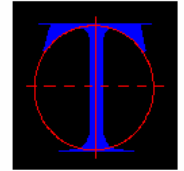


STRUCTURES DATA SHEET 8

Internal Fracture Test



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As a part of a structural appraisal it is often necessary to undertake tests on the concrete in order to make an estimation of in-situ concrete strength.

This is normally achieved by extracting core samples in representative members and crushing these in a compressive testing machine. When this is not possible, it is necessary to use a different technique to obtain the compressive strength. One such technique, devised by the Building Research Establishment is called the Internal Fracture Test.

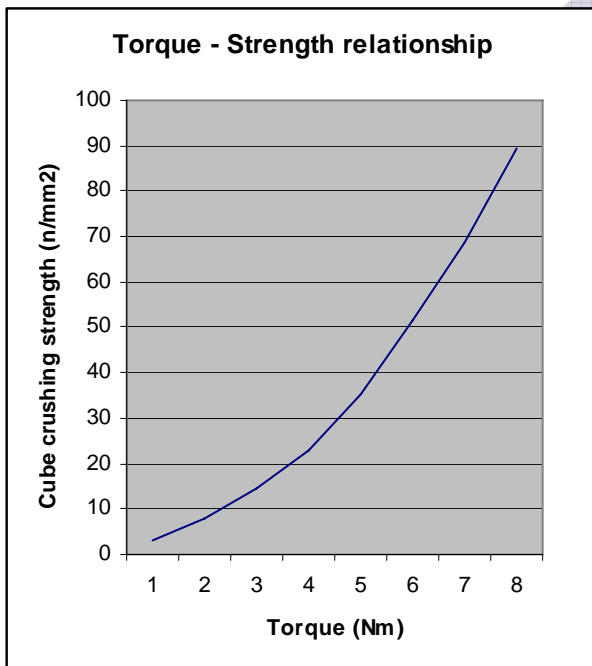


A 30-35mm deep, 6mm hole is drilled in the concrete and then a standard 6mm diameter wedge anchor bolt is tapped into the hole to a depth of 20mm. A thrust pad and stool ring assembly is placed over the anchor bolt and dial reading wrench (torque meter) is used to tighten the nut on the anchor bolt. At each turn the torque is recorded and the procedure is continued until the meter readings reach a maximum and begin to fall or a maximum reading of 10 Nm is reached.

The torque record at the point of failure when a conical shear plane develops can then be translated into estimated in-situ strength using correlation tables. The mode of failure should be noted and photographs taken of the shear plane.

The BRE Internal Fracture tester has a torque range equating to estimated in-situ concrete strength of between 10 and 40 N/mm². The testing technique is described in British Standard 1881: Part 207 and BRE Information Booklet IP 22/80T.

In order to improve accuracy it is recommended that 6 tests are undertaken in each location. If however the first 4 tests show consistent results then this latter number is considered to be satisfactory.



In practice the BRE IFT has been found to be 4 or 5 N/mm² over actual strength values within the range of 10 – 40 N/mm². Officially, with aggregates up to 20mm, the quoted accuracy of assessment using the overall mean relationship will be within plus or minus 30%.

The BRE Internal Fracture Test is particularly useful for estimation of in-situ compressive strength on High Alumina Cement Concrete (HAC) beams where it is impractical to extract large diameter cores from the relatively slender pre-cast beams. In this way rapid assessment of HAC concrete structures can be appraised to establish the likely condition and service life.

REFERENCES:

British Standard 1881 : Part 207
Building Research Establishment IP 22/80