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## INSITU STRUCTURAL CONCRETE TOPPINGS FOR COMPOSITE PRECAST FLOOR CONSTRUCTION

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1). In offering a design solution to use pre-cast floor units compositely with a structural topping **Carter Concrete Ltd.** cannot accept responsibility for the supply and laying of the topping undertaken by others.

2). Structural Topping ; To be designed by Clients Engineers.

**Carter Concrete Ltd.** recommendations for Structural Topping to be as the following :-

Specification for Concrete :- See BS 8500 Concrete (2006) – Complementary British Standard to BS EN 206-1 and standard Notes on layout drawings or similar approved.

Typical recommended specification of a concrete mix :-

Concrete Mix Specification for Insitu Reinforced concrete for structural toppings for pre-cast Floor Construction :-	
Compressive Strength Class of Concrete	C32 / 40
Minimum cement content :-	360 kg/m <sup>3</sup>
Maximum cement content :-	460 kg/m <sup>3</sup>
Maximum free water / cement ratio	0.45
Maximum aggregate size :-	10mm
Chloride content class :-	Cl0,20
Consistence Class :-	S3
Class of Cement :-	CEM I 42,5R
Admixture :- ( see Engineers Specification)	None
Min. / Max temperature of fresh Concrete :-	5 / 30
Intended Working Life of Structure :-	50 years
Nominal Cover to all reinforcement :-	25mm
Exposure Class :-	XC3 / 4

Workability or Slump for the concrete mix will be to suit the method of placement. If a topping with high workability is to be used, i.e. a pumped mix, the main contractor must give consideration to sealing the joints between the pre-cast units to prevent excessive grout loss (See item 7 below).

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- 3). Reinforcement in topping to be designed by Clients Engineers. Nominal reinforcement must be provided in all cases (especially when the Clients Engineer has not specified the reinforcement) to limit shrinkage cracking. Nominal reinforcement should be located at mid-depth within the topping and the following mesh types (to BS 4483) are adequate for most applications.

<u>Depth of In situ Topping</u>	<u>Recommended Mesh</u>
Up to 50mm	A98
50mm to 150mm	A142
150mm to 200mm	A193

Minimum top cover to transverse reinforcement on Beam Units to be 25mm. Minimum transverse reinforcement in topping for Pre-stressed concrete Units to be R6 @ 600 mm centres or A98 mesh to be laid direct on top of units and to project 450mm into adjacent bays spanning at right angles.

- 4). When **Carter Concrete Ltd.** floor units are designed to act Compositely, the structural topping must be effectively bonded to the pre-cast unit. The Horizontal Shear Stresses which will exist at the interface of the pre-cast unit and the in-situ topping are resisted by the frictional forces developed between the two contact surfaces. In the majority of situations the "as cast" finish on the pre-cast units as defined in BS 8110 Part 1 Table 5.5 is sufficient to bond the two components, Therefore, no additional roughening of the top surface is normally required.
- 5). The following procedures are recommended for the laying of the structural topping. Further guidance can be found in BS 8204 Part 2 1987.
- 6). Before placing the structural topping the top surface of the pre-cast unit must be cleaned of all loose material and thoroughly wetted with clean water.

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- 7). It is recommended that grouting between the pre-cast units and placing the in - situ topping is carried out in one operation by the main contractor. Unless stated otherwise the joints between pre-cast units will be left UNGROUTED by **Carter Concrete Ltd.**

If joints between the pre-cast units are to be sealed before placing the structural in-situ topping this can be carried out by the Main Contractor in one of the following ways :-

- a). Tape or Foam Rod at top of flange joint (50mm from bottom of the unit)
  - b). Concrete or sand cement mortar to within 50mm from the bottom of the unit.  
The grout material shall be compacted into the joint from the top. Any infilling within the bottom 50mm of the joints or dubbing out of the soffit of the Unit shall be by the Customer.
  - c). Temporary support timber battens along underside of joints.
  - d). Part fill joints (approx.2/3rds) with cement grout. Care must be taken to avoid excessive cement laitance on the tops of pre-cast units when grouting as this may affect the bonding required.
- 8). Construction joints in the structural topping should be located over the supports of the pre-cast units. Joints in the topping are to be located and designed by the Clients Engineer in all cases.
- 9). The structural topping should be cured in accordance with the recommendation of BS 8110 Part 1 cl 6.6.etc.  
The correct use of a curing membrane, polythene or Hessian sheets will aid adequate curing.
- 10). Pre-stressed units have an upward camber which varies with load and span etc. and allowance must be made for this when determining bearing levels, structural topping, screed, floor finishes etc. The specified depth, thickness of the structural topping is a MINIMUM.
- 11). Partition walls **MUST NOT** be built off the pre-cast units but off the topping.