

EXPERIMENTAL INVESTIGATION OF PERFORATING MASONRY BRICK WALLS IN CENTER CORE REHABILITATION METHOD; DEVELOPMENT OF TECHNIQUES AND EQUIPMENT

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ABSTRACT

An advantageous method for retrofitting of brick unreinforced masonry buildings is center core. In this method vertical holes with given intervals are perforated through the brick walls to the footing and then reinforcing steel bars are embedded in the holes and grout will be injected finally to create bond strength between wall and bars. This method would not affect inner and outer appearance of the building; therefore it would be suitable for historical buildings. It could be also achieved without thorough evacuation of the building from residents and furniture. However, the difficulty of conducting such deep boreholes in weak and thin brick walls especially of older buildings remains a serious challenge in the method. So a practical investigation was designed to investigate the feasibility of the method and develop the techniques and equipment needed. This article aims to report the results of the experiment. However, the main contribution of the study has been finding new drilling techniques, designing and testing of the best suited drilling bit which is particularly appropriate for boring brick walls without deterioration and cracking.

INTRODUCTION

An advanced, advantageous method for retrofitting of un-reinforced masonry (URM) buildings is center core (CC). Center core strengthening system consists of a reinforced grouted core placed in the center of an existing URM wall. Coring a vertical hole from the top continuously through the wall into the existing footing will provide the core (Figure 1). Reinforcing steel bars are then embedded in these holes and grout would be injected finally to create bond strength between wall and bars. CC would not affect inner and outer appearance of the building (same as nondestructive methods), therefore it would be suitable for historical buildings. It could be also achieved without thorough evacuation of the building from residents and furniture because it can be done externally from the roof.

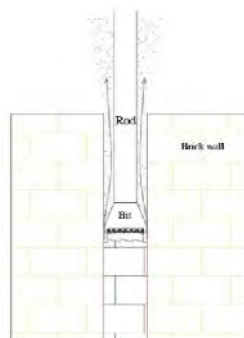


Figure 1. Boring process in Center core method