

Approved Document K and Access Rooflights

A specifier's guide to designing for
roof access in dwellings

GLAZINGVISION

visionary rooflights

Introduction - What is an Approved Document?

This guide is one of a series designed to help you understand specifically how Approved Documents may affect the specification of rooflights and how building design considerations can improve compliance with the Building Regulations.

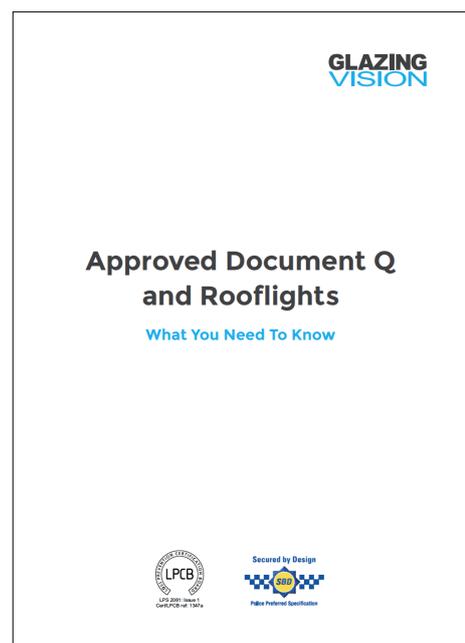
Approved Documents are a series of guidance notes approved by the Secretary of State providing practical guidance on how to meet the requirements of the Building Regulations 2010 for England. Scotland, Wales and Northern Ireland are covered under separate Building Regulations and therefore requirements may differ.

The Approved Documents provide guidance on technical parts of the regulations and on regulation 7.

Also available in this series

Disclaimer

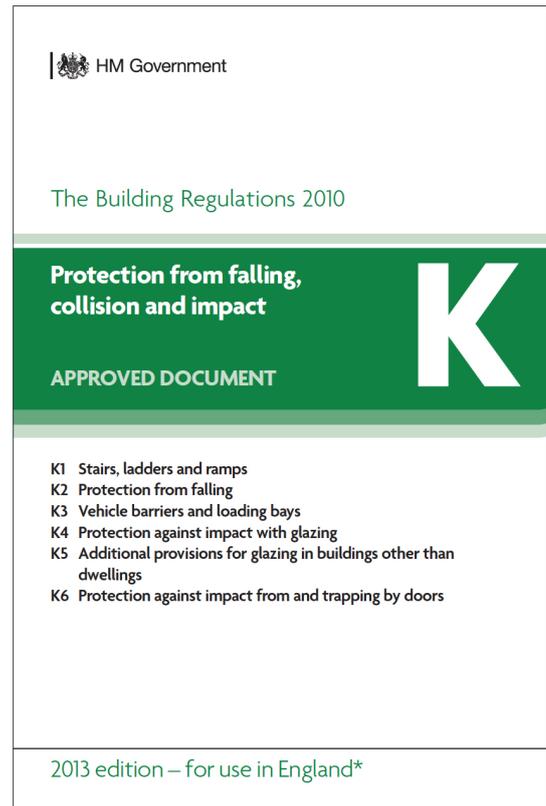
Whilst every effort has been made to provide accurate advice based on interpretation of the current (2016) Building Regulations and our experience of supplying and installing rooflights for access applications, this document alone should not be relied upon as a source of information and we always recommend proper consultation with your local building control officer prior to commencing any works.



What is Approved Document K?

Approved Document K supports Part K: Protection from falling, collision and impact and was last updated on 6th April 2013 for use in England.

Approved Document K was updated to amalgamate Approved Document N: Glazing – safety in relation to impact, opening and cleaning along with additional guidance from Approved Document M: Access to and use of buildings.



Broadly speaking the document covers protection from falling, collision and impact with sections K1 to K6 specifically addressing:

- K1 Stairs and ladders
- K2 Ramps and protection from falling
- K3 Vehicle barriers and loading bays
- K4 Protection against impact with glazing
- K5.1 Protection from collision with open windows etc.
- K5.2 Manifestation of glazing
- K5.3 Safe opening and closing of windows etc.
- K5.4 Safe access for cleaning windows etc.
- K6 Protection against impact from and trapping by doors

How does Part K affect rooflight specification?



Rooflights are a great way of providing a safe and secure means of accessing a roof and increasing usable roof space by converting flat roofed areas into terraces and roof gardens, they can also be installed to provide less frequent access to a roof area in order to complete maintenance tasks.

When you are considering access to a roof space there are several factors that should be taken into account in order to comply with the Building Regulations.

The first consideration is why roof access is required, if it's only for infrequent or maintenance access the requirements will be different than if regular access is required to the space.

Once the reason for requiring access has been determined the Building Regulations will dictate how the rooflight is approached and also what safety features should be employed both in the unit itself but also on the roof surrounding the opening.

For example maintenance access may only require provision for a temporary set of ladders to be used and a latch-way system on the roof whereas regular access to a terrace area will most likely require a full flight of stairs and suitable balustrade around the opening.

Rooflights are a great way of providing a safe and secure means of accessing a roof and increasing usable roof space

Requirement K1 and maintenance access

Requirement K1: Stairs, ladders and ramps covers the design, construction and installation of such provisions in order to make it safe for people to move between different levels in or about the building.

Requirement K1 can be met by ensuring that the steepness, rise and going, handrails, headroom, length and width of any stairs, ladders and ramps between levels are appropriate to afford reasonable safety to people gaining access to and moving about buildings.

