BS 5499-4:2013

BSI Standards Publication

Safety signs

Part 4: Code of practice for escape route signing

Working document

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to vi, pages 1 to 50, an inside back cover and a back cover.

Foreword

Publishing information

This part of BS 5499 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 December 2013. It was prepared by Subcommittee PH/8/1, *Graphical symbols – Safety signs*, under the authority of Technical Committee PH/8, *Graphical symbols*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This part of BS 5499 supersedes BS 5499-4:2000, which is withdrawn.

Relationship with other publications

This part of BS 5499 is part of a series that contains the following current part:

- BS 5499-10, *Guidance for the selection and use of safety signs and fire safety notices.*

The original suite of standards on safety signs in BS 5499 included BS 5499-1, BS 5499-5, BS 5499-6 and BS 5499-11. They were all crosslinked. All have been superseded as follows:

- BS 5499-1 is superseded by BS ISO 3864-1;
- BS 5499-6 is superseded by BS ISO 3864-3;
- BS 5499-5 is superseded by BS EN ISO 7010;
- BS 5499-11 is superseded by BS ISO 20712-1;
- BS ISO 3864-4 is new and covers material replacing that in the previous edition of ISO 3864-1, specifically the colour of safety signs. BS 5378-2 has been withdrawn.

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Information about this document

This British Standard has been prepared to improve public safety by providing recommendations on the use and location of escape route signs together with advice on the use of arrows to provide directional information.

This is a full revision of the standard and the principal changes are a consequence of the adoption of ISO 3864-1, ISO 3864-3 and ISO 3864-4 as British Standards and the graphical images of the registered safety signs in BS EN ISO 7010 with regard to colour specification and presentation. The example figures used in this edition no longer include the graphical images BS 5499-5; 2002, 0080 and 0082 as options because they are no longer registered safety signs. All escape route signs now include a direction arrow. Additional recommendations are provided on viewing distances for escape route signs and associated supplementary text, including the effects of viewing angle.

Use of this document

The colours represented in the electronic file of this British Standard can be neither viewed on screen nor printed as true representations. Although the copies of this British Standard have been produced to correspond (with an acceptable tolerance as judged by the naked eye) to the colour requirements, it is not intended that these printed copies be used for colour matching. Instead, colorimetric and photometric properties together with, as a guideline, references from colour order systems are provided in BS ISO 3864-4.

This part of BS 5499 takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this part of BS 5499 is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this part of BS 5499 that the execution of its provisions will be entrusted to competent people, for whose use it has been produced.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

The word "should" is used to express recommendations of this standard. The word "may" is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the Clause. The word "can" is used to express possibility, e.g. a consequence of an action or an event.

Notes and commentaries are provided throughout the text of this standard. Notes give references and additional information that are important but do not form part of the recommendations. Commentaries give background information.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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Introduction

This British Standard reflects good practice for the implementation of an escape route signing system. The figures within this standard show a system designed to provide the optimum amount of information to identify clearly the location and direction of the means of escape from the premises to a place of safety. The escape route signs used conform to BS EN ISO 7010.

A standardized method of signing with the use of appropriate supplementary text throughout the premises assists the process of education and instruction on the meaning of safety signs, and the appropriate actions to be taken.

The signing of escape routes might form part of the management of means of escape. Many considerations have to be taken into account, including the requirements of people with special needs, in order to establish a safe procedure. Advice can be found in BS 9999. The supplementary text component of the signs shown in the illustrations demonstrates how escape route signing can have a role to play in the management of a building. The use of supplementary text helps building occupants to differentiate normal egress routes from those intended for emergency use only.

By following the principles set out within this standard, the designer or specifier of the escape route signing can assist in creating a uniformity of application of escape route signs to increase familiarity, and therefore improve safety, for the building's occupants, visitors and for the general public. The figures within this standard are based on the assumption that some of the occupants may be unfamiliar with the premises and the figures are to be interpreted as recommendations and not as minimum requirements.

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1 Scope

This part of BS 5499 gives recommendations for the selection and use of escape route signs conforming to BS EN ISO 7010 to be provided within buildings. This part of BS 5499 gives further recommendations on the use of appropriate escape route signs conforming to BS EN ISO 7010:2012, E001 and E002, the use of supplementary text to assist in the interpretation of signs and the use of arrows to provide additional directional information.

This British Standard covers the use of all escape route signing systems within premises, including the selection of the appropriate type of sign, the location of signs, mounting positions, lighting and maintenance. The standard covers high-mounted signs as specified by BS EN ISO 7010 but it does not cover low-mounted way guidance systems (see BS ISO 16069).

This British Standard applies to premises where a formal risk assessment carried out under management of health and safety, and in particular the Regulatory Reform (Fire Safety) Order 2005 [1], has indicated a need for escape route signs to form an integral part of normal working procedures. This need exists where the premises are complex or may be unfamiliar to any of the occupants.

This British Standard does not cover the determination of the need for escape route signing. This British Standard assumes that a need for escape route signing has already been established. However, signs can be used with advantage in most premises, other than domestic premises.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 5266-1, *Emergency lighting – Part 1: Code of practice for the emergency escape lighting of premises*

BS EN 60598-1, *Luminaires – Part 1: General requirements and tests*

BS EN 60598-2-22, *Luminaires – Part 2-22: Particular requirements – Luminaires for emergency lighting*

BS EN ISO 7010:2012, *Graphical symbols – Safety colours and safety signs – Registered safety signs* (ISO 7010:2012)

BS ISO 3864-1, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs and safety markings*

BS ISO 3864-3, *Graphical symbols – Safety colours and safety signs – Part 3: Design principles for graphical symbols for use in safety signs*

BS ISO 3864-4, *Graphical symbols – Safety colours and safety signs – Part 4: Colorimetric and photometric properties of safety sign materials*

BS ISO 17398:2004, *Safety colours and safety signs – Classification, performance and durability of safety signs*

3 Terms and definitions

For the purposes of BS 5499-4, the following terms and definitions apply.

3.1 combination sign
sign that combines a safety sign and one or more associated supplementary signs on the same rectangular carrier

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[SOURCE: BS ISO 3864-1:2011, **3.1**]

3.2 escape route
route forming part of the means of escape (**3.12**) from any place in a premises to a final exit (**3.7**)

3.3 escape route sign
sign directing people along escape routes (**3.2**) towards exits (**3.4**)

3.4 exit
doorway or other suitable opening leading to a place of safety (**3.15**)

3.5 externally illuminated safety sign
safety sign that is illuminated, when required, by an external source

[SOURCE: BS ISO 3864-4:2011, **3.4**]

3.6 factor of distance, *z*
relationship between the height (h) of a sign and the observation distance (l), used to determine observation distances of signs

$$z = l/h$$

[SOURCE: BS ISO 3864-1:2011, **3.2**]

3.7 final exit
transient point between an escape route (**3.2**) and a place of safety (**3.15**)

3.8 identifiability
property of a graphical symbol which enables its elements to be perceived as the objects or shapes depicted

[SOURCE: BS ISO 9186-2:2008, **3.1**]

3.9 internally illuminated safety sign
safety sign that is illuminated, when required, by an internal source

[SOURCE: BS ISO 3864-4:2011, **3.5**]

3.10 mains-failure
failure of the power supply to the normal lighting

3.11 management/manager
persons or person in overall control of the premises while people are present, exercizing this responsibility either in their own right or by delegation

3.12 means of escape
structural means whereby safe routes are provided for persons to travel from any place within a premises to a place of safety (**3.15**)

3.13 ordinary material
material which is neither retroreflecting nor fluorescent nor phosphorescent nor involves powered light emission nor is activated by a radioactive source

[SOURCE: BS ISO 3864-4:2011, **3.11**]

3.14 phosphorescent material
material incorporating phosphors that, if excited by UV or visible radiation, store energy, which is emitted as light over a period of time

[SOURCE: BS ISO 3864-4:2011, **3.12**]

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NOTE A phosphorescent sign is the same as "photoluminescent" commonly used in the literature of the photoluminescent safety sign industry.

3.15 place of safety
predetermined place in which persons are in no immediate danger from the effects of a fire

3.16 safety sign
sign which gives a general safety message, obtained by a combination of a colour and geometric shape and which, by the addition of a graphical symbol, gives a particular safety message

[SOURCE: BS ISO 3864-1:2011, **3.12**]

3.17 sign height
diameter of a circular geometric shape or height of a rectangular or triangular geometric shape

[SOURCE: BS ISO 3864-1:2011, **3.13**]

3.18 storey exit
doorway or final exit (**3.7**) giving direct access into a protected space, protected stairway, fire fighting lobby or external escape route (**3.2**)

3.19 supplementary sign
sign that is supportive of a safety sign and the main purpose of which is to provide additional clarification

[SOURCE: BS ISO 3864-1:2011, **3.14**]

3.20 travel distance
actual distance that a person needs to travel within a building to the nearest exit (**3.4**), allowing for the layout of walls, partitions and fittings

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4 System design

4.1 General

An escape route signing system should ensure that from any place within a building, where direct sight of an exit is not possible and doubt might exist as to its position, a directional sign (or series of signs) is provided. Signs should be placed so that a person moving within the means of escape is progressed towards a final exit and all signing systems should be clear so that they minimize the risk of confusion for the public.

An escape route system within a building should address several needs including:

a) the results of a risk assessment determining the adequacy of the means of escape provision;

b) the requirements (if any) of enforcing authorities;

c) the operational needs of the responsible person and/or duty holder;

d) the convenience of the users of the building, both workers and the public.

A comprehensive statement of requirements should be prepared and agreed by all interested parties, addressing the factors listed in **4.2** and **4.3**.

This should be used as the basis for the detailed design and specification for the escape route signing system.

4.2 Analysis of the problem

The following factors should be evaluated before designing an escape route signing system:

a) the use of the premises;

b) the legislation applicable to the building and the requirements, if any, of the enforcing authorities;

NOTE 1 These include requirements made in England and Wales under the Building Regulations [2], in Scotland under the Building Standards (Scotland) Regulations [3], in Northern Ireland under the Building Regulations (Northern Ireland) [4] and under the Regulatory Reform (Fire Safety) Order 2005 [1] and might include particular requirements made under other local or national legislation, e.g. by liquor or other licensing authorities.

c) the management system controlling the use of the premises, e.g. public access, security provisions;

NOTE 2 Security considerations may dictate preferred exits for normal use. Some regularly used exits may not be available at all times that a building is occupied and therefore do not form part of the escape route.

d) the fire detection and warning systems provided;

e) the evacuation strategy for the premises;

NOTE 3 Some strategies rely on the occupants responding to an evacuation alarm, while others employ trained staff to initiate and control evacuation.

f) the degree of familiarity of the occupants with the premises.

4.3 Planning

An escape route signing system should provide simple identification of the means of escape to allow people to escape without assistance, possibly under conditions of stress. To be effective, signing should be complete and potential points of confusion should be avoided. Clear, unambiguous directions should be provided so that people escaping from any place in the building can use an escape route to reach a place of safety.

The following should be evaluated when planning an escape route signing system:

a) the siting and nature of all designated escape routes, in particular the location of stairs and other changes in level and any changes of direction;

b) the relative conspicuity or otherwise of escape routes;

c) any areas of high fire risk;

d) the position of all doors and other exits sited on escape routes including storey exits and final exits;

e) any escape routes which cross open areas;

f) the provision, if any, of any other systems (such as low-mounted guidance systems or audible devices) to assist people in finding their way in the event of an emergency evacuation;

g) the lighting levels within the building under both normal and mains-failure conditions;

NOTE 1 Some buildings, such as entertainment premises, may have low lighting levels as part of normal operation.

h) the location and lighting of any other signs, architectural features, decor or barriers that could conceal or divert attention from an escape route sign;

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NOTE 2 A department store, for instance, may have many signs which compete for the viewer's attention.

i) the type, location and lighting of any other escape route signs.

4.4 Design of signs

An escape route sign (see Figure 1) is a combination sign consisting of the emergency exit sign BS EN ISO 7010:2012, E001 or E002, and should be accompanied by a supplementary safe condition direction arrow (see BS EN ISO 7010:2012, E001 and E002 additional information) and supplementary text (see **4.7** and **4.8**).

NOTE 1 For identifying the graphical component "emergency exit", the height of the sign BS EN ISO 7010:2012, E001 or E002, determines the maximum viewing distance normal to the escape route sign (see Table 2, Table 3 and Table 4).

NOTE 2 For legibility of the supplementary text, the height of the lower case letters determines the maximum viewing distance normal to the escape route sign (see Annex C).

Where the angle of viewing of the escape route sign is not predominantly normal to the sign, the effect of angle of viewing should be taken into account, using the guidance in BS ISO 3864-1, and the factor of distance reduced by a multiplying factor of cosine of the angle of viewing to the normal to the sign (see Annex C).

Figure 1 **Examples of an escape route sign**

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To avoid confusion, all signs within a system of escape route signing should be of similar style, design, size and format.

4.5 Location of signs

The system designer should identify the primary escape route from each place within the premises.

NOTE 1 This is normally the shortest travel distance to a place of safety.

If there is a choice of escape routes, the escape route signing system should indicate the shortest travel distance. If at any place there is a choice of two escape routes of equal travel distance, both routes should be indicated by a separate series of signs (see Figure A.19).

The following principles should be applied when locating signs:

a) at least one escape route or doorway leading to an escape route should be visible from any place within every room or enclosure. Where this route is not conspicuous or confusion could occur, the route should be indicated by a sign;

b) where direct sight of the escape route or of the sign indicating the escape route is obstructed, one or more intermediate signs should be provided;

c) doors or passageways which might be confused as leading to a designated escape route should be marked clearly;

d) escape route signs should take precedence over all other signs. Signs with a potentially conflicting message (e.g. "no thoroughfare" and "fire exit") should not be used in the same location. Where this conflict is unavoidable,

a supplementary text sign (e.g. "except in an emergency") should be provided to override the prohibition message;

e) all changes of direction in corridors, stairways and open spaces forming part of an escape route should be marked with intermediate signs. Each intermediate door or junction should be similarly signed;

NOTE 2 Thus, an escape route sign is always in sight whenever a person escaping along any designated escape route has a choice of direction or door.

f) signs should be evenly spaced and consistently located so that the evacuee can effectively and quickly predict the location of the next sign within the escape route;

g) additional signs should be provided where the line of sight to the next sign would otherwise exceed the recommended maximum viewing distance for the chosen size of the sign;

h) a sign should be provided wherever confusion could otherwise occur;

i) every designated escape route should lead to a place of safety. A place of safety should not be provided with escape route signs but may be provided with a sign indicating "assembly point" BS EN ISO 7010 E007 (see Figure A.18). The location of the evacuation assembly point should not be indicated until the final exit on the escape route has been passed. If the position of the assembly point is not clear on leaving the final exit, safety signs BS EN ISO 7010 E007 with supplementary direction arrows should be provided to indicate the location of the assembly point;

j) signs should not be fixed to doors or sited where they could be obscured by opening doors;

k) where commercial or artistic considerations require signs or objects which owing to their size, brightness, design or proximity could be confused with or prevent recognition of an escape route sign, the location of the escape route sign may be slightly displaced provided safety is not compromised thereby. Otherwise the confusing signs or objects should be removed;

l) the effectiveness of any escape route sign should not be adversely affected by the presence of other signs conveying directional information in a similar format or by other internally illuminated signs or by competing or distracting light sources.

4.6 Mounting height

Escape route signs should be sited conspicuously within the normal field of vision.

To assist evacuees with the prediction of the location of successive signs, the following principles should be applied:

a) signs above doors or open spaces should be mounted between 2 m and 2.5 m from floor level, measured to the base of the sign and be sited as close to the centre line of the escape route as practicable;

NOTE 1 This mounting height is intended to ensure that signs can be readily seen, e.g. over the heads of people.

b) signs sited on walls should be mounted between 1.7 m and 2 m, from floor level measured to the base of the sign;

NOTE 2 This mounting height is intended to ensure the signs are within the immediate field of vision.

c) mounting heights greater than 2.5 m may be used, e.g. in large open spaces or for operational reasons, but such signs should be both conspicuous and identifiable and therefore larger signs might be necessary;

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d) signs should be sited at the same height throughout the escape route, so far as is reasonably practicable.

4.7 Use of supplementary text

Every escape route sign should incorporate, or be accompanied by, a supplementary text sign in which the text is in lower case letters with an initial upper case letter. The supplementary text should aid understanding of the meaning of the graphical symbol BS EN ISO 7010:2012, E001 or E002, so that it is fully understood and it may convey additional information.

The font used should be either a sans serif typeface, for example Helvetica bold or Helvetica medium, or a typeface with very small serifs with the following characteristics:

a) widths of strokes throughout the letters constant within 10%;

b) widths of strokes at least one sixth of the letter height;

c) width of lower case letter "x" not less than 70% of the letter height;

d) not condensed, expanded, italic, script, outline or shaded;

e) letters individually formed and not joined together.

