3-D APPLIED ELEMENT METHOD FOR PP-BAND RETROFITTED MASONRY

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ABSTRACT

Masonry, through its long history, is widespread used around the world and still remains a main building material in many places especially developing countries. However a poorly designed masonry is known as brittle and susceptible to earthquakes. To improve masonry seismic capacity, polypropylene band retrofitting technique was purposed based on economic point of view and local availability of material and skilled labor. In this study, we proposed the 3-D Applied Element Method as an analysis tool to help understanding the polypropylene band retrofitted masonry behavior which will be benefit in the future design process. Unlike the previous version, 3-D Applied Element Method elements can be any rectangular prism which helps reducing the number of elements. Brick and mortar springs are represented by using different spring properties. Nonlinear constitutive law of the mortar spring employed the Gambarotta model which considers the material softening. Polypropylene band is modeled as beam element using conventional plastic constitutive law connected together with the masonry by elastic spring representing the polypropylene band to brick connector. The numerical simulation of non-retrofitted and retrofitted out