family Dwellings
Chapter 3 Building Planning
Chapter 4 Foundations
R404.1.6 Height above finished grade

1997 Uniform Building Code
Chapter 18 Foundations and Retaining Walls
1806.1 General
Chapter 23 Wood
2306.8 Wood and Earth Separation

The BOCA National Building Code / 1999
Chapter 18 Foundations and Retaining Walls
Chapter 23 Wood
2311.4.2 Framing

SBCCI Standard Building Code 1997
Chapter 18 Foundations and Retaining Walls
Chapter 23 Wood
Section 2304 Protection against decay and termites, 2304 2.5

2003 International One- and Two- Family Dwelling Code 1998
Chapter 4 Foundations
R404.1.6 Height above finished grade

Moisture Management
2006 International Building Code
Chapter 14 Exterior Walls
1404.1 General
1404.2 Weather-resistive barrier
1405.1 General
1405.2 Weather Protection
1405.3 Flashing

2003 International Residential Code for One- and Two- Family Dwellings
Chapter 7 Wall Covering
R703.2 Weather-resistant sheathing paper
R703.8 Flashing

1997 Uniform Building Code
Chapter 14 Exterior Wall Coverings
1402.1 Weather-resistive barriers
1402.2 Flashing and Counterflashing
UBC Standard 14-1 Kraft Waterproof Building Paper

The BOCA National Building Code / 1999
Chapter 14 Exterior Wall Coverings
14040 3 Weather protection
1406 3 6 Water-resistive barrier
1406 3 10 Flashings

SBCCI Standard Building Code 1997
Chapter 14 Exterior Wall Covering
Section 1403 Veneered Walls; 1403 1 3; 1403 1.4

1998 International One- and Two- Family Dwelling Code 1998
Chapter 7 Wall Covering
R703.2 Weather-resistant sheathing paper
R703.8 Flashing

Wall Construction
2006 International Building Code
Chapter 22 Steel
Chapter 23 Wood

2003 International Residential Code for One- and Two- Family Dwellings
Chapter 6 Wall Construction
R602.10 Wall bracing

1997 Uniform Building Code
Chapter 22 Steel
Chapter 23 Wood
2320.11.3 Bracing

The BOCA National Building Code / 1999
Chapter 22 Steel
Chapter 23 Wood
2305.7 Wind bracing
2305.8 Seismic bracing
2305 9 Braced wall

SBCCI Standard Building Code 1997
Chapter 23 Wood
2308.2 Bracing of exterior stud walls

1998 International One- and Two- Family Dwelling Code 1998
Chapter 6 Wall Construction
R602.10 Wall bracing

Fastening
2006 International Building Code
Chapter 14 Exterior Walls
1405.15 Fiber cement siding
1406 2 2 Architectural trim

2003 International Residential Code for One- and Two- Family Dwellings
Chapter 7 Wall Covering
R 703.1 General

1997 Uniform Building Code
Chapter 6 Types of Construction
Section 601.5.5 Trim

The BOCA National Building Code / 1999
Chapter 14 Exterior Wall Covering
Section 1407 2 2 Construction requirements

SBCCI Standard Building Code 1997
Chapter 14 Exterior Wall Covering
Section 1404.1 Architectural trim

NOTES

ICC Evaluation Service, Inc.
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Legacy report on the 2000 *International Building Code®*, the BOCA® *National Building Code*/1999, the 1999 *Standard Building Code®*, the 1997 *Uniform Building Code™*, the 2000 *International Residential Code®*, the *2002 Accumulative Supplement to the International Codes™* and the 1998 *International One and Two Family Dwelling Code®*

DIVISION 06 — WOOD AND PLASTICS
Section 06160 — Sheathing

DIVISION 07 — THERMAL AND MOISTURE PROTECTION
Section 07450 — Fiber-Reinforced Cementitious Panels
Section 07460 — Siding

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www.jameshardie.com

1.0 SUBJECT

1.1 SIDING AND SOFFIT BOARDS

1.1.1 Hardiplank ® lapsiding
1.1.2 Hardiflex™ panel
1.1.3 Hardipanel ® siding
1.1.4 Harditex ® baseboard
1.1.5 Hardisoffit ® panel
1.1.6 Hardishingle™ cladding
1.1.7 Hardishingle™ panel
1.1.8 Hardipanel ® Shiplap

1.2 LINING BOARD AND UNDERLAYMENT

1.2.1 Titan ® panel
1.2.2 Hardibacker ® backerboard
1.2.3 Hardibacker ® underlayment
1.2.4 Titan ®-FR panel
1.2.5 Hardibacker 500 ® backerboard

1.3 SUBFLOOR PANELS

1.3.1 Compressed Sheet™

2.0 PROPERTY FOR WHICH EVALUATION IS SOUGHT

2.1 Exterior Wall Covering
2.2 Structural Performance
2.3 Noncombustible Construction
2.4 Fire-resistive Construction
2.5 Thermal Resistance

3.0 DESCRIPTION

3.1 GENERAL

The exterior siding and soffit boards, interior lining and underlayment, and subfloor panels are single-faced, cellulose fiber-reinforced cement (fiber-cement) building boards. The Titan ®-FR panel is a composite panel composed of a $^1/_8$-inch (3.2 mm) thick fiber-cement skin laminated to $^1/_2$-inch (12.7 mm) thick proprietary Type X gypsum board.

All fiber-cement planks and panels are produced from the same components and differ in surface treatments and board configurations. Exterior siding and soffit boards are identified as Hardiplank® (Hardihome™, Sentry™, Colonial Smooth®, Colonial Roughsawn®, Cemplank® and Hardishingle™), Hardiflex™, Hardipanel®, Cempanel®, Harditex® baseboard, Hardisoffit ®, Cemsoffit® boards, Hardishingle™ panel and Hardishingle™ cladding shingles. Interior backerboards and underlayments are identified as Titan®, Hardibacker® (backerboard), Hardibacker® (underlayment), Ultraboard® and Titan®-FR panel. Subfloor panels are identified as Compressed Sheet. The planks, panels, and shingles are manufactured by the Hatschek process and cured by high-pressure steam autoclaving. All products are cut to shape on-site by the score-and-snap method using a tool available from the manufacturer, a hand guillotine or a handsaw utilizing a carbide blade.

The fiber-cement products have a flame-spread index of 0 and a smoke developed index of 5 when tested in accordance with ASTM E 84. The products are classified as noncombustible when tested in accordance with ASTM E 136. The siding and soffit products comply with ASTM C 1186, *Standard Specification for Grade II, Type A, Non-Asbestos Fiber-Cement Flat Sheets*. The subfloor panels comply with ASTM C 1186, *Standard Specification for Grade IV, Type A, Non-Asbestos Fiber-Cement Flat Sheets*. The interior lining products, Hardibacker® and Titan®, comply with ASTM C 1288, *Standard Specification for Grade II Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets*. The interior lining product Hardibacker 500® complies with ASTM C 1288, *Standard Specification for Grade I Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets*. All interior lining boards comply with ANSI A118.9 as cementitious backer units. When tested in accordance with ASTM C 177, "K" and "R" values for the products are as shown in Table 4 of this report. When tested in accordance with ASTM E 96, products with a thickness of $^1/_4$-inch (6.4 mm) or greater have demonstrated the permeance values given in Table 5 of this report.

3.1.1 James Hardie Trade Names

Hardiplank®	Hardihome™
Cemplank®	Hardipanel®
Sentry™	Cempanel®
Colonial Smooth®	Hardiflex™
Colonial Woodgrain®	Harditex®
Hardisoffit®	Hardie®
Cemsoffit®	James Hardie®
Hardibacker®	Titan®-FR
Ultraboard®	Max "C"™
Titan®	Hardibacker 500®
Hardirock®	

3.2 SIDING AND SOFFIT BOARDS

Hardiplank®, Hardiflex™, Hardipanel®, Harditex® baseboard, Hardishingle™ planks and panels, Hardisingle™ cladding shingles, and Hardisoffit® boards are used as siding on exterior walls and soffits. The exterior siding and soffit products may be supplied unprimed or primed for subsequent application of a compatible primer and/or exterior-grade topcoat(s).

Nominal dimensions are noted in Table 1 of this report, maximum basic wind speeds in Table 2a, 2b, 6, 7, 8, and 9 of this report, and maximum shear values in Table 3 of this report.

3.2.1 Hardiplank® (Hardihome™, Sentry™, Colonial Smooth®, Colonial Roughsawn®, Hardishingle™ and Cemplank®) Lap Siding

3.2.1.1 General: Lap siding is available in various finish textures. The siding is applied horizontally commencing from the bottom course of a wall with minimum $1^1/_4$-inch (32 mm) wide laps at the top edge. Vertical joints butt over studs except where the "off-stud splice device" is utilized as described in Section 3.2.1.2 of this report, or where the planks are installed over solid panel sheathing.

When installed on wood-framing members, the siding shall be fastened either through the overlapping planks (face nailed) or through the top edge of single planks (blind nailed) with corrosion-resistant nails into each wood-framing member. The lap conceals the fasteners in the previous course when blind nailed. When attached to metal framing members, the siding is fastened either through the overlapping planks with $1^5/_8$-inch (41 mm) long No. 8 by 0.323-inch (8.2 mm) HD, self-drilling, corrosion-resistant, ribbed buglehead screws or with 0.100 in. (2.54 mm) shank by 0.25 in. (6.4 mm) HD by $1^1/_2$-in. (38 mm) long ET & F brand pin fasteners at each metal framing member, or through the top edge of single planks with minimum $1^1/_4$-inch (32 mm) long No. 8 by 0.375-inch (9.5 mm) HD, self-drilling, corrosion-resistant, ribbed waferhead screws or with 0.100 in. (2.54 mm) shank by 0.313 in. (7.5 mm) HD by 1 ½ in. (38 mm) long ET & F Panelfast® brand fasteners at each metal framing member. Planks may also be fastened to a wall constructed of concrete masonry units complying with ASTM C 90 with 0.14 in. (3.5 mm) shank by 0.300 in. (7.6 mm) HD by 1 1/4 in. (32 mm) long ET & F brand Stud Nails. The lap conceals the fasteners in the previous course.

3.2.1.2 Off-Stud Splice Device: Vertical joints of the planks shall butt over framing members or between the framing members when an "off-stud splice device" is placed on each plank end. The splice device's bottom lip is placed over the adjacent solid course of planks. The plank is then fastened to the framing. The abutting plank is positioned and fastened into place ensuring that the lower edges of the two planks align. The metal device is located centrally over the joint. Restrictions on the "off-stud splice device" locations are as follows:

- Splices shall be located a minimum of two stud cavities from wall corners.
- Successive splices within the same plank course shall be located no closer than 48 inches (1219 mm) from one another.
- Splices shall be staggered at minimum 24-inch (610 mm) intervals when located in the same wall cavity
- Splices shall be at least one stud cavity away from door or window openings.

Where a specified level of wind resistance is required, plank lap siding shall be attached to solid panel sheathing or framing members, appropriately spaced, with fastener types, lengths, and spacing described in Tables 2b and 9 of this report.

3.2.2 Hardiflex™ Siding (Hardipanel® Smooth)

Hardiflex™ siding is used as an exterior wall cladding. The siding has a smooth unsanded surface. Dimensions are as noted in Table 1 of this report. Fasteners are installed with a minimum $^3/_8$-inch (9.5 mm) edge distance and a minimum 2-inch (51 mm) clearance from corners. Joints are fastened at abutting sheet edges and optionally protected by polyvinyl chloride (PVC) joint treatment, lumber battens or sealant.

Where a specified level of wind resistance or shear resistance is required, the Hardiflex™ panel is attached to framing members, appropriately spaced, with fastener types, lengths, and spacing described in Table 2a and Table 3 of this report.

3.2.3 Hardipanel® Siding (Cemplank® Siding)

Hardipanel® siding is available in various surface textures including smooth. Dimensions are noted in Table 1 of this report. Fasteners are installed with a minimum $^3/_8$-inch (9.5 mm) edge distance and a minimum 2-inch (51 mm) clearance from corners. Joints are fastened at abutting sheet edges and optionally covered by polyvinyl chloride (PVC) joint treatment, lumber battens or sealant.

Where a specified level of wind resistance or shear resistance is required, the Hardipanel® siding is attached to framing members, appropriately spaced, with fastener types, lengths, and spacing described in Table 2a and 3 of this report.

3.2.4 Harditex® Baseboard

Harditex® baseboard is for exterior applications to walls and soffits. Dimensions are noted in Table 1 of this report. Harditex® baseboard has a smooth finish and is available with either tapered or trough edges on the two long sides for joint treatment or all square edges. Harditex® baseboard is supplied either sealed or unsealed for the subsequent application of a primer or sealer by the end user as a component in a direct-applied exterior coating or finish system. Joints shall be sealed with a sealant or bedding compound, including any required joint reinforcing mesh or tape, specified by the coating manufacturer. Other installation details are in accordance with Section 3.2.2 of this report. Harditex® baseboard has been evaluated for water-resistive qualities but its use as an alternative to a weather-resistive barrier is outside the scope of this report, see Section 7.4 of this report.

Where a specified level of wind resistance or shear resistance is required, the Harditex® baseboard is attached to framing members, appropriately spaced, with fastener types, lengths, and spacing described in Table 2a or 3 of this report.

3.2.5 Hardisoffit® Board (Cemsoffit® Board)

Hardisoffit® board is for use as exterior vented or unvented soffits. Hardisoffit® board is available with either a woodgrain texture or a smooth unsanded surface. Vented Hardisoffit® provides 5 square inches of net free ventilation per lineal foot of soffit. Dimensions are noted in Table 1 of this report. All Hardisoffit® board edges are supported by framing with fasteners installed with a minimum $^3/_8$-inch (9.5 mm) edge distance and minimum 2-inch (51 mm) clearance from corners. Hardisoffit® boards are attached to framing members with fastener types, lengths, and spacings described in Table 2a and 3 of this report.

3.2.6 Hardishingle™ Cladding (individual shingles)

Hardishingle™ cladding shall be installed over solid wall sheathing which complies with the applicable code. Dimensions are as noted in Table 1 of this report. The wall sheathing shall be protected by a weather-resistive barrier which complies with the applicable code.

When Hardishingle™ cladding is installed over minimum $^{15}/_{32}$-inch (11.9 mm) thick plywood complying with the applicable code, with two corrosion resistant roofing nails [0.121-inch (3.1 mm) shank diameter by 0.371-inch (9.4 mm) head diameter by $1^1/_4$-inch (32 mm) long] spaced a maximum of 1 inch (25.4 mm) from each edge and the nails positioned to be covered 1 inch (25.4 mm) nominally by the succeeding course, the maximum allowable wind loads, building heights, and exposure categories for the systems installed with 8-, 7-, and 6-inch (203, 178, and 152 mm) weather exposures, shall be as indicated in Table 6A, 6B, and 6C of this report. Nails shall secure siding but shall not be overdriven.

When Hardishingle™ cladding is installed over minimum $^7/_{16}$-inch (11.1 mm) thick Oriented Strand Board (OSB), complying with the applicable code, with two corrosion resistant siding nails [0.091-inch (2.3 mm) shank diameter x 0.221- inch (5.5 mm) head diameter by $1^1/_2$-inch (38 mm) long] spaced a maximum of 1 inch (25.4 mm) from each edge and the nails positioned to be covered 1 inch (25.4 mm) nominally by the succeeding course, the maximum allowable wind loads, building heights, and exposure categories for the systems installed with 8-, 7-, and 6-inch (203, 178, and 152 mm) weather exposures, shall be as indicated in Table 7A, 7B, and 7C of this report. Nails shall secure siding but shall not be overdriven.

When Hardishingle™ cladding is installed over minimum $^7/_{16}$-inch (11.1 mm) thick Oriented Strand Board (OSB), complying with the applicable code, with three corrosion resistant siding nails [0.091-inch (2.3 mm) shank diameter x 0.221- inch (5.5 mm) head diameter by $1^1/_2$-inch (38 mm) long] for 12-inch (305 mm) wide shingles and two corrosion resistant siding nails for 6- and 8-inch (152 mm and 203 mm) wide shingles, the maximum allowable wind loads, building heights, and exposure categories for the systems installed with 8-, 7-, and 6-inch (203, 178, and 152 mm) weather exposures, shall be as indicated in Table 8A, 8B, and 8C of this report. One siding nail shall be spaced a maximum of 1 inch (25.4 mm) from each edge on the panel, with the third siding nail installed midspan of the 12-inch (305 mm) wide shingles. All nails shall be covered 1 inch (25.4 mm) nominally by the succeeding course. Nails shall secure siding but shall not be overdriven.

3.2.7 Hardishingle™ Panels

Hardishingle™ panels have a woodgrain texture and are available in three configurations: half-round®, staggered-edge®, and square-edge®. Dimensions are as noted in Table 1 of this report. The siding is applied horizontally to braced wall framing complying with the applicable code commencing from the bottom course of a wall. Install Hardishingle™ panels with joints in moderate contact. Due to the overlapping of the panels, joint sealant is not required. Fasteners are a minimum 0.083-inch (2.1 mm) shank x 0.187-inch (4.7 mm) HD by $1^1/_2$-inch (33 mm) long corrosion-resistant siding nail. For application to open braced framing, vertical joints butt over studs.

Where a specified level of wind resistance is required, Hardishingle™ panel sidings are attached to framing members appropriately spaced or to solid wall sheathing, with fastener types, lengths, and spacing described in Table 2 of this report.

Secure a $^1/_4$-inch (6.4 mm) thick lath strip and a minimum $9^1/_4$-inch (235 mm) wide Hardiplank® lap siding starter course. Trim the first panel so the end aligns with the furthest stud. Allow trimmed panel $^1/_8$ inch (3.2 mm) from the trim board for caulk and secure above keyways [approximately 8 inches (203 mm) clearance from butt edge of panel] on 16- inch (406 mm) or 24-inch (310 mm) centers [$13^3/_4$-inch (349 mm) centers maximum for application only to minimum $^7/_{16}$- inch (11.1 mm) thick APA rated Oriented Strand Board sheathing]. Work across the wall allowing $^1/_8$-inch (3.2 mm) gap from trim.

Start the second course, and every following even number course (i.e. fourth, sixth) by moving the equivalent of one full stud cavity from the straight edge end (the left side). Save this piece for the other end of the wall. Secure the beginning panel leaving $^1/_8$-inch (3.2 mm) clearance from the trim board for caulking. Position nails to penetrate through the previous course and into the framing members or Oriented Strand Board.