The supplementary text should not overpower the graphical symbol. The height of the lower case letters of "Exit" or "Fire" should be at least 20% of the sign height. The supplementary text height should not be used to determine the maximum viewing distance (see Clause **6** and Annex C). The supplementary text should not be used on its own, and might need to be in more than one language.

A supplementary text sign reading "Exit" (as shown in Figure 2) should be used with an escape route sign to indicate a doorway or other suitable opening that leads to a place of safety. This is the route normally used to enter or leave the building.

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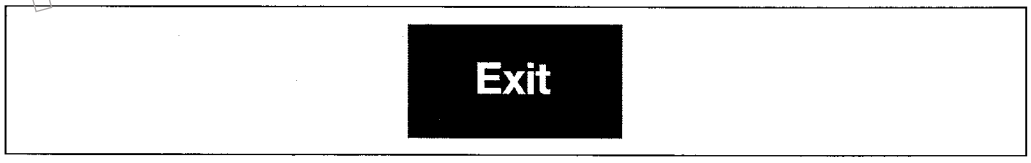
Figure 2 **Supplementary text sign: Exit**



A supplementary text sign reading "Fire exit" (as shown in Figure 3) should be used with an escape route sign to indicate a doorway or other suitable opening that leads to a place of safety which has been provided specifically as an alternative exit to be used in the event of the evacuation of the premises.

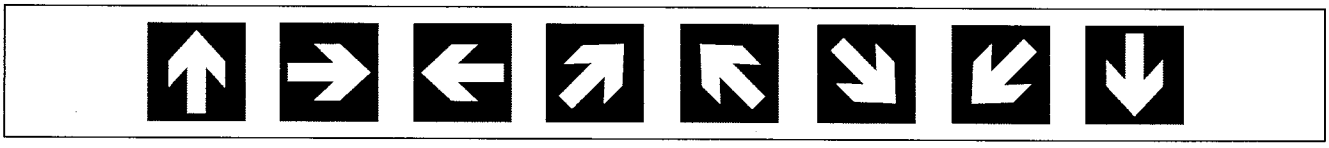
Figure 3 **Supplementary text sign: Fire exit**

4.8 Use of arrows

Every escape route sign should be accompanied by a directional arrow in accordance with the additional information given with BS EN ISO 7010:2012, E001 and E002. The arrow should indicate the direction of travel leading to the place of safety.

The use of an appropriate arrow should assist understanding of the direction of egress (see Figure 4 and Table 1) and also make the sign more conspicuous (see Annex A). The message of the upward vertical direction sign at an emergency exit door is "progress through this door"; the sign does not indicate decisions or directions that should be made on the other side of the door.

Figure 4 **Examples of appropriate directional arrows**



The following principles should be applied:

a) an arrow should not be used on its own;

b) arrows should be correctly orientated;

c) arrows should be used to indicate each change of direction or change of level;

d) arrows should be used wherever additional signs are provided in accordance with **4.5**g), i.e. where the line of sight to the next sign would otherwise exceed the recommended maximum viewing distance for the chosen size of sign;

e) an arrow should be provided wherever confusion might otherwise occur.

Table 1 gives the recommended combination of BS EN ISO 7010:2012, E001 or E002 with supplementary direction arrow and supplementary text.

NOTE Annex B gives the recommended combination of BS EN ISO 7010:2012, E001 or E002 with supplementary direction arrow and supplementary text where the sign is presented vertically.

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Table 1 **Escape route signs (meaning and use of BS EN ISO 7010:2012, E001 or E002 with directional arrow)**

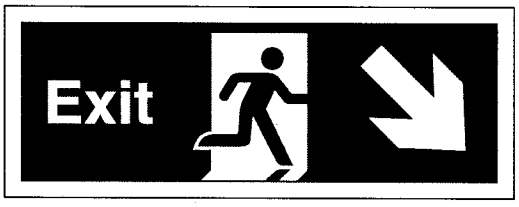
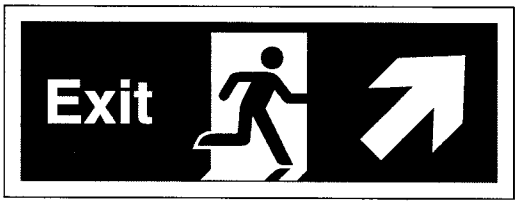
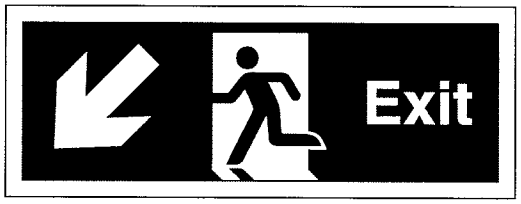
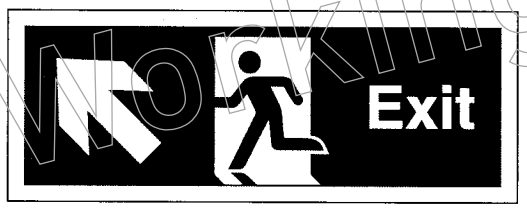
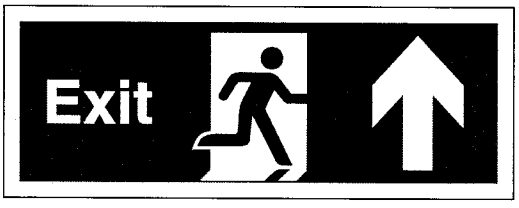
Escape route sign	Meaning	Location
	1. Progress down to the right (indicating change of level), see Figure A.3.	1. On wall or suspended at head of stairs or ramp. 2. On half landing wall or stairs. 3. Suspended at change of level.
	1. Progress up to the right (indicating change of level), see Figure A.9. 2. Progress forward and across to the right from here when suspended within an open area, see Figure A.17.	1. On wall or suspended at foot of stairs or ramp. 2. On half landing wall or stairs. 3. Suspended at change of level. 4. Suspended in open areas.
	1. Progress down to the left (indicating change of level), see Figure A.6.	1. On wall or suspended at head of stairs or ramp. 2. On half landing wall or stairs. 3. Suspended at change of level.
	1. Progress up to the left (indicating change of level), see Figure A.8. 2. Progress forward and across to the left from here when suspended within an open area.	1. On wall or suspended at foot of stairs or ramp. 2. On half landing wall or stairs. 3. Suspended at change of level. 4. Suspended in open areas.
	1. Progress forward from here (indicating direction of travel). 2. Progress forward and through from here, when sign is sited above a door (indicating direction of travel), see Figure A.1. 3. Progress forward and up from here (indicating change of level), see Figure A.16.	1. Suspended in corridor leading to door. 2. Suspended in open areas. 3. Suspended in front of door. 4. Positioned above door. 5. Suspended at foot of stairs or ramp.

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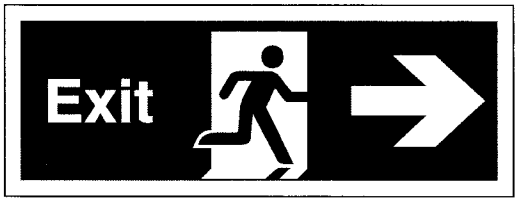
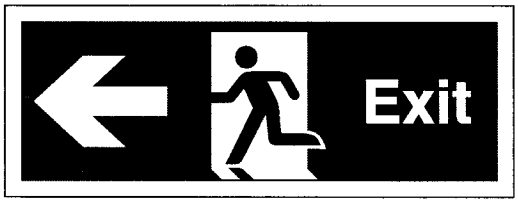
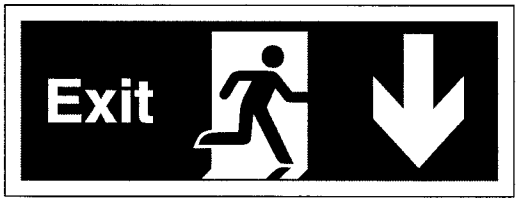
Table 1 **Escape route signs (meaning and use of BS EN ISO 7010:2012, E001 or E002 with directional arrow)**

Escape route sign	Meaning	Location
	1. Progress to the right from here (indicating direction of travel), see Figure A.13.	1. On corridor walls. 2. Suspended adjacent and left of the exit. 3. Suspended at change of direction.
	1. Progress to the left from here (indicating direction of travel), see Figure A.12.	1. On corridor walls. 2. Suspended adjacent and right of exit. 3. Suspended at change of direction.
	1. Progress down from here (indicating change of level), see Figure A.3.	1. Suspended at head of stairs or ramp. 2. Suspended at change of level.

5 Sign type

5.1 Lighting

To ensure that signs are identifiable and conspicuous, both in normal and in mains-failure conditions, escape route signs should be illuminated.

NOTE 1 It is not normally considered satisfactory to rely on daylight alone for satisfactory illumination.

NOTE 2 There are various ways of ensuring the satisfactory illumination of signs and in some premises, legislation dictates the method of illumination.

NOTE 3 Some types of lighting, e.g. low pressure sodium, do not enable effective colour recognition and are therefore unlikely to be suitable for the illumination of escape route signs.

Where emergency lighting is the source of illumination of the sign in a mains-failure condition, the response time of the emergency lighting should conform to BS 5266-1, which also provides a minimum duration requirement for the emergency lighting.

5.2 Externally illuminated signs

The colour and photometric properties of externally illuminated escape route signs should conform to BS ISO 3864-4. Where a sign is illuminated by an external source, the vertical illumination should be not less than 100 lux under normal lighting conditions and should provide not less than 5 lux on any part of the face of the sign under mains-failure conditions.

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5.3 Phosphorescent signs

The colour and photometric properties of externally illuminated phosphorescent escape route signs should conform to BS ISO 3864-4. The phosphorescent material should be not less than BS ISO 17398:2004, classification C. Where a phosphorescent sign is used, the vertical illumination should be not less than 100 lux under normal lighting conditions.

In premises with emergency lighting, the vertical illumination should provide not less than 5 lux on any part of the face of the sign under mains-failure conditions.

5.4 Internally illuminated signs

The colour and photometric properties of internally illuminated escape route signs should conform to BS ISO 3864-4. The light source of an internally illuminated sign should provide a luminous contrast appropriate to its environment without producing glare.

In premises with emergency lighting, the escape route sign under mains-failure conditions should conform to BS 5266-1.

NOTE Non-maintained internally illuminated signs require external illumination under normal, non-mains-failure conditions.

6 Sign size and viewing distance

NOTE 1 The viewing distance of a sign is the maximum distance from which the sign has to be identifiable.

Escape route signs should be both conspicuous and identifiable.

NOTE 2 The size of sign necessary to achieve these criteria depends upon both the viewing distance and the illumination of the sign.

The viewing distance of an escape route sign should be determined by its position within the primary escape route (i.e. signs should not be sized by their position within any alternative escape route). Any variation of the sizes of signs within a premises should be kept to a minimum.

NOTE 3 Smaller viewing distances enable smaller sizes to be used while remaining conspicuous and identifiable. Conversely, larger viewing distances can reduce the number of signs required but increase their size.

Within large open areas with multiple escape routes, particular care should be taken to ensure that the signs are the appropriate size for the intended primary escape route.

NOTE 4 Escape route signs E001 and E002 given in BS EN ISO 7010:2012 are in a uniform 70 mm size with corner marks to enable accurate enlargement and reduction scaling. A border is not shown.

NOTE 5 The height of BS EN ISO 7010:2012, E001 and E002 are a scaled size of the 70 mm template size. For the supplementary direction arrow, the height is scaled from the size of the image given under "Additional information for E001 and E002", in BS EN ISO 7010:2012.

Viewing distance of the escape route sign should be calculated using the sign height of the graphical image BS EN ISO 7010:2012, E001 or E002. The maximum viewing distance normal (perpendicular) to the sign, l, should be calculated from the sign height, h, using the appropriate distance factor, z_0:

$$l = z_0 h$$

where l and h have the same dimensional units (see Figure 5); this is typically measured in mm.

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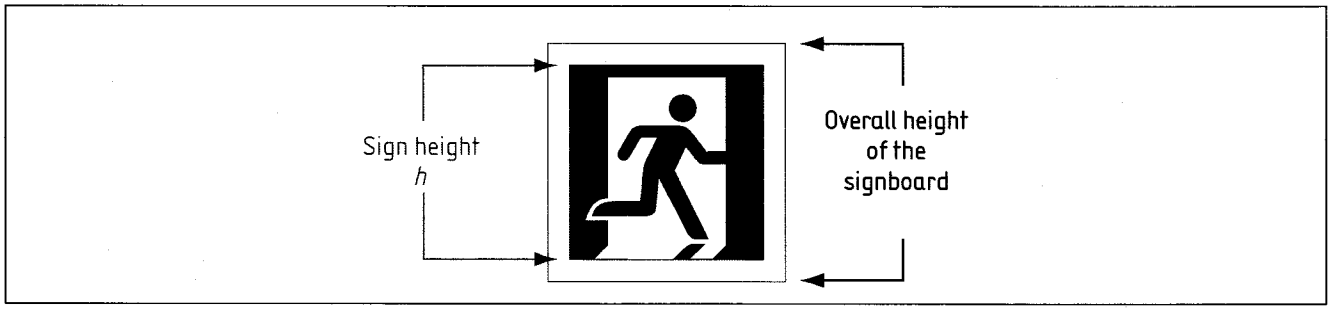
The viewing distance of an escape route sign might be affected by the vertical illumination on the sign or its luminance in the case of an internally illuminated sign. The lower the vertical illuminance (or luminance), the larger the sign should be for any chosen viewing distance as shown by the limits of Table 2, Table 3 and Table 4.

Figure 5 – Sign size and viewing distance



The arrow used in the escape route sign (Figure 6) should be the same height as the graphical image BS EN ISO 7010:2012, E001 or E002.

Figure 6 – Supplementary direction arrows

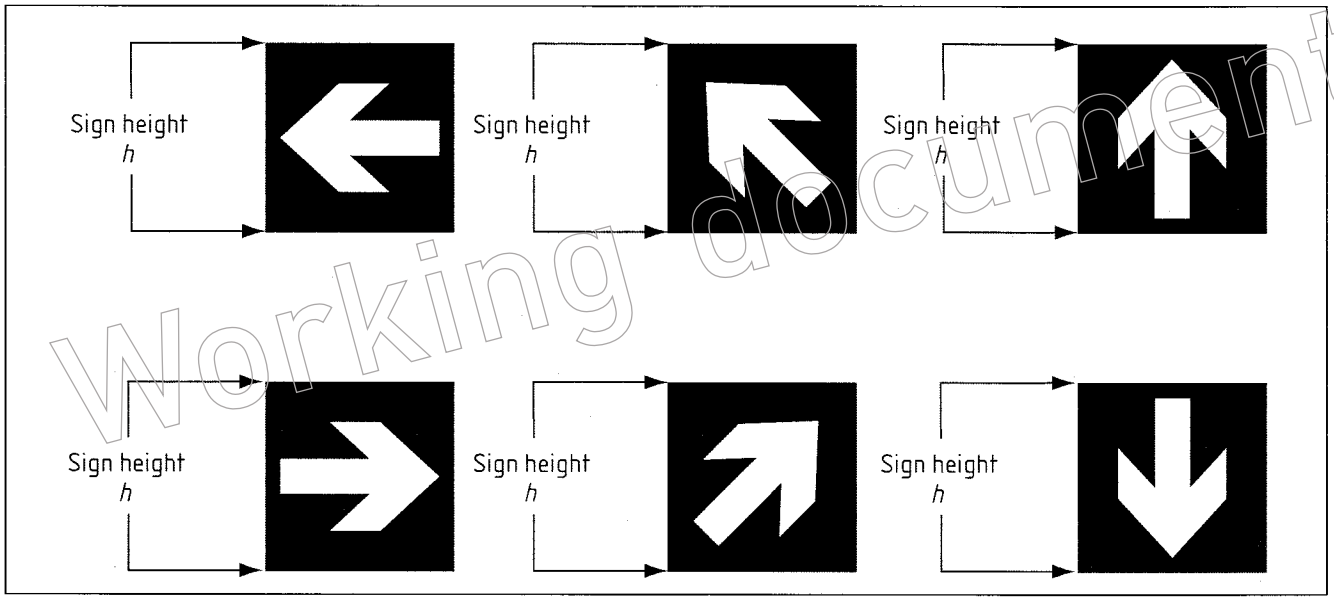


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Table 2 should be used to determine the distance factor for externally illuminated escape route signs under a range of different conditions of vertical illuminance. Table 3 should be used to determine the distance factors for internally illuminated escape route signs with different ranges of mean luminance of the contrast colour white.

Table 2 **Distance factor z_0 for externally illuminated escape route signs based on ordinary materials or phosphorescent materials**

Vertical illuminance at sign lux	**Distance factor, z_0, for normal to the sign**
≥5	95
≥100	170
≥200	185
≥400	200

NOTE 1 BS 5266-1 requires z_0 = 100 in the mains-failure condition.

NOTE 2 Over the illuminance range up to about 200 lx, z_0 varies approximately linearly with the logarithm of illuminance.

