

Architectural Sheet Metal Roofs



Metal Roofs



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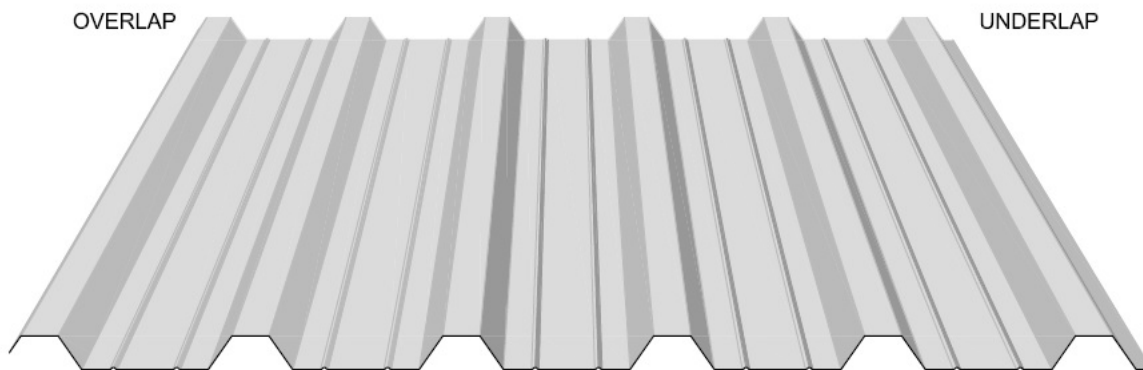
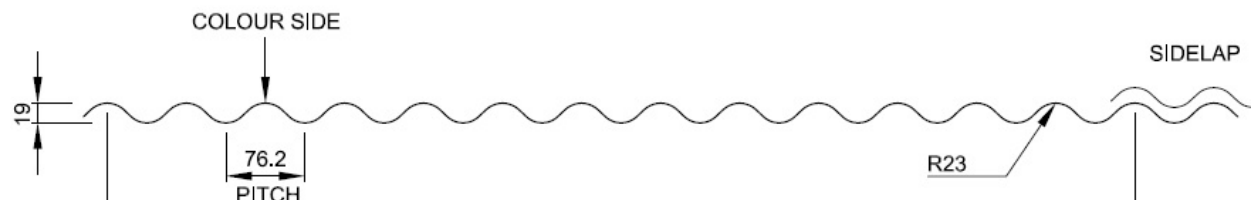
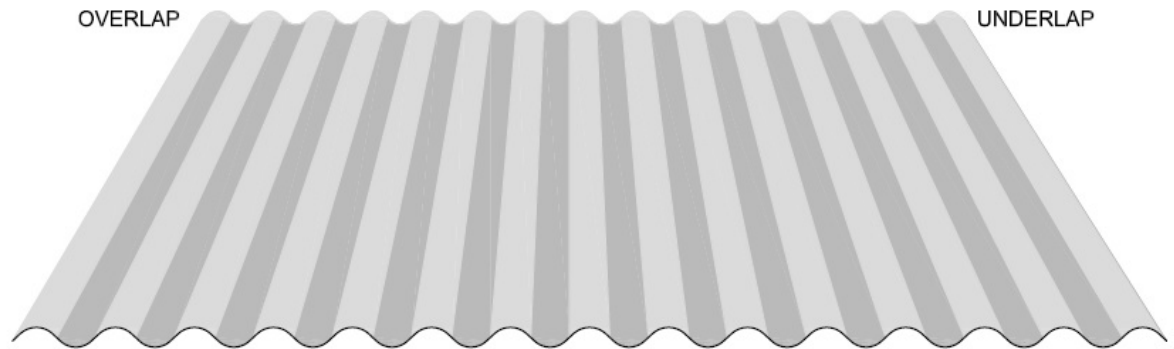
Many Things to Consider:

- Environmental conditions – rain, snow & wind
- Roof slopes
- Penetrations & valleys
- Seam heights & type
- Insulated or uninsulated assembly
- Length of metal panel
- Fastening

Performance is a System

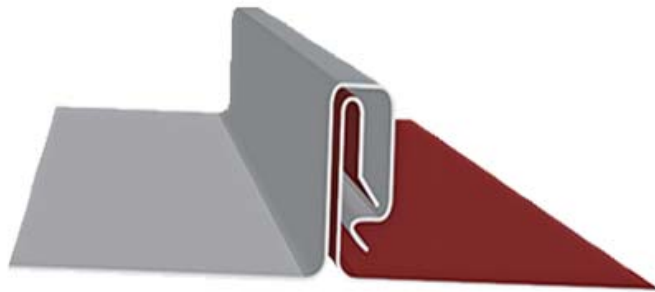
- Metal roofs work as a system
- Removal of components – “value engineering” compromises the entire assembly!

Panel Profiles Not Accepted in the RoofStar Guarantee Program



Panel Seam Types

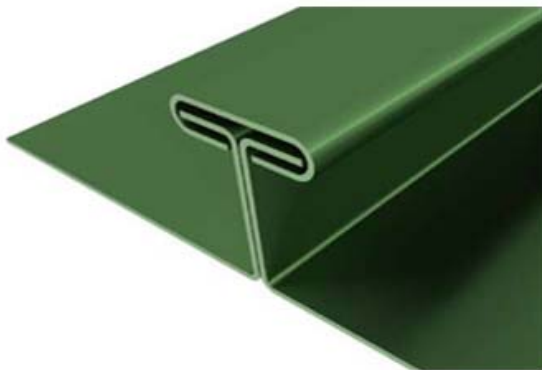
SNAP-LOCK



MECHANICAL SEAM



BATTEN PANEL



NAIL/FASTENER FLANGE



Panels 101

- Wide panels (max 20”) cover roof fast but less wind resistance – more likely to oil can
- Lower the slope the higher the seam must be
- Striations (stiffening ribs) “reduce oil-canning”
- Fastener flanged panels have length limitations
- Make panels one piece – no end laps
- RCABC minimum 24ga sheet steel

