

FASET Bulletin No. 14 (August 2012) Drilled Fixings



Safety Nets should not be supported by any drilled anchor fixed into a structure unless the Rigging Company can provide evidence that the structure, the anchoring material, and the anchor are capable of taking an applied load of 6kN at 45°.

The design, selection and testing of anchors should be carried out by a competent person.

In general, concrete elements which are part of the load bearing structure will be suitable once they have cured sufficiently to sustain the anchor load. Masonry[1] structures may be suitable if they are load bearing, solid with cured mortar.

The Rigging Company must provide details to the client of the distance an anchor is from an edge of the structure (i.e. corner, window or door jamb) and with the maximum spacing's between anchors.

Consideration needs to be given to the height of masonry above the anchor, and how the wall is restrained.

Anchor manufacturers may give Recommended (Safe Working) Loads[2] for use in concrete and some other base materials. Manufacturers recommended loads for use in concrete should not be used for masonry. If no load data exists for the anchoring material, or its strength is in doubt, as is often the case with brickwork / blockwork / stonework, then preliminary tests should be carried out to determine the allowable load[3] for the anchor in the anchoring material.

To demonstrate the adequacy of an installed anchor a tensile pull test device, that has been calibrated within the last 12 months, (similar to the one shown opposite), can be used in accordance with the manufacturers instructions. This type of test only confirms the horizontal pull out resistance of the anchor. Since the load is considered to be applied at 45°, the vertical component of the load[4] will apply shear and bending to the anchor. The capacity of the anchor for shear and bending in the anchoring material should be checked with the manufacturer, and if necessary vertical load tests can be carried out.

Where preliminary tests are required, 5 tests should be carried out in each type of the anchoring material. Tests should be carried out on sample anchors in the anchoring material but away from areas which will be used in the job. All anchors, except nylon anchors, should be test loaded in tension to 2 x the working load to be applied to the anchor [4]. Nylon anchors should be tested to 3 x working load.



Proof tests should be carried out to check that anchors to be used in the job have been correctly installed.

A minimum of 3 randomly spread anchors should be tested or at least 5% (1 in 20) should be tested to 6kN[5] the working load. If any anchor fails, the reason(s) for failure should be investigated and identified.

The testing rate should also be increased:-

- 1 failure – double test rate to 1 in 10 and at least 6.
- 2 failures – double again to 1 in 5 and at least 12.
- More than 2 failures – test 100% of the anchors for the job, review the fixing specification and installation method.

NB: this symbols illustrates indicative fixing and testing arrangements and not that the tie or equipment shown are approved, recognised or official FASET requirements.



[1] Masonry includes brickwork, stonework and concrete blocks.

[2] Recommended Load is the load which can be applied to the anchor quoted by the manufacturer for a specific anchoring material.

[3] Allowable Load is the load which may be applied to the anchor determined from 'Preliminary' tests.

[4] TG4 : 11 recommends a preliminary test of 2 X working load (3 x working load for nylon anchors) and a proof load of 1.25 x working load. The anchor working load is 6kN @ 45 degrees which can be resolved into a horizontal and vertical load of 4.25kN. The preliminary tension test load will be 2 X 4.25kN = 8.25kN (3 x 4,25kN = 12.75kN for nylon anchors). The proof load will be 1.25 x 4.25kN = 5.3kN. Since the proof load of 5.3kN is close to 6kN, for simplicity a proof load of 6kN is recommended.

[5] Working Load is the design load to be applied to the anchor.

NB: Further information on the classification of temporary work, anchors, their installation and testing can be obtained from the :-

- FASET Bulletin No. 19 'Safety Nets' classification of Temporary Works
- Health & Safety Executive SIM/02/2010/04 <http://www.hse.gov.uk/foi/internalops/sectors/construction/021004.htm>
- NASC technical guidance note TG4 : 11 – Anchorage Systems for Scaffolding. (March 2011)
- Construction Fixings Association's website www.fixingscfa.co.uk