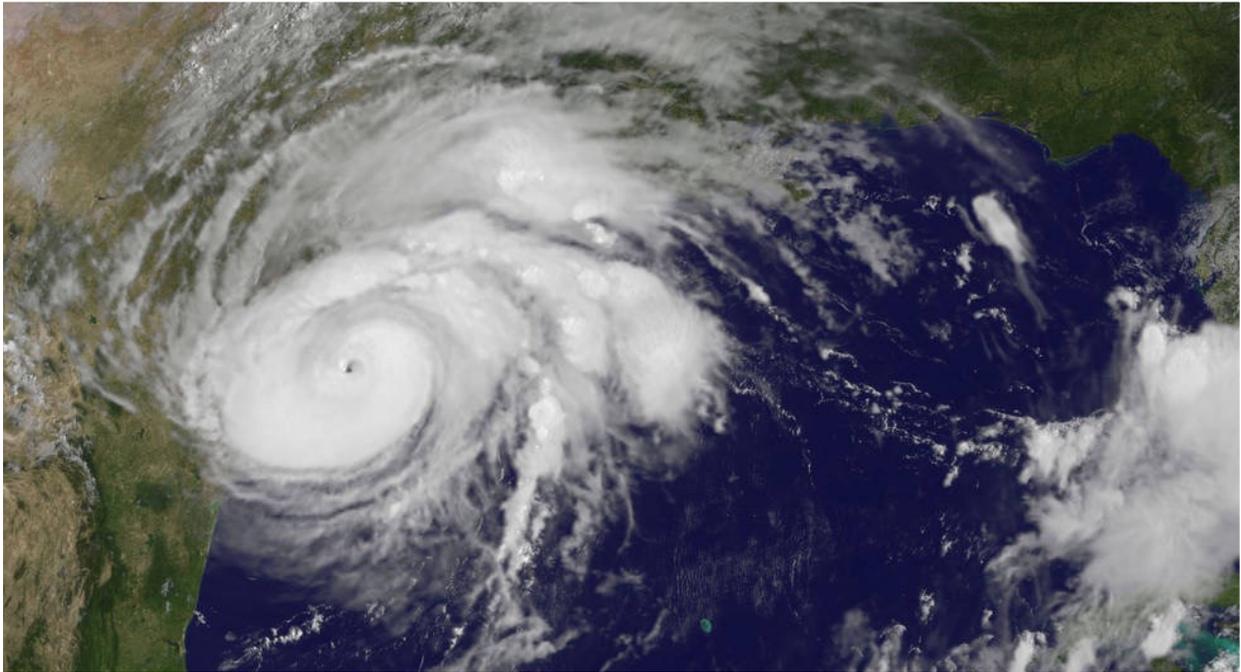




PREMIER STEEL ROOFING SYSTEMS

*The following report was written by Todd Miller, president of Isaiah Industries, a leading manufacturer of residential metal roofing. Todd has 35+ years of industry experience and is well-respected for his knowledge and insight in the fields of residential roofing and ventilation.*



## A Frontline Report: Roof Performance in a Horrible Hurricane

A couple of weeks after Hurricane Harvey made landfall in Texas, I had the opportunity to visit the areas that were so devastated by this horrible storm. My heart goes out to those impacted by the storm. The amount of human suffering resulting from recent earthquakes and hurricanes is impossible to fathom. Following is my report on what I observed as far as roof performance during my trip to Texas.

One thing that occurred to me as I reviewed the Texas damages was that, if there is anything good that can come of events like these, it is the opportunity to learn from them

and to make changes so that we're better prepared in the future. History has shown that we can learn from each storm and do better in the future. It was very apparent from my visit to the greater Corpus Christi area where Harvey made landfall that new structures withstood the storm better than old structures did. This is undoubtedly due to enhanced building codes and enforcement, as well as improved building materials and the fact that newer buildings have not been weakened by previous storms.

