Dear Sir,
We have tested 190 concrete cube samples (190 X 3 speciments) taken during batching of concrete at batching plant from 01.10.10 to 15.11.10.The quality of ingredients like sand, aggregate,cement and water used for manufacturing concrete were of same quality. The concrete mixer is having capacity of 0.5 M3. My questions are :
Q No. 1. How I shall identify a 'Batch' of concrete.
Q No. 2. While calculation Standard Deviation, test result of first 30 samples (acceptable as per Cl. 15.4) have to be considered (say sample no.1 to 30). For calculation S.D. for next 30 samples (sample no. 31 to 60) shall I consider only 30 samples or 60 samples (sample no.1 to 60) together and so on.
Q No. 3. As per Cl. 16.1 a) Mean strength from any group of four cubes (ammendment no.3) have to be considered :- From where shall I start grouping ? shall I satrt from start date like 1-4,5-8,9-12 etc. ? Please clarify.
Q No. 4. Suppose sample no.1,2,3 (01.10.10) are from individual foundations and 4-10 (02.10.10) are from one single foundation and 11-16 (03.10.10) are from another single foundation. Grouping is made taking 1-4, 5-8,9-12 ,13-16.Now, if group 1-4 fails (as per Cl.16.1a) but 5-8 passes then what will be the fate of the single foundation (sample no. 4-10).
I shall be oblised if you kindly clarify my doubts.
(Manas Sarkar)
B.C.E.

Dear Manas,

Q.No.1 “Batch” theoretically means the quantity of concrete mixed at one time. But for the purpose of Quality Control, we do not have to test every batch of concrete. The frequency of sampling and how to ensure that the samples are representative is described in Clause no. 15.2.

Q.No.2 The Clause 15.4 means that we have to cast three specimens of concrete from each sample. (Please notice the difference between samples and specimens). The three specimens are to be tested at the same time. If the results of all three *specimens* are within 15 percent of each other, then the test is valid and the average value for that
sample
should be recorded. If not, the results of this
sample
should be rejected. In case, the Specifications say that the Standard Deviation of 30 samples is to be calculated, then these have to be 1 to 30 and 31 to 60 and so on.

Q.No.3 From the averages of four, it is implied that they can be any four consecutive samples, that is 1 to 4, 2 to 5, 3 to 6 and so on. The acceptance criterion is given in Table no. 11 of the same code.

Q.No.4 If there are doubts regarding the integrity of the structure, we should resort to Non Destructive Testing. The suggestion in such cases is, that since the correlations between Rebound Hammer Values and the Ultrasonic Pulse Velocity depend on the quality of sand, cement and aggregates, the tables and charts given in books or manufacturers are not very reliable. If we carry out these tests every time we conduct a compression test, we can have our own data base which is based on our own cement, sand and aggregates. We can then use this data base with confidence. Some of the results going out of specified limits does not spell disaster and does not mean replacement of concrete. Structure should be tested in such cases.

I trust this answers your question.

Sincerely,

Dr. Sharma