Table 3 **Distance factor z_0 for internally illuminated escape route signs**

Mean luminance of white contrast colour cd/m²	**Distance factor, z_0, for normal to the sign**
≥10	150
≥30	175
≥100	200
≥200	215
≥500	230

NOTE 1 BS 5266-1 requires z_0 = 200 in the mains-failure condition.

NOTE 2 Over the luminance range up to about 50 cd/m², z_0 varies approximately linearly with the logarithm of luminance.

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Maximum viewing distances for the identification of the safe condition direction arrow should be based upon the relevant distance factor given in Table 2 or Table 3.

People with visual impairment can have low visual acuity, for example for people with visual acuity of 0.3, so the values of z_0 in Table 2 and Table 3 should be multiplied by a factor of 0.3.

Where the angle of viewing of the escape route sign is not predominantly normal to the sign, the effect of viewing should be taken into account as well as the factor of distance in Table 2 and Table 3 reduced by a multiplying factor of cosine of the angle of viewing to the normal to the sign (see Annex C).

Table 4 includes different heights of lower case letters based upon 20% of the sign height and their associated legibility distances.

Table 4 **Examples of maximum viewing distances for externally illuminated escape route signs and supplementary directional arrow sign (BS EN ISO 7010) of different sign height and supplementary text subject to a vertical illuminance of 100 lux**

Sign height	Lower case letter height [A)]	Identification distance normal to the sign of escape route sign and directional arrow [B)]	Legibility distance normal to the sign of supplementary text [C)]
mm	mm	m	m
75	15	12.7	3.3
100	20	17.0	4.5
110	22	18.7	4.9
120	24	20.4	5.4
130	26	22.1	5.8
150	30	25.5	6.7
180	36	30.6	8.1

[A)] The height of the lower case letters is 20% of the sign height.
[B)] The appropriate value for z_0 selected from Table 2 is 170.
[C)] The appropriate value for z_0 for lower case letters is 225.

7 Construction: durability and suitability

Signs should be selected to be suitable for their operating environment.

Factors that should be taken into account include:

a) durability:
   1) of base material;
   2) of graphical content;
   3) colour/light fastness;
b) safety:
   1) electrical;
   2) combustibility;
   3) surface spread of flame;
c) fixings: type and suitability.

Electrically powered signs should conform to BS EN 60598-1 and electrically powered emergency signs should conform to BS EN 60598-2-22.

Signs should be suitable for the normal/expected environmental conditions.

NOTE BS ISO 17398 covers aspects of performance and durability of safety sign.

8 Servicing and maintenance

Escape route signs should be cleaned and visually inspected at regular intervals, and action should be taken to remedy any defects.

Signs required as part of the emergency escape lighting installation should be inspected, tested and maintained in accordance with the recommendations of BS 5266-1.

If the building is modified or the building use changes, or if any of the design considerations detailed under **4.2** and **4.3** vary significantly, the escape route sign installation should be reviewed and modified as necessary.

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Annex A (informative)

Use of escape route signs

Figures A.1 to A.22 and the accompanying text show how escape route signs are to be used in various typical situations.

The supplementary text component of the signs shown within the illustrations demonstrates how escape route signing can have a role to play in the management of a building.

Supplementary text assists with the training of staff in the meaning of signs and the actions to be taken in an emergency.

The use of appropriate supplementary text helps building occupants to differentiate normal egress routes from those intended for emergency use only.

Figure A.1 **Typical connecting corridor showing the correct use of escape route sign(s) with supplementary text**

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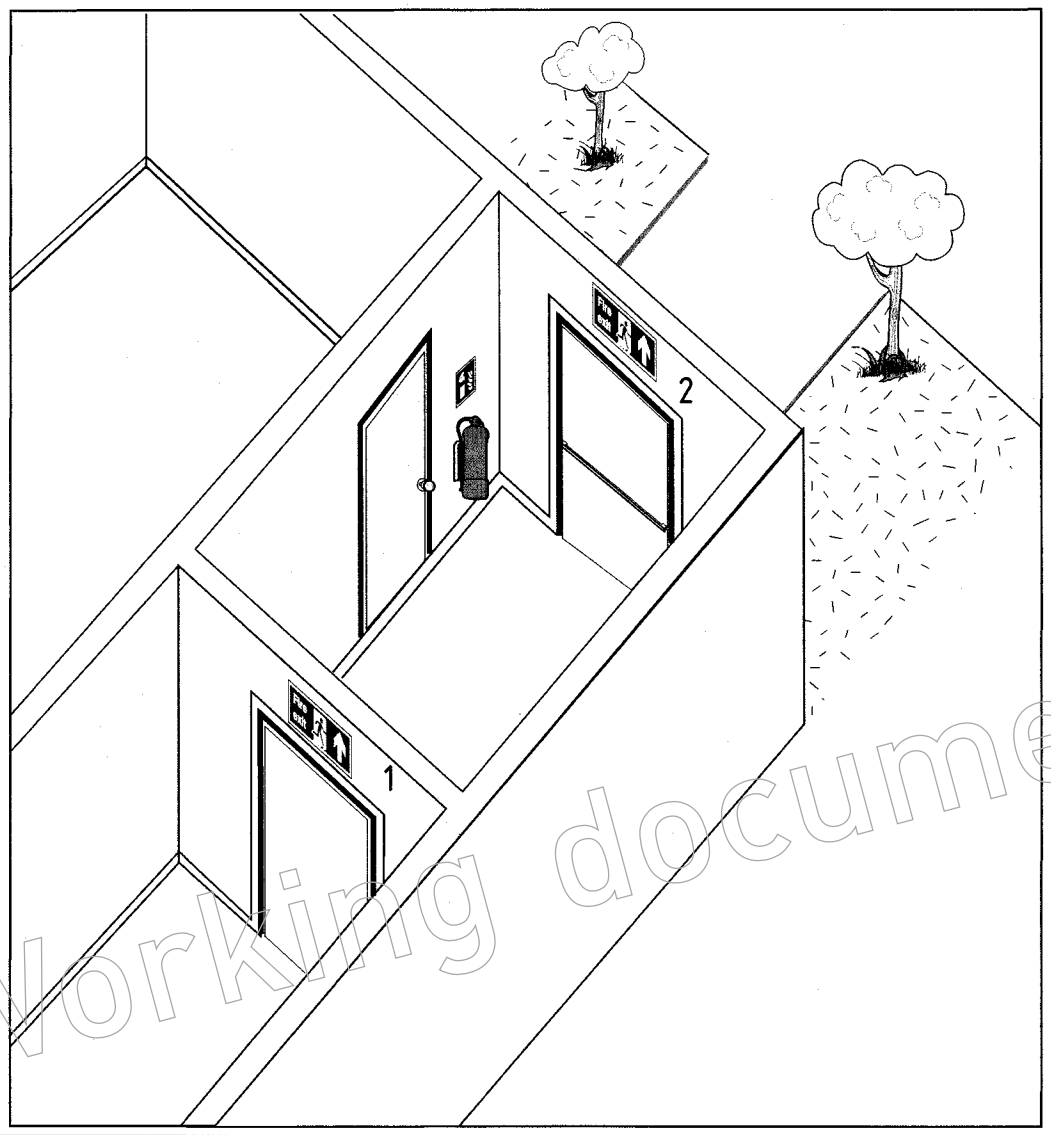
Use of escape route signs			
1	Progress forward and through from here as viewed from in front of the sign.	1	Positioned above door.
2	Progress forward and through from here as viewed from in front of the sign.	2	Positioned above door.

Figure A.2 **Typical adjoining corridor to final fire exit showing the correct use of escape route sign(s) with supplementary text**



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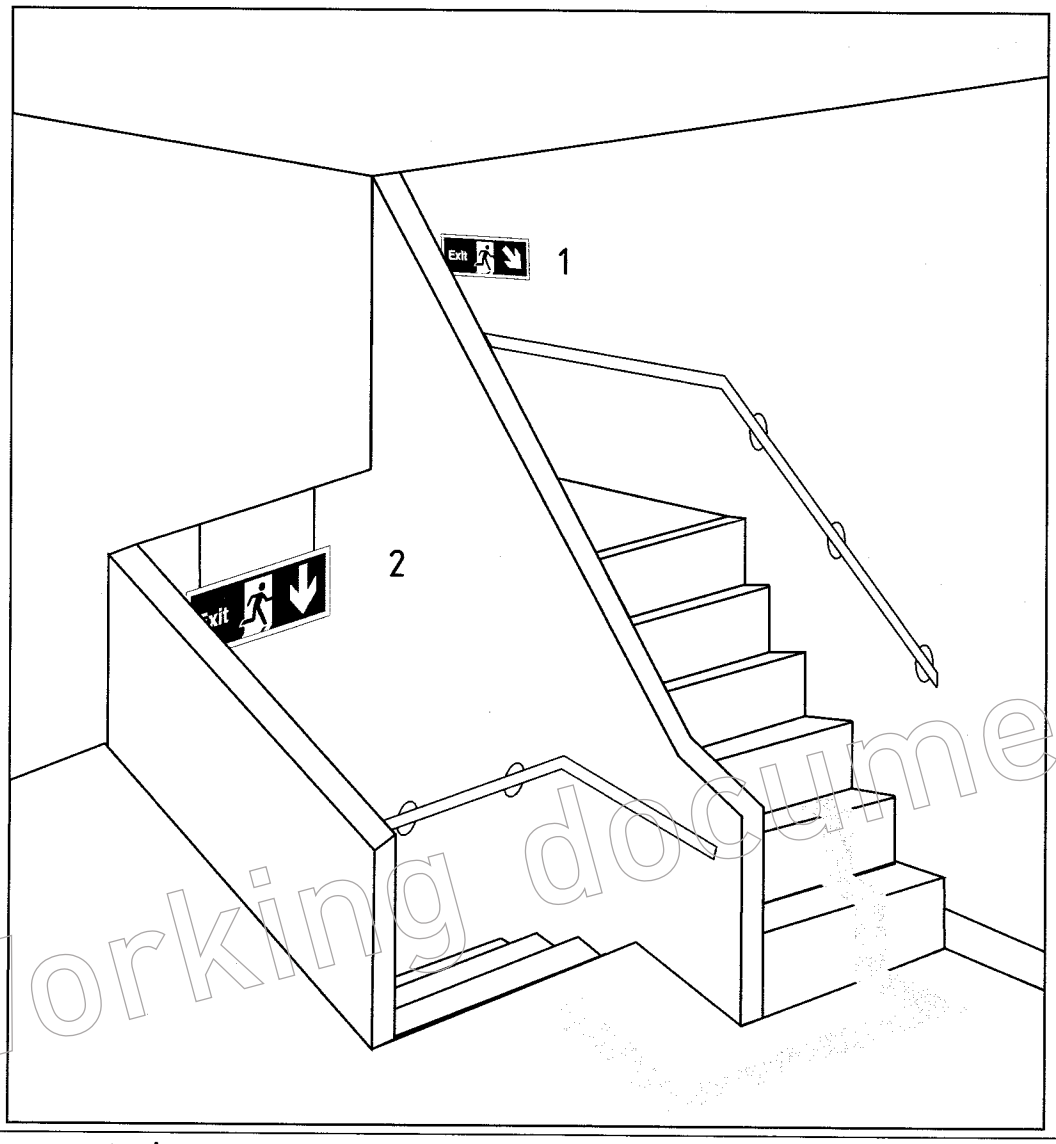
Use of escape route signs	
1 Progress forward and through from here as viewed from in front of the sign.	1 Positioned above door.
2 Progress forward and through from here as viewed from in front of the sign.	2 Positioned above door.

Figure A.3 **Typical half landing stairway showing the correct use of escape route sign(s) with supplementary text**



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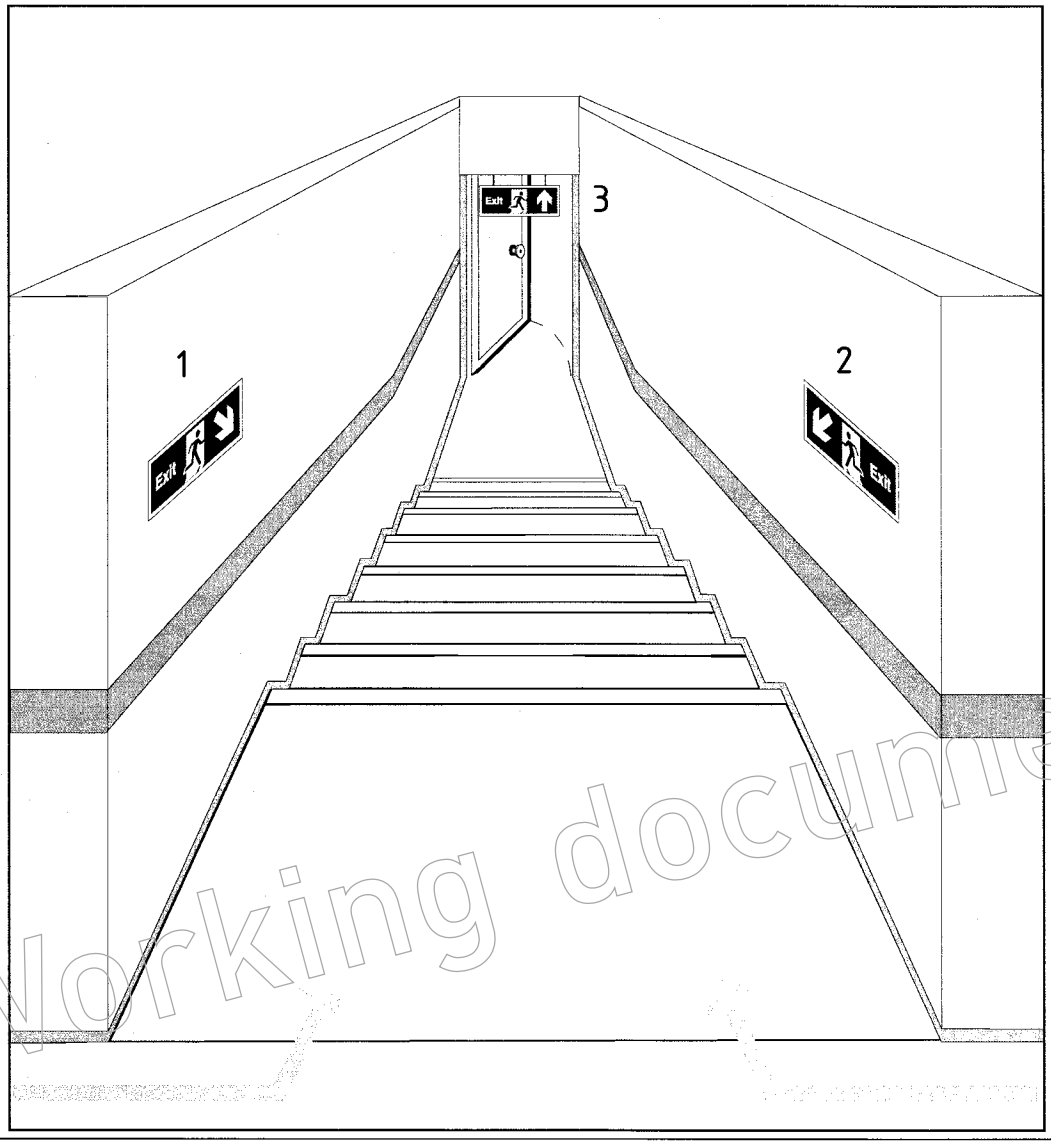
Use of escape route signs	
1 Progress down to the right as viewed from in front of the sign.	1 On wall of half landing.
2 Progress down from here as viewed from in front of the sign.	2 Suspended at change of level.

