

BRIDGE TECHNICAL DIRECTION BTD2014/01

TRAFFIC LOADING FOR BRIDGES

Background

AS 5100 Bridge Design was adopted for the design of bridges and related structures on the classified road network in NSW on 7 May 2004.

AS 5100 defines a design traffic loading model designated as SM1600. The SM1600 traffic loading does not correspond to any specific truck configurations, but it does account for the possibility of two multi-trailer trucks travelling in convoy in a traffic lane.

Unlike some previous Australian bridge design codes the traffic loading model does not make provision for reduced traffic loadings for minor roads with low traffic volumes.

However, it is recognised that in some limited circumstances, a lighter traffic loading could be appropriate for the design of the structure. This BTD defines the conditions where reduced traffic loading may be permitted and prescribes the minimum traffic loading that could be adopted for the design of bridges on minor roads.

Information

The SM1600 traffic loading was developed in response to increasing legal truck mass and truck axle loads, and new configurations of heavy vehicles to ensure that over the design life of bridges the actual traffic loads will not exceed the design loads. The traffic load factor of 1.8 in the ultimate limit state was derived from statistical records of measured axle loads to account for the likelihood of over-loaded vehicles on the road network.

It is recognised that, under certain conditions, a reduced traffic loading may be appropriate for structures on minor local roads.

This Bridge Technical Direction replaces BPC 2004/06 which is now withdrawn.

Bridge Technical Direction

- Bridges on or over *classified roads* may be designed for a lesser traffic loading than SM1600 provided that **all** of the following criteria are satisfied:
 - a. The bridge will provide access to either a limited number of private properties, crown land, state and national park or state forest or a combination of these where the likelihood of land use change is low, because physical; landscape or planning constraints would make future development difficult.;

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- b. The route alignment is unsuitable for B-doubles or other multi-trailer heavy vehicles, and is unlikely within the design life of the structure to be improved to a sufficient standard to allow travel by such vehicles;
 - c. The number of heavy vehicle movements is predicted not to exceed 150 AADT within 30 years;
 - d. The maximum span of the bridge is 25 m; and
 - e. Either the superstructure of the bridge consists of simply supported spans (i.e. not structurally continuous), or the superstructure is continuous and the application of SM1600 traffic loading would not cause a load reversal in any of the members of the structure at the ultimate limit state or uplift at the supports at the serviceability limit state
- The approval of the Principal Engineer, Bridge and Structures shall be obtained prior to the adoption of a reduced traffic loading.
 - Irrespective of the traffic loading to be adopted for design of new bridges, their traffic barrier performance requirements and design shall be in accordance with the AS 5100.
 - The minimum reduced traffic loading (including centrifugal and braking forces) for bridges on the road network shall be the W7, T44 and L44 traffic loadings with corresponding load factors, multiple lane modification factors and Dynamic Load Allowance as specified in the 1992 Austroads Bridge Design Code and as detailed in Part 7 of AS 5100. For fatigue loading the number of stress cycles for a Functional Class 1 road, as defined in 1992 Austroads Bridge Design Code shall apply.

Classified road has the same meaning as contained in the Roads Act 1993, namely “any of the following:

- (a) a main road,
- (b) a highway,
- (c) a freeway,
- (d) a controlled access road,
- (e) a secondary road,
- (f) a tourist road,
- (g) a tollway,
- (h) a transitway,
- (i) a State work”

References: BPC 2004/06

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Approved: Wije Ariyaratne
Principal Engineer, Bridge and Structures

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