

COURT OF LAW IN L'AQUILA

Court of Law in L'Aquila. Design; Work supervision; Base isolation; Seismic assessment; Retrofit; Collective building

Client

Ministry of transport and of infrastructures - Provveditorato interregionale per le opere pubbliche Lazio, Abruzzo e Sardegna

Project and works supervision

Studio Calvi Srl

Classes and categories of works

E20,S04, IA01, IA02, IA03 € 18.333.366,40 circa

Start of planning

2011

End of planning

2011

Start of works

2011

End of works

2012

DESCRIPTION OF PROJECT

The building of the Court of Law of L'Aquila has been heavily damaged during the 2009 earthquake occurred next to the town. Both retrofitting and construction works have been carried out.

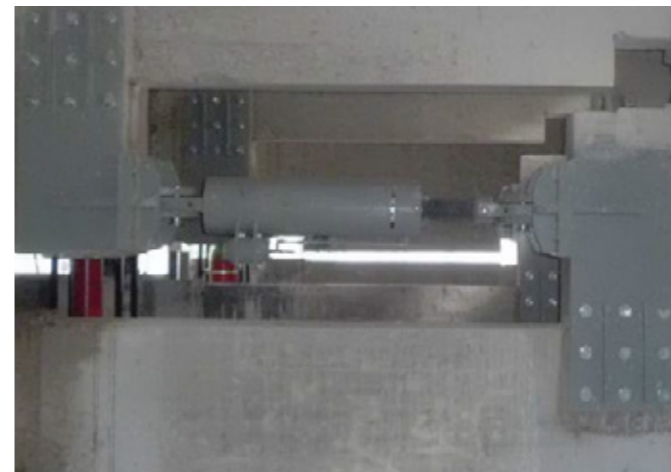
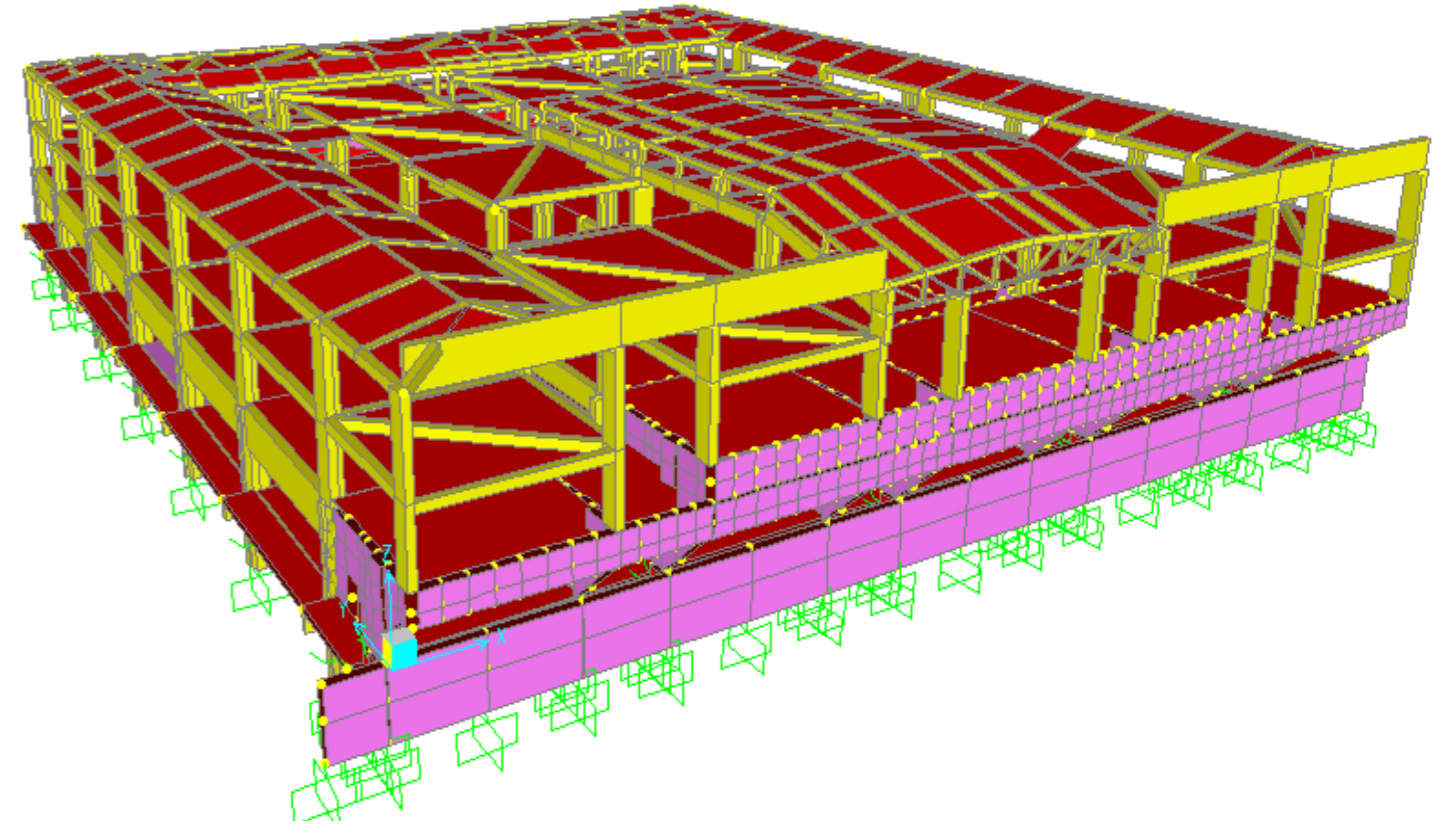
It is a four storey reinforced concrete frame building, with a plan area of about 4,500 m² and a total volume of about 60,000 m³. The repair and strengthening intervention included the demolition and reconstruction of the two upper stories, the introduction of an isolation system at mid height of the lower, in ground, storey, the addition of a damping system and the selected strengthening of a few

weak columns.

More in detail the project main features involve:

- The introduction of a seismic isolation system, through the cutting of columns and walls located at the garage level, and the subsequent installation of the anti-seismic devices.
- The removal of any connection between the structures involved in this intervention and the adjacent ones, in correspondence of these connections are going to be placed joints that allow horizontal displacements induced by seismic actions.
- The implementation of measures to improve the foundation system.
- The verification of integrity and implementation of strengthening interventions for walls and columns affected by shear at the garage level, as a consequence of the modified static scheme due to the installation of isolators.
- The construction of new levels, through a new reinforced concrete structure made of new cast-in-place columns and a bidirectional system of precast beams and joists.
- The sloping roofs are made of light elements dry assembled.

The structural system consists of the lower existing parts and the new ones at the upper floors; it has been globally analyzed in order to solve potential critical issues based on both seismic and gravity forces. It appeared necessary to introduce some improvements for the existing structural elements, such as the shear reinforcement of some beams at garage level and the strengthening of beam-column joint, due to the increased shear action as a consequence of the installation of the isolators.



Above. Court of Law in L'Aquila. The building has been heavily damaged during the 2009 earthquake.

Opposite page, from above to below. Finite element model of building. Foundations and columns retrofit. Viscous damper. Disconnection of the walls to the foundation floor to allow movement of the superstructure.