Figure A.4 **Typical single flight descent stairway showing the correct use of escape route sign(s) with supplementary text**



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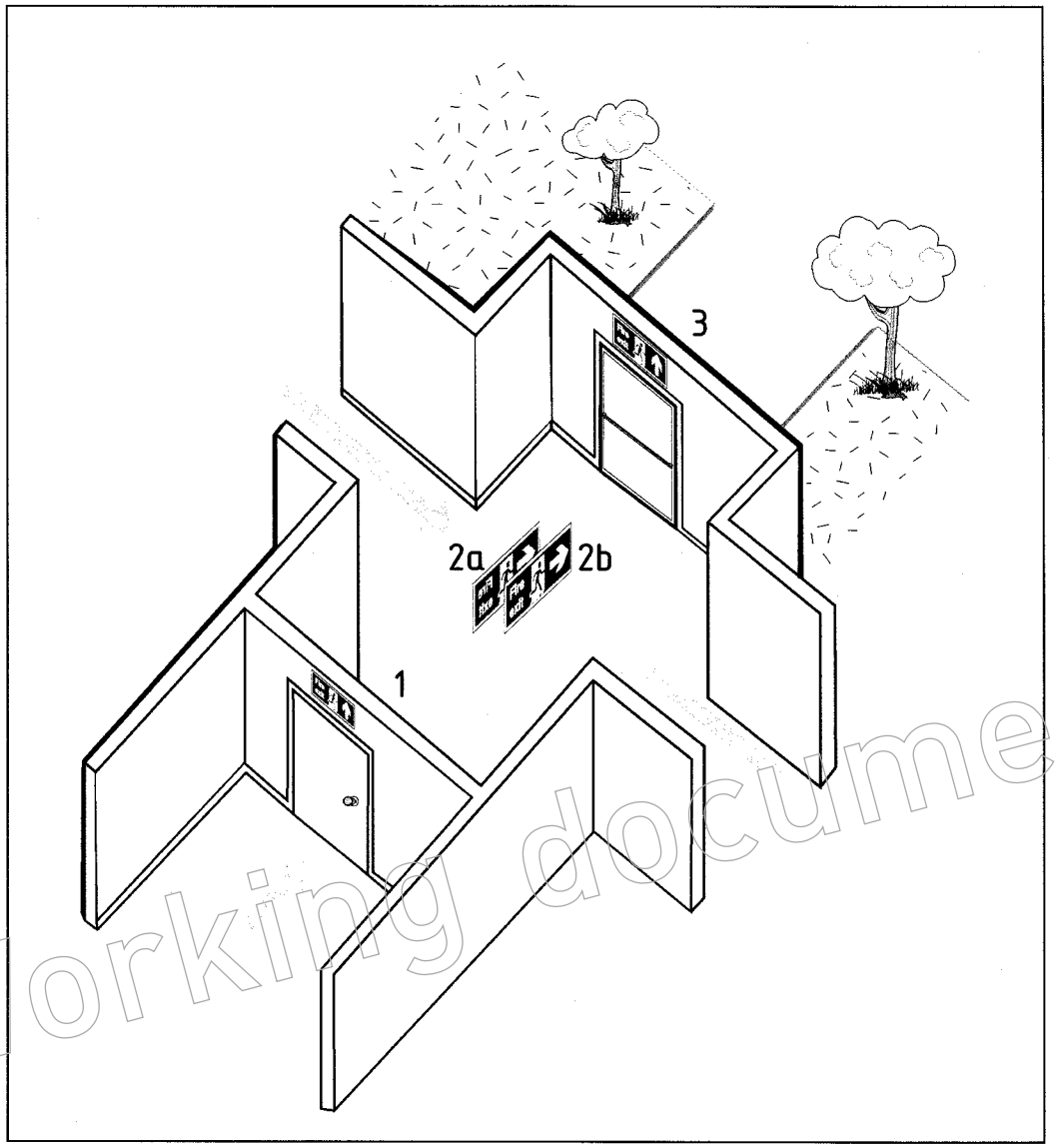
Use of escape route signs			
1	Progress down to the right as viewed from in front of the sign.	1	On wall at head of stairs.
2	Progress down to the left as viewed from in front of the sign.	2	On wall at head of stairs.
3	Progress forward and through from here as viewed from in front of the sign.	3	Suspended in front of door.

Figure A.5 **Typical cross junction/corridor(s) to final fire exit showing the correct use of escape route sign(s) with supplementary text**



Use of escape route signs			
1	Progress forward and through from here as viewed from in front of the sign.	1	Positioned above door.
2a	Progress to the left from here.	2a	Suspended at change of direction.
2b	Progress to the right from here.	2b	Suspended at change of direction.
3	Progress forward and through from here as viewed from in front of the sign.	3	Positioned above door.

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Figure A.6 **Typical lobby entrance leading to left-handed descent stairway showing the correct use of escape route sign(s) with supplementary text**

Use of escape route signs	
1 Progress forward and through from here as viewed from in front of the sign.	1 Positioned above door.
2 Progress down to the left from here as viewed from in front of the sign.	2 On wall at head of stairs.

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Figure A.7 **Typical lobby entrance leading to right-handed descent stairway showing the correct use of escape route sign(s) with supplementary text**

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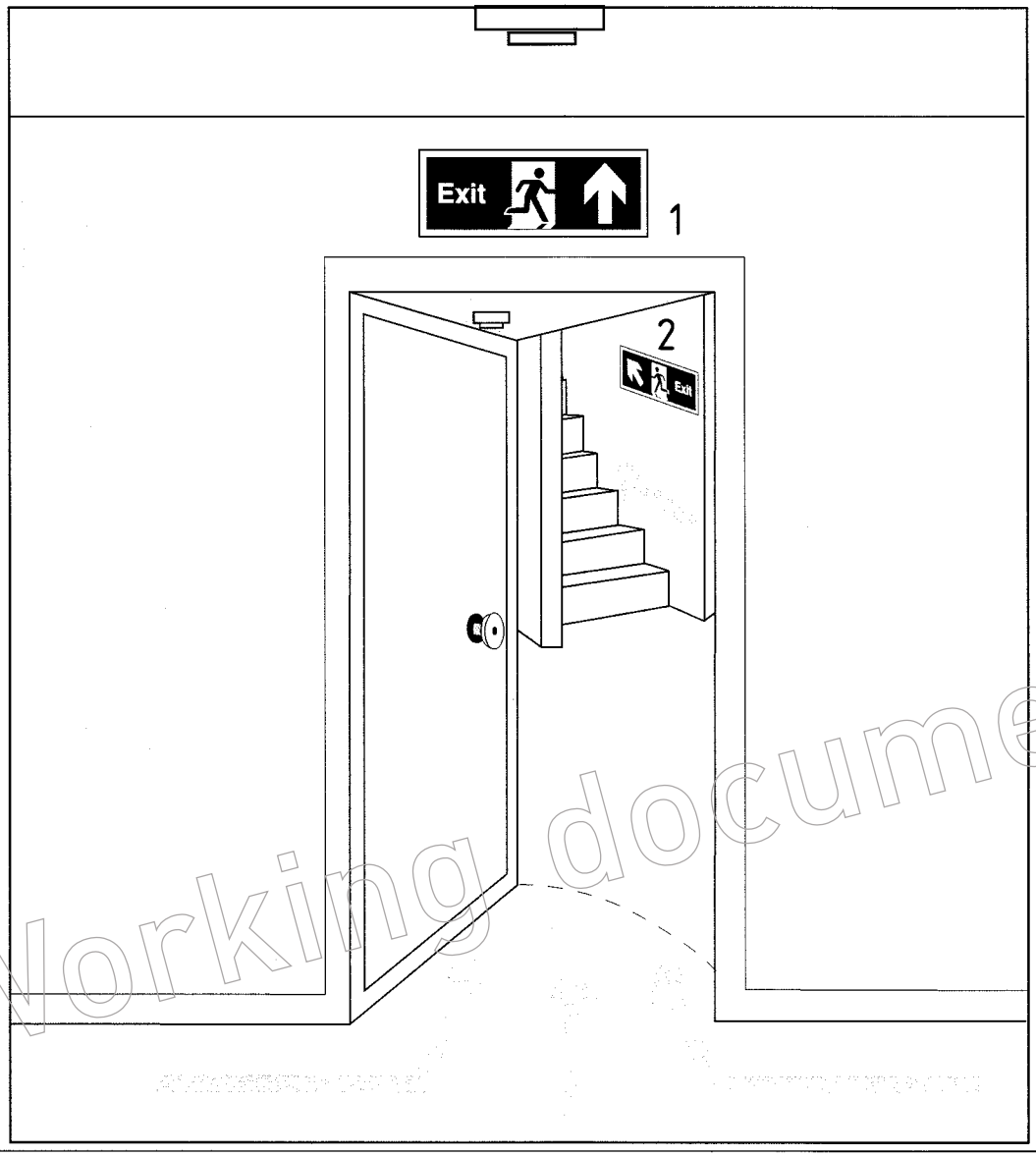
Use of escape route signs	
1 Progress forward and through from here as viewed from in front of the sign.	1 Positioned above door.
2 Progress down to the right as viewed from in front of the sign.	2 On wall at head of stairs.

Figure A.8 **Typical lobby entrance leading to left-handed ascent stairway showing the correct use of escape route sign(s) with supplementary text**



Use of escape route signs	
1 Progress forward and through from here as viewed from in front of the sign.	1 Positioned above door.
2 Progress up to the left as viewed from in front of the sign.	2 On wall at foot of stairs.

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Figure A.9 **Typical lobby entrance leading to right-handed ascent stairway showing the correct use of escape route sign(s) with supplementary text**

Use of escape route signs	
1 Progress forward and through from here as viewed from in front of the sign.	1 Positioned above door.
2 Progress up to the right as viewed from in front of the sign.	2 On wall at foot of stairs.

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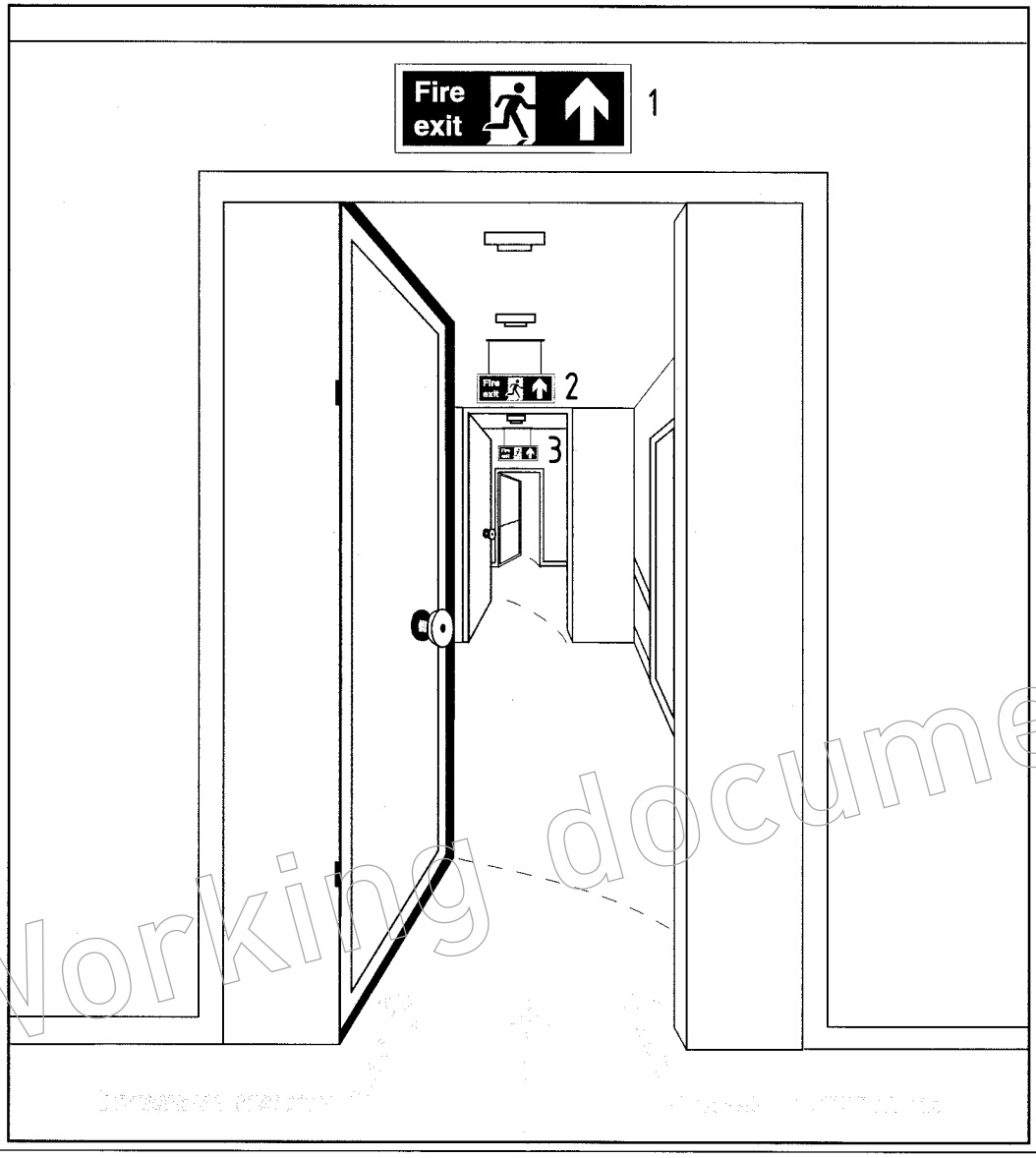
Figure A.10 **Typical connecting corridor(s) to final fire exit showing the correct use of escape route sign(s) with supplementary text**



Use of escape route signs			
1	Progress forward and through from here as viewed from in front of the sign.	1	Positioned above door.
2	Progress forward from here as viewed from in front of the sign.	2	Suspended at change of direction.
3	Progress forward from here as viewed from in front of the sign.	3	Suspended in corridor leading to door.

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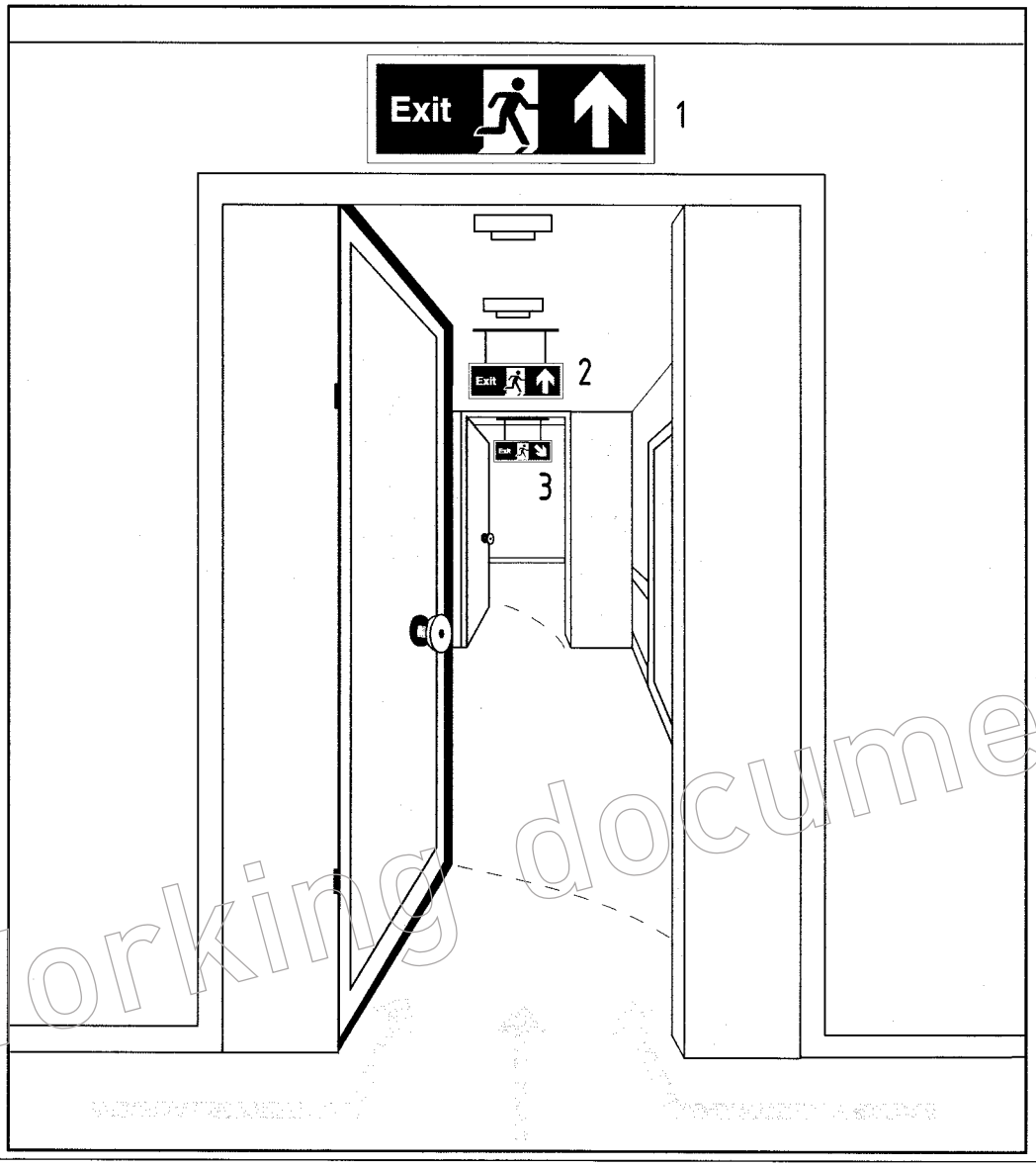
Figure A.11 **Typical connecting corridor leading to descent stairway showing the correct use of escape route sign(s) and supplementary text**



Working document

Use of escape route signs			
1	Progress forward and through from here as viewed from in front of the sign.	1	Positioned above door.
2	Progress forward from here as viewed from in front of the sign.	2	Suspended in corridor leading to door.
3	Progress down to the right as viewed from in front of the sign.	3	Suspended at head of stairs.

