18 WAYS
TO REDUCE RISK WHEN SPECIFYING STANDING SEAM METAL ROOF PANELS

MCELROY METAL

18 WAYS TO REDUCE RISK WHEN SPECIFYING STANDING SEAM METAL ROOF PANELS

We get it....your life is chock full of RISK! In fact, for most of the architects we work with, the Risk vs. Reward battle is constant. As might be expected, decisions impacting the building envelope, specifically roofing, are often the most concerning.

We find that once architects are armed with knowledge about standing seam metal roofing, the scales tip heavily toward the reward side. Standing seam metal roofs offer a life expectancy of 50-60 years, are virtually maintenance free, 100% recyclable, and can help reduce utility load by 20%. With that kind of demonstrated performance, it's no surprise that metal roofing continues to gain both popularity and market share. But admittedly, there is risk with using metal roofing panels. And it's true that if certain items are not addressed, your outcome may not be as good as you'd hoped.

But honestly, what product doesn't carry risk?

Our goal with this eBook is to educate you of the risks with metal roofing so that you can prepare for them and even more importantly avoid them! It's the classic case of knowledge is power. We'll start by identifying some topics and ways to mitigate risk during the design phase and then move on to sharing some tips to reduce your risk in the specification phase of your project.

And one more quick note before we get started.

Don't let the fact that we identify 18 different risks scare you away from what is truly a premier product for your building owner.

Instead, consider this opportunity to learn from our 57 years of experience as a way of helping you look brilliant!

DESIGN PHASE CONSIDERATIONS

1

First and foremost, reach out to a manufacturer's rep during the design phase to ensure metal is not only a good fit for the project but that the type of panel you envision is suitable for your application. Metal roofing is a wonderful product that can be successfully used on most building types but there are rare occasions where it may not be the best suited product. Further, there are many different panel systems to choose from. While aesthetics are obviously one of the criteria for product selection, there are others.

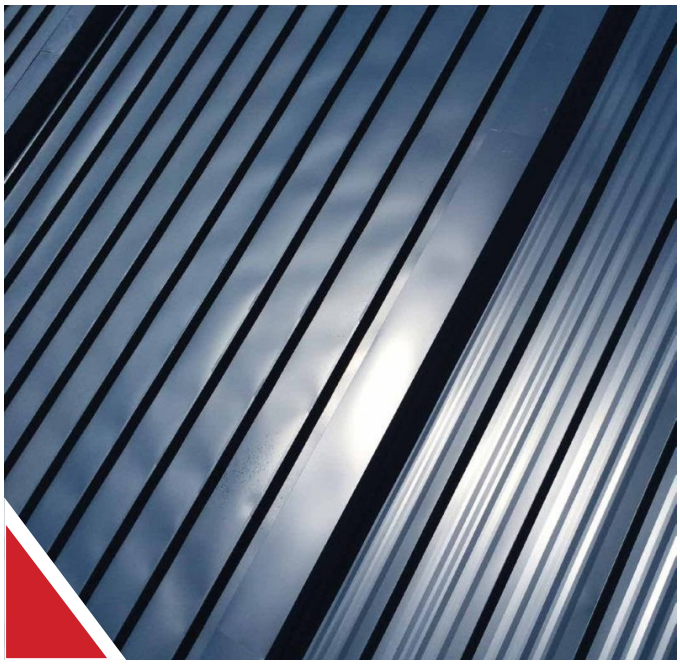
For example, some panel systems are water shedding (or hydrokinetic) meaning they function well with water that moves over them. Others are considered to be water static (or hydrostatic) which means that they can literally perform when submerged under water for periods of time. Realistically you could use a hydrostatic system on a roof with a slope as low as ¼:12 and greater.

However, since they are typically mechanically seamed systems, their use is unusual at slopes greater than 3:12. Conversely a hydrokinetic system should typically only be used on slopes of 3:12 or greater. Selecting the wrong panel system spells trouble before you even get started.

2

Don't ignore the oil canning conversation. Sure metal roofing lasts longer than most other commercial roofing options. It also offers excellent durability against Mother Nature, helps reduce electricity consumption, and requires almost no maintenance. But there's give and take with every product.

If you truly want to reduce risk on a metal roofing project, talk to your owner from the beginning about oil canning. Explain what it is and give the owner some options to control the phenomena. Some carry a higher cost such as going to narrower panel widths and heavier gauges, but many do not, such as adding striations or pencil ribs to the flat area of the panel.



The photo above is a great example. The left panels exhibit oil canning. The panels on the right side have striations which are offered by most manufacturers for no additional cost.

3

Metal continually expands and contracts due to thermal cycling. Consequently, it's important to accommodate for that movement in your details so the phenomena can be properly controlled. Always consider where you want metal roofing systems to be "pinned." They should be fixed at only one point in the system.

