

Each of these bullet points has one or more representational photos in demonstration or explanation.

Due to different installation styles and materials it looked to me like the job had been performed by different crews, or companies. It also appeared that there was not a complete understanding of JH installation techniques.

There were other observations as well, discussed in the report.

The following JH links are referred to and used in the report. They are as follows:

<https://www.jameshardie.com/d2w/best-practices/hardieplank-hz5-us-en.pdf>

<https://www.jameshardie.com/d2w/best-practices/intro-tools-hz5-us-en.pdf>



Water has been dripping where the garage wall abuts the main house. Ice has formed obviously. A length of sheet metal has been installed to deflect water from hitting the box window trim, but there was deep snow and it could not be determined if kick-out flashing is present against the house. The gutter is close to the siding, but it was not measured, but JH recommends an inch from the siding.

Kick-out flashing can be seen in diagram 5 of the first link above, page 93, and the gutter distance from the siding in figure 9.



Two different lights on different bases.

Neither base subscribes to the installation instructions on the JH website.

Given the two different bases it is suspected that two different companies installed them?

Fixtures and penetrations should be installed on what JH calls blocks, or Sturdi Mount bases, with flashing over the top similar to windows and doors.

An example of a block can be seen in figure 13 of the first link above, page 93.



Page 19, 20 and 21 of the second link above has an additional explanation of the various desired bases.

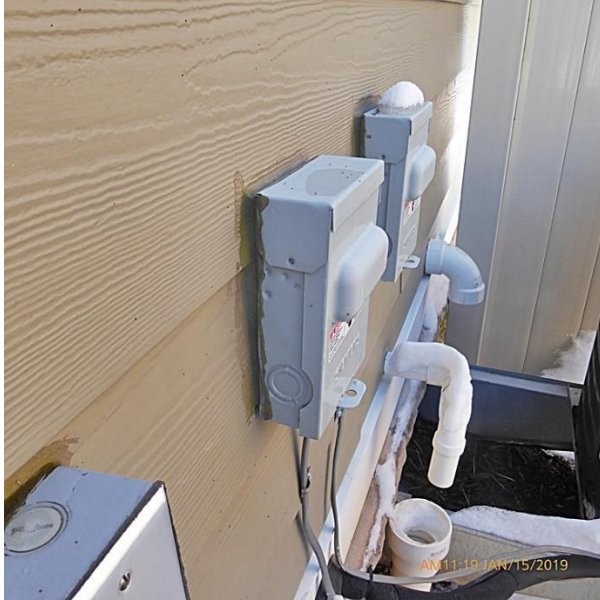


These two photos are examples of the many locations where the butt ends are too far apart.

In the upper photo the separation is about $3/16^{\text{th}}$ " and the lower about $1/4$ ".

JH says that butt joints should have "moderate edge contact." See page 89 of the first link above.





These are other examples of various penetrations not placed on a proper mount, or installed directly into the siding.

Caulking is not a finished edge.

There is no flashing over any of these penetrations.

The installer seems to be guessing about how to install things. And the caulking is not the least bit professional or attractive.



Both photos are representative of the many butt edges that are not in plane.

Notice the face nailing, too far from the joint. See figure 15 on page 94 of the first link above.

Being so far apart neither nail can be into a stud, which is the only way the plank could stay firmly attached to the wall.

The upper arrow in the top photo shows a loose plank.

Such looseness is all over the house.

Loose planks can happen for many reasons, but mostly because of improper nailing.



Nails on topside of each plank should be placed between $\frac{3}{4}$ " and 1" from the top edge.

And there should be a minimum overlap of $1\frac{1}{4}$ " of one plank over another.

See figure 2 on page 92 of the first link above, and figures 14 and 15 of page 94.

On the topic of nailing, I could not feel that there was a starter strip on the lowest plank anywhere on the house. A starter strip is explained on page 86 of the first link, one of many such explanations.



More examples of poorly installed siding and trim.

Looseness abounds.

Again, these photos are merely representational areas all over the house.

The upper red arrow in the photo to the left points to a loose nail, albeit barely visible.

The nail could not be into a stud and it is too short (more on such short nails later).