Mechanical Locking Seam



Mechanical Locking Seam



Panel allows for use of in-seam sealant on low slopes

Mechanical Locking Seam Clips

FIXED CLIP



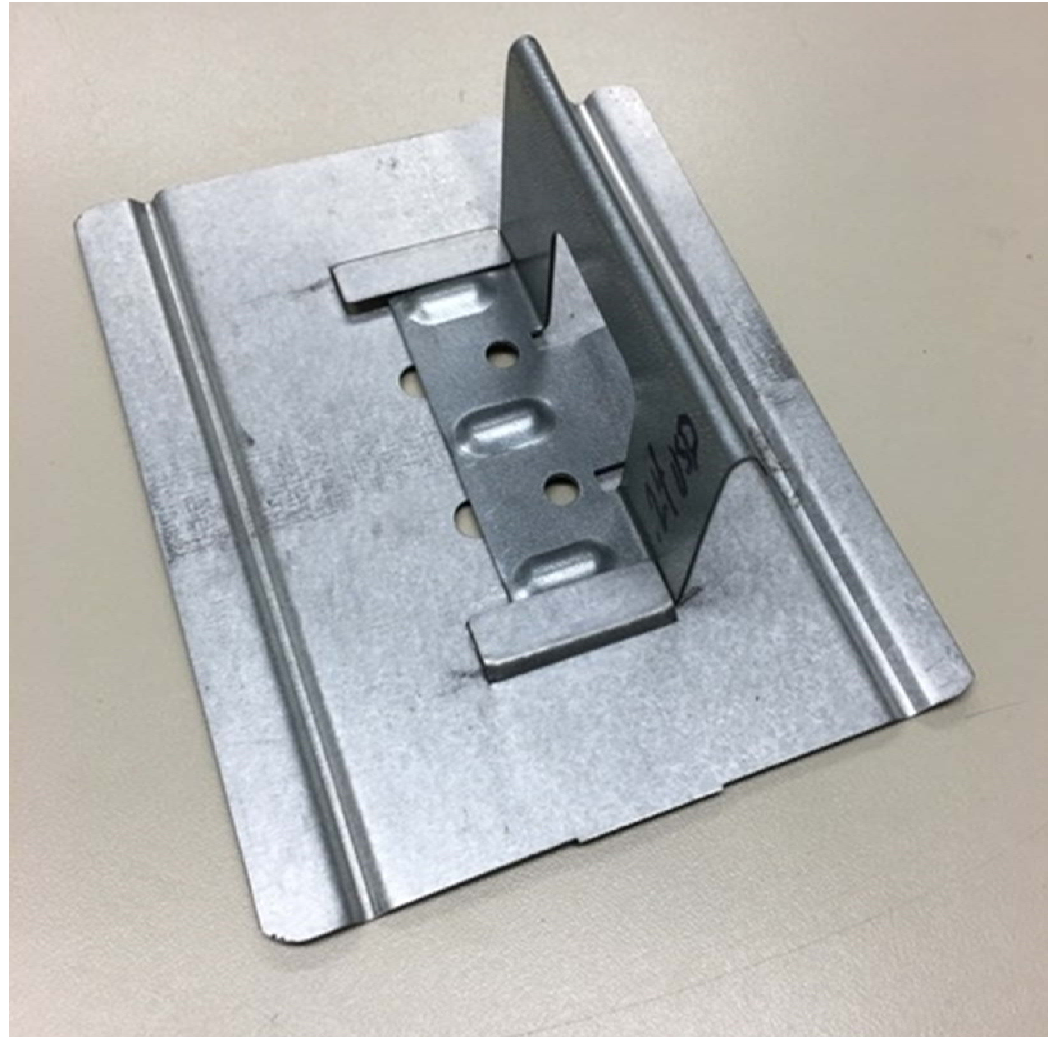
EXPANSION CLIP



Snap Lock with Concealed Clip



Note: Clip Allows for Unlimited Thermal Expansion & Contraction



Snap Lock with Built-in Nailing Flange



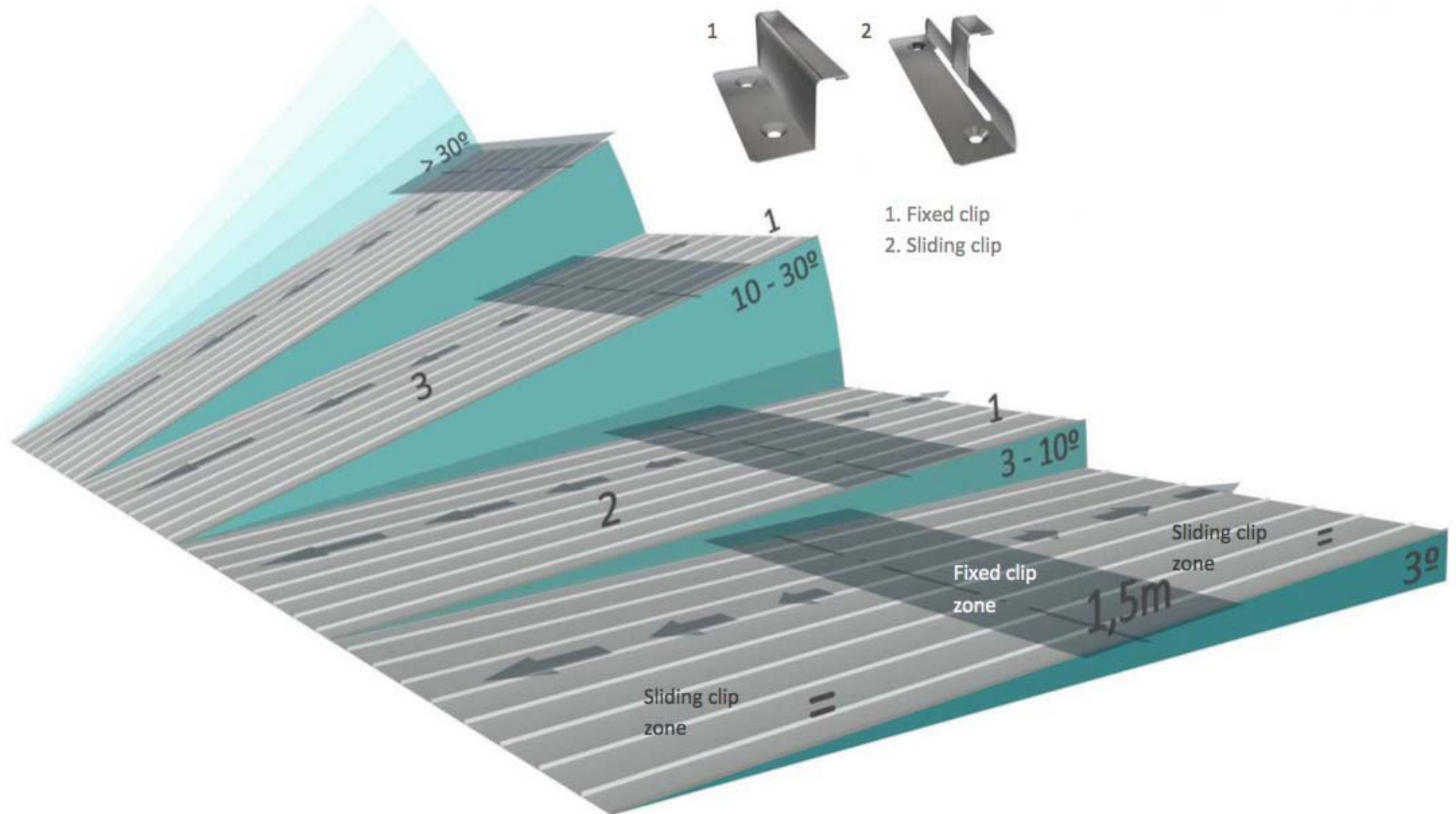
Expansion & Contraction

Example:

- 80' panel
- Temperature expansion coefficient for sheet steel = 0.000013
- Expansion and contraction expected between -10°C and 70°C = $\pm 25.36\text{mm}$ or 1"