Figure A.12 **Typical connecting corridor with left-turn juncture showing the correct use of escape route sign(s) and supplementary text**

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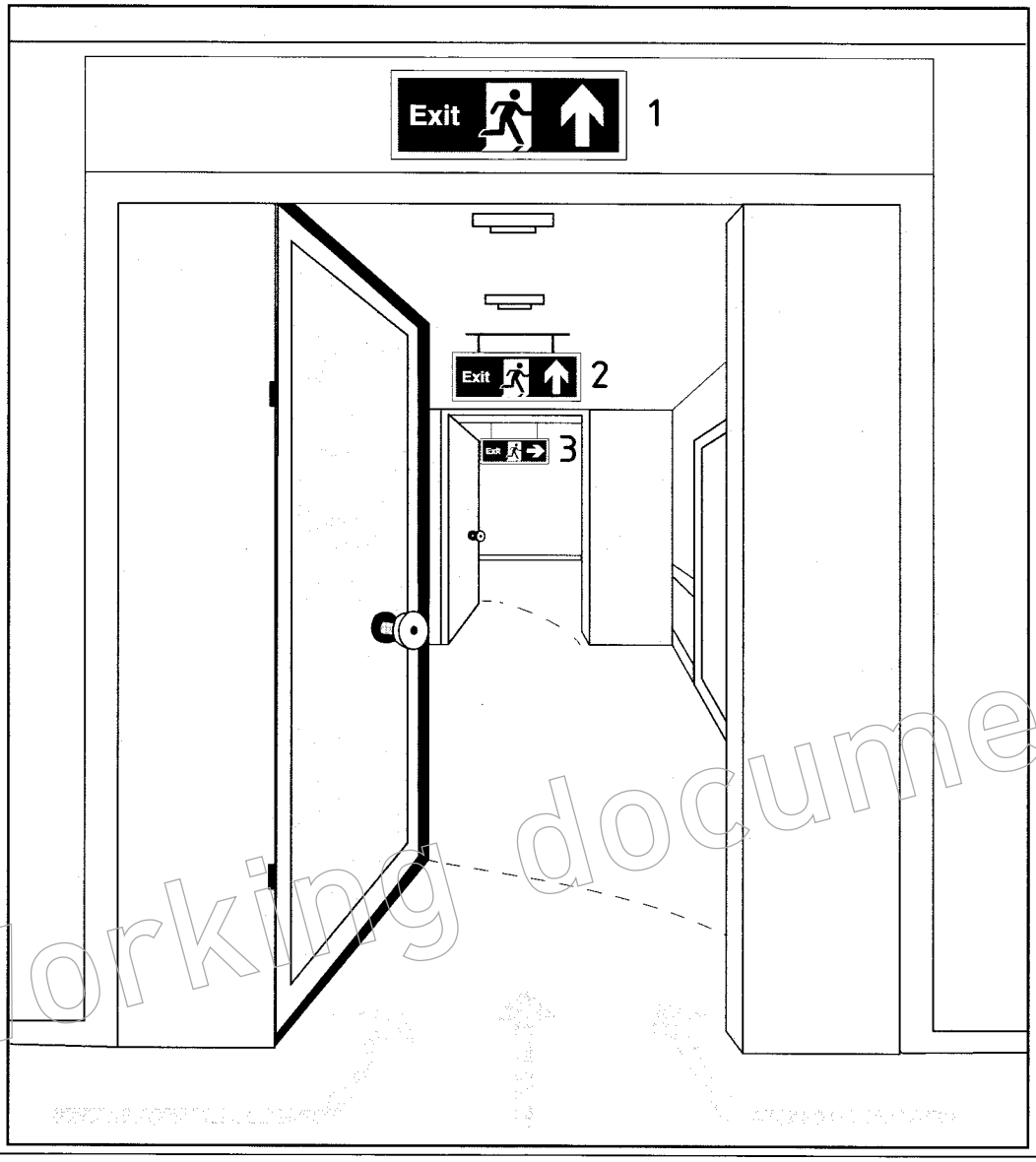
Use of escape route signs			
1	Progress forward and through from here as viewed from in front of the sign.	1	Positioned above door.
2	Progress forward from here as viewed from in front of the sign.	2	Suspended in corridor leading to door.
3	Progress to the left as viewed in front of the sign.	3	Suspended at change of direction.

Figure A.13 **Typical connecting corridor with right-turn juncture showing the correct use of escape route sign(s) with supplementary text**



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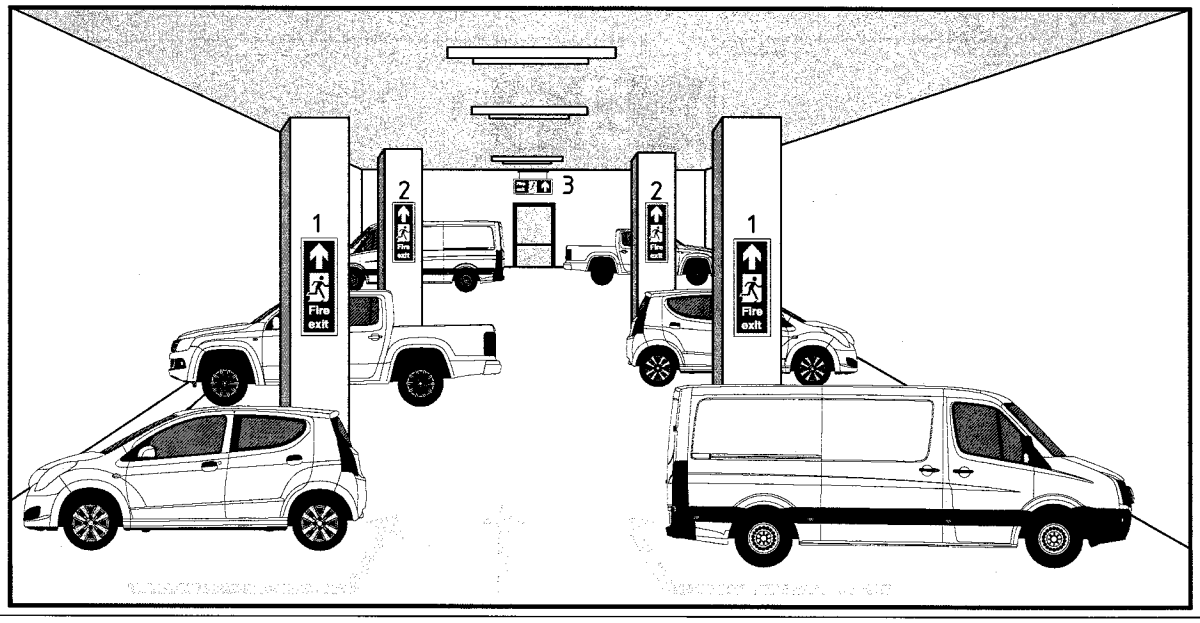
Use of escape route signs			
1	Progress forward and through from here as viewed from in front of the sign.	1	Positioned above door.
2	Progress forward from here as viewed from in front of the sign.	2	Suspended in corridor leading to door.
3	Progress right from here as viewed from in front of the sign.	3	Suspended at change of direction.

Figure A.14 **Typical internal car park progressing forward to the final fire exit showing the correct use of escape route sign(s) with supplementary text (vertical juxtaposition)**



Use of escape route signs			
1	Progress forward from here as viewed from in front of the sign.	1	Positioned on buttress.
2	Progress forward from here as viewed from in front of the sign.	2	Positioned on buttress.
3	Progress forward and through from here as viewed from in front of the sign.	3	Suspended from ceiling in front of door.

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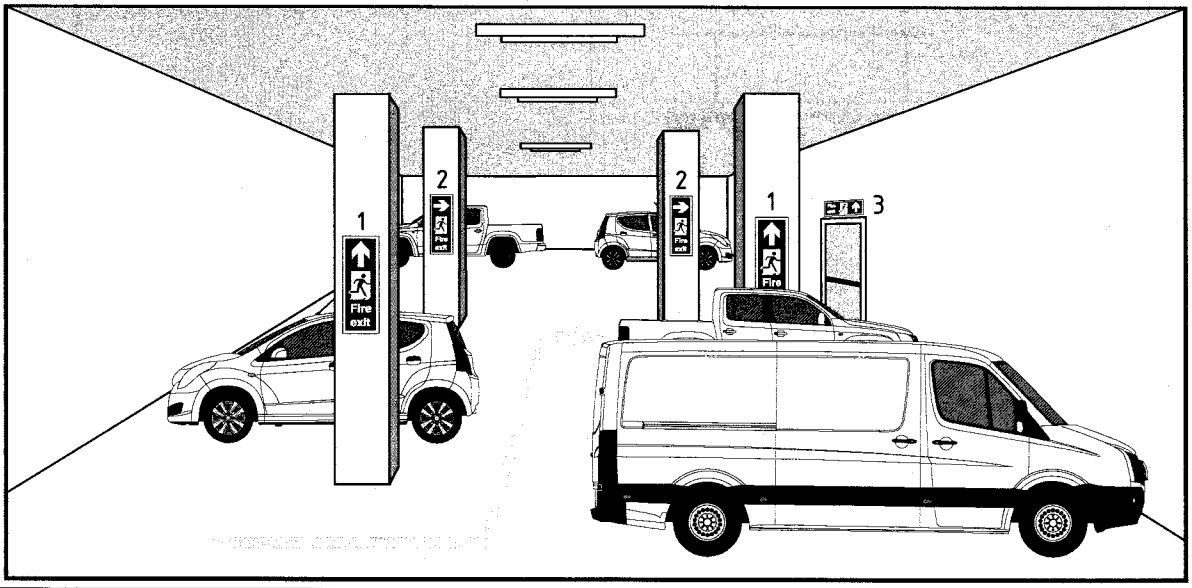
Figure A.15 **Typical internal car park progressing forward then right to the final fire exit showing the correct use of escape route sign(s) with supplementary text**



Use of escape route signs			
1	Progress forward from here as viewed from in front of the sign.	1	Positioned on buttress.
2	Progress to the right as viewed from in front of the sign.	2	Positioned on buttress at change of direction.
3	Progress forward and through from here as viewed from in front of the sign.	3	Positioned above door.

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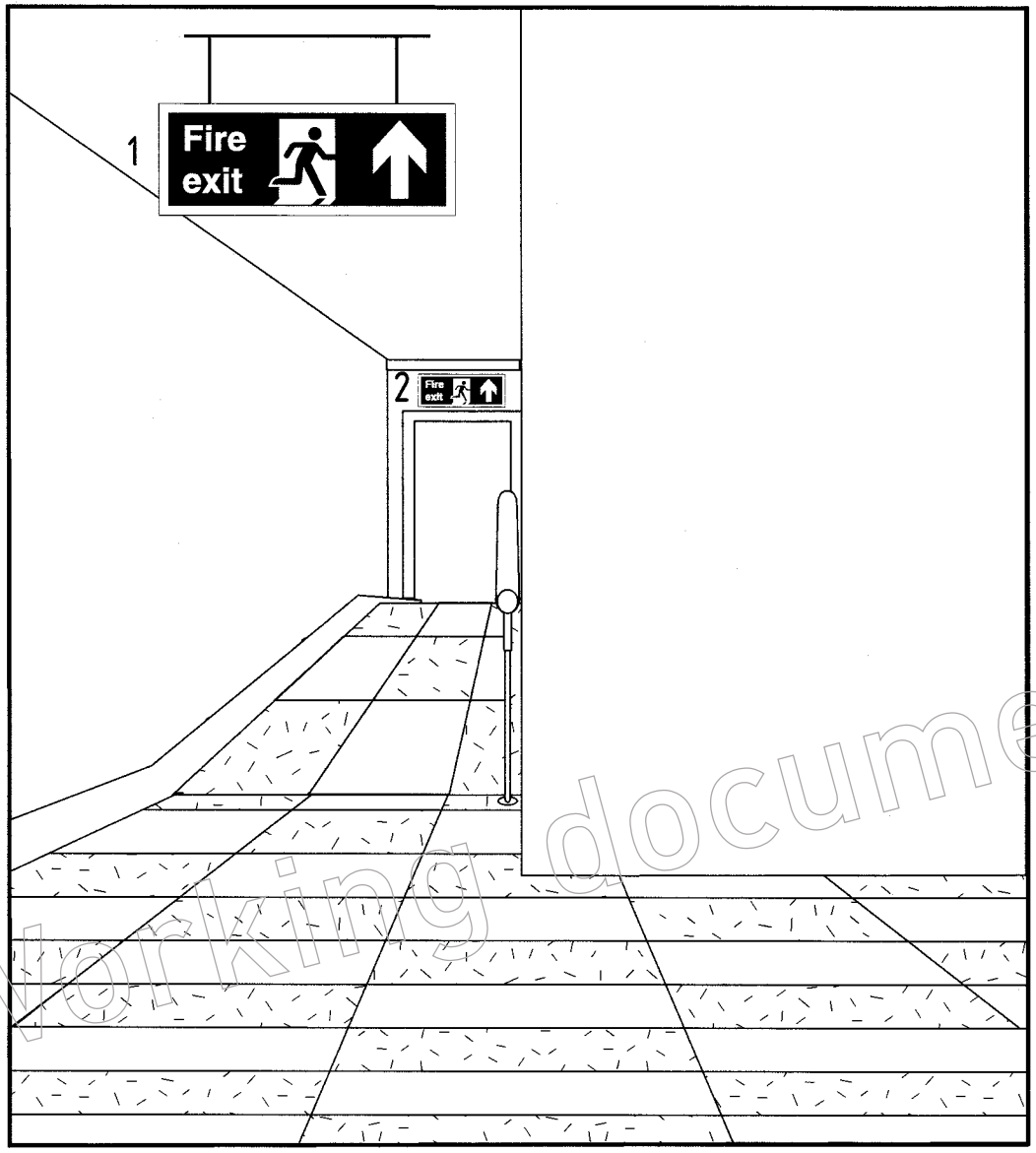
Figure A.16 **Typical corridor with ramped slope designated as a fire exit route showing the correct use of escape route sign(s) with supplementary text**



Use of escape route signs	
1 Progress forward and up from here.	1 Suspended at foot of stairs or ramp.
2 Progress forward and through from here as viewed from in front of the sign.	2 Positioned above door.

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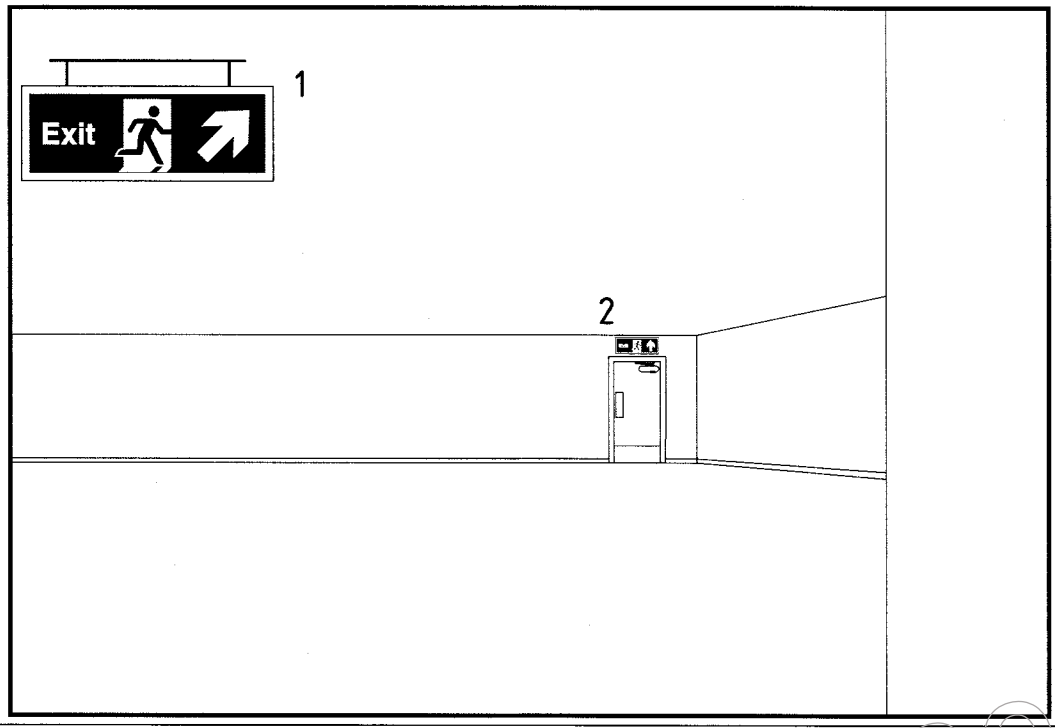
Figure A.17 **Typical large open-plan area showing the correct use of escape route sign(s) and supplementary text**



Use of escape route signs	
1 Progress forward and across to the right from here.	1 Suspended in open area.
2 Progress forward and through from here.	2 Positioned above door.

