

Supplementary guidance on the design of stairs to help achieve compliance with the Building Regulations



Comhshaol, Pobal agus Rialtas Áitiúil
Environment, Community and Local Government



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1.0 Introduction

Stairs serve many different functions in a building e.g. a mean of escape, a means of access for ambulant disabled people or an effective and simple means of vertical circulation, or sometimes a combination of these. Functional requirements and guidance on compliance for stairs are given in various Parts of the Building Regulations namely:

- Part K (Stairways, Ladders, Ramps and Guards) for stairs in general,
- Part B (Fire Safety) for escape, and
- Part M (Access and Use) for stairs suitable for ambulant disabled people.

Designers should refer to the relevant Part and accompanying TGD when designing stairs.

- Technical Guidance Document K (Stairways, Ladders, Ramps and Guards) contains the primary guidance document on stairs design in an overall sense when the stairs is located within (or immediately outside) a building.
- Technical Guidance Document B (Fire Safety) considers, inter alia the stairs design criteria that need to be addressed with respect to safe egress and is very much dependent on the building purpose group, building occupancy level, etc.
- Technical Guidance Document M (Access and Use) in the context of stairs has an objective to provide independently accessible approach to the main entrance(s) of a building and means of circulation around a building

Where works are carried out in accordance with the TGDs, this will, prima facie, indicate compliance with the relevant parts of the Second Schedule to the Building Regulations (as amended).

2.0 Purpose of this guidance

The choice of stairs is crucially dependent on the designers understanding of the function of the stairs under consideration i.e. approach, access, circulation, egress or any combination of these. This supplementary guidance document was developed as a tool to assist building professionals readily determine some of the key criteria of stairs design and expresses the individuality of some of the key stairs design criteria.

The Technical Guidance Documents give guidance on minimum standards. Those involved in the design and construction of buildings should have also have regard to the principles of Universal Design and consider making additional provisions where practical and appropriate.

3.0 How to use the supplementary guidance

The guide is presented in 3 tables.

- Table 1 deals with external stairs outside a building other than a dwelling.
- Table 2 deals with internal stairs in a building other than a dwelling.
- Table 3 deals with both internal and external stairs in an about dwellings.

Compliance with this supplementary guidance **does not** confer immunity from compliance with the Building Regulations (or any other Regulations).

4.0 Further reading

C722 Safer stairs in public places - assessment of existing stairs - CIRIA (2013)

Refurbishing stairs in dwellings to reduce the risk of falls and injuries – BRE TRUST (2013)

Table 1 External stairs outside buildings (other than dwellings)

	Part K Stairways, Ladders, Ramps and Guards	Part M Access and Use	Part B Fire Safety	Designer decision required below on function of stairs under consideration. ↓					
Building Regulations Requirements	K1 Stairways, ladders and ramps shall be such as to afford safe passage for the users of a building.	M1 Adequate provision shall be made for people to access and use a building, its facilities and its <u>environs</u> .	B1 Means of escape in case of fire B5 Access and facilities for the fire service.						
Application of Building Regulations relating to the provision of external steps/ stairs outside a building:	Requirement K1 DOES NOT apply to steps or access routes outside a building other than where steps are immediately outside the external door of a building.	Applies to: 1. the approach route(s) to the accessible entrance(s) (Refer to 1.1.2 of TGD M 2010 for the defined approach routes); 2. the circulation routes around a building (Refer to 1.1.2 for the defined circulation routes)	Where stairs are provided: • Design for vertical escape; • Make provision for people with disabilities; • Provision for personnel access to buildings for firefighting. Refer to Section 1.2.6 'External Escape Routes' of TGD B for provision of external escape stairways. ⁹						
Criteria	TGD K 2014	TGD M 2010		TGD B 2006	Stairs designed for:	Reference/ relevant TGD			
		New buildings Section 1	Existing buildings Section 2^c						
1. Stairs width (For landing width see Note h below)	As required by TGD B or TGD M. See across ⇒	1200 (min) between walls, upstands, strings and 1000 (min) between handrails	As wide as possible but not less than 1000 mm between handrails.	Refer to 1.3.4 and 1.3.5 for determining widths of stairways (but not less than 800 mm). ^a	Egress	B (See across)			
					Approach/ Access/ Circulation	M (See across)			
					Egress + any of above	The wider of B and M			
2. Max rise of flight between level landings	16 rises or 18 rises where going ≥ 350 ^b	1500 mm (max) rise or 18 rises where going ≥ 350 ^b		No additional requirements	Egress	K (See across)			
					Approach/ Access/ Circulation	M (See across)			
					Egress + any of above				
3. Rise (R)	Semi Public	Opt	Max	150 (min) to 180 (max)	150 (min) to 180 (max)	No additional requirements	Egress	K (See across)	
	Public	165	190				Approach/ Access/ Circulation	150 (min) to 180 (max)	
		150	180				Egress + any of above		
4. Going (G)	Semi Public	Opt	Min	300 (min) to 450 (max)	As large as possible but not less than 280	No additional requirements	Egress	K (See across)	
	Public	300	250				Approach/ Access/ Circulation	M (See across)	
		300	280				Egress + any of above		
5. Gait (2R+G)	Min	Opt	Max	No additional requirements	No additional requirements	No additional requirements	Egress	K (See across)	
	550	600	700				Approach/ Access/ Circulation		
	Egress + any of above								
6. Open risers	Allowed subject to 16mm (min) overlap of nosing & 100mm (max) gap between treads			Not allowed	No additional requirements	No additional requirements	Egress	Allowed	
							Approach/ Access/ Circulation	Not allowed	
							Egress + any of above		
7. Tapered treads	Semi Public	Avoid (unless necessary)		Not allowed	No additional requirements	No additional requirements	Egress	K (See across)	
	Public	No allowed					Approach/ Access/ Circulation	Not allowed	
							Egress + any of above		
8. Headroom	≥ 2000			≥ 2100	≥ 2000	≥ 2000	Egress	≥ 2000	
							Approach/ Access/ Circulation	≥ 2100	
							Egress + any of above		
9. Handrail provision	> 3 risers	Provide handrails		Both sides of all stairs flight regardless of number of risers. ^d			Egress	B (See across)	
	> 1000	Both sides					Approach/ Access/ Circulation		
	≤ 1000 wide	One side only					Egress + any of above		Both sides ^{de}

