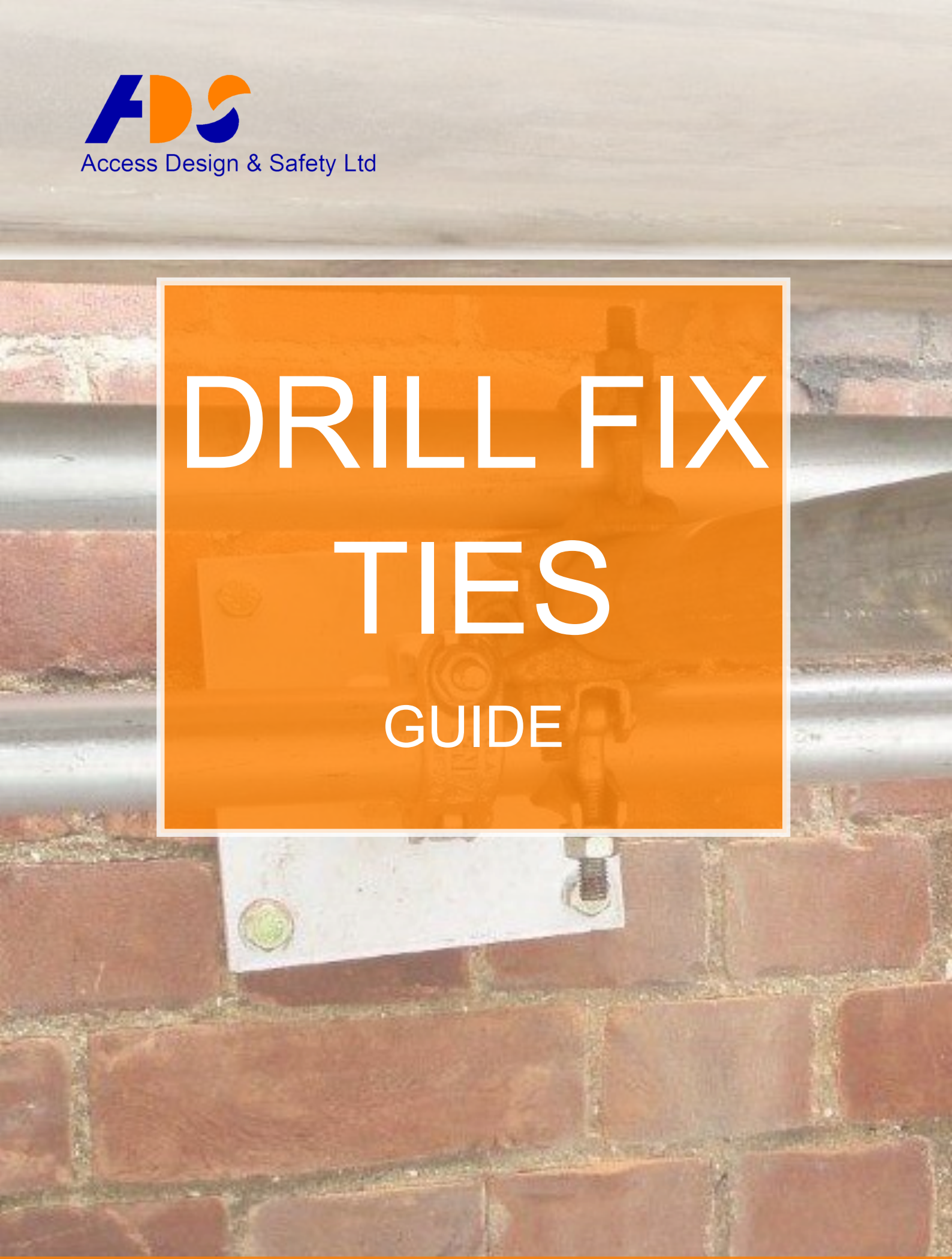
Access Design & Safety Ltd



DRILL FIX TIES

GUIDE

BY ACCESS DESIGN & SAFETY

Contents

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Working Loads And Recommended Loads

The working tie loads for a scaffold are the expected loads that will be applied to the ties arising from normal use of the scaffold, e.g. from wind acting on the scaffold. This is the tie load that is stated when using a TG20:13 compliance sheet for a standard scaffold. For non-standard scaffolds where a design is required the maximum tie load should be stated within the design.