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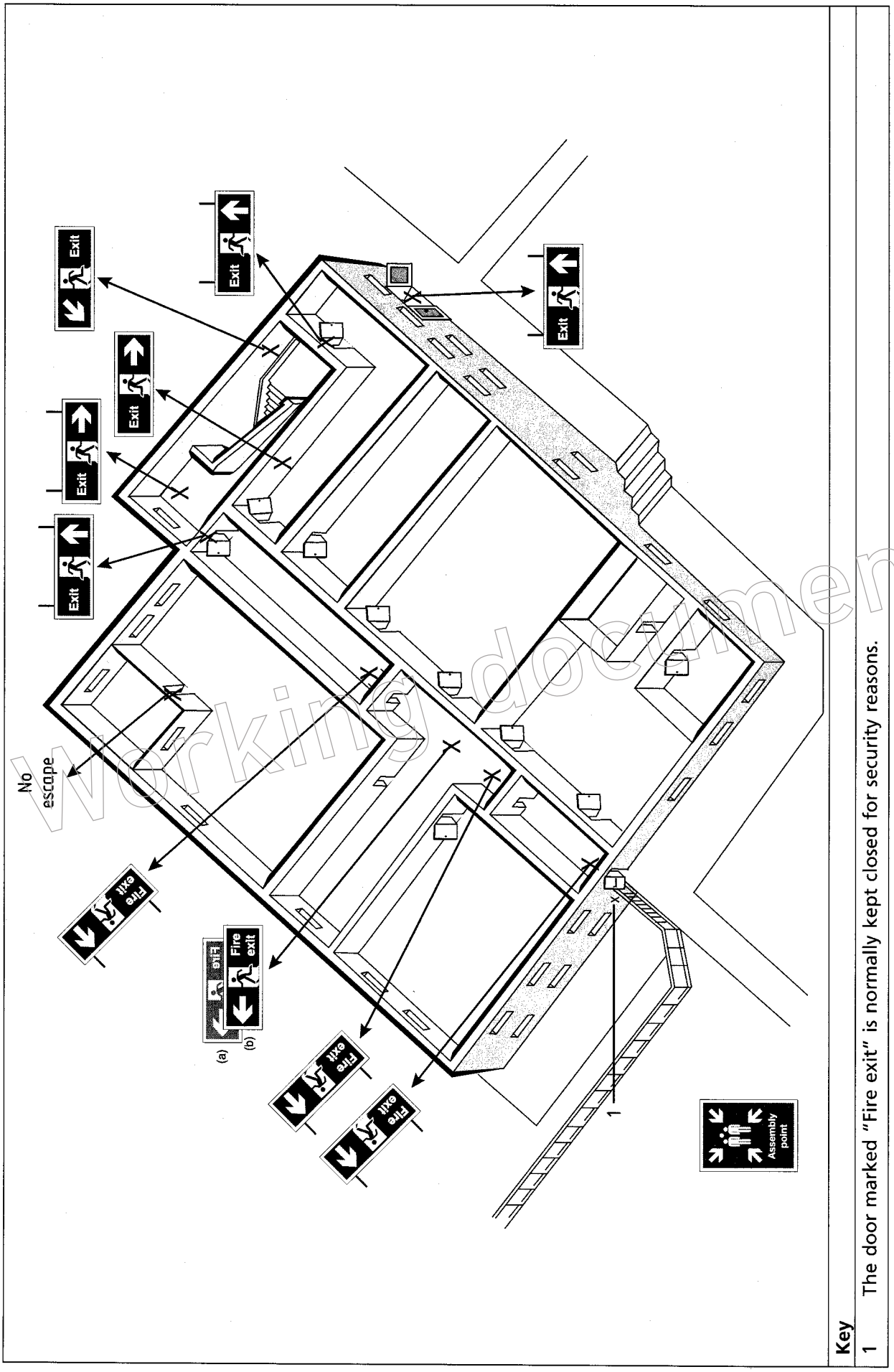

Key

1 The door marked "Fire exit" is normally kept closed for security reasons.

Figure A.18 **Use of supplementary text**

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Figure A.18 **Use of supplementary text**

NOTE 1 Signs (a) and (b) are viewed from single corridors leading into an open area indicating change of direction.

NOTE 2 A supplementary text sign reading "Exit" is used with an escape route sign to indicate a doorway or other suitable opening that leads to a place of safety.

NOTE 3 A supplementary text sign reading "Fire exit" is used with an escape route sign to indicate a doorway or other suitable opening that leads to a place of safety which provides an alternative exit to be used in the event of the evacuation of the premises. A door marked "Fire exit" may also be used during the day-to-day occupation of the premises.

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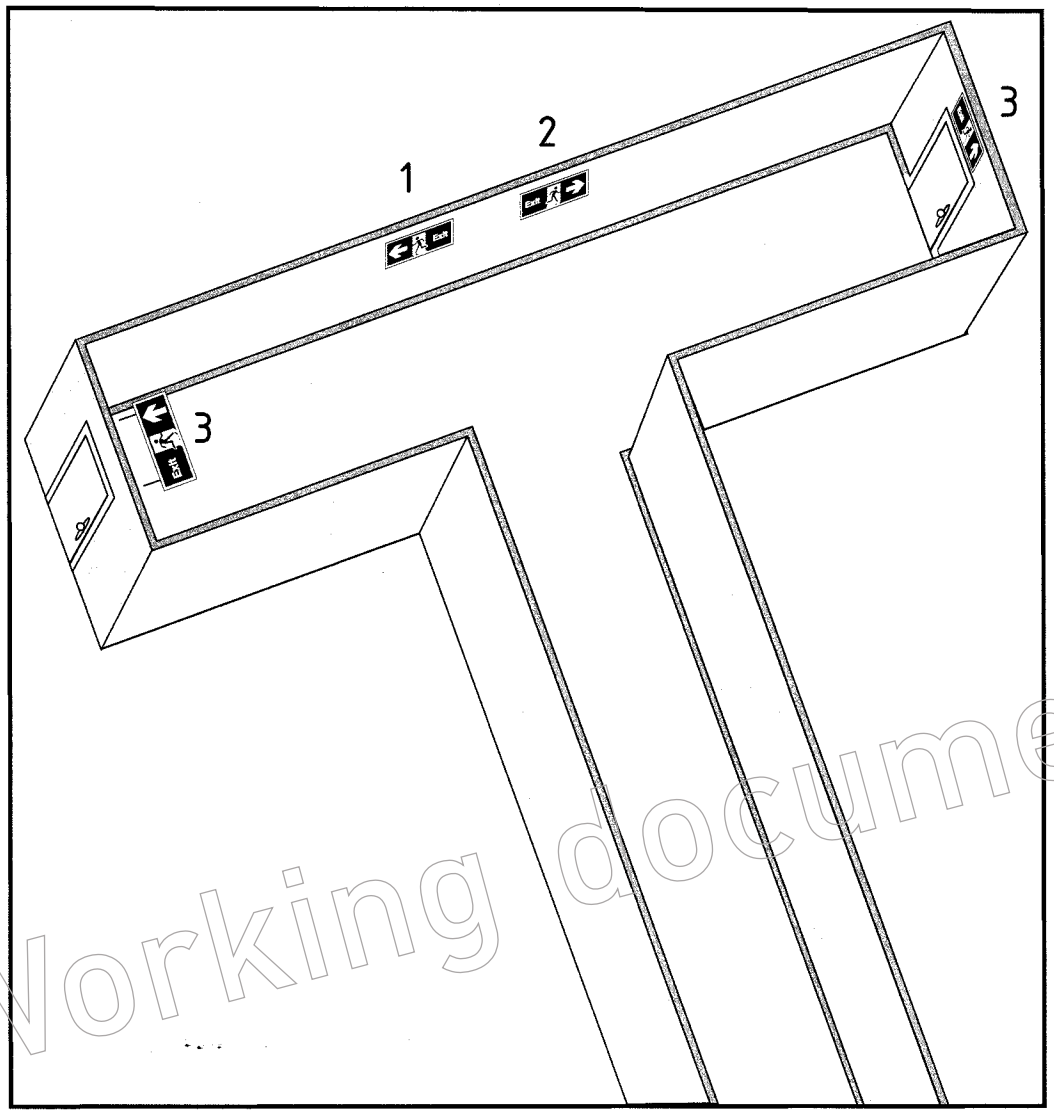
Figure A.19 **Typical T-junction corridor offering alternate equidistant routes showing the correct use of escape route sign(s) and supplementary text**



Use of escape route signs			
1	Progress to the left from here as viewed from in front of the sign.	1	On corridor wall.
2	Progress to the right from here as viewed from in front of the sign.	2	On corridor wall.
3	Progress forward and through from here as viewed from in front of the sign.	3	Positioned above door.

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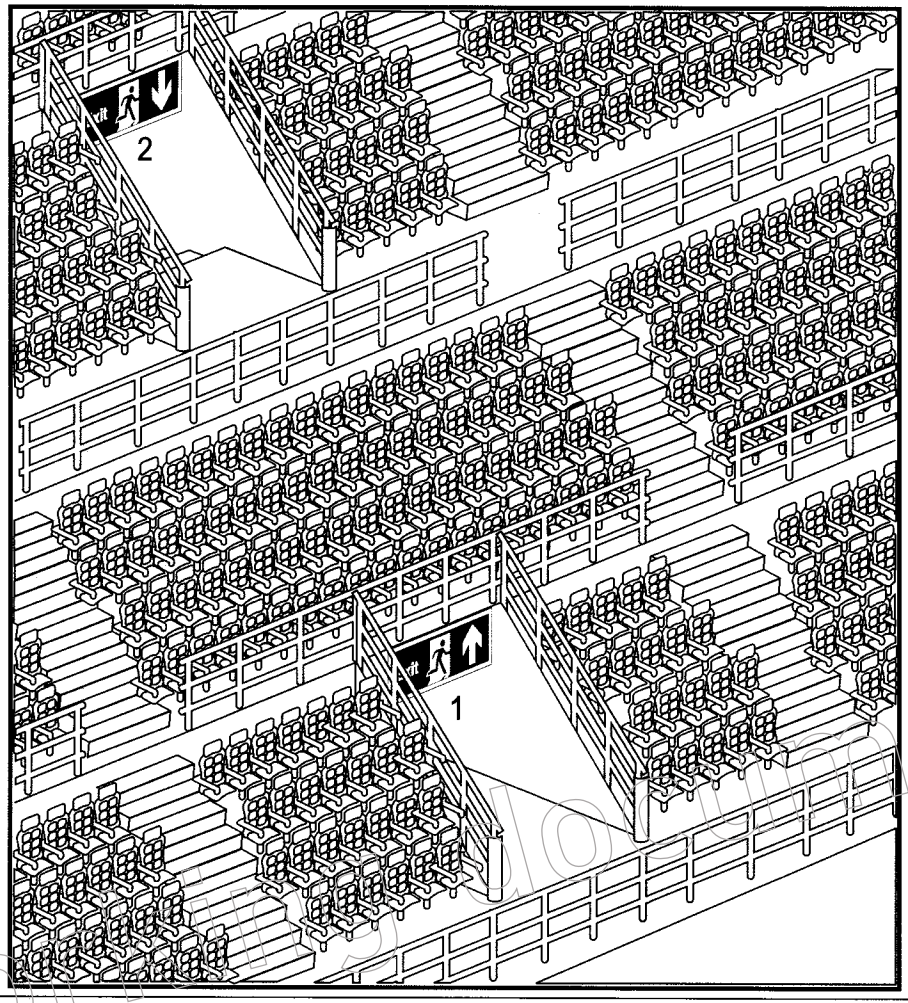
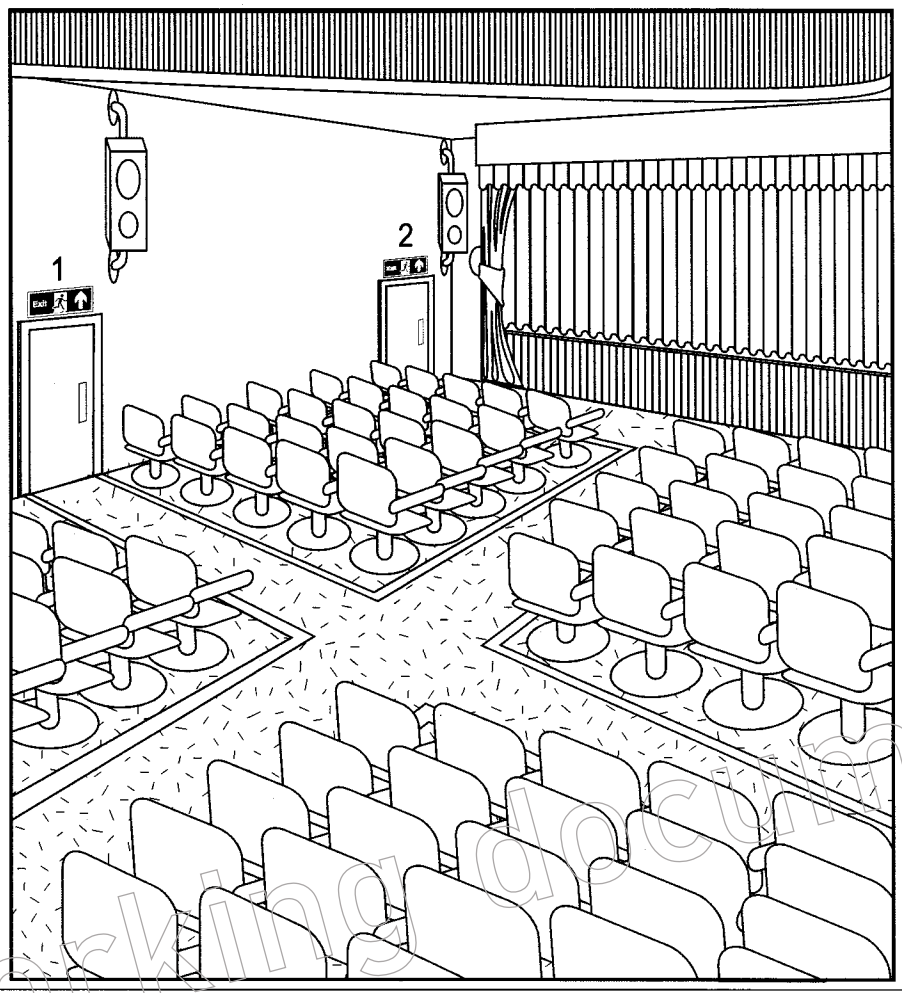
Figure A.20 **Typical stadia showing the identification of vomitory exit(s) with the correct use of escape route sign(s) and supplementary text**



Use of escape route signs			
1	Progress forward and through from here.	1	Suspended in front of opening.
2	Progress down from here.	2	Suspended in front of opening.

Withdrawn Document

Figure A.21 **Typical auditorium/theatre showing the identification of exit(s) with the correct use of escape route sign(s) and supplementary text**



Use of escape route signs	
1 Progress through from here as viewed from in front of the sign.	1 Positioned above door.
2 Progress through from here as viewed from in front of the sign.	2 Positioned above door.

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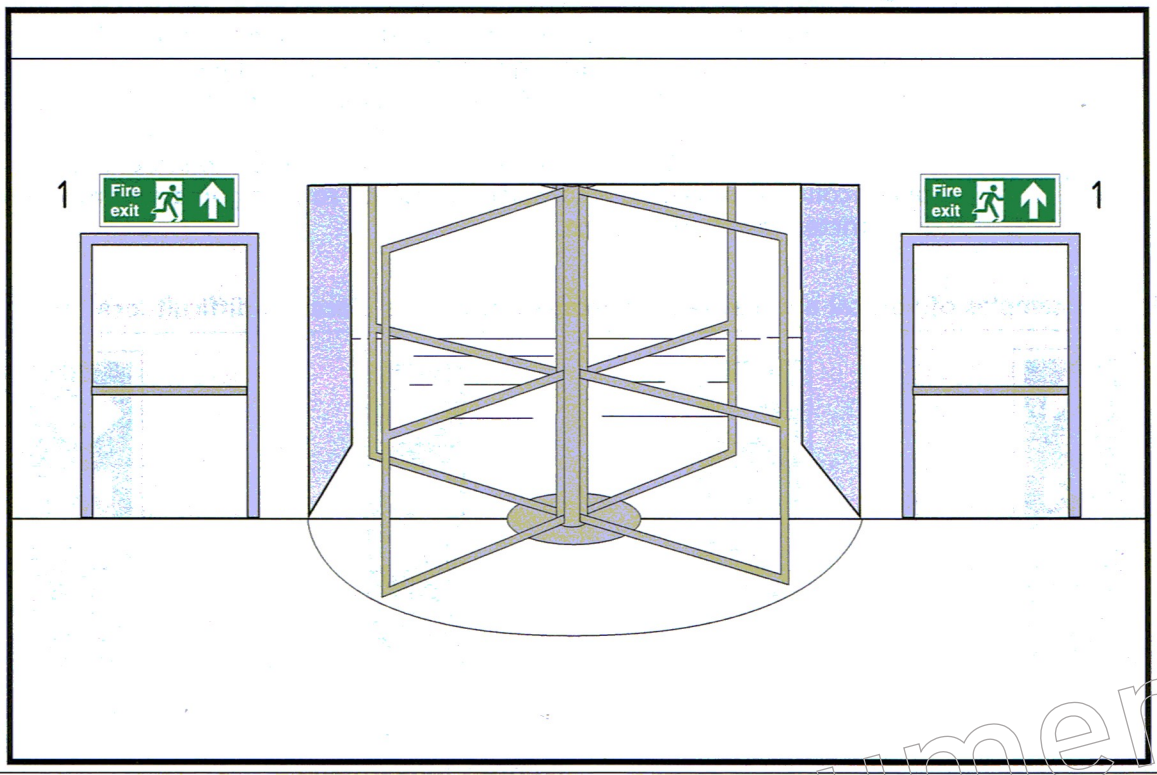
Figure A.22 **Typical revolving door arrangement showing the identification of fire exit(s) with the use of escape route sign(s) and supplementary text**



Use of escape route signs	
1 Progress forward and through from here.	1 Positioned above door.
2 Progress forward and through from here.	2 Positioned above door.