10. Handrail height	Above:	Min	Max	New build	Min	Max	Existing building	Min	Max	No additional requirements	Egress	K (See across)
	Pitch line	900	1000	Pitch line	900	1000	Pitch line	840	1000		Approach/ Access/ Circulation	M (See across)
	Intermediate landing	900	1100	Intermediate landing	900	1100	Intermediate landing	840	1100		Egress + any of above	
11. Guarding	Stairs should be guarded at the sides where the total rise is > 600 mm. (See 1.1.18)			No additional requirements					No additional requirements		Approach/ Access/ Circulation/ Egress	K (see across)
12. Tactile hazard warning surfaces	No requirements			Top & bottom landings					No requirements		Egress	No requirements
13. Visibility	No requirements			All step nosing to incorporate permanently contrasting material on the tread. Illuminance at tread level to be at least 100 lux					Adequate artificial lighting should be provided to all external escape routes (See 1.4.8)		Approach/ Access/ Circulation	M (See across)
											Egress + any of above	
											Egress	No requirements
											Approach/ Access/ Circulation	M (See across)
											Egress + any of above	

Notes:

^a Method of measurement as per Para B1.0.10 Methods of Measurement – Width “(iii) a stairway is the clear width between walls or balustrades, (strings and handrails intruding not more than 30 mm and 100 mm respectively may be ignored.”

^b In places of assembly to which large numbers of people have resort, there should be no more than two consecutive flights each having a maximum of twelve risers, without a change in direction of at least 30° between flights;

^c Section 2 provides additional guidance on the minimum provisions for certain elements and features of existing buildings where it is not practicable to achieve the provisions set out in Section 1.

^d If width between handrails > 2000 mm then divide stairs into channels not less than 1000 mm and not > 2000 mm.

^e In such a case the stairway width on each side of the handrail needs to be considered separately for the purpose of assessing stairway capacity.

^g External escape stairways should be sufficiently protected from the weather and is adequately protected from a fire in the building (see 1.3.9 TGD B).

^h Top and bottom landings should be level and at least as great as the smallest width of the flight determined by Criteria 1.

