

Sleeved Holding Down Bolts

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Key Words

Holding down bolts; sleeved; conical sleeves; anchor bolts,

Introduction

One of the greatest problems faced by a steel erector on site is inaccuracy in the locations of the anchor bolts. Precision surveying equipment and techniques are required to accurately set out solidly cast-in anchor bolts in accordance with NZS 3404.1. The required setting out tolerances of these fixed holding down bolts is very tight. To provide increased tolerance and some allowance for site adjustment, sleeved anchor bolts can be used. See Figure 1. These allow some adjustment of bolt positioning after concreting. This article describes the requirements for holding down bolts sleeves.

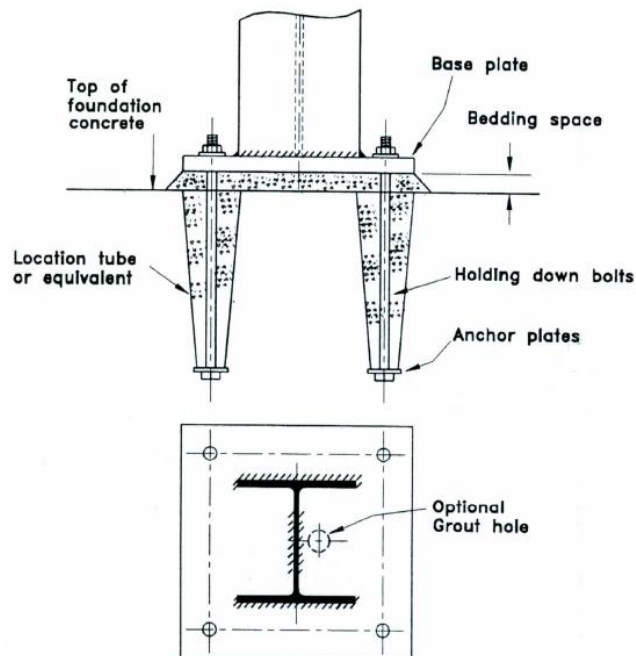


Figure 1: Holding-down Bolts with Conical Sleeve to Allow Movement (Davison, Owen, 2003)

Sleeve Requirements

The two commercially available bolt boxes for forming the sleeve detail are the waxed conical shaped cardboard tube and the polystyrene conical shaped void former. These are shown in Figure 2 and 3. The waxed cardboard tube may be reused by ensuring that 25mm of the box is left protruding and rotated before the concrete has completely set. The polystyrene former is dissolved after the concrete is set with a solvent.

The diameter of the tube or the tops of the cones should be at least 100mm or 3 times the diameter of the bolt, whichever is greater. (SCI & BCSA, 2002) It is important to have the bolts set both vertical and loose in the sleeve. There should be 25mm clearance at top of concrete. The length of sleeve needs to vary based on the bolt diameter if the anticipated degree of bolt adjustment is to be realised.

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A bedding space of at least 50mm is the normal allowance when using high strength bedding material. (SCI & BCSA, 2002) This gives reasonable access for grouting the bolt pockets, which is necessary to prevent corrosion, and for thoroughly filling the space under the base plate. It also makes a reasonable allowance for tolerances. For smaller, more lightly loaded bases a gap of 25mm to 50mm will be found to be adequate.



Figure 2: Waxed Conical Shaped Cardboard Tube (LM Products,2009)

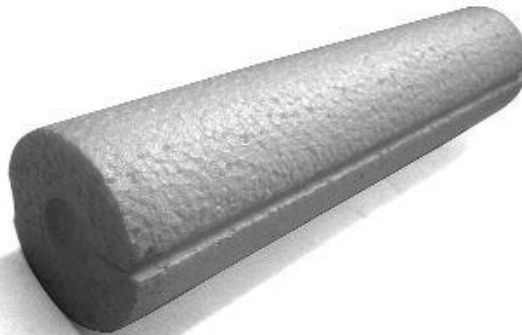


Figure 3: Conical Shaped Polystyrene Void Former (LM Products,2009)

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