This lower photo is an example of the loose edge of the tops of many planks along the roof fascia.

This edge is held in place with caulking, and not very well.



More loose face nails, very small and very short.



This looseness is likely caused by driving a nail (too small and too short) in too hard.

It grabbed nothing inside the wall, and gouged a large hole into the top of the plank it overlaps.

Face nails, and all such blind nails, should be driven between $\frac{3}{4}$ " and 1" from the top of the plank. See page 88 and figure 10.5 on the first link.



This plank was so loose it could come out to the second joint on my finger.

The nails was driven so hard it split or delaminated the plank.

It also was too short and could not have been driven into a stud as it is loosely attached all around.



This is an example of two face nails placed too closely together. Why is that necessary?

Again, they are not and cannot be secured into a stud.

Beyond that, both were driven so hard they also split the plank.



This nail, and maybe two nails, broke the skin of the plank.

This is another example of improper face nailing.

And this is only one example of many such a buried nail heads.



Again, we have butt ends not in plane.

And these are under a plank on top which also got two nails apparently to try to secure or push the planks below into alignment.

The nail on the right is driven too deep and has punctured the skin.



This is the material used as joint flashing.

It looks to be roof felt.

While JH would prefer a hard joint flashing, but anything that is waterproof and not aluminum is acceptable.

The problem with such felt is that it is very weak and susceptible to tearing.



This piece of joint flashing felt was found hanging behind a loose plank.

What held it in place was the plank above.

It would have eventually fallen sometime in the future as wind would lift and lower the loose plank.

It was saved to be used as an example here.



When this very loose plank was lifted water marks could be seen.

In fact water marks could be seen in many areas when loose siding was lifted.

It is feared that water is getting behind the siding.



The nail here was driven so hard it cracked the siding under this window trim.

On this side of the house two cracked siding planks could be seen.

It is suspected that there are many more not seen, and perhaps hidden by paint.



This photo is an attempt to capture examples of the erratic paint.

The two spots on the right are light playing with the camera lens.

Such erratic paint was evident all over the house.



This lower photo is a cropped example of another location with similar paint.



Looking from the street at the wall above the garage roof, the lower arrow points to what appears to be siding the recommended 2" from the shingles.

It could not be measured.

But again, looking from the street, the higher shingles, as indicated by the upper arrow, looked to be very close to the shingles.

See figure 3 on page 93 of the first link above for the 2" distance between siding and shingles.



One more example of improper face nailing, with small nails which have come loose.

And again, this is only one of many such examples around the house.



All cut edges should be painted or treated with a JH sealant.

See page 28 of the second link above.

Sealing edges is very important.

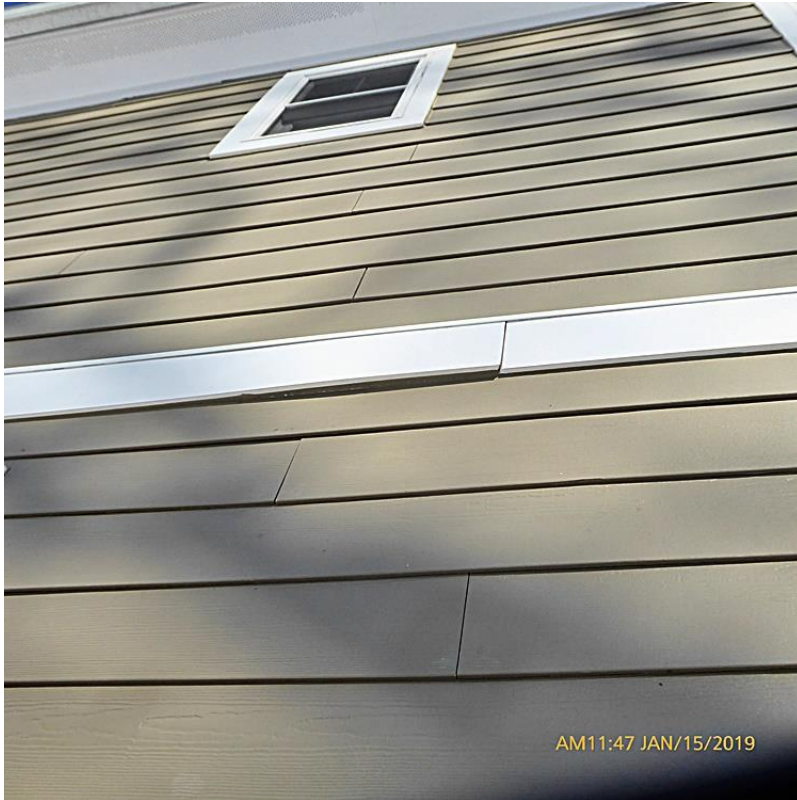
The JH siding is part cement and part cellulose. It is called a “fiber cement” siding.

