



Quality Alert

Bonded composite toppings for pre-stressed concrete planks

Projects are being designed, mainly for roofs using bonded composite toppings which then have a hot melt or bonded roofing material applied. Two issues have been noted with this system.

1. The requirement for top surface of the precast plank preparation to an extent over and above that initially specified, or in some cases when no specific surface preparation has been included in the specification, detailed on drawings or where applicable, measured in the Bills of Quantities
2. The requirement for the finished surface of the bonded screed suitable for the roofing system is not described or included in the specification, detailed on drawings or where applicable, measured in the Bills of Quantities

During the design process for composite structural toppings, the designer makes assessments in his calculations regarding the performance of the bond of the concrete topping with the pre-stressed units and the requirements for the surface texture of the pre-stressed units. **It is not the Contractors choice** what texture is required for the surface of the planks to receive a structural composite topping.

If the design of pre-cast plank and topping is a **Contractor's Design Portion** you must take advice from a competent designer the surface finish and confirm with the Building Designer, to BS EN 1992-1-1, the Classification of Interface Surfaces

It is far more economical to incorporate the specified finish at the time of manufacture rather than texturing the units on site. The surface of the planks must be cleaned of dust and debris ideally by vacuuming and wetted, approximately 30 minutes before placing the topping. (shorter on warm days) leaving a saturated but free of excess surface water surface Check that water does not remain in the cores of wide slab planks.

The **topping is structural concrete** which increases the load capacity of the planks and needs to achieve its full strength. To achieve this the concrete must be cured, usually with a spray applied membrane, the performance of the curing membrane will be included in the specification.

Bonded membrane

The surface finish required by the specified waterproof covering manufacturer must be part of the contract specification for the bonded topping. It is, critical that the requirements of an adequately finished and dry surface are understood before works commence by all parties involved. Weather conditions can heavily influence the drying out process and need to be allowed for. As the waterproof covering is bonded to the bonded topping an adhesion test must confirm the acceptability of the substrate. , The film left on the concrete from the surface applied curing compound can prevent the development of sufficient bond with the waterproof covering. The conundrum faced is the need for curing of the concrete, and the bonding of the membrane. Alternative curing methods are appropriate but each come with their own challenge. Remember that the topping is not a levelling screed but an integral part of the structure. **At pre-construction consider if an alternative design or deeper widespan plank not requiring a bonded topping would mitigate this risk.**

The simpler option is for mechanical preparation of the concrete surface removing the curing membrane applied and producing a texture of finish suitable to receive the bonded membrane.

This advice should be used, where the above is applicable, and the information discussed with your team highlighting the following points:

- The requirement for surface texture of the pre-cast plank should be clearly specified in the contract documents
- Are there alternative structural solutions for the floor to avoid bonded structural toppings
- Design falls should take into account any construction tolerances and potential deflection. No backfall or ponding is acceptable even on zero fall defined roofs.
- Adhesion test should be carried out at regular intervals <50m²

Toolbox Talk Packages (put an 'x' next to the related work packages):

Brickwork / Blockwork	Doors & Windows	X	Roof	Drainage	Frames	Roads, Paths, Pavings & Surfacing	Site preparation works
Substructure	FFE		Flooring	Internal walls & partitions, Ceilings	Joinery / General Carpentry	Painting	Fire & Lightning protection
Walling (Tiling)	Electrical installations		Services / Systems	Water installations	DFMA (Offsite Manufacture)	Design	Miscellaneous



Everyone has the right to be

100% Safe