The recommended load is the allowable load for a tie into a base material. Tie manufactures will state a recommended or allowable load for each type or size of tie into one or more types of base material. Most manufactures will give a load for their tie into good quality concrete, some manufactures will also give additional loads for other base materials such as masonry.

The working tie load for a given scaffold must be less than the recommended load for the selected tie into the correct base material.

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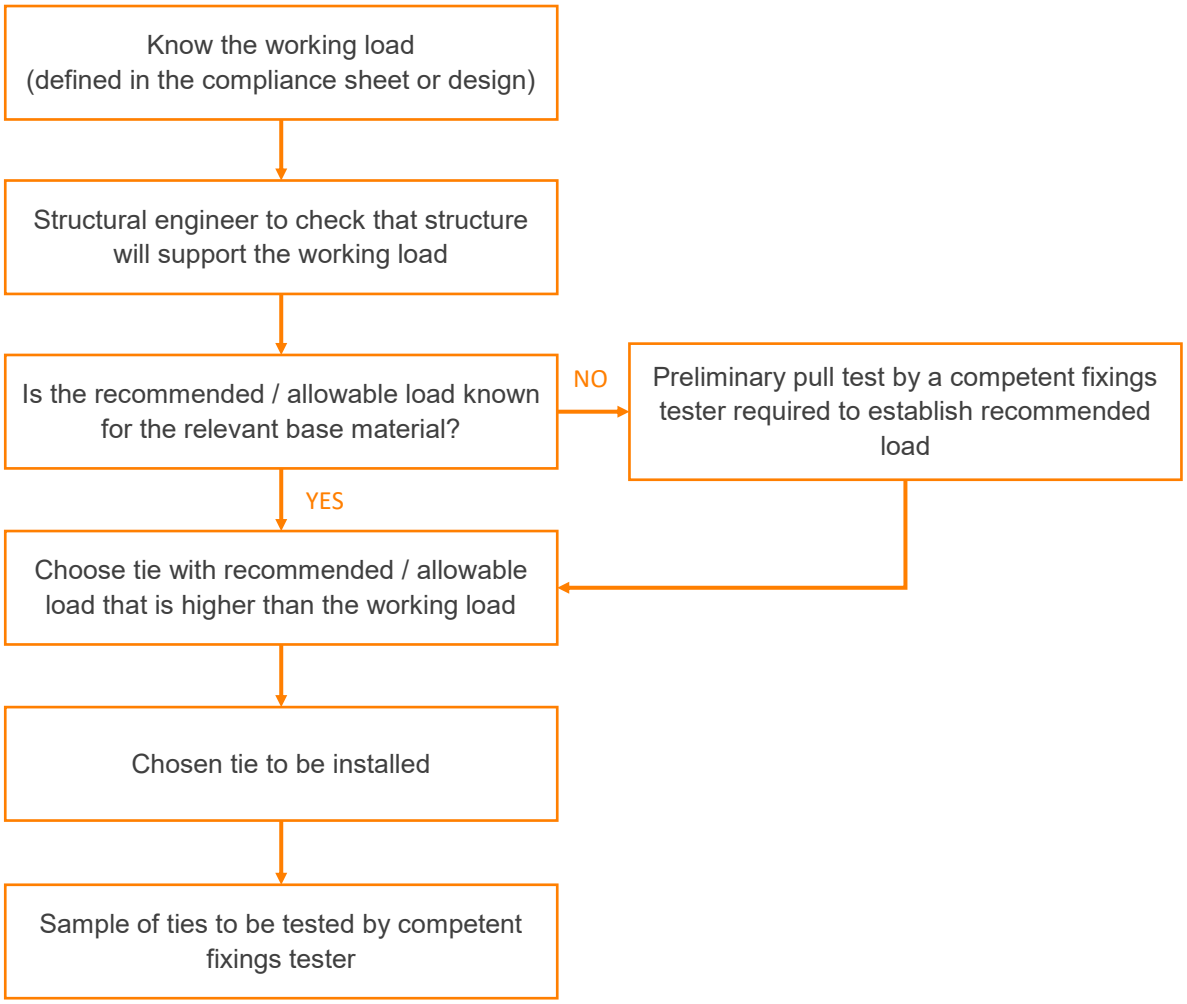
Pull Testing

Where the recommended load is not known, for example if the scaffold is to be tied into old concrete or masonry but the recommended tie load is for good concrete only, then a preliminary pull test should be carried out by a competent fixings tester, to determine the recommended load.

