ACT Government

USE OF FIRE SEVERITY CALCULATIONS

FIRE SAFETY GUIDELINE

FSG-13

JUSTICE AND COMMUNITY SAFETY DIRECTORATE
ACT EMERGENCY SERVICES AGENCY
ACT FIRE & RESCUE

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Content

FOREWORD

Empirical Fire Severity/Time Equivalence Calculations are a standardised and widely accepted assessment methodology, utilised in the Fire Safety Engineering discipline to assess and demonstrate the adequacy of a buildings structural design. To ensure compliance with Performance Requirements C1P1 and C1P2 of the National Construction Code, adequate conservatism must be applied to the assumptions, inputs and parameters when undertaking these assessments.

PURPOSE

ACTF&R have developed this Fire Safety Guideline to provide guidance to Fire Safety Engineers on some assumptions, inputs and parameters deemed acceptable as well as required justification when Fire Severity/Time Equivalence Calculations are utilised in a Performance Solution.

FIRE SEVERITY/TIME EQUIVALENCE CALCULATIONS

Where Fire Severity/Time Equivalence Calculations are undertaken the following must be considered/included:

- Pictorial identification/markup of the input calculation areas relevant to the fire severity calculations must be provided.
- For sensitivity multiple methods of fire severity calculations should be evaluated. Three potential methods include – CIB Formula, Law Formula & Eurocode Formula.
- Input parameters are not to be manipulated to meet formula constraints, ie openings must not be altered to meet prescribed ventilation ratio constraints.
- Fuel load data must demonstrate a level of conservatism in line with IFEG Part 3.4.1 - *'fire load density cannot be prudently chosen at the mean level – this would provide a negative safety factor for all values greater than the mean. At least the 95% fractile should be selected.'*
- Where a reliable sprinkler system is installed appropriate to the hazard, a reduction in design fuel loading may be applied to the fire severity calculations given adequate justification. However, a reasonable safety factor must be applied to the results, and a sensitivity analysis undertaken on sprinkler failure.
- Clear justification is to be provided in relation to nominated ventilation opening sizes.
- Breakage areas of glazed elements used as ventilation openings must be realistic in relation to their height and overall size. Breakage areas greater than 50% for glazed elements must be provided with detailed justification.
- Where internal compartment openings are relied upon for calculations, it must be demonstrated that the building envelope has adequate air flow/supply to meet the entrainment requirements to the internal openings.
- All parameters used to determine fire severity must be clearly referenced.
- All relevant information must be provided in Performance Based Design Brief for review and consideration.

These above points are not considered exhaustive or complete. Use of Fire Severity/Time Equivalence Calculations will be assessed on a case-by-case basis with consideration given to all supporting justification.

GLOSSARY OF TERMS

Acronym / Term	Definition
ACTF&R	Australian Capital Territory Fire & Rescue
NCC	National Construction Code
IFEG	International Fire Engineering Guidelines (Edition 2005)

RELATED LEGISLATION AND DOCUMENTS

Related legislation and documents
Building Act 2004 (ACT)
Building Regulation 2008 (ACT)
Emergencies Act 2004 (ACT)
National Construction Code (NCC)
International Fire Engineering Guidelines (Edition 2005)

AMENDMENT HISTORY

Version	Description of changes
1.0	Created

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