

WATERPROOF, DAMP-PROOF AND CORROSION RESISTANT CONCRETE PERFORMANCE SPECIFICATION FOR MEMBRANE-FREE DESIGN AND CONSTRUCTION

The design intent of this specification is the prevention of the transmission of water, moisture and dampness through the concrete and to protect the steel reinforcement from corrosion. All concrete (SPECIFY AREAS) to be constructed in accordance with the drawings and to contain a waterproofing admixture system which must meet all of the following requirements:

1. Minimum cement content, CEM1, 335kg/m³. Portland cement replacements (Referred to as 'Additions' in BS8500, e.g. ggbs, pfa, limestone and silica fume) may be used subject to the approval of the structural engineer and the minimum total cementitious content being 350kg/m³.

In regard to the use of cement replacement materials, it is the responsibility of the concrete supplier to ensure that the use of such materials does not compromise the properties of the concrete and that the required compressive strength is achieved. Where the concrete supplier does not already have contemporary test data for a mix design to be used, a trial mix should be carried out to determine the characteristics of the concrete and to confirm that the required properties of the concrete will be met, including the requirements not to exceed the maximum water absorption rates stated below when tested under BS 1881:122 and BS EN 480-5. Such trial mix is wholly the responsibility of the concrete supplier;

2. The free water:cement ratio shall be no greater than 0.45;
3. The concrete shall have a corrected 30 minute water absorption of not greater than 1% (one percent) as measured by BS 1881-122:2011, when concrete samples are made in accordance with BS EN 480-1:2014, except that the age at test shall be 7 days (note that oven drying starts 4 days before test), and shall have an absorption value of less than 25% of control when tested in accordance with BS EN 480-5:2005, tested for 28 days after 90 days curing.
4. Any admixture or ingredient used to comply with the absorption requirement must be shown by an independent authority to have been used in concrete exposed to an aggressive environment for a minimum of 25 years without significant deterioration of the cement matrix, embedded reinforcing steel or measurable reduction in the absorption performance of the concrete;
5. Admixtures must contain no chlorides. The supplier shall satisfy the engineer that any admixture or ingredient used, or their combination, does not detrimentally affect the strength or other properties of the concrete;
6. The admixture supplier is to attend the concrete batching plant to ensure correct dosing of the admixture into the concrete and to be on site to record where the concrete is placed and the circumstances of the placement;
7. If requested, the admixture supplier must be able to act as the 'basement waterproofing specialist', as defined in BS8102:2009, and hold professional indemnity insurance of not less than £1m any one claim for this activity;
8. The manufacturer of the waterproofing ingredient to provide a guarantee of not less than 12 years against the visible migration of water through properly compacted concrete containing the ingredient which has been placed in accordance with the manufacturer's specification;
9. The waterproofing admixture must be CE marked in compliance with the Construction Products Regulation as a water resisting admixture; and
10. The selected admixture system to hold an Agrément certificate for use in structural concrete, certifying compliance for use in the specified areas in accordance with the relevant national standards or building regulations without the need for a membrane or other barrier system and shall be approved in writing by the design engineer.