MINISTRY OF DEFENCE

**Property Directorate**

DEFENCE ESTATES
*Delivering Estate Solutions to Defence Needs*

# Fixed Access Systems

## Practitioner Guide 03/10

**Estate Management**

### Document Aim:

This Practitioner Guide (PG) aims to provide general guidance for the selection and design of *fixed access systems* for safe use on the defence estate.

### Document Synopsis:

This PG describes factors that may affect the approach to determining when it would be appropriate to introduce a *fixed access system* on the defence estate, and if appropriate what form it may take.

The regulations, standards and limits of technical knowledge relating to *fixed access system* solutions are numerous, can be complex and even sometimes conflicting. This PG contains information on relevant legislation, regulations, standards, MOD publications and other technical references. It describes the general requirements and principles to be followed when introducing or modifying *fixed access systems* on the defence estate.

### Key Point to note:

This Practitioner Guide updates and supersedes Technical Bulletin 00/06 ‘Fixed access ladder systems’.

| Document Information | |
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| **Property Directorate Sponsor:** Martin Coulson | **Date of Issue:** 25 Mar 10 |
| **Contact if different from above Sponsor:** Principal Structures, Professional and Technical Services, Defence Estates, Kingston Road, Sutton Coldfield. B75 7RL<br>Military 94421 2005 Civil 0121 311 2005 | |
| **Who should read this:** CEstOs, Top Level Budget Holders, Defence Estates Advisors, Estate Managers, DE Facilities Managers and Property Managers/Site Estate Representatives, Property Management Works Services (including the legacy work of EWCs/WSMs), DE Health and Safety Teams, DE Project Managers and any other person who is responsible for the planning, design, installation, maintenance and use of fixed access systems on the defence estate. | |
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## Document Control

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### Related Documents

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| e.g.Other JSP leaflets, etc | JSP375; Vol 2; Leaflet 7 and Vol 3; Chapter 7 |
| e.g.Other practitioner guides | PG 09/08 and PG 10/08 |
| e.g. EBMS Processes | 2.5.4.8 |

# Contents

# 1 Foreword

1.1 This Practitioner Guide (PG) provides guidance for the selection and design of *fixed access systems*, as typically found on domestic and industrial buildings, machinery and plant, masts, towers and other tall structures on the Ministry of Defence (MOD) estate. It is applicable to the whole of the defence estate unless agreed otherwise, for example, as per host nation agreements, and as in accordance with the policy of the Secretary of State.

1.2 For the purpose of this PG the definition of a *fixed access system* shall include any combination of vertical fixed ladders (75 degrees or greater), companion way ladders (65 to 75 degrees), associated access, work or rest platforms, high level walkways, associated handrails and balustrades and associated fixed fall arrest systems. This PG applies to *fixed access systems* that are found on any domestic buildings (e.g. living accommodation), industrial buildings (e.g. hangars), machinery, plant, masts, towers, other tall structures and any other permanent facility or installation that is found on the defence estate.

1.3 A stairway in a permanent workplace, although a type of access, does not constitute work at height and for the purpose of this PG is excluded from the definition of a *fixed access system*. A fire escape ladder or access system is also excluded within the context of this PG.

1.4 The overriding requirement of legislation is that work is not to be carried out at height where it is reasonably practicable to carry out the work safely other than at height. It is important to always bear in mind that access or egress, except by a stairway in a permanent workplace, to a place of work where a person could fall a distance liable to cause personal injury would constitute work at height.

1.5 This PG is intended for use primarily by designers, specifiers, users and anyone else with responsibility for the procurement and through-life management of *fixed access systems*.

1.6 This PG does not reproduce technical criteria that already exist in UK legislation or standards. It aims to describe the overall objectives to be achieved and the principles to follow that will allow a designer, specifier, user and anyone else with responsibility for the procurement and through-life management of *fixed access systems* to achieve practical and safe solutions within the parameters of current legislation, technical standards and achieving value for money.