When a course is broken by a window or doorway, continue the application as if the wall was complete. Trimming for the opening and using the resulting piece may throw off the spacing above the break.

3.2.8 Hardipanel® Shiplap Panel Siding

Hardipanel® Shiplap panel siding is used as an exterior wall cladding. The siding is available in various surface textures including smooth. Dimensions are noted in Table 1 of this report. Fasteners are installed with a minimum $^3/_8$-inch (9.5 mm) edge distance and a minimum 2-inch (51 mm) clearance from corners.

Where a specified level of wind resistance or shear resistance is required, the Shiplap panel siding is attached to framing members, appropriately spaced, with fastener types, lengths, and spacing described in Table 2a and 3 of this report.

3.3 LINING BOARD AND UNDERLAYMENT

Titan® panel, Hardibacker® and Hardibacker 500® (ceramic tile backerboards), and Hardibacker® underlayment are used as wet or dry area lining/underlayment substrates applied to the interior of buildings. Titan®-FR (tapered-edge) panel is only intended for dry interior wall and ceiling applications.

3.3.1 Titan® Panel

Titan® panel is only intended for interior walls and ceilings including shower and bath areas. Subsequent finishing using paint, wallpaper or tile is required as indicated in Sections 3.3.1.1 and 3.3.1.2 of this report. The panel has a smooth finish with tapered edges on the two long dimensions for joint treatment. Dimensions are noted in Table 1 of this report. Maximum shear values are noted in Table 3 of this report.

3.3.1.1 Paint or Wallpaper Finish: Titan® panel is installed with the long dimension either vertical or horizontal to nominal 2 x 4 wood framing members or minimum No. 20 gage (0.0329-inch) steel framing members, spaced a maximum of 24 inches (610 mm) on center with end joints staggered from adjacent courses in both vertical and horizontal applications. To fasten to wood framing members, minimum $1^{3}/_{8}$-inch (35 mm) long gypsum board nails or minimum 1-inch (25.4 mm) long No. 8 x 0.323-inch (8.2 mm) HD self-drilling, corrosion-resistant, ribbed buglehead screws are used and spaced a maximum of 8 inches (203 mm) on center at all supports. To fasten to metal framing members, minimum 1-inch (25.4 mm) long No. 8 x 0.323-inch (8.2 mm) HD self-drilling, corrosion-resistant, ribbed buglehead screws are used and spaced a maximum of 6 inches (152 mm) on center at all supports. Fasteners shall be located at least $^{3}/_{8}$- inch (9.5 mm) from board edges, and 2 inches (51 mm), minimum, from lining board corners. Panels are placed with a minimum $^{1}/_{4}$-inch (6.4 mm) clearance from the floor surface. Metal or PVC corner angles are attached with the above described nails or screws placed approximately 12 inches (305 mm) on center.

A flush-joint procedure is permitted on Titan® panels. Gypsum board joint compounds, complying with ASTM C 474 and C475, shall be troweled into the joints. Paper joint tape is embedded into the wet joint compound and allowed to dry thoroughly. A second coat of joint compound, approximately 8-inches (203 mm) wide, is then applied across the joint and allowed to dry. A third coat of topping compound, 10-inches (254 mm) wide, is applied across the joint. Topping compound shall also be applied over all fastener heads in intermediate locations.

Internal corners are finished by filling with joint compound, working the joint tape into the joint, and applying a second coat of joint compound. A third coat of topping compound is applied over the area.

External corners are treated by filling the joint with joint compound and allowing it to thoroughly dry. Corrosion-resistant metal or PVC corner angles are then fastened to the corner, followed by a second coat of joint compound. When the second coat is completely dry, a third coat of topping compound is applied over the area. Topping compound is also applied over all fastener heads in intermediate locations.

3.3.1.2 Tile Finish: Titan® panel is installed with the long dimension either vertical or horizontal to nominal 2 x 4 wood-framing members or minimum No. 20 gage (0.0329- inch, 0.84 mm) metal framing members spaced 24 inches (610 mm) on center, maximum, with end joints staggered from adjacent courses in both vertical and horizontal applications. To comply with ANSI A108.11, framing members are spaced 16 inches (406 mm) on center, maximum. To fasten to wood framing members, minimum $1^{1}/_{4}$-inch (32 mm) long, corrosion-resistant (galvanized or stainless steel) roofing nails, or $1^{1}/_{4}$-inch (32 mm) long No. 8 x 0.375-inch (9.5 mm) HD self-drilling, corrosion-resistant, ribbed waferhead screws are used and spaced a maximum of 6 inches (152 mm) on center at all supports. To fasten to metal framing members, minimum $1^{1}/_{4}$-inch (32 mm) long No. 8 x 0.375-inch (9.5 mm) HD self-drilling, corrosion-resistant, ribbed waferhead screws are used and spaced a maximum of 6 inches (152 mm) on center at all supports. Fasteners are located at least $^{3}/_{8}$ inch (9.5 mm) from board edges, and 2 inches (51 mm), minimum, from board corners. Corner gaps are filled with a flexible, silicone sealant compatible with fiber-cement. Panels are placed with a minimum $^{1}/_{4}$-inch (6.4 mm) clearance from the floor surface. This gap shall be free of adhesive and grout and filled with a flexible sealant. On large tiled areas, movement joints are provided in the walls in accordance with ANSI A108, Section AN-3.7.

A flush-joint procedure is permitted on Titan® panel. The same type of tile adhesive or mortar used to set the tiles shall be troweled into joints as a joint compound. Joints shall be reinforced with 2-inch (51 mm) wide, high-strength, coated, alkali-resistant, glass fiber reinforcing joint tape embedded into the wet tile adhesive and allowed to dry thoroughly.

Internal corners are finished by filling with tile adhesive, working the reinforcing joint tape into the joint, and applying a second coat of tile adhesive and allowing it to dry thoroughly.

External corners are treated by filling the joint with tile adhesive and allowing it to dry thoroughly. Corrosion-resistant metal or PVC corner angles are then fastened in place, followed by a second coat of tile adhesive. Tile adhesive is also applied over all fastener heads in intermediate locations.

Wall tiles complying with ANSI A137.1 are attached to the board with flexible Type I, mastic adhesives complying with ANSI A136.1, or acrylic or latex-modified thinset mortars complying with ANSI A118.4, in accordance with ANSI A108. The same adhesives are permitted to fill and level the sheet joints.

3.3.2 Hardibacker® and Hardibacker 500® (Ceramic Tile Backerboard)

Hardibacker® and Hardibacker 500® ceramic tile backerboards are only intended for interior walls and floors, including shower and bath areas (excluding the shower floor). Subsequent finishing with tile is required. The square-edge backerboards have a smooth-finished surface and square edges for closely butted joints. Dimensions are noted in Table 1 of this report. Maximum shear values are noted in Table 3 of this report.

3.3.2.1 Floors: When Hardibacker® or Hardibacker 500® backerboards are used on floors, the subfloor assembly shall consist of a minimum $^{5}/_{8}$-inch (15.9 mm) thick, Exterior Grade, Group 2 or 3 species plywood or equivalent thickness of subfloor and shall be designed such that the maximum deflection in a plane, including live and dead loads, is *L*/360 of the span, in accordance with the applicable code. Movement joints shall be provided where existing structural joints (building control joints) occur and where changes in direction occur such as in "L"-shaped rooms. For large tiled areas, movement joints are provided in accordance with ANSI A108, Section AN-3.7.

The subfloor is then covered with a minimum $^{3}/_{32}$-inch (2.4 mm) thick latex, or acrylic-modified thinset setting material. The backerboard is then installed in a staggered brick pattern at right angles to the subfloor and fastened before the setting material films over.

The backerboards are fastened with $1^{1}/_{4}$-inch (32 mm) long, corrosion-resistant (galvanized or stainless steel) roofing nails or minimum 1-inch (25.4 mm) long No. 8 by 0.323-inch (8.2 mm) HD self-drilling, corrosion-resistant, ribbed buglehead screws. To meet the requirements of ANSI A108.11, minimum $1^{1}/_{4}$-inch (32 mm) long No. 8 x 0.375-inch (9.5 mm) HD self-drilling, corrosion-resistant ribbed waferhead screws are used. Fasteners shall be located a maximum of 8 inches (203 mm) on center around the perimeter and in the field. Fasteners shall be located a minimum of $^{3}/_{8}$-inch (9.5 mm) and a maximum of $^{3}/_{4}$ inch (19.1 mm) from the backerboard edges, and 2 inches (51 mm) minimum, from underlayment corners. For latex or acrylic modified thinset mortars, the joints shall be reinforced with 2-inch (51 mm) wide, high-strength, coated, alkali-resistant, glass fiber reinforcing tape embedded into the wet mortar and allowed to dry thoroughly.

Floor tiles complying with ANSI A137.1 are attached to the board with flexible Type I mastic adhesives complying with ANSI A136.1, or acrylic or latex-modified thinset mortars complying with ANSI A118.4, in accordance with ANSI A108. The same adhesives are also used to fill and level the sheet joints.

3.3.2.2 Walls: Hardibacker® and Hardibacker 500® backerboards are installed with the long dimension either vertical or horizontal to nominal 2 x 4 wood framing members or minimum No. 20 gage (0.0329-inch, 0.84 mm) metal framing members spaced a maximum of 24 inches (610 mm) on center with end joints staggered from adjacent courses in both vertical and horizontal applications. To comply with ANSI A108.11, framing members shall be spaced a maximum of 16 inches (406 mm) on center. To fasten to wood framing members, minimum $1^1/_4$-inch (32 mm) long, corrosion-resistant (galvanized or stainless steel) roofing nails or $1^1/_4$-inch (32 mm) long No. 8 by 0.375-inch (9.5 mm) HD self-drilling, corrosion-resistant, ribbed waferhead screws are used and spaced a maximum of 8 inches (152 mm) on center at all supports. To fasten to metal framing members, minimum $1^1/_4$-inch (32 mm) long No. 8 by 0.375-inch (9.5 mm) HD self-drilling, corrosion-resistant ribbed waferhead screws are used and spaced a maximum of 8 inches (152 mm) on center at all supports. Fasteners are located at least $^3/_8$ inch (9.5 mm) from board edges and 2 inches (51 mm), minimum, from board corners. Corner gaps are filled with a silicone sealant compatible with fiber-cement underlayments. Underlayments are placed with a minimum $^1/_4$-inch (6.4 mm) clearance from the floor surfaces and other horizontal tile termination locations, such as above tub edges. This gap shall be free of adhesive and grout and filled with a flexible sealant. For large tiled areas, movement joints are provided in accordance with ANSI A108, Section AN-3.7.

Wall tiles complying with ANSI A137.1 are attached to the underlayment with flexible Type I mastic adhesives complying with ANSI A136.1, or acrylic or latex-modified thinset mortars complying with ANSI A118.4, in accordance with ANSI A108. The same adhesives are used to fill and level the sheet joints. Joints shall be reinforced with 2-inch (51 mm) wide, high-strength, coated, alkali-resistant, glass fiber reinforcing tape embedded into the wet mastic or modified thinset mortar and allowed to dry thoroughly.

3.3.3 Hardibacker® Underlayment (Ultraboard®)

Hardibacker® underlayment is only intended for interior floors including showers and bath areas (excluding the shower floor). Subsequent finishing with resilient floor covering or tile is required. The underlayment face has a smooth surface, an acrylic based seal coat and square edges for close-butted joints. The reverse side of the underlayment has lightly textured surface, is unsealed and has square edges. Dimensions are noted in Table 1 of this report.

The underlayment shall be installed over a structurally sound subfloor assembly designed to limit the maximum deflection in a plane, including live and dead loads, to *L*/360 of the span, in accordance with the applicable code.

When the underlayment is installed on existing floor construction, floor finishes and subflooring shall be repaired, removed and/or replaced as necessary to create a smooth and level surface. The ability of the existing floor structure and subfloor to support the additional loads of the underlayment and new floor finish shall be substantiated. Alterations shall comply with applicable codes.

The underlayment boards are laid in a staggered end joint pattern at right angles to the subflooring. Joints are offset $^1/_8$ inch (3.2 mm) from walls and cabinet bases and cut edges turned to the outside, wherever possible.

3.3.3.1 Resilient Flooring: With the smooth face up, the underlayment is placed over the prepared subflooring and fastened to support framing with either 3d, corrosion-resistant, ring shank nails or No. 18 gage (0.0475-inch) corrosion-resistant staples with a $^1/_4$-inch (6.4 mm) crown located a maximum of 3 inches (76 mm) on center around the perimeter and 6 inches (152 mm) on center in a random/staggered pattern in the field. Fasteners shall be located at least $^3/_8$ inch (9.5m) from underlayment edges and 2 inches (51 mm) minimum, from the underlayment corners. Fastener heads shall be flush with the surface. Fasteners shall be of sufficient length to penetrate at least 1-inch (25.4 mm) sound subflooring or framing.

To minimize the possibility of surface irregularities in the underlayment and fastener heads penetrating through the resilient flooring, the boards shall be installed flush and level. Height variations are treated by filling joints, gouges and low spots with a water-resistant, cementitious leveling compound recommended by the floor-covering manufacturer. After the leveling compound has dried, filled areas are sanded level to the surrounding subfloor.

Prior to the application of the resilient flooring, the prepared surfaces shall be free of dust, grease and other foreign material.

Finish floor coverings are installed in accordance with the flooring material manufacturer's published instructions, which shall include application procedures, compatible adhesives and recommended accessories.

3.3.3.2 Tile: With the smooth face up, follow the additional instructions described in Section 3.3.2.1 of this report.

3.3.4 Titan®-FR Panel: Titan®-FR (tapered-edge) panel is only intended for dry interior wall and ceiling applications. The panel has a smooth finish with tapered edges on the two long dimensions for joint treatment. Dimensions are as noted in Table 1 of this report.

3.3.4.1 Paint or Wallpaper Finish: Titan®-FR tapered-edge panel is installed with the long dimension either vertical or horizontal to nominal 2 x 4 wood framing members or minimum No. 20 gage (0.0329-inch, 0.84 mm) steel framing members, spaced a maximum of 24 inches (610 mm) on center with end joints staggered from adjacent courses in both vertical and horizontal applications. To fasten to wood framing members, minimum $1^7/_8$-inch (47.6 mm) long gypsum board nails or minimum $1^1/_2$ inch (38 mm) long, Type W, gypsum board screws are used and spaced a maximum of 8 inches (203 mm) on center at all supports. To fasten to metal framing members, minimum 1 inch (25.4 mm) long, Type S or S-12, self-drilling gypsum board screws are used and spaced a maximum of 12 inches (305 mm) on center at all supports. Fasteners shall be located at least $^3/_8$ inch (9.5 mm) from board edges, and 2 inches (51 mm), minimum, from board corners. wall panels are placed with a minimum $^1/_4$-inch (6.4 mm) clearance from the floor surface. Metal or PVC corner angles are attached with the above described nails or screws placed approximately 12 inches (305 mm) on center.

A flush-joint procedure is permitted on Titan®-FR (tapered-edge) panels. Gypsum board joint compounds, complying with ASTM C 474 and C 475, shall be troweled into the joints. Paper joint tape or equivalent is embedded into the wet joint compound and allowed to dry thoroughly. A second coat of joint compound, approximately 8 inches (203 mm) wide, is then applied across the joint and allowed to dry. A third coat of topping compound, 10 inches (254 mm) wide, is applied across the joint. Topping compound shall also be applied over all fastener heads in intermediate locations.

Internal corners are finished by filling with joint compound, working the joint tape into the joint, and applying a second coat of joint compound. A third coat of topping compound is applied over the area.

External corners are treated by filling the joint with joint compound and allowing it to dry thoroughly. Corrosion-resistant metal or PVC corner angles are then fastened to the corner, followed by a second coat of joint compound. When the second coat is completely dry, a third coat of topping compound is applied over the area. Joint compound is also applied over all fastener heads in intermediate locations.

3.4 SUBFLOOR PANELS

Compressed sheet is used as subflooring over complying wood or metal floor joists spaced a maximum of 24 inches (610 mm) on center. The panels have a smooth unsanded surface. Cutouts for plumbing and electrical shall be oversized. Floor opening penetrations shall be protected in accordance with the applicable code. Dimensions are noted in Table 1 of this report.

Panels are installed over two or more spans, with the long dimension perpendicular to supports. The sheets are fastened to wood framing members by counterstriking minimum No. 10 x 0.350-inch (8.9 mm) HD wood screws spaced a maximum of 12 inches (305 mm) on center at all supports. The sheets are fastened to metal framing members by counterstriking minimum No. 9 by 0.350-inch (8.9 mm) HD self-drilling, corrosion-resistant nbbed buglehead screws spaced a maximum of 6 inches (152 mm) on center around the sheet perimeter and 12 inches (305 mm) on center at immediate joist locations. Fasteners shall be of sufficient length to penetrate at least 1inch (25.4 mm) into wood framing members or $^1/_4$ inch (6.4 mm) into metal framing members. Holes are drilled in compressed sheet with a masonry bit, allowing a 0.04-inch (1.02 mm) clearance over diameter of screw to be used. Fasteners are located a minimum of $^3/_8$ inch (9.5 mm) and a maximum of $^3/_4$ inch (19.1 mm) from sheet edges, and 2 inches (51 mm) minimum from sheet corners. Fastener heads are flush with the surface. Edges shall be blocked or the panels shall be covered with minimum $^1/_4$-inch (6.4 mm) thick underlayment or $^3/_4$-inch (19.1 mm) thick wood strip finish flooring.

As an alternative, sheets are field glued in conjunction with mechanical fastening with a structural adhesive (APA/HUD AFG-01) applied to joints. Framing members shall be free of surface moisture, dirt, cement and other foreign materials prior to application of the adhesive. Adhesives shall be applied in accordance with the adhesive manufacturer's instructions. The application rate shall be a $^1/_4$-inch (6.4 mm) diameter bead applied to each joist or blocking member, except two $^1/_4$-inch (6.4 mm) diameter beads are applied where sheets abut on a joist. Installation of the sheets shall be within the time limit designated by the adhesive manufacturer.

