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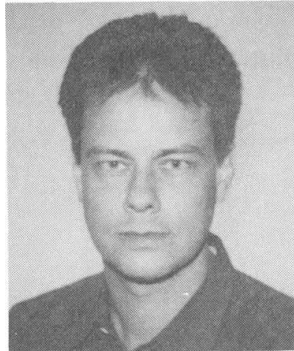
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## Emergency Protection of War Damaged Buildings

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### Summary

The Protection of War Damaged Buildings and Waste Management, Reconstruction of Mostar, Bosnia and Herzegovina, was performed for the European Administration of Mostar (EUAM) following the local cease-fire agreement in 1994 between the Muslim and Croat warring factions. The *protection of buildings* comprised all kinds of partial demolition and construction work in order to protect buildings against further destruction and to protect people against the risk of structural collapse and falling objects.

### 1. Scope of Protection Work

Generally, the protection work comprises all "protected buildings" (historical buildings) exposed to damage excluding those which must be demolished due to the extent of damage. However, a number of other important buildings also required protection.

The *protection work* was planned and conducted according to engineering design of the individual buildings with respect to future plans of repair and reconstruction. The engineering designs are based on a detailed survey of the structural stability and risk analyses of structural failures and collapses, including the risk of seismic impact (level 6 area). In some cases the protection work was performed as *emergency demolition/protection work* comprising the most urgent precautions to secure the building and the public against any hazards.

For the whole of the City of Mostar, it is expected that 30% of Damage Category 5 (DC5) buildings and 90% of Damage Category 6 might be demolished which results in a planning figures of totally 1000 buildings with 130,000 m<sup>2</sup> GFA for demolition and after evaluating the individual options for demolition or reconstruction comprises a total gross floor area of approximately 200,000 m<sup>2</sup>, the amount of demolition waste roughly amounts to 200,000 tonnes. To this amount should be added wastes arising from the reconstruction works of buildings and infrastructure.

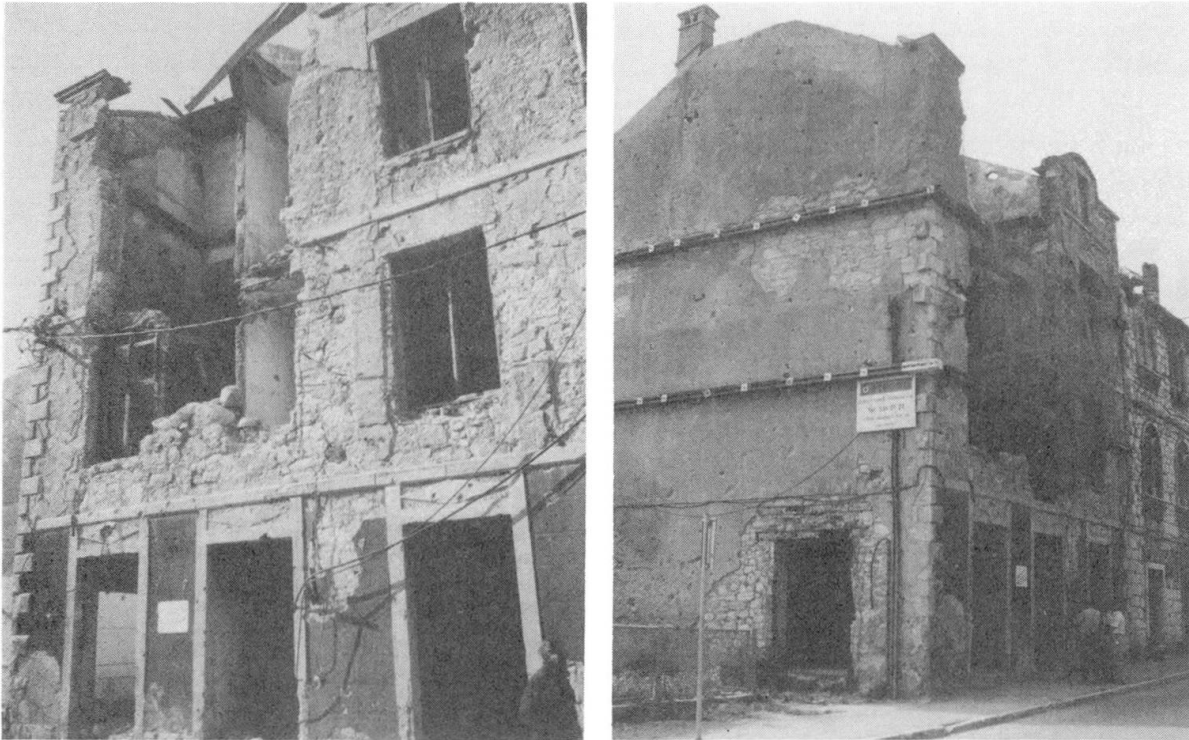
### 2. Implementation

The EUAM and the Municipality of Mostar agreed that the physical condition, historical value and ambient situation should form the priority of demolition. Referring to the EUAM Decree on

Demolition of Building Structures, 19 March 1995, the EUAM would provide for the demolition (partial and total) of damaged buildings which

- endanger the lives and health of people or property, or
- hinder efficient use of communications or other structures, or
- disrupt the sight of the immediate environment to a considerable extent, or
- stand in the way of construction of dwellings, industrial or other structures.

Some of the most important buildings of historic and cultural interest have been surveyed together with UNESCO and the importance of the buildings and the protective measures have been discussed and agreed upon.



*Fig. 1 & 2 Example on Emergency Protection of building with historical value.*

### 3. Conclusions

The results of the work are very satisfactory. It has been a very positive experience for the local citizens and to UNESCO to save so many historical buildings from complete destruction. The buildings are now protected, ready for reconstruction and a number of buildings have already been repaired and some are under reconstruction. Certain specific problems have been encountered during the protection and demolition works, these including

- presence of unexploded ordnance (UXO) which must be cleared by authorised personnel
- location of disposal sites for reusable materials and appropriate disposal sites
- time consumption for appropriate discussion & approval by local Municipal Administration
- lack of local equipment and experience.

Based on the experiences of the presented emergency protection and demolition work in Mostar it is evident, that there is an urgent need for the concept of Emergency Building & Solid Waste Management integrated with post war Rehabilitation Programmes.