U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Change 18 to STANDARDS FOR SPECIFYING CONSTRUCTION OF AIRPORTS-- New Acceptance Limits

Date: 4/7/83
Initiated by: AAS-200

AC No: 150/5370-10
Change: 18

1. PURPOSE. New limits have been developed for statistical acceptance of Item P-501, Portland Cement Concrete Pavement, for flexural strength.

The Change number and date of change are carried at the top of each page. The changed material is marked by asterisks in the margin.

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source, aggregate characteristics, or mix design is changed, additional groups of test beams may be required until the Engineer is satisfied that the concrete mixture being used complies with the strength requirements of these specifications. Test ages will be 7 days and 28 days.

The flexural strength of the concrete shall meet the following requirements: (1) the average of any 4 consecutive strength tests, tested at the end of 28 days, shall have an average flexural strength equal to or greater than the specified flexural strength; (2) not more than 20 percent of the beams tested at the end of 28 days shall have a flexural strength less than the specified strength. Specimens which are obviously defective shall not be considered in the determination of the strength. When it appears that the test specimens will fail to conform to the requirements for strength, the Engineer shall have the right to order changes in the concrete sufficient to increase the strength to meet the requirements. When a satisfactory relationship between 7-day and 28-day strengths has been established and approved, the 7-day test results may be used as an indication of the 28-day strengths. However, the 7-day test results will not replace the results of the 28-day tests if the 28-day results fall below the requirements.

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Compressive strength tests offer some degree of correlation with flexural strength tests and may be used to obtain approximations of flexural strength. However, they shall not be used for project acceptance. The specimens shall be tested in accordance with ASTM C39.

An alternate method of accepting concrete for flexural strength is on a lot basis. A lot will consist of [**_____] square yards or cubic yards and will be divided into four equal sublots. One test will be made for each sublot. Random samples will be taken from the plastic concrete at the site in accordance with accepted statistical procedures.

The concrete shall be sampled in accordance with ASTM C172. Flexural strength specimens shall be made in accordance with ASTM C31 and tested in accordance with ASTM C78.

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The lot will be accepted without adjustment in payment if the average 28-day flexural strength, based on four acceptance tests of the lot, is equal to or greater than the acceptance limit shown under the 1.00 pay factor in the table in this note. If the average strength does not meet this limit, the Contractor may elect to leave the lot in place at a reduced payment determined in accordance with the table. If the average 28-day flexural strength of the lot fails to attain the lower acceptance limit shown for a 0.75 pay factor, the Engineer may order the removal of all the concrete in the lot. The pay factor for concrete which is allowed to remain in place when the flexural strength is below the 0.75 pay factor limit will be 0.50.

The Engineer shall specify the lot size in the specifications.

PAY FACTOR SCHEDULE FOR FLEXURAL STRENGTH AT 28 DAYS

Pay Factor	Acceptance Limits Average Flexural Strength (4 tests)
1.00	greater than M +0.120 R
0.95	M to M +0.115 R
0.85	M -0.090 R to M -0.005 R
0.75	M -0.170 R to M -0.095 R

Where: M = Modulus of Rupture (specified 28 day flexural strength)

R = the range of a sample of size N=4; the difference between the largest and smallest test

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3.8 MIXING CONCRETE. The concrete may be mixed at the work site, in a central mix plant or in truck mixers. The mixer shall be of an approved type and capacity. Mixing time shall be measured from the time all materials, except water, are emptied into the drum. Ready-mixed concrete shall be mixed and delivered in accordance with the requirements of ASTM C94, except that the minimum required revolutions of the mixing speed for transit mixed concrete may be reduced to not less than that recommended by the mixer manufacturer. The number of revolutions recommended by the mixer manufacturer shall be indicated on the manufacturer's serial plate attached to the mixer. The Contractor shall furnish test data acceptable to the Engineer verifying that the make and model of the mixer will produce