

3500902 CEMENT CONCRETE PAVEMENT
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

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Comments: (8-31-22 Industry)

Cement Concrete Pavement- The Standard spec section 350-2 requires a concrete strength of 3000 psi as “ Submit a mix design to the Engineer for approval prior to use. Provide concrete with a minimum 28-day compressive strength of 3,000 psi and maximum water to cementitious materials ratio of 0.50” . The proposed draft in section “ 350-9.2.1 Reduced Frequency for Quality Control Tests under sub section 1. Advise “1. The average of the acceptance compressive strengths is equal to or greater than 2,500 psi plus 2.33 standard deviations.”

Please verify if the proposed draft in 350-9.2.1 conflicts with the spec section 350-2 for concrete strength.

Response:

The proposed language in 350-9.2.1 meets the requirements article 350-2. The specified compressive strength ($f'c$) in 350-9.2.1 is also 3,000 psi.

Sub article 350-9.2.1 is also consistent with Section 346-9.2.1 Reduced Frequency for Acceptance Tests.

<p>Submit strength test results indicating that the two following criteria are met:</p> <ol style="list-style-type: none">1. The average of the acceptance compressive strengths is equal to or greater than the specified minimum compressive strength ($f'c$) plus 2.33 standard deviations minus:<ol style="list-style-type: none">a. 500 psi, if $f'c$ is 5,000 psi or less.b. $0.10 f'c$, if $f'c$ is greater than 5,000 psi.2. Every average of three consecutive strength test equals or exceeds the $f'c$ plus 1.34 standard deviations.

The equations in Section 346 and 350:

$$(f'c - 500) + 2.33 StdDev$$

and

$$f'c + 1.34 StdDev$$

In the first equation, $(f'c - 500) + 2.33 StdDev$, $(f'c - 500)$ has been changed to 2,500 psi, because in Section 350 (Concrete Class I Pavement) the $f'c = 3,000$ psi.

Item 1 “The average of the acceptance compressive strengths is equal to or greater than $(f'c - 500) + 2.33$ standard deviations “or $2,500 + 2.33$ standard deviations statistically means that the submitted historical compressive strength test results needs to be equal or higher than 4,200 psi.

Item 2 “Every average of three consecutive strength test equals or exceeds the 3,000 plus 1.34 standard deviations” statistically means that the submitted historical compressive strength test results needs to be equal or higher than 4,200 psi.