

A Review Paper of Seismic Analysis of Normal Brick and Interlocking Block in Residential Building

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Abstract: - In this study, an attempt is made to analyze the structure of interlocking blocks. The structure is modelled using STAAD PRO software. RCC structure are built by normal bricks but due to rapid growth and expensive materials, now-a-days construction engineer are going for interlocking blocks. In this project a residential building of G+1 structure is considered.

Key Words: — *Interlocking block, STAAD PRO, seismic analysis.*

I. INTRODUCTION

In the most of the developing world with the increase in population the housing facility is inadequate & therefore due to high rate of urbanisation the cost of land & material of construction is increasing rapidly. Different types of interlocking blocks are being developed worldwide. Expansion of interlocking earth block is one of the best technologies for the production of low-cost building materials. [1].

II. LITERATURE REVIEW

Parimal Borbar, July 2020, the concept, design and application of interlocking precast block design will prove effective example for sustainable approach towards construction. According to the analysis done in the Ansys, it is clearly seen that the deformation of the retaining wall is produced less than 3mm which is quite safe enough. It is clearly observed that, when the RCC wall is compared with the precast wall stresses induced in the precast wall are very less as compared to RCC wall.

S.S.Deshmukh, June 2019, the seismic analysis of single storey , single bay frame with infill wall build using interlocking blocks and bricks are conducted and compered. In order to obtain more realistic value for stress and displacement results, we have conducted 3d analysis of structure. When compared the displacement result of the frame with interlocking block wall, brick wall and frame without any infill wall (bare frame) it has been observed.

Mubeena Salam, 2018, storey drifts are found within the limits as specified by code (is 1893-2002 part-1). The seismic base shear obtained by is code is not in a good agreement with the values obtained from equivalent static and response spectrum analysis using etabs.

Bhavani Shankar, October 2016, it has been observed that overall displacement of interlocking block wall is reduced by about 69% when compared with frame without infill wall and about 15% when compared with brick infill wall. In all the cases stress value is more in y direction. Thus, interlocking block will be effective in resisting the earthquake loads.

Farzad Hejazi, 2015, finite element model of mortarless block masonry wall foundation soil system has been developed. The model is at micro level which includes the modelling of masonry material, mortarless dry joint and block- grout interface behaviour.

A. Jeba Jeslin, 2019, the compressive strength of the interlocking block increases by 15% to 30% when compared with the nominal brick. Interlocking blocks have better tolerances and no efflorescence when compared with nominal brick. The bond strength of interlocking block is greater than

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that of nominal brick. The resistance due to impact for interlocking block is 80% to 85% greater when compared to the nominal brick. The energy absorbed by interlocking

- block is 60% to 70% greater than that of nominal brick.
- *Rinju Mathew*, in this study, the effect of openings in the wall under the lateral loading are studied and discussed.
- *Farzad Hejazl, 2014*, the interlocking keys provided for this system were able to integrate the blocks into a sturdy wall and can replace the mortar layers that are used for conventional masonry construction in low seismic area.



Fig.1. Interlocking block wall

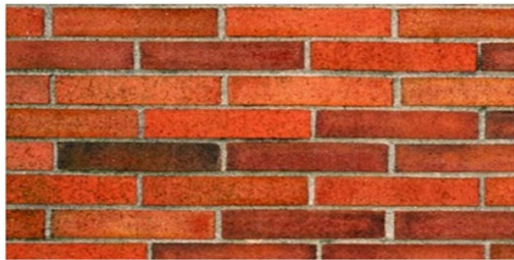


Fig.2. Sand Crete brick wall [2]

Objective:

- To study the comparison between normal bricks and interlocking block.
- To design the structure using conventional bricks wall and interlocking blocks.
- To calculate analytically the boundary loading conditions on both developed structures.
- To analyse the model using software analysis response.

Mix Proportion of Blocks				
Mix ID	Fly Ash (Kg/m ³)	Quarry Dust (Kg/m ³)	Sodium Silicate (Kg/m ³)	Sodium Hydroxide (Kg/m ³)
FDQ01	450	1316	200	80
FDQ02	420	1352	200	80
FDQ03	378	1404	200	80
FDQ04	336	1456	200	80
FDQ05	294	1508	200	80

Fig.3. Components in block construction

III. CONCLUSION

In this paper the interlocking blocks of various types and composition are studied and discussed from various papers by investigators. To analyze the seismic behavior of block with load as concluded following

- The load is transferred with interlocking block is easier and other bricks.
- The block can be constructed as per the requirement of location.
- Adding fly ash increases the compressive strength of block.
- Interlocking blocks are useful for 3 storey building only.
- Interlocking blocks are more economical and cost friendly to budget.
- As compared to other blocks available in the market it gives a more strength.

Further research developable can go for development of structure with interlocking blocks for more than G+3 building by improvement in interlocking block strength to resist more load.

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