

E10 MIXING/CASTING/CURING IN SITU CONCRETE

132 DESIGNED CONCRETE FOR ALL BASEMENT FOUNDATIONS, RETAINING WALLS, WALLS AT BASEMENT LEVEL (and/ or as appropriate) = (WATER-RESISTING CONCRETE) (See clause 418)

- Reinforcement/ embedded metal: Yes.
- Compressive strength class (cylinder/ cube): C28/35 (minimum).
- Target density (oven-dry): Normal.
- Aggregates:
 - Size (maximum): 20mm.
 - Type/ Density: Normal weight.
 - Recycled coarse aggregates: Subject to approval by Structural Engineer.
 - Other requirements: absorption not greater than 3%.
- Design chemical class: As required, based on Site Investigation.
- Limiting values for composition:
 - Water/Binder ratio (maximum): 0.45.
 - Binder (CEM1) content (minimum): 335kg/m³.
 - Binder/ Combinations:

The minimum material content of cementitious combinations (in kg/m³) shall be:

Mix Binder materials	Minimum Total binder content	Maximum % of replacement material
CEM1 + GGBS	350 kg/m ³	70%
CEM1 + pfa	350 kg/m ³	35%

The use of GGBS or pfa is subject to the Consulting Structural Engineer's approval of the source of the material

- Air content: No Requirement.
- Consistence class: S2 recommended unless otherwise agreed
- Binder/Combinations: CEM I 42.5N, 52.5N
- Chloride class: CL 0.40.
- Admixtures: Everdure Caltite System from Cementaid UK Limited.
- Mix design to include (as per producers specifications, **see also clause 418**):
 - a. Superplasticiser conforming to tables 3.1 and 3.2 of BSEN 934-2:2009 for use as a high range water-reducing admixture (dosed as required to achieve a minimum 20% water-reduction).
 - b. Everdure Caltite: 30 litres per cubic metre of concrete

All other producer's specifications and recommendations to be followed.

The BBA Certificate No 93/2888 to be provided.

- Colour: Not required.
- ACEC class: AC-1.
- Exposure Class: (as required)
- Concrete Cover to be 25 - 50 mm at the top surface.
- Other requirements: See clause 418

E 10 - 418 Proprietary Admixture

Type: Integral waterproofing/damp-proofing
Manufacturer: Cementaid UK Limited
Product reference: **EVERDURE CALTITE SYSTEM**
Special Requirements:

SPECIFICATION DETAILS

DETAILED SPECIFICATION

Concrete:

All concrete must conform to current British Standard Specifications and be designed, WITHOUT ADDITIVES, for a compressive strength complying with the requirements of at least C28/35 (BS8500), or greater if required as specified in the relevant clauses. The concrete must contain a minimum of 335kg CEM1 cement per m³ (or minimum 350kg/m³ combination cement as per Clause 132, with the cementitious content being stated on the delivery docket) and have a W/C ratio not in excess of 0.45.

Admixtures:

All concrete shall contain Everdure Caltite at the rate of 30 litres per m³. In addition, a Superplasticiser conforming to tables 3.1 and 3.2 of BSEN 934-2:2009 for use as a high range water-reducing admixture (dosed as required to achieve a minimum 20% water-reduction) shall be included. No other admixtures or ingredients are to be included or allowed for in the concrete unless specifically authorised by Cementaid in writing. The water requirement is to be reduced accordingly to allow for the effect of the admixtures on the concrete slump. The concrete is to be thoroughly mixed.

Trial Mixes:

Where requested by the Consulting Structural Engineer, or as required by QSRMC (The Quality Scheme for Ready Mixed Concrete), the concrete supplier, with Cementaid present, shall mix and test a trial mix of concrete with the Everdure Caltite System ingredients to confirm that the enhanced concrete conforms to strength, consistence and any other requirements.

Consistence (Slump):

Consistence class is to be in accordance with the requirements of S2 (EN206) unless agreed in writing. Flowing concrete, or consistence in excess of S2, is only allowed when the mix design is altered to accommodate such a requirement with the approval of the Consulting Structural Engineer and Cementaid.

Concrete Suppliers:

Not all concrete suppliers are approved for supplying Everdure Caltite System quality concrete. The Contractor should check with Cementaid for approved suppliers before ordering concrete. Cementaid approval does not remove responsibility for basic concrete quality, in respect of its compressive strength or minimum cement content, from the concrete producer or the Contractor.

Reinforcement:

All reinforcement shall be high tensile rib deformed bar to the Consulting Structural Engineer's detail drawings.

Placing:

Concrete shall not be placed at concrete temperatures below 5⁰ C, nor above 30⁰ C, and must be placed according to current Codes of Practice and Cementaid recommendations. Concrete received from the batch plant which cannot be placed free from honeycombs shall be rejected by the Contractor. Care shall be taken to fill every part of the forms, to force concrete under and around reinforcement without displacing it, to work back coarse aggregate from the face and to remove all air bubbles and voids. Compaction shall be assisted by a sufficient number of appropriate immersion type vibrators. These shall not be held against forms or reinforcing steel or used for spreading concrete into place. Vibrators shall not be held in one place so long as to result in segregation of concrete materials or formation of laitance on the surface.

NB: Unless agreed in writing, pour sizes must be within the limits of current Codes of Practice. If in doubt, please contact Cementaid to discuss.

Finishing:

All concrete to be properly finished according to the Architect's or Consulting Structural Engineer's specification.

Curing and Cooling:

Proper curing shall be carried out in accordance with the appropriate British Standard. For slabs, curing should start immediately after finishing and as soon as the concrete can withstand a man's weight without marking. For larger slabs, curing should be done in sections and this is especially the case with powerfloat finishes where commencement of curing must not be delayed. For walls, the top surface must be appropriately covered as soon as finishing is complete. Curing of the walls must commence immediately the formwork is removed. All concrete surfaces are to be protected from direct sunlight and frost by appropriate covering during the curing period. The curing time should be for a minimum of 72 hours after placement or longer as specified. Spray-on curing membranes are not recommended unless the immediate use of plastic sheeting over wet hessian will mark the concrete. Where a resin-based curing membrane is used under such circumstances, it should have a minimum 90% efficiency rating. Covering with wet hessian and plastic sheeting should commence as soon as practicable thereafter.

Loading:

Loading of the structure, including back-filling, is not permitted until the concrete has reached the strength specified by the Consulting Structural Engineer and approval has been given.

Site Attendance:

A representative of Cementaid is to be in attendance at the batch plant and on site during all Everdure Caltite pours. Cementaid is to be notified by the Contractor at least 7 working days before the first intended placement of Everdure Caltite System concrete and thereafter at least 24 hours before each placement. Such site attendance does not constitute supervision, which remains the responsibility of the Contractor.

Construction and Movement Joints:

Construction or day joints shall conform to the details supplied by Cementaid. Movement joints are permitted but their performance is not guaranteed by Cementaid unless the proposed movement joint construction is agreed to by Cementaid in writing and is acceptable to the Consulting Structural Engineer. In particular, the design of suspended structures must allow for the expansion and contraction of the concrete due to temperature changes, both during construction and in its final form, to relieve stresses likely to cause cracking.

Section Thickness:

Slab and wall thicknesses are to be as specified and, unless agreed by Cementaid in writing, the minimum section thicknesses permitted for slabs or walls is 200mm.