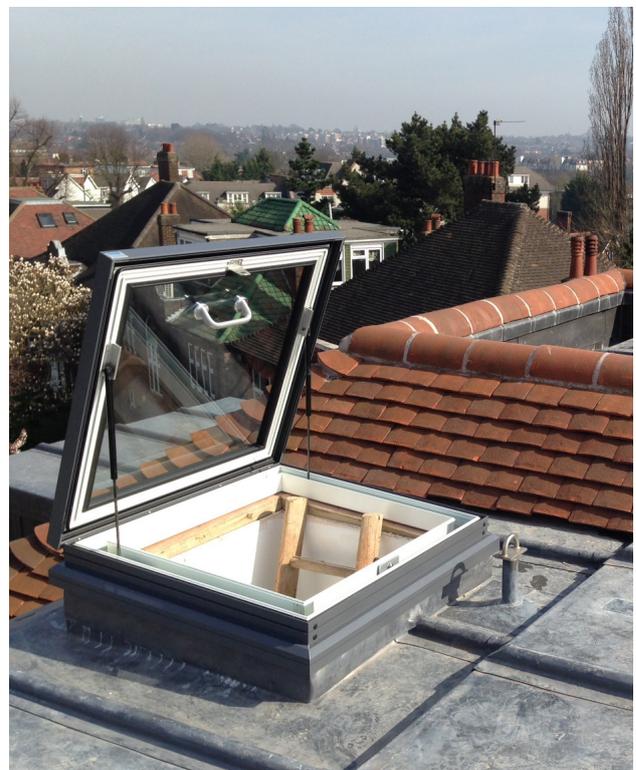
The level of safety for access and use will depend on the circumstances but expect this to be higher in public buildings due to inhabitants relative unfamiliarity with the building and increased number of users.

Contrary to this a lower standard of provision may be acceptable in situations where access is only required for maintenance, because greater care can be expected from those required to gain access.

Where stairs or ladders are used for maintenance access a minimum of once per month you should follow provisions such as those for private stairs in dwellings or for industrial stairs and ladders in BS 5395-3:1985 Stairs, ladders and walkways. Code of practice for the design of industrial type stairs, permanent ladders and walkways (AMD 14247) (No longer current but cited in Building Regulations)

If maintenance access is required less frequently than this it may be more appropriate to use portable ladders which are covered under the Construction (Design and Management) Regulations 2007.

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Requirement K1 and regular/terrace access

We know that occasional maintenance access can be achieved using ladders, portable or otherwise and anything over and above this requirement will need a more permanent solution.

Those clients looking to install a method of access to a roof terrace will need to ensure that appropriate provision is included in their scheme.

Guidance on what is deemed appropriate as always will vary depending on your scheme and it is strongly recommended that you consult your local Building Control Officer for advice prior to commencing any works, but it is widely accepted that a permanently installed flight of stairs offers the most appropriate solution for those looking to access a roof terrace via a rooflight or any other means.



a permanently installed flight of stairs offers the most appropriate solution for those looking to access a roof terrace

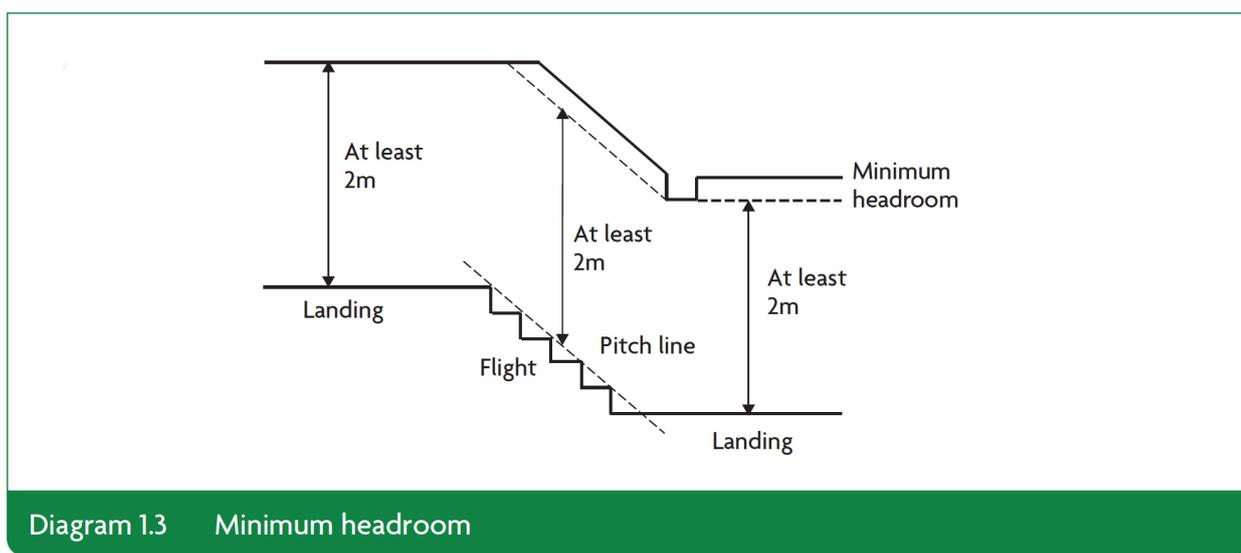
Minimum head height

Head height is almost certainly one of the key issues when it comes to moving between levels in a building and Approved Document K offers guidance in relation to this which will in turn enable the specifier to ensure that their desired product will be large enough and include the correct features to allow safe passage.

Diagram 1.3 (below) states that a minimum headroom of 2m (measured from the pitch line) is adequate for access between levels, so assuming that in most applications this type of project would be considered a 'private stair' intended for use in only one dwelling, the maximum permitted pitch would be 42 degrees.

Combined with an average roof thickness which can be considerable when taking into account requirements for structural load and insulation, care should be taken to make sure that the void or opening created in the roof and the rooflight itself covering it is physically large enough to achieve the required 2m at the maximum permitted pitch.

a minimum headroom of 2m (measured from the pitch line) is adequate for access between levels