Fixed Clip Location

Variables must be considered



Thermal Clips



Entangled Mesh



Low Slope Clip Components

Note: Not ideal for high snow load areas



Courtesy of Flynn Canada

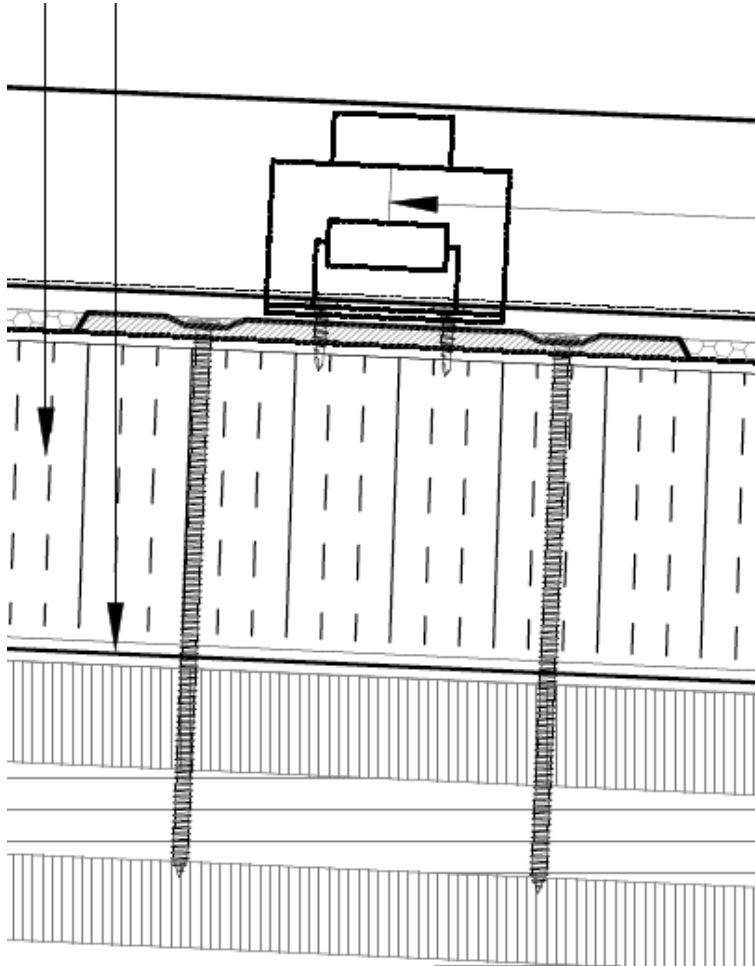
Components assembled



Note: profiled
perimeter
of bearing plate

Courtesy of Flynn Canada

Neoprene Gasket Seal

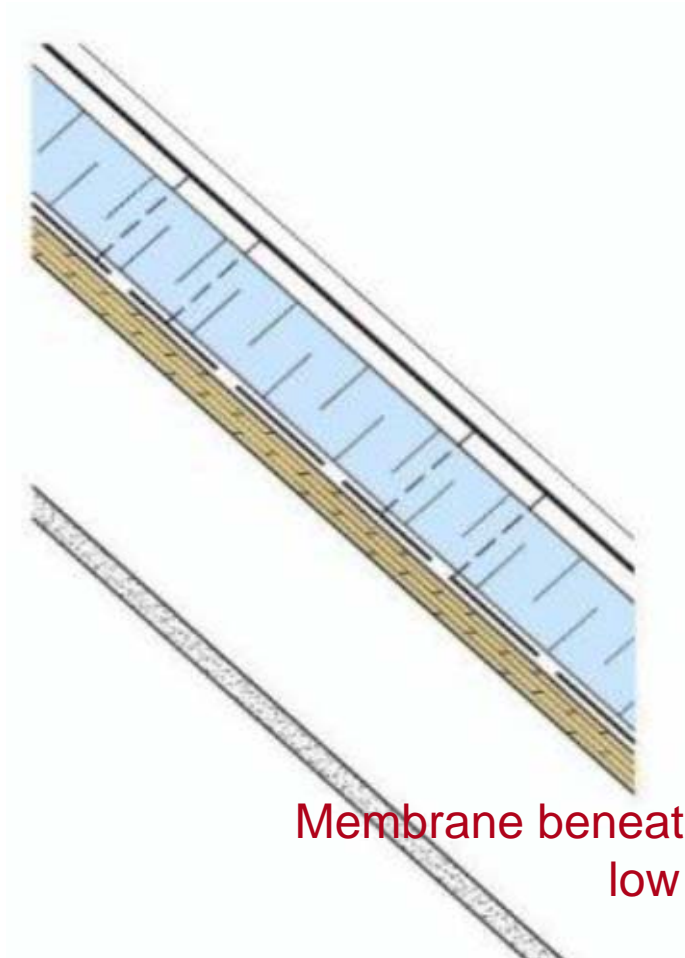


Courtesy of Flynn Canada

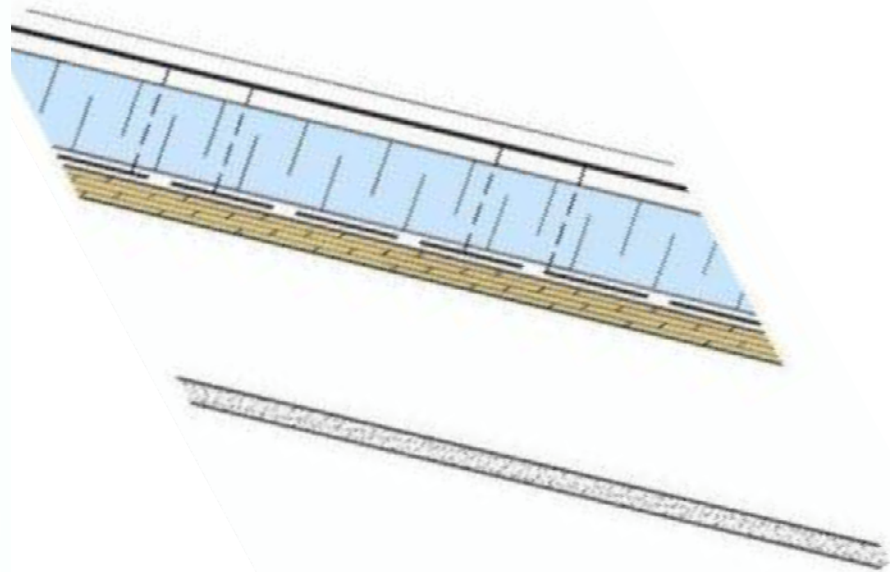


Principals

Steep slope metal roof



Low slope metal roof

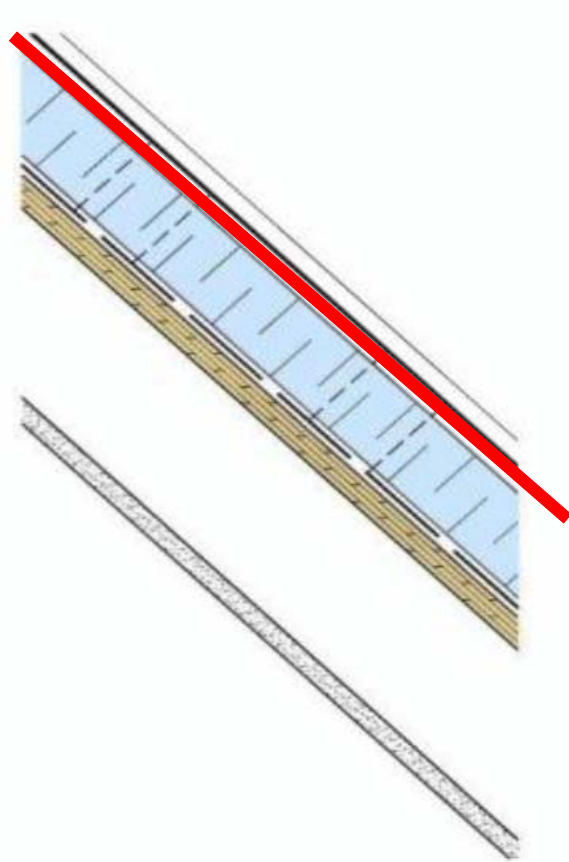


Membrane beneath metal panels varies between low and steep slope

Principals

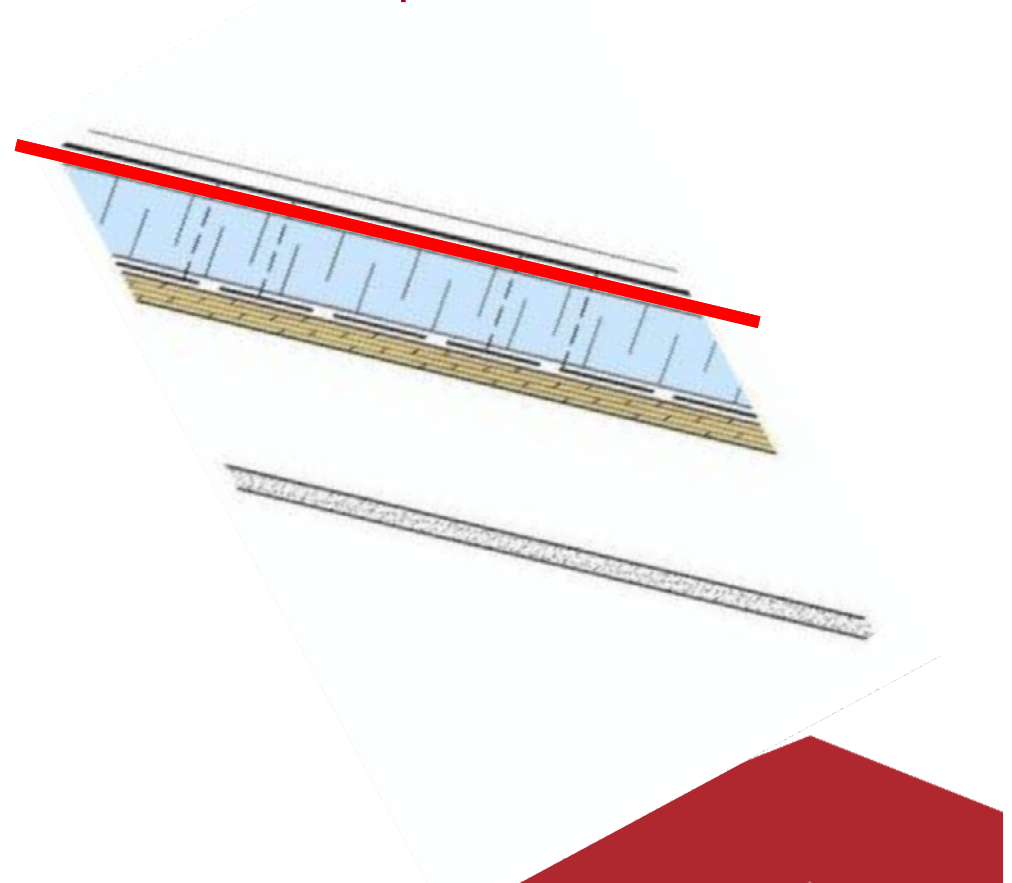