For example, the eave may be fixed or pinned and the ridge would then "float." But it could be vice versa and in long panel runs, instead of fixing at the eave or ridge, they may be fixed in the center to allow for maximum panel expansion/ contraction.

Unsure? Reach out to a reputable manufacturer with on-staff engineers to assist with the decision. Our engineers routinely field these types of calls.

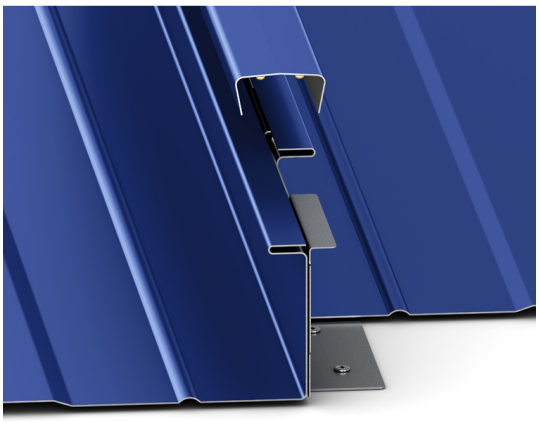
4

Avoid panel laps in roof systems when possible. Properly installed panel lap conditions are highly effective. The risk occurs when errors are made during installation. Improperly installed lap conditions can become a constant headache for both you and your owners. The easiest way to remove the risk is to require single piece panels. Many reputable manufacturers now have the ability to roll-form continuous panel lengths on-site to accommodate single piece panels up to 250' in length. For projects where single piece panels aren't a possibility, be sure to use the manufacturers recommended lap details and require laps to be staggered if possible.

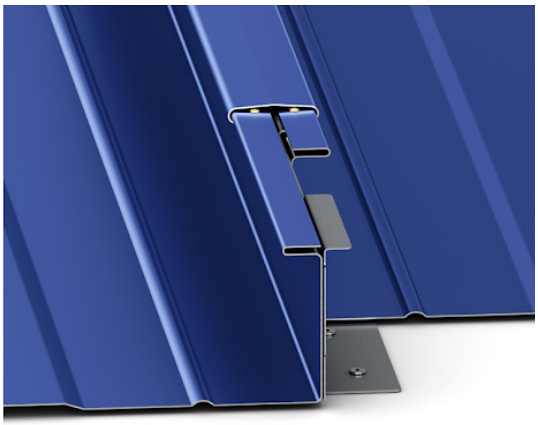
5

Never attempt a slope transition between two metal roof areas without first engaging with a metal roofing manufacturer. While these types of conditions add a nice architectural touch, there are specific flashing details that need to be addressed to make the condition watertight.

6 **For projects where additions, remodels or those with a high chance for weather related repairs exist, consider T style standing seam panels with separate seam caps as opposed to vertical leg panels where the batten cap is integrated into the panel.** T style systems allow for individual panel replacement where traditional vertical leg systems are difficult, if not impossible, to repair without tearing off the whole roof. T style systems are also much easier to seam and far less likely to have seaming machine issues. And even if the seam is watertight, no owner is ever thrilled to see a mangled seam on their brand new building!



238T Before Seaming



238T After Seaming

7 **Consider the size of all roof penetrations during the design phase and use curbs if the penetration flashing doesn't allow for easy water flow on both sides.** Curbs should be made from a minimum of .063 welded aluminum, include a diverter on the uphill side and be one-piece when possible. And recommend they be installed per SMACNA details with an over/under water shedding lap. If you want to learn even more about curbs, check out this information from the Metal Construction Association.

Lastly, if your project has a Weather Tightness Warranty, be sure to require that the flashing details around the curbs be included in the warranty. Many manufacturers exclude the flashing around curbs if it is not specifically requested. *(Note: The curb itself is typically excluded from the warranty.)*

8 Consider Mother Nature.

For projects in areas that receive snow, it's important to consider what happens after the snow falls. Another benefit of metal roofing is that as temperatures move above freezing, the snow tends to slide off the roof. This phenomena actually helps save on heating costs over shingles and membrane type roofs where the snow stays on the roof longer. The downside is that snow sliding off a roof can create safety issues, especially around building entrances and sidewalks. Consequently, in snow belt areas, it's important to include a snow retention or snow fence into your project design. While there are a host of different products on the market, we like the S-5! Product for several reasons.

Adhesive attached show retention devices are often prone to failure and can damage the coating system and void coating and substrate warranties.

S-5! ColorGard system utilizes clamps that attach to standing seams without adhesives or penetrating the roof systems.

First the revolutionary clip for the system attaches "to" the seam instead of "through" the seam like some competing products. Incidentally, these clips can also be used to attach all kinds of other products to a metal roof like roof hatches, laddering systems etc. All without penetrating the roof!

