Insight

FALL PROTECTION EXPLAINED

12-04-19 Insight Issue 2

Guarding on Roof Steps: Requirements under UK Regulations

In Insight Issue 1 we discussed the requirements under the UK Building Regulations concerning providing guarding for personnel and public access. This falls under section K2.

In this Issue we shall be looking at K1 Stairs, Ladders and Ramps. Specifically, we shall be looking at the requirements for stairs for roofing access and the guarding that needs to be provided. In our research we have also taken into account references made within other pertinent legislation.

Requirements

Requirement	*Limits on application*
Stairs, ladders and ramps	
K1. Stairs, ladders and ramps shall be so designed, constructed and installed as to be safe for people moving between different levels in or about the building.	Requirement K1 applies only to stairs, ladders and ramps which form part of the building.

Figure 1 *Source HM Government Approved Document K*

Please note: Images used are for reference purposes only and there is no implied failure to conform. All applications are assumed to have been risk assessed and the correct solutions implemented under the discussed regulations. We have looked to use images from reputable companies who we are aware implement the following practices as a matter of course.

Responsibility for all building work compliance to the Building Regulations 2010 lies with those in control of the work in question, however it lies principally with the building owner to ensure that all contractors comply with their requirements of their relevant trades, and that all works are certified by a registered competent person, as is it is this building owner that can be served with an enforcement notice.

Figure 2 *Source altussafety.co.uk*

It is noted within the regulations that "Building Work" consists of all areas of construction and maintenance provision. This includes erection of buildings, extensions, material alterations and controlled service provision or extension. In general, this is applicable for new and existing buildings.

The UK Building Regulations 2010, Part K considers many aspects of fall protection and access that should be taken into account with respect to solution provision within the health and safety community, as support to compliance to the Working at Height Regulations and, with respect directly to any area governed by section K1 we must also consider the requirements of the Workplace (Health, Safety & Welfare) Regulations 1992.

It is possible to meet the requirements of K1 by ensuring that the steepness, rise and going, handrails, headroom, length and width of stairs are appropriate to afford reasonable safety to people gaining access to and moving about buildings. In the majority of installations of steps on roofing areas this is not the case, and there is one key area not accounted for, and that is suitable hand rail.

This is generally taken as "OK" as the standards also state that a standard of provision for maintenance personnel may be lower than for areas of public access as "greater care can be expected from the people requiring to get access". As we all know, this is not the case, with falls from height remaining the number 1 cause of death in the construction industry, and all of these deaths occur with people who work at height every day and therefore should have the same assumed increased level of care when at work.

Human nature is one of taking the line of least resistance, that being the shortest point from A to B with the fewest obstacles. We rush, we cut corners, we don't follow rules that we don't see as beneficial to our work practices.

So not having hand rails leaves the worker open to making an easy choice to walk off the steps if the route would prove to be shorter. Guard rails add an additional obstacle to be overcome and psychologically this removes the attraction of the shorter route, leaving them on the safe, slip resistant steps with a hand rail provided should they stumble.

Ask yourself this question, why would we have handrails on Figure 2, Figure 3 and not on Figure 4?

The answer is simple, there is no reason to have anything different in each of these cases. They are all installed access stairs used for maintenance personnel, all are used for moving from one area of a roof to another, and all appear to meet the other requirements set out in Section K1.

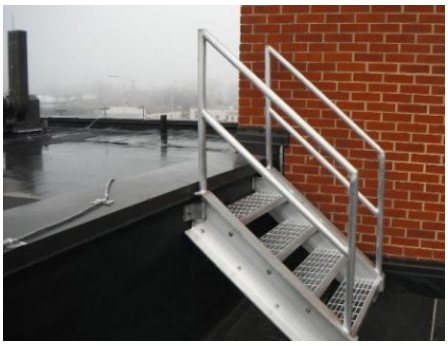

Figure 3 *Source gsmroofing.com*

Also, there is no discernible increased risk between the scenarios, and the installation of each system is first class and executed using high quality materials.