Steep Slope Metal Roof

Vapour Open



Low Slope Metal Roof

Vapour Closed



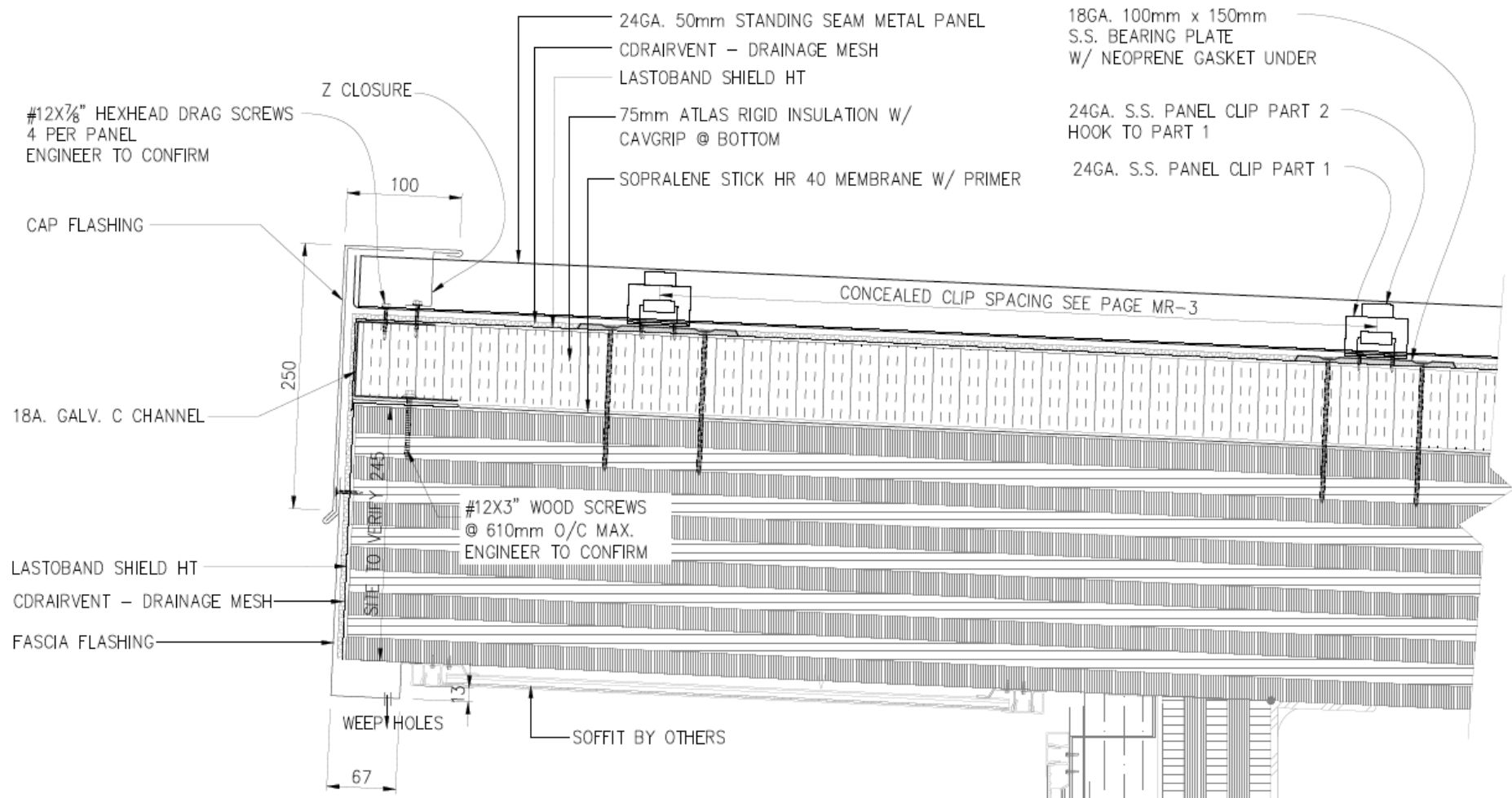
Vapour Open Membranes

- Be aware of vapour open membranes limitations
- Side lap distances?
- Tape seams?
- Walkability surface
- Permeability

Insulations

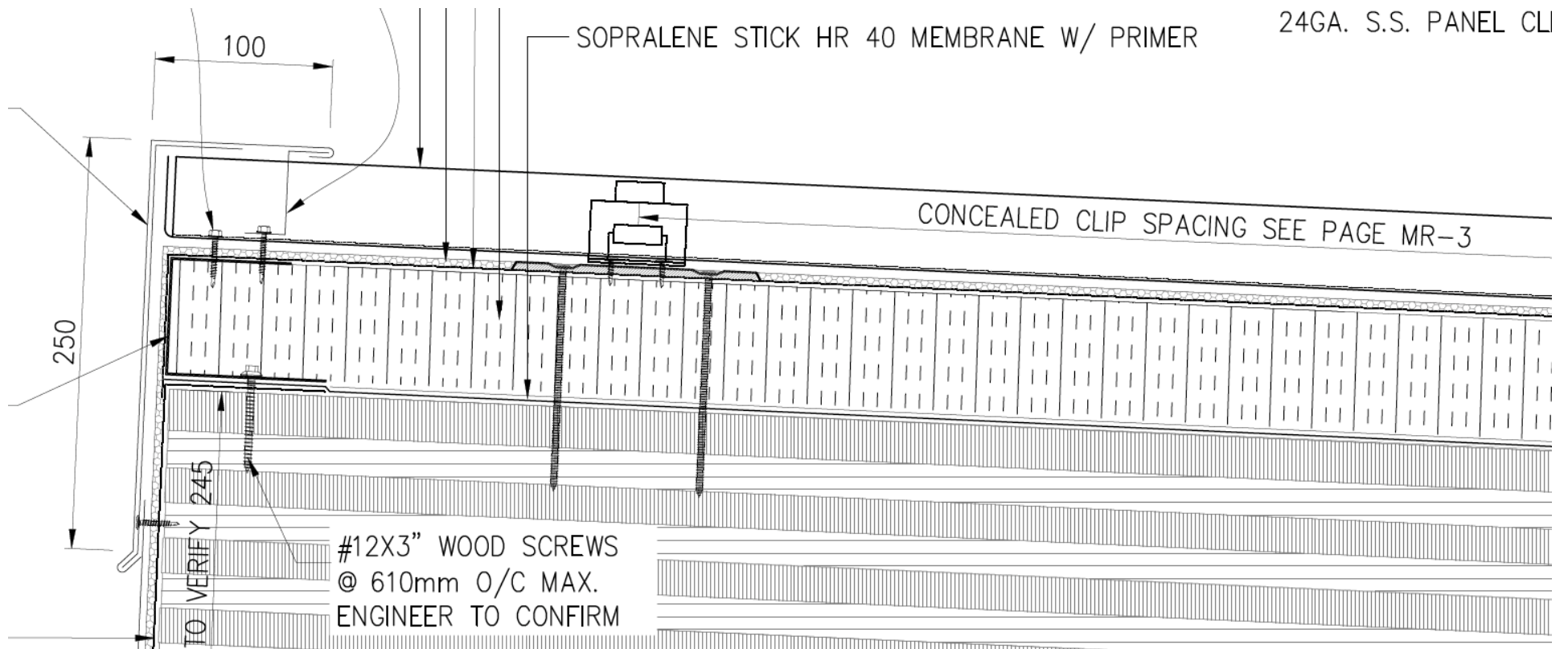
- Be aware of service temperatures of plastic insulations EPS & XPS
- Color of roof
- Avoid the use of wood nailers
- Cover-boards are not necessary
- No one layer to exceed 60% of of cumulative thermal resistance

A Look at Low Slopes < 2/12



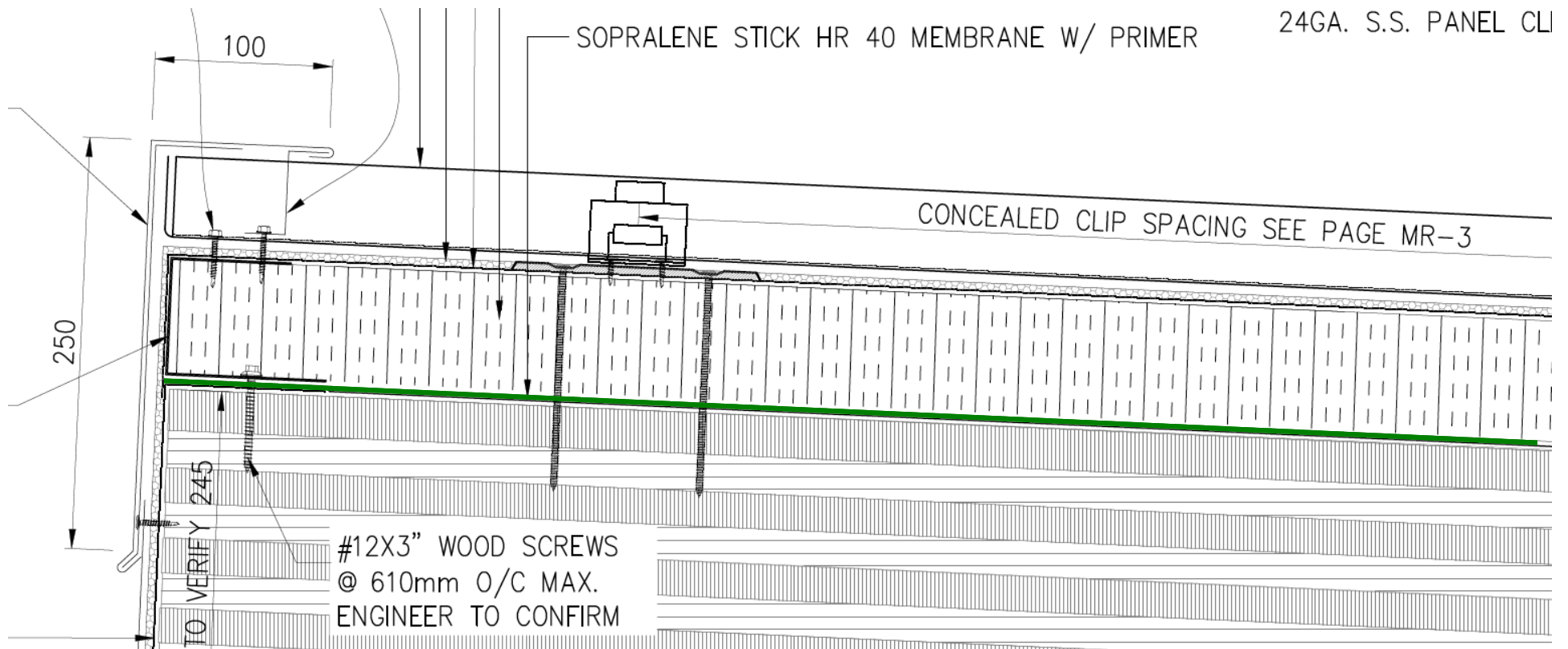
Courtesy of Flynn Canada

Lets look at the layers...



