The Work at Height Safety Association

Technical Guidance Note 6

"Guidance on inspecting eyebolts used for personal fall protection purposes"

A series of informative notes for all industries involved with work at height or rescue.

The Work at Height Safety Association (WAHSA) is a UK trade association for manufacturers of equipment for work at height and rescue. This series of guidance notes is published by WAHSA to provide information on topical issues relating to work at height which may be a source of confusion, or where other information may be lacking. The information provided is only intended to apply within the UK.

They should be regarded by readers as a source of information only and are not intended to be exhaustive, or to indicate any specific course of action.

It is the responsibility of readers to judge the relevance and applicability of this information to their own situation.

WAHSA Technical Guidance Note no. 6

Guidance on inspecting eyebolts used for personal fall protection purposes

Foreword

All new class A1 anchors have to be tested, examined, marked and certified to BS EN 795. In addition installed eyebolts have to be installed, tested, examined, marked and certified in accordance with BS7883.

The responsibility assumed by the company carrying out periodic examinations is significant as the report it issues as a result of the examination – if confirming that anchor devices may be used – is effectively re-certifying the installations as being fit for purpose. It must not be taken lightly.

Introduction

This leaflet is intended to provide guidance on carrying out periodic examination on class A1 Anchor Devices to BS EN 795[1] in accordance with the recommendations of BS 7883:2005[2].

It offers general advice about the types of issues which should be considered. It does not give information detailed guidance on specific procedures or indicate whether individual methods might be preferable.

More general information on inspecting equipment for work at height can be found in WAHSA technical guidance note no 3.

Background

The requirements for periodic examination of Class A1 anchor devices for fall arrest have been revised in BS 7883:2005. There are new recommendations for many aspects of installation and load testing which raise issues of how existing installations should be examined.

This Technical Guidance Note is intended to help examining bodies understand the full implications of the new recommendations and to give clear guidance as to how different aspects may be handled.

The new recommendations in BS 7883 make it clear that the examining body must do more than simply remove eyebolts for examination and carry out a load test. When an examining body carries out an examination, and issues a favourable certificate, that body is effectively certifying the installation as being fit for purpose. The installation must be checked, as far as possible, to see that it complies with all requirements of BS 7883:2005.

Many existing installations will not comply in one way or another either because of new requirements of 7883 or because of bad practices carried out in the past.

What are Class A1 anchor devices?

Class A1 anchor devices, often referred to as ‘eyebolts’ or ‘windows cleaners eyebolts’, comprise structural anchors designed to be secured to vertical, horizontal and inclined surfaces, e.g. walls, columns, lintels.

Most Class A1 anchors supplied in the UK consist of two elements. The ‘eyebolt’ and a ‘structural anchor’. The structural anchor is fixed into the structure typically using resin. An expanding anchor can also be used as a structural anchor. They are supplied in two parts to enable the eyebolt to be removed for inspection.

They are generally used as single user attachment points, but can be used for Rope Access when used in pairs.

Periodic Examination

BS 7883:2005

Requirements for periodic examination are described in detail in BS 7883:2005 section 12 with associated aspects of inspection and testing in section 11 and marking in section 13.

It is useful to summarise them here but readers must be familiar with the standard.

Any company intending to carry out periodic examinations of anchor devices should make sure that their staff are thoroughly familiar with all the requirements of BS 7883:2005.

A summary of requirements:

BS7883:2005 requirements are shown in italics.

Note: where no specific reference is made to the intended use of the anchor device (i.e. fall arrest, rope access or fall restraint/work positioning) the recommendations for fall arrest should be assumed. References shown thus [12.1.2] are section numbers in BS 7883:2005

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Periodic examinations are required at intervals of no more than 12 months for fall arrest and 6 months for rope access. For anchor devices used infrequently they may be used if they have been examined within the last 12 (6) months. [12.1.2]

Examinations are to be carried out by a competent person. A competent person is a "designated person suitably trained or qualified by knowledge and practical experience to enable the required task or tasks to be carried out properly" [3.20 from BS 8437:2005 3.10, see also EN 365:2004 3.3] Reading this Guidance Note alone does not satisfy this requirement.