Where more than one sheet is used, an effective seal shall be provided between sheets. The bonded surfaces shall be clean and an approved structural adhesive (APA/HUD AGF-01) shall be used. Edges of the sheets to be joined shall be thoroughly cleaned and the dust removed. A layer of adhesive is "buttered" to the leading edge of the first installed sheet and the next sheet laid against it ensuring that an adequate film of adhesive is present. Forcing adhesive into the joint after the sheets have been fastened is not permitted. After the joint is filled, any excess adhesive shall be removed from the surface of the sheet.

Use as a diaphragm is outside the scope of this report.

Allowable loads are as follows:

ALLOWABLE UNIFORM LOAD AT DEFLECTION LIMIT = *L*/360[1]

PRODUCT	JOIST SPACING	
	16 inches o.c.	24 inches o.c.
Compressed Sheet II (½ and 5/8-inch thick)	190 psf	105 psf
Compressed Sheet II (3/4-inch thick)	300 psf	145 psf

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa
1. *L* = length of span (inches)

3.5 FIRE-RESISTANCE RATED ASSEMBLIES

3.5.1 Assembly 1

The nonsymmetrical nonloadbearing, 1 hour, fire-resistance rated wall assembly consists of minimum $3^5/_8$-inch (92 mm) deep, No. 20 gage (0.0359-inch, 0.91 mm), steel "C" studs at 24 inches (610 mm) on center with corresponding top and bottom tracks. One layer of $^5/_8$-inch (15.9 mm) thick Type "X" gypsum board, 48 inches (1219 mm) wide, is applied vertically to the studs and secured with $1^1/_4$-inch (32 mm) long, Type S, gypsum board screws, spaced 8 inches (203 mm) on center at board edges and 12 inches (305 mm) on center at intermediate framing members. The $^5/_8$-inch (15.9 mm) thick gypsum board joints and screw heads require treatment consisting of joint compound followed by joint tape and a second layer of joint compound. The opposite face of the wall is covered with one layer of $^1/_2$-inch (12.7 mm) thick Hardirock® Max "C"™(Type "X") gypsum board, followed by one layer of either $^1/_4$-inch (6.4 mm) thick Titan® (tapered-edge), Hardibacker® (square-edge), or Harditex® board. Boards are applied vertically to framing members with vertical edges staggered 24 inches (610 mm). The $^1/_2$-inch (12.7 mm) thick Hardirock® Max "C"™ (Type "X") gypsum board is fastened to the framing members with $1^1/_4$-inch (32 mm) long, Type S, gypsum board screws spaced 24 inches (610 mm) on center. Titan®, Hardibacker® or Harditex® boards are fastened through the gypsum board to the framing members with minimum $1^5/_8$-inch (41 mm) long by minimum 0.323-inch (8.2 mm) HD or self-drilling, corrosion-resistant, ribbed buglehead or ribbed waferhead screws located a maximum of 8 inches (203 mm) on center. Board joints and fasteners require treatment similar to that described in Sections 3.3.1.1, 3.3.1.2, 3.3.2.2 and 3.2.4 of this report.

3.5.2 Assembly 2

The nonsymmetrical nonload bearing, 1-hour, fire-resistant rated wall assembly consists of minimum $3^5/_8$-inch (92 mm) deep, No. 25 gage (0.0209-inch, 0.53 mm), steel "C" studs at 16 inches (406 mm) on center with corresponding top and bottom tracks. One layer of $^5/_8$-inch (15.9 mm) thick Type "X" gypsum board, 48 inches (1219 mm) wide, is applied vertically to the studs and secured with minimum 1 inch (25.4 mm) long, Type S, gypsum board screws, spaced 8 inches (203 mm) on center at board edges and 12 inches (305 mm) on center at intermediate framing members. The $^5/_8$-inch (15.9 mm) thick Type "X" gypsum board joints and screw heads require treatment consisting of joint compound followed by joint tape and a second layer of joint compound. The stud cavities are insulated with minimum 3-inch (76 mm) thick, 3 pcf (48 kg/m^3), unfaced, friction-fit, mineral fiber insulation complying with ASTM C 665, Type I. The opposite face of the wall is covered with one layer of $^7/_{16}$-inch (11.1 mm) thick Hardibacker® (backerboard) or Titan® panel or Harditex® boards. The boards are applied vertically to framing

members with vertical edges staggered 16 inches (406 mm). Hardibacker®, Titan® or Harditex® boards are fastened through to the framing members with minimum 1-inch (25.4 mm) long No. 8 by 0.323-inch (8.2 mm) HD self-drilling, corrosion-resistant, ribbed buglehead (or equivalent) screws located a maximum of 6 inches (152 mm) on center. Board joints and fasteners require treatment similar to that described in Sections 3.3.1.1, 3.3.1.2 or 3.3.2.2 of this report, and using the glass fiber reinforcing tape.

3.5.3 Assembly 3

The nonsymmetrical limited loadbearing, 1 hour fire-resistant rated wall assembly consists of nominal 2 x 4 wood studs at 16 inches (406 mm) on center with two top plates and a single bottom plate. The lesser of 800 pounds per stud or 31 percent of full design load is permitted to be superimposed, provided structural consideration for axial, flexural and bearing perpendicular-to-grain stresses are resolved in accordance with Part III of the *National Design Specification*, 1997 edition, published by the American Forest & Paper Association. One layer of $^5/_8$-inch (15.9 mm) thick Type "X" gypsum board, 48 inches (1219 mm) wide, is applied vertically to the studs and secured with minimum $1^7/_8$-inch (22 mm) long cup-head gypsum board nails, spaced 7 inches (178 mm) on center at board edges and intermediate framing members. The $^5/_8$-inch (15.9 mm) thick Type "X" gypsum board joints and nail heads require treatment consisting of joint compound followed by joint tape and a second layer of joint compound. The stud cavities are insulated with minimum 3-inch (76 mm) thick, 3 pcf, unfaced, friction-fit, mineral fiber insulation complying with ASTM C 665, Type I. The opposite face of the wall is covered with one layer of $^7/_{16}$-inch (11.1 mm) thick Titan® panel or Hardibacker® backerboard. The fiber cement board is applied vertically to framing members with vertical edges staggered 16 inches (406 mm) from the gypsum board edges. Boards are fastened through to the framing members with minimum $1^1/_2$-inch (38 mm) long, corrosion-resistant roofing nails located a maximum of 6 inches (152 mm) on center. Board joints and fasteners require treatment similar to that described in Section 3.3.2.2 of this report. The side of the wall clad with fiber-cement board is covered with standard grade ceramic tile, nominal $^1/_4$-inch (6.4 mm) thick. Tiles, any expansion or control joints, and grout are installed in accordance with ANSI A108.4 when Type I organic adhesive is used, or ANSI A108.5 if dry set, acrylic-modified or latex-modified portland cement mortar is used.

3.5.4 Assembly 4

The nonsymmetrical loadbearing 1 hour fire-resistant rated wall assembly consists of nominal 2 x 4 wood studs at 24 inches (610 mm) on center with two top plates and a single bottom plate. Full design loads are permitted to be superimposed, provided structural consideration for axial flexural and bearing perpendicular-to-grain stresses are resolved in accordance with Part III of the *National Design Specification*, 1997 Edition, published by the American Forest & Paper Association. One layer of $^5/_8$-inch (15.9) thick Type "X" gypsum board, 48 inches (1219 mm) wide, is applied vertically to the studs and secured with minimum $1^3/_4$-inch (44 mm) long cup-head gypsum board nails, spaced 7 inches (178 mm) on center at board edges and intermediate framing members. The $^5/_8$-inch (15.9 mm) thick Type "X" gypsum board joints and nail heads require treatment consisting of joint compound followed by joint tape and a second layer of joint compound. The stud cavities are either insulated or uninsulated. The opposite face of the wall is covered with one layer of $^1/_2$-inch (12.7 mm) thick Type "X" water-resistant core gypsum sheathing and one layer of maximum 12-inch (305 mm) wide Hardiplank® lap siding lapped a minimum of $1^1/_4$ inches (32 mm). The $^1/_2$-inch (12.7 mm) thick Type "X" water-resistant core gypsum sheathing is applied vertically to framing members with vertical edges staggered 24 inches (610 mm) from the joints on the opposite side. The $^1/_2$-inch (12.7 mm) thick Type "X" water-resistant core gypsum sheathing is fastened to the framing members with $1^3/_4$-inch (44 mm) long roofing nails spaced 7 inches (178 mm) on center in the field and 4 inches (102 mm) on center along the perimeter of each board. An outer layer of $^5/_{16}$-inch (7.5 mm) thick, 12-inch (305 mm) wide Hardiplank® lap siding is applied over the $^1/_2$-inch (12.7 mm) thick Type "X" water-resistant core gypsum sheathing by attaching a $1^1/_2$-inch (38 mm) wide Hardiplank® starter strip attached through the gypsum sheathing into the bottom plate and 12-inch (305 mm) wide Hardiplank® lap siding applied horizontally with a minimum nominal $1^1/_4$-inch (32 mm) headlap and fastened with a single 6d corrosion resistant common nail driven through the lapped planks at each stud.

3.5.5 Assembly 5

The symmetrical nonload bearing, 1 hour, fire-resistant rated wall assembly consists of minimum $3^5/_8$-inch (92 mm) deep, No. 20 gage (0.0359 inch, 0.91 mm), steel "C" studs at 24 inches (610 mm) on center with corresponding top and bottom tracks. Both sides of the wall are covered with one layer of $^1/_2$-inch (12.7 mm) thick Hardirock® Max "C"™ (Type "X") gypsum board, followed by one layer of either $^1/_4$-inch (6.4 mm) thick Titan® panel, Hardibacker® backerboard, or Harditex® baseboards. Boards are applied either perpendicular (horizontally) or parallel (vertically) to framing members. Base layer and face layer board joints of both wall sides are offset by 24 inches (610 mm). The $^1/_2$-inch (12.7 mm) thick Hardirock® Max "C"™ (Type "X") gypsum board is fastened to the framing members with minimum 1-inch (25.4 mm) long, Type S, gypsum board screws spaced 24 inches (610 mm) on center. Titan®, Hardibacker® or Harditex® boards are fastened through the gypsum board to the framing members with minimum $1^5/_8$-inch (41 mm) long by minimum 0.323-inch (8.2 mm) HD self-drilling, corrosion-resistant, ribbed buglehead or ribbed waferhead screws located a maximum of 8 inches (203 mm) on center. Board joints and fasteners require finish treatment similar to that described in Sections 3.3.1.1, 3.3.1.2, 3.3.2.2, or 3.2.4 and of this report.

3.5.6 Assembly 6

The symmetrical nonload bearing, 1 hour, fire-resistant rated wall assembly consists of minimum $3^5/_8$-inch (92 mm) deep, No. 20 gage (0.0359 inch, 0.91 mm), steel "C" studs at 24 inches (610 mm) on center with corresponding top and bottom tracks. Both sides of the wall are covered with one layer of $^5/_8$-inch (15.9 mm) thick Titan®-FR panel. Boards are applied either perpendicular (horizontally) or parallel (vertically) to framing members. Panel joints are offset by 24 inches (610 mm). The $^5/_8$-inch (15.9 mm) thick Titan®-FR panel is fastened to the framing members with minimum 1 inch (25.4 mm) long, Type S, gypsum board screws spaced 12 inches (305 mm) on center. Board joints and fasteners require finish treatment similar to that described in Sections 3.3 1.1 or 3.3.1.2 of this report.

4.0 INSTALLATION

Installation shall comply with this report and a copy of this report shall be available at all times on the job site during installation. Additional details are in the applicable manufacturer's product information sheets issued December 1993. Where non-editorial differences occur between the manufacturer's product information sheets and this report, this report shall be null and void.

5.0 IDENTIFICATION

James Hardie Building Products, Inc., Hardiflex®, Hardipanel® Cempanel®, Hardisoffit® and Cemsoffit® boards; Harditex® baseboards; Titan®, Titan®-FR, Hardibacker®, Ultraboard® and Hardibacker 500® lining boards, backerboard and underlayment; Compressed Sheet subflooring; pallets of Hardiplank® and Cemplank® lap siding; and pallets of Hardishingle™ planks and panels shall bear a label identifying the manufacturer's name and telephone number, the product name, and the name of the quality control agency, Intertek Testing Services, Inc. (NER-QA219), and this ICC-ES Legacy report number (NER-405) for field identification.

6.0 EVIDENCE SUBMITTED

6.1 The following test reports issued by the Building Research Association of New Zealand (BRANZ) in accordance with ASTM E 72, Conducting Strength Test of Panels of Building Construction, Section 9, Transverse Load, and Section 14, Racking Load:

Report No.	Date	ASTM Standard Section
S100	June, 1984	9
S101	June, 1984	9
S102	June, 1984	9
S103	June, 1984	9
S104	June, 1984	9
S105	June, 1984	14
S106	June, 1984	14
S109	July, 1984	9
S112	August, 1984	14
S113	August, 1984	9
STR122	April, 1985	9
STR123	April, 1985	14
STR127	April, 1985	9
STR128	May, 1985	14
STR131	May, 1985	9
STR132	May, 1985	14

6.2 The following test reports issued by the Building Research Association of New Zealand (BRANZ) in accordance with the weatherability test procedures noted:

Report No.	Date	Procedure
MTR658	November, 1983	U.B.C. Standard 32-12
MTR662	November, 1983	Freeze/Thaw
MTR709	June, 1984	Percolation Test
MTR723	May, 1984	ASTM G 26, D 2616, FD-714
MTR778	June, 1985	NSZ3204; Wet/Dry Cycling
MTR787	June, 1985	U.B.C. Standard 47-17
T176	June, 1984	ASTM E 96
T177	June, 1984	ASTM E 96

6.3 Quality Assurance Manual for James Hardie Building Products, Inc., signed by Rich Klein, James Hardie Building Products, Inc 2/18/02 and Kathy Bishop, Intertek Testing Services, Inc. 2/20/02.

6.4 Manufacturer's descriptive literature.

6.5 United States Testing Company, Test Report No. LA 50049-1, dated February 7, 1985,containing testing in accordance with ASTM E 84, *Test of Surface Burning Characteristic of Building Materials.*

6.6 Ramtech Laboratories, Inc., Test Report No. 8047-87, dated April 6, 1987, containing testing in accordance with ASTM E 72, *Conducting Strength Tests of Panels for Building Construction* — Section 9, Transverse Load; and Section 14, Racking Load.

6.7 Structural Calculations for "Determination of Wind Speed" by Ronald I. Ogawa, P.E., in accordance with Section 1205 of the 1988 *Standard Building Code®*.

6.8 The following test reports were issued by Inspection Concepts for "Transverse Load Tests" of panels:

Report No.	Date
IC-1021-88	May, 1988
IC-1022-88	May, 1988
IC-1042-88	February, 1989
IC-1054-89	September, 1989
IC-1055-89	September, 1989
IC-1121A-91	March 20, 1991
IC-1121B-91	March 20, 1991
IC-1201-92	January 22, 1993
IC-1203-92	January 22, 1993
IC-1228-93	July 2, 1993
IC-1270-94	April 20, 1994
IC-1271-94	April 20, 1994

6.9 The following test reports were issued by Inspection Concepts for "Racking Tests" of panels:

Report No.	Date
IC-1013-88	January, 1988
IC-1014-88	January, 1988
IC-1030-88	September, 1988
IC-1032-88	September, 1988
IC-1037-88	November, 1988
IC-1038-88	November, 1988
IC-1057-89	September, 1989
IC-1062-89	November ,1989
IC-1100-90	October 30, 1990
IC-1107-91	January 5, 1991
IC-1108-91	January 6, 1991
IC-1109-91	January 8, 1991
IC-1110-91	January 8, 1991
IC-1120A-91	March 20, 1991
IC-1120B-91	March 20, 1991
IC-1120C-91	March 20, 1991
IC-1120D-91	March 20, 1991
IC-1202-92	January 22, 1993
IC-1202-92	January 22, 1993
IC-1237-93	August 5, 1993
IC-1273-94	April 20, 1994
IC-1274-94	April 29, 1994

6.10 The following test reports were issued by Inspection Concepts for "Transverse Load Tests" of planks:

Report No.	Date
IC-1020-88	May, 1988
IC-1011-88	January, 1988
IC-1034-88	October, 1988
IC-1035-88	October, 1988

6.11 The following test reports were issued by Southwest Research Institute for "1 hour Fire-resistant Assemblies":

Report No.	Date
01-2602-802	March, 1989
01-2602-803	March, 1989

6.12 Structural calculations verifying design values for Table 2 and 3 of this report, prepared by Inspection Concepts dated March 7, 1990, signed and sealed by Ronald I. Ogawa, P.E.

6.13 Inspection Concepts, Test Report No. IC-1093A-90, dated October 18, 1990, in accordance with ASTM E 136.

6.14 Smith-Emery Company, Test Report No. L-87-1732, dated October 8, 1987, in accordance with ANSI A118.9.

6.15 United States Testing Company, Inc., Test Report No. 176842, dated September 14, 1990, in accordance with ASTM D 1037.

6.16 Truesdail Laboratories, Inc., Test Report No. 30240-1, dated March 1, 1989, revised March 28, 1991, in accordance with ASTM G 21.

6.17 Truesdail Laboratories, Inc., Test Report No. 30240-2, dated March 1, 1989, revised March 28, 1991, in accordance with ASTM G 22.

6.18 Inspection Concepts, Report No. IC-1131-91, dated May 8, 1991, in accordance with ASTM C 947, C666 Procedure B, and ANSI 136-1.

6.19 ETL Testing Laboratories, Report No. 497742, dated March 5, 1990, in accordance with ASTM E 84.

6.20 Inspection Concepts, Report No. IC-1039-89, dated January 6, 1989, revised May 11, 1990, containing comparative fastener pullout and pull-through testing results.

6.21 James Hardie Building Products, Inc. product information sheets issued October 1991.

6.22 Structural calculations verifying design values for Table 2 and 3 of this report, prepared by Inspection Concepts dated October 20, 1993, signed by Ronald I. Ogawa, P.E.

6.23 Letter correcting structural calculations for BRANZ Reports S106 and STR128 prepared by Inspection Concepts dated February 14, 1993, signed and sealed by Ronald I. Ogawa, P.E.

6.24 Letter reviewing "Racking Tests" and "Transverse Load Tests" for Group III wood species verification for Table 2 and 3 of this report, prepared by Inspection Concepts dated October 14, 1993, signed and sealed by Ronald I. Ogawa, P.E.