1.7 The defence estate has approximately 3000 masts and towers, incorporating various forms of *fixed access systems* and a much greater number of *fixed access systems* as found on domestic buildings, industrial buildings, machinery, plant and other tall structures.

1.8 A *fixed access system* on the defence estate may constitute a ‘Restricted High Place’ (RHP) as defined in the MOD Health and Safety Handbook (Joint Services Publication 375; Volume 3; Chapter 7 Working at Height on Restricted High Places). Where a high place has been assessed to have a risk of a fall liable to cause personal injury, it may be designated as an RHP by the Authorising Engineer (Working at Height). Access to an RHP is to be controlled under the safe system of work as detailed in Chapter 7.

1.9 At the time of preparation of this PG, it is noted that UK technical standards recommend provision for protection from falls in the form of ‘caged’ or ‘hooped’ ladders. However, research sponsored by the Health and Safety Executive (Research Report 258) appears to question the suitability of this provision. In all cases, legislation takes precedence, and it is considered incumbent upon the designer or specifier, so far as is reasonably practicable, to monitor the current debate on the subject in order to avoid foreseeable risks in the choice of such provision for fall protection.

1.10 This PG is to support MOD’s statutory duties under the Health and Safety at Work etc Act 1974 and in particular the Management of Health and Safety at Work Regulations and The Work at Height Regulations. The guidance is intended for use on new structures but can be applied to existing structures as determined by risk assessment.

1.11 For MOD Establishments occupied by the United States Visiting Forces (USVF), the responsibility is jointly held by the USVF and DE (USF). At base level this joint-managed organisation is to take appropriate action to note the contents of this PG. Where this PG contains procedures which differ significantly from USVF practice, a DE (USF) Code of Practice section is to be appended.

1.12 No work involving expenditure on any MOD account is to be entered into without authority from the appropriate MOD officer for that location or facility.

# 2 Legislation, Regulations, Standards, MOD Publications and other References

The following Legislation, Regulations, British and International Standards are included for reference purposes. The list is not exhaustive. The reader must be satisfied that any reference made to the actual document is to be the most up to date version.

## 2.1 Statutory Legislation

Health and Safety at Work etc Act 1974

Health and Safety at Work etc (NI) Order 1978

Occupiers' Liability Act 1984

## 2.2 Statutory Regulations

Management of Health and Safety at Work Regulations 1999

The Construction (Design and Management) Regulations 2007

The Work at Height Regulations 2005

The Work at Height (Amendment) Regulations 2007

The Work at Height Regulations (Northern Ireland) 2005

The Work at Height (Amendment) (Northern Ireland) Regulations 2007

The Lifting Equipment and Lifting Operations Regulations 1998

The Provision and Use of Work Equipment Regulations 1998

The Building Regulations 2000 (Approved Document K)

## 2.3 National Standards

BS 4211:2005 Specification for permanently fixed ladders

BS EN ISO 14122 Safety of machinery. Permanent means of access to machinery (4 parts)

BS 6399-1:1996 Loadings for buildings. Code of practice for dead and imposed loads

BS 5395-1:2000 Stairs, ladders and walkways. Code of practice for the design, construction and maintenance of straight stairs and winders

BS 5395-3:1985 Stairs, ladders and walkways. Code of practice for the design of industrial type stairs, permanent ladders and walkways

BS 8437:2005 Code of Practice for selection, use and maintenance of personal fall protection systems and equipment for use in the workplace

BS EN 353 Personal protective equipment against falls from a height (2 parts)

## 2.4 MOD Publications

JSP 375 MOD Health and Safety Handbook

JSP 569 Working at Height Personal Protective Equipment

Practitioner Guide 09/08 Masts and Towers - Design and Appraisal

Practitioner Guide 10/08 Masts and Towers - Condition Inspection

## 2.5 Reference Publications

Factory Stairways, Ladders and Handrails including Access Platforms and Ramps, Publication 105, 7th Edition, The Engineering Equipment and Materials Users' Association ISBN 0 85931 154 6

Health and Safety in Roof Work, HSG 33, Health and Safety Executive ISBN 978 0 7176 6250 0

