Computer Models
For
Fire and Smoke

Model Name:	BRANZ TR8
Version:	2.6
Date:	January 2014
Model Actively Supported?:	No.
Classification:	Fire Resistance (Endurance) Model
Very Short Description:	A model to predict the fire resistance of concrete slabs and floor systems.
Modeler(s), Organization(s):	Colleen Wade, BRANZ, New Zealand.
User's Guide:	Wade, C.A. and Lovatt, A.J. User's Guide to BRANZ TR8. Software for Calculating Fire Resistance of Concrete Beams and Floor Systems. Building Research Association of New Zealand. (1996).
Technical References:	Method for Fire Engineering Design of Structural Concrete Beams and Floor Systems. BRANZ Technical Recommendation No 8. Building Research Association of New Zealand. (1991).
Validation References:	(all of the following papers cite experimental comparisons with the model): Wade, C.A. Performance of Concrete Floors Exposed to Real Fires. Journal of Fire Protection Engineering, 6(3) pp 113-124. (1994).
Availability:	Available from http://www.branz.co.nz/cms_display.php?sn=75&st=1&pg=9458
Price:	Free.

Necessary Hardware:	Runs under Windows**.**
Computer Language:	Microsoft Visual Basic 6.0
Size:	Approximately 1.5 MB of disk space.
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Detailed Description:

TR8 software can be used for the design of reinforced or prestressed concrete floor systems when required to have fire resistance.

TR8 is based on BRANZ Technical Recommendation No. 8 which you should use to gain an understanding of the basis for the software. BRANZ Technical Recommendation No. 8 is referenced by NZS 3101 as an acceptable calculation method for determining the fire resistance of concrete floor systems. The underlying procedure applies structural engineering principles and material properties at elevated temperature to the calculation of the fire resistance of reinforced or prestressed concrete floor systems.

TR8 applies to floor systems:

- which may be rectangular or tapered in cross-section (for beams), or tee-beams, with a minimum width of 100 mm.

- which are made with normal-weight concrete (assumed density greater or equal to 2000 kg per m^3), light-weight concrete (assumed to be less than 2000 kg per m^3), and the following for slabs only - alluvial quartz concrete (equivalent to NZS 3101 Type A), dacite aggregate concrete (equivalent to NZS 3101 Type B) or pumice aggregate concrete (equivalent to NZS 3101 Type C);

- in which support conditions are assumed to be either simply supported or continuous over the supports;

- where the section includes either prestressing tendons or deformed reinforcing bars;

- which are designed in accordance with the requirements of NZS 3101, New Zealand Code of Practice for the Design of Concrete Structures and NZS 4203, New Zealand Standard Code of Practice for General Structural Design and Design Loadings for Buildings;

- where it is assumed that the concrete element has reached its equilibrium moisture content, and that the occurrence of concrete spalling during fire will be minimal;

- where the mode of failure for the floor system is assumed to be in flexure; failure is taken as the time at which the reduced moment capacity of the element becomes less than the moment applied to the element;

- where factors of safety are already included into the fire resistance period and with respect to the normal design loads. In fire design it is normal to allow the load factors and design live loads to be reduced.