Minimum head height cont'd

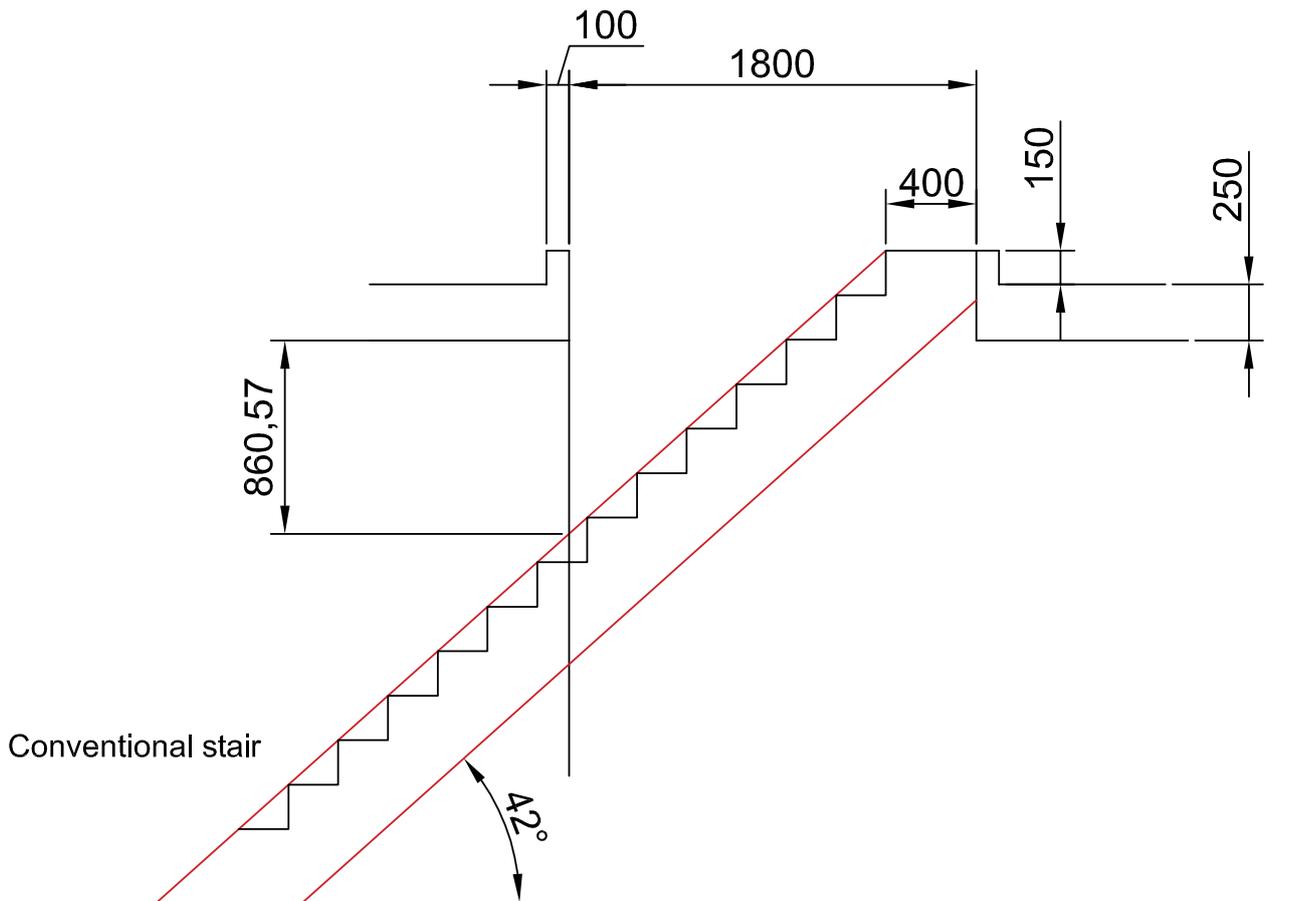


Fig 1.1

Fig 1.1 shows that a popular sized flat rooflight with a 2m external dimension and a 1.8m internal dimension cannot be used for regular access to a roof terrace with a conventional stair and comply with part K of the Building Regulations. This drawing shows a stair with the minimum going of 220mm and a short landing area of 400mm providing a headroom of only 860mm where part K requires 2m.

It should also be noted that this example has a very slim roof construction of only 250mm, it is likely that most roof constructions would be deeper than this and this dimension will directly affect the head clearance achieved. This also takes no account of the height of the frame profile of the rooflight itself.

Minimum head height cont'd

Fig 1.2 demonstrates that to comply with part K of the Building Regulations the minimal internal opening needs to be 3065mm. This example still has a very slim roof construction of only 250mm, it is likely that most roof constructions will be deeper than this and this dimension directly affects the head clearance achieved.

For every additional 50mm on the depth of the roof construction an additional 56mm will need to be added to the length of the opening to maintain compliance.

This also takes no account of the height of the frame profile of the rooflight itself. This is the only compliant solution where the width of the rooflight is no greater than the width of the stair.

