TECHNICAL BULLETIN

Best Practices for Flat Roofing with Structural Insulated Panels (SIPs)

Structural Insulated Panels (SIPs): An Overview

SIPs are high-performance building panels used for walls, roofs, and floors. They consist of an insulating core (typically expanded polystyrene, polyurethane or mineral wool) sandwiched between two structural facings, usually oriented strand board (OSB). This construction creates a panel that is strong, energy-efficient, and lightweight. SIPs are prefabricated in a factory, which allows for precise sizing and reduces on-site construction time.

Direct Waterproofing Application Over SIPs: Not Recommended

Installing a waterproofing membrane directly over SIPs is generally not advised. This is due to the potential for moisture damage caused by interstitial condensation to the SIPs and their dimensional instability, which can stress the membrane. Leading SIPs manufacturers recommend alternative roofing approaches.

Cold Roof Construction with SIPs

To prevent condensation and ensure the longevity of the SIPs, a cold roof design is recommended. This approach aligns with the guidance provided in BS 5250, which emphasizes the importance of managing interstitial condensation in building structures. A cold roof involves creating a ventilated cavity above the SIPs, adhering to the principles outlined in BS 5250. Above this ventilated space, a separate structural deck, typically plywood or OSB timber boarding, is installed to meet the requirements of the waterproofing manufacturer. This deck provides a stable and level surface for the application of the waterproofing system

Warm Roof Construction with SIPs

Warm roofs can be a viable option for SIPs construction, but careful design and installation are crucial. In a warm roof, the layers are as follows: the air and vapor control layer (AVCL) are installed directly onto the SIPs, followed by the insulation layer, and finally, the waterproofing system on top. This configuration necessitates a high-performance AVCL to prevent moisture ingress from the interior, and it should be meticulously sealed at all penetrations and junctions to maintain its integrity.

To ensure long-term performance, it is highly recommended to conduct a thorough condensation risk analysis for warm roof construction with SIPs. This analysis helps determine the most suitable AVCL product and the minimum insulation thickness required to prevent interstitial condensation within the roof assembly.

TECHNICAL ADVICE:

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