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Strength evaluation of dry-stack masonry

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ABSTRACT

Accelerated dry-stack masonry construction is seen all over the world in the last two decades. Intense investigation on structural behaviour of dry-stack masonry is also seen worldwide. This research work, presents an investigation of the structural behaviour of Hydraform dry-stack masonry developed in South Africa. Unit compressive strength, masonry wall compressive strength and flexural resistance of dry-stack masonry/reinforced concrete beams were investigated.

Due to the interlocking mechanism nature of Hydraform dry-stack blocks, three different unit compressive testing methods were investigated. The methods are described as:

- Shoulder test;
- Centre test;
- Cube test.

Tests were carried out under different humidity conditions:

- Dry;
- Wet;
- Normal.

Influence of different cement contents within the block units and moisture contents were investigated. The study made proposal of Hydraform block unit grads to be used for design.

Compressive strength of dry-stack masonry walls was experimentally investigated. Dry-stack masonry wall specimens made by different block grades were subjected to in-plane vertical uniformly distributed load. Test results were used to establish dry-stack masonry characteristic compressive strength for several block grades.

Flexural strength of dry-stack masonry/reinforced concrete composite beams was investigated. Series of beams were tested for flexural resistance. Applicability of conventional reinforced masonry flexural analysis philosophy was established.