

Chapter

8

Strengthening and Modernization of a Characteristic Masonry Building in Vienna, Austria

Dimitrios Stefanoudakis¹ and Eftychia Apostolidi²

¹Civil Engineer, MSc. Dr.techn., Vienna, Austria

²Research Associate, DI MSc, University of Natural Resources and Life Sciences, Vienna, Austria

Abstract

Historical buildings from the period of Promoterism constructed between 1850 and 1910, called “Gründerzeitgebäude,” represent a main part of the building stock in Vienna. A typical building from this period is presented, along with the pathology of such buildings. A step-by-step strengthening and modernization strategy is described, including structural analysis data and design of sections data before and after interventions, along with detailing according to the respective codes.

Keywords: earthquake, strengthening, brick floors, timber floors, historical building, masonry

8.1 Introduction

The city of Vienna is located in a weak earthquake zone with a seismic return period of 475 years. The strongest earthquake recorded in Austria was in the year 1590 (M 5.75) with an epicentre 30–40 km outside of Vienna¹ and an earthquake in 1972 with the intensity of ~60 % of the aforementioned earthquake just caused a few damages to the existing buildings. In spite of many wars, but fortunately just few natural disasters, the city of Vienna still has a good conserved building stock inside the city centre. This area was inside the city wall, called the “Ring,” which was removed between 1858 and 1875 and was replaced by the “Ring” avenue. Outside this down town-city centre area, there are newer buildings, called “Gründerzeit” (“the Founder Epoch”) buildings, constructed between 1850 and 1910 the age of promoterism. These buildings with typically decorated façades still dominate the townscape of Vienna. They are taller and more slender than the older mainly baroque buildings. “Gründerzeit”-buildings are clay-brick masonry buildings of 2 to 6 stories with wooden joist floors. The roof floor is mostly a timber floor, and the cellar floor is a brick arch (*Fig. 8.1*). There are about 30 000 such buildings in Vienna. The existing buildings from the “Period of Promoterism” are of high importance for the city as cultural heritage and they are still used as residential buildings. They are very popular to live in, although they are less comfortable and less safe than modern buildings.