## Installation Matters

We also know that roofs which have been properly installed to meet manufacturer specifications and building code requirements will consistently out-perform roofs with a sub-standard installation. While my time in Texas did not allow me to do a great deal of in-depth inspection regarding installation-related things like fastener type and fastener placement, it is still a very safe assumption that well-installed roofs performed the best. Roofing materials and installed assemblies are carefully tested by manufacturers and independent laboratories. [Those tests reveal great information regarding ultimate performance which is then captured in manufacturer recommendations and code requirements.](#)

Here are my field observations of the people I encountered on that trip:

## People of Great Resiliency

First of all, I saw great resilience and desire to rebuild amongst the great folks of Texas. A good number of the homes most heavily damaged by winds were second residences, meaning that those owners were not completely displaced by the storm damages. That was a relief to see but in no way does it negate the horrible impact of Harvey nor the fact that thousands of individuals have found themselves homeless.

## Adjuster Efficiency

In the greater Corpus Christi area, I saw numerous disaster teams on the ground from insurance companies, national restoration contractors, local contractors, and building materials suppliers despite the almost unbearable heat and humidity. From what I saw, insurance adjusters were very efficient and quick-acting, anxious to get customers "made whole" and to settle claims as quickly as possible. I did not see any of the back and forth negotiation that can often occur with insurance work. Instead, I saw adjusters totaling out roofs to swiftly expedite claim settlements. Of course, some negotiation may come later as contractors quote the jobs and try to reconcile the numbers established by the adjuster.

# Roof Performance: I Saw Many Different Things

## Underlayments & Water Intrusion

If the roof covering (shingle, tile, metal, etc.) came off in the high winds and exposed the next layer in the roof assembly, the [newer synthetic and self-adhering underlayments](#) stayed on roofs better than traditional “old school” felts did. The inclusion of these newer materials helped to minimize interior damages by providing some protection against water intrusion. That said, at the height of the winds, water was finding its way into homes around windows, by blowing doors open, and through various vents and other roof penetrations. I suspect that very few homes that endured 100+ mph winds for a significant length of time didn't have some water intrusion. One comment that was made to me was that even if the roof covering did stay in place, the torrential rains, especially in the Houston area, simply overwhelmed roofs and flashings, causing leaks that had never before occurred and, God willing, will never occur again.

## Asphalt Shingles and Fiberglass Shingles

Traditional asphalt and fiberglass shingles, if fairly new, held up very well in many cases, especially if they were a few miles outside of “ground zero” where the hurricane first made landfall in Rockport and Port Aransas, Texas. On the other hand, asphalt shingles did not seem to do so well if they were more than a few years old or if they were very close to “ground zero.” And, unfortunately, usually, when the shingles failed, they left exposed roof decks (many of them had traditional felt underlayments that also stripped off in the wind), resulting in significant interior damages. The recent trend toward using synthetic underlayments beneath asphalt and fiberglass shingle roofs should be very helpful in the future.

## Tile Roofs

Tile roofs didn't fare so well from what I saw. In the “ground zero” area, entire slopes and even entire roofs of these products which rely heavily on gravity to stay on the roof were removed by the high winds. Outside of the most severely damaged areas, you'd still see missing and broken tiles on roofs. Some of the damage may have started with tiles that were already cracked while other damage may have resulted from airborne debris during the high winds (perhaps even from tiles blowing off of other areas of the same roof!). I visited one home with a facsimile metal tile roof that looked great from the ground, but it had been totaled out due to damages caused by clay tiles from the neighbor's roof bouncing across it. I was hearing that some area Homeowners' Associations are considering disallowing tile roofs in light of the blow-offs sustained. I had the opportunity to talk to one [HOA representative and help them with writing a proposal for new roofing covenants](#).

## **Standing Seam Roofs**

Mechanical seam standing seam roofs seemed to do the best in terms of “staying attached” to the roof deck. These roofs that have crimped seams between the vertical metal panels probably did the best overall at protecting the interior of structures from water damage. That said, these roofs still visually showed widespread “stress” in the form of oil canning and ripples that I do not think were there previously. I suspect that most of these roofs will be totaled out due to the stressing which has caused cosmetic concerns and, more than likely, functional concerns as well.

## **Interlocking Metal Roofs**

Interlocking metal roofs - both snap lock standing seam and [metal shingles](#) – did fairly well but if an interlock was breached in any way (perhaps from flying/rolling debris or from a poorly fitting flashing at a protrusion on the roof), significant areas of roofing tended to be lost on that roof plane. In most cases, it looked like just the affected roof planes can be replaced – the entire roof probably does not need to be replaced as the inherent air permeability of interlocking products avoided the “stress” that was seen with mechanical seam products. If a significant portion of roofing was lost, though, it probably resulted in interior water damage beneath that area unless the synthetic or self-adhering underlayment stayed in place and provided good protection – another good argument for quality underlayments.