6.25 The following test reports were issued by Omega Point Laboratories for "1 hour Fire-resistant Assemblies":

Report No.	Date
11710-92783	February 13,1992
11710-92851	September 9,1992
11710-98414	May 1, 1995
11710-105198	August 2, 1999
11710-105199	August 3, 1999

6.26 Ramtech Laboratories, Inc., Test Report No. 8108A-87, dated May 20, 1987, in accordance with ASTM C 725 for flexural strength tests conducted on $^1/_4$-inch and $^3/_4$-inch thick compressed sheet panels.

6.27 Ramtech Laboratories, Inc., Test Report No. 8108B-87, dated May 26, 1987, in accordance with ASTM E 72, Section 18, concentrated load on $^1/_4$--inch and $^3/_4$-inch thick compressed sheet panels.

6.28 Ramtech Laboratories, Inc., Test Report No. 8108C-87, dated June 24, 1987, in accordance with ASTM E 72, Section 9, transverse load on $^1/_4$-inch and $^3/_4$-inch thick compressed sheet panels.

6.29 Inspection Concepts, Test Report No. IC-1257-94, dated January 13, 1994, in accordance with ASTM E 331 for water penetration of $^1/_4$-inch thick Hardi-panel® vertical siding.

6.30 Inspection Concepts, Test Report No. IC-1243-93, dated August 26, 1993, in accordance with ASTM E 228 for linear-thermal expansion of $^1/_4$-inch thick James Hardie fiber cement products.

6.31 Ramtech Laboratories, Inc., Laboratory No. 9778-93, IC-1225-93, dated June 4, 1993,. The Hardibacker board was tested in accordance with ASTM C 177 *Test for Steady-State Thermal Transmission Properties by Means of the Guarded Hot Plate.* The results are listed in Table 4 of this report.

6.32 Ramtech Laboratories, Inc., Test Report No. IC-1230-93, Laboratory No. 9778-93, dated June 1993. The Hardibacker® board materials were tested in accordance with ASTM E 96-90 to determine the water vapor transmission properties. The average permeance (perms) of the panels are shown in Table 5 of this report.

6.33 Ramtech Laboratories, Inc. Laboratory No. 10367A-95/1363, dated September 18, 1995. The 7 $^1/_4$-inch and 9 $^1/_4$-inch wide Hardiplank® lap sidings were tested in accordance with ASTM E 330 Transverse Load Test. The panels were installed on nominal 2 x 4 wood structural members spaced 16 inches on center (o.c.).

6.34 Structural Calculations verifying design values for Table 3 of this report, prepared by Inspection Concepts dated October 6, 1995, signed by Ronald I. Ogawa, P.E.

6.35 Wind analysis and calculations for Hardishingle and Hardislate roofing and Hardie® Shingleside® cladding installed with 8-, 7-, and 6-inch weather exposures. Analysis and calculations conducted by Ronald I. Ogawa, P.E. dated March 28, 1997; March 31, 1997; and April 2, 1997.

6.36 Structural calculations to determine design wind load on 8.25 Hardiplank®, dated October 24, 1996, signed and sealed by Ronald I. Ogawa, P.E. of Inspection Concepts Inc..

6.37 Structural calculations to determine design values for Table 2a, 2b, and 3 of this report, prepared by Inspection Concepts dated July 16, 1997, July 19, 1997, and August 19, 1997, signed and sealed by Ronald I. Ogawa, P.E.

6.38 Ramtech Laboratories, Inc., Report Lab. No. 10868-97/1475, dated June 26, 1997. The report contains results of testing in accordance with ASTM E 72 and ASTM E 330 on $^{5}/_{16}$-inch thick Hardipanel.

6.39 Ramtech Laboratories, Inc., Report Lab. No. 10869-97/1482, dated July 14, 1997 containing results of transverse load testing in accordance with ASTM E 72 on 9 $^{1}/_{4}$-inch wide Hardiplank® lap siding.

6.40 Applied Research Laboratories, Lab No. 29278-UD1, dated September 1, 1994, containing reports of tensile pull-out testing of fasteners.

6.41 Structural calculations to determine the allowable fastener spacing based on a wind speed of 110 mph, Exposure Category C, prepared by Inspection Concepts, dated November 2, 1994, signed and sealed by Ronald I. Ogawa, P.E.

6.42 Ramtech Laboratories, Inc., Laboratory Number 10794-97/1458, dated March 13, 1997, containing results of an Uplift Resistance Test of 18-inch long by 12-inch wide by $^{1}/_{4}$-inch thick Hardishingle™ roofing installed on $^{15}/_{32}$-inch thick, 4 ply, 3 layer CDX plywood.

6.43 Ramtech Laboratories, Inc., Laboratory Number 10794-97/1460, dated March 13, 1997, containing results of an Uplift Resistance Test of 18-inch long by 12-inch wide by $^{1}/_{4}$-inch thick Hardie® Shingleside® as siding roofing installed on $^{7}/_{16}$-inch thick Oriented Strand Board utilizing 2 siding nails per 12-inch wide panel.

6.44 Ramtech Laboratories, Inc., Laboratory Number 10794-97/1464, dated March 13, 1997, containing results of an Uplift Resistance Test of 18-inch long by 12-inch wide by $^{1}/_{4}$-inch thick Hardie® Shingleside® as siding roofing installed on $^{7}/_{16}$-inch thick Oriented Strand Board utilizing 3 siding nails per 12-inch wide panel.

6.45 Ramtech Laboratories, Inc., Laboratory Number 11149-98/1554, dated October 7, 1998, containing results of an ASTM E 330 Transverse Load Test of 6 $^{1}/_{4}$-inch wide Hardiplank® siding installed on 20-ga. metal framing members spaced at 16-inch and 24-inch centers and fastened with ET & F pin fasteners through the lap to each stud.

6.46 Ramtech Laboratories, Inc., Laboratory Number 11149-98/1554A, dated October 7, 1998, containing results of an ASTM E 330 Transverse Load Test of 12-inch wide Hardiplank® siding installed on 20-ga. metal framing members spaced at 16-inch and 24-inch centers and fastened with ET & F pin fasteners through the lap to each stud.

6.47 Ramtech Laboratories, Inc., Laboratory Number 11149-98/1554B, dated October 7, 1998, containing results of an ASTM E 330 Transverse Load Test of 8 $^{1}/_{4}$-inch wide Hardiplank® siding installed on 20-ga. metal framing members spaced at 16-inch and 24-inch centers and fastened with ET & F pin fasteners blind nailed to each stud.

6.48 Ramtech Laboratories, Inc., Laboratory Number 11284-99/1580, dated April 15, 1999, containing results of an ASTM E 72 Racking Shear Test of $^{5}/_{16}$-inch thick x 48-inch wide x 96-inch long Hardipanel® siding installed on 20-ga. metal framing members spaced at 16-inch and 24-inch centers and fastened with ET & F pin fasteners spaced at 4 inches o.c. perimeter and 8 inches o.c. intermediate framing members.

6.49 Ramtech Laboratories, Inc., Laboratory Number 11149-98/1554D, dated September 14, 1998, containing results of an ASTM E 330 Transverse Load Test of $^{5}/_{16}$-inch thick x 48-inch wide x 96- inch long Hardipanel® siding installed on 20-ga. metal framing members spaced at 16-inch and 24-inch centers and fastened with ET & F pin fasteners spaced at 4 inches o.c. perimeter and 8 inches o.c. intermediate framing members.

6.50 Wind analysis and calculations for Hardipanel® panels for exposure categories B, C, and D. Analysis and calculations signed and sealed by Ronald I. Ogawa, P.E., dated March 26, 2000.

6.51 Ramtech Laboratories, Inc., Laboratory Number 11552/1636, dated April 20, 2000, containing results of an ASTM E 330 Uplift Resistance Test of $^{1}/_{4}$-inch thick x 24-inch wide vented Hardisoffit® panel installed on nominal 2 x 4 framing members spaced at 24 inch centers and fastened with 1 $^{1}/_{4}$-inch long x 0.083 inch shank x 0.187 inch HD nails spaced at 8 inches o.c. perimeter and intermediate framing members.

6.52 Wind analysis and calculations for 24-inch wide vented Hardisoffit® panel for exposure categories B, C, and D. Analysis and calculations signed and sealed by Ronald I. Ogawa, P.E., dated May 4, 2000.

6.53 Ramtech Laboratories, Inc., Laboratory Number 11436-99/1602, dated October 29, 1999, containing results of an ASTM E 330 Transverse Load Test of $^{1}/_{4}$-inch thick x 19-inch long x 48-inch wide Heritage™ (half round) panel siding installed on $^{7}/_{16}$-inch thick APA rated Oriented Strand Board sheathing only with 1 $^{1}/_{4}$-inch long x 0.083-inch shank x 0.187-inch HD nails spaced at 13 $^{3}/_{4}$-inch o.c.

6.54 Ramtech Laboratories, Inc., Laboratory Number 11436-99/1603, dated October 27, 1999, containing results of an ASTM E 330 Transverse Load Test of $^{1}/_{4}$-inch thick x 19-inch long x 48- inch wide Heritage™ (half round) panel siding installed on nominal 2 x 4 framing members spaced at 16-inch centers and fastened with 1 $^{1}/_{4}$-inch long x 0.083-inch shank x 0.187-inch HD nails to each framing member.

6.55 Ramtech Laboratories, Inc., Laboratory Number 11436-99/1604, dated October 28, 1999, containing results of an ASTM E 330 Transverse Load Test of $^{1}/_{4}$-inch thick x 19-inch long x 48- inch wide Heritage™ (half round) panel siding installed on nominal 2 x 4 framing members spaced at 24-inch centers and fastened with $1^{1}/_{4}$-inch long x 0.083-inch shank x 0.187-inch HD nails to each framing member.

6.56 Letter justifying horizontal application of panels in accordance with Table 3 of this report, based on Table 23-II-I-1 of the *1997 Uniform Building Code*™ and similar tables in the BOCA® *National Building Code*/1999 and 1999 *Standard Building Code*®, prepared by Inspection Concepts Inc, dated October 20, 1999, and signed and sealed by Ronald I. Ogawa, P.E.

6.57 Wind analysis and calculations for Hardiplank® lap siding installed with ET & F pin fasteners for exposure categories B, C, and D. Analysis and calculations signed and sealed by Ronald I. Ogawa, P.E., dated December 14, 1998.

6.58 Wind analysis and calculations for Hardiplank® lap siding based on various test reports of installations with nail and screw fasteners. Analysis and calculations signed and sealed by Ronald I. Ogawa, P.E., dated July 7, 1998.

6.59 Underwriters Laboratories Inc. letter, dated May 29, 1997, recognizing James Hardie Gypsum's $^{1}/_{4}$-inch thick Hardirock® Max "C"™ gypsum board as an alternative to Super Fire X gypsum board.

6.60 Underwriters Laboratories Inc. letter, dated February 23, 2000, recognizing James Hardie® Gypsum's $^{1}/_{4}$-inch thick Hardirock® Max "C"™ gypsum board as an alternative to Super Fire X gypsum board.

6.61 Underwriters Laboratories, Inc., File R8701, Project 96NK16606, dated December 19, 1996, containing results of ANSI/UL 263 (ASTM E 119, NFPA 251), *Fire Tests of Building Construction and Materials*, for $^{1}/_{4}$-inch thick x 8 feet long x 4 feet wide gypsum board installed on steel columns of 25 MSG steel studs spaced at 12- inch centers and fastened with 3-inch long Type S self-drilling, self-tapping board screws spaced at 12-inch centers in a UL G512 assembly.

6.62 Underwriters Laboratories, Inc., File R8701, Project 96NK35820, dated July 23, 1997, containing results of ANSI/UL 263 (ASTM E 119, NFPA 251), *Fire Tests of Building Construction and Materials*, for $^{5}/_{8}$-inch thick x 144-inch long x 48-inch wide gypsum board installed in a UL X515 floor-ceiling assembly.

6.63 Wind analysis and calculations for Shingleside® Heritage™ panels for exposure categories B, C, and D. Analysis and calculations signed and sealed by Ronald I. Ogawa, P.E., dated December 3, 1999.

6.64 Ramtech Laboratories, Inc., Laboratory Number 11436-99/1612, dated December 20, 1999, containing results of an ASTM E 72 Racking Shear Test of $^{5}/_{16}$-inch thick x 48-inch wide x 96- inch long Hardipanel® Shiplap siding installed on nominal 2 x 4 wood framing members spaced at 16-inch centers and fastened with 0.092-inch shank by 0.225-inch HD by 2-inch long nails spaced at 3 inches o.c. perimeter and 8 inches o.c. intermediate framing members.

6.65 Ramtech Laboratories, Inc., Laboratory Number 11436-99/1616, dated December 27, 1999, containing results of an ASTM E 72 Racking Shear Test of $^{5}/_{16}$-inch thick x 48-inch wide x 96- inch long Hardipanel® Shiplap siding installed on nominal 2 x 4 wood framing members spaced at 16-inch centers and fastened with 0.092-inch shank by 0.225 inch HD by 2-inch long nails spaced at 8 inches o.c. perimeter and 8 inches o.c. intermediate framing members.

6.66 Wind analysis and calculations of Ramtech Laboratories, Inc., Test Reports Laboratory Number 11436-99/1612 and 11436/1616, prepared by Inspection Concepts dated January 14, 2000, signed and sealed by Ronald I. Ogawa, P.E.

6.67 Wind analysis and calculations for Hardipanel® installed on steel studs spaced 16 and 24 inches o.c. Analysis and calculations signed and sealed by Ronald I. Ogawa, P.E., dated June 15, 1999.

6.68 Ramtech Laboratories, Inc., Laboratory Number 11436-99/1619, dated January 19, 2000, containing results of a Uniform Negative Transverse Load Test of $^{5}/_{16}$-inch thick x 48-inch wide x 96-inch long Hardipanel® Shiplap Panel installed on nominal 2 x 4 wood framing members spaced at 16-inch centers and fastened with 0.092-inch shank by 0.225-inch HD by 2-inch long ring shank nails spaced at 3 inches and 8 inches o.c. perimeter and 8 inches o.c. field.

6.69 Wind analysis and calculations of Ramtech Laboratories, Inc., Test Report Laboratory Number 11436-99/1619, prepared by Inspection Concepts dated February 4, 2000, signed and sealed by Ronald I. Ogawa, P.E.

6.70 Ramtech Laboratories, Inc., Laboratory Number 11443/1613, dated February 10, 2000, containing results of testing, in accordance with ASTM C 36, of $^{5}/_{6}$-inch thick x 48-inch wide x 120-inch long Titan®-FR panel consisting of $^{1}/_{4}$-inch thick Hardirock® Max "C"™ gypsum board and $^{3}/_{32}$-inch thick Hardie® fiber-cement board adhered with PVA adhesive.

6.71 Ramtech Laboratories, Inc., Laboratory Number 11443/1613, dated March 25, 2000, revision to report to additionally show compliance with ASTM C 1278.

6.72 Ramtech Laboratories, Inc., Laboratory Number 11443/1629, dated March 22, 2000, containing testing of Hardibacker 500® in accordance with ASTM C 1288, *Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets.*

6.73 Omega Point Laboratories, Report Number 11710-106315, dated March 7, 2000, containing results of surface burning characteristic testing, indicating compliance with ASTM E 84 for the Hardibacker 500® backerboard.

6.74 Ramtech Laboratories, Inc., Laboratory Number 11569/1647, dated June 2, 2000, containing results of water tightness testing performed in accordance with ASTM C 1185 on Hardibacker 500®.

Table 1
STANDARD NOMINAL PLANK & PANEL DIMENSIONS

Product Type	Width	Length	Thicknesses (Inches)
Hardiplank	4, 5-1/4, 6, 6-1/4, 7-1/4, 7-1/2, 8, 8-1/4, 9-1/4, 9-1/2 11-1/4 & 12 inches	12, 14 feet	5/16
Hardisoffit (unvented)	4, 6, 12, 16, 24 & 48 inches	8 & 12 feet	3/16 & 1/4
Hardisoffit (vented)	4, 6, 12, 16 & 24 inches	12 feet	1/4
Hardiflex	48 inches	8, 9 & 10 feet	3/16, 1/4, 5/16 & 3/8
Hardipanel	48 inches	8, 9 & 10 feet	1/4 & 5/16
Harditex	48 inches	8, 9 & 10 feet	1/4, 5/16, 3/8 & 7/16
Hardipanel Shiplap	48-3/4 inches	8, 9 & 10 feet	5/16
Hardibacker (backerboard)	36 & 48 inches	4, 5, 8 feet	1/4 & 7/16
Hardibacker 500 (backerboard)	36 & 48 inches	5, 8, 9, 10 feet	13/32
Titan (tapered edge)	48 inches	8, 9 & 10 feet	1/4 & 7/16
Hardibacker (underlayment)	36 & 48 inches	4, 5 & 8 feet	1/4
Titan-FR	48 inches	8, 9 & 10 feet	5/8
Hardishingle cladding shingles	6, 8, & 12 inches	18 inches	1/4
Hardishingle panel (square & staggered edge)	48 inches	16 inches	1/4
Hardishingle panel (half round)	48 inches	19 inches	1/4
Compressed Sheet	48 inches	8, 9 ,10 feet	½, 5/8 & 3/4

Notes to Table 1:

1. Plank and panel products are also available in other lengths, widths, and thicknesses by special arrangement.
2. 1 inch = 25.4 mm, 1 ft = 304.8 mm