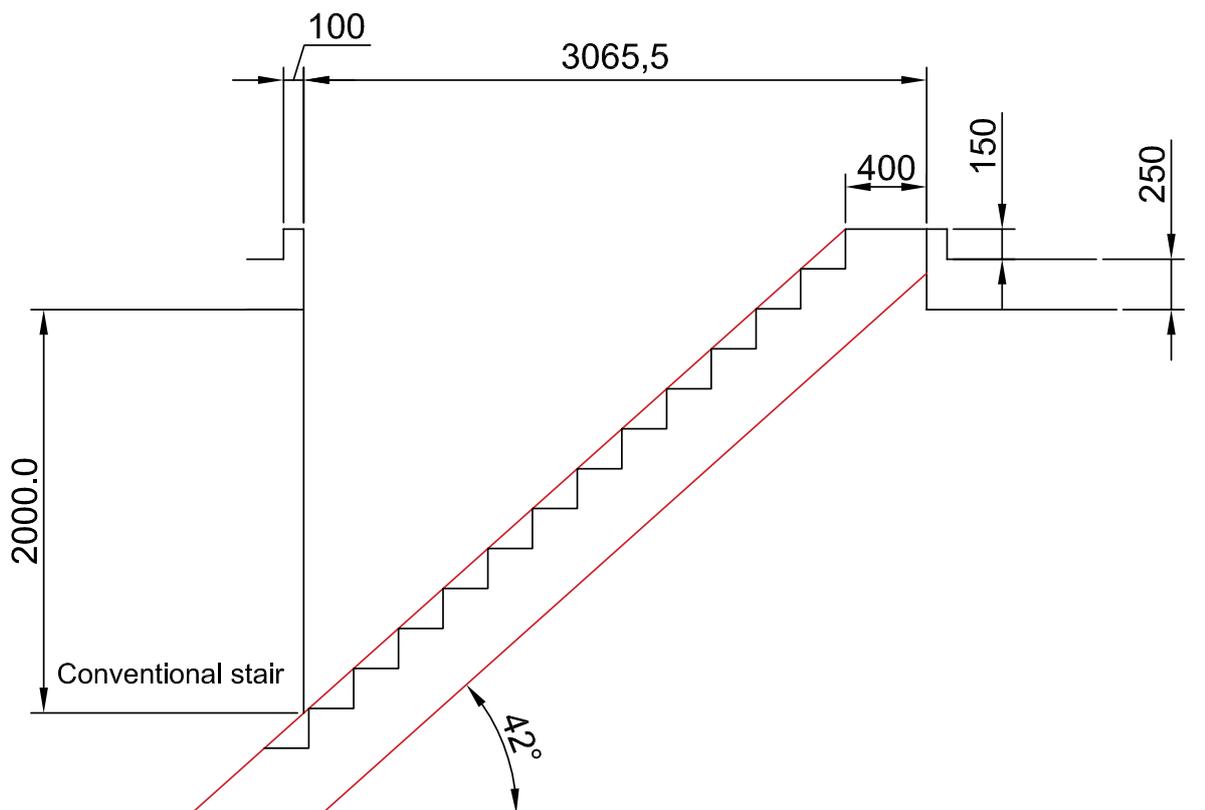


Fig 1.2

Minimum head height double stair

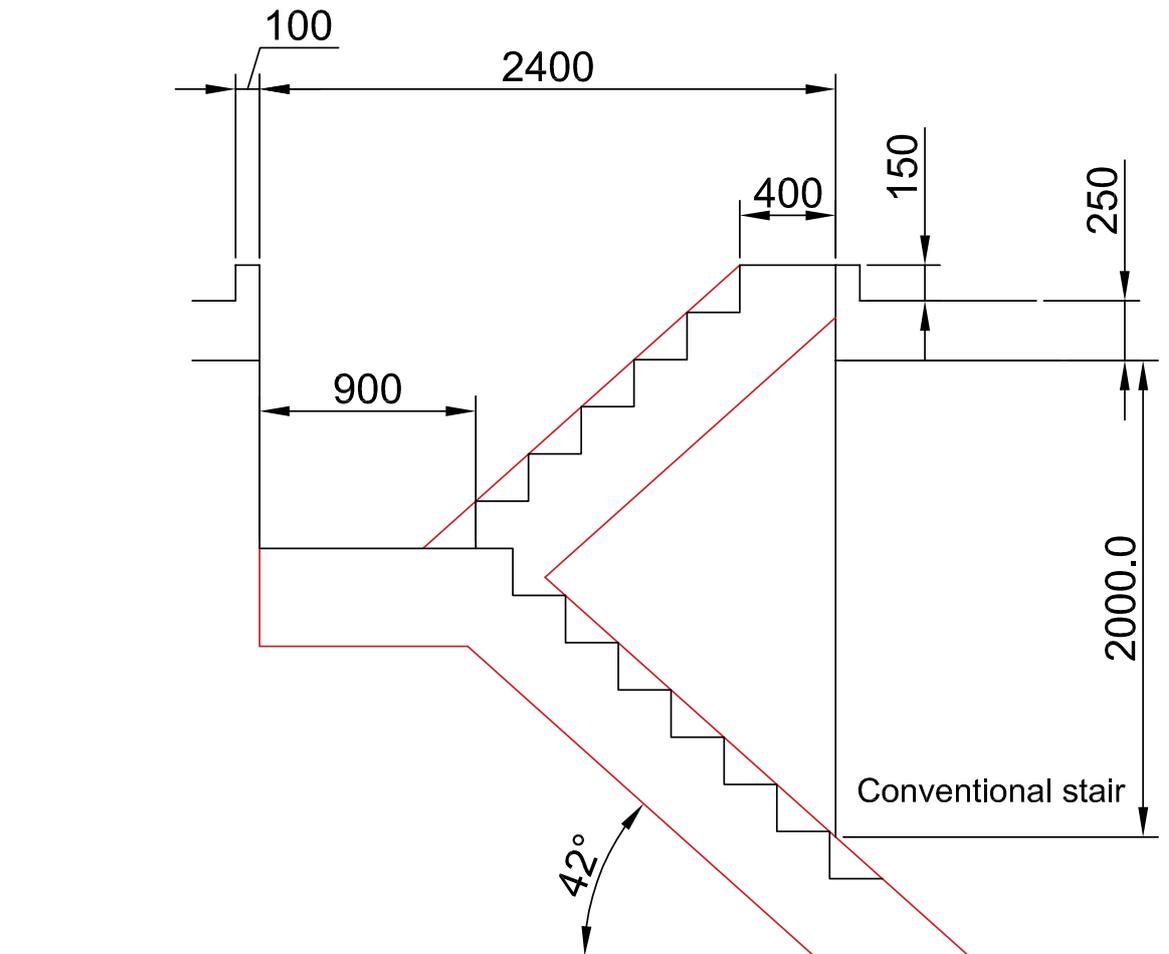


Fig 1.3

Fig 1.3 shows that where the width of the opening is wide enough to accommodate double the stair width and thus a landing can be incorporated, then the minimum internal length of the rooflight reduces to 2.4m based on a 900mm landing.

To comply with part K of the Building Regulations the landing must be at least the same as the width of the stairs. The suggested minimum width of stairs in England is 800mm although in some circumstances this may be as little as 600mm, check with your local building control office. The same caveats referred to in Fig 1.2 also apply.

Close relationships with product manufacturers is incredibly important as they can offer guidance and advice with regard to size limitations and materials specifications. Glass rooflights for example can become more complex and difficult to open in larger sizes due to the sheer weight of the material, this will also have a bearing on cost that should be considered.

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Requirement K1 and regular/terrace access

Fig 1.4 shows that where the rooflight does not provide a completely clear opening the headroom of the partially open rooflight frame also needs to be taken into account as well as the headroom of the internal ceiling.