A structural engineer must also ensure the capacity of the building to support the working loads, even when the strength of the base material is known. For example a recommended tie load may be given for a tie into masonry and the scaffold will be tied into a masonry wall where the bricks are in good condition, however the strength of the mortar may not be sufficient to prevent an individual brick from being pulled out of the wall.

Once a suitable tie has been selected and the structural engineer is happy that the structure can support the tie loads, the ties should then be installed, and a sample of ties should be tested by a competent tester.

Approach To Safe Fixings



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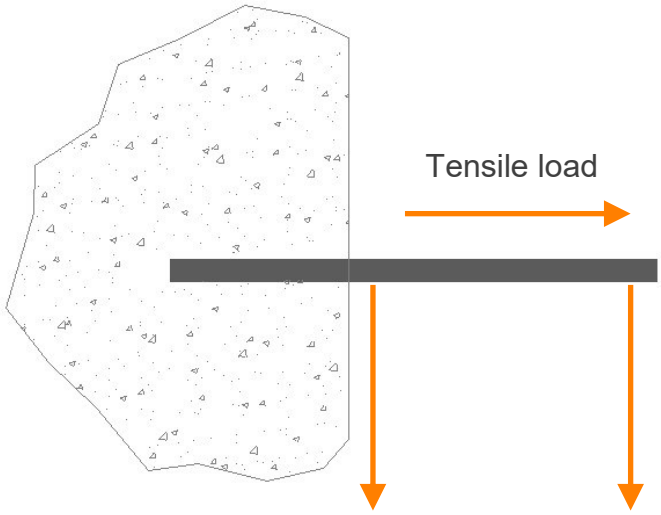
Load Direction

Tie loads can act in a variety of directions depending on how the scaffold is constructed or the intended use for the scaffold.

For standard scaffolds the tie loads are usually tensile loads, meaning the load will want to travel outwards away from the wall, however there are occasionally circumstances where the tie loads will want to travel in a parallel direction along the face of the wall, these could be laterally (side to side) or vertically (up or down). An example of this could be if a goods hoist is tied to the scaffold, this will often cause a lateral tie load. Another example is if the scaffold cannot be founded from ground and must be fixed to the face of the wall, this will cause a vertical tie load.

If a lateral or vertical load is acting on a tie very close to the face of the wall it will place that tie in shear, if the load is acting further away from the wall it may place the tie in bending. It is important to understand which direction a tie load will want to travel & the limitations of certain types of ties in coping with different load directions.



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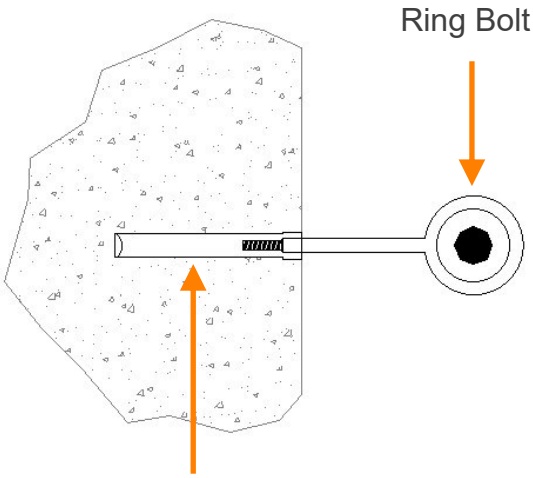
Common Ties For Tensile Loads

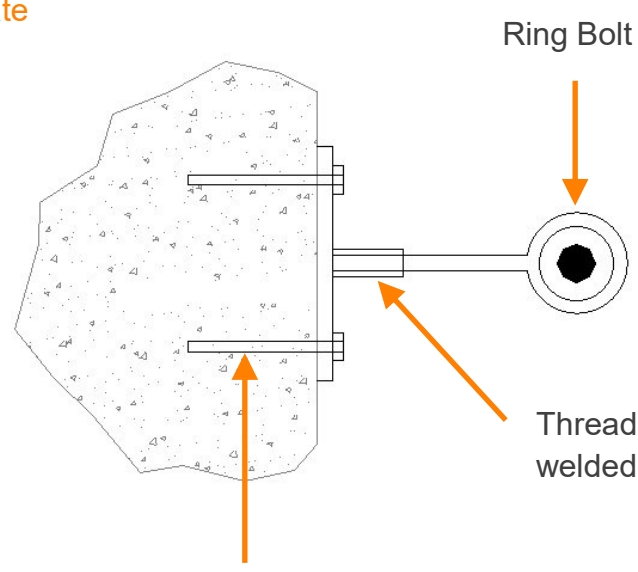
In recent years there has been a move away from the use of drop-in type expansion anchors in brickwork. Developments in new fixing methods mean there is now a wide range of ties & tying in methods available. Below are some examples of typical tie arrangements that can be used for normal tensile tie loads.