Also, this system uses a piece of Kynar coated steel made from the same metal as the roofing system so color matching and long-term color retention are spot on! Some competing systems use adhesive glue to attach snow guards and over time the adhesive can release, leaving the owner with the adhesive residue on their roof panels. While a bit cheaper to purchase initially, as you can see in the photo above, over time the adhesive applied systems often leave building owners with no snow guards AND a mess.

9

Have a plan for dissimilar materials. Dissimilar materials occur when two materials placed in an electrolytic solution react with one another chemically. In simple terms, it's when two pieces of metal get wet, and one causes the other to corrode. Dissimilar materials can be disastrous to a metal roof. Problems can be the result of either direct contact or even simple run off from one product type to another.

When metal panels are exposed to the elements found in products like treated lumber, wet mortar; drainage from air conditioners with copper coils (shown in the image below) or even lead pipes, corrosion can occur quickly. When two dissimilar metals being used together, cannot be avoided, care must be taken to assure that they must not be able to get wet, and a barrier sheet of some sort must separate them.

SPEC WRITING CONSIDERATIONS

1

Establish firm contractor qualification expectations and uphold your spec. While not a guarantee, you'll typically have far fewer headaches and a better quality install by requiring manufacturer certification and training. Consider including a requirement for things like five years experience installing projects of similar size and complexity in your specification. And consider adding a requirement for contractors to submit a copy of their manufacturer certification and a list of references from previous installs to your submittal requirements.

A word on caution though on the topic of manufacturer training. Many manufacturers conduct their certification classes in a hotel conference room environment and will certify contractors after completion of a 2 hour instructor-led only class with powerpoint slides. Other manufacturers certification programs include 1-2 days "hands-on" training where attendees are truly installing panels.

While there is a greater financial and time investment for contractors to attend hands-on training classes, there is a large benefit to you and your building owners for hands on vs. classroom type certification programs.

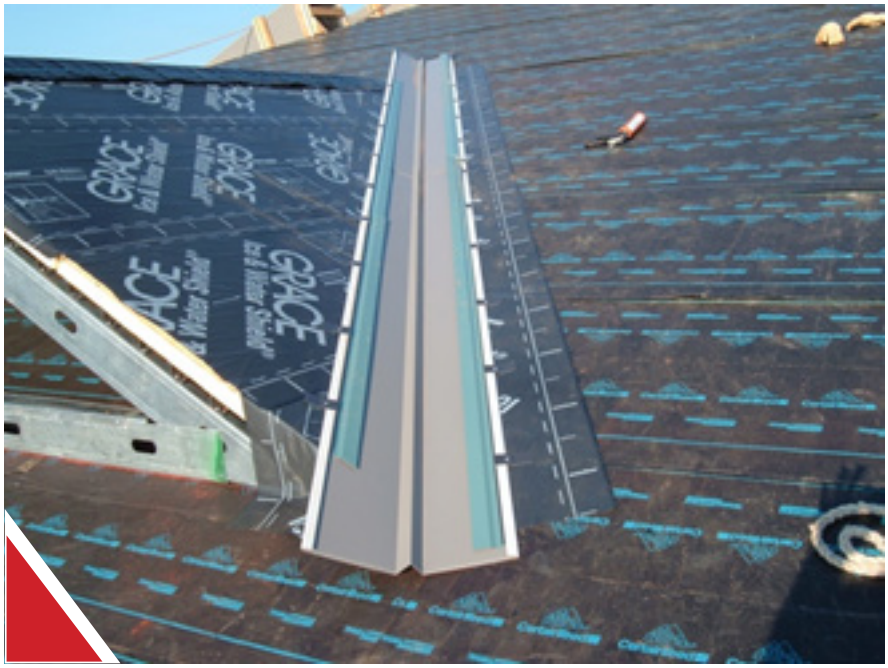
2 **Create a spec of reputable manufacturers and stick to your spec.** Yes you'll likely receive some pressure during bidding to allow others, but allowing different panels and manufacturers with whom you're not comfortable during the hectic bidding phase is fraught with risk.

3 **Ensure your spec is reviewed by listed manufacturers PRIOR to publishing bid documents.** Sure things can get caught at bidding and addressed via RFI and Addendum, but that leads to possible confusion, last minute questions for you and always the possibility that a bidder didn't see (or include) information published in an addendum or RFI. While you're technically covered on that front, as you know no one really wins that fight.

4 **Require all penetrations land in the flat of the panel.** While this may seem minor, it can be virtually impossible to properly seal a penetration that penetrates the male/female vertical legs as shown in the photo below. While T style panels easily allow for a single panel replacement in cases like these (we talked about them earlier in # 6), traditional vertical leg panels do not. Which means you're faced with either accepting the install or ripping panels all the way back from the rake edge to fix the issue. Neither of which make for happy owners, schedules or architects.

