



EARTHQUAKE ENGINEERING FIELD INVESTIGATION TEAM (UK) – DATA AND DISCUSSION ON 2016 CENTRAL ITALY MISSION

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Abstract

At 3.36 am on 24th August 2016 a Mw 6.2 (USGS) earthquake struck the central region of Italy, with epicentre in the Apennines range, near the village of Accumoli and with a fault rupture of 25 km. Earthquake shaking was felt as far as Rome (120 km SW), Florence (220 km NW) and Urbino (200 km N). The worst affected region has a radius of 20 km around the epicentre, including a number of towns and small villages across the regions of Umbria, Lazio and Marche. The building stock of these urban centres mainly consists of historic rubble masonry structures, with a modest proportion of reinforced concrete (RC) constructions.

Between the 4th and 15th of October the Earthquake Engineering Field Investigation team from the United Kingdom deployed three teams in the area struck by the earthquake for a reconnaissance mission aimed at carrying out observations of rupture surface, investigating soil conditions at accelerometric stations which registered the event, documenting geotechnical failures, and collecting geo-referenced damage data for structures.

The team collected data in the areas of Amatrice, Accumoli, Norcia focusing on masonry and reinforced concrete buildings and cultural heritage buildings. In particular, special focus was dedicated to churches in the municipality of Norcia. Churches in the Norcia area, at the time of the investigation, showed reasonably satisfactory performances in the aftermath of the August earthquake. A discussion on the retrofitting actions taken as a result of previous events in the area such as the 1997 earthquake were observed and discussed with local experts who joined the mission.

This latter aspect is relevant since two other destructive earthquakes on the 26th (Mw 6.0 -USGS) and the 31st (Mw 6.5 - USGS) of October struck the same area. The epicenters of these two events were close to Norcia municipality and located in proximity of the churches inspected. Many of the cultural heritage structures inspected during the mission collapsed dramatically after the subsequent earthquakes.

Data collected during the mission and the post-process currently ongoing are shown and discussed with a specific focus on the peculiar characteristics of this earthquake sequence.

Keywords: historic rubble masonry structures; cultural heritage; reinforced concrete; geotechnical failures