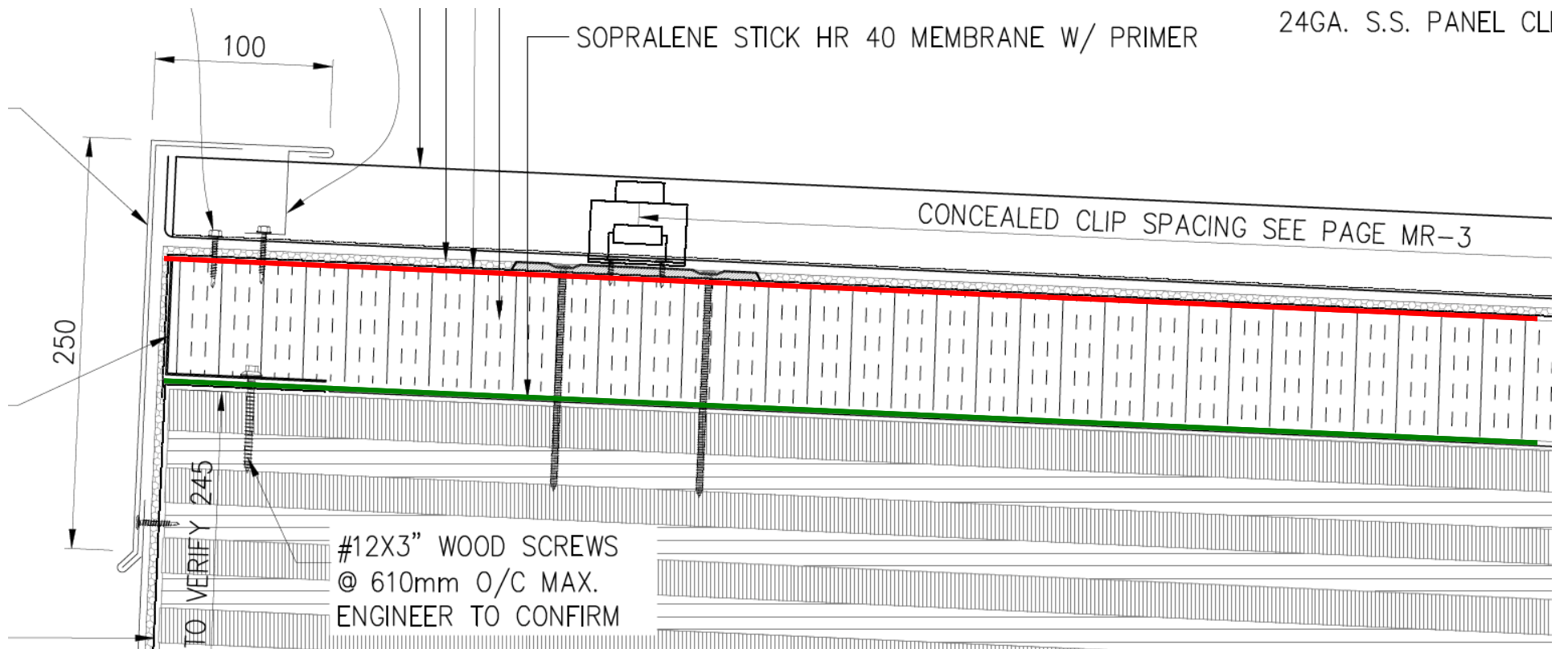
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Air/Vapour Control Layer



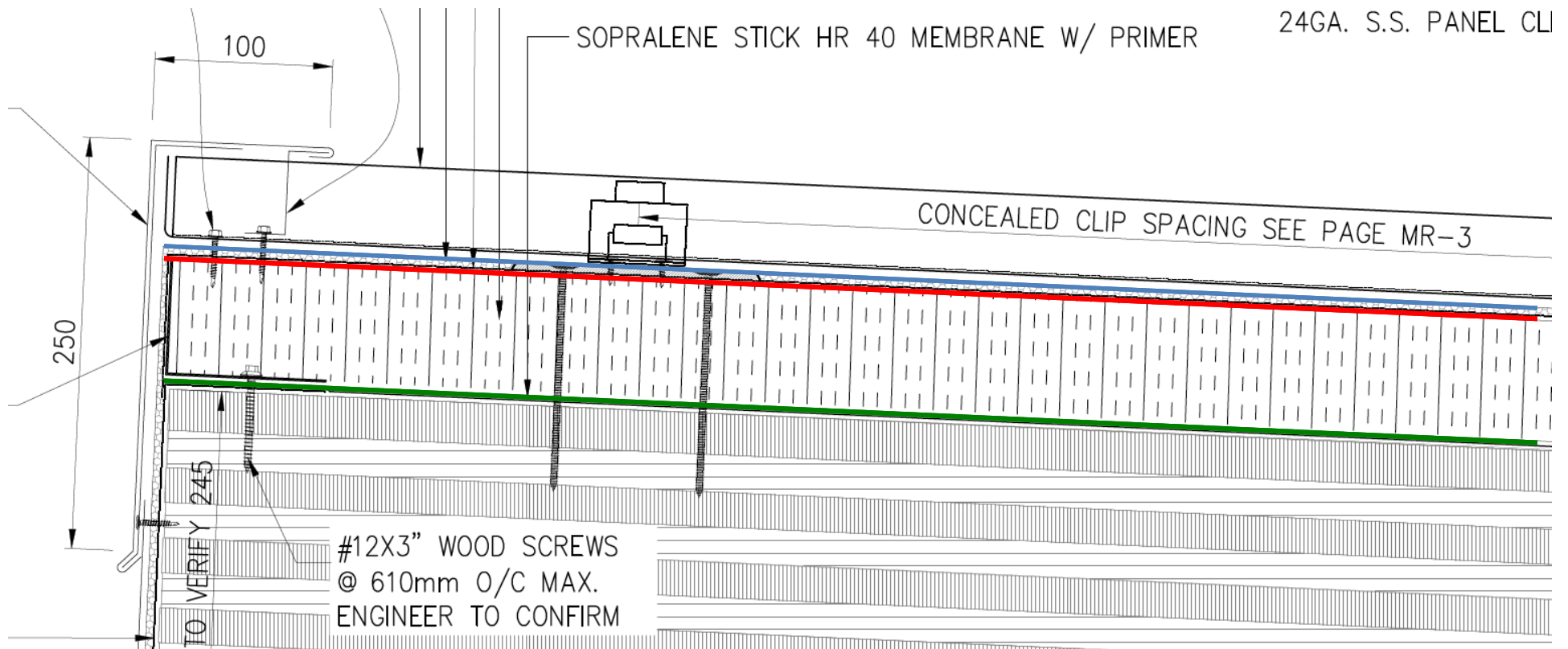
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Water Resistive Layer



