

## **XX CONVEGNO ANIDIS “L'INGEGNERIA SISMICA IN ITALIA”**

### **SPECIAL SESSION:**

#### **"VULNERABILITY AND SEISMIC RESILIENCE OF BUILDING AGGREGATES IN ITALIAN HISTORIC CENTRES: ANALYSIS METHODOLOGIES AND SUSTAINABLE RETROFIT STRATEGIES"**

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#### **Abstract**

The masonry aggregates of Italian historic centres, which are cultural and historical heritage of inestimable value, are seriously exposed to seismic risk. Their protection requires urgent and targeted action to reduce their vulnerability and strengthen their resilience. The typological heterogeneity, the intrinsic vulnerabilities and the complexity of the interactions among the structural units require a specific approach for the seismic risk assessment and the planning of effective retrofit interventions.

This Special Session focuses on the analysis of the seismic behaviour of masonry aggregates through the use of advanced numerical modeling methodologies and the elaboration of fragility curves which, by describing the probability of exceeding certain damage states as the seismic intensity varies, allow to assess the vulnerability of these building complexes and to identify their structural criticalities.

Different retrofit strategies, including integrated seismic-energy solutions, to improve the seismic response and energy efficiency of aggregates will be presented and discussed. The proposed interventions, from traditional techniques to innovative combined reinforcement and thermal insulation systems, will be evaluated in terms of effectiveness, sustainability and compatibility with the urban context.

In conclusion, the aim is to provide a complete picture of the methodologies for assessing the seismic behaviour of masonry aggregates and the intervention strategies available to support seismic risk management and planning of mitigation interventions.

**Keywords:** Masonry aggregates, historic centres, seismic vulnerability, fragility curves, seismic consolidation, integrated seismic-energy retrofit.