Ring Bolt with Threaded Socket



Internal threaded socket. Can also be bonded using adhesive resin for increased tie load capacity

Ring Bolt with Threaded Connector Plate



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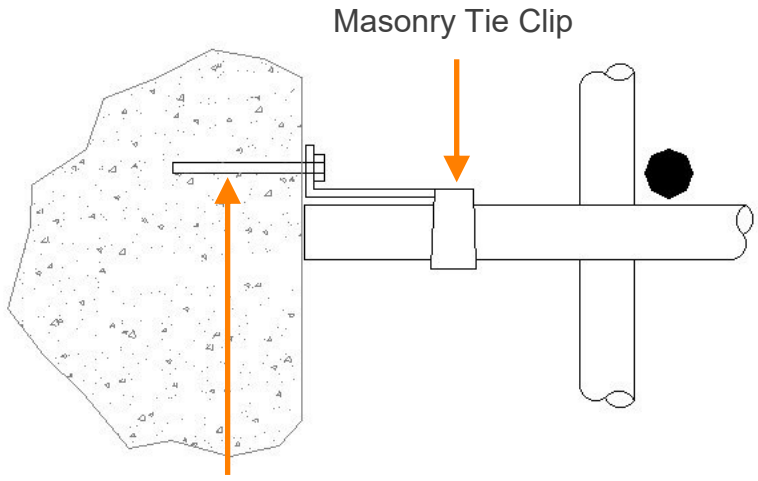
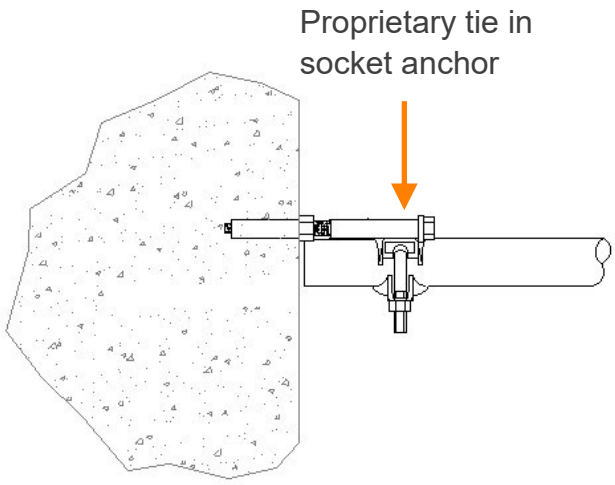
Common Ties For Tensile Loads

Masonry Tie Clip

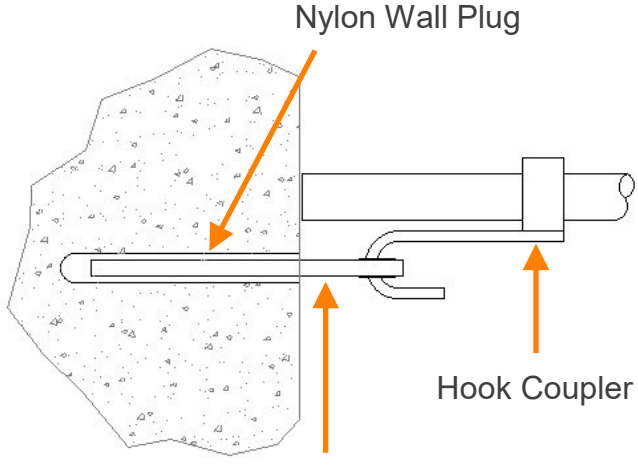


Self tapping concrete screw bolt.