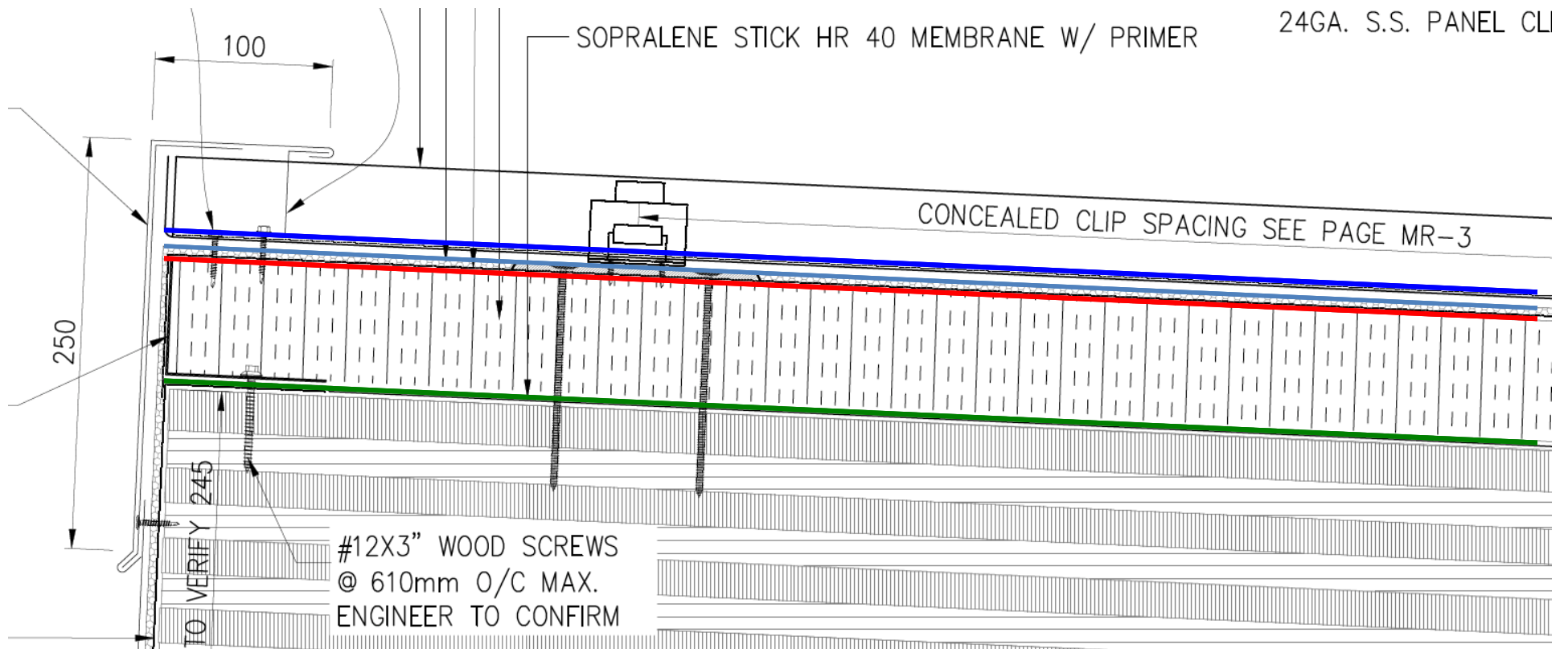
Courtesy of Flynn Canada

Capillary Break / Drainage and Venting Layer



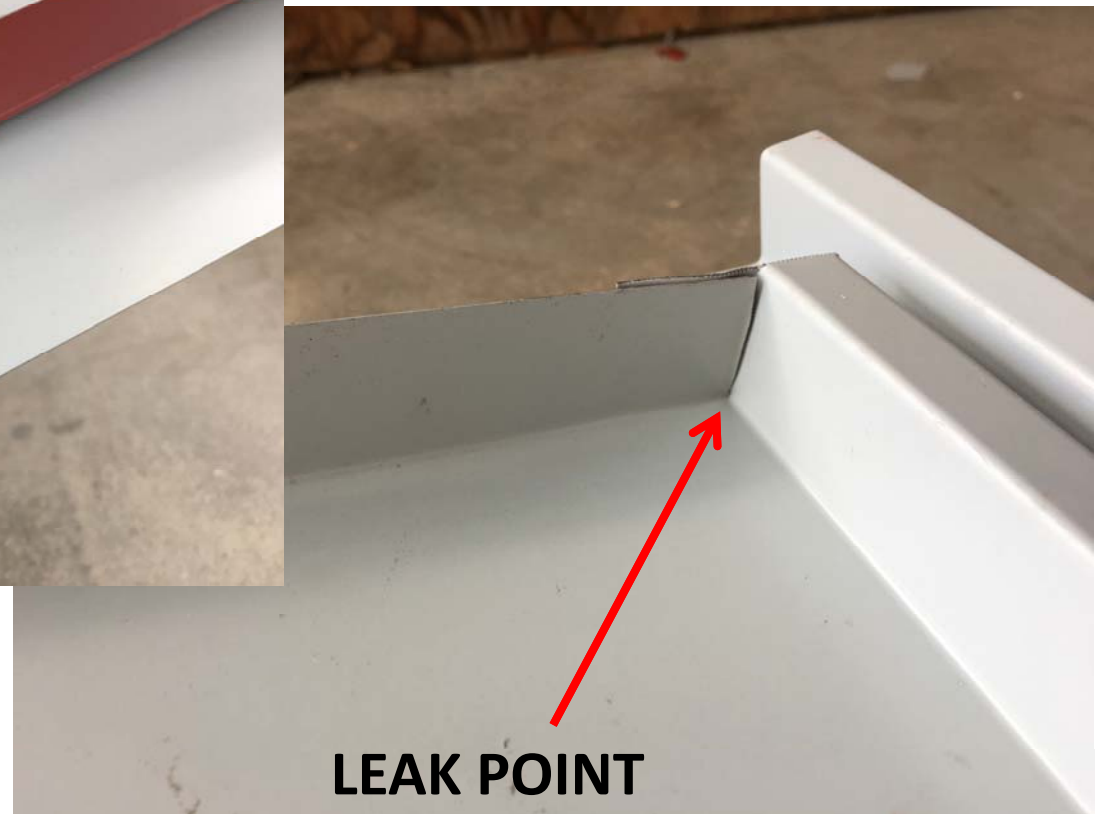
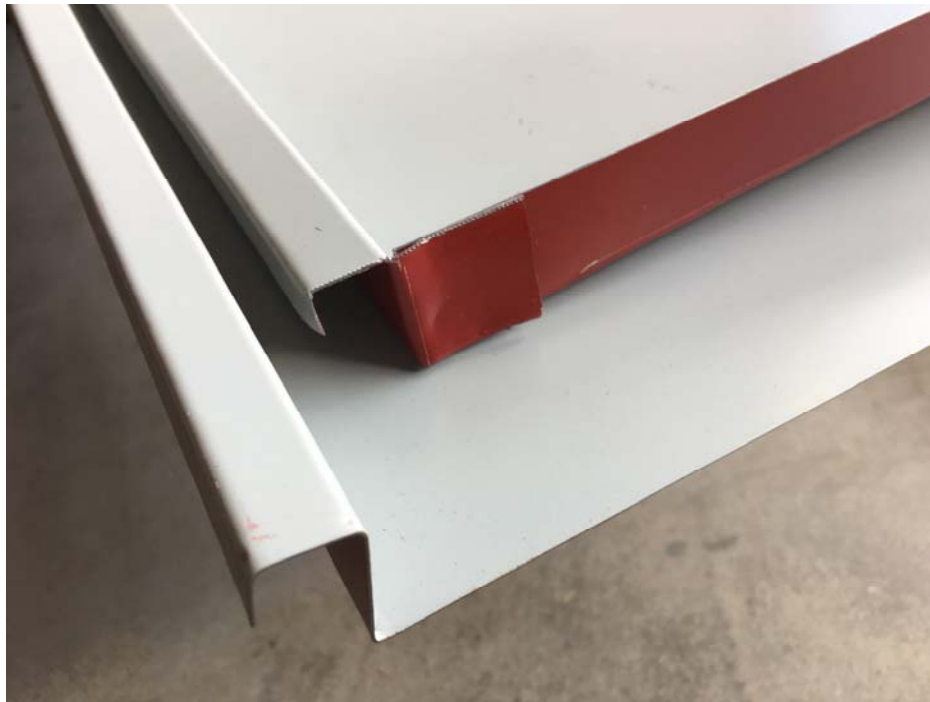
Courtesy of Flynn Canada