Table 2a — MAXIMUM WIND SPEED

Product Type	Product Thick. (in.)	Fastener Type	Fastener Spacing (in.)	Frame Type[1]	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category								
							Uniform Building Code			*Standard Building Code*			*BOCA National Building Code*		
							B	C	D	< 60 ft	C	D	B	C	D
Hardiflex Hardisoffit (unvented)	3/16	4d common 1-1/2 in. long	6	2 × 4 wood	16	20 40 60 100	90 80 70 70	70	-	90 80 70	70	-	90 80 70 70	70	-
Hardipanel Hardiflex Harditex Hardisoffit (unvented)	1/4	4d common 1-1/2 in. long	8	2 × 4 wood	16 24	20 40 60 20 40	90 80 70 70		-	90 80 70		-	90 80 70 70		-
Hardisoffit (vented)	1/4	0.083" shank x 0 187" HD ringshank nail at 8" o.c. at all bearing	-	2 x 4 SG = 0.40	22.5 max	0-15 20 40 60 100	150 150 150 150 140	140 130 130 120 105	120 120 110 110 100	150 140 130 120	 105	 90	150 150 150 150 130	140 130 120 110 105	110 110 100 100 90
Hardipanel Hardiflex Harditex	1/4	6d common 2 in. long	6	2 × 4 wood	16	20 40 60 100 200	120 120 110 100 90	100 95 90 85 80	-	120 120 120	120 110 110 70 70	-	120 120 120 95 80	100 90 90 70 70	-
Hardipanel Hardiflex Harditex	1/4	No. 11 ga. 1-1/4 in. long galvanized roofing nail	6	2 × 4 wood	16 24	20 40 100 150 200 20 40 100	110 105 90 80 80 80 80 70	80 80 70 70	-	110 105	80 80 70 70	-	110 105 90 80 80 80 80 70	80 80 70 70	-
Hardipanel Hardiflex Harditex	1/4	No. 11 ga 1-1/4 in long galvanized roofing nail	4 edge 12 field	2 × 4 wood	16	20 40 60 100 200	120 120 100 90	90 90 80 70	-	120 120 110	90 90 80 70	-	120 120 100 90	90 90 80 70	-
Hardipanel Hardiflex Harditex	5/16	0.091 in shank, 0.225 in HD, 1.5 in. long ring shank nail	4 edge 8 field	2 × 4 wood[2]	16	0-15 20 40 60 100	110 110 95 90 80	100 95 85 80	-	100 95 85 80	80 75 70	-	115 110 95 85 70	85 80 75 70 70	-
Hardipanel Hardiflex Harditex	5/16	4d common 1-1/2 in. long	8	2 × 4 wood	16 24	40 100 150 200 20 40 60	110 90 80 70 90 80 70	80 70	-	110	80 70	-	110 90 80 70 90 80 70	80 70	-
Hardipanel Hardiflex Harditex	5/16	6d common 2 in. long	6	2 × 4 wood	16	20 40 60 100 200	120 120 110 100 90	110 100 95 90 80	-	120 120 120	120 120 100 90	-	120 120 120 95 80	100 90 80 70	-
Hardipanel Hardiflex Harditex	5/16	6d common 2 in. long	6	2 × 4 wood	24	20 40 60 100 200	110 100 90 80 70	80 80 70 70	-	120 105 95	110 90 90	-	120 105 95 80 70	80 80 70	-
Hardipanel Hardiflex Harditex	5/16	6d common 2 in. long	4	2 × 4 wood	16	20 40 60 100 200	120 120 120 120 120	120 120 120 110 100	-	120 120 120	120 120 110 80 70	-	120 120 120 120 105	100 100 90 80 70	-
Hardipanel Hardiflex Harditex	5/16	6d common 2 in long	4	2 × 4 wood	24	20 40 60 100 200	120 120 110 100 90	105 100 90 85 80	-	120 120 120	120 110 110 80 70	-	120 120 120 100 80	105 95 90 80 70	-

Table 2a — MAXIMUM WIND SPEED

Product Type	Product Thick. (in.)	Fastener Type	Fastener Spacing (in)	Frame Type'	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category								
							Uniform Building Code			*Standard Building Code*			*BOCA National Building Code*		
							B	C	D	< 60 ft	C	D	B	C	D
Hardipanel Hardiflex Harditex	5/16	6d common 2 in. long	6 edge 12 field	2 × 4 wood	16	40 60 100 200	120 100 90	90 80 70	-	120 110	90 80 70	-	120 100 90	90 80 70	-
Hardipanel Shiplap Panel	5/16	0.092" shank × 2" × 0.225" HD ringshank nail	3 edge 8 field	2 × 4 SG = 0.40	16	0-15 20 40 60 100	140 130 120 115 105	110 105 95 90 85	95 95 90 85 80	125 120 110 100	 80	 -	150 150 130 120 95	110 105 95 90 80	90 85 80 75 -
Hardipanel Shiplap Panel	5/16	0.092" shank × 2" × 0.225" HD ringshank nail	4 edge 8 field	2 × 4 SG = 0.40	16	0-15 20 40 60 100	130 130 115 110 100	100 100 95 90 80	90 90 85 80 75	120 115 100 95	 75	 -	150 140 125 115 90	105 100 90 85 75	85 80 75 75 -
Hardipanel Shiplap Panel	5/16	0 092" shank × 2" × 0.225" HD ringshank nail	5 edge 8 field	2 × 4 SG = 0.40	16	0-15 20 40 60 100	130 120 110 100 90	95 95 85 80 80	85 80 80 75 70	115 110 95 90	 -	 -	140 140 120 110 90	90 90 85 80 75	80 80 75 - -
Hardipanel Shiplap Panel	5/16	0.092" shank × 2" × 0.225" HD ringshank nail	6 edge 8 field	2 × 4 SG = 0.40	16	0-15 20 40 60 100	120 115 110 100 95	90 90 85 80 75	80 80 75 75 -	105 100 90 85	 -	 -	140 130 110 100 80	95 90 80 75 -	75 70 70 - -
Hardipanel Shiplap Panel	5/16	0 092" shank × 2" × 0.225" HD ringshank nail	7 edge 8 field	2 × 4 SG = 0.40	16	0-15 20 40 60 100	110 110 100 90 85	85 80 80 75 70	75 70 70 - -	100 95 85 80	 -	 -	130 120 100 90 75	90 85 80 70 -	70 70 - - -
Hardipanel Shiplap Panel	5/16	0.092" shank × 2" × 0.225" HD ringshank nail	8 edge 8 field	2 × 4 SG = 0.40	16	0-15 20 40 60 100	105 100 90 85 80	80 80 70 70 -	70 70 - - -	90 90 80 75	 	 	120 110 95 90 75	80 80 70 - -	70 - - - -
Hardiflex Harditex	7/16	No. 11 ga 1-3/4 in. long galvanized roofing nail	6	2 × 4 wood	16	20 40 60 100 200	120 120 120 110 110	120 110 110 110 100	-	120 120 120	120 110 100 90 80	-	120 120 120 110 100	120 110 	-
Hardishingle Panel Straight Installation	1/4	0.083" shank ×0.187" HD ringshank nail into OSB only	13.75		-	0-15 20 40 60 100	100 90 85 80 70	70 70 70 - -	- - - - -	80 80 70 70	 -	 -	110 105 90 80 70	70 70 70 - -	- - - - -
Hardishingle Panel Staggered Installation	1/4	0.083" shank ×0.187" HD ringshank nail into OSB only	13.75		-	0-15 20 40 60 100	90 90 80 70 -	70 70 - - -	- - - - -	80 80 70 -	 -	 -	90 90 80 70 -	70 - - - -	- - - - -
Hardishingle Panel	1/4	0.083" shank × 0.187" HD ringshank nail at each stud	-	2 × 4 SG = 0.40	16	0-15 20 40 60 100	150 150 140 130 120	120 120 110 105 100	110 100 100 95 90	150 150 130 120	 90	 80	150 150 150 140 110	120 120 110 100 90	100 100 90 90 80
Hardishingle Panel	1/4	0.083" shank × 0.187" HD ringshank nail at each stud	-	2 × 4 SG = 0.40	24	0-15 20 40 60 100	115 110 105 90 85	90 85 80 75 70	80 70 70 - -	100 100 90 85	 -	 -	130 120 110 100 80	90 85 80 75 -	70 70 - - -

Table 2a — MAXIMUM WIND SPEED

Product Type	Product Thick. (in.)	Fastener Type	Fastener Spacing (in.)	Frame Type[1]	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category								
							Uniform Building Code			*Standard Building Code*			*BOCA National Building Code*		
							B	C	D	< 60 ft	C	D	B	C	D
Hardiflex Hardisoffit (unvented)	3/16	Min. No. 8 x 1 in. long × 0.323 in. HD ribbed buglehead screws	6	Min. No. 20 ga. × 3-5/8 in.×1-3/8 in. metal C-stud	16	20 40 60 100	80 80 70 70	70	-	80 80 70	70	-	80 80 70 70	70	-
Hardipanel Hardiflex Harditex	1/4	Min. No. 8 x 1 in. long × 0.323 in. HD ribbed buglehead screws	6	Min. No. 20 ga. × 3-5/8 in.×1-3/8 in. metal C-stud	16	20 40 60 100 150 200	120 110 100 90 90 80	90 90 80 80 70 70	N/A	120 110 100 90 80	90 90 80 80 70 70	N/A	120 110 100 90 90 80	90 90 80 80 70 70	N/A
					24	20 40 100	90 80 70	70		90 80	70 70		90 80 70	70	
Hardipanel	5/16	ET & F 0.100 × 1.5" × 25" HD ES 4144	4 edge 8 field	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60 100	150 140 130 120 110	115 110 105 100 95	100 100 90 90 85	130 130 120 110	75	-	150 150 140 130 105	120 110 100 100 85	100 90 90 80 70
Hardipanel	5/16	ET & F 0.100 × 1.5" × 25" HD ES 4144	4 edge 8 field	Min No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60 100	120 110 100 95 85	90 85 80 75 70	80 75 70 70 -	105 100 90 85	-	-	135 130 110 100 80	90 90 80 75 -	75 70 70 70 -
Hardiflex Harditex	7/16	Min. No. 8 x 1 in. long × 0.311 in. HD ribbed buglehead screws	6	Min. No. 20 ga. × 3-5/8 in.×1-3/8 in metal C-stud	16	20 40 60 100 200	120 120 120 120 110	120 120 110 110 110	-	120 120 120	120 120 90 80	-	120 120 120 120 100	120 120 110 90 80	-

Notes to Table 2a:

1. Values are for species of wood having a specific gravity of 0.42 or greater, unless otherwise noted.
2. Values are for species of wood having a specific gravity of 0.36 or greater.

Table 2b — MAXIMUM WIND SPEED

Product Type	Product (in.)		Fastener Type	Fastener Spacing (in.)	Frame Type[1]	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category								
								Uniform Building Code			*Standard Building Code*			*BOCA National Building Code*		
	Thick.	Width						B	C	D	< 60 ft	C	D	B	C	D
Hardiplank	5/16	4.00	ET & F pin 0.100 × 1.5" × 0.25" HD	Through Overlap	Min. No. 20 ga. × 3.62" × 1 375" Metal C-stud	16	0-15	150	150	150	150			150	150	150
							20	150	150	150	150			150	150	150
							40	150	150	150	150			150	150	150
							60	150	150	150	150			150	150	140
							100	150	150	150		140	120	150	140	120
Hardiplank	5/16	6 00	ET & F pin 0.100 × 1.5" × 0.25" HD	Through Overlap	Min. No 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	150	150	140	150			150	150	130
							20	150	150	140	150			150	150	130
							40	150	140	130	150			150	140	120
							60	150	130	120	150			150	130	110
							100	150	130	120		110	100	140	110	100
Hardiplank	5/16	6 25	ET & F pin 0.100 × 1.5" × 0.25" HD	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	150	150	140	150			150	150	130
							20	150	150	130	150			150	150	120
							40	150	140	130	150			150	140	120
							60	140	130	120	150			150	130	110
							100	130	130	120		110	100	130	110	100
Hardiplank	5/16	7.50	ET & F pin 0 100 × 1.5" × 0.25" HD	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	150	140	120	150			150	140	110
							20	150	130	120	150			150	130	110
							40	150	120	110	130			150	120	105
							60	140	120	110	130			150	110	110
							100	130	110	100		100	80	120	100	80
Hardiplank	5/16	8.00	ET & F pin 0.100 × 1.5" × 0.25" HD	Through Overlap	Min. No. 20 ga. × 3.62" × 1 375" Metal C-stud	16	0-15	150	130	110	150			150	130	110
							20	150	130	110	150			150	130	110
							40	150	120	110	130			150	120	100
							60	130	110	105	12			150	110	90
							100	130	110	100		95	90	120	95	85
Hardiplank	5/16	8 25	ET & F pin 0.100 × 1.5" × 0.25" HD	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	150	130	110	150			150	130	110
							20	150	130	110	140			150	130	100
							40	140	110	100	130			150	115	100
							60	130	110	100	120			140	110	90
							100	120	105	100		90	80	120	90	80
Hardiplank	5/16	9.50	ET & F pin 0.100 × 1 5" × 0.25" HD	Through Overlap	Min. No. 20 ga. × 3 62" × 1.375" Metal C-stud	16	0-15	150	120	105	140			150	120	100
							20	150	120	100	130			150	120	100
							40	140	110	100	120			140	110	90
							60	120	105	90	110			130	100	90
							100	120	100	90		80	75	110	80	75
Hardiplank	5/16	12.00	ET & F pin 0.100 × 1.5" × 0.25" HD	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	140	110	90	120			150	110	90
							20	140	105	90	120			150	110	90
							40	120	100	90	110			130	100	80
							60	110	95	85	100			120	90	80
							100	105	90	80		75	70	100	75	70
Hardiplank	5/16	4.00	ET & F pin 0.100 × 1.5" × 0.25" HD	Through Overlap	Min. No. 20 ga × 3.62" × 1.375" Metal C-stud	24	0-15	150	140	130	150			150	150	120
							20	150	140	125	150			150	140	120
							40	150	130	120	150			150	135	110
							60	150	125	115	140			150	125	105
							100	140	120	100		100	90	130	100	90
Hardiplank	5/16	6 00	ET & F pin 0 100 × 1.5" × 0.25" HD	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	150	120	100	140			150	120	100
							20	150	115	100	135			150	120	100
							40	130	110	95	120			140	105	90
							60	125	100	90	110			130	100	85
							100	115	100	90		80	70	110	80	75
Hardiplank	5/16	6.25	ET & F pin 0.100 × 1.5" × 0.25" HD	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	150	120	100	135			150	120	100
							20	150	110	100	130			150	110	95
							40	130	105	95	120			130	105	90
							60	120	100	90	110			120	100	80
							100	110	95	90		80	70	90	90	70
Hardiplank	5/16	7.50	ET & F pin 0.100 × 1.5" × 0.25" HD	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	130	100	90	120			150	100	85
							20	125	100	85	110			140	100	80
							40	115	90	80	100			120	90	75
							60	110	85	80	95			110	80	75
							100	100	80	75		75	-	90	70	-

Table 2b — MAXIMUM WIND SPEED

Product Type	Product (in.) Thick.	Product (in.) Width	Fastener Type	Fastener Spacing (in.)	Frame Type¹	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category: Uniform Building Code B	Uniform Building Code C	Uniform Building Code D	Standard Building Code < 60 ft	Standard Building Code C	Standard Building Code D	BOCA National Building Code B	BOCA National Building Code C	BOCA National Building Code D
Hardiplank	5/16	8.00	ET & F pin 0.100 × 1.5" × 0 25" HD	Through Overlap	Min. No. 20 ga. × 3 62" × 1.375" Metal C-stud	24	0-15	130	100	85	115			150	100	80
							20	120	95	80	110			140	100	80
							40	110	90	80	100			120	90	75
							60	105	85	75	95			110	80	70
							100	95	80	70		70	-	90	70	-
Hardiplank	5/16	8.25	ET & F pin 0.100 × 1.5" × 0.25" HD	Through Overlap	Min. No. 20 ga. × 3 62" × 1.375" Metal C-stud	24	0-15	125	95	85	110			140	100	80
							20	120	90	80	105			140	90	80
							40	110	85	80	95			120	85	70
							60	100	80	75	90			110	80	70
							100	90	80	70		70	-	90	70	-
Hardiplank	5/16	9.50	ET & F pin 0 100 × 1.5" × 0.25" HD	Through Overlap	Min No. 20 ga × 3.62" × 1.375" Metal C-stud	24	0-15	120	90	80	100			130	90	70
							20	110	90	75	100			130	90	70
							40	100	80	70	90			110	80	70
							60	90	80	70	85			110	80	-
							100	85	70	-		-	-	80	-	-
Hardiplank	5/16	12.00	ET & F pin 0.100 × 1.5" × 0.25" HD	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	100	80	-	90			120	80	-
							20	100	80	-	90			110	80	-
							40	90	70	-	80			90	70	-
							60	85	70	-	75			90	-	-
							100	80	-	-		-	-	70	-	-
Hardiplank	5/16	4.00	ET & F Panelfast 0.100 × 1.5" × 0.313" HD	Through top edge of plank	Min No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	150	150	150	150			150	150	150
							20	150	150	150	150			150	150	150
							40	150	150	150	150			150	150	150
							60	150	150	150	150			150	150	150
							100	150	150	150		150	150	150	150	140
Hardiplank	5/16	6.00	ET & F Panelfast 0.100 × 1.5" × 0.313" HD	Through top edge of plank	Min. No 20 ga × 3.62" × 1.375" Metal C-stud	16	0-15	150	110	100	130			140	110	90
							20	150	110	100	140			140	105	85
							40	130	100	90	120			130	95	80
							60	120	100	90	110			120	90	80
							100	110	90	80		75	-	95	75	-
Hardiplank	5/16	6 25	ET & F Panelfast 0.100 × 1.5" × 0.313" HD	Through top edge of plank	Min. No 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	140	110	100	130			150	100	85
							20	140	110	90	120			140	100	80
							40	120	100	90	115			120	90	75
							60	120	95	85	105			110	85	70
							100	110	90	80		70	-	90	70	-
Hardiplank	5/16	7.50	ET & F Panelfast 0.100 × 1.5" × 0.313" HD	Through top edge of plank	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	120	90	80	110			130	90	70
							20	120	90	80	100			120	85	70
							40	110	80	75	95			105	75	-
							60	100	80	70	90			95	70	-
							100	90	75	70		-	-	75	-	-
Hardiplank	5/16	8 00	ET & F Panelfast 0.100 × 1 5" × 0.313" HD	Through top edge of plank	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	110	90	80	100			120	80	70
							20	110	85	70	100			110	80	-
							40	100	80	70	90			100	70	-
							60	90	70	70	80			90	70	-
							100	80	70	-		-	-	70	-	-
Hardiplank	5/16	8 25	ET & F Panelfast 0.100 × 1.5" × 0.313" HD	Through top edge of plank	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	110	90	70	100			120	80	-
							20	110	80	70	95			110	80	-
							40	100	80	70	85			100	70	-
							60	90	70	-	70			90	-	-
							100	80	70	-		-	-	70	-	-
Hardiplank	5/16	4.00	ET & F Panelfast 0 100 × 1.5" × 0.313" HD	Through top edge of plank	Min No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	150	150	150	150			150	150	150
							20	150	150	150	150			150	150	150
							40	150	150	150	150			150	150	140
							60	150	1501	150	150			150	150	130
							100	150	50	150		130	110	150	130	110
Hardiplank	5/16	6.00	ET & F Panelfast 0.100 × 1.5" × 0.313" HD	Through top edge of plank	Min. No. 20 ga × 3.62" × 1 375" Metal C-stud	24	0-15	130	100	90	110			140	95	80
							20	120	100	85	110			130	90	70
							40	110	90	85	100			110	80	70
							60	110	85	80	90			105	80	-
							100	100	80	70		-	-	80	-	-

