WAHSA
WORK AT HEIGHT SAFETY ASSOCIATION

WAHSA TGN07

Technical Guidance Note 7 Rev. 2

GUIDANCE ON THE SUITABILITY OF ABSEIL RAILS. DESIGN, SELECTION, USE, MAINTENANCE AND INSPECTION

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

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GUIDANCE ON THE SUITABILITY OF ABSEIL RAILS. DESIGN, SELECTION, USE, MAINTENANCE AND INSPECTION

INTRODUCTION

This guidance note gives advice on the design, selection, use, maintenance and inspection of abseil rails for use with abseiling/rope access techniques. These rails are designed to provide an unquestionably reliable anchor to allow abseil access from a structure.

The guidance below is designed for anyone involved in planning, organising or completing Industrial rope access works. These works should at all times comply with the requirements of the applicable Industrial rope access Standard (BS 7985:2013) and/or approved codes of practice such as the IRATA International Code of Practice.

This technical guidance note is designed for anyone involved in the planning or undertaking of rope access works and also for building managers or any other interested party.

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1 WHAT ARE ABSEIL RAILS?

Abseil rails are a permanent anchoring system for routine inspection, testing and maintenance works. They provide a quick and easy method for attaching ropes to a structure. These ropes are usually attached using EN 795 anchor slings, approved EN 362 connectors and knots in line with IRATA or British Standard rope access techniques. Abseil rails are attractive as rigging is easy and they usually provide access around the perimeter of a building. This allows rope access workers to make a number of drops covering all sections of the building below.

Depending on the length of the rail, the rail may have to be supported by one or more intermediate supports. These supports are usually fix through to the steel frame of the building or chemical anchored into concrete. The roof is then waterproofed following installation. Abseil rails may be retrofitted or may have been designed as the primary form of access for building maintenance. Other forms of access may also be present such as Suspended Access Equipment. Examples of these are cradles or building maintenance units (BMU's) which offer a powered forms of access.

Any fixing to the building must be inspected by a competent person prior to first use as per LOLER 1998. This is particularly important if a waterproof covering is to be applied.

Abseil rails may also be fitted with carriages that travel along the rail. Two separate carriages need to be fitted to attach both the primary and secondary ropes which are then equalized to prevent shock loading on one anchor. Carriages are advantageous as the user does not need to de-rig their ropes and then re-rig them the other side of the intermediate support and can traverse the building making this a quicker and more cost-effective cleaning method than other forms of abseil systems.

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2 SAFETY ISSUES

There are a number of things that must be considered when selecting an abseil rail. It is imperative that the rail provides an unquestionably reliable anchor for both the work being carried out and any rescues that may have to be performed. All rope access work must be properly planned and have detailed method statements and risk assessments that are site specific as detailed in the IRATA code of practice.

A number of these considerations are discussed below. Please note this list is not exhaustive.

2.1 POSITION OF THE ABSEIL RAIL

The position of the abseil rail should be carefully considered by the installer and/or manufacturer prior to installation. The rail should be in a suitable position so as to provide safe access to the building below. Before using an abseil rail, you should check that the area is free from hazards such as:

- Skylights or fragile structures
- Air conditioning units or vents
- Sharp edges (rope protectors should always be used when ropes pass over edges)
- Other hazards as identified by a competent person

2.2 USER'S WEIGHT EXCEEDING THE PERMITTED MAXIMUM

It is important that you observe any maximum user weights that have been applied to the rail. This is the maximum loading and will have a calculated factor of safety. The host structure may not be able to take higher loadings even if the rail itself can. If you cannot find the maximum user weight you should contact the manufacturer for guidance. It is important that any calculations of weight include equipment and any tools use.

2.3 MARKINGS AND LABELLING

You must check the markings and labelling of the abseil rail before use. This will have important information on the rail which you must observe. This information may include:

- Date of manufacture
- Any relevant standard
- A CE mark and number of the awarding governing body if applicable
- Maximum user weights
- Date of last and next inspection

Note: this list is not exhaustive.

2.4 INFORMATION SUPPLIED BY THE MANUFACTURER

In addition to the labelling on the rail there may also be an accompanying operations and maintenance manual. If one of these isn't available on site, you should contact the manufacturer for clarification. You must always ensure you are familiar with the equipment and that you are properly trained before use. Users must have appropriate levels of qualification and be supervised by a competent person.

2.5 USE OF ALTERNATIVE ANCHORS, SUCH AS SUSPENDED ACCESS EQUIPMENT AS ABSEIL RAILS

Rooftops may have other forms of suspended access equipment present that may not have been designed for abseiling. These may include cradle systems or BMU's. It is important that you do not use any equipment that is not designed for abseiling. Tracking and component parts are unlikely to have been designed to take the potential shock loadings that can occur during rope access techniques (these loadings are discussed further in section 3.0). In addition, equipment may have been designed to be loaded in a different direction.

A change of use may be suitable if there has been a suitable and sufficient risk assessment of the equipment by a competent person such as a structural engineer. This process would also normally include consultation with the manufacturer of the equipment who can offer guidance on the limits of the equipment for rope access purposes.

