A BRIEF PERSPECTIVE ON FOUNDATION UNDERPINNING FOR EXISTING BUILDING STRUCTURES

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Abstract. In structural engineering, sometimes there exists an inevitable need for retrofitting or strengthening of existing building structures. Building structures are not only constantly being exposed to a variety of loading conditions and degrading environmental actions but also to thecontinuous demands of the industry in the face of technology advancement. Existing factories experiences changes in process equipment in the form of more massive and heavier loading to meet the latest industrial requirements. Selection of right techniques, materials and procedures for the strengthening and underpinning of the existing building structures and foundations therefore, posed a major challenge to even the most experienced professionals in this field. This is so to avoid potential structural failure, reduce safety risks, upgrade the existing capacity and further enhance the durability of the structures. Thus, in-depth understanding of the issues at hand, inspections, desk-studies, analyses, design options that come with cost evaluations and constructability, construction, safety management and monitoring are deemed a prerequisite as far as structural strengthening and foundation underpinning is concerned, all of which have to be conducted in phases to ensure the implementation of a systematic procedure for the works. This paper attempts to put forth procedural recommendations that encompass site inspection, appraisal of the existing structures, site investigations, analyses, various design options, cost considerations, construction methods, safety managements, projects scheduling and monitoring works among other, via 3 selected case studies; then underpinning works of a 5-storey apartment, a 7-storey process tower structure for refinery plant and a 2-storey food additive manufacturing facility.

Keywords: Structural engineering, structural, strengthening, foundation underpinning, appraisal, settlement.

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