

### Code of Practice for the Structural Use of Concrete 1987

This Code is being reviewed in the light of experience, current knowledge as well as the level of expertise now available locally. A revised Code will be published in due course.

2. Meanwhile, Clause 7 on the limit state design option has been revised for use with immediate effect.

#### Clause 7 - Alternative to Working Stress Method

3. The limit state design method for concrete structures recommended in BS 8110, BS 5400:Part 4 or BS 8007, as appropriate to the type of structure, may be used by registered structural engineers as an alternative to the working stress method. In such case, the requirements specified below should apply.

#### General Considerations

4. The recommendations given in the British Standards should be adopted only without prejudice to the requirements of the Building (Construction) Regulations and recommendations of any other Practice Notes for Authorized Persons and Registered Structural Engineers.

5. Provisions of some parts of BS5400 are not relevant to Hong Kong conditions and should be substituted by the recommendations given by the Structures Design Manual for Highways and Railways prepared by the Highways Department.

#### Design

6. The characteristic dead load, imposed load and wind load should be the dead load, imposed load and wind load calculated in accordance with the provisions of the Building (Construction) Regulations.

7. The characteristic strength of concrete should be the specified grade strength given in the Building (Construction) Regulations. Design should be based on the 28 day characteristic strength without adjustment in respect of the age of the concrete. The specified grade strength should normally not exceed 45 MPa unless a stringent quality assurance scheme is adopted.

8. The short-term modulus of elasticity, creep, shrinkage and other properties of concrete should follow the specifications in the Code of Practice for the Structural Use of Concrete 1987, instead of the British Standards.

#### Additional Tests

9. In addition to the regular compressive tests on concrete cubes, concrete core samples should be taken from the finished structure and tested to verify that the specified grade strength of the concrete has been achieved. The coring and testing should be carried out in the following manner:

- (a) *Frequency and location of coring.* The authorized person/registered structural engineer should propose a coring scheme indicating the structural elements selected for coring, as well as the number, size and location of the concrete cores, taking into consideration the strength adequacy of the structural elements after coring. At least one set of representative samples should be taken on each of every three floors. The number of cores taken from each type of structural element proposed for coring should be determined from the volume of concrete cast and should not be less than three on the same floor.
- (b) *Size of the concrete cores.* The diameter of the concrete cores should preferably be 150 mm for 40 mm aggregate and 100 mm for 20 mm aggregate or less, and must not be less than 75mm. The ratio of diameter to the maximum aggregate size should be not less than 3. The length of the test sample cut from the concrete core should be at least 95% of the diameter.
- (c) *Identification of the concrete cores.* The supervisory personnel should mark and sign on the concrete cores to enable the testing laboratory to identify them clearly. He should also ensure that the delivery of the cores to the laboratory and the tests are properly carried out.
- (d) *Tests for compressive strength of concrete cores.* Tests for compressive strength of concrete cores should be carried out in accordance with the method specified in CS1:1990, by a Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory.

/(e) Criteria/....

(e) *Criteria for acceptance.* The criteria for acceptance of the test are:

- (i) Concrete cores should not show evidence of segregation of individual materials. .
- (ii) There should be no honeycombing in the cores and the extent of voids in the cores should not be more than "few" in accordance with the classification defined in Table 4 of CS1:1990.
- (iii) For any set of cores representing a test location, the estimated in-situ cube strength of each core specimen should be at least 75% of the specified grade strength and the average estimated in-situ cube strength of the set should be at least 85% of the specified grade strength. In this respect, the estimated in-situ cube strength of each core specimen should be calculated in accordance with CS1:1990.

#### Qualified Supervision

10. The authorized person/registered structural engineer should provide adequate supervision and inspection on the construction of the concrete works to ensure compliance with the approved plans. The sampling, making and curing of concrete test cubes and the drilling of core samples should be supervised by a technically competent person. The person supervising the drilling of core samples should be independent from the contractor.

11. The names and qualifications of the supervisory personnel representing the authorized person/registered structural engineer and the registered contractor respectively should be entered into an inspection log book. All inspections should be clearly recorded, with date and time of inspections and details of site activities. The log book should be kept at the site office and, when required, produced to the Building Authority for inspection.

  
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