So, unless there is a planning application reason preventing the handrails from being installed due to building heights or other reasons, then as there is no discernible difference in risk, there should therefore be no differing solution.

Figure 4 *Source keesystems.com*

Every solution available on the market has the option to be provided with a suitable hand rail. It therefore can be concluded that one of two things are happening. Either they are not being offered for reasons such as we have already discussed, or they are being rejected by the final client for either cost or planning reasons.

The HSE, during investigations and inspections will look into the risks purported to be in evidence and assess the impact on the business to implementing the suitable measures. In terms of what they require of duty-holders, HSE considers that duties to ensure health and safety so far as is reasonably practicable ("SFAIRP") and duties to reduce risks as low as is reasonably practicable ("ALARP").

The sacrifice (in terms of money, time or trouble) is weighted against the risks evident, and the comparison highlights where SFAIRP and ALARP have been achieved. The HSE's view is that the greater the risk, no doubt, the less will be the weight to be given to the factor of cost.

As falls from height remain the biggest cause of workplace fatalities, then the cost of prevention is potentially carrying the lowest weight versus risk ratio of them all.

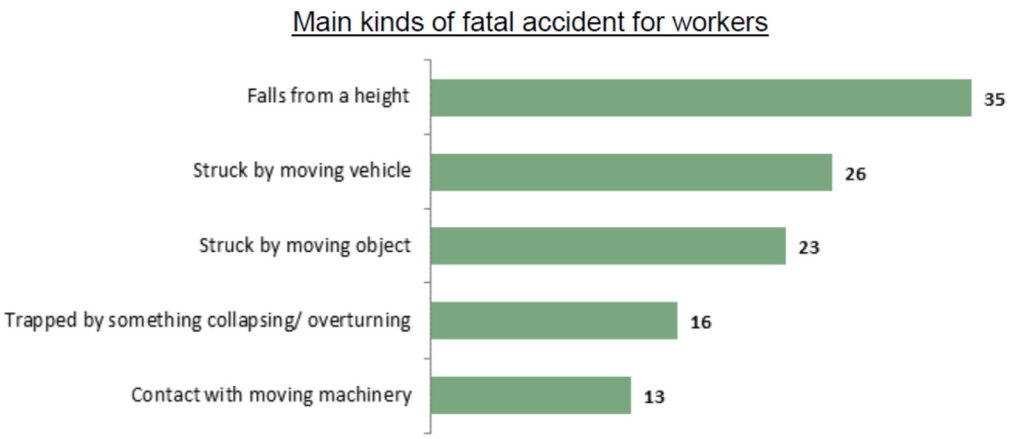

Figure 5 *Source HSE Workplace Fatal Injuries in Great Britain 2018*

So, how do we set about creating safe stairways for roof access?

The first requirement for safe access is to ensure that the dimensions of the steps themselves are such that a worker can walk up and down the stairs with ease, not tripping and also have enough space on each tread for their feet to comfortably fit and allow them to maintain balance.

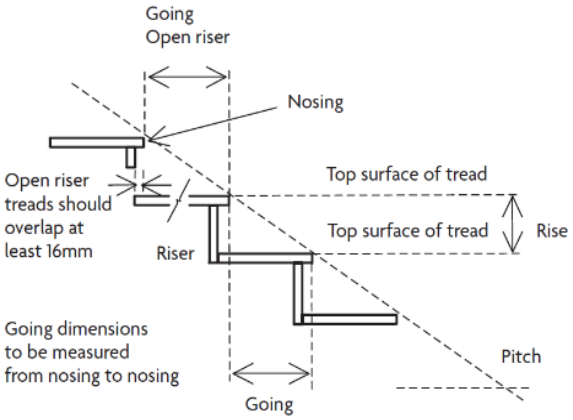

Figure 6 *Source HM Government Approved Document K*

Table 1.1 Rise and going

	Rise*		Going*	
	Minimum (mm)	Maximum (mm)	Minimum (mm)	Maximum (mm)
Private stair[1,2]	150	220	220	300
Utility stair	150	190	250	400
General access stair[3]	150	170	250	400

Notes:
[1] The maximum pitch for a private stair is 42°.
[2] For dwellings, for external tapered steps and stairs that are part of the building the going of each step should be a minimum of 280mm.
[3] For school buildings, the preferred going is 280mm and rise is 150mm.

