



Technical Bulletin 2023-01

Pre-cast Concrete Roof Decks

(June 22, 2023)

Intent – This technical bulletin is intended to provide clarity to all those involved in the design, installation and review of pre-cast concrete roof decks. By their nature, pre-cast roof decks will vary in dimensional tolerances and deflection, resulting in a roof deck that may not uniform.

Note: This technical bulletin does not cover appropriate duration for curing of the concrete topping slab. Concrete manufacturers, roofing membrane manufacturers and other authorities having jurisdiction may vary on the required curing time.

Information and Issues Noted During Construction

Typically, a topping slab is required over precast concrete decks to eliminate the uneven surface and provide an appropriate roof deck for the roof assembly to be installed.

A concrete pre-cast roof deck will include joints between each panel (length and ends), creating the potential for height variations from panel to panel. The Canadian Roofing Contractors Association (CRCA) Roofing Reference Manual, as well as, other provincial roofing associations and roofing industry standard practices have general requirements to consider for roof deck inspection. The following items are specific to pre-cast concrete roof deck inspections:

1. Joints: Precast concrete decks to have joints grouted
 - a. If grouting joints impedes water drainage, a concrete topping layer is required
2. Level: height difference from panel to panel (the joints) should not exceed 6mm (1/4 in)
 - a. If height is greater than 6mm (1/4 in) but less than 19mm (3/4 in), ensure grout is feathered at a slope of 1:50 from the high panel to the lower panel
 - b. If height is greater than 19mm (3/4 in), a concrete topping layer is required to achieve a level deck surface
3. Finish: the topping slab should be finished with no projections or rough areas over 1mm (1/32 in). The International Concrete Repair Institute establishes various finish profiles. For roofing application, specifically for heat welded membrane installation the finish should be between Concrete Surface Profile (CSP) 3 and 5 with CSP-3 profile recommended.

Considering the above noted requirements in relation to manufacturing and construction tolerances, the design authority should always anticipate the need of the concrete topping slab and calculate/design accordingly. Typical topping slabs are, generally, a minimum of 50mm (2 in) thick to provide a uniform flat surface or to create a sloped roof deck. Adhesion of the roof assembly, particularly the vapour retarder, to the roof deck is essential.





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Contractors should visually review the roof deck for the items noted above and prepare for the roof assembly installation. If there is no topping slab and the Contractor observes issues with the height differences or slope concerns, they should be brought to the attention of the Owners Representative immediately. The roof assembly will likely not be able to be installed without further work to the roof deck and will lead to schedule delays.

Conclusion

A topping slab over precast concrete decks should be integrated into the design of the building structure and scheduled accordingly. The primary purpose of the topping slab is to eliminate the uneven surface issues and provide an appropriate roof deck for the roof assembly to be installed.

Not including a topping slab could result in both project cost overruns and project schedule delays in addition to potential issues with the roofing system installation.

Disclaimer: This Technical Bulletin is not intended to supersede any code, rule, regulation or legislation.



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