

BRIDGE POLICY CIRCULAR

BPC2002/02

SUBJECT: MAXIMUM CONCRETE STRENGTHS FOR USE IN RTA WORKS

No. Sketches Following	0	No. Appendix Sheets Following	0
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Background

The 92 Austroads Bridge Design Code Section 5 concrete has a maximum design strength for concrete 50MPa. The RTA specification concrete works for bridges contains the provision limiting the maximum supplied strength of concrete to 80MPa. The maximum limit of 80MPa was chosen to prevent the possibility of unintended brittle failures within the concrete member at ultimate load when the concrete member had been only designed for maximum strength 50MPa concrete.

The brittle failure of concrete of strengths around 100 MPa and greater has the potential to reduce the reliability of the concrete in shear and consequently the reliability of concrete members designed for shear with very high strength concretes.

The Australian Standard Concrete for Structures (AS3600) permits the use of the normal design equations for concrete up to 65MPa in strengths. The draft Australian Bridge Design Code (AS5100) also proposes 65MPa as the upper strength limit for applicability of the design equations for that code. Allowing for the normal distribution of concrete strengths, a target strength of 75MPa is required to meet the 65MPa design requirements. Such a concrete will have approximately 5% of concrete including 85MPa. For this and other reasons, the RTA's current limitations in specification B80 and associated specifications is no longer feasible. Nevertheless, it is important to retain an upper limit on the design strength used for concrete unless specific modifications to the design equations and reinforcement detailing are made to cater for the very high strength concretes. It is also necessary to prevent excessively high strength concretes from being used in works that are designed assuming normal behaviours of concretes.

Action now required

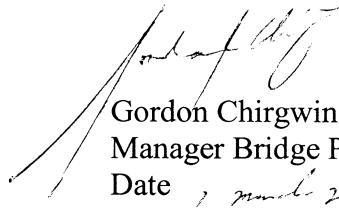
The maximum value of the concrete strengths to be used for design purposes (f'_c) shall be 65MPa.

To permit effective manufacturer of concrete members using this high design strength, the maximum target strength for concrete mixed design shall be 75MPa and the assumed standard deviation of the concrete shall be 6MPa.

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Where concrete strengths of over 85MPa are recorded, the concrete strengths and batching records shall be examined to ensure that the concrete supply is still in statistical control. Where the concrete supply is not in statistical control action shall be taken to bring the concrete supply into control. Where the concrete supply is in statistical control no action need be taken on the basis of an occasional high result for concrete strengths.

Advice on determining whether the concrete supply is in statistical control can be obtained from the undersigned.


Gordon Chirgwin
Manager Bridge Policies & Standards
Date 7 March 2002

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