Post - Hearthquake reconstruction of historic city centre:

the case study of L'Aquila

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ABSTRACT

Reconstruction following a destructive natural hazard is of paramount importance for human life and built environment.

Post -earthquake reconstruction of the historic city centre of L'Aquila, Italy, can be considered as the largest building site now under operation in Europe. The earthquake that hit the city of L'Aquila on 6th April 2009 generated a so-called seismic crater that comprises 56 municipalities and concerns an area of almost 2.400 Km^2. The earthquake of 2009 destroyed or severely damaged all historic buildings of the city centre.

After the seismic event of 2009 the reconstruction phase took place in two times. Firstly soon after the earthquake, the reconstruction focused on timely interventions of safety works to prevent additional collapses of damaged buildings. Then, in 2010 started the reconstruction process concerning the reconstruction of damaged and collapsed buildings. In 2019 there are more than 8.000 ended construction sites and almost 4.000.000 t of removed rubble. The reconstruction process of L'Aquila has been soon defined as "the biggest construction site of Europe".

This experience of co-ordination of a huge number of building sites in the same location highlighted the need of multi-project coordination of the reconstruction activities. Therefore, a general construction site plan has been proposed in a previous research. The co-ordination of many construction sites that are located very close to each-other can be based upon the managing and sharing of different resources: space for tower cranes, access routes for vehicles, space for temporary scaffoldings and space for debris storage and disposal. In particular, the problem of rubble transport and storage has been addressed. In fact, debris transportation and storage can be considered a major problem for projects co-ordination in a multi-project environment. Therefore, transportation and storage of building rubble can be considered a basic criterion for the multi-project optimization process.

A simulation of project coordination in a city area, building block that includes eleven building sites has been performed with the traditional resource allocation process. Considering a specific time frame, the rubble production process can be simulated for each building site belonging to a building block. Then construction project schedules are modelled with the traditional activity network approach and then optimised to take into account the quantitative limits of rubble transportation and disposal processes.

REFERENCES

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