In this example, one half of the rooflight slides over the other half providing only a 50% opening. This is an ideal example of where a box rooflight would be better suited than a flat sliding rooflight as it provides additional headroom to achieve the desired clearance.

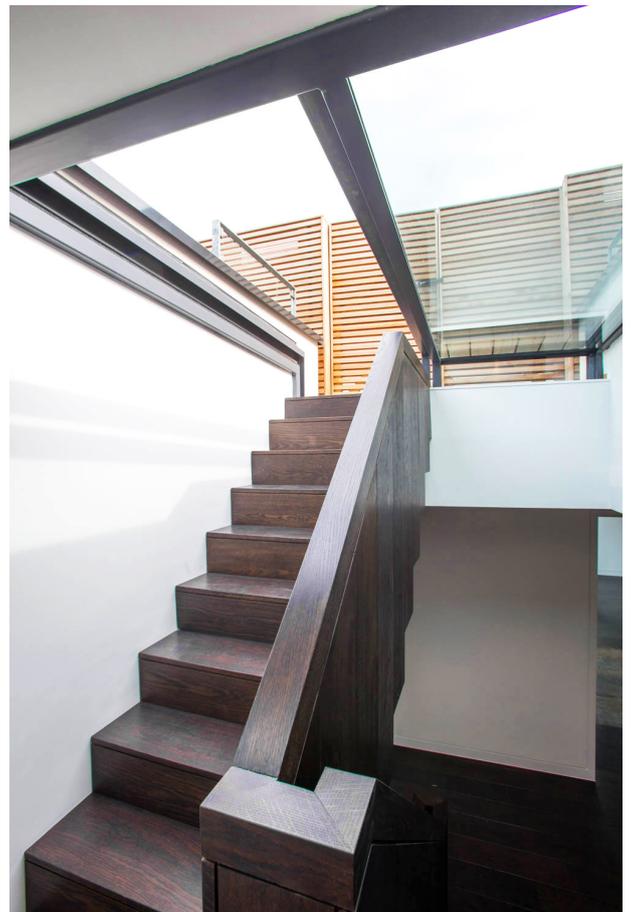
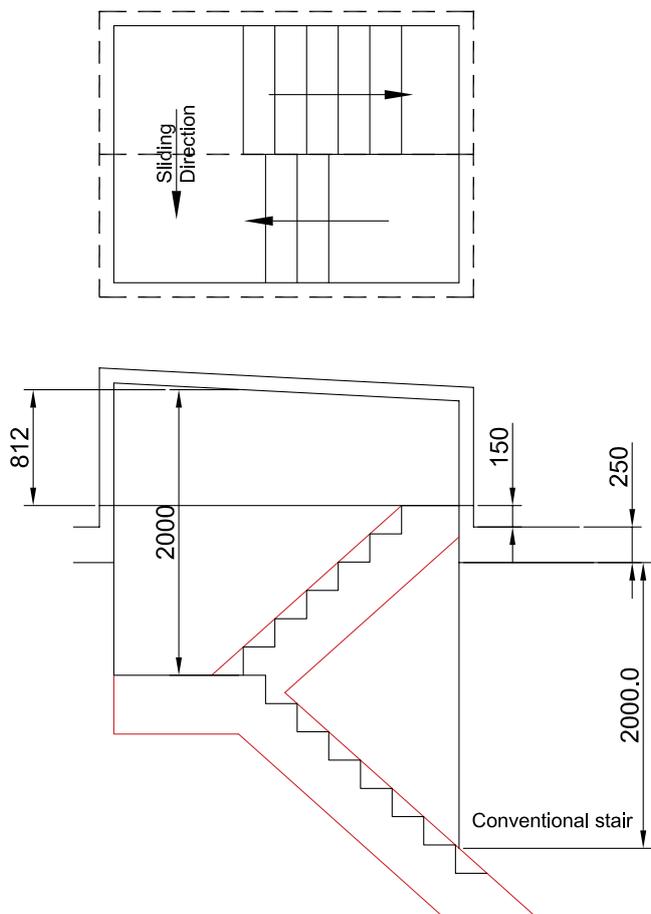