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Annex B (informative)

Examples of vertical alternatives for escape route signs placed in difficult locations

In some environments, restrictions may exist which limit the installation of conventional "horizontal" arrangement escape route signs. The vertical arrangement(s) shown in Table B.1 accommodate restricted environments such as car parks/industrial areas where ceiling and wall installations are impractical. Vertical arrangement escape route signs can be secured to structural pillars/columns providing a conspicuous escape route signing system where there is restricted installation space.

Table B.1 **Examples of vertical alternatives for escape route signs placed in difficult locations**

Progress forward from here; Progress forward and through from here; or Progress forward and up from here.	Progress up to the right; or Progress forward and across to the right.	Progress up to the left; or Progress forward and across to the left.	Progress to the left.
Progress down from here.	Progress down to the right.	Progress down to the left.	Progress to the right.

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Annex C (informative) Examples of application of distance factors to the graphical symbol and text components of escape route signs

C.1 General

BS ISO 3864-1 shows that the distance of observation of a safety sign depends upon a multiplying factor of cos α (where α is the angle from the normal to the sign). As a consequence, the boundary to the observation distance at different angles of α lies on the surface of a sphere. For a safety sign of height h and distance factor normal to the sign z_0, the sphere has a diameter of z_0h centred at a perpendicular distance of $z_0h/2$ from the sign.

In Figures C.1 to C.7, the curves for the emergency exit sign are also applicable to the direction arrow.

C.2 Horizontal plane at the level of escape route sign

Figure C.1 shows that on the horizontal viewing plane of the sign when looking towards the sign, the boundary to the observation distances is a circle of diameter z_0h. The examples illustrate an externally illuminated sign under not less than 100 lux with a z_0 of 170 and different safety sign heights of 75 mm, 100 mm, 110 mm, 120 mm, 130 mm, 150 mm and 180 mm (see Table 4). At the observation position P on the circle, the sideways distance from the normal to the sign is given by $0.5z_0h\sin2\alpha$ and the observation distance is $z_0h\cos\alpha$. The maximum sideways distance is $0.5z_0h$ where the observation distance is $0.707z_0h$.

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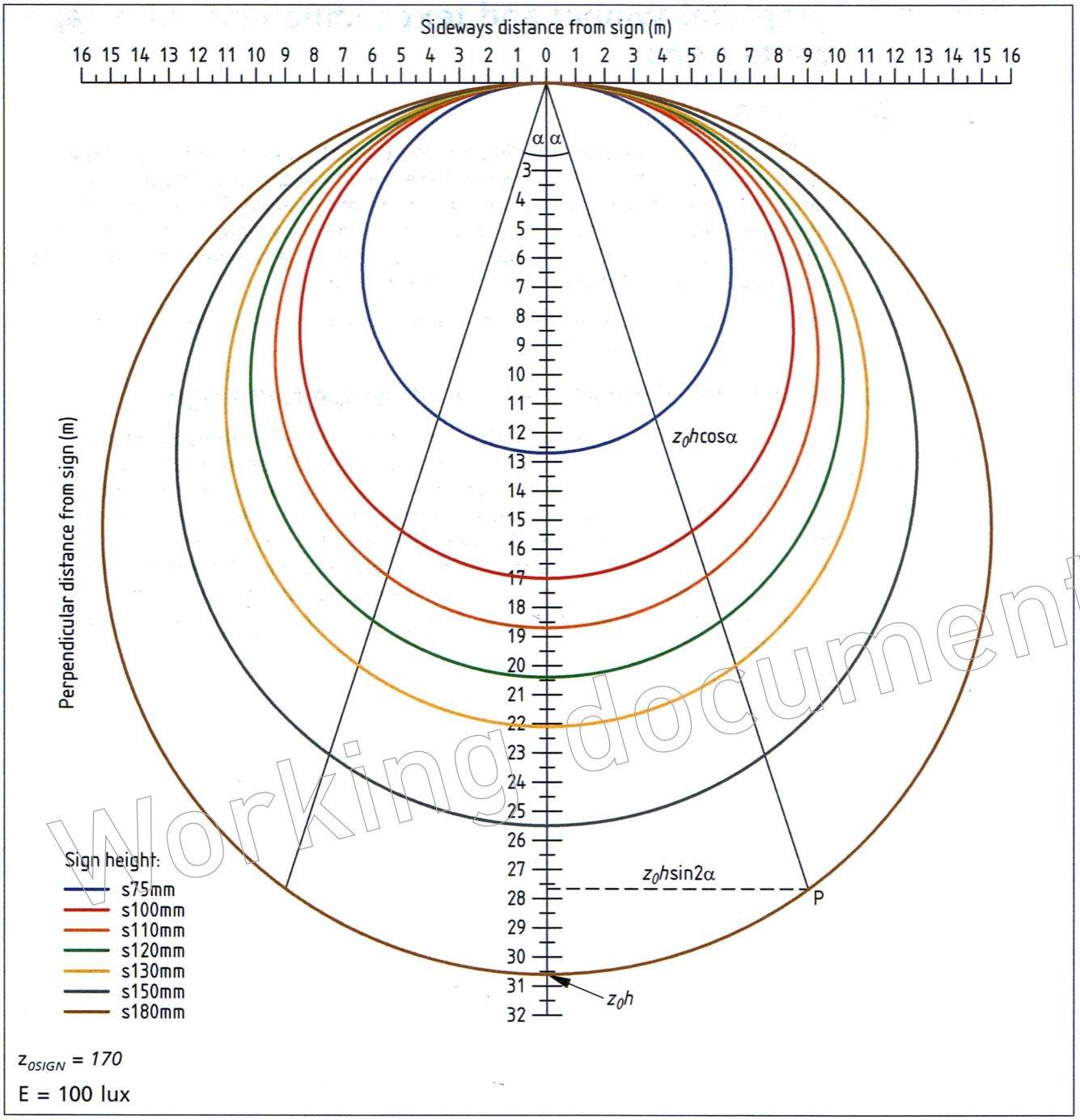
Figure C.1 **Circular boundaries of observation distances in horizontal plane**



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C.3 Horizontal plane above or below the level of escape route sign

When the observation is made at an eye height of ΔH above or below the height of the sign, the radius of the circular boundary is reduced. The radius of the circle, centred at a perpendicular distance of $z_0h/2$ from the sign, is given by:

$$r = \sqrt{[(0.5z_0h)^2 - (\Delta H)^2]}$$

Figure C.2 shows how the radius r varies with differences in height ΔH for different safety sign heights for an externally illuminated escape route sign under not less than 100 lux with a z_0 of 170. As the difference in eye height from the safety sign height increases, the radius r within which the observer needs to be positioned to identify the safety sign decreases.

NOTE r can be calculated in terms of observation angle α. The height difference ΔH is given by $0.5z_0 h \sin 2\alpha$ and r is given by $0.5z_0 h \cos 2\alpha$.

Figure C.2 **Variation of radius r against difference in observation height ΔH for an externally illuminated escape route sign under 100 lux**

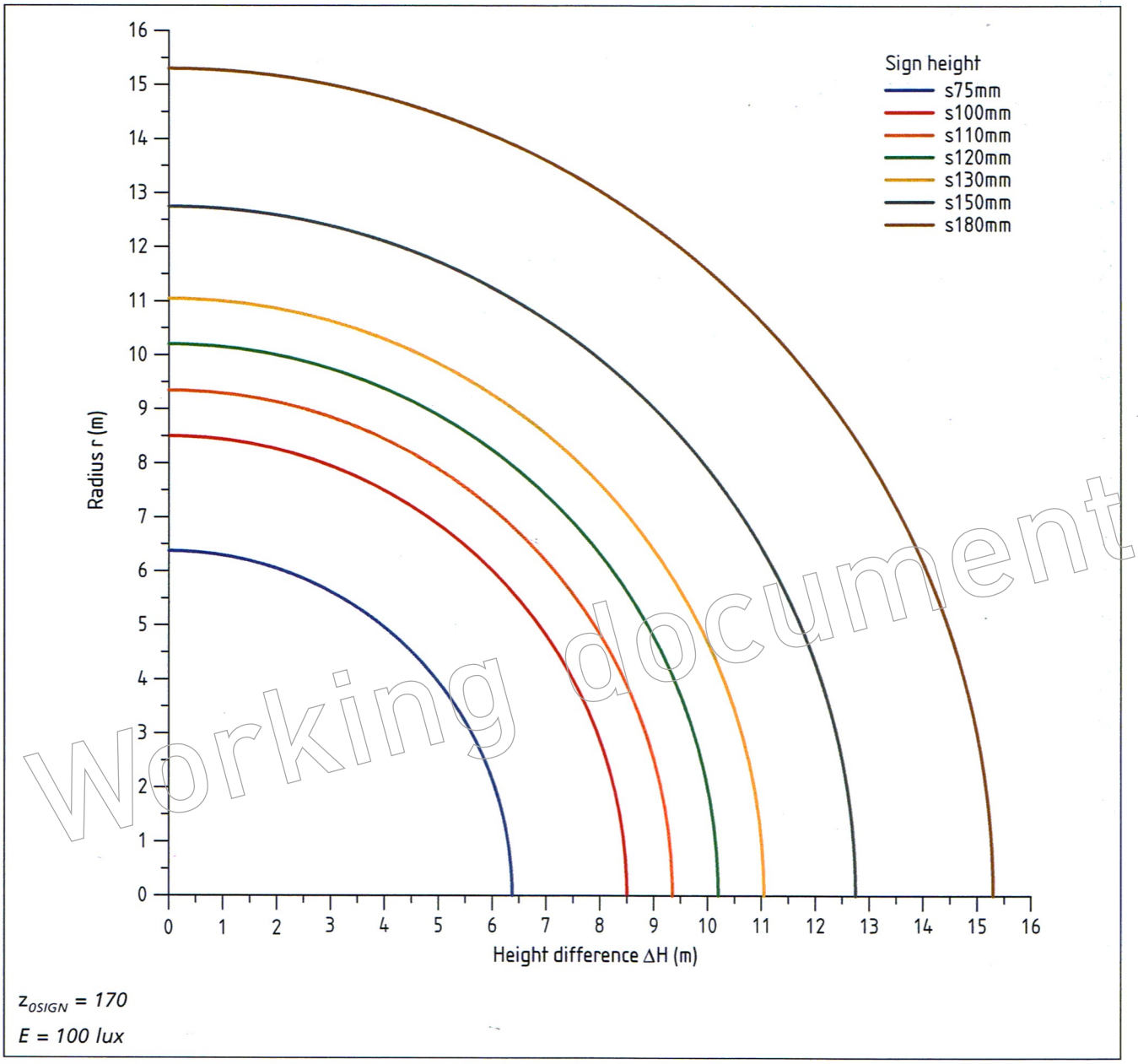

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Figure C.3 shows the slightly smaller circles when ΔH is ±Δ2 m. The effect of eye height relative to the height (location) of a safety sign reduces the observation distance and is more marked for the smaller sign heights (75 mm and 100 mm).

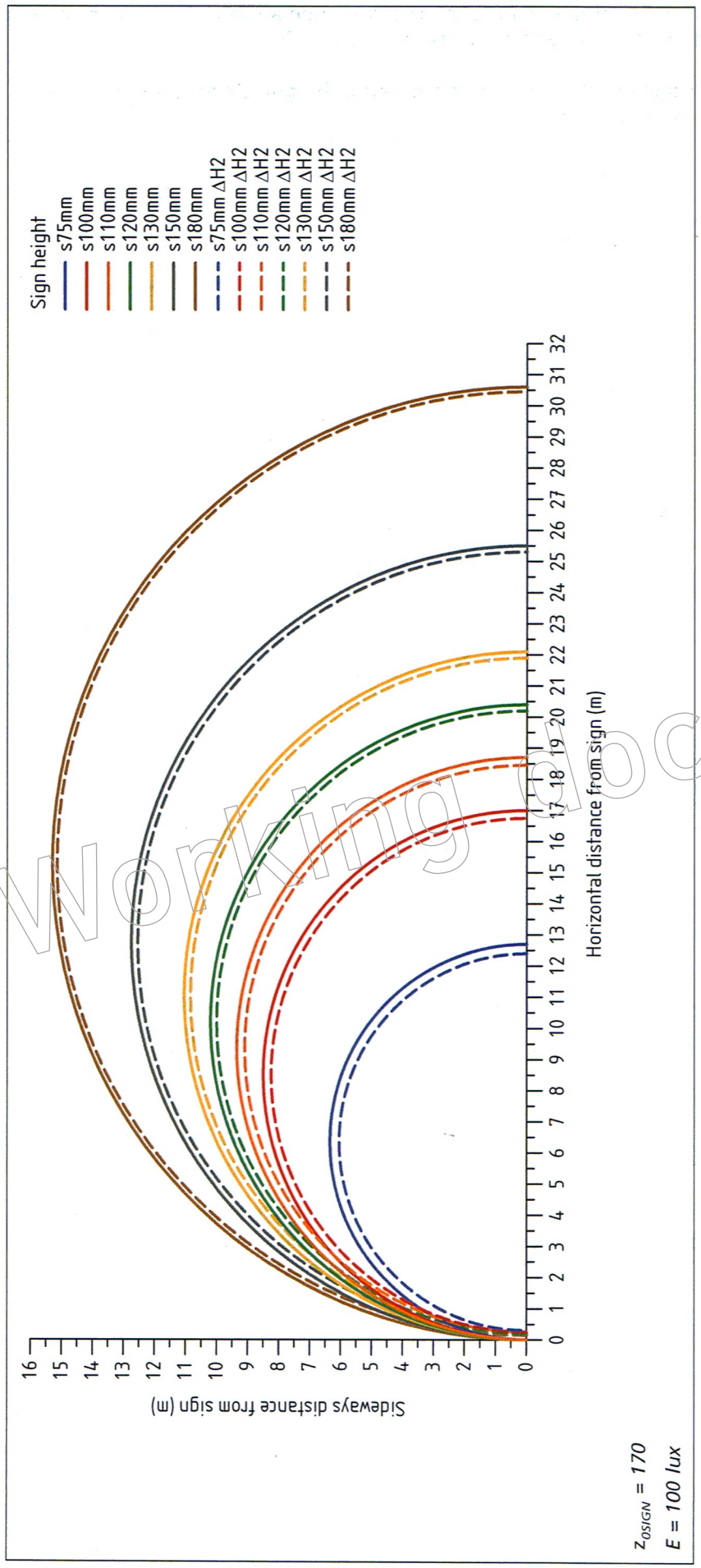

Figure C.3 **Circular boundaries of observation distances in horizontal plane: at eye level of sign and eye levels of ±2 m above and below the height of sign**

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C.4 Emergency exit sign and lower case supplementary text: Horizontal plane at the level of escape route sign

As the distance of observation from the escape route sign increases, the subtended visual angles of supplementary text decreases. Legibility of the letters becomes more difficult as the distance of observation increases, resulting in smaller percentages of the building's occupants finding the letters legible. Hence at certain short distances of observation, the letters are to be sized so that a very high percentage of the building's occupants find the letters and words legible; whereas at some longer distances of observation, a low percentage or none of the building's occupants are able to decipher the words. As the distance for legibility of the letters varies between individuals, the probability that a certain percentage of the building's occupants finding letters legible is statistical in nature. It is therefore important that a high percentage of the intended occupants of the building be able to correctly identify the graphical symbols of the escape route sign, correctly read the text and have the opportunity to follow the message.

For lower case letters, a distance factor normal to the sign of 225 is to be used for externally illuminated escape route signs (based on ordinary or phosphorescent materials) under normal lighting. Under emergency lighting, a distance factor normal to the sign of 110 is to be used. For internally illuminated signs, a distance factor normal to the sign of 225 is to be used.

Examples of maximum viewing distances for a range of sign heights of externally illuminated escape route signs subject to a vertical illuminance of 100 lux are based upon the values in Table 2. Figure C.4 shows the circular boundaries for observation distances for the BS EN ISO 7010:2012, E001 and E002 emergency exit sign, (labelled "s") and lower case letters supplementary text (labelled "lc"). Figure C.5 shows the circular boundaries when within 3 m distance from the sign. In these examples, for each combination of sizes of the BS EN ISO 7010:2012, E001 and E002 and lower case letters, the observation distance is shorter for the lower case text. The curves labelled "lc" are based on a height of lower case letters that are 20% of the sign height and a distance factor normal to the sign of 225.

