



COST C26

# Urban habitat constructions under catastrophic events

1<sup>st</sup> Workshop

*Prague, 30<sup>th</sup>-31<sup>st</sup> March, 2007*

WG3 – Blast and Explosion resistance

*M. Byfield, G. De Matteis*

### Objectives of WG3

The scope of WG3 has been agreed at the **Delft Meeting**.

*Seventeen presentations have been provided during the meeting, allowing the identification of the main aspects that could be covered within the group.*

Identified areas of activity are the following:

## List of contents

### **1. Codes and Standards related to Robustness**

- Existing methodologies
- General principles
- Future trends and recommendations for best practice

### **2. Vulnerability to progressive collapse due to localised damage from blast or impact**

- Multi-storey buildings with pre-cast load bearing walls
- Load redistribution using catenary action in steel framed buildings
- Impact from collapsed floors

### **3. Quantification of actions related to extreme events**

- Detonation of vehicle borne improvised explosive devices or hand held devices
- Natural gas explosions
- Vehicle impact
- Aircraft impact

### **4. Protection systems and design methodologies to resist blast and impact**

- Capacity design
- Collateral problems due to demolition
- Maintenance of stand-off

### **5. Assessment and repairing of damaged structures**

### **6. Experimental testing**

- Component testing in shock tubes
- Small to medium scale blast testing using high explosives
- Large scale arena tests
- Performance of new materials

### **7. Numerical simulation**

- Blast-structure interaction
- Impact-structure interaction
- Progressive collapse
- Brittle failure

## WG3 – Blast and Explosion resistance

### List of papers to be presented at this seminar

- 1 Summary of TU Delft Workshop: State of the art in Europe and activity developed within WG3 Impact and Explosion  
P.D. Smith, Cranfield University, UK
- 2 Robust design of steel framed buildings against extreme loading  
M.P. Byfield, G. De Matteis and F. Dinu
- 3 Aircraft impact on reinforced concrete structures  
S. A. Kilic and G. Altay
- 4 Peak pressure in flats due to gas explosion  
I. Langone, G. De Matteis, V. Rebecchi, F.M. Mazzolani
- 5 Disproportionate collapse in steel framed buildings  
M. P. Byfield and S. Paramasivam
- 6 Reconstruction and seismic strengthening of St. Athanasius church damaged by explosion  
V. Sendova, B. Stojanoski and Lj. Tashkov
- 7 Analysis of reinforced concrete structures subjected to blast loading  
S. Karapinar, I. Sanri and G. Altay
- 8 Robust structures by joint ductility  
U. Kuhlmann, L. Rolle, J.-P. Jaspart and J.F. Demonceau
- 9 **Protecting critical infrastructure systems**  
**T. Krauthammer**