Since the edges contain so much cellulose, and it is said as much as 50%, the edge will be susceptible to moisture intrusion and damage.

The edge will discolor and swell and deteriorate if not treated.

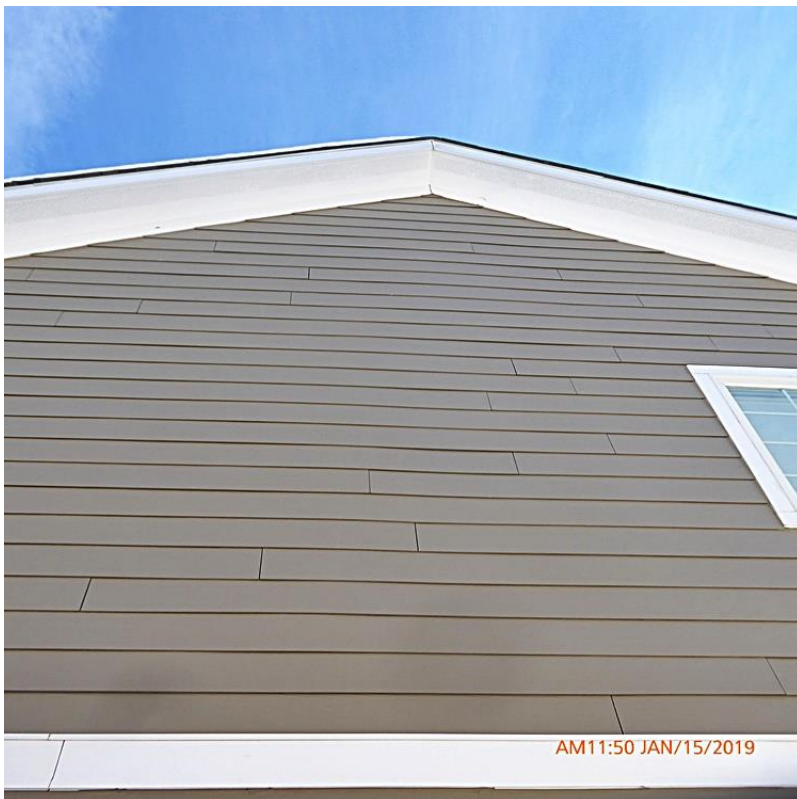
Similar to such locations as the photo to the left, the cut edges of the siding along the roof in the photo on the previous page would also ALL need to be so treated.

The sealing of the undersides of these cut siding members would have to be verified by climbing on the roof to see.



More loose trim, and general waviness of the siding.

Again, this is due to improper nailing.



Perhaps hard to see in this photograph, but there is great waviness and looseness in the entire face of this wall.

Improper nailing and siding installation is the reason.



The shingles on the front of the house, over the garage door, were all wavy, erratically placed where edges did not make sense, and had touch-up paint over face nails that did not match.



This is another example of the same area, with touch-up paint that does not even look to be close to the same color.



And here is a final example of the same area.

This also shows looseness of the shingles, and the red arrow points to a spot on the shingle that should have been buried beneath the shingle on top.

This is an example of an edge that does not make sense.



This photo is instructive.

The nail on the left was removed from the siding. It was hanging very loose, so it was removed.

The nail on the right is an example of the kind of nail recommended as a fastener on page 91 of the first link above.

The nail on the left appears to be aluminum, forbidden by JH as it will interact badly with the cement.