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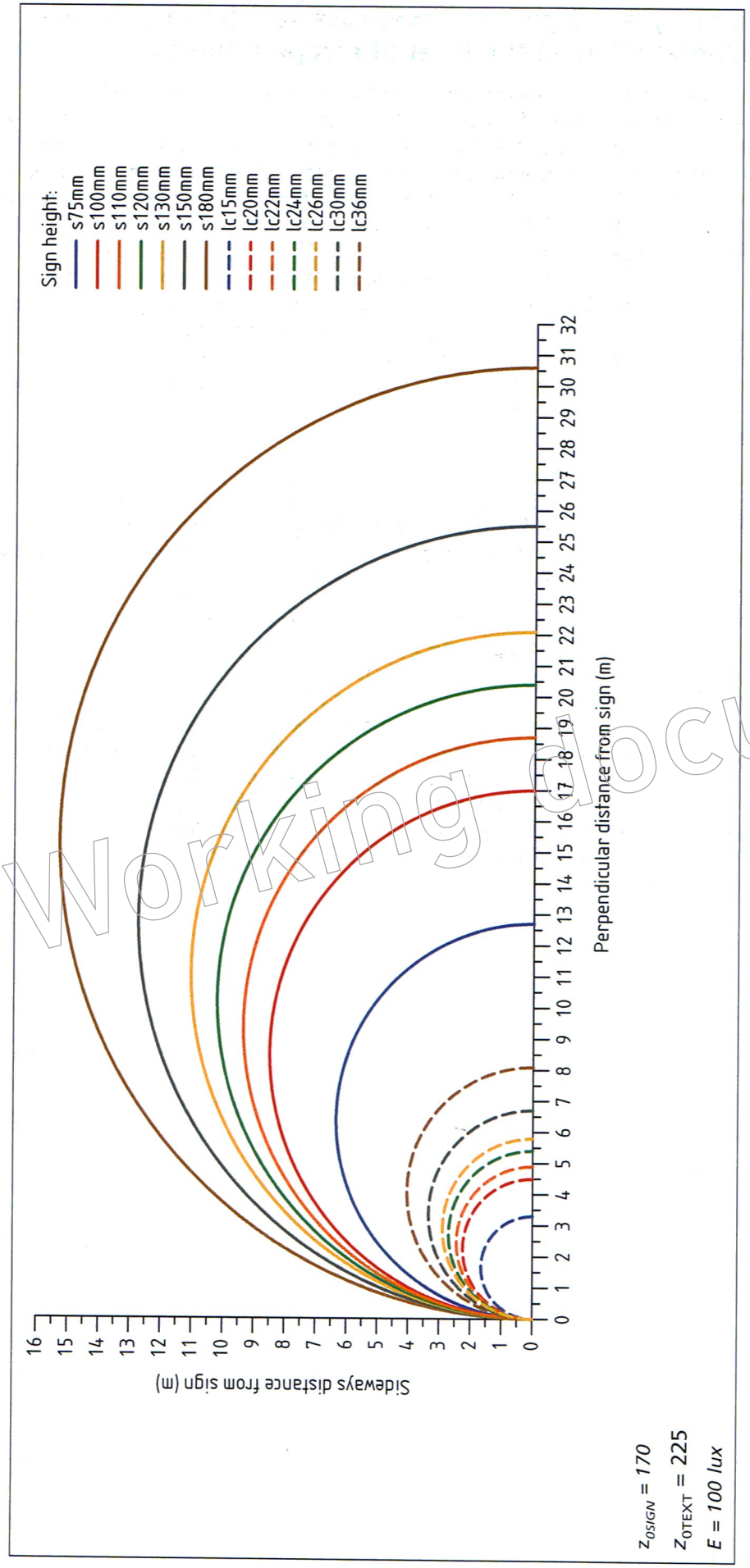
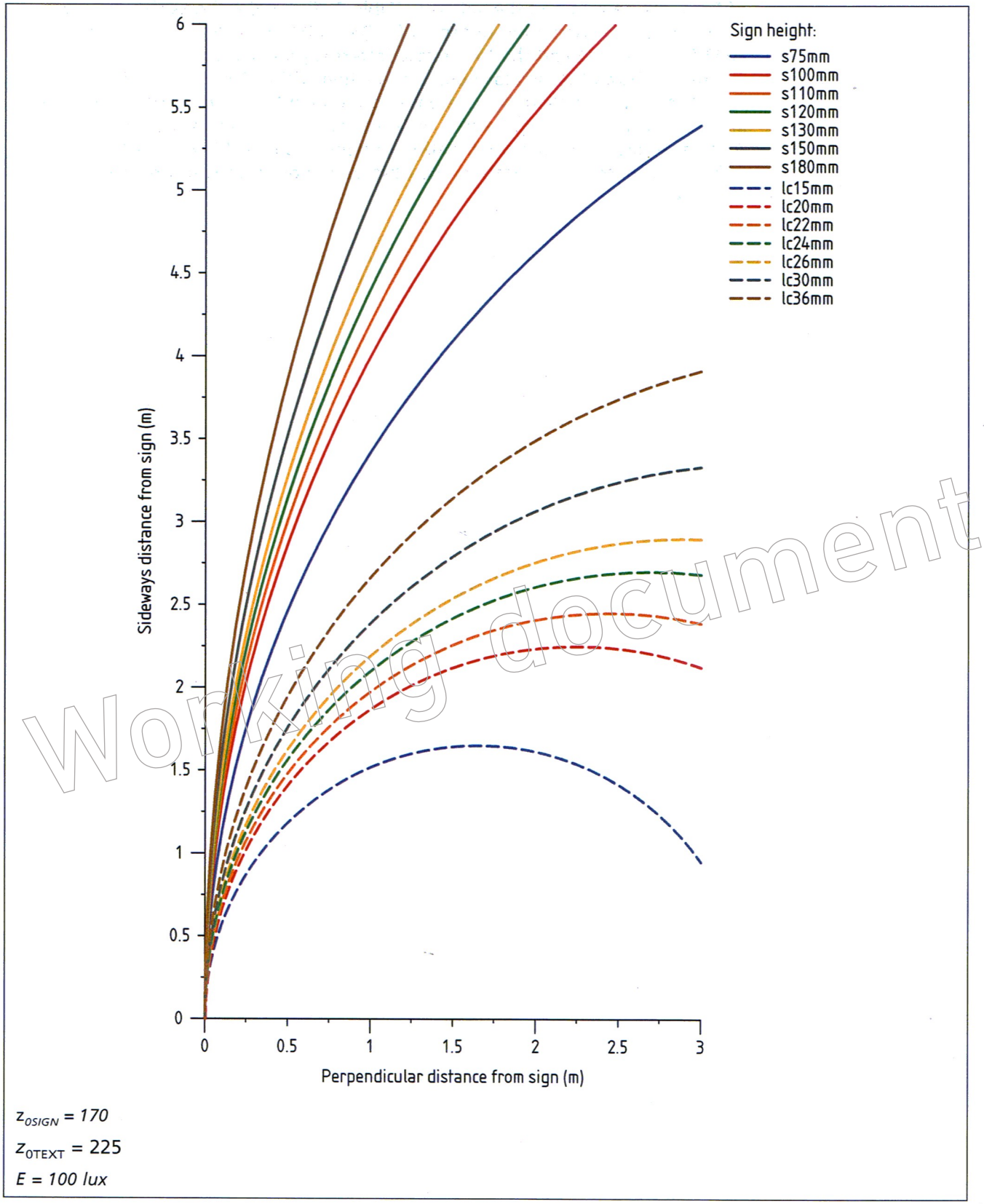
Figure C.4 **Circular boundaries of observation distances for escape route sign and lower case supplementary text in horizontal plane: vertical illuminance 100 lux**



Working document

Figure C.5 **Circular boundaries of observation distances for escape route sign and lower case supplementary text in horizontal plane: vertical illuminance 100 lux**



z_{0SIGN} = *170*

z_{0TEXT} = 225

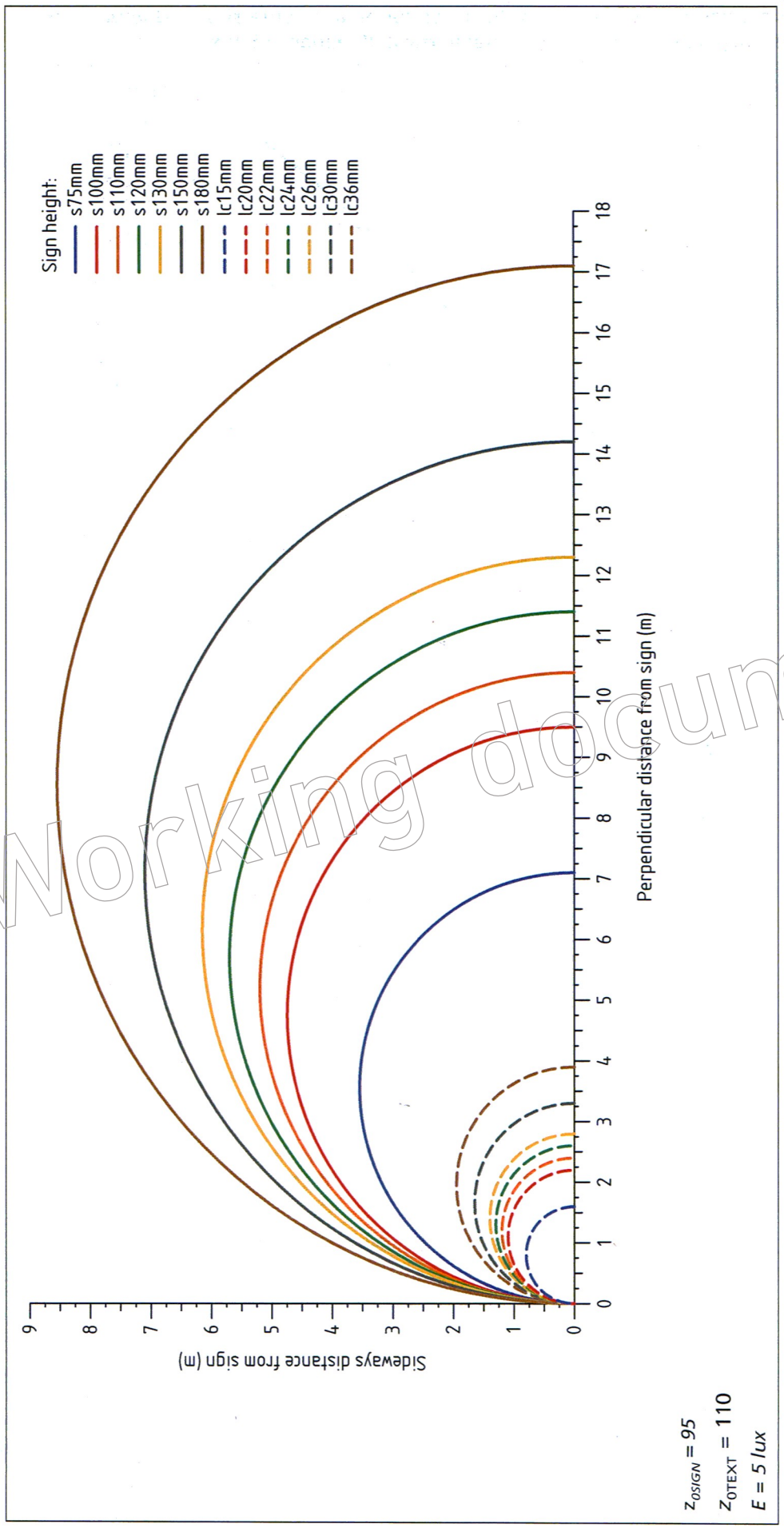
E = 100 lux

Working document

Examples of maximum viewing distances for a range of sign heights of externally illuminated escape route signs subject to a vertical illuminance of 5 lux are based upon the values in Table 2. Figure C.6 shows the circular boundaries for observation distances for BS EN ISO 7010:2012, E001 and E002 (labelled "s") and the lower case letters supplementary text (labelled "lc"). Figure C.7 shows the circular boundaries when within 3 m distance from the sign. The curves labelled "lc" are based on a height of lower case letters that are 20% of the sign height and a distance factor normal to the sign of 110. In these examples, for each combination of sizes of BS EN ISO 7010:2012, E001 and E002 and the lower case letters, the observation distance is shorter for the lower case text.

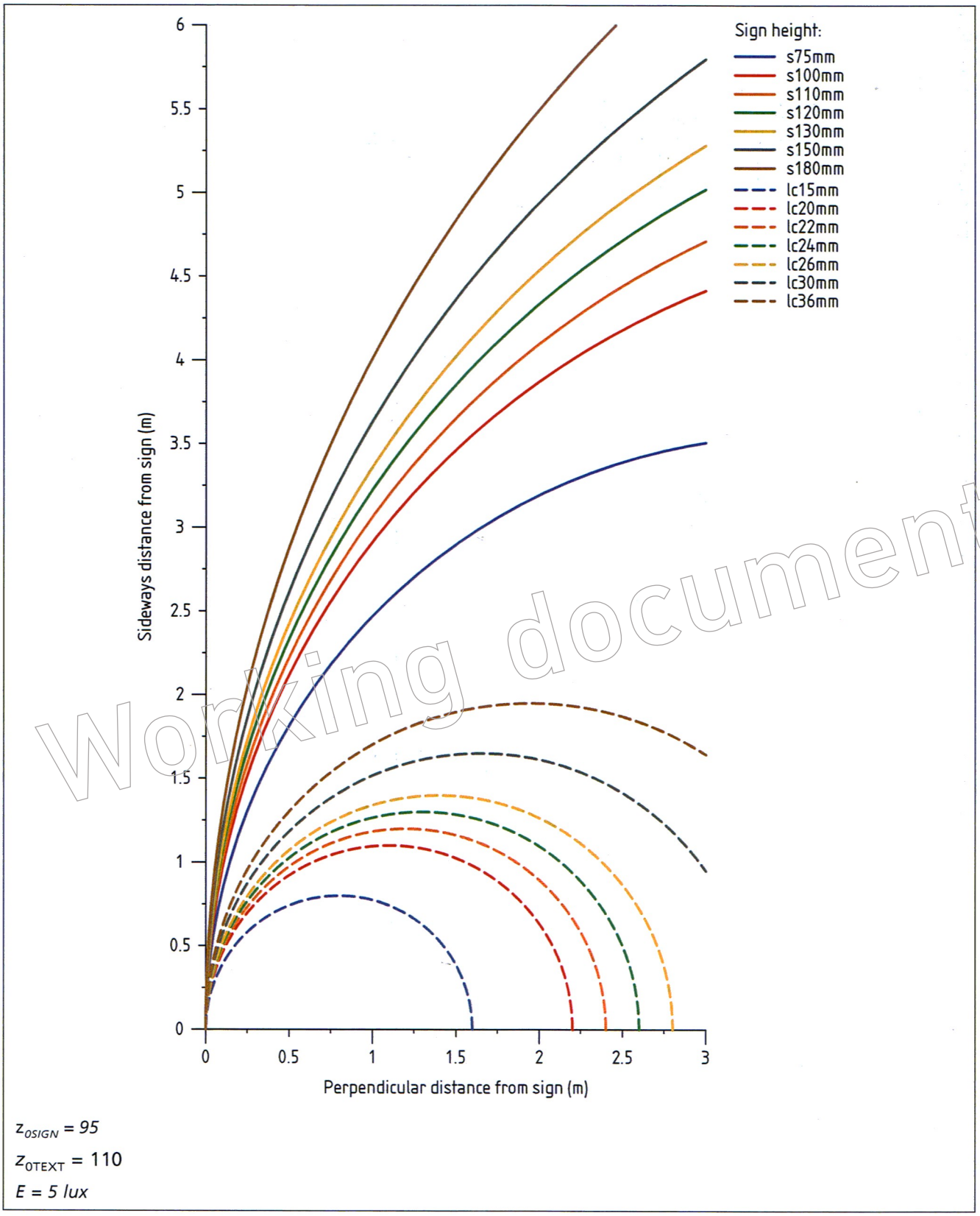
Working document

Figure C.6 **Circular boundaries of observation distances for esacpe route sign and lower case supplementary text in horizontal plane: vertical illuminance 5 lux**



Working document

Figure C.7 **Circular boundaries of observation distances for escape route sign and lower case supplementary text in horizontal plane: vertical illuminance 5 lux**



Working document

Drawing appropriately sized circles on a scaled plan can assist in determining an appropriate height of the sign for the particular location and range of approach of people towards the sign.

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For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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BS ISO 9186-2, *Graphical symbols – Test methods – Part 2: Method for testing perceptual quality*

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[4] NORTHERN IRELAND. The Building Regulations (Northern Ireland) 2012. London: The Stationery Office.

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