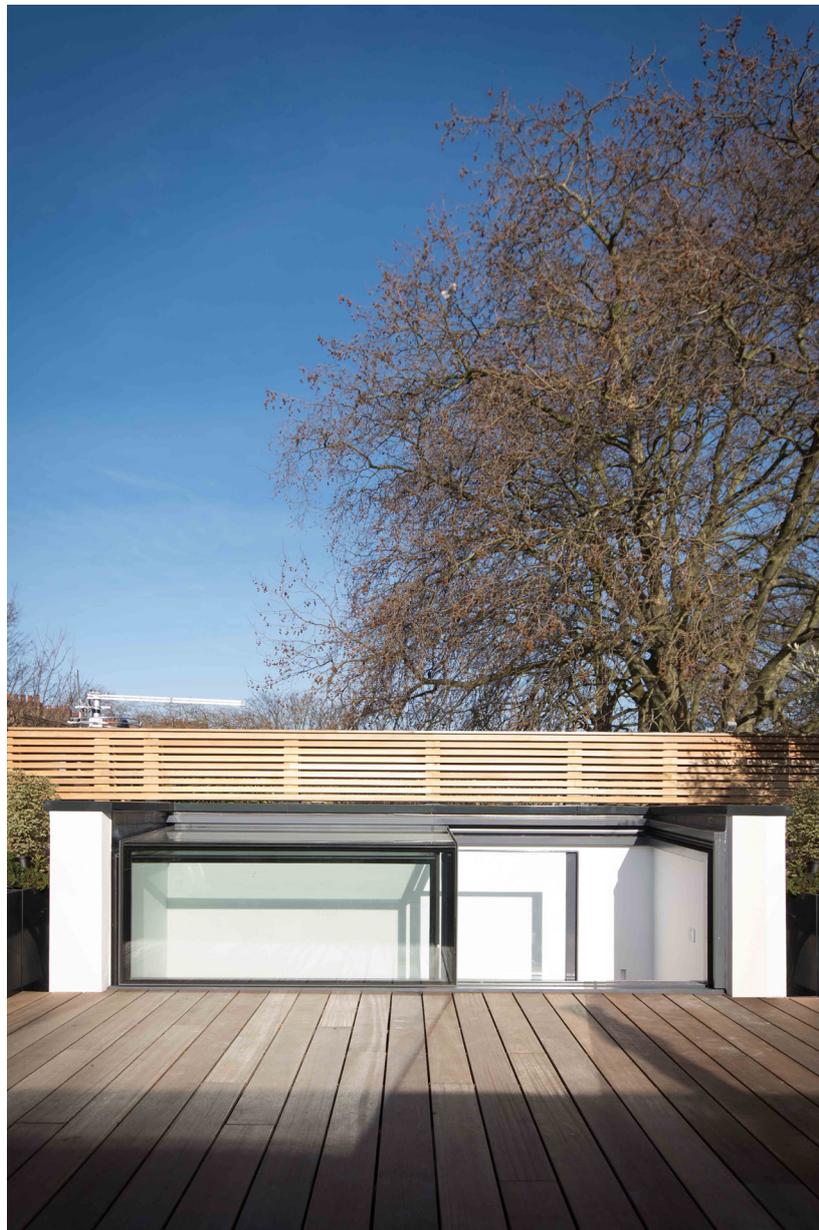
Fig 1.4

Adding extra head height with box rooflights

Box rooflights are the ultimate fit when it comes to rooflight access to terrace areas as they introduce another dimension into the equation when comparing them to hinged products, height. Box rooflights are designed as a physical structure and therefore add additional head height above the internal ceiling level which if designed correctly can provide the desired clearance for access.

These rooflights tend to function by sliding sections of glass (instead of operating via a hinge) so careful positioning of the stair is needed to ensure that the threshold is situated where the product completes its travel and is in the open position.

In most cases box rooflights are operated at a distance either by wall mounted control unit or remote, thus adding further peace of mind that the rooflight will already be partially open whilst ascending the stair.



Requirement K1: Landings for stairs

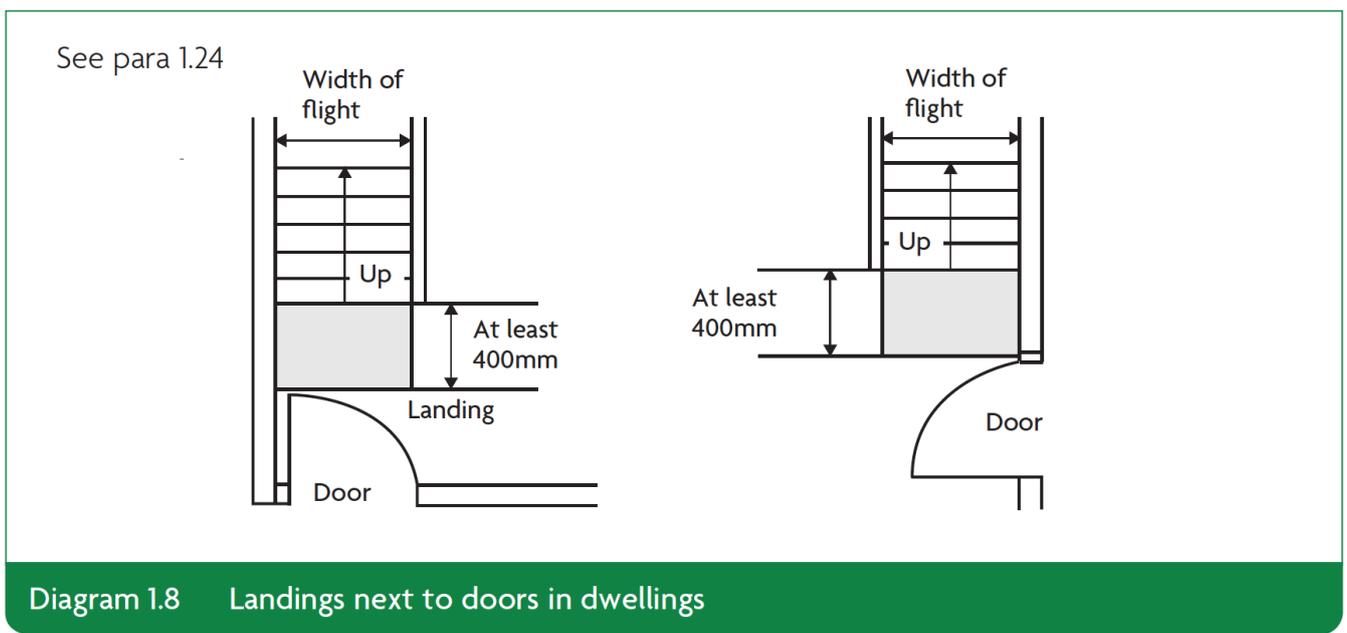


Part K offers guidance in relation to the minimum requirements for both rise and going of steps for permanent flights of stairs.