The Specialist Access Engineering & maintenance Association (SAEMA) Document No. SDN. 14005 Issue date 20th June 2015 states 'We acknowledge that 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' (SAEMA, 2015).

2.6 INSPECTION AND CHECKS

It is imperative that the abseil rail has been inspected by a competent person with sufficient skills and knowledge to carry out the task at the required intervals (maximum interval every 6 months). You must never use an abseil rail that is not in date. The

The rail should be free of any corrosion or damage and the bolts attaching the rail to the roof should be checked (if visible) to ensure they are securely fastened and free of corrosion.

Abseil rails should be proof load tested as part of a detail inspection in line with the manufacturer's instructions prior to first use and then as per examination schedule provided by manufacturer. An example of this proof load test can be found in the IRATA International Code of Practice August 2014 "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" (IRATA, 2014)

2.7 OTHER FACTORS

This technical guidance note is designed as a guide only. There are other factors that may play a part in whether or not an abseil rail is suitable for use. This may include adverse weather such as lightning, the presence of any chemicals, salt water corrosion or vandalism to name a few.

People involved with the planning and carrying out of rope access works using abseil rails are the responsibility of the building duty holder who must ensure that they are competent to take on the works.

3 LOADINGS PRODUCED BY INDUSTRIAL ROPE ACCESS

To calculate the loadings back to the anchor points for industrial rope access, the 'Competent Person' must consider the loads applied by the Industrial Rope Access operatives and their equipment.

The main points for consideration are:

- 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.
- While it is unlikely for two people to load the anchorage at the same time in a fall, it is theoretically possible.
- It is extremely unlikely that three or more people to load the anchorage at the same time in a fall, so for this reason, only the mass of the third (and additional) users is taken into account. 100kg equals approximately 1kN, not the load that could be experience in a fall (6kN).
- The loadings applied to the parapet when the abseil rope passes over it.
- The loadings to the cladding imparted by the abseilers themselves which could potentially cause damage and warranty issues.

4 DESIGN

Abseil rails are designed for use by multiple users at the same time to allow for rescue. The strength of the rail therefore needs to be sufficient to take the loadings discussed in Section 3.0.

As there is no British or European Standard which exclusively deals with Abseil Rails, designers must look to the information that is available. As discussed in the Introduction, the design of the Abseil Rail may vary. Abseil Rails may conform to BS EN 795: 2012 which covers a number of anchor devices, but as it is not specific to Abseil Rails, they are not required to.

BS 7985: 2013 *Code of practice for the use of rope access methods for industrial purposes – Recommendation and guidance supplementary to BS ISO 22846* states "anchors should be unquestionably reliable" (BSI, 2013).

Under BS 7883: 2019, deviation anchors are considered as a Type A device, meaning they must also be factory tested to 15kN and should be treated the same way as a standalone abseil point.

BS 7985 also 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 the anchor lines, should be at least 15k. 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" (BSI, 2013).

The IRATA International Code of Practice states that “in the absence of any recognised standards for anchor rails, it is recommended that 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” (IPAF, 2014).

5 CONCLUSION

In the absence of a specific standard for Abseil Rails, it is the responsibility of the manufacturer or structural engineer to design a suitable Abseil Rail. There are a number of manufacturers in the market who offer off the shelf or bespoke systems, some of which conform to BS EN 795: 2012. It is the responsibility of a competent person, such as a structural engineer, to deem the Abseil Rail fir for purpose.

Rope access technicians should be certain that the rail is unquestionably reliable for use.

6 USEFUL REFERENCE DOCUMENTS

BS 6037-1: 2003 *Code of practice for the planning, design, installation and use of permanently installed access equipment. Suspended access equipment.*

BS 6037-2: 2004 *Code of practice for the planning, design, installation and use of permanently installed access equipment. Travelling ladders and gantries.*

BS EN 795: 2012 *Personal fall protection equipment. Anchor devices.*

BS 7883: 2019 *Personal fall protection equipment. Anchor systems. System design, installation and inspection. Code of practice.*
Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)

Provision and Use of Work Equipment Regulations 1998 (PUWER)

The Management of Health and Safety at Work Regulations 1999

The Work at Height Regulations 2005

7 REFERENCES

SAEMA (Specialist Access Engineering & Maintenance). 2015. *Guidance on the use of Permanent Suspended Access Equipment.* [Online]. SAEMA. Available from: http://www.saema.org/documents/14005%20-%20SAEMA%20Guidance%20Document%20on%20Using%20Permanently%20Installed%20Suspended%20Access%20Equipment.pdf [Accessed 13 December 2016]

IRATA (International Rope Access Trade Association). 2014. *International code of practice for industrial rope access.* [Online]. IRATA. Available from: http://www.irata.org/default.php?cmd=210&doc_category=506 [Accessed 13 December 2016]

BSI (British Standards Institution). 2013. *BS EN 7985: Code of practice for the use of rope access methods for industrial purposes. Recommendations and guidance supplementary to BS ISO 22846.* London, BSI.