Proprietary Tie In Socket Anchor



Hook Coupler With Eye Bolt



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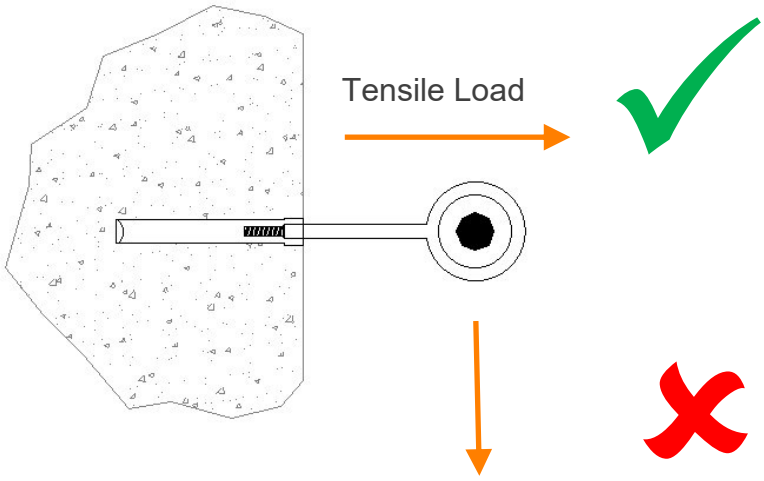
Common Ties For Lateral / Vertical Loads

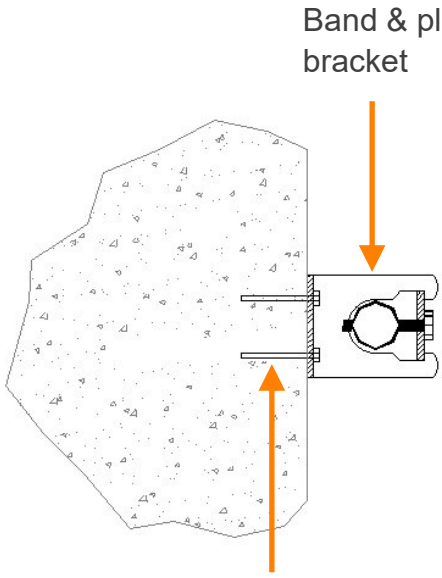
As most ties have a poor bending capacity it's recommended that lateral loads are applied to the tie as close to the wall or base structure as possible so that the tie is acting as a shear tie. This means that some ties designed for tensile loads are not suitable for lateral / vertical loads.



Lateral or Vertical load placing the tie into bending

Following are some examples of common shear ties that can be used for lateral or vertical tie loads.

Band & Plate Bracket



Self tapping concrete screw bolts

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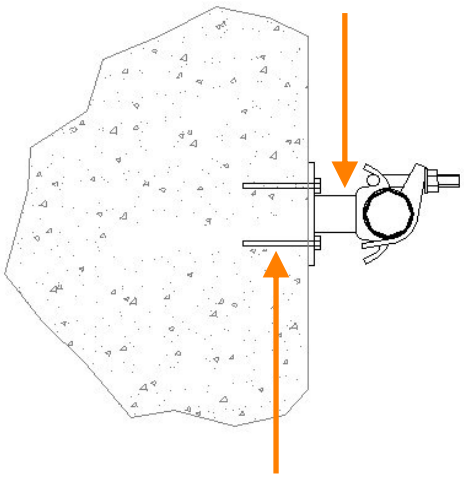
Common Ties For Lateral / Vertical Loads

Shear Plate With Fitting

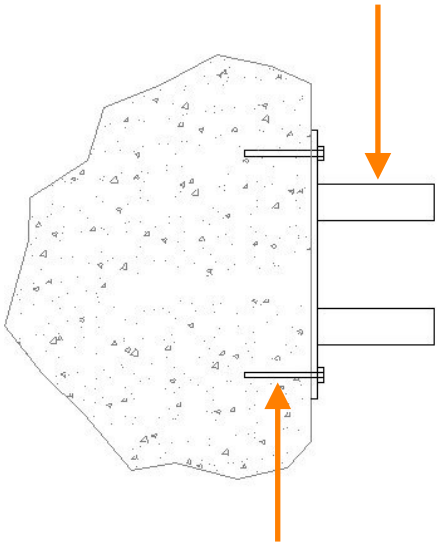
Shear plate with welded fitting



Self tapping concrete screw bolts.

Shear Plate With Tubes

Shear plate with welded tubes



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Call or email us now, for all of your scaffold design or design checking requirements.

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