Examinations should be carried out to the manufacturer's instructions. These should follow recommendations of BS 7883 and are specified by the installer in documentation which must be passed to the client on completion of the installation [13.1.1].

It is recommended that the client /building owner be asked, before the examination is undertaken, to provide a copy of the documentation provided by the original installer specifying the examination requirements. This for instance will confirm if the requirements are those for a solid or a cavity construction. If no such documentation is available the recommendations of BS7883:2005 should be followed for the type of installation/structure.

A check must be made before the examination to determine whether or not a through fixed installation has been made, this will avoid problems with for instance through fixed components falling onto occupants of the floor below if a floor fixed eyebolt is unscrewed on the assumption that it is set in a resin socket.

Competence for Inspection

Detailed examination requirements are as follows:

For all installations

- examine the eyebolt for correct marking, this depends on the date of installation and must be clear and indelible. See section below.
- check that the structural anchor is of an approved type and appropriate to the structure
- check that the anchor device is manufactured from materials suitable for the corrosion conditions, e.g. stainless steel if any part is external.
- check, as far as possible that positioning requirements are met especially:
- structure is sufficiently load bearing *e.g. not in top of parapet wall or directly below a window*,
- anchor device can be accessed before the user is at risk
- edge distances are in accordance with manufacturer's recommendations

- free fall distance and fall factor are the minimum practicable
- free space below the anchor device is sufficient. This distance may be more than expected see BS 8437[3] sections 9.7.2 and appendix F.
- examine surrounding structure for damage or cracks (before and after any load testing).
- check that the eyebolt bears against the structure via a flexible washer
- for rope access uses check that two anchor devices are provided at suitable anchor spacings.
- tag any anchor devices that should be withdrawn from service (see below) with a suitable tag or label.

For anchor devices set into solid constructions

- remove eyebolt and examine for wear corrosion and other defects.
- replace the eyebolt and check correct thread engagement as eyebolt is replaced e.g. for an M12 coarse thread at least 10 full turns will give an engagement of 18mm, 12 will give 20mm..
- apply new label with date for next examination . See notes on labelling below.
- test to 6kN. (See below regarding testing.)

Installations made before October 2005 (when BS7883:2005 was published) should also be tested to 6kN for reasons stated in the foreward - section c). Such installations should be capable of taking a load of 10kN so 6kN is not an overload.

Structural anchors which fail at loads between 5 and 6kN would have passed the post installation proof test of 5kN and any subsequent examination to 5kN but the installation is still less good than should have been achieved.

Structural anchors which fail at loads less than 5kN should not have been passed in the first place or at subsequent testing unless there is a clear reason why the anchorage should have deteriorated in the mean time.

For anchor devices fixed through the structure:

- if this is the first examination by this examining body a sample of 5% of the installations and at least 3 should be disassembled to check that they are made from the correct materials (e.g. stainless steel if any part is external, but NOT a mixture of stainless foe external components with galvanised for internal components) and correctly assembled (e.g. adequate thread engagement). If satisfactory or if previously checked by this examining body, then no further installations need be disassembled. If any aspect proves to be unsatisfactory then all installations must be disassembled and checked.
- re-assemble any satisfactory disassembled installations in accordance with the manufacturer's instructions.
- examine all installations to ensure that the eyebolt cannot be unscrewed by hand and that there is sufficient thread engagement through the nut. *There should be no need to reapply a tightening torque.*
- if fixed through a solid structure carry out the 6kN load test. (See below regarding testing.)
- if fixed through a cavity structure the anchor device should not be load tested.
- apply new label with date for next examination. See notes on labelling below.

Examination report

A report should be provided to the client/building owner detailing the examination and tests carried out and the outcome. Anchor devices should be listed as suitable for continued use or those which are to be withdrawn from service with details of the reasons why and any remedial work required. A warning against misuse must be included plus the requirement for all anchor devices to be inspected on each occasion prior to use.

