Abstract

Technically, the seismic retrofitting of an existing structure can be performed in different ways for instance, by strengthening the structure, by reducing the seismic demand on the structure, by suitably altering the force transfer mechanism etc. Researchers worldwide have developed and proved several of such retrofitting techniques that may lead to significantly improved seismic behavior of the structures designed according to non-seismic design provisions. Several of such techniques have been applied in practice for improving the seismic performance of real-life existing structures. No single retrofitting technique is suitable for retrofitting every structure and therefore a careful and detailed examination and analysis of the existing structure is needed to identify the deficiencies and weak links that need to be fixed by retrofitting.

Since every technical retrofitting technique involves in attaching new elements to the existing structural members, one common link between different strengthening techniques is the anchorage of the strengthening element to the existing structure. This anchorage can be made using the post-installed reinforcing bars, post-installed mechanical anchors, anchorage through bonding using adhesives etc. Since the retrofitting elements are connected to the existing structures using certain anchorage methods, it is obvious that the reliability of the retrofitting performing its function well is directly related to the reliability of the anchorage used to connect them to the existing structure. This is because, in the event of an earthquake, the forces and/or displacements are transferred from the structural members to the retrofitting element through the anchorage. If the anchorage does not serve its function well, the entire strengthening scheme might render not only ineffective but also counter-productive.

This presentation discusses the issue of seismic strengthening through a different perspective that considers inelastic behavior of the structures while judging the most suitable retrofitting technique and giving due importance to the connection between the structure and the strengthening elements using anchorages.

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