

the three cube results in any batch) exceeds 15% of the average of that batch, or if the range of the three batch averages exceeds 20% of the overall average of the batches.

G. Actual Characteristic Strength

1. The average 28 day cube strength achieved in the trials shall be designated as the Target Mean Strength and from this the Actual Characteristic Strength shall be calculated for each mix.
2. The Actual Characteristic Strength equals the Target Mean Strength minus a margin of 1.64 times the standard deviation, except that the margin shall not be less than 4MPa.
3. In no case shall the Actual Characteristic Strength be less than the minimum CCS specified in the performance requirements.
4. The Actual Characteristic Strength so determined shall be used throughout the duration of the project as the primary indicator of control of mix proportions and water/cement ratio.

H. The Engineer will review the Contractor's trial-mixes and all test results. The Engineer will then determine which of the trial mixes shall be used. If none of the trial mixes for a class of concrete meets the Specifications, the Engineer will direct the Contractor to prepare additional trial-mixes. No class of concrete shall be prepared or placed until its job-mix proportions have been approved by the Engineer.

I. The approval of the job-mix proportions by the Engineer in establishing those proportions, in no way relieves the Contractor of the responsibility of producing concrete which meets the requirements of these Specifications.

J. The Engineer may also require practical tests to be made on the site by filling trial moulds incorporating the reinforcing details to confirm the suitability of the mix for the Works. In these tests, the type of plant used for mixing, the method of placing and compaction used and the type of formwork intended for use in the Works shall be used.

K. All costs connected with the preparations of trial-mixes and the design of the job-mixes shall be borne by the Contractor.

L. When the mix has been approved, no variations shall be made in the proportions, the source of the cement and aggregates, or in the type, size and grading zone of the latter without the consent of the Engineer who prior to giving such consent may require further tests to be made.

M. The heat of hydration test sample shall comprise a 1m x 1m x 1m test cube,