POST-TENSION COLUMN FOR IBS BLOCKWORK BUILDING SYSTEM

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I dedicate this piece of my hard work to the person that I love most.

Especially, My Mother and Father
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ABSTRACT

Industrialized Building System (IBS) is now a common remark in construction industry. The used of this system have grown rapidly around develop country including Malaysia. This research is mainly focused on the interlocking blockwork system for the residential building house. The concrete blocks were assembled by stacking up and jointed together, by the bolt only without the interlocking void in the blocks. The assembly of beam and column are by bolts only. This study focuses on the pretension bolt at the column only. The stress value at the bolt is needed in order to apply pretension or preloading to the bolt. The purpose of this study is to investigate the behaviour of the frame structure of the blockwork system under point loads in both experimental which is constructed in the laboratory and analysis of the structure modeled in finite element analysis software (Abaqus/CAE). The behaviour of the structure observed during the testing was merely the pattern of the crack occurred when the frame is loaded. Based on the analysis that has been performed, the residual stress in the bolt is determined and the actual pretension bolt value in the column is calculated which gives 0.251 kN, while the torque that need to be applied at the nut is 0.102 kNmm.
ABSTRAK

Sistem Bangunan Perindustrian (IBS) kini merupakan perkataan yang tidak asing lagi dalam industri pembinaan. Penggunaan sistem ini telah berkembang dengan pesat di seluruh negara membangun termasuk Malaysia. Kajian ini lebih tertumpu pada sistem blok konkrit saling mengunci untuk bangunan rumah kediaman. Blok konkrit ini telah dipasang dengan meletakkan dan menyesusun secara bertingkat melalui bolt tanpa ruang kosong saling mengunci di dalam blok konkrit. Pemasangan tiang dan rasuk adalah melalui bolt sahaja. Kajian ini hanya memfokuskan bolt prategangan pada tiang sahaja. Nilai tegasan pada bolt adalah perlu supaya prategangan boleh diaplikasikan pada bolt tersebut. Tujuan kajian ini adalah untuk menyiasat tingkah laku struktur kerangka sistem blok konkrit di bawah beban tumpu pada kedua-dua eksperimen yang dibina di makmal dan analisis dari perisian unsur terhingga (Abaqus/CAE). Kelakuan struktur yang diperhatikan semasa ujian yang dilakukan adalah semata-mata corak retak yang berlaku apabila beban diletakkan. Berdasarkan analisis yang telah dijalankan, tegasan baki dalam bolt telah ditentukan dan nilai sebenar prategangan bolt dalam tiang adalah 0.251 kN, manakala tork yang perlu diaplikasikan pada nat adalah 0.102 kNm.