The nail on the right is galvanized, properly sized, and appropriate.



If the nails we can see are aluminum, what of the nails we cannot? Are they also aluminum? Were aluminum nails used all over the house? If so this would cause severe problems with the siding all over the house!

The photo to the left is another issue.

The conduit servicing the electric meter was not given a slip joint.

As such, as the soil settled over time, the conduit pulled away also, approximately 2", exposing the service

conductors inside. This is something that needs to be remedied sooner rather than later.



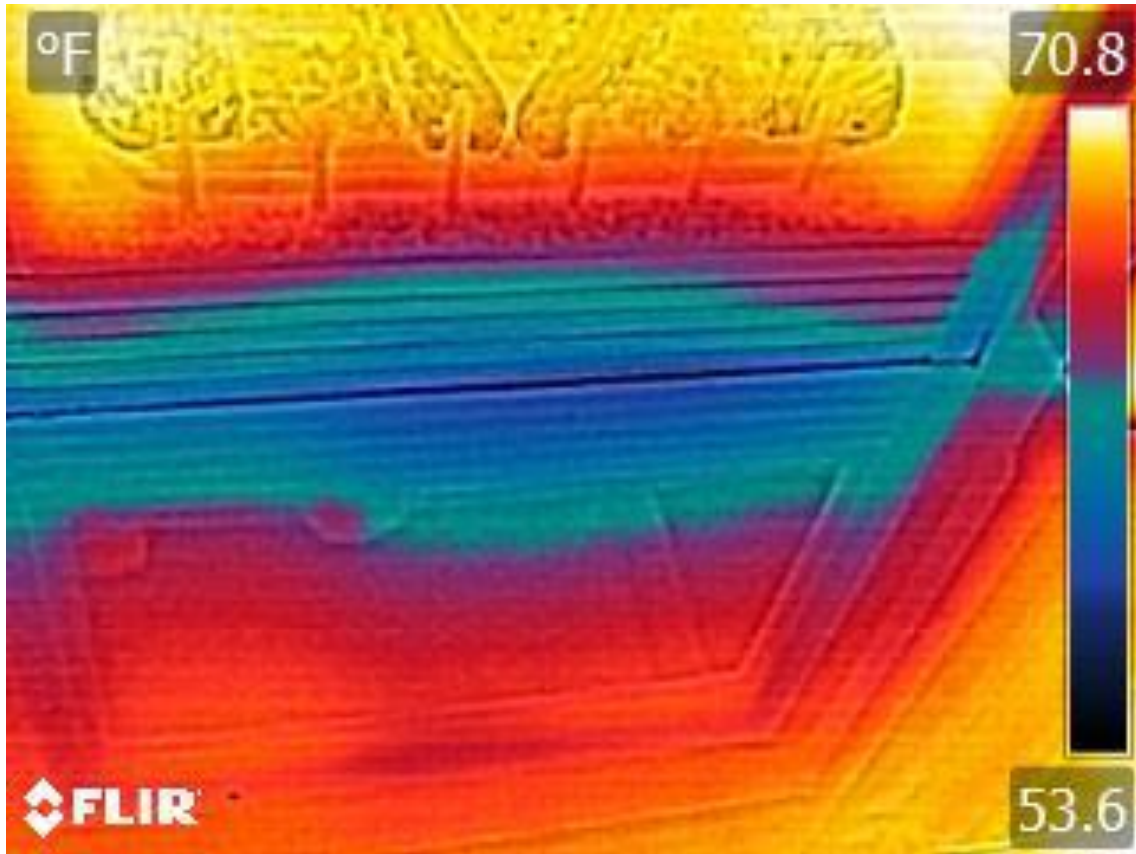
Looking under the box penetration housing the fireplace it could be seen that the gap between the soffit cover and the sides and where it abuts the house was never caulked.

It appears to have never been primed or painted.

The covering was also bowing downward.

This likely means the insulation has pulled away from the sub floor, which creates a cold floor and cold air coming in through the fireplace.

