



The Container Connection of the New Indian Antarctic Research Station

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Abstract

Bharati, the New Indian Antarctic Research Station, consists of a self-supporting structure of customized ISO shipping containers. Up to eight ISO corner fittings per node are three-dimensionally interconnected forming a multi-storey building, so that the structural bracing is entirely given by the containers. The therefore necessary container connections are the key to an efficient structure. It consists of simple parts: bolts, shear blocks, anchor blocks, stackers and thread bars. In combination these elements guarantee force transmission in all directions by mounting them into the openings of the ISO corner fittings. All parts can easily be installed by hand using a wrench. The efficient use of containers did not only reduce the building material, but also the carbon dioxide emission on all transport activities by truck, ship and helicopter.

Keywords: Container structures; corner fittings; corner castings; Antarctic buildings.

1 Introduction

Containerised buildings are advantageous, because they easily erectable, demountable and therefore suitable for temporary buildings. Containers are light and easily transportable, thus technically suitable and economical for secluded areas like Antarctica. Shipping containers are equipped with so-called corner fittings providing holes for fastening to ships and trucks.

Prior to design of Bharati, the New Indian Research Station, the author's research on previously built container structures had shown that existing container connections, either off-the-shelf lashings or their modifications for buildings, did not satisfy the demands given by the complexity of the proposed design. Therefore, it was necessary to create a new connection type.

2 Conventional Container Connections

The container lashing industry provides various container connections for securing ISO containers on ships and trucks. The most important ones with high potential for the use in container buildings are given in Table 1.

The force-transmitting main body of the majority of these connections is located outside of the corner fitting, e.g. Bridge Fittings have an external tensile member. Quick ties were especially invented to join two 20-foot containers to the size of one 40-foot container, significantly reducing handling time and fees in container terminals. Therewith connected containers have a clear space of 76 mm, which can be disadvantageous in buildings. ISO shipping containers are designed to withstand wind and wave actions on ships being