



Safe support of overhead services - Insert anchors

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Purpose

The purpose of this health and safety alert is to highlight the risks of falling overhead building services caused by the failure of insert anchors. Overhead building services include air conditioning ducts, cable trays, water pipes and waste pipes.

Background

In late 2018 two separate incidents occurred in Queensland involving insert anchors. Insert anchors are also known as post-installed anchors and use a number of installation methods including the use of a hammer, cordless drill/driver or torque wrench.

In the first incident, a large air conditioning duct, suspended from the underside of a suspended concrete slab, dropped to the floor below. The anchors were loaded in direct tension (pull out) and failed. In this incident cheap 'hammer in' type insert anchors were used. The anchor manufacturer clearly states that the anchors were unsuitable for an overhead application.

In the second incident, a 70 metre long cable tray holding heavy electric cable pulled away from a concrete wall and injured workers next to the cable tray. The cable tray was supported by a combination of threaded rods from above and cantilevered brackets that were fixed to the wall using screw bolt type insert anchors.





Photograph 1: Dropped air conditioning duct



Photograph 2: Dropped cable tray

Contributing factors

The incidents are being investigated. The failure of insert anchors can be caused by a number of factors including:

- overloading of the anchors
- failure to install the anchor in accordance with the manufacturer's instructions
- using the incorrect type¹ of anchors for applications where anchor failure can cause loss of life or injury
- using an anchor where the manufacturer's instructions are impractical to meet (e.g. reinforcement steel in the concrete makes it impractical to drill holes of the correct diameter and depth).

Note¹: Most of the larger manufacturers of post-installed anchors produce a range of anchors of differing quality for a broad range of applications. Many of the cheaper and smaller anchors are not intended for applications where the failure of the anchor can cause death or injury. Wherever the manufacturer states that certain applications are unacceptable, these instructions must be complied with.

Action required

To reduce the likelihood of failure of insert anchors used to support overhead services ensure:

- Only anchors specified as suitable for the application, with a manufacturer's load rating equal to or exceeding the maximum applied loads, are used.
- Insert anchors are installed in accordance with the manufacturer's instructions.
- Anchors are not installed in holes that are oversized, too shallow or where the concrete is cracked or damaged.
- A documented system that verifies the actual loading applied to the anchors is less than or equal to the maximum allowable specified by the anchor manufacturer is provided. This will usually require a professional engineer to undertake calculations and provide a certification statement.

Where there is any doubt about the application in which an anchor is to be used, written confirmation should be obtained from the anchor manufacturer. Confirmation by a professional engineer alone may not be adequate as limited information may be available to the engineer.

Where the installation method is likely to encounter problems such as regularly hitting reinforcement steel in the concrete, the use of alternative anchorage systems (e.g. cast in ferrules or 'through bolts') should be considered.

Anchors that require a specific tightening torque are installed with calibrated torque wrenches or with specific drivers as specified by the anchor manufacturer which reliably achieve the correct tightening torque. Documentation verifying the tightening torque and the name of the installer should be provided for these anchors.

Further information

Further information can be obtained from the following:

[Tilt-up and pre-cast construction Code of Practice 2003](#) (PDF, 979.59 KB)


[Scaffolding Code of Practice 2009](#) (PDF, 1159.67 KB)

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Related links

 [Tilt-up and pre-cast construction Code of Practice 2003](#) (PDF, 979.6 KB)

 [Scaffolding Code of Practice 2009](#) (PDF, 1.1 MB)

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