Computer Models
For
Fire and Smoke

Model Name:	WSHAPS
Version:	Version 1
Classification:	Structural Finite Difference
Very Short Description:	Model for the calculation of the fire resistance of loaded, protected W-shape steel columns.
Modeler(s), Organization(s):	T.T. Lie and K.H. Almand, National Fire Laboratory, Institute for Research in Construction, National Research Council of Canada.
User's Guide:	-----
Technical References:	Lie, T.T., and Almand, K.H., "A Method to Predict the Fire Resistance of Steel Building Columns," Engineering Journal, American Institute of Steel Construction, Inc., Vol. 27, No. 4, 1990.
Validation References:	-----
Availability:	Not Available
Price:	N/A
Necessary Hardware:	-----
Computer Language:	FORTRAN 77
Size:	100 kB
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Detailed Description:

Input:

Dimensions of steel and insulation, thermal properties of insulation, strength of the steel, effective length of column and eccentricity of the load.

Output:

Strength of column as function of time during exposure to fire.

Assumptions:

WSHAPS calculates, using a finite difference method, the temperature history in the column and, using a finite element method, the strength of the column during exposure to the North American standard fire (any other fire can be substituted). The fire resistance is determined by calculating the time at which the column can no longer support the applied load.