



Re: **Mechanically Attached Roof Membrane - Sheet Flutter**

To Whom It May Concern;

This letter is in response to an inquiry about membrane sheet flutter (or billowing) and the potential impact it may have on the performance of the Carlisle roofing system.

Carlisle's mechanically fastened roofing systems incorporate a loose laid reinforced membrane between rows of mechanical fasteners that could be as much as 12 feet apart. Therefore, the membrane is free to move with the presence of positive pressure within a building. Additionally, fluttering of the membrane can occur due to winds that cause a negative pressure and create a lifting force on the roof membrane.

These conditions are considered normal and have been factored into the development of our Mechanically Fastened Roofing Systems. Billowing or fluttering will not impact the performance of the installed system and will not jeopardize the issuance of the Carlisle Membrane System Warranty.

If sheet flutter (or billowing) is of concern to the building owner, efforts can be incorporated into the roof system design to minimize the fluttering. The use of narrower sheets (5'-0" to 8'-0" wide) will limit the amount of billowing that would occur during wind events. To further restrict uplift on the membrane, sealing of the membrane and perimeter conditions to minimize air infiltration at the building perimeter zones will also significantly reduce membrane flutter.

The billowing could also be minimized by incorporating a continuous air barrier over the structural decking prior to the installation of the insulation and membrane system. This would minimize any internal pressure from acting on the underside of the roof membrane.

If you have additional questions or require more information please contact me.

Sincerely,

A handwritten signature in black ink that reads "Kenneth Gingerich".

Kenneth Gingerich
Manager, Project Review and Design
Carlisle SynTec Systems