Water Shedding Surface



Courtesy of Flynn Canada

Incorrect Bread Pan



Correct Bread Pan



Drag Load Fasteners



Oil Canning – No Striations

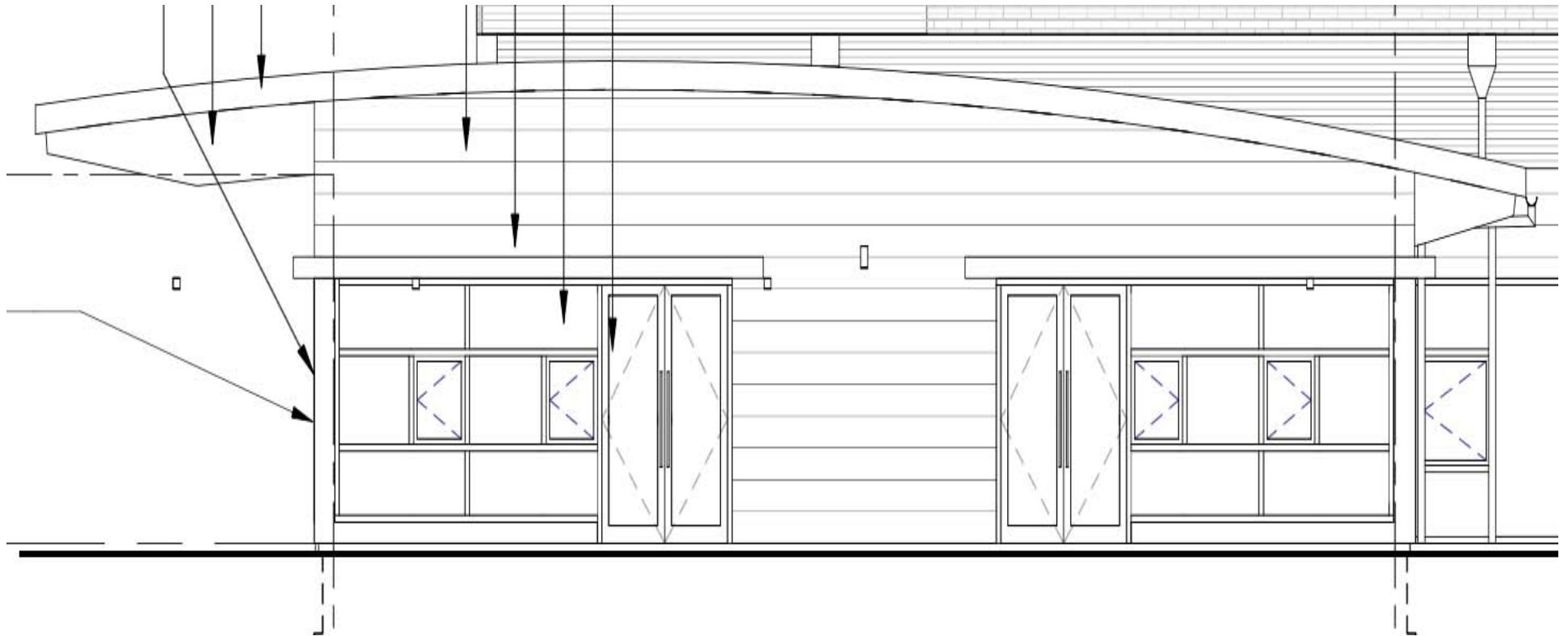


Striations

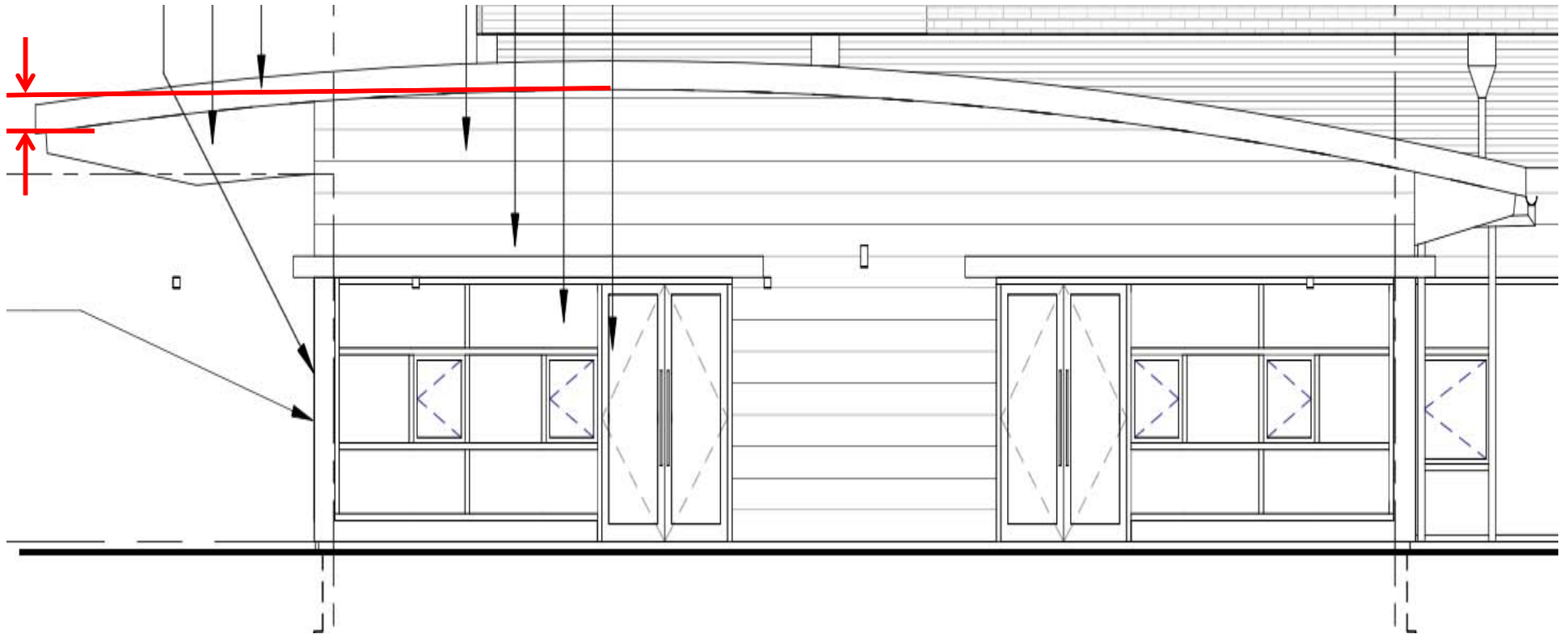


Can also help with air movement

Barrel Roofs



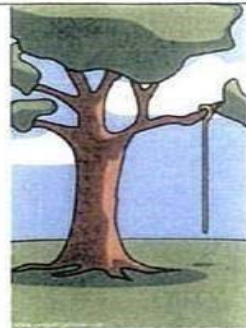
Barrel Roofs



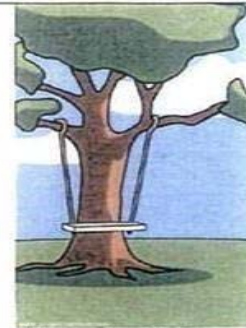
Barrel Roofs



What the Customer Described.



What got budgeted.



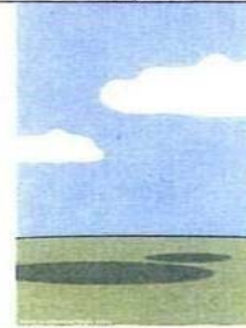
What the Engineer Designed.



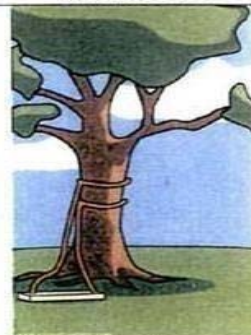
How Manufacturing Installed it.



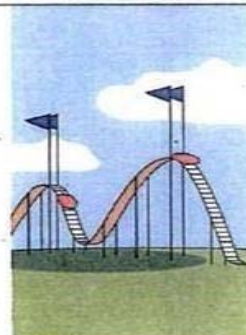
What Marketing Advertised.



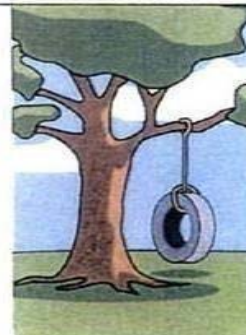
What got documented.



What the Customer finally received.

