



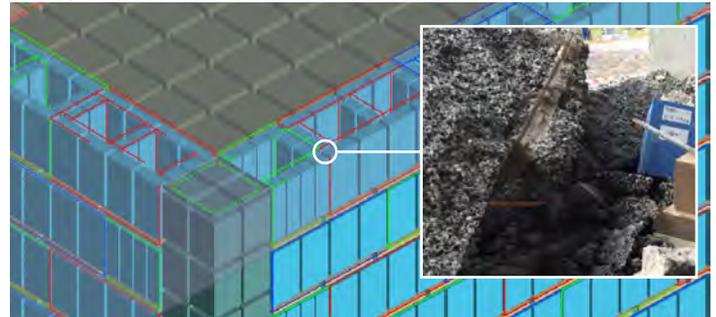
RECONASS PILOT BUILDING

INACHUS and RECONASS projects conjunction activity, Sweden, 2016

Air blast analysis of high explosive modelling of the RECONASS Pilot Building

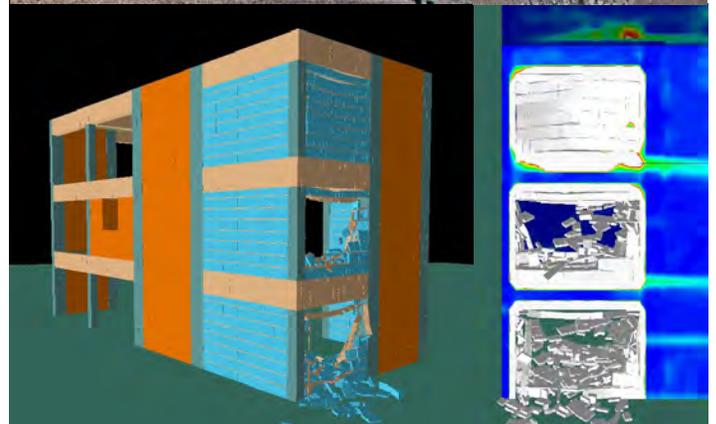
European project RECONASS aims to provide a monitoring system for constructed facilities that will provide a near real time, reliable and continuously update assessment of the structural condition of the monitored facilities after a natural or manmade disaster. In order to achieve this objectives, RECONASS has developed small wireless local positioning tags that will be embedded in the structural elements of the monitored buildings. Following a disaster, comparison of the original position of the tags, in the undamaged state, with the final position of the tags, in the damaged state, will be used in order to assess the structural response, damage and loss. In order to validate the system, RECONASS project preformed a pilot test in which a total weight of 400kg TNT was detonated 13 mt far from the Pilot Building.

Girders, slabs, columns and RC walls were modelled with implicit steel bars, taking into account all the bars overlap, the different spacing of the stirrups and the embedded connection between different elements, like the columns and the adjacent RC walls. Masonry walls have been modeled extruding the real shape of the used blocks with mortar layer interposed in order to implement in the model the rebars embedded in the mortar layer during the construction.



Detail view of the mesh used to model the masonry walls

The analysis performed with the ELS software shows a good accordance with the damage state documented after the explosion.



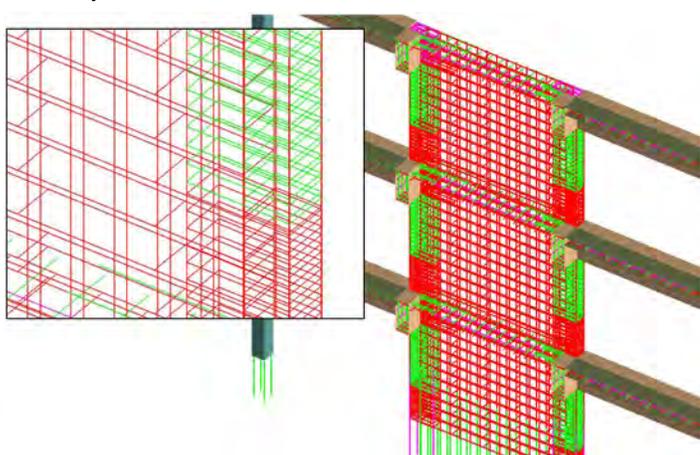
ELS Results compared to the pictures of the RECONASS Pilot

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View of the RECONASS Pilot Building

ASI Europe, as partner of the INACHUS FP7 Project, performed a simulation of the RECONASS Pilot test in order to evaluate the effects of the explosion on the Pilot Building and validate the capabilities of the Applied Element Method (AEM) implemented in Extreme Loading® for Structures (ELS) software to accurately model dynamic behavior of reinforced concrete structures.



ASI's Extreme Loading® for Structures (ELS) Software –
Reinforcement details implemented in AEM model