



WILLMOTT DIXON

SINCE 1852

Fixings and Anchors Policy

February 2019

This Fixings & Anchors Policy
must be included in, and
inform, the project's
Quality Delivery Plan
Appendix C.



In the civil engineering, transport and nuclear sectors, all supports and fixings that carry any load are:

- designed to take the load
- specified by the installation company; and
- installed by operatives trained to install those specific fixings and who are supervised by a competent person

As a result of this compliance, these industry sectors are confident that fixings are being designed and installed correctly and will perform as designed with no post-installation testing required.

In the construction industry, we do not currently have that confidence and recent failures highlight that we are at risk of a fixing failure with potential fatal consequences.

The solution is not complex but does involve a significant change for our people, our Designers and our Supply Chain Partners.

For every safety critical fixing and anchor, we require evidence that the proposed fixing or anchor will achieve the designed loading and that the operatives and supervisors responsible for the installation and sign off are trained and competent.

Fortunately, a British Standard exists that will help in the majority of circumstances, namely BS 8539:2012. It deals with the selection and installation of **post-installed anchors** in concrete and masonry. By following the process set out in the BS, we can rely on manufacturers performance test data rather than on site pull-out testing.

Compliance with BS 8539:2012 is the responsibility of everyone involved with anchors, right from the specification point by the project engineer up to their installation which shall be overseen and certified by the responsible supervisor.

Fixings into steel or timber are not covered by the British Standard however we still need to ensure their correct installation and performance. Following the process outlined in BS8539:2012 for all safety critical fixings will ensure we can verify the selection and installation of these fixings. Specialist advice must be sought from a fixing supplier to confirm the performance of steel and timber fixings.

Every Willmott Dixon project now requires a Fixings & Anchors Project Plan that:

- conforms to **BS 8539:2012**
- ensures all safety critical fixings are specified and installed correctly; and
- is included within the project's **Quality Delivery (QD) Plan** to ensure there is a full audit trail.

A Fixings and Anchors Project Plan is simply a record of how we:

1. Identify which fixings and anchors require confirmation of their performance and who is going to provide that information
2. Obtain loading information from the Designer
3. Ensure the Supply Chain Partner issues the respective information relating to their fixings and anchors
4. Ensure that the operatives and supervisors are suitably training and competent to install and sign off the proposed fixing

The consequence of incorrectly specified and installed fixings and anchors.....



PULL-OUT TESTING

It is important that all sites are aware that fixing manufacturers often receive requests for unnecessary pull-out testing due to misunderstanding of BS 8539:2012.

As per BS 8539:2012, site pull-out testing is not required if anchors have an ETA* (the main Manufacturers such as Fischer, Hilti, SIG, etc. can provide published performance data) and installation is undertaken by competent operatives.

In situations where Manufacturers' are unable to provide performance data (e.g. fixing into old masonry material), they must perform site tests to determine allowable loads for the specific site conditions, such as when fixing into existing concrete/during a refurb project.

Every organisation appointed to undertake pull-out testing must be CFA (Construction Fixings Association) approved. A list of CFA approved testers is available on their website: <http://www.the-cfa.co.uk/approved-testers/>. Also all full members of the CFA (Fischer, Hilti, ITW etc) are able to carry out pull-out tests to CFA standards in addition to the approved testers.

All requests for pull-out testing must be made using CFA Form 8539/04, which is available from the CFA website: <http://www.the-cfa.co.uk/publications-and-downloads/cfa-8539-forms/>.

* ETA stands for European Technical Assessment - www.eota.eu/pages/etassessments/default.aspx

Our Supply Chain must submit their project-specific 'Fixing & Anchors Project Plan' for approval:

DESIGNERS AND SPECIFIERS MUST ENSURE THAT:

The Designer should take into account the design considerations listed below and supply all the necessary information to the Specifier.

- a) ability of the structure to support applied actions
- b) concrete condition
- c) robustness, redundancy and progressive collapse

If the Designer is not the Specifier, they must supply all the necessary information to enable the Specifier to correctly select and specify all anchors / fixings.

Full technical data must be provided by the Manufacturer/Supplier to the Specifier before the specification and/or use of the same can be accepted.

SUPPLY CHAIN GOODS PARTNERS MUST ENSURE THAT:

1. The correct anchor is obtained as per the specification, and that the product in question has UKAS accredited certification.
2. The installer is trained in the correct installation of the specified anchor and is supervised by a competent supervisor who has completed a training course delivered by a CFA approved training organisation such as CFA, Fischer, Hilti etc.
3. Any proposal to change the anchor to an alternative is subjected to the full selection procedure of the BS 8539:2012 (Clause 10).
4. The strength of the base material is at least that assumed by the Specifier in the selection of the anchor / fixing.
5. If site tests are called for they must be:
 - carried out by a CFA approved tester
 - to the appropriate procedure
 - in the correct location; and
 - the results recorded and retained in project documentation and communicated to the specifier.
6. Once the installation is completed, and prior to service loading, the installation should be certified by the competent supervisor as being fit for loading.