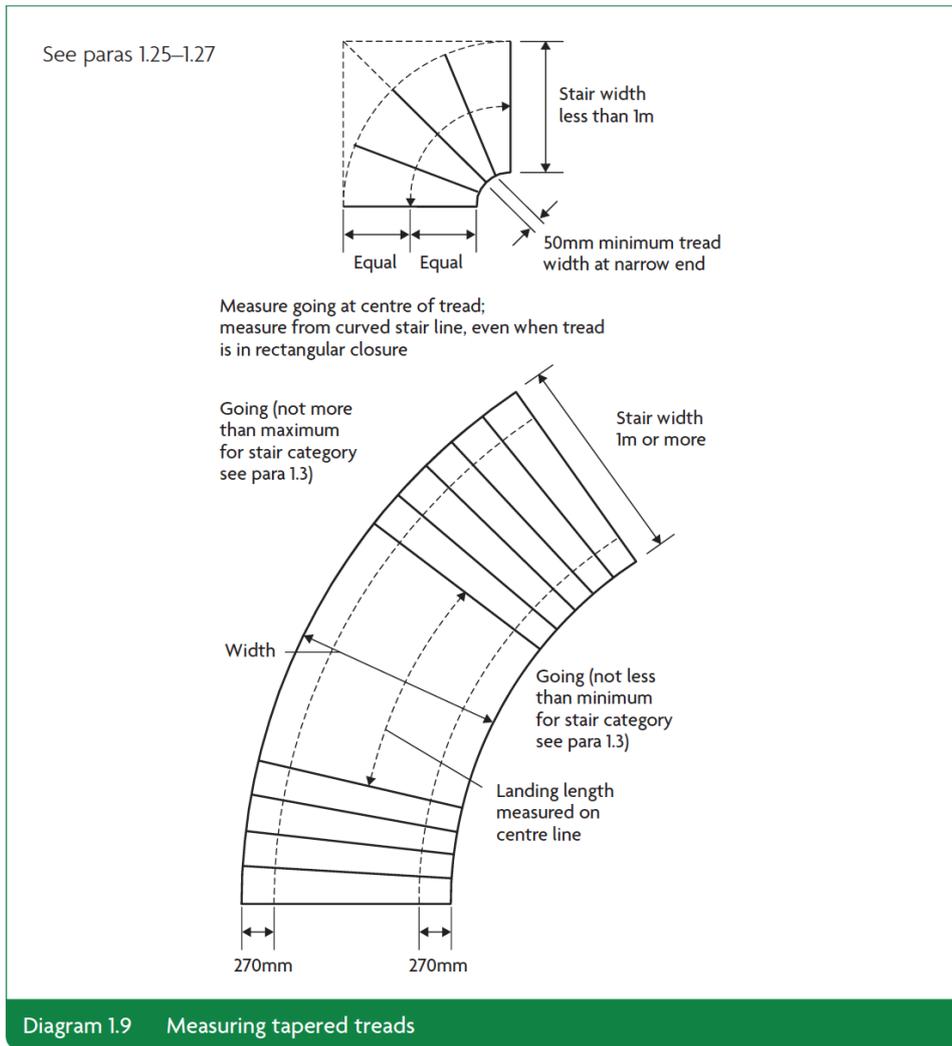
For access rooflights the final step should be considered a landing as it appears at the top of the flight of stairs in accordance with section 1.20 Landings for stairs (for all buildings)

Diagram 1.8 below covers minimum required dimensions for landing areas in dwellings, note that a 400mm minimum tread width should be in place at the top of the flight of stairs where the user would exit on to the roof.

The example above demonstrates a two wall box rooflight where the appropriate width has been provided.



Requirement K1: Special stairs, tapered treads



Installing a flight of stairs in a dwelling incorporating tapered treads is permissible and covered under ‘Special stairs’ in Approved Document K.

The rise and going should be designed with the usual requirements and comply with guidelines detailed in paragraph 1.2 and 1.3 of the document, but for the going of tapered treads you should consult Diagram 1.9 above.

If you are planning to use consecutive tapered treads then the going will be the same on each but for those considering a stair consisting of both straight and tapered treads, then the going of the tapered tread should not be less than that of the straight tread.

The going should be measured at the centre of the tread and a minimum width of 50mm should be provided at the narrow end.

Requirement K1: Alternating tread stairs in dwellings

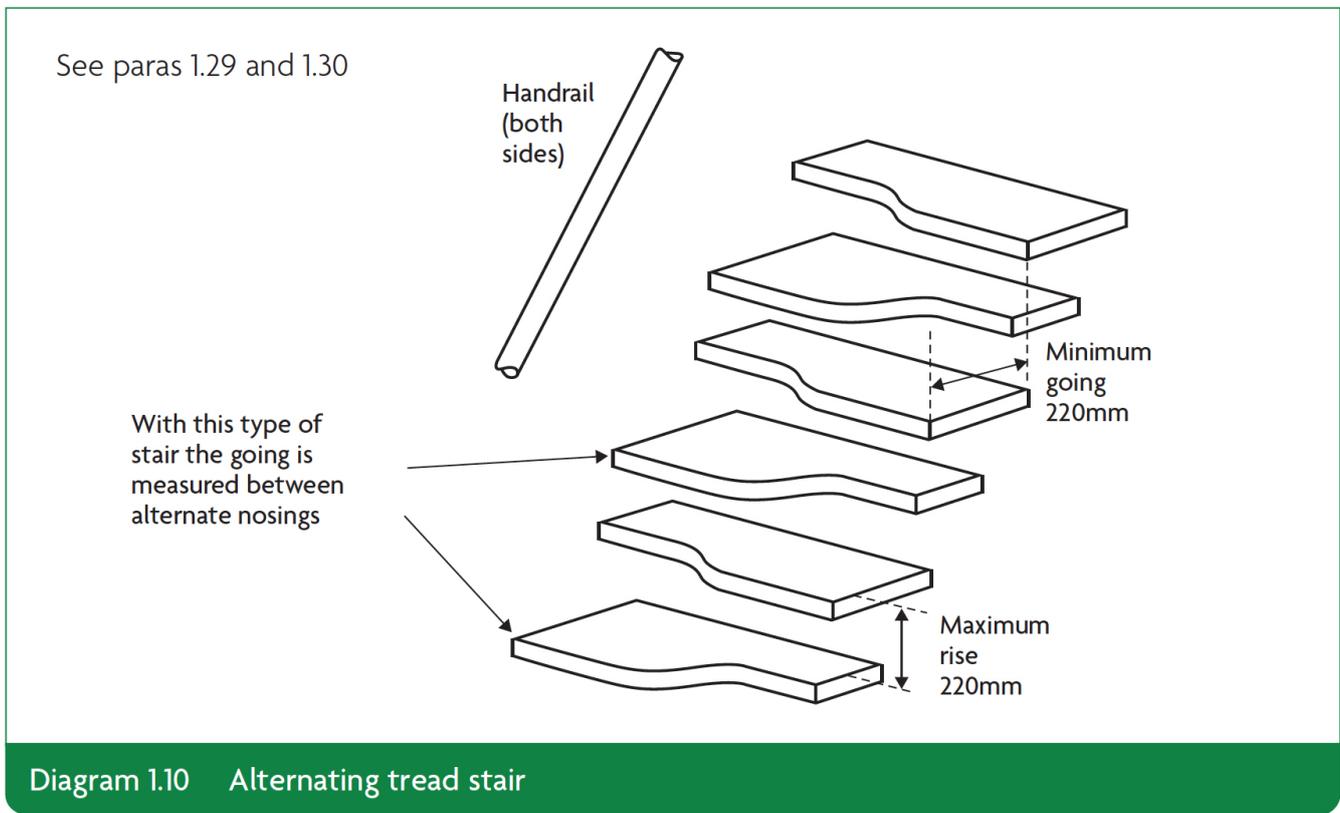
In some cases there simply may not be enough space to accommodate a full flight of stairs and section 1.29 of Approved Document K covers the potential scope for the use of 'alternating tread stairs' the design of which must comply with diagram 1.10 below.