## **Metal Roofing Sheets**

Through-fastened metal roofing sheets seemed to do well if fairly new but not so well if not fairly new. I assume this is because expansion and contraction had caused fasteners to loosen and fastener holes to wallow out over time, making them prone to uplift. When new, though, it is hard to beat a direct-fastened roof system which is not reliant on things like sealants, gravity, or interlocks to stay in place. Unfortunately, though, after the thermal cycling of a few seasons, the superiority and effectiveness of those products are diminished.

## **Wood Shingle Roofs**

It was interesting for me to note that machine split wood shingle roofs with a short reveal (5 – 6”), if not very aged and cracking, did extremely well in the storm. Due to other life expectancy issues and the fire risk, there is not a large number of roofs like that in the affected area, but the ones I saw did very well.

## **Tree Damage**

As you got away from “ground zero,” there was much tree damage to roofs as well as damage from blowing debris. In many cases, unless the structure was breached by a falling tree or branch, the roofs stayed on, preventing water damage inside. I hope that homeowners learn from this storm and start to cut trees back away from their homes.

This may be not so nice in terms of shade from the hot sun, but it will certainly be better in terms of protecting homes from tree damage during wind and rain events. Trim metal and perimeter flashings, most prevalent on metal roofs, were vulnerable to tree damage but they were also vulnerable to wind uplift. This was also the case with cap accessories on various metal shingle roofs where you'd often see most caps stay in place but a few removed by the high winds. Flashings that were cleated in place or otherwise well-secured out-performed floating lineal flashings. Manufacturers of building codes would be wise to provide more prescriptive standards for roof trim application in the future.

I did drive through some non-coastal areas like Victoria and Refugio, Texas and there seemed to be a lot of roof damages there, but I did not have time to investigate them. I think those areas endured several hours of punishing winds which is always tough on any roof system ... plus trees and blowing debris.

### **Wind Damage**

In the midst of all of this damage, it was apparent that wind damage was most severe on the "back" side of roofs rather than the side facing the wind. This is because, as high winds roll over the top of the roof plane they hit, they create a vacuum or uplift effect on the opposite side of the roof, pulling the roof system apart.

### **Flooding**

During my visit to Houston, I was never able to visit any flood-damaged areas though I know I was near some. The flooding, of course, was devastating and horrible in some areas but that tended to be areas around creeks, bayous, and run-off ditches and not as widespread as I had expected it to be. That said, there are thousands of families displaced by the flooding. I saw a few asphalt roofs with wind damage in Houston but did not see wind damage to other roofing materials. I also did not see any tree damage in Houston.

## **Texas Strong**

Rebuilding efforts along the gulf coast are already well underway and every place you go, people are saying "Texas Strong" as encouragement. A lot of money has been raised to help those in need. I attended a fundraising event held by a major roofing distributor who had already raised over \$500,000. It is good to see people pulling together to help each other.

## Summary: A Call for the Security of Homes

In summary, I encourage us all to work hard to make sure that construction products and practices provide the best possible security for homeowners based upon the significant weather risks in their area. We can learn much from unfortunate storms like Hurricane Harvey. As mentioned earlier, too, proper installation is critical and trumps just about everything else. Since I was on the Gulf Coast, I will say that if someone opts for a metal roof, aluminum would be preferable to steel in terms of performance along the coast. If your home is on a coast, [our family of roofing products can accommodate your need for aluminum, in place of steel.](#)

To learn more about taking taking steps for the security of your home and all that it contains from the invasion of weather, I invite you to consider our proven, wind and water resistant roofing products. The [many benefits of a Kassel & Irons metal roof](#), including [the very best warranty in the business](#), will give you peace of mind, for the very last roof you will ever need to purchase. Let me know if I can answer any questions you have regarding roof selection or performance. I can be emailed at [tmiller@isaiahindustries.com](mailto:tmiller@isaiahindustries.com).

And, please, keep those affected by recent weather and natural events in your thoughts and prayers...and maintain your generous and caring spirit. We never know just how close we ourselves may be to needing the help of a stranger.

A handwritten signature in black ink, appearing to read 'Todd Miller', with a stylized flourish at the end.

Todd Miller, President  
Isaiah Industries, Inc.