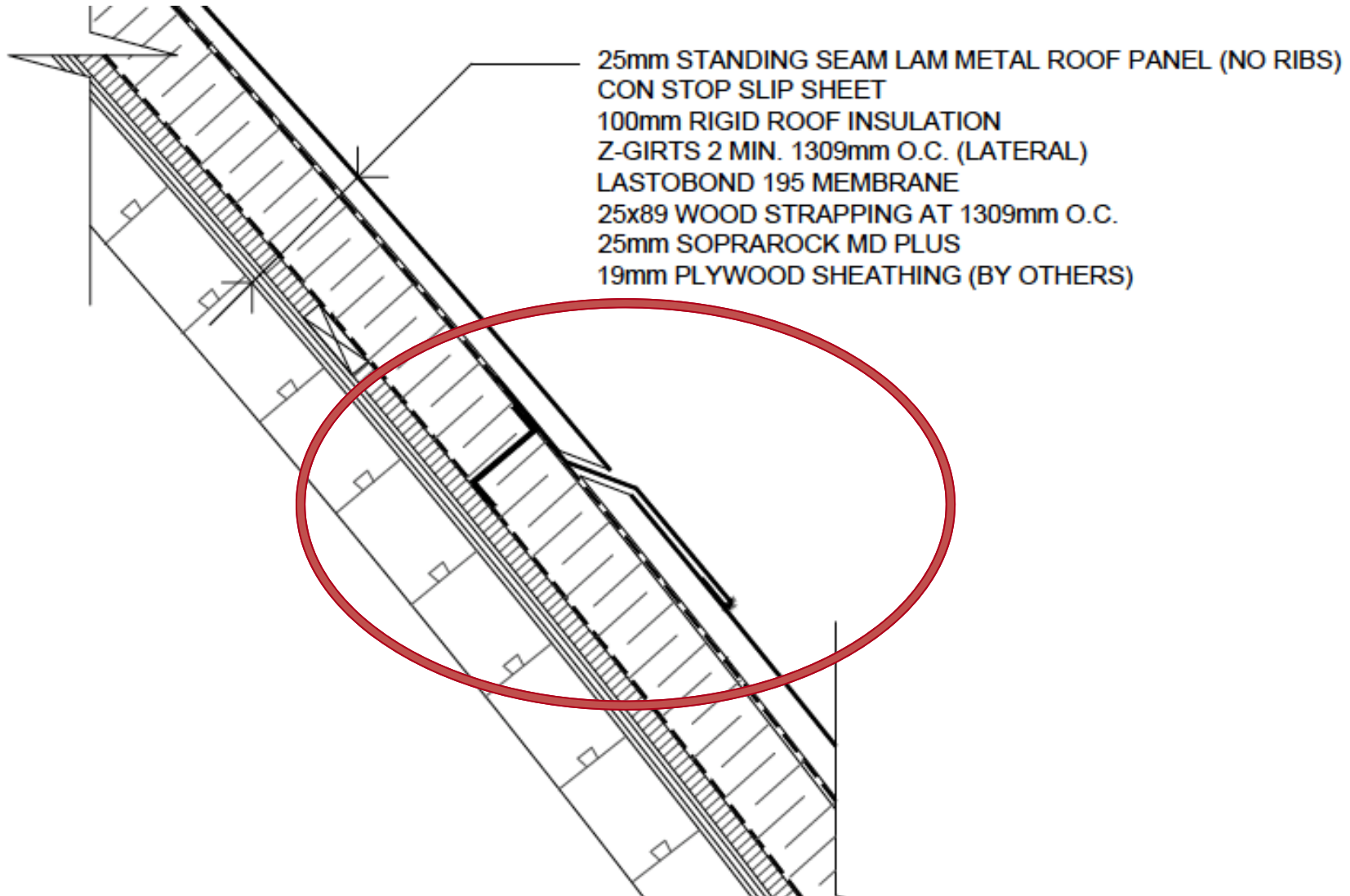


What the customer was billed for.



What the customer actually wanted.

Barrel Roofs – as drawn

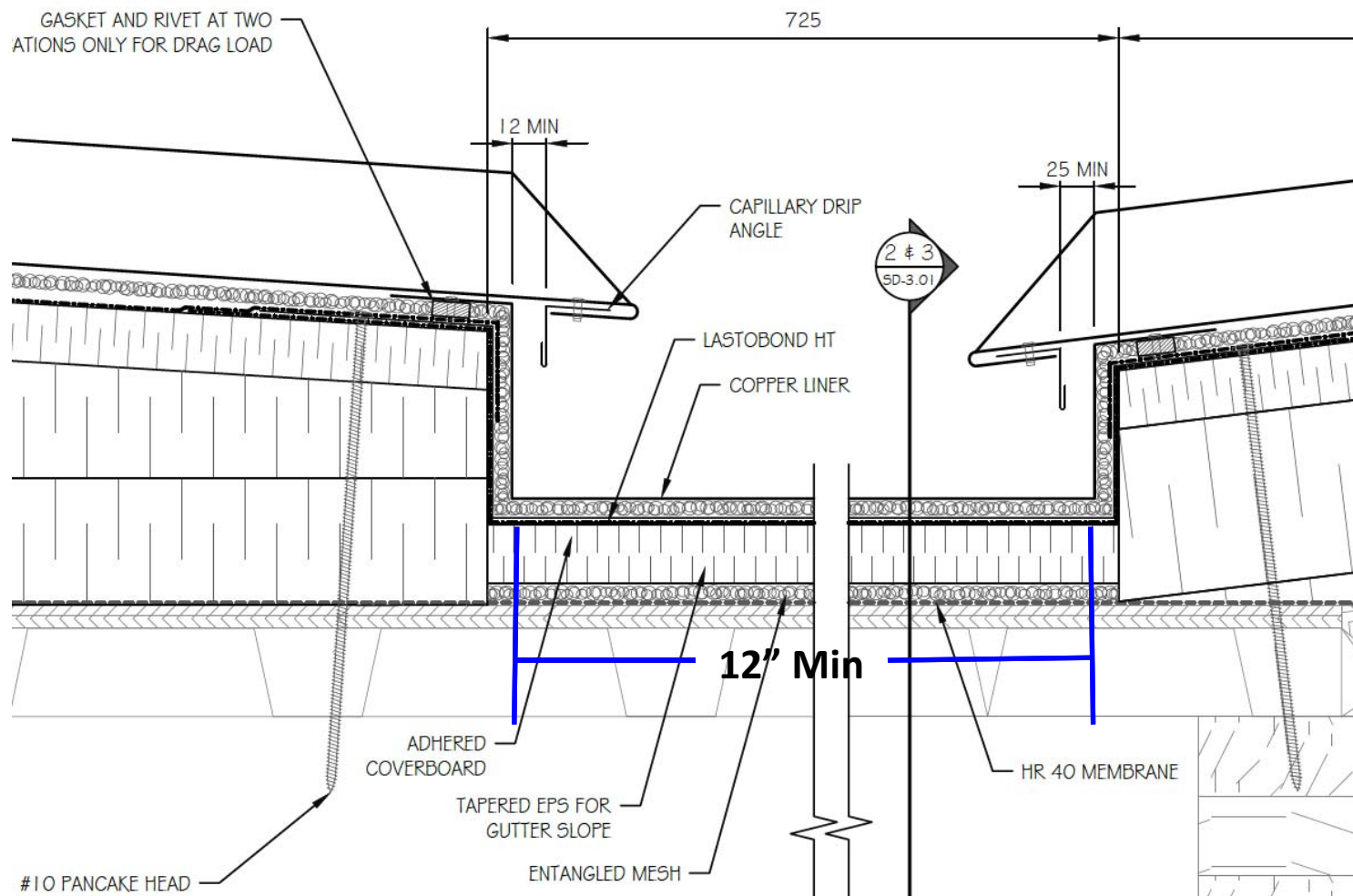


Barrel Roofs- as installed



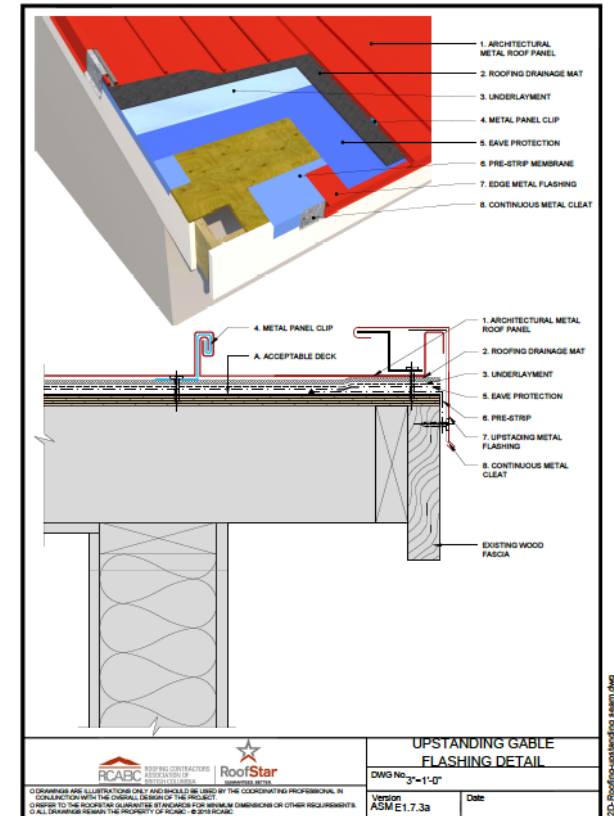
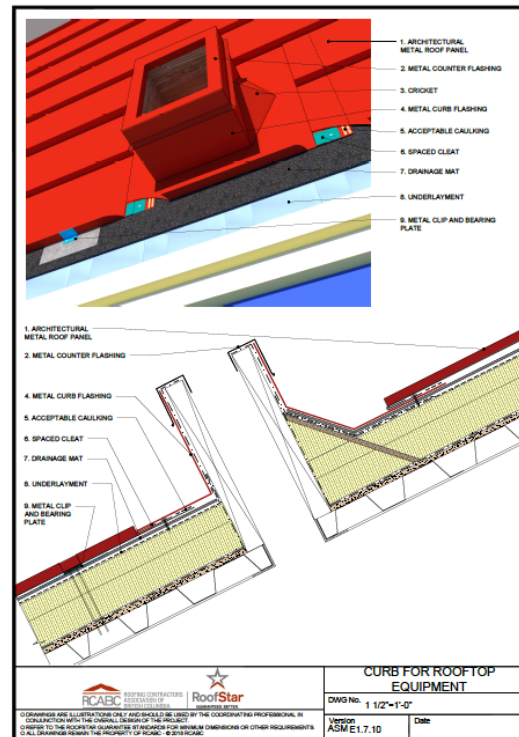
Built-in Gutters

Gutter depth cannot be greater than its width



New ASM standards online

- The latest standards are now online
- rpm.rcabc.org



2D-roofing-upstanding 1-asm.dwg

Thanks – Any Questions?

