

# DAMP-PROOF CONCRETE PERFORMANCE SPECIFICATION FOR MEMBRANE-FREE DESIGN AND CONSTRUCTION

To prevent the ingress of moisture and dampness and to protect steel reinforcement, all concrete (SPECIFY AREAS) to be constructed in accordance with the drawings and to contain a time-proven specialised admixture system wherein:

- The minimum content of cementitious material (in kg/m<sup>3</sup>) shall be:

<u>Mix</u>	<u>Total Minimum Cementitious Materials</u>	<u>Minimum PC</u>
PC only	335	335
PC + ggbs	350	105
PC + pfa	350	227

The maximum percentage cement replacement the contractor can use in the design of the mix is:-

PC + ggbs	ggbs not to exceed	70%	of total cementitious content
PC + pfa	pfa not to exceed	35%	of total cementitious content

The use of ggbs or pfa is subject to the engineer's approval of the source of the material.

- The free water cement ratio shall be no greater than 0.45.
- The concrete shall have a corrected 30 minute water absorption of not greater than 1.0 (one) % as measured by BS 1881: Part 122: 2011, except that the age at test shall be 7 days. (Note that oven drying starts 4 days before the test). The absorption test is to be conducted on cores taken from cubes or cylinders as specified in the standard, unless the use of cast specimens is approved by the engineer.  
  
Prior to construction, trial mixes are to be conducted under the supervision of the engineer or his representative to confirm that the proposed mix conforms with this absorption requirement.  
  
During construction, absorption samples shall be taken as directed by the structural engineer. These shall be tested as above and shall conform with the absorption requirement.
- The concrete as placed and cured in the actual structure is required to comply with the water absorption limit within 7 days of placement. The engineer reserves the right to take cores to confirm compliance.
- Any admixture or ingredient other than cement, aggregate or approved water reducing admixture, used by the contractor 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.
- 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.
- 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.
- 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 for this activity.
- The manufacturer of the waterproofing ingredient to provide a guarantee of not less than 10 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. In addition, for business customers only, the manufacturer's guarantee shall be independently insurance backed.
- 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, shall comply with the mandatory conditions of BS EN 934-2:2001 tables 1 & 9 (Water resisting admixtures for concrete), and shall be approved in writing by the design engineer.