Anchor devices to be withdrawn from use: *Some aspects of the examination clearly warrant the condemnation of anchor devices if they are not satisfied and these will need to be withdrawn from use. EN 365 section 4.1.1.2 m) implies that equipment should be withdrawn from use should any doubt arise about its condition for safe use.*

Examples include, but are not limited to anchor devices which:

- *do not conform to the requirements of BS EN 795;*

- *are of the wrong material for corrosion conditions; fail the 6kN load test;*
- *are set in a structure that is clearly non-structural and incapable of taking the shock load,*
- *at an edge distance that is unsafe or below the minimum recommended at the time of installation,*
- *in a position that allows excessive free fall or insufficient free space;*
- *are set externally when windows are accessed internally;*
- *whose anchor points cannot be removed for examination or stand away from the surface*
- *have insufficient thread engagement with the structural anchor;*
- *where only one anchor device is provided for rope access.*

Some aspects of inspection may warrant being drawn to the attention of the client/building owner for further investigation with the original installer if known e.g. free fall distance could be improved even though fall factor is less than one; edge distance not clearly in compliance due to masking of structure.

Labels

Labels for FALL ARREST should show that anchor devices are for "For fall arrest " and one user, with a fall arrest system which includes an energy absorber to EN 355 along with the date for next examination.

Labels for ROPE ACCESS and WORK POSITIONING should show that anchor devices are for "For rope access only" or "For work positioning only" plus allowable load in terms of body weight *and a reminder that two anchor points are provided and* ***both*** *working and safety lines must be attached to* ***both*** *anchor points*. Date for next examination.

Labels for RESTRAINT should show that anchor devices are for "For restraint only", and for single user with Personal Protective Equipment *plus instructions to ensure that the method of use is such that no risk of a fall exists e.g. limits on lanyard length to guarantee Restraint is maintained*. Date for next examination.

Labels should be provided on or near the anchor device in such a way as to demonstrate that the anchor point (eyebolt) has been removed for inspection e.g. by plastic disc set behind the eyebolt. *Where anchor points may not be removed, e.g. with anchor devices fixed through the structure, a tag fitted to the anchor point via a cable tie is suitable*.

Label should be permanent, not prone to deterioration

Marking of eyebolts

Marking requirements are shown in relevant British Standards and the PPE Directive.

- between 1980 and 1997 BS 5845[4] required a reference to the "manufacturer's statement" and to BS 5845.
- from 1997 onward BS EN 795 requires marking to comply with EN 365.
- from 1992 to 2004 EN 365 1992[5] required: last two digits of year of manufacture, manufacturer's identification and batch number.
- from 2004 onward EN365 2004[6] additionally requires: BS EN 795:1997 to be shown.
- from 1992 onward the PPE Directive[7] also requires CE marking.

Test equipment

Load testing devices should direct loads at least 50mm from the centre line of the anchor device and in the case of masonry, into adjacent masonry to also test the strength of the mortar joint. The load should be held for 15 seconds without any sign of failure, i.e. movement of the anchor point or damage to structure including mortar joints.

The load should be applied through the anchor point into the structural anchor, not directly into the structural anchor unless specifically called for by the manufacturer.

References:

[1] BS EN 795:1997 Protection against falls from a height – Anchor devices - Requirements and testing

[2] BS 7883:2005 Code of practice for the design, selection, installation, use and maintenance of anchor devices conforming to BS EN 795.

[3] BS 8437: 2005 Code or practice for selection, use and maintenance of personal fall protection systems and equipment for use in the workplace.

[4] BS 5845: 1980 and 1991 Specification for Permanent anchors for industrial safety belts & harnesses.

[5] EN 365:1992 Personal Protective equipment against falls from a height – General requirements for instructions for use, and for marking.

[6] EN 365:2004 Personal Protective equipment and other equipment for protection against falls from a height – General requirements for instructions for use, maintenance, periodical examination, repair, marking and packaging.

[7] Personal Protective Equipment (EC Directive) Regulations 1992 (SI 1992/3139)