Table 2b — MAXIMUM WIND SPEED

Product Type	Product (in.) Thick.	Product (in.) Width	Fastener Type	Fastener Spacing (in.)	Frame Type'	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category: Uniform Building Code B	Uniform Building Code C	Uniform Building Code D	Standard Building Code < 60 ft	Standard Building Code C	Standard Building Code D	BOCA National Building Code B	BOCA National Building Code C	BOCA National Building Code D
Hardiplank	5/16	6.25	ET & F Panelfast 0 100 × 1.5" × 0 313" HD	Through top edge of plank	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	120	95	80	110			130	90	70
							20	120	90	80	100			120	85	70
							40	110	85	70	90			110	80	-
							60	100	80	70	80			90	75	-
							100	90	70	70		-	-	70	-	-
Hardiplank	5/16	7 50	ET & F Panelfast 0 100 × 1.5" × 0.313" HD	Through top edge of plank	Min. No. 20 ga. × 3.62" × 1 375" Metal C-stud	24	0-15	110	90	70	100			120	80	70
							20	110	85	70	100			110	80	-
							40	100	80	70	90			100	70	-
							60	90	75	70	80			90	70	-
							100	85	70	-		-	-	70	-	-
Hardiplank	5/16	8.00	ET & F Panelfast 0.100 × 1.5" × 0.313" HD	Through top edge of plank	Min. No 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	100	80	70	90			110	70	-
							20	100	75	70	90			100	70	-
							40	90	70	-	80			85	-	-
							60	80	-	-	75			80	-	-
							100	75	-	-		-	-	-	-	-
Hardiplank	5/16	8.25	ET & F Panelfast 0.100 × 1.5" × 0.313" HD	Through top edge of plank	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	90	70	-	80			100	-	-
							20	90	70	-	80			90	-	-
							40	80	-	-	70			80	-	-
							60	75	-	-	70			70	-	-
							100	70	-	-		-	-	-	-	-
Hardiplank	5/16	4.00	6d common 2" long	Through Overlap	2 × 4	16	0-15	150	150	150	150			150	150	150
							20	150	150	150	150			150	150	150
							40	150	150	150	150			150	150	150
							60	150	150	150	150			150	150	130
							100	150	150	140		130	120	150	130	120
Hardiplank	5/16	6 00	6d common 2" long	Through Overlap	2 × 4	16	0-15	150	150	135	150			150	150	130
							20	150	150	130	150			150	150	130
							40	150	150	120	150			150	140	120
							60	150	150	120	150			150	130	115
							100	150	150	120		110	100	140	110	100
Hardiplank	5/16	6.25	6d common 2" long	Through Overlap	2 × 4	16	0-15	150	150	120	150			150	150	130
							20	150	150	120	150			150	1501	120
							40	150	150	120	150			150	40	120
							60	150	130	120	150			150	130	115
							100	150	130	110		110	100	150	110	100
Hardiplank	5/16	7.50	6d common 2" long	Through Overlap	2 × 4	16	0-15	1501	150	120	150			150	140	120
							20	50	150	120	150			150	140	120
							40	150	130	110	140			150	120	120
							60	150	120	110	130			150	120	115
							100	130	110	110		110	90	140	100	90
Hardiplank	5/16	8.00	6d common 2" long	Through Overlap	2 × 4	16	0-15	150	130	120	150			150	140	110
							20	150	130	115	150			150	140	110
							40	150	120	110	130			150	120	100
							60	140	120	105	130			150	115	100
							100	130	110	100		95	85	120	95	85
Hardiplank	5/16	8.25	6d common 2" long	Through Overlap	2 × 4	16	0-15	150	130	115	150			150	140	110
							20	150	130	110	150			150	130	100
							40	150	120	110	130			150	120	100
							60	140	115	105	120			150	110	100
							100	130	110	100		95	80	130	95	80
Hardiplank	5/16	9 50	6d common 2" long	Through Overlap	2 × 4	16	0-15	150	120	110	140			150	130	105
							20	150	120	110	140			150	120	100
							40	140	110	100	120			140	120	95
							60	130	105	100	120			120	120	90
							100	120	100	95		90	80	115	90	80
Hardiplank	5/16	12.00	6d common 2" long	Through Overlap	2 × 4	16	0-15	140	110	95	130			150	110	95
							20	140	105	95	120			150	110	90
							40	120	100	90	110			140	100	85
							60	115	95	85	105			120	95	80
							100	110	90	80		80	70	100	80	70

Table 2b — MAXIMUM WIND SPEED

Product Type	Product (in.) Thick.	Product (in.) Width	Fastener Type	Fastener Spacing (in.)	Frame Type[1]	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category: Uniform Building Code B	Uniform Building Code C	Uniform Building Code D	Standard Building Code < 60 ft	Standard Building Code C	Standard Building Code D	BOCA National Building Code B	BOCA National Building Code C	BOCA National Building Code D
Hardiplank	5/16	4.00	6d common 2" long	Through Overlap	2 × 4	24	0-15	150	130	115	150			150	130	110
							20	150	130	110	140			150	130	110
							40	150	120	110	130			150	120	100
							60	140	120	100	120			150	115	95
							100	130	110	100		95	80	120	95	80
Hardiplank	5/16	6.00	6d common 2" long	Through Overlap	2 × 4	24	0-15	140	110	95	130			120	110	90
							20	140	100	95	120			120	110	90
							40	130	100	95	110			120	100	80
							60	115	95	85	105			120	90	80
							100	105	90	80		80	70	100	80	70
Hardiplank	5/16	6.25	6d common 2" long	Through Overlap	2 × 4	24	0-15	120	105	95	120			120	110	90
							20	120	100	90	120			120	100	85
							40	120	95	85	110			120	95	80
							60	110	90	80	100			120	90	80
							100	105	85	80		80	70	100	80	70
Hardiplank	5/16	7.50	6d common 2" long	Through Overlap	2 × 4	24	0-15	120	95	85	110			120	100	80
							20	120	95	85	110			120	95	80
							40	110	85	80	100			120	90	75
							60	100	85	75	95			120	85	70
							100	95	80	70		70	70	90	70	-
Hardiplank	5/16	8.00	6d common 2" long	Through Overlap	2 × 4	24	0-15	120	95	80	110			120	100	80
							20	120	95	80	105			120	90	70
							40	105	85	70	100			110	80	70
							60	100	85	70	90			105	80	70
							100	90	75	70		70	-	85	70	-
Hardiplank	5/16	8.25	6d common 2" long	Through Overlap	2 × 4	24	0-15	115	95	80	110			120	95	80
							20	115	95	80	100			120	90	75
							40	105	85	70	95			110	80	70
							60	100	85	70	90			105	75	70
							100	90	75	70				85	-	-
Hardiplank	5/16	9 50	6d common 2" long	Through Overlap	2 × 4	24	0-15	110	85	75	100			120	90	70
							20	110	85	70	95			120	85	70
							40	95	75	70	85			100	80	-
							60	90	75	-	85			100	70	-
							100	85	70	-		-	-	80	-	-
Hardiplank	5/16	12.00	6d common 2" long	Through Overlap	2 × 4	24	0-15	70	75	-	90			110	80	-
							20	95	70	-	85			110	75	-
							40	90	70	-	80			95	70	-
							60	80	-	-	75			85	-	-
							100	70	-	-		-	-	70	-	-
Hardiplank	5/16	4.00	No 8-18 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	150	150	150	150			150	150	150
							20	150	150	150	150			150	150	140
							40	150	150	140	150			150	150	140
							60	150	150	140	150			150	150	130
							100	150	150	130		130	115	150	130	115
Hardiplank	5/16	6.00	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	150	150	140	150			150	150	120
							20	150	140	140	150			150	140	120
							40	150	130	130	150			150	130	115
							60	150	130	130	140			150	120	110
							100	140	120	120		105	95	135	105	95
Hardiplank	5/16	6.25	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	150	140	120	150			150	150	120
							20	150	140	120	150			150	140	120
							40	150	130	110	140			150	130	110
							60	150	120	110	140			150	120	105
							100	140	120	110		105	90	130	105	90
Hardiplank	5/16	7.50	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	150	130	110	150			150	130	110
							20	150	120	110	140			150	130	105
							40	140	110	105	130			150	115	100
							60	130	110	100	120			150	110	90
							100	120	100	95		90	80	115	90	80

Table 2b — MAXIMUM WIND SPEED

Product Type	Product (in.) Thick.	Product (in.) Width	Fastener Type	Fastener Spacing (in.)	Frame Type[1]	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category: *Uniform Building Code* B	*Uniform Building Code* C	*Uniform Building Code* D	*Standard Building Code* < 60 ft	*Standard Building Code* C	*Standard Building Code* D	*BOCA National Building Code* B	*BOCA National Building Code* C	*BOCA National Building Code* D
Hardiplank	5/16	8.00	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	150	130	110	150			150	130	110
							20	150	120	110	140			150	130	105
							40	150	110	105	130			150	115	100
							60	150	110	100	120			140	110	90
							100	130	100	95		90	80	115	90	80
Hardiplank	5/16	8.25	No 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No. 20 ga × 3.62" × 1.375" Metal C-stud	16	0-15	150	120	110	140			150	130	110
							20	150	120	110	140			150	120	105
							40	140	110	105	120			150	115	100
							60	120	110	100	120			140	105	90
							100	120	100	95		90	80	115	90	80
Hardiplank	5/16	9.50	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	150	115	100	130			150	120	100
							20	150	110	100	130			150	115	95
							40	130	110	95	120			140	105	90
							60	120	110	90	110			130	100	85
							100	115	95	85		85	75	110	85	75
Hardiplank	5/16	12 00	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No 20 ga. × 3.62" × 1 375" Metal C-stud	16	0-15	130	100	90	120			150	110	90
							20	130	100	90	120			150	105	80
							40	120	90	80	100			120	95	80
							60	110	90	80	100			120	90	75
							100	100	85	80		75	-	95	75	-
Hardiplank	5/16	4.00	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	150	150	130	150			150	150	120
							20	150	140	130	150			150	140	120
							40	150	130	120	150			150	130	110
							60	150	130	110	140			150	120	110
							100	140	110	110		105	90	135	105	90
Hardiplank	5/16	6 00	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	150	130	105	140			150	120	100
							20	150	130	100	130			150	120	100
							40	150	110	100	120			140	110	95
							60	140	105	90	115			130	100	90
							100	130	100	90		85	75	110	85	75
Hardiplank	5/16	6.25	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	150	120	100	135			150	150	100
							20	150	110	100	130			150	140	95
							40	130	105	90	120			140	130	90
							60	120	100	90	110			130	120	85
							100	110	95	90		85	70	110	85	75
Hardiplank	5/16	7.50	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	140	110	90	120			150	110	90
							20	130	100	90	120			150	105	90
							40	120	95	85	110			130	95	80
							60	110	90	80	100			120	90	80
							100	100	90	80		80	70	115	80	70
Hardiplank	5/16	8.00	No. 8 × 1-5/8" long × 0 323" HD ribbed bugle head screw	Through Overlap	Min. No 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	130	105	90	120			150	110	90
							20	130	100	90	115			150	105	85
							40	120	95	80	105			130	95	80
							60	110	90	80	100			120	90	75
							100	100	85	80		75	-	95	75	-
Hardiplank	5/16	8.25	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	130	100	90	120			150	105	90
							20	130	100	90	115			150	105	85
							40	120	90	80	105			120	90	80
							60	110	90	80	100			115	85	75
							100	100	85	75		75	-	95	75	-
Hardiplank	5/16	9.50	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	120	95	80	110			140	100	80
							20	120	90	80	105			140	95	80
							40	110	85	75	95			120	85	75
							60	100	80	70	90			110	80	70
							100	90	80	70		70	-	90	70	-
Hardiplank	5/16	12.00	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Through Overlap	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	115	80	70	100			130	90	70
							20	110	80	70	95			120	85	70
							40	95	75	70	85			100	75	-
							60	90	70	-	80			95	70	-
							100	80	70	-		-	-	80	-	-

Table 2b — MAXIMUM WIND SPEED

Product Type	Product (in.) Thick.	Product (in.) Width	Fastener Type	Fastener Spacing (in.)	Frame Type[1]	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category: *Uniform Building Code* B	*Uniform Building Code* C	*Uniform Building Code* D	*Standard Building Code* < 60 ft	*Standard Building Code* C	*Standard Building Code* D	*BOCA National Building Code* B	*BOCA National Building Code* C	*BOCA National Building Code* D
Hardiplank	5/16	4.00	No. 11 ga. 1-1/4" long Galv. roofing nail	Through top edge of plank	2 × 4 wood	16	0-15	150	150	150	150			150	150	150
							20	150	150	150	150			150	150	150
							40	150	150	150	150			150	150	150
							60	150	150	150	150			150	150	150
							100	150	150	150		140	120	150	140	120
Hardiplank	5/16	6.00	No. 11 ga 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	16	0-15	150	150	130	150			150	150	130
							20	150	150	130	150			150	150	120
							40	150	140	120	150			150	130	115
							60	150	130	120	140			150	130	110
							100	150	120	110		110	95	140	110	95
Hardiplank	5/16	6.25	No. 11 ga. 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	16	0-15	150	150	130	150			150	150	120
							20	150	140	120	150			150	140	120
							40	150	130	120	150			150	130	110
							60	150	130	110	140			150	120	110
							100	140	120	110		100	95	135	100	95
Hardiplank	5/16	7.50	No. 11 ga. 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	16	0-15	150	130	115	150			150	130	110
							20	150	130	110	140			150	130	110
							40	150	120	110	135			150	120	100
							60	140	115	105	125			150	110	95
							100	130	110	100		95	85	120	95	85
Hardiplank	5/16	8.00	No. 11 ga. 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	16	0-15	150	130	110	150			150	130	105
							20	150	120	110	140			150	120	100
							40	140	115	100	130			150	115	95
							60	130	110	100	120			140	110	95
							100	120	110	95		90	80	115	90	80
Hardiplank	5/16	8.25	No. 11 ga. 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	16	0-15	150	120	110	140			150	130	105
							20	150	120	105	140			150	120	105
							40	140	110	100	125			150	110	95
							60	130	110	100	120			140	105	90
							100	120	100	95		90	80	115	90	80
Hardiplank	5/16	9.50	No. 11 ga. 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	16	0-15	150	110	100	130			150	120	100
							20	140	110	100	130			150	115	95
							40	130	100	90	115			140	100	90
							60	120	100	90	110			130	100	85
							100	110	95	80		80	70	105	80	70
Hardiplank	5/16	12.00	No. 11 ga. 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	16	0-15	130	100	90	115			150	105	85
							20	120	100	80	110			140	100	80
							40	110	90	80	100			120	95	75
							60	110	80	80	95			110	85	75
							100	100	80	75		75	-	90	75	-
Hardiplank	5/16	4.00	No. 11 ga. 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	24	0-15	150	150	140	150			150	150	130
							20	150	150	140	150			150	150	130
							40	150	150	130	150			150	140	120
							60	150	140	130	150			150	140	120
							100	150	130	120		115	105	150	115	105
Hardiplank	5/16	6.00	No. 11 ga. 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	24	0-15	150	120	110	140			150	130	105
							20	150	120	105	140			150	120	105
							40	140	110	100	125			150	110	95
							60	130	110	100	115			140	105	90
							100	120	100	100		90	80	110	90	80
Hardiplank	5/16	6.25	No. 11 ga 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	24	0-15	150	120	110	140			150	125	100
							20	150	120	100	130			150	120	100
							40	130	110	100	120			150	110	95
							60	120	110	95	110			130	105	90
							100	120	100	90		85	80	110	85	80
Hardiplank	5/16	7.50	No. 11 ga. 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	24	0-15	140	110	95	120			150	115	90
							20	140	105	90	120			150	110	90
							40	120	100	90	110			130	100	80
							60	120	95	85	100			120	95	80
							100	110	90	70		80	70	100	80	70