5 **If portable roll forming is allowed, always require the production to be completed by factory technicians or approved personnel on manufacturer supplied/approved equipment.** When this expectation isn't set, it allows contractors to find the lowest cost panel supply which often means panels are run on machines that are maintenance starved and produce panels outside of panel specifications which can ultimately lead to performance problems including system failure.

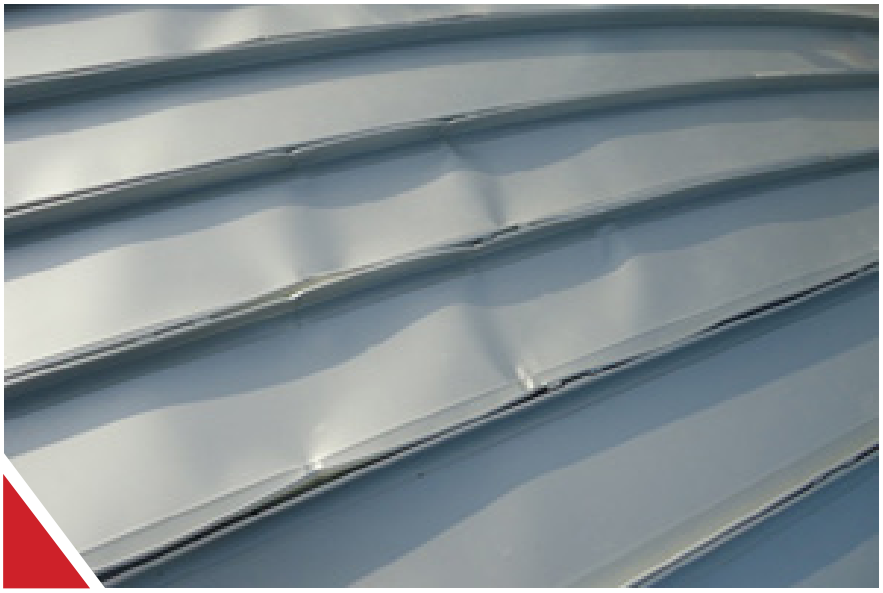
6 **Give proper consideration to valley details.** Believe us, we get it. Valleys "can" look great on metal roofing projects when they're properly designed and installed. But they can also be a big source of risk. When using metal panels on projects with a valley, make diverters as steep as possible but a minimum of 1 ½" high; include backup water protection such as ice and water; require shop drawing of proposed detail and require valley trim with integral cleats as shown in photo above.



7 **In an ideal world, you want the manufacturer to produce the shop drawings.** There's no better way to mitigate risk than ensuring all the details used on the project are per manufacturers recommendations. While most reputable manufacturers will create shop drawings, you may be faced with a scheduling restriction or perhaps a contractor preference to create their own drawings. In those cases, it is always in your best interest to require the manufacturer review and approve all shop drawings that they didn't produce.

8

As we discussed earlier, oil-canning is a natural inherent element in metal roofing. And that is true; but it's also true that installers can make some mistakes during installation which exacerbates oil canning. If you want to reduce risk associated with oil canning, be sure to set the expectation in your specification that the installer accepts the substrate and it is within the required plane and free from defects before commencing installation. While that does not seem like a big deal, issues with the substructure are only magnified once metal roofing is installed as shown in the photo above. While this looks (and is) alarming, including a manufacturer's rep from the project onset to shore up your specifications on this topic and maintaining your installer qualifications will go a long way towards mitigating this risk.



9

Monitor Panel Modularity. In the execution or installation section of your specifications, include the requirement to check panel modularity and adjust as necessary. And require your field observers or project manager to keep a close eye on this! A standing seam roof system can easily perform with virtually no maintenance for 50 + years, BUT only when they are properly installed. When panels get off-module during installation (meaning they grow or shrink from the intended panel width) it can be challenging to make the system watertight.

CONCLUSION

In summary, there's inherent risk in everything you do. And that includes using standing seam roof panels on your next project. As you well know, at the end of the day it's all about risk vs. reward. Standing seam metal roofs offer a life expectancy of 50-60 years, are virtually maintenance free, 100% recyclable, and can help reduce utility load by 20%. With rewards that high, the product family can't be ignored. Instead, it's simply a matter of finding ways to mitigate the risk. Like we said earlier, knowledge is power. And one of the best ways to gain knowledge is to involve a reputable manufacturer's rep from the start of your project.

If you're interested in learning more tips to deliver great results with standing seam roof panels, contact us. We'd love to help make your project successful, help your owner experience all the rewards that metal roofing offers and make your life a little more stress-free at the same time.

318.747.8000
info@mcelroymetal.com

1500 Hamilton Road,
Bossier City, LA 71111