THE FLOOR STIFFNESS EFFECT ON VULNERABILITY ASSESSMENTS AND INTERVENTION DESIGNS OF HISTORIC BUILDINGS: THE CASE STUDY OF THE "PROCURATIE VECCHIE" IN VENICE, ITALY

IRENE ROCCA[1]*, LUISA BERTO[1], SONIA BELLIN[2], BEAUDIN F. DONGMO[3], ANNA SAETTA[1], RENATO VITALIANI[4]

[1] DCP - University IUAV of Venice
Campus Terese, Dorsoduro 2206- 30123 Venice - Italy
e-mail: irocca@iuav.it; lberto@iuav.it; saetta@iuav.it

[2] Structural engineer
e-mail: soniabellin93@gmail.com

[3] Structural engineer
e-mail: fdongmo@yahoo.fr

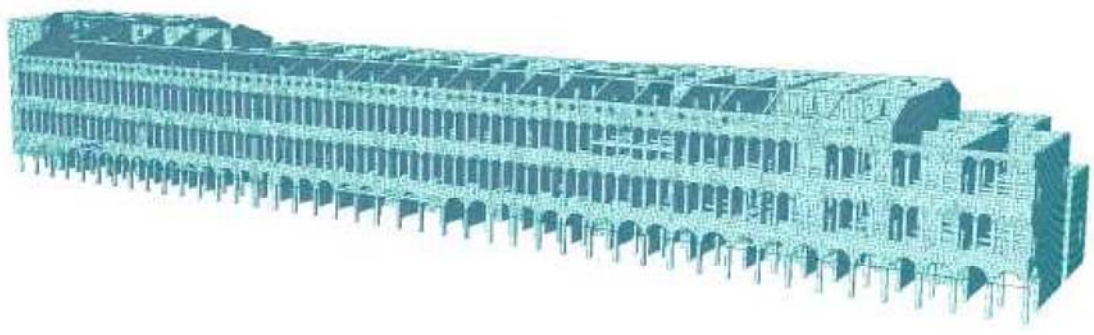
[4]DICEA - University of Padua,
Via Francesco Marzolo 9, 35131 Padova – Italy
e-mail: renato.vitaliani@unipd.it

Keywords: Historical Structure, Masonry, Floor in-plane stiffness

Abstract. In the Italian seismic scenario, and beyond, interventions on existing buildings focused on the evaluation and reduction of seismic risk of cultural heritage have gained more and more importance in the engineering field.

Therefore, for the designer it becomes increasingly useful to have a methodology that allows to carry out, in the study of an existing structure behavior, the vulnerability assessment of both the actual state and the design state, evaluating the adequacy of potential intervention of seismic improvement.

In this paper some phases of this methodology are presented in the context of the restoration work started in November 2017, and currently in progress, of the historical building of Procuratie Vecchie in Piazza San Marco in Venice, with particular focus on the consolidation intervention of the timber floors which satisfy the conservation requirements imposed by the Superintendence of Venice. Actually, the influence of floor diaphragms on structural behavior of existing masonry building subjected to seismic action is critically discussed with particular reference to the effects of in-plane stiffness of floors on the seismic distribution of forces on lateral walls and on the out–of–plane mechanism of the walls.



Global FEM of Procuratie Vecchie building in Piazza San Marco, Venice. (Midas Gen)