Table 2 Internal stairs in buildings (other than dwellings)

	Part K Stairways, Ladders, Ramps and Guards	Part M Access and Use	Part B Fire Safety	<p>Designer decision required below on function of stairs under consideration.</p> <p style="text-align: center;">↓</p>				
Building Regulations Requirements	K1 Stairways, ladders and ramps shall be such as to afford safe passage for the users of a building.	M1 Adequate provision shall be made for people to access and use a building, its facilities and its environs.	B1 Means of escape in case of fire B5 Access and facilities for the fire service.					
Application of Building Regulations relating to the provision of internal stairs.	ALL internal stairs (as required) must comply with Part K.	At least one set of stairs suitable for ambulant disabled people should be provided to access all floors above or below entrance level.	Where stairs are provided: <ul style="list-style-type: none"> • Design for vertical escape; • Make provision for people with disabilities; • Make provision for personnel access to buildings for firefighting. 					
Technical Guidance Documents								
Criteria	TGD K 2014	TGD M 2010		TGD B 2006	Stairs designed for:	Reference/ relevant TGD		
		New buildings Section 1	Existing buildings Section 2^c					
1. Stairs width (For landing width see Note f below)	As required by TGD B or TGD M (if stairs suitable for ambulant disabled people)	1200 (min) between walls, upstands, strings and 1000 (min) between handrails.	As wide as possible but not less than 1000 mm between handrails.	Refer to 1.3.4 and 1.3.5 for determining widths of stairways (but not less than 800 mm ^a).	Circulation/ Egress/ Both	B ^a (See across)		
					Ambulant disabled only	M (See across)		
					Any combination of above	The wider of B ^a and M		
2. Max rise of flight between level landings	16 risers ^b	1800 (max)		No additional requirements	Circulation/ Egress/ Both	16 rises ^b		
					Ambulant disabled only	1800 (max) ^b		
					Any combination of above			
3. Rise (R)	Opt	Max	150 (min) to 180 (max)	No additional requirements	Circulation/ Egress/ Both	K (See across)		
	Semi Public	165			190	Ambulant disabled only	150 (min) to 180 (max)	
	Public	150			180	Any combination of above		
4. Going (G)	Opt	Min	300 (min) to 450 (max)	As large as possible but not less than 250	No additional requirements	Circulation/ Egress/ Both	K (See across)	
	Semi Public	300				250	Ambulant disabled only	M (See across)
	Public	300				280	Any combination of above	
5. Gait (2R+G)	Min	Opt	Max	No additional requirements	No additional requirements	Circulation/ Egress/ Both	K (See across)	
	550	600	700					
6. Open risers	Allowed subject to 16mm (min) overlap of nosing & 100mm (max) gap between treads		Not allowed		No additional requirements	Circulation/ Egress/ Both	K (See across)	
						Ambulant disabled only	Not allowed	
						Any combination of above		
7. Tapered treads	Semi Public	Avoid (unless necessary)	Not allowed		No additional requirements	Circulation/ Egress/ Both	K (See across)	
	Public	Not Allowed				Ambulant disabled only	Not allowed	
						Any combination of above		
8. Headroom	≥ 2000		≥ 2100		≥ 2000	Circulation/ Egress/ Both	≥ 2000	
						Ambulant disabled only	≥ 2100	
						Any combination of above		

9. Handrail provision	> 3 risers	Provide handrails		Both sides of all stairs flight regardless of number of risers ^d						> 3 risers	Provide handrails	Circulation/ Egress/ Both	B (See across)
	≤ 1000 wide	one side only								≤ 1000	one side only	Ambulant disabled only	Both sides ^{de}
	> 1000	both sides								> 1000	both sides	Any combination of above	
										> 1800	In addition provide a central handrail ^e		
10. Handrail height	Above	Min	Max	Above:	Min	Max	Above	Min	Max	No additional requirements	Circulation/ Egress/ Both	K (See across)	
	Pitch line of flight	900	1000	Pitch line of flight	900	1000	Pitch line of flight	840	1000		Ambulant disabled only	M (See across)	
	Intermediate landing	900	1100	Intermediate landing	900	1000	Intermediate landing	840	1100		Any combination of above		
11. Guarding	Stairs should be guarded at the sides where the total rise is > 600 mm. See 1.1.18 for further details			No additional requirements						No additional requirements		Circulation/ Egress/ Ambulant disabled	K (See across)
12. Tactile hazard warning surfaces	No requirements											Circulation/ Egress/ Ambulant disabled	No requirements
13. Visibility	No requirements			All step nosing to incorporate permanently contrasting material on the tread. Illuminance at tread level to be at least 100 lux						Adequate artificial lighting should be provided to all internal escape routes (See 1.4.8)		Circulation/ Egress/ Both	B (See across)
												Ambulant disabled only	M (See across)
												Any combination of above	Both B & M

Notes:

^aMethod of measurement as per Para B1.0.10(c) Methods of Measurement – Width “(iii) a stairway is the clear width between walls or balustrades, (strings and handrails intruding not more than 30 mm and 100 mm respectively may be ignored.”

^b In places of assembly to which large numbers of people have resort, there should be no more than two consecutive flights each having a maximum of twelve risers, without a change in direction of at least 30° between flights;

^c Section 2 provides additional guidance on the minimum provisions for certain elements and features of existing buildings where it is not practicable to achieve the provisions set out in Section 1.