* The normal relationship between the dimensions of the rise and going is: twice the rise plus the going (2R + G) equals between 550mm and 700mm.

For existing buildings the dimensional requirements in Table 1.1 should be followed, unless due to dimensional constraints it is not possible. Any alternative proposal should be agreed with the relevant building control body and included in an access strategy (refer to Approved Document M).

Figure 7 *Source HM Government Approved Document K*

There is a psychological reason behind this. Humans are used to walking up and down stairs, and any that are either outside of what we are used to, or differing heights through out will cause us to become unbalanced as we ascend or descend the stairs. Making them uniform increases safety and decreases the likelihood of an accident.

Secondly, we need to consider the risks to the worker when it comes to guarding and hand rails.

Figure 8 *Source keesystems.com*

Section K1 states that for all buildings, handrails should be provided for stairs. These handrails should be 900 to 1000mm from the pitch line or floor. Also, if the stairs are 1000mm or wider then a had rail should be provided on both sides.

When we specifically look at the need for stairs on a roof, the only reason to have them there is to provide safe access for maintenance workers. Any access for maintenance needs to be considered using the following rationale from the Building Regulations 2010.

Approved Document K states that where access will be required a minimum of once a month then provisions should be made in accordance with BS 5395-3. This standard was superseded by EN ISO 14122, so the requirements under this standard need to be met. The provisions required within this standard are mainly geometry-based and testing provisions calling out the requirements for widths, rise height and nose overhang, but do refer to the need for guard rail or hand rail.

The requirements for step dimensions are very clearly stated within this standard. The clear width of the stain, unless there are exception circumstances preventing it, shall be no less than 600mm, and if there is to be passing or crossing of several persons then the stair shall be increased to 1000mm minimum.

Still, in section 7.2.1 of BE EN ISO 14122-3:2001 + A1:2010 it does state that a stair shall have at least one handrail, and if the stair is greater than 1200mm in width then there shall be 2 handrails.

This standard also states in section 7.2.1 that a guard rail shall be fitted whenever the height to climb exceeds 500mm, and when there is a lateral space adjacent to the string of more than 200mm.

When we consider the Construction (Design and Management) Regulations 2015 (CDM Regulations 2015) the duty of the designer is to take into account the principles of prevention in order to eliminate or reduce risk to any person during the construction, use and maintenance of the building for which they are responsible, adding additional weight to the requirements under the Building Regulations 2010.

Figure 9 *Source bettersafeinternational.com*

Conclusions

Taking all of this legislature into account then routes for maintenance must be risk assessed and the appropriate measures put into place. The appropriate measures highlighted in our research seem to be clear.

Taking the worst case of each of the applicable, and actually contradictory standards the following is true.

- If you have steps, then you need a handrail.
- The steps should be a minimum of 600mm in width, and 1000mm if you have passing personnel.
- The treads should have a rise of 150mm to 190mm, and a depth (or going) of 250mm to 400mm.
- If the steps are wider than 1000mm then you need two handrails.

Figure 10 *Source altussafety.co.uk*

Guidance is given to Section K of the Building regulations in the HM Government Approved Document K. A link to a download for this is shown below.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/443181/BR_PDF_AD_K_2013.pdf

Need advice? Call Bettersafe International on (UK) +44 (0) 1260 217 437 (Europe) + 31 (0) 183 820 280

Bibliography

- BE EN ISO 14122-3:2001 + A1:2010
- Building Regulations 2010
- HM Government Approved Document K.
- BS 5395-3
- Construction (Design and Management) Regulations 2015
- RR 174 - Costs of compliance with health and safety regulations – HSE
- HSE Annual Statistics Workplace fatal injuries in Great Britain 2018