Communication Structures, Brian W. Smith BA MS FREng CEng FICE FIStructE FASCE, 2007, Thomas Telford Publishing, London ISBN 978 0 7277 3400 6

## 2.6 Research Publications

Research Report 258, Preliminary Investigation into the fall-arresting effectiveness of ladder safety hoops, D Riches BSc (Hons), 2004, HSE Books ISBN 0 7176 2885 X

# 3 Fixed Access Systems – Technical Guidance

## 3.1 Introduction

3.1.1 All *fixed access systems* are to be designed suitable for their intended purpose. Their type, form and function are selected following a design risk assessment and taking into consideration relevant standards and regulations. Factors to be considered in the design risk assessment include type of structure, location, environment, purpose, intended users (including their competence in climbing) and cost.

3.1.2 The defence estate covers broad categories of buildings and installations, for example domestic dwellings, industrial buildings (hangars, workshops etc) and machinery and plant installations (internal or external). Standards for *fixed access systems* are readily available for these types of buildings and installations.

3.1.3 For facilities such as masts, towers and other tall wind sensitive structures, there are at present, no specific national standards, and 'industry practice' is a specialist area where technical solutions for *fixed access systems* are varied. A competent person (as defined in Practitioner Guide 09/08) is required to determine the most appropriate *fixed access system* solutions. Technical guidance on the design and provision of *fixed access systems* on masts, towers and other tall wind sensitive structures is provided in section 3.4.

## 3.2 General Principles

3.2.1 *Fixed access systems* on the defence estate, whether proposed or existing, are subject to the guidance provided in this PG, for their procurement and through-life management.

3.2.2 For new-build structures, a stairway is to be given preference as far as reasonably practicable, thus avoiding the need to work at height.

3.2.3 *Fixed access systems* are to be assessed in accordance with JSP 375; Volume 3; Chapter 7 in respect to safety during work at height. If a *fixed access system* forms part of a Restricted High Place (RHP), the provisions of Chapter 7 shall apply for its safe use and access. In all cases the appropriate Authorised Person (Working at Height) shall be consulted initially.

3.2.4 Where it is deemed reasonably practicable, following a risk assessment, to introduce a new *fixed access system* or modify an existing system, then the *fixed access system* shall be selected and designed taking account of factors including, amongst others, the intended frequency of use, the facility, the location, the minimum level of competency of personnel required to access it and all other associated hazards.

3.2.5 The type, materials and dimensional arrangements of the *fixed access system* shall comply with all relevant UK regulations and British standards, section 2 refers.

## 3.3 Domestic and Industrial Buildings, Machinery and Plant

3.3.1 Domestic buildings are to have stairways incorporated into the design where a change in floor level is required, and the particular requirements of The Building Regulations 2000 (Approved Document K) shall apply.

3.3.2 Dependent on the form of the domestic or industrial building, machinery or plant installations and the associated design risk assessment, the designer may propose a *fixed access system* including vertical ladders, platforms and handrails as determined by the following lead references:

- The Building Regulations 2000 (Approved Document K)
- BS 5395-1:2000 Stairs, ladders and walkways. Code of practice for the design, construction and maintenance of straight stairs and winders

- BS 5395-3:1985 Stairs, ladders and walkways. Code of practice for the design of industrial type stairs, permanent ladders and walkways

- BS EN ISO 14122 Safety of Machinery. Permanent means of access to machinery (4 parts)

- Factory Stairways, Ladders and Handrails including Access Platforms and Ramps, Publication 105, 7th Edition, The Engineering Equipment and Materials Users' Association.

## 3.4 Masts, Towers and other Tall Structures

3.4.1 Dependent on the structural form of the mast or tower and the associated design risk assessment, the designer may propose a fixed access system including vertical ladders, platforms and handrails as determined by the following lead references:

- BS4211:2005+Amendment A1:2008 Permanently Fixed Ladders

- Communication Structures, Brian W. Smith BA MS FREng CEng FICE FIStructE FASCE, 2007, Thomas Telford Publishing, London ISBN 978 0 7277 3400 6

3.4.2 Where practical design issues are encountered, continuous ladder lengths are permissible, without cages or 'hoops', provided a suitable fixed fall arrest system is installed over the entire height of the ladder or lattice structure. It must be recognised that access for maintenance personnel will necessitate an advanced level of competence.

