Whole Building Behaviour - Results from a series of large-scale tests

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Objective of the presentation

To inform you of the extent of the work carried out at BRE’s Large Building Test Facility at Cardington. There is insufficient time to go into details for any of the tests as each one is worthy of a presentation in itself. The work is presented to inform and possibly to point the way towards future collaborative research programmes.
Large Building Test Facility

- Background
- Steel framed building
- Concrete building
- Timber Frame Building
- Other Full-Scale Tests
Background

- Ronan Point 1968
- ICE report 1986
- Cardington hangar
- Experimental Buildings - steel (composite), concrete, timber
- Other programmes - NFSC, Steel housing, precast concrete hollow core slabs
Steel Building Fire Tests

- Furnace tests
- Restrained Beam Test
- Plane Frame Test
- British Steel Corner Test
- BRE Corner Test
- Large Compartment Test
- Demonstration Test
- Unprotected Connections
Furnace tests
Restrained beam test
Restrained beam test
Plane frame test
British Steel Corner
British Steel corner test
BRE corner fire test
BRE corner fire test
BRE corner fire test
BRE large compartment test
BRE large compartment test
BRE large compartment test
Demonstration test
Demonstration test
Demonstration test
New test - 2003, unprotected connections
New test
Concrete building

- High grade/high strength/high performance concrete
- spalling
- polypropylene fibres
- whole building behaviour - thermal expansion/restraint to thermal expansion
Concrete building
Concrete building
Concrete building
Timber building

- Compartment Fire Test
- Stair Trials
- Stair Fire Test on Timber Frame Building
- Reinstatement
- Combustible cavities
Compartment fire test
Compartment fire test
Stair fire test
Reinstatement
Combustible cavities
Combustible cavities
Other full scale tests - NFSC
Other full-scale tests - NFSC
Other full-scale tests - hollow core slabs
Other full-scale tests - Hollow core slabs
Other full-scale tests - Steel housing
Other full-scale tests - Steel housing
Outputs from large-scale fire tests

- Validation for numerical models for heat transfer and structural performance
- Identification of load carrying mechanisms at the fire limit state
- Identification of modes of failure at the fire limit state
- Development of new design guidance
- Input to new and emerging codes and standards
- Input to revisions to Building Regulations
Design of Steel Framed Buildings without Applied Fire Protection

Fire and Steel Construction
APPROVED DOCUMENT

B1  Means of escape
B2  Internal fire spread (linings)
B3  Internal fire spread (structure)
B4  External fire spread
B5  Access and facilities for the fire service

1992 EDITION
THE END

Thank You for your attention