Table 2b — MAXIMUM WIND SPEED

Product Type	Product (in.) Thick.	Product (in.) Width	Fastener Type	Fastener Spacing (in.)	Frame Type'	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category: *Uniform Building Code* B	*Uniform Building Code* C	*Uniform Building Code* D	*Standard Building Code* < 60 ft	*Standard Building Code* C	*Standard Building Code* D	*BOCA National Building Code* B	*BOCA National Building Code* C	*BOCA National Building Code* D
Hardiplank	5/16	8 00	No 11 ga. 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	24	0-15	130	100	90	120			150	110	90
							20	130	100	90	115			150	105	80
							40	120	95	80	105			120	95	80
							60	120	95	80	100			110	90	75
							100	110	90	70		90	-	95	90	-
Hardiplank	5/16	8.25	No. 11 ga. 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	24	0-15	130	100	90	120			150	110	85
							20	130	100	90	110			140	105	85
							40	120	95	80	100			120	90	80
							60	110	95	80	95			110	90	75
							100	100	90	75		75	-	90	70	-
Hardiplank	5/16	9.50	No. 11 ga. 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	24	0-15	120	95	80	110			140	100	80
							20	120	90	80	105			130	90	75
							40	110	90	70	95			115	85	70
							60	100	85	70	90			105	80	70
							100	95	75	70		70	-	85	70	-
Hardiplank	5/16	12.00	No. 11 ga. 1-1/4" long galv. roofing nail	Through top edge of plank	2 × 4 wood	24	0-15	110	80	70	90			120	85	70
							20	110	80	70	90			120	80	70
							40	100	80	70	80			105	75	-
							60	80	80	-	80			90	70	-
							100	80	80	-		-	-	80	-	-
Hardiplank	5/16	4.00	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Through top edge of plank	Min. No. 20 ga. X 3.62" x 1 375" Metal C-stud	16	0-15	150	150	150	150			150	150	150
							20	150	150	150	150			150	150	140
							40	150	150	150	150			150	150	130
							60	150	150	150	160			150	150	130
							100	150	140	140	-	120	110	150	120	110
Hardiplank	5/16	6	No 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Through top edge of plank	Min. No. 20 ga. X 3.62" x 1 375" Metal C-stud	16	0-15	150	140	125	150			150	150	120
							20	150	140	120	150			150	140	120
							40	150	130	115	140			150	130	110
							60	150	120	110	140			150	120	105
							100	140	120	110	-	100	90	130	100	90
Hardiplank	5/16	6-1/4	No. 8 x 1-1/4 in. long x 0.375 in HD ribbed waferhead screws	Through top edge of plank	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	16	0-15	150	140	120	150			150	140	125
							20	150	140	120	150			150	140	115
							40	150	130	110	140			150	130	110
							60	150	120	110	130			150	120	105
							100	135	110	100	-	100	90	130	100	90
Hardiplank	5/16	7-1/2	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Through top edge of plank	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	16	0-15	150	130	110	150			150	135	110
							20	150	120	105	140			150	130	100
							40	140	115	105	130			150	120	100
							60	140	100	105	130			140	110	95
							100	125	95	95	-	90	80	115	90	80
Hardiplank	5/16	8	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Through top edge of plank	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	16	0-15	150	125	110	140			150	130	100
							20	150	120	105	140			150	120	100
							40	140	110	100	125			140	110	90
							60	130	110	100	120			130	105	90
							100	120	100	95	-	90	85	115	90	80
Hardiplank	5/16	8-1/4	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Through top edge of plank	Min. No. 20 ga X 3.62" x 1 375" Metal C-stud	16	0-15	150	120	110	140			150	125	105
							20	150	120	105	130			150	120	100
							40	140	110	100	125			140	110	95
							60	130	105	95	115			130	100	90
							100	120	100	90	-	85	75	110	85	75
Hardiplank	5/16	9-1/2	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Through top edge of plank	Min. No. 20 ga. X 3 62" x 1.375" Metal C-stud	16	0-15	150	115	100	130			150	120	100
							20	140	110	100	130			150	110	90
							40	130	105	90	120			140	100	90
							60	120	100	90	110			120	95	85
							100	110	90	85	-	85	80	100	85	80

Table 2b — MAXIMUM WIND SPEED

Product Type	Product (in.) Thick.	Product (in.) Width	Fastener Type	Fastener Spacing (in.)	Frame Type[1]	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category: Uniform Building Code B	Uniform Building Code C	Uniform Building Code D	Standard Building Code < 60 ft	Standard Building Code C	Standard Building Code D	BOCA National Building Code B	BOCA National Building Code C	BOCA National Building Code D
Hardiplank	5/16	4	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Through top edge of plank	Min No. 20 ga. X 3.62" x 1.375" Metal C-stud	24	0-15	150	140	125	150			150	150	120
							20	150	140	120	150			150	140	120
							40	150	130	115	140			150	130	110
							60	150	120	110	140			150	120	105
							100	140	120	110	-	100	90	130	100	90
Hardiplank	5/16	6	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Through top edge of plank	Min No. 20 ga. X 3.62" x 1.375" Metal C-stud	24	0-15	150	120	100	130			150	120	100
							20	150	110	100	130			150	115	95
							40	130	105	90	120			135	105	90
							60	120	100	90	110			130	100	85
							100	110	95	90	-	85	75	105	85	75
Hardiplank	5/16	6-1/4	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Through top edge of plank	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	24	0-15	150	115	100	130			150	120	100
							20	140	110	100	130			150	115	90
							40	130	105	95	115			140	105	90
							60	120	100	90	110			130	100	85
							100	110	95	85	-	85	70	105	85	70
Hardiplank	5/16	7-1/2	No. 8 x 1-1/4 in. long x 0 375 in. HD ribbed waferhead screws	Through top edge of plank	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	24	0-15	140	105	90	120			150	110	90
							20	130	100	90	115			150	100	85
							40	120	95	85	105			130	90	75
							60	110	90	80	100			120	75	75
							100	100	85	70	-	NA	NA	90	NA	NA
Hardiplank	5/16	8	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Through top edge of plank	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	24	0-15	130	100	90	120			150	105	85
							20	130	100	85	115			140	100	85
							40	120	90	80	100			125	90	75
							60	10	85	80	95			115	85	75
							100	100	80	75	-	75	NA	90	75	NA
Hardiplank	5/16	8-1/4	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Through top edge of plank	Min No. 20 ga. X 3.62" x 1.375" Metal C-stud	24	0-15	130	100	90	110			150	105	85
							20	125	100	85	110			140	100	85
							40	115	90	80	100			125	90	75
							60	105	85	80	95			110	85	75
							100	100	80	75	-	75	NA	90	75	NA
Hardiplank	5/16	9-1/2	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Through top edge of plank	Min. No. 20 ga. X 3.62" x 1 375" Metal C-stud	24	0-15	120	90	80	110			140	100	80
							20	120	90	80	105			130	90	75
							40	105	85	75	95			115	80	70
							60	100	80	75	90			105	75	70
							100	90	75	NA	-	NA	NA	85	NA	NA
Hardiplank	5/16	4.00	0.089" shank × 0 221" HD × 2" long galv. siding nail	Through overlap	2 × 4	16	0-15	150	115	100	130			150	120	95
							20	140	110	95	125			150	110	95
							40	130	105	90	115			140	100	90
							60	120	100	90	110			130	95	85
							100	110	90	85		80	70	105	80	70
Hardiplank	5/16	6.00	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	16	0-15	120	90	85	110			140	95	80
							20	120	90	80	100			130	90	70
							40	105	80	75	90			110	85	70
							60	100	80	70	90			105	80	70
							100	90	75	70		-	-	90	-	-
Hardiplank	5/16	6.25	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	16	0-15	120	90	80	100			140	95	70
							20	105	90	80	100			130	90	70
							40	105	85	70	90			110	80	70
							60	95	80	70	85			105	75	-
							100	90	75			-	-	90	-	-
Hardiplank	5/16	7.50	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	16	0-15	110	80	70	90			120	85	70
							20	100	80	70	90			120	80	70
							40	90	75	-	80			100	75	-
							60	85	70	-	80			95	70	-
							100	80	70	-		-	-	75	-	-
Hardiplank	5/16	8.00	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	16	0-15	100	80	70	90			120	80	70
							20	100	80	70	90			115	80	-
							40	90	70	-	80			100	70	-
							60	80	70	-	75			90	70	-
							100	75	-	-		-	-	70	-	-

Table 2b — MAXIMUM WIND SPEED

Product Type	Product (in.) Thick.	Product (in.) Width	Fastener Type	Fastener Spacing (in.)	Frame Type[1]	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category: *Uniform Building Code* B	*Uniform Building Code* C	*Uniform Building Code* D	*Standard Building Code* < 60 ft	*Standard Building Code* C	*Standard Building Code* D	*BOCA National Building Code* B	*BOCA National Building Code* C	*BOCA National Building Code* D
Hardiplank	5/16	8.25	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	16	0-15	100	80	70	90			120	80	-
							20	100	80	70	90			110	80	-
							40	90	70	-	80			100	70	-
							60	80	70	-	75			90	70	-
							100	75	-	-		-	-	70	-	-
Hardiplank	5/16	9.50	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	16	0-15	100	70	-	80			110	75	-
							20	90	70	-	80			105	70	-
							40	80	-	-	75			90	-	-
							60	80	-	-	70			85	-	-
							100	70	-	-		-	-		-	-
Hardiplank	5/16	12.00	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	16	0-15	90	-	-	70			100	70	-
							20	80	-	-	70			90	-	-
							40	70	-	-	-			80	-	-
							60	70	-	-	-			70	-	-
							100	-	-	-		-	-	-	-	-
Hardiplank	5/16	4.00	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	24	0-15	120	90	80	110			140	95	80
							20	120	90	80	105			130	90	75
							40	105	85	75	90			110	85	70
							60	100	80	70	90			105	80	70
							100	90	75	-		-	-	90	-	-
Hardiplank	5/16	6.00	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	24	0-15	100	70	-	90			115	80	-
							20	90	70	-	85			115	75	-
							40	85	70	-	75			90	70	-
							60	80	-	-	70			85	-	-
							100	70	-	-		-	-	70	-	-
Hardiplank	5/16	6.25	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	24	0-15	100	70	-	85			110	75	-
							20	90	70	-	80			105	70	-
							40	85	-	-	75			90	-	-
							60	80	-	-	70			80	-	-
							100	70	-	-		-	-	70	-	-
Hardiplank	5/16	7.50	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	24	0-15	90	70	-	80			105	70	-
							20	85	70	-	75			100	70	-
							40	80	-	-	70			85	-	-
							60	70	-	-	-			80	-	-
							100	70	-	-		-	-	-	-	-
Hardiplank	5/16	8.00	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	24	0-15	80	-	-	70			100	-	-
							20	80	-	-	70			90	-	-
							40	75	-	-	-			80	-	-
							60	70	-	-	-			70	-	-
							100	-	-	-		-	-	-	-	-
Hardiplank	5/16	8.25	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	24	0-15	80	-	-	70			100	-	-
							20	80	-	-	70			90	-	-
							40	75	-	-	-			80	-	-
							60	70	-	-	-			70	-	-
							100	-	-	-		-	-	-	-	-
Hardiplank	5/16	9.50	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	24	0-15	80	-	-	70			90	-	-
							20	70	-	-	-			80	-	-
							40	-	-	-	-			70	-	-
							60	-	-	-	-			70	-	-
							100	-	-	-		-	-	-	-	-
Hardiplank	5/16	12.00	0.089" shank × 0.221" HD × 2" long galv. siding nail	Through overlap	2 × 4	24	0-15	70	-	-	-			80	-	-
							20	-	-	-	-			80	-	-
							40	-	-	-	-			-	-	-
							60	-	-	-	-			-	-	-
							100	-	-	-		-	-	-	-	-
Hardiplank	5/16	4.00	0.093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	16	0-15	150	130	110	150			150	130	110
							20	150	120	110	140			150	130	105
							40	140	115	100	130			150	115	100
							60	140	110	100	120			140	110	95
							100	125	100	95		90	80	110	90	80

Table 2b — MAXIMUM WIND SPEED

Product Type	Product (in.) Thick.	Product (in.) Width	Fastener Type	Fastener Spacing (in.)	Frame Type[1]	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category: Uniform Building Code B	Uniform Building Code C	Uniform Building Code D	Standard Building Code < 60 ft	Standard Building Code C	Standard Building Code D	BOCA National Building Code B	BOCA National Building Code C	BOCA National Building Code D
Hardiplank	5/16	6.00	0.093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	16	0-15	130	100	80	110			150	100	80
							20	120	95	80	110			140	95	80
							40	110	90	80	100			120	90	75
							60	100	85	75	90			110	85	70
							100	95	80	70		75	-	90	75	-
Hardiplank	5/16	6.25	0.093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	16	0-15	120	90	80	110			140	100	80
							20	120	90	80	100			130	95	75
							40	105	80	75	95			115	85	70
							60	100	80	70	90			110	70	70
							100	90	75	70		70	-	95	70	-
Hardiplank	5/16	7.50	0.093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	16	0-15	110	85	75	100			130	90	70
							20	110	80	70	95			120	85	70
							40	95	80	70	85			105	80	-
							60	90	75	-	80			95	70	-
							100	80	70	-		-	-	85	-	-
Hardiplank	5/16	8.00	0.093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	16	0-15	100	80	70	90			120	85	70
							20	100	80	70	90			115	80	70
							40	90	75	-	80			100	75	-
							60	80	70	-	80			90	70	-
							100	80	-	-		-	-	80	-	-
Hardiplank	5/16	8.25	0.093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	16	0-15	100	80	70	90			120	80	70
							20	100	80	-	90			115	80	-
							40	90	75	-	80			100	70	-
							60	80	75	-	75			90	70	-
							100	75	-	-		-	-	80	-	-
Hardiplank	5/16	9.50	0.093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	16	0-15	100	75	-	80			110	80	-
							20	90	70	-	80			110	75	-
							40	80	-	-	70			90	70	-
							60	80	-	-	70			80	-	-
							100	70	-	-		-	-	-	-	-
Hardiplank	5/16	12.00	0 093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	16	0-15	90	-	-	70			100	70	-
							20	80	-	-	70			90	-	-
							40	75	-	-	-			80	-	-
							60	70	-	-	-			70	-	-
							100	-	-	-		-	-	-	-	-
Hardiplank	5/16	4.00	0.093" shank × 0.222" HD × 2" long galv siding nail	Through top edge of plank	2 × 4	24	0-15	140	105	95	120			150	110	90
							20	130	100	90	115			150	105	85
							40	120	95	85	105			130	95	80
							60	115	90	80	100			120	90	75
							100	105	85	80		75	-	95	75	-
Hardiplank	5/16	6 00	0.093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	24	0-15	100	80	70	90			120	80	-
							20	100	80	-	90			110	80	-
							40	90	70	-	80			100	70	-
							60	85	70	-	75			90	70	-
							100	75	-	-		-	-	75	-	-
Hardiplank	5/16	6 25	0.093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	24	0-15	100	80	70	90			120	70	-
							20	100	75	-	85			110	70	-
							40	90	70	-	80			95	-	-
							60	85	-	-	75			85	-	-
							100	75	-	-		-	-	70	-	-
Hardiplank	5/16	7 50	0.093" shank × 0.222" HD × 2" long galv siding nail	Through top edge of plank	2 × 4	24	0-15	90	70	-	80			100	70	-
							20	90	-	-	75			100	70	-
							40	80	-	-	70			85	-	-
							60	70	-	-	-			75	-	-
							100	-	-	-		-	-	-	-	-
Hardiplank	5/16	8.00	0.093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	24	0-15	90	-	-	80			100	70	-
							20	85	-	-	75			100	70	-
							40	75	-	-	70			80	-	-
							60	70	-	-	-			75	-	-
							100	-	-	-		-	-	-	-	-

Table 2b — MAXIMUM WIND SPEED

Product Type	Product (in.) Thick.	Product (in.) Width	Fastener Type	Fastener Spacing (in.)	Frame Type[1]	Stud Spacing (in.)	Height of Bldg (ft)	Maximum Basic Wind Speed (Mph) for Exposure Category: *Uniform Building Code* B	*Uniform Building Code* C	*Uniform Building Code* D	*Standard Building Code* < 60 ft	*Standard Building Code* C	*Standard Building Code* D	*BOCA National Building Code* B	*BOCA National Building Code* C	*BOCA National Building Code* D
Hardiplank	5/16	8.25	0.093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	24	0-15	85	-	-	70			100	70	-
							20	85	-	-	70			95	-	-
							40	70	-	-	-			85	-	-
							60	70	-	-	-			75	-	-
							100	-	-	-		-	-	-	-	-
Hardiplank	5/16	9.50	0.093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	24	0-15	80	-	-	70			90	-	-
							20	80	-	-	70			90	-	-
							40	70	-	-	-			75	-	-
							60	-	-	-	-			70	-	-
							100	-	-	-	-	-	-	-	-	-
Hardiplank	5/16	12.00	0.093" shank × 0.222" HD × 2" long galv. siding nail	Through top edge of plank	2 × 4	24	0-15	70	-	-	-			70	-	-
							20	-	-	-	-			80	-	-
							40	-	-	-	-			-	-	-
							60	-	-	-	-			-	-	-
							100	-	-	-	-	-		-	-	-
Hardiplank	5/16	9.50	0.091" shank, 0.221" HD, 1.5" long corrosion resistant nail	Face nailed through the overlap @ 12" o.c.	7/16" thick APA rated OSB sheathing or equivalent solid sheathing	-	0-15	100	80	-	90			115	80	-
							20	95	75	-	85			110	75	-
							40	85	70	-	80	-		90	70	-
							60	80	-	-	75	-		85	-	-
							100	70	-	-	-	-		70	-	
												-	-			

Notes to Table 2b:

1 Values are for species of wood having a specific gravity of 0.42 or greater, unless otherwise noted.

Table 3 — SHEAR VALUES ALLOWABLE LOADS IN POUNDS PER LINEAL FOOT FOR PANEL SHEAR WALLS[1,2]

Product Type	Product Thickness (inch)	Fastener Type	Fastener Spacing (inch)	Frame Types	Stud Spacing (inch)	Shear Value (plf)
Hardiflex Hardisoffit	3/16	4d common 1-1/2 in. long	6	2 × 4 wood[5]	16	145
Hardipanel Hardiflex Hardisoffit	1/4	4d common 1-1/2 in. long	8	2 × 4 wood[5]	16 & 24	120
Hardibacker Titan	1/4	0.086 in. × 1-3/8 in. long gypsum wall board nail	6	2 × 4 wood[5]	16 & 24	140
Hardipanel Hardiflex	1/4	6d common 2 in. long	6	2 × 4 wood[5]	16	190
Hardipanel Hardiflex Harditex Hardibacker Titan	1/4	No. 11 ga. 1-1/4 in. long galvanized roofing nail	6	2 × 4 wood[5]	16 & 24	180
Hardipanel Hardiflex Harditex Hardibacker Titan	1/4	No. 11 ga. 1-1/4 in. long galvanized roofing nail	4 edge 12 field	2 × 4 wood[5]	16 & 24	265
Hardipanel Hardiflex Harditex Hardibacker Titan	1/4	No. 11 ga. 1-1/4 in. long galvanized roofing nail	3 edge 6 field	2 × 4 wood[5] w/48 in. mid-height block	16 & 24	295
Shiplap	5/16	0.092 in. shank, 0.225 in. HD, 2 in long ring shank nail	3 edge 8 field	2 × 4 wood[4]	16	268
Shiplap	5/16	0.092 in. shank, 0.225 in HD, 2 in. long ring shank nail	4 edge 8 field	2 × 4 wood[4]	16	238
Shiplap	5/16	0.092 in. shank, 0.225 in. HD, 2 in. long ring shank nail	5 edge 8 field	2 × 4 wood[4]	16	208
Shiplap	5/16	0.092 in. shank, 0.225 in. HD, 2 in. long ring shank nail	6 edge 8 field	2 × 4 wood[4]	16	179
Shiplap	5/16	0.092 in shank, 0.225 in. HD, 2 in long ring shank nail	7 edge 8 field	2 × 4 wood[4]	16	149
Shiplap	5/16	0.092 in. shank, 0.225 in. HD, 2 in. long ring shank nail	8 edge 8 field	2 × 4 wood[4]	16	119
Hardipanel Hardiflex	5/16	0.091 in. shank, 0.225 in. HD, 1.5 in. long ring shank nail	4 edge 8 field	2 × 4 wood[3]	16	198
Hardipanel Hardiflex	5/16	4d common 1-1/2 in. long	8	2 × 4 wood[5]	16 & 24	120
Hardipanel Hardiflex	5/16	6d common 2 in long	6	2 × 4 wood[5]	16	200
Hardipanel Hardiflex	5/16	6d common 2 in. long	6	2 × 4 wood[5]	24	153
Hardipanel Hardiflex	5/16	6d common 2 in. long	4	2 × 4 wood[5]	16	233
Hardipanel Hardiflex	5/16	6d common 2 in. long	4	2 × 4 wood[5]	24	212
Hardipanel Hardiflex	5/16	6d common 2 in long	6 edge 12 field	2 × 4 wood[5]	16	157
Hardipanel Hardiflex	5/16	6d common 2 in. long	6 edge 12 field	2 × 4 wood[5]	24	145
Hardipanel Hardiflex Harditex Hardibacker	5/16	No. 11 ga. 1-1/2 in. long galvanized roofing nail	6	2 × 4 wood[5]	16	200
Hardipanel Hardiflex Harditex Hardibacker	5/16	No. 11 ga. 1-1/2 in. long galvanized roofing nail	4 edge 12 field	2 × 4 wood[5]	16	280