Alternating tread stairs can save valuable space and work at a steeper pitch but Part K only recommends their use for loft conversions and only when there is not enough space for a full flight and the stairs provide access to only one habitable room.

The use of this type of stair should be considered a 'last resort' where there is insufficient room for a conventional stair. Budgetary considerations are highly unlikely to be accepted by Building Control as justification for their use.

Use in relation to a loft conversion to a single habitable room is justified by expectations of intended use and that the number of people likely to be using the stair at any one time will also be limited. It should be expected that the number of people using access to a roof terrace would normally be more than those requiring access to a single habitable room in a loft conversion.

Approved Document K does not cover roof terrace access specifically but advice from LABC states that in their opinion an alternating tread stair is of limited use and would not satisfy the requirements of Part K under general circumstances and recommend that the specifier seeks advice from their local Building Control Officer if they are considering alternatives to a full flight of stairs.



Requirement K1: Construction of steps



rooflight
installations
overhead can
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natural daylight

Section K1 also covers construction of steps and states that when referring to all buildings, the rise and going of each step are consistent throughout the flight of stairs. It goes on to state the benefits of installing steps with risers, noting that:

- a) It removes the possibility of the front of a foot or walking aid being caught underneath a tread during ascent, possibly causing a fall.
- b) It avoids the feeling of insecurity people get when looking through open risers on the stair.

Section 1.9 specifically refers to dwellings and states that steps may have open risers provided they comply with the following guidance:

- a) Overlap treads by a minimum of 16mm.
- b) Construct the steps so that a 100mm diameter sphere cannot pass through the open risers.

In many cases, installing a flight of steps with open risers in conjunction with rooflight installations overhead can increase the amount of natural daylight available in the stairwell.

Requirement K3: Terraces, guards and barriers



Section K3: Guards and barriers covers several aspects where safety barriers may be required, with regard to rooflight installations it specifically refers to pedestrian guarding where it is reasonably necessary for safety to guard the edges of any part of a roof including rooflights and other openings.

In single family dwellings and residential buildings the minimum height requirement for such elements is 900mm on stairs, landings, ramps and edges of internal floors and 1100mm for external balconies and edges of the roof.

Building Category and location See paras 1.38, 3.2 and 3.4		Height (h)	
Single family dwellings	Stairs, landings, ramps, edges of internal floors	900mm for all elements	
	External balconies, including Juliette balconies and edges of roof	1100mm	
Factories and warehouses (light traffic)	Stairs, ramps	900mm	
	Landings and edges of floors	1100mm	
Residential, institutional, educational, office and public buildings	All locations	900mm for flights otherwise 1100mm	

When considering a roof terrace whose sole means of access is via an opening rooflight, this is particularly relevant as barriers may be required around the opening to avoid anyone falling through it.

Whether a barrier is ultimately required will depend on product selection, how it operates and its orientation on the roof in relation to the building fabric.

whether a barrier is ultimately required will depend on product selection

Rooflights as safety barriers



Hinged access rooflights can still be safely used with minimal barriers if the scheme and layout of the building permits and the orientation of the rooflight is considered carefully.

The actual opening section of the rooflight can be used successfully as a safety barrier whilst in the fully open position provided it meets the minimum criteria covered in Approved Document K with regard to sizes and that the glass is compliant with Approved Document N in relation to safety glass.

In this example a hinged opening rooflight has been installed directly adjacent to a party wall so that when fully open the wall and the glass combined form barriers along both lengths of the opening.

All that is required is a balustrade at the rear to allow this set up to comply, had the rooflight been installed in the opposite orientation then a barrier would have been required along the length in order to comply with regulations.

Removing the need for safety barriers



Box rooflights are the ideal solution for those wishing to avoid the extra hassle of installing barriers or balustrades around the rooflight. As these products are constructed as a physical structure, the glazing of the rooflight itself forms a barrier.

Requirement K4: Protection against impact with glazing

The materials used, particularly the glass itself must still comply with the Building Regulations in respect to its design and reference should be made in this case to Requirement K4: Protection against impact with glazing, which goes on to state that any glazing with which people are likely to come into contact whilst moving in or about the building shall:

- a) If broken on impact, break in a way which is unlikely to cause injury; or
- b) Resist impact without breaking; or
- c) Be shielded or protected from impact.





In order to meet this requirement, in critical locations one of the following approaches would be accepted:

- a) Measures to limit the risk of cutting and piercing injuries by the use of glazing that is reasonably safe, such that, if breakage did occur, any particles would be relatively harmless.
- b) Use of glazing sufficiently robust to ensure that the risk of breakage is low.
- c) Steps are taken to limit the risk of contact with the glazing.

In the case of rooflights the most common solution is compliance by adopting the use of toughened safety glass designed to fracture into smaller less harmful pieces in the event of breakage.

Some rooflight manufacturers offer higher specification heat soak tested toughened safety glass in order to reduce the potential risks of nickel sulphide inclusions formed during the toughening process, which have reportedly led to spontaneous glass fractures.

Another option would be to specify glazing with a laminated interlayer designed to hold any fractured sections of glass intact preventing them falling out of the frame and injuring the buildings occupants.



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