WILLMOTT DIXON OPERATIONAL TEAMS MUST ENSURE THAT:

- The specification and installation of all fixings and anchors is recorded - please refer to 'Fixings and Anchors Tracker Template' on the following page.

Fixing and Anchors Tracker Template (to be included within Quality Delivery Plan)

Package	Name of Supply Chain Goods Partner (SCP)	Date Fixing Specification requested from SCP	Date Fixing Specification complete and data sheets (ETA or similar) available	Date Fixing Board set up on site if required	Date Operative Training provided (Manufacturer TBT or certification)	Date Supervisor competence confirmed (CFA fixings training or similar)	Date Pull Out Test completed (if required) VJT Technologies/ CFA to attend site and assist?*	Date Install Approved & Signed Off
Mechanical								
Electrical								
Dry Lining								
SFS & sheathing board								
Curtain Walling								
Rainscreen Cladding								
Cladding System								
Brickwork & Blockwork								
Windows								
Capping / Parapet								
Balustrading								
Add relevant packages where full fixing specification not in standard specification								

* Contact details for these organisations are available from your Regional Quality Team.

Examples of Good Site Practice

These Fixing Boards have been created by our Supply Chain Partners to ensure that only the correct fixings are used.



Anchors should be installed to the correct torque as per the specifiers/manufacturers information. Overtightening can be as damaging as not tight enough. These should be inspected and calibrated annually. A torque wrench can be rendered useless through receiving an impact i.e. being dropped.

All torque wrench's used to confirm torque of installed fixings must have a recent calibration certificate.

NICEIC 18th Edition Wiring Regulations

Following recent cases where fire-fighters died after becoming tangled in cables, the 18th Edition Wiring Regulations have been amended to prevent the premature failure of cable supports. Unfortunately the regulations are not fully prescriptive and there has been some debate over what is compliant. Research from the BRE has shown that plastic plug fixings (such as Rawlplugs, nail plugs) have softened and failed in simulated tests when used with metal ancillaries to secure cables.

To avoid differing standards across our business, the following will be mandatory on all projects designed under the 18th Edition and or commencing on to start 1st April 2019.

All cables must be supported via non-combustible elements to avoid premature failure in the case of a fire. Plastic plugs with fixings which support cables and cable management components are banned.

Plastic conduit is acceptable if installed in conjunction with non-combustible components such as concrete screws and metal clips/cable ties. Plastic clips or plastic base holders for cable ties are.

Please note that cables within the curtilage of individual residential dwellings are exempt from these requirements. Residential communal areas and corridors etc. are not exempt.

Request fixings & anchors information from SCP prior to work commencing

What substance is the SCP fixing into?

Concrete or Cracked Concrete

Timber or Metal including Decking, HRS, Plywood, OSB etc.

Seek specific advice from the fixing system provider and inform your local QD Manager.

PLEASE NOTE - if you are not using post - installed anchors BS 8539 : 2012 does **NOT** apply!

New Build

Refurbishment

Is an ETA (Employer Technical Assessment) for the fixing suitable?

A pull out test will be required as the performance of the substitute is unknown - BS 8539 : 2012

Yes

No

A pull out test **WILL NOT** be required if ETA's are available for the chosen fixing and are installed by a trained operative under the supervision of a competent supervisor

A pull out test **WILL** be required. BS 8539 : 2012 specifies the minimum number of pull out tests to be carried out: 2.5% of the fixings of each type when tested to 1.5% x applied load OR 5% of the fixings if testing to 1.25 x applied load

What substrate is being fixed into?

Concrete, cracked concrete or masonry

Metal or timber inc. hot and cold rolled steel, metal decking, plywood, OSB, CLT etc.

What type of fixings and anchors are being proposed?

Post - installed anchors such as:
Drop in anchors
Shield anchors
Expansion anchors
Concrete screws
Resin anchors

Fired anchors
(gas, powder, electric)

These anchors are covered by BS8539:2012. Code of practice for the selection and installation of post-installed anchors in concrete and masonry

These anchors are **NOT** covered by BS8539:2012

Fixings into these substrates are **NOT** covered by BS8539:2012

However confirmation must be sought from the SCP that the proposed fixing is suitable for the intended application and evidence must be recorded

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Some European Technical Assessments are available and should be sought from the specifier/manufacturer/supplier

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New Build

Refurbishment

Does the proposed anchor have a European Technical Assessment (ETA) covering its proposed use?

A pull out test **WILL** be required as the performance of the substrate is unknown - BS8539 2012

Yes

No

A pull out test **WILL NOT** be required if ETA's are available for the chosen fixing and are installed by a trained operative under the supervision of a competent supervisor

A pull out test **WILL** be required. BS853:2012 specifies the minimum number of pull out tests to be carried out: 2.5% of the fixings of each type when tested to 1.5% x applied load OR 5% of the fixings if testing to 1.25 x applied load

Installers of fired anchors must hold a valid training certificate for the system being installed.

A pull-out test **WILL** be required to confirm the designed loading is being achieved

Any specific technical requirements of the proposed fixings (such as torque etc.) must be discussed in a Tool Box talk with the installer

A pull-out test **WILL** be required to confirm the designed loading is being achieved in variable substrates such as timber