Table 3 — SHEAR VALUES ALLOWABLE LOADS IN POUNDS PER LINEAL FOOT FOR PANEL SHEAR WALLS[1,2]

Product Type	Product Thickness (inch)	Fastener Type	Fastener Spacing (inch)	Frame Types	Stud Spacing (inch)	Shear Value (plf)
Hardipanel Hardiflex Harditex Hardibacker	5/16	No. 11 ga. 1-1/2 in. long galvanized roofing nail	3 edge 6 field	2 × 4 wood[5] w/48 in. mid-height block	16	340
Hardiflex Hardipanel Harditex Hardibacker Titan	7/16	No. 11 ga 1-3/4 in. long galvanized roofing nail	6	2 × 4 wood[5]	16	280
Hardiflex Hardisoffit	3/16	Min. No. 8 x 1 in. long × 0.323 in. HD ribbed buglehead screws	6	Min. No. 20 ga. × 3-5/8 in × 1-3/8 in. metal C-stud	16	140[6]
Hardipanel Hardiflex Harditex Hardibacker Titan	1/4	Min. No. 8 x 1 in. long × 0.323 in. HD ribbed buglehead screws	6	Min. No. 20 ga. × 3-5/8 in. × 1-3/8 in. metal C-stud	16 & 24	125[6]
Hardipanel Hardiflex Harditex Hardibacker	5/16	Min. No. 8 x 1 in. long × 0.323 in. HD ribbed buglehead screws	6	Min. No 20 ga. × 3-5/8 in. × 1-3/8 in. metal C-stud	16	160[6]
Hardipanel Hardiflex Harditex Hardibacker Titan	7/16	Min. No 8 x 1 in. long × 0.311 in. HD ribbed buglehead screws	6	Min. No. 20 ga × 3-5/8 in. ×1-3/8 in. metal C-stud	16	162[6]
Hardipanel Hardiflex Harditex	5/16	ET & F 1-1/2 in. long × 0.10" knurled shank × 0.25" HD pin fastener (AKN100-0150NA)	4 edge 8 field	Min. No. 20 ga. × 3-5/8 in. × 1-3/8 in. metal C-stud	16	154
Hardipanel Hardiflex Harditex	5/16	ET & F 1-1/2 in. long × 0.10" knurled shank × 0.25" HD pin fastener (AKN100-0150NA)	4 edge 8 field	Min. No. 20 ga. × 3-5/8 in. × 1-3/8 in. metal C-stud	24	133

1. All board edges shall be supported by framing. Panels shall be applied with the long dimension either parallel or perpendicular to studs.
2. The maximum height-to-length ratio for construction in this Table is 2:1.
3. Values are for species of wood having a specific gravity of 0.36 or greater
4. Values are for species of wood having a specific gravity of 0.40 or greater.
5. Values are for species of wood having a specific gravity of 0.42 or greater, unless otherwise noted.
6. Under the *Uniform Building Code*™, these steel-framed assemblies are limited to wind load resistance only.
7. 1 inch = 25.4 mm, 1plf = 14.59 N/m

Table 4 — "K" and "R" VALUES FOR FIBER-CEMENT PRODUCTS

Product Thickness[3] (inch)	Thermal Conductivity[1] K_{eff} = Btu/hr-ft²-°F	Thermal Resistance[1] R = 1/K_{eff}	Actual Thermal Conductivity[2] (K_{eff})	Actual Thermal Resistance[2] ®)
1/4	1.95	0.51	7.80	0.13
5/16	2.07	0.48	6.62	0.15
3/8	2.18	0.46	5.81	0.17
13/32	8.39	0.12	20.07	0.05
7/16	2.30	0.44	5.26	0.19

Notes to Table 4:
1. Based on 1 inch of panel thickness.
2. Actual value for panel thickness shown.
3. SI units conversion: 1 inch = 25.4 mm, 1 Btu/h-ft²-°F = 5.678 W/m²-K

Table 5 — PERMEANCE VALUES FOR FIBER-CEMENT PRODUCTS

Product Thickness[1] (inch)	Permeance (perms)
1/4	1.75
5/16	1.54
3/8	1.32
13/32	2.84
7/16	1.10

Note to Table 5:
1. SI units conversion: 1 inch = 25.4 mm, 1 perm = 57 mg/(s•m²•Pa)

Table 6A
BOCA® *National Building Code*/1999
ALLOWABLE BASIC WIND SPEEDS (MILES PER HOUR) FOR
HARDISHINGLE™ CLADDING EXTERIOR WALL FINISH

Sheathing Type	Fastener Type	Weather Exposure and Fastener Location	Height of Building (feet)	Exposure Category	
				B	C
Minimum 15/32 inch thick plywood complying with DOC PS 1-95	Min. 0.121 in. shank x 0.371 in. HD x 1-1/4 in. long corrosion resistant roofing nail	8 inch exposure 2 roofing nails 9 inches from butt edge	0-15 20 40 60 100 200	110 110 110 110 80 70	95 90 80 75
		7 inch exposure 2 roofing nails 8 inches from butt edge	0-15 20 40 60 100 200	110 110 110 110 95 80	110 105 95 90 75 70
		6 inch exposure 2 roofing nails 7 inches from butt edge	0-15 20 40 60 100 200	110 110 110 110 105 90	110 110 105 100 85 75

Table 6B
SBCCI - 1999 *Standard Building Code*®
ALLOWABLE BASIC WIND SPEEDS (MILES PER HOUR) FOR
HARDISHINGLE™ CLADDING EXTERIOR WALL FINISH

Sheathing Type	Fastener Type	Weather Exposure and Fastener Location	Height of Building (feet)	Exposure Category	
				Standard	Coastal
Minimum 15/32 inch thick plywood complying with DOC PS 1-95	Min. 0.121 in. shank x 0.371 in. HD x 1-1/4 in. long corrosion resistant roofing nail	8 inch exposure 2 roofing nails 9 inches from butt edge	0-15 20 40 60	105 100 90 85	105 100 90 85
		7 inch exposure 2 roofing nails 8 inches from butt edge	0-20 40 60	110 100 95	110 100 95
		6 inch exposure 2 roofing nails 7 inches from butt edge	0-60 100 200	110 75 70	110 75 70

Table 6C
ICBO - 1997 *Uniform Building Code*™
ALLOWABLE BASIC WIND SPEEDS (MILES PER HOUR) FOR
HARDISHINGLE™ CLADDING EXTERIOR WALL FINISH

Sheathing Type	Fastener Type	Weather Exposure and Fastener Location	Height of Building (feet)	Exposure Category	
				B	C
Minimum 15/32 inch thick plywood complying with DOC PS 1-95	Min. 0.121 in. shank x 0.371 in. HD x 1-1/4 in. long corrosion resistant roofing nail	8 inch exposure 2 roofing nails 9 inches from butt edge	0-20 40 60 100 200	110 100 95 90 80	90 80 75 70 70
		7 inch exposure 2 roofing nails 8 inches from butt edge	0-20 40 60 100 200	110 110 110 105 95	105 95 90 85 80
		6 inch exposure 2 roofing nails 7 inches from butt edge	0-20 40 60 100 200	110 110 110 110 100	110 105 100 95 90

Notes to Tables 6A, 6B and 6C:
1. Table values are based on an importance factor of 1.0
2. 1 foot = 305 mm, 1 inch = 25.4 mm, 1 mph = 1.6 km/h

Table 7A
BOCA® *National Building Code*/1999
ALLOWABLE BASIC WIND SPEEDS (MILES PER HOUR) FOR
HARDISHINGLE™ CLADDING EXTERIOR WALL FINISH

Sheathing Type	Fastener Type	Weather Exposure and Fastener Location	Height of Building (feet)	Exposure Category	
				B	C
Minimum 7/16 inch thick OSB sheathing complying with DOC-PS 2-95	Min. 0.091 in. shank x 0.221 in. HD x 1-1/2 in. long corrosion resistant siding nail	8 inch exposure 2 siding nails 9 inches from butt edge	0-15 20 40 60	110 110 90 85	75 75 70
		7 inch exposure 2 siding nails 8 inches from butt edge	0-15 20 40 60	110 110 105 100	90 85 80 75
		6 inch exposure 2 siding nails 7 inches from butt edge	0-15 20 40 60 100 200	110 110 110 110 85 75	100 95 90 80 70

Table 7B
SBCCI - 1999 *Standard Building Code*©
ALLOWABLE BASIC WIND SPEEDS (MILES PER HOUR) FOR
HARDISHINGLE™ CLADDING EXTERIOR WALL FINISH

Sheathing Type	Fastener Type	Weather Exposure and Fastener Location	Height of Building (feet)	Exposure Category	
				Standard	Coastal
Minimum 7/16 inch thick OSB sheathing complying with DOC-PS 2-95	Min. 0.091 in. shank x 0.221 in. HD x 1-1/2 in. long corrosion resistant siding nail	8 inch exposure 2 siding nails 9 inches from butt edge	0-20 40 60	85 75 70	85 75 70
		7 inch exposure 2 siding nails 8 inches from butt edge	0-15 20 40 60	100 95 85 80	100 95 85 80
		6 inch exposure 2 siding nails 7 inches from butt edge	0-20 40 60 100	110 105 100 70	110 105 100 70

Table 7C
ICBO - 1997 *Uniform Building Code*™
ALLOWABLE BASIC WIND SPEEDS (MILES PER HOUR) FOR
HARDISHINGLE™ CLADDING EXTERIOR WALL FINISH

Sheathing Type	Fastener Type	Weather Exposure and Fastener Location	Height of Building (feet)	Exposure Category	
				B	C
Minimum 7/16 inch thick OSB sheathing complying with DOC-PS 2-95	Min. 0.091 in. shank x 0.221 in. HD x 1-1/2 in. long corrosion resistant siding nail	8 inch exposure 2 siding nails 9 inches from butt edge	0-15 20 40 60 100	100 90 85 80 70	75 70
		7 inch exposure 2 siding nails 8 inches from butt edge	0-15 20 40 60 100 200	110 110 100 90 85 70	90 85 80 75 70
		6 inch exposure 2 siding nails 7 inches from butt edge	0-20 40 60 100 200	110 110 105 80 70	95 85 80

Notes to Tables 7A, 7B, and 7C:
1. Table values are based on an importance factor of 1.0
2. 1 foot = 305 mm, 1 inch = 25.4 mm, 1 mph = 1.6 km/h

Table 8A
BOCA® *National Building Code*/1999
ALLOWABLE BASIC WIND SPEEDS (MILES PER HOUR) FOR
HARDISHINGLE™ CLADDING EXTERIOR WALL FINISH

Sheathing Type	Fastener Type	Weather Exposure and Fastener Location	Height of Building (feet)	Exposure Category	
				B	C
Minimum 7/16 inch thick OSB sheathing complying with DOC-PS 2-95	Min. 0.091 in. shank x 0.221 in. HD x 1-1/2 in. long corrosion resistant siding nail	8 in. exposure 3 siding nails per 12 in. wide, 9 in. from butt edge, 2 siding nails per 6 & 8 in. wide	0-15 20 40 60 100	110 110 100 95 75	90 85 75 70
		7 in. exposure 3 siding nails per 12 in. wide, 8 inches from butt edge, 2 siding nails per 6 & 8 in. wide	0-15 20 40 60 100 200	110 110 110 110 90 80	105 100 90 85 70
		6 in. exposure 3 siding nails per 12 in. wide, 7 inches from butt edge, 2 siding nails per 6 & 8 in. wide	0-20 40 60 100 200	110 110 110 100 85	110 100 90 80 70

Table 8B
SBCCI - 1999 *Standard Building Code*©
ALLOWABLE BASIC WIND SPEEDS (MILES PER HOUR) FOR
HARDISHINGLE™ CLADDING EXTERIOR WALL FINISH

Sheathing Type	Fastener Type	Weather Exposure and Fastener Location	Height of Building (feet)	Exposure Category	
				Standard	Coastal
Minimum 7/16 inch thick OSB sheathing complying with DOC-PS 2-95	Min. 0.091 in. shank x 0.221 in. HD x 1-1/2 in. long corrosion resistant siding nail	8 in. exposure 3 siding nails per 12 in. wide, 9 in. from butt edge, 2 siding nails per 6 & 8 in. wide	0-15 20 40 60	100 95 85 80	100 95 85 80
		7 in. exposure 3 siding nails per 12 in. wide, 8 inches from butt edge, 2 siding nails per 6 & 8 in. wide	0-15 20 40 60	110 105 95 90	110 105 95 90
		6 in. exposure 3 siding nails per 12 in. wide, 7 inches from butt edge, 2 siding nails per 6 & 8 in. wide	0-15 20 40 60 100	110 110 110 105 70	110 110 110 105 70

Table 8C
ICBO - 1997 *Uniform Building Code*™
ALLOWABLE BASIC WIND SPEEDS (MILES PER HOUR) FOR
HARDISHINGLE™ CLADDING EXTERIOR WALL FINISH

Sheathing Type	Fastener Type	Weather Exposure and Fastener Location	Height of Building (feet)	Exposure Category	
				B	C
Minimum 7/16 inch thick OSB sheathing complying with DOC-PS 2-95	Min. 0.091 in. shank x 0.221 in. HD x 1-1/2 in. long corrosion resistant siding nail	8 in. exposure 3 siding nails per 12 in. wide, 9 in. from butt edge, 2 siding nails per 6 & 8 in. wide	0-15 20 40 60 100 200	110 110 100 90 80 70	85 80 75 70 70
		7 in. exposure 3 siding nails per 12 in. wide, 8 inches from butt edge, 2 siding nails per 6 & 8 in. wide	0-15 20 40 60 100 200	110 110 110 110 100 90	110 105 100 95 80 75
		6 in. exposure 3 siding nails per 12 in. wide, 7 inches from butt edge, 2 siding nails per 6 & 8 in. wide	0-15 20 40 60 100 200	110 110 110 110 105 95	110 105 100 95 90 85

Notes to Tables 8A, 8B, and 8C:
1. Table values are based on an importance factor of 1.0
2. 1 foot = 305 mm, 1 inch = 25.4 mm, 1 mph = 1.6 km/h

Table 9A
SBCCI - 1999 *Standard Building Code*©
Allowable Fastener Spacing (in.)
Hardiplank Lap Siding fastened to ASTM C 90 Concrete Wall

Height of Building (feet)	6-1/4 and 6 inch wide Hardiplank	7-1/2 inch wide Hardiplank	8-1/4 and 8 inch wide Hardiplank	9-1/2 inch wide Hardiplank
0-15	18.25	14.5	13.75	11.5
20	16.5	13.25	12.25	10.5
30	14.75	11.75	11	9.25
40	13.5	10.75	10.25	8.5
50	12.75	10.25	9.5	8
60	12.25	9.75	9	7.5

Table 9B
BOCA© *National Building Code*/1999
Allowable Fastener Spacing (in.)
Hardiplank Lap Siding fastened to ASTM C 90 Concrete Wall

Height of Building (feet)	6-1/4 and 6 inch wide Hardiplank		7-1/2 inch wide Hardiplank		8-1/4 and 8 inch wide Hardiplank		9-1/2 inch wide Hardiplank	
	Exposure B	Exposure C	Exposure B	Exposure C	Exposure B	Exposure C	Exposure B	Exposure C
0-15	24.0	15.0	24.0	12.0	24.0	11.25	20.25	9.5
20	24.0	13.75	23.0	11.0	21.5	10.25	18.25	8.75
40	21.0	11.25	16.75	9.0	15.75	8.5	13.25	7.25
60	17.75	10.0	14.25	8.0	13.25	7.5	11.25	6.25
100	14.0	8.75	11.25	7.0	10.5	6.5	8.75	5.5

Table 9C
ICBO - 1997 *Uniform Building Code*™
Allowable Fastener Spacing (in.)
Hardiplank Lap Siding fastened to ASTM C 90 Concrete Wall

Height of Building (feet)	6-1/4 and 6 inch wide Hardiplank		7-1/2 inch wide Hardiplank		8-1/4 and 8 inch wide Hardiplank		9-1/2 inch wide Hardiplank	
	Exposure B	Exposure C	Exposure B	Exposure C	Exposure B	Exposure C	Exposure B	Exposure C
0-15	24.0	14.25	19.25	11.25	18.0	10.5	15.25	9.0
20	22.5	13.25	18.0	10.5	16.75	9.75	14.25	8.25
40	17.75	11.5	14.25	9.25	13.5	8.5	11.25	7.25
60	15.75	10.5	12.75	8.5	11.75	8.0	10.0	6.75
100	13.25	9.25	10.5	7.5	9.75	7.0	8.25	5.75

Notes to Table 9A, 9B, and 9C:

1. Fasteners shall be ET&F Fastening Systems, Inc. Erico Stud nail, ET & F No. ASM-144-125, head dia. = 0.30 in., shank dia. = 0.14 in.
2. Maximum basic wind speed shall be 110 mph.
3. Exposure Category C (for Table 9A).
4. 1 inch = 25.4 mm, 1 foot = 305 mm.