

**E10****MIXING/ CASTING/ CURING IN SITU CONCRETE**

To be read with Preliminaries/ General conditions.

**CONCRETE**

101

**SPECIFICATION**

- Concrete generally: To BS EN 206-1 and BS 8500-2.

105

**DESIGNATED CONCRETE for trench-fill foundations and pads**

- Designated concrete: GEN 3.
  - Aggregates:
    - Size (maximum): 20mm.

125

**SUBSTITUTION OF STANDARDIZED PRESCRIBED CONCRETE FOR DESIGNATED CONCRETE**

- General: Conform to BS 8500-2, clause 8.
- Substitution: In accordance with BS 8500-1, table A.7.
  - Proposals: Submit for each substitution, stating reasons.
- Mixing: If standardized prescribed concretes are made on site conform to BS 8000-2.1, subsections 2, 3 and 4.

**MATERIALS, BATCHING AND MIXING**

215

**READY-MIXED CONCRETE**

- Production plant: Currently certified by a body accredited by UKAS to BS EN 45011 for product conformity certification of ready-mixed concrete.
- Source of ready-mixed concrete: Obtain from one source if possible. Otherwise, submit proposals.
  - Name and address of depot: Submit before any concrete is delivered.
  - Delivery notes: Retain for inspection.
- Declarations of nonconformity from concrete producer: Notify immediately.

225

**CHANGES TO SPECIFICATION**

- Changes to specification of fresh concrete (outside concrete producer's responsibility): none

315

**AGGREGATES FOR EXPOSED VISUAL CONCRETE**

- Limitations on contaminants: Free from absorbent particles which may cause 'pop-outs', and other particles such as coal and iron sulfide which may be unsightly or cause unacceptable staining.
- Colour: Consistent.
- Supply: From a single source and maintained throughout the contract.
- Samples: Submit on request.

415

**ADMIXTURES**

- Calcium chloride and admixtures containing calcium chloride: Do not use.

**IDENTITY TESTING/ CERTIFICATION**

505

**IDENTITY TESTING OF FRESH CONCRETE**

- Testing: To BS EN 206-1, annex B and BS 8500-1, annexe B.
  - Nonconformity: Obtain instructions immediately.
- Recording: Maintain complete correlated records including:
  - Sampling, site tests, and identification numbers of specimens tested in the laboratory.
  - Location of the parts of the structure represented by each sample.

is taken.

- Location in the structure of the batch from which each sample

508                      **REGULAR IDENTITY TESTING**

- Tests:  
none \_\_\_\_\_ .
- Sampling:  
none \_\_\_\_\_ .

530                      **IDENTITY TESTS RESULTS**

- Submission of reports: Within one day of completion of each test.
  - Number of copies: \_\_\_\_\_ .
- Reports on site: A complete set, available for inspection.

630                      **PREMATURE WATER LOSS**

- Requirement: Prevent water loss from concrete laid on absorbent substrates.
  - Underlay: Select from:  
Polyethylene sheet: 250 micro-metres thick.  
Building paper: To BS 1521, grade B1F.
  - Installation: Lap edges 150 mm.

**PLACING/ COMPACTING/ CURING AND PROTECTION**

640                      **CONSTRUCTION JOINTS**

- Locations of construction joints: Submit proposals where not shown on drawings.
- Preparation of joint surfaces: Select from:
  - Brushing and spraying: Remove surface laitance and expose aggregate finish while concrete is still green.
  - Other methods: Submit proposals.
- Condition of joint surfaces immediately before placing fresh concrete: Clean and damp.

650                      **SURFACES TO RECEIVE CONCRETE**

- Cleanliness of surfaces immediately before placing concrete: Clean with no debris, tying wire clippings, fastenings or free water.

680                      **PLACING**

- Records: Maintain for time, date and location of all pours.
- Timing: Place as soon as practicable after mixing and while sufficiently plastic for full compaction.
- Temperature limitations for concrete: 30°C (maximum) and 5°C (minimum). Do not place against frozen or frost covered surfaces.
- Continuity of pours: Place in final position in one continuous operation up to construction joints. Avoid formation of cold joints.
- Discharging concrete: Prevent uneven dispersal, segregation or loss of ingredients or any adverse effect on the formwork or formed finishes.
- Thickness of layers: To suit methods of compaction and achieve efficient amalgamation during compaction.
- Poker vibrators: Do not use to make concrete flow horizontally into position, except where necessary to achieve full compaction under void formers and cast-in accessories and at vertical joints.

690                      **COMPACTING**

- General: Fully compact concrete to full depth to remove entrapped air. Continue until air bubbles cease to appear on the top surface.
  - Areas for particular attention: Around reinforcement, under void formers, cast-in accessories, into corners of formwork and at joints.

- Consecutive batches of concrete: Amalgamate without damaging adjacent partly hardened concrete.
- Methods of compaction: To suit consistence class and use of concrete.

#### 810 CURING GENERALLY

- Evaporation from surfaces of concrete: Prevent, including from perimeters and abutments, throughout curing period.
  - Surfaces covered by formwork: Retain formwork in position and, where necessary to satisfy curing period, cover surfaces immediately after striking.
  - Top surfaces: Cover immediately after placing and compacting. If covering is removed for finishing operations, replace it immediately afterwards.
- Surface temperature: Maintain above 5°C throughout the specified curing period or four days, whichever is longer.
- Records: Maintain details of location and timing of casting of individual batches, removal of formwork and removal of coverings. Keep records on site, available for inspection.

#### 811 COVERINGS FOR CURING

- Sheet coverings: Suitable impervious material.
- Curing compounds: Selection criteria:
  - Curing efficiency: Not less than 75% or for surfaces exposed to abrasion 90%.
  - Colouring: Fugitive dye.
  - Application to concrete exposed in the finished work: Readily removable without disfiguring the surface.
  - Application to concrete to receive bonded construction/ finish: No impediment to subsequent bonding.
  - Interim covering to top surfaces of concrete: Until surfaces are in a suitable state to receive coverings in direct contact, cover with impervious sheeting held clear of the surface and sealed against draughts at perimeters and junctions.

#### 820 CURING PERIODS

- General: Curing periods are in days (minimum).
  - Definition of 't': The average number of degrees Celsius air temperature during the curing period.
- Curing periods for concrete surfaces which, in the finished building, will be exposed to the elements; concrete wearing surface floors and pavements; water resistant concrete:

	Concrete made using CEM1; SRPC (BS 4027); IIA	Concrete made using IIIB;
IIB; IIIA; IVB		
Drying winds or dry, sunny weather	<u>140</u> t+10	<u>180</u> t+10
Intermediate conditions	<u>100</u> t+10	<u>140</u> t+10
Damp weather, protected from sun and wind	<u>100</u> t+10	<u>100</u> t+10

combinations as above):

- Curing periods for other structural concrete surfaces (cements/

special	Drying winds or dry, sunny weather	$\frac{80}{t+10}$	$\frac{140}{t+10}$
	Intermediate conditions	$\frac{60}{t+10}$	$\frac{80}{t+10}$
	Damp weather, protected from	No special	No
	sun and wind requirements	requirements	

combinations: Submit proposals.

- Curing periods for concretes using admixtures or other types of cements/

#### 840 PROTECTION

- Prevent damage to concrete, including:
  - Surfaces generally: From rain, indentation and other physical damage.
  - Surfaces to exposed visual concrete: From dirt, staining, rust marks and other disfiguration.
  - Immature concrete: From thermal shock, physical shock, overloading, movement and vibration.
  - In cold weather: From entrapment and freezing expansion of water in pockets, etc.