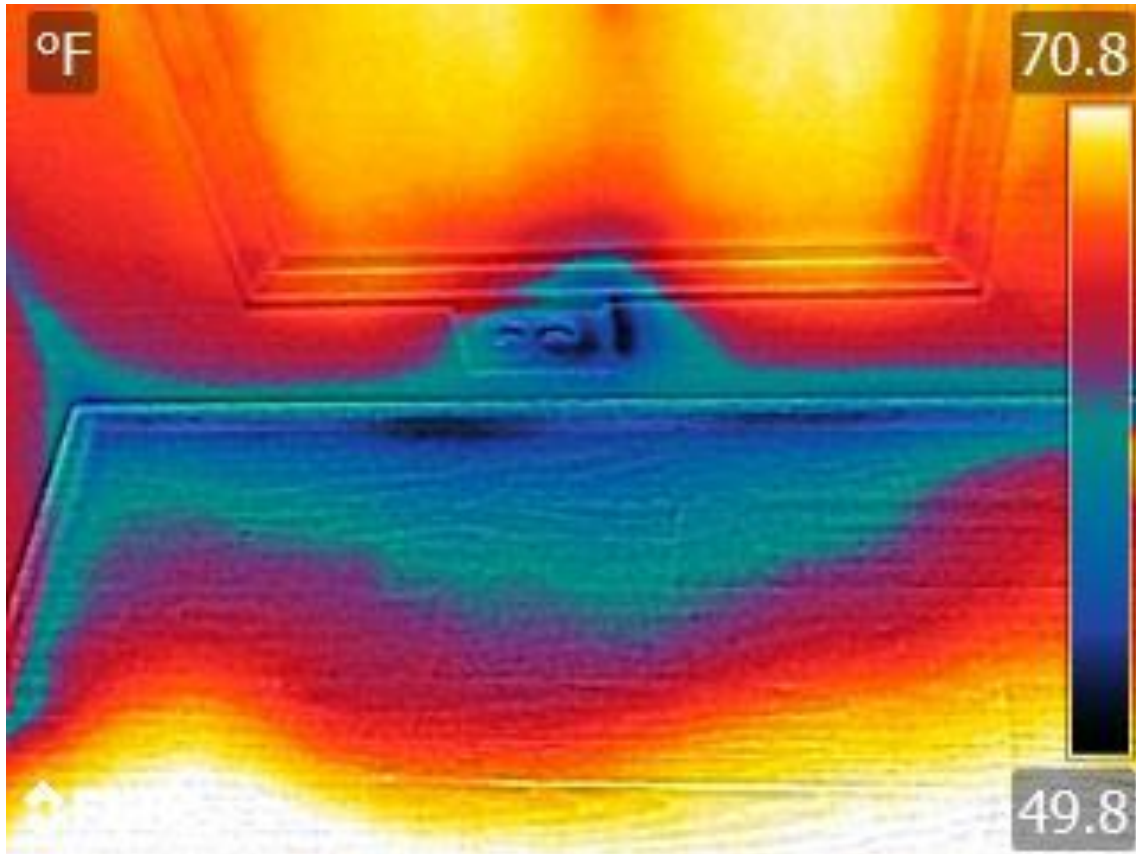
Cold air could in fact be felt in front of the fireplace.



This is a thermal image of part of the area in front of the fireplace. It is very cold, almost 54F, which can be felt standing in front of the fireplace in stocking feet.

And when looking at the cooler areas, indicated by blue, the image indicates that the cold is progressing onto the hearth.

The cover needs to be removed on the underside of the wall penetration outdoors, the insulation needs proper placement, and the cover needs to be installed properly, being primed and painted, and sealed against air intrusion with caulking.



Due to ice and snow the underside of the penetration in the front bump out (dining room), to the right of the front porch, could not be seen.

However, it is similarly cold, which might mean a similar condition exists with the insulation, soffit cover and air intrusion.

Also, it is evident that the receptacle box was never sealed against air intrusion, typically done with foam.

The temperatures here are very cold, as low as 49.8F.

It might be added here that exterior wall penetrations like switches, receptacles, canister light fixtures, etc., all together account for about 10% of energy losses in a house if those penetrations are not sealed. It all adds up.