



Transport
Roads & Maritime
Services

Test method T366

Dowel pull-out test

OCTOBER 2012



Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
		Reformatted and Revision Summary Added	D.Dash	May 1999
		Date on Test Method Revised to Agree with Date on Revision Summary	D.Dash	Feb 2001
Ed 1/ Rev 0	All	Reformatted RMS template	J Friedrich	October 2012

Note that Roads and Maritime Services is hereafter referred to as 'RMS'.

The most recent revision to Test method T366 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T366

Dowel pull-out test

1. Scope

- (a) This test method sets out the procedure for determining the average bond stress required to move a coated steel dowel embedded in concrete, by not less than 0.25 mm using a tensile load.
- (b) The method is applicable to steel dowels used in concrete road pavements, for transferring loads across joints while providing for thermal movement of the joint.

2. Apparatus

- (a) Cylindrical metal mould having a nominal internal diameter of 150 mm, as used for making concrete test cylinders
- (b) Scoop
- (c) A vibrator, either internal or external, which complies with Test Method T304
- (d) Calipers for measuring the diameter of a steel dowel, in the range 25 - 38 mm and 300 mm measuring scale
- (e) Loading machine capable of exerting a tensile force of 10 MN complying, as regards accuracy, with the requirements of AS 2193 (Methods for the Calibration of Testing Machines) for Grade C machines

3. Sample Preparation

- (a) Secure the debonded dowel centrally in the mould so that the dowel embedment length at the time of the test will be one half of the dowel length (± 20 mm).
- (b) Fill and compact concrete in the mould in accordance with Test Method T304, taking care not to damage the debonder coating, whilst ensuring that the dowel remains centred in the mould.
- (c) The concrete must be of a mix which complies with Specification R83 or R84
- (d) Strike off and smooth the surface of the concrete.
- (e) Cure the concrete cylinder for seven (7) days in accordance with AS 1012.8.

4. Procedure

- (a) At age seven (7) days, remove the concrete cylinder from the mould and remove any debonder coating from the exposed length of dowel.
- (b) Measure the diameter of the dowel and the height of the concrete cylinder.
- (c) Mount the test specimen in the testing machine, so that movement of the dowel relative to the concrete can be measured.
- (d) Apply a tensile load to the dowel; to achieve a movement of not less than 0.25 mm. Testing must be completed within 3 hours of removal from the curing regime.
- (e) Record the maximum load exerted in the test.

5. Calculations

- (a) Calculate the average bond stress (S) at the maximum load (P) as follows:

$$S = \frac{P}{\pi \cdot D \cdot L}$$

Where	D	is the diameter of the dowel in <i>mm</i>
	L	is the embedment length of the dowel in <i>mm</i>
	S	is in <i>MPa</i> when P is in Newtons (<i>N</i>).

6. Reporting

Report:

- (a) The dowel diameter (mm)
- (b) Embedment length (mm)
- (c) Maximum test load (N)
- (d) Average bond stress (MPa)