3.4.3 For structures of a sufficient face width, an independent ladder is recommended (Fig 1) and, where physically possible priority must given to ensure that the ladder can be mounted on the inside of the structure. For certain specialist structures, e.g. complex antennae mounted on lattice masts, it may be permissible to utilise the bracing pattern as part of the ladder to form a climbing face (Fig 2), although this would be subject to a design risk assessment.

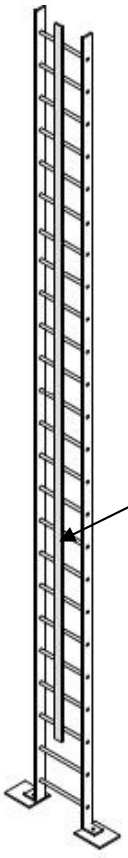

Fig 1


Fig 2

# 4 Permanently Installed Fall Protection Systems

4.1 In accordance with the hierarchy of avoidance of risks from work at height, as contained in The Work at Height Regulations, installation of a fall protection system shall be considered as a last resort.

4.2 Only following design risk and cost benefit analyses for a through-life solution shall a fall protection system be installed, where it is shown that it is not otherwise reasonably practicable to provide passive protection or work restraint.

4.3 The disadvantages of fall protection systems include:

- specialist selection, installation, maintenance and user knowledge
- specialist training and management costs
- associated PPE costs, inspection and replacement

4.4 BS 4211 currently states that the use of 'caged' or 'hooped' ladders provides *'passive collective protection'*. However, following a risk assessment, use of a fall protection system may additionally be incorporated by the designer. The designer MUST obtain evidence from the manufacturer of the proposed fall protection system for it to be compatible and fit for purpose if installed inside a 'caged' ladder.

4.5 Historically, MOD adopted the following fall arrest systems as 'standard' for installation on the defence estate:

- 'Arresta-Rail'
- 'SALA Railok'

4.6 'SALA Railok' fall arrest trolleys are currently the only WaH PPE referred to in JSP 569, and are supported by:

DE&S
Air Commodities Team
GSE6
c/o ACT Registry
Room V111, Palmer Pavilion
Royal Air Force Wyton
Huntingdon
Cambs
PE28 2EA

4.7 Other fall protection systems are available and may be considered for use by the designer, where they are shown to be fit for purpose and offer value for money. Prior to introduction of a fall protection system on the defence estate other than those listed at 4.5, approval shall be sought from DE. Selection of a proprietary fall protection system may depend on a number of factors including type of installation, location and use. Advice shall be sought from the manufacturer and end-users when deciding fitness for purpose. In addition, the IPT as per 4.6 shall be contacted for advice on support services.

4.8 Designers and specifiers are to ensure that the loadings applied to a structure as a result of deployment of a fall protection system are duly considered in respect of component and structure capacities. The number of users can affect the anticipated theoretical maximum forces and this information is usually supplied by the relevant manufacturer. In all cases the manufacturer's technical product data and installation instructions shall be adhered to.

# 5 Anti-Climb Devices

5.1 All *fixed access systems* on the defence estate are to be risk assessed for unauthorised entry or access to a Restricted High Place.

5.2 Where a risk assessment deems an appropriate control measure to be provided by physical means, then a suitable anti-climb device (ACD) is to be installed, a typical example is shown at Fig 3. Alternatively, all or part of the facility and/or access system is to be secured by the use of perimeter fencing, or similar physical protection, commensurate with factors e.g. the hazards present, environment, location, etc.

5.3 Appropriate signage is to be fixed to the ACD, or in the immediate vicinity of the *fixed access system* (see JSP375; Volume 3; Chapter 7 for further guidance).


Fig 3 - Example of a typical anti-climb device on a fixed ladder