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D2E Guidance

Using Components of Existing BMU Systems as Anchorage Points for Industrial Rope Access

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1 Introduction

This document has been prepared to assist anyone who is considering using existing suspended access equipment as anchorage points for industrial rope access (e.g. facilities managers, building owners, main contractors and other persons acting as duty holder).

There have been many instances recently where Specialist Access Engineering and Maintenance Association (SAEMA) members have witnessed installed suspended access systems being used incorrectly and dangerously as industrial rope access anchors.

The guidance below relates to the interface between industrial rope access techniques and suspended access equipment, and anyone involved in planning, organising, or completing industrial rope access works. These works should at all times comply with all requirements of the applicable industrial rope access standards, ACOP's and refer to the requirements of the Industrial Rope Access Trade Association (IRATA) codes of practise.

1.1 Purpose

The purpose of this D2E guidance document is to provide some guidance to assist in determining the feasibility of whether the existing suspended access equipment can be used as an anchorage for industrial roped access.

2 List of Suspended Access Equipment

Existing suspended access equipment is not designed for use as anchorages for industrial roped access:

- BMU tracks
- BMU track anchorages
- Roof trollies
- Monorails
- Monorail trollies
- Cradles
- Gantries and travelling ladders
- Davits
- Parapet trollies

NB. This list is not exhaustive

The majority of suspended access equipment is not designed or suitable for the loadings imposed by rope access techniques.

Under no circumstances should the assumption be made that this equipment is of unquestionable strength, or that it is capable of taking the minimum required loading, without failing, of 15kN required for the anchorage of roped access systems.

NB. Rope access technicians are only allowed to make this assumption on a 'one off' basis and this cannot be relied on for a permanent change of use.

3 Change of Use

3.1 Documents Required Before a Change of Use Is Permitted

The Work at Height Regulations 2005 and The Management of Health and Safety at Work Regulations 1999 state that when designing or planning works at height you must:

- Complete a risk assessment and note reasons for change
- Confirm that equipment is designed in line with the hierarchy for work at height

The duty holder should complete the risk assessment to assess the reason for changing from use of collective protection (work equipment), to using personal protective measures (work positioning), a lower option in line with the Working at Height Regulations (WAHR) and hierarchy for work at height.

Using personal protective measures is a lower option than collective protection according to the WAHR.

The equipment will also require verification that it is suitable and capable of taking the proposed loadings. This will need to be completed by a competent person. This would normally be a structural engineer.

The original suspended access equipment manufacturer, or on occasion, the maintaining suspended access equipment contractor, where they have suitable and sufficient structural knowledge of the equipment and its anchorages.

Change of use should not be considered if these processes have not been completed, verified and documented.

The following documents are required to be in place before permanent change of use is permitted:

- Risk assessment of reason for change
- Report from engineer verifying the 'equipment' is adequate for the new loads

4 Loadings Produced by Rope Access

In order to calculate the loadings back to anchor points for industrial rope access, the 'competent person' must consider the loads applied by the industrial rope access operatives and their equipment (see Annex-A).

The main issues are summarised as follows:

1. Generally, the opinion of experts in the roped access industry in the UK suggest that:
    1. Where more than one technician could be in a span of track at any one time, the anchorage should be capable of sustaining 15kN per person for the first two persons, plus 1kN per subsequent person.
    2. While it is unlikely for two people to load the anchorage at the same time in a fall, it is theoretically possible, and for three people to load the anchorage at the same time is extremely unlikely.
    3. Hence, only the mass of the user is taken into account for the third person (100kg = approx. 1kN), not the load that could be experienced in a fall (i.e. 6kN).
    4. We refer to the anchorage rail here and not the individual anchors to the structure.

Other loads to consider:

5. Loadings to the parapet when abseil rope passes over the parapet.
6. Loadings to the cladding imparted by the abseilers themselves (potential damage to façade and loss of warranty).

4.1 D2E Position

D2E acknowledge there may be a need for industrial rope access on a building but the decision to use this form of access should not be taken lightly when changing from permanent suspended access equipment to an industrial rope access solution.

Industrial rope access is perfectly acceptable if designed correctly.

5 References

The regulations and standards used when compiling this guidance note are listed below:

(The list is not claimed to be conclusive, other regulations and standards may exist that offer further advice that should be considered regarding the health and safety of façade access equipment users and rope access technicians when developing anchors for rope access systems).

- WAHR 2005: Work at Height Regulations
- The Management of Health and Safety at Work Regulations 1999
- LOLER 1998: Lifting Operations and Lifting Equipment Regulations
- PUWER 1998: Provision and Use of Work Equipment Regulations
- BS EN6037-1:2003 Code of Practise for the planning, design, installation and use of permanently installed access equipment. Suspended access equipment.
- BS EN6037-2:2004 Code of Practise for the planning, design, installation and use of permanently installed access equipment. Travelling ladders and gantries.
- EN361:2002 Personal Protective Equipment against falls from height – full body harnesses
- EN358 Personal Protective Equipment against falls from height – Work Positioning equipment
- EN813 Personal Protective Equipment against falls from height – Sit harnesses
- BS7985:2013 Code of practise for the use of rope access methods for industrial purpose
- IRATA International code of practise (ICOP) for industrial rope access
- SAEMA

Annex – A

ISO 22846-2:2012 Personal equipment for protection against falls – rope access systems – part 2 – code of practise, states:

Anchors

7.7.3.1 Examples of anchors are eye bolts, lift-shaft housings, structural steel and natural geological features.

7.7.3.5 Anchors should:

1. Be unquestionably reliable
2. Be positioned such that the operative can maintain their work position, relative to the anchors, without difficulty
3. Be placed so that operatives can connect to, or disconnect from, the rope access system in an area where there is no risk of a fall from a height
4. Have a minimum static strength of 12kN, but preferably of 15kN

   NB. The anchor can yield but not fail at these loads

BS7895:2013 Code of Practise for the use of rope access methods for industrial purposes, states:

The maximum permissible impact force on the user in the event of a fall should not exceed 6kN. This British Standard has used a safety factor of 2.5 to determine the anchor strength requirement. Therefore, the static strength of all anchors, except deviation anchors and anchors placed simply to maintain the position of anchor lines, should be at least 15kN.

There is no requirement for designers (e.g. building designers) to add a further safety factor but, of course, the static strength may be increased if it is considered prudent or necessary to do so. These values have been determined assuming a total mass of the operative plus their equipment of 100kg, which is the standard test mass used in European Standards for personal fall protection equipment. The mass of the user might be greater than this, especially in the case of rescue, where there could be more than one person attached to the anchor system (during rescue, rope access operatives are required to follow procedures which restrict the potential for dynamic loading of the anchor system).

IRTA International code of practise (ICOP) for industrial rope access – Part-3-Annex-F-2013-Sep-01 – Anchor devices – considerations, states:
F.2 Installed Anchor Devices

Warning: Anchor devices should only be installed by competent persons, who should be trained in the installation of each type of anchor device to be installed and for each type of base material into which they are to be installed. An IRATA rope access qualification at any level is not sufficient to assume competency to install or test anchor devices, or to carry out a detailed inspection of them. It should not be assumed that a level 3 or other IRATA rope access technician is competent to install or inspect eyebolts or other specialist anchor systems.

F.2.2.4 In the absence of any recognised standards for anchor rails, it is recommended that the anchor rails are designed by a competent engineer. In

addition, it is recommended that a static strength type test is carried out and that anchor rails (including any travellers, where travellers are intended to be used) are able to withstand a minimum static load of (15+1/0) kN for (3+0,25/0) min when the load is applied gradually i.e. as slowly as is practicable, at:

1. An extremity anchor
2. An intermediate anchor if one is fitted
3. The centre of the largest span
4. The centre of any span containing a joint in the anchor rail
5. The end of any cantilevered section

A span is considered to be the distance between:

1. Extremity anchors (i.e. anchors at the ends of an anchor rail), where there is no intervening intermediate anchor
2. An extremity anchor and an intermediate anchor
3. Two intermediate anchors

F.2.2.5 The type test should be carried out on a sample of the anchor rail installed as recommended by the manufacturer of the anchor rail in a sample of the base material that is representative of the base material to which it is intended to install the anchor rail for the rope access work in hand. If the type test is to be carried out on site, it should be well away from this work area. The static test load to be applied to the anchor rail should be in the intended direction of use, e.g. in shear.

F.2.2.6 The static strength test described in F.2.2.4 and F.2.2.5 should be applied to the anchor rail via an anchor sling fitted to the anchor rail or, if the anchor system is intended to incorporate a traveller, via a traveller fitted to the anchor rail. During the test, yielding is acceptable but should take into account any necessary clearance distances required to avoid contact by the rope access technician with the ground structure, should a fall occur.

F.2.2.7 Normally, only one rope access technician should be attached to any one span of the anchor rail at any one time. When establishing the static strength of an anchor rail, the possibility of use by more than one person per span should be taken into consideration and the strength increased accordingly. Advice on what the increase should be is not given in this annex because opinions vary between different countries, their authorities and their standards bodies. Consideration should also be given to extra loads that maybe imposed during rescue.

IRTA ICOP for industrial rope access – Part 2-Detailed Guidance-2014-July-01-1, states:

2.11.2.1 The anchor system is of primary importance in the rope access system and should be unquestionably reliable.

2.11.2.6 To determine the minimum anchor strength recommendation, this code of practice uses a safety factor of 2.5. The maximum impact load on the user in the event of a fall should not exceed 6kN; therefore, as a general rule, the static strength of anchors, with the exception of some deviation anchors, should be at least 15kN.

NB. The anchor may yield but should not fail at this load.

2.11.2.7 There is no requirement for designers (e.g. building designers) to add a further safety factor but, of course, the static strength may be increased if it is considered prudent or necessary to do so.

2.11.2.8 The values have been determined assuming a rope access technician with a mass, including equipment, of 100kg, which is a typical standard test mass used in product standards for personal fall protection equipment. Rope access technicians with a mass that is greater than 100kg including equipment should take appropriate steps to ensure that their anchors are of sufficient strength, e.g. by ensuring that there is sufficient energy absorption in the anchor system to keep the impact load on them and the anchors down to 6kN or less in the case of any fall, and/or by increasing the strength of the anchors above the recommended minimum of 15kN.

The recommendations regarding situations where the mass could be more than 100kg applies especially in the case of rescue, where there could be more than one person attached to the anchor system. However, during rescue, IRATA rope access technicians are required and trained to follow procedures which restrict the potential for dynamic loading of the anchor system.

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