^d If width between handrails > 2000 then divide stairs into channels not less than 1000 and not > 2000 mm.

^e In such a case the stairway width on each side of the handrail needs to be considered separately for the purpose of assessing stairway capacity.

^fTop and bottom landings should be level and at least as great as the smallest width of the flight determined by Criteria 1.

Table 3 Dwellings

		External Stairs				Internal Stairs						
		*(See Notes 4 for Requirements of Part B Fire Safety)				*(See Notes 1 to 3 for Requirements of Part B Fire Safety)						
Building Regulations Requirements*	Part K Stairways, Ladders, Ramps and Guards			Part M Access and Use			Part K Stairways, Ladders, Ramps and Guards			Part M Access and Use		
Application of Building Regulations and provision of stairs.	Requirement K1 DOES NOT apply to steps or access routes outside a building other than where steps are immediately outside the external door of a building.			Where it is not practicable to provide the required level, gently sloped or ramped approach to a dwelling entrance from the point of access, a stepped approach may be used.			All internal stairs in a dwelling must comply with Part K.			Where there is no habitable room at entry level, the stairway providing access to the storey containing the main living room should comply with the following:		
Criteria	Technical Guidance Document						Technical Guidance Document					
	TGD K 2014			TGD M 2010 Section 3 (Dwellings)			TGD K 2014			TGD M 2010 Section 3 (Dwellings)		
1. Stairs width (mm) (For landing width see Note 5 below)	800 (min) between handrails			900 (min) between handrails			800 (min) between handrails			900 (min) between handrails		
2. Max rise of flight between level landings	16 No. risers			1800 mm (max)			16 No. risers			1800 mm (max)		
3. Rise (R)	Optimum	Max		100 (min) to 150 (max)			Optimum	Max		≤ 175		
	175	220						175				
4. Going (G)	Optimum	Min		≥ 280			Optimum	Min		≥ 280		
	250	220						250				
5. Gait (2R+G)	Optimum	Min	Max	No additional requirements			Optimum	Min	Max	No additional requirements		
	600	550	700					600				
6. Open risers	Allowed subject to 16mm (min) overlap of nosing & 100mm (max) gap between treads			No additional requirements			Allowed			No additional requirements		
7. Tapered treads	Avoid unless necessary (See 1.1.6)			Avoid unless necessary (See 3.1.2.5 (f))			Avoid unless necessary (See 1.1.6)			Avoid unless necessary (See 3.3.2.2 (f))		
8. Headroom	2000 (min)			2100 (min)			2000 (min) ⁶			No additional requirements		
9. Handrail provision	> 3 risers	Provide handrails		Where > 3 risers	continuous both sides		> 3 risers.	Provide handrails		Where 3 or more risers provide continuous handrail both sides		
	≤ 1000	one side only					≤ 1000	one side only;				
	> 1000	both sides		Where going ≥ 750	handrails need not be provided.		> 1000	both sides				
10. Handrail height	Above:	Min	Max	Above:	Min	Max	Above:	Min	Max	Above:	Min	Max
	Pitch line of flight	900	1000	Pitch line of flight	900	1000	Pitch line of flight	900	1000	Pitch line of flight	900	1000
	Intermediate landing	900	1100	Intermediate landing	900	1100	Intermediate landing	900	1100	Intermediate landing	900	1100
11. Guarding	Stairs should be guarded at the sides where the total rise is > 600 mm. See 1.1.18 for further details			No additional requirements			Stairs should be guarded at the sides where the total rise is > 600 mm. See 1.1.18 for further details			No additional requirements		

Notes:

- For dwelling houses with no floors more than 4.5m above ground level (Purpose Group 1(a)) refer to 1.5.2 of TGD B for additional considerations on stairway design.
- For dwelling houses with one floor more than 4.5m above ground level (Purpose Group 1(b)) refer to 1.5.3 of TGD B for additional considerations on stairway design.
- For dwelling houses with more than one floor more than 4.5m above ground level (Purpose Group 1(b)) refer to 1.5.4 of TGD B for additional considerations on stairway design.
- For Duplex dwellings, Purpose Group 1(c) refer to 1.3.9 of TGD B for specific requirements for external escape stairs.
- Top and bottom landings should be level and at least as great as the smallest width of the flight determined by Criteria 1.
- In the conversion of a loft where space is limited, headroom measured at the centre of the stairs should be not less than 1.9 m but may reduce to not less than 1.8 m at the side of the stairs.