

Flexible buntion end connection using slotted holes

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The conveyance guidance system in deep level mining most commonly utilizes a structure composed of vertical guides and horizontal buntions fixed to the mine shaft walls. The current design practice is based on SANS 10208^[1] and referenced to COMRO User Guide No 21^[2]. SANS 10208^[1] and COMRO Design Guide No 21^[2] give guidance to overall design procedure for fixed mine shaft steelwork designs. The dynamic behaviour of the shaft steelwork is a result of the travelling characteristics of the conveyance, and is dependent on various factors including buntion stiffness and end fixity. To assist in the constructability issues of shaft steelwork and the alignment the steelwork during equipping of the mine shaft, bolted connections with slotted holes in the buntion ends is increasingly being utilised. The current standard for steel design in South Africa, SANS 10162^[3] provides little guidance for the use of slotted holes under dynamic loading conditions. To address these issues Anglo American conducted a number of physical tests over the last few years for various mine shaft projects.

This paper will describe the dynamic interaction of shaft steelwork with the conveyances, present test results done in three shaft configurations, present the dynamic properties and connection stiffnesses of the test specimens, and evaluate the effect of using the buntion end connection flexibility in the dynamic response of the system.

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