

Products for tactile paving surface indicators — Specification

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Committees responsible for this British Standard

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 British Cement Association
 British Ceramic Research Ltd.
 British Precast Concrete Federation Ltd.
 Concrete Society
 County Surveyors' Society
 Department of the Environment, Transport and the Regions (Highways Agency)
 Institution of Civil Engineers
 Interlay (Association of Block Paving)
 Interpave (Concrete Block Paving Association)
 Landscape Institute
 Society of Chemical Industry
 Stone Federation
 Transport Research Laboratory

The following bodies were also represented in the drafting of the standard, through Subcommittee B/507/5, Tactile paving:

Department of Trade and Industry (Represented by the Building Research Establishment)
 Department of Transport, Local Government and the Regions (Wildlife and Countryside Directorate)
 Royal National Institute for the Blind

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Foreword

This British Standard has been prepared by Technical Committee B/507.

It has been prepared to reflect the current recommendations by the Department of Transport for the use of tactile paving surfaces in public areas which are intended to assist visually impaired people. The recommendations are based on the DTLR mobility inclusion unit publication (see [1]).

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 17 and a back cover.

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1 Scope

This British Standard specifies requirements for products for tactile paving surface indicators of pedestrian paving units, manufactured in concrete, stone or clay and used to convey information for visually impaired people, including the nominal size of paving products, dimensions for raised surfaces, patterns, colour, engineering properties and installation.

NOTE Information on the nature of visual impairment is given in Annex A. Information on the use of tactile information is given in Annex B.

2 Normative references

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

BS 6717, *Precast, unreinforced concrete paving blocks — Requirements and test methods.*

BS 7263-1, *Precast concrete flags, kerbs, channels, edgings and quadrants — Part 1: Precast, unreinforced concrete paving flags and complementary fittings — Requirements and test methods.*

BS 7263-3, *Precast concrete flags, kerbs, channels, edgings and quadrants — Part 3: Precast, unreinforced concrete kerbs, channels, edgings and quadrants. Requirements and test methods.*

BS 7533-3, *Pavements constructed with clay, natural stone or concrete pavers — Part 3: Code of practice for laying precast concrete paving blocks and clay pavers for flexible pavements.*

BS 7533-4, *Pavements constructed with clay, natural stone or concrete pavers — Part 4: Code of practice for the construction of pavements of precast concrete flags or natural stone slabs.*

BS 7533-6, *Pavements constructed with clay, natural stone or concrete pavers — Part 6: Code of practice for laying natural stone, precast concrete and clay kerb units.*

BS EN 1341, *Slabs of natural stone for external paving — Requirements and test methods.*

BS EN 1342, *Setts of natural stone for external paving — Requirements and test methods.*

BS EN 1343, *Kerbs of natural stone for external paving — Requirements and test methods.*

BS EN 1344, *Clay pavers — Requirements and test methods.*

3 Terms and definitions

For the purposes of this British Standard the following terms and definitions apply.

3.1

visually impaired

blind or partially sighted

3.2 tactile paving surface indicators

3.2.1

tactile paving surface

profiled paving finish used to convey information to visually impaired pedestrians about their environment

3.2.2

blister surface

profiled paving finish comprising rows of flat topped domes

NOTE The blister surface provides a warning to visually impaired people in the absence of a kerb upstand at controlled and uncontrolled crossings.

3.2.3

corduroy hazard warning surface

profiled paving finish comprising raised rounded bars running transversely across the product

NOTE A corduroy hazard warning surface conveys the message “hazard proceed with caution”. It is used to provide a warning to visually impaired people of the presence of specific hazards, for example steps, level crossings or the approach to on-street light rapid transit (LRT) platforms, and where a footway joins a segregated shared route on the cyclist side.

3.2.4

platform edge (off-street) warning surface

profiled paving finish comprising raised off-set rows of flat topped domes

NOTE This surface provides a warning to visually impaired people of the edge of an off-street railway platform.

3.2.5

platform edge (on-street) warning surface

profiled paving finish comprising raised lozenge shapes

NOTE 1 The platform edge (on-street) warning surface provides a warning to visually impaired people that they are approaching the edge of an on-street light rapid transit (LRT) platform.

NOTE 2 With the introduction of on-street LRT platforms, it is now possible for pedestrians to encounter a platform while walking along a footway.

3.2.6

guidance path surface

profiled paving finish comprising raised flat top bars with rounded ends

NOTE The guidance path surface guides visually impaired people along a route when the traditional cues, such as a property line or kerb edge, are not available. It may also be used to guide people around obstacles, for example street furniture in a pedestrianized area. The surface is designed so that people can be guided along the route either by walking on the tactile surface or by maintaining contact with a long cane.

3.2.7

segregated shared cycle track/footway surface

profiled paving finish comprising raised flat-top bars running the full width of the product

NOTE The segregated shared cycle track/footway surface advises visually impaired people of the correct side to enter the track or footway.

3.2.8

central delineator strip

profiled paving finish comprising raised trapezoidal shapes

NOTE 1 The central delineator strip helps visually impaired people keep to the pedestrian side of a cycle track/footway.

NOTE 2 The central delineator is normally installed along the length of the route dividing the pedestrian side from the cyclist side.

3.3

on-street light rapid transit (LRT) platform

platform in a street environment or where pedestrians cross and/or walk, without restriction, along or alongside the infrastructure

3.4

kerb upstand

vertical upstand greater than or equal to 25 mm

3.5

controlled crossing

pedestrian crossing point such as a pelican, zebra, puffin and toucan crossing and traffic signalled junction with pedestrian phases

3.6

uncontrolled crossing

pedestrian crossing point, other than a controlled crossing, where there is no level difference between the footway and the carriageway, typically at side roads or at locations away from junctions

3.7

segregated shared route

footway shared by pedestrians and cyclists

4 Requirements for surfaces of products

4.1 General

Products shall be manufactured to ensure that the profile of the whole tactile paving surface has the same dimensions as the profile of the individual products including any joints. When modules are laid in bonded or half bonded patterns, the layout of the surface profile shall ensure that the pattern is repeated without disruption, making due allowance for joint width between modules.

NOTE Information on the application of tactile surface indicators is given in Annex C. Detailed guidance on application and layout is given in *Guidance on the use of tactile paving surfaces* [1].

The sizes of products and their designation, according to module type, shall conform to Table 1.

Table 1 — Designation and sizes of products

Module type	Nominal size mm
1	450 × 450
2	400 × 400
3	200 × 133

4.2 Blister surface for pedestrian crossing points

4.2.1 Colour

The colour of blister surface products at controlled crossings shall be red. Colour evaluation for red products shall be in accordance with Annex D and the requirements of Table D.1. At uncontrolled crossings the blister surface products shall be any colour other than red (commonly a buff colour) which contrasts with the surrounding paving.

4.2.2 Profile

The profile of the blister surface shall comprise rows of flat-topped blisters 5 mm ± 0.5 mm high, spaced at approximately 65 mm in each direction, arranged to conform to the requirements of 4.1. Dimensions and pattern-repeat of blister surfaces for pedestrian crossing point products shall be in accordance with the relevant figures in Annex E (see Figure E.1 for module type 1, Figure E.2 for module type 2 and Figure E.3 for module type 3).

4.3 Corduroy hazard warning surface

4.3.1 Colour

The colour of corduroy hazard warning surface products shall be any colour other than red as red is restricted to the blister surface at controlled crossings (see 4.2.1).

4.3.2 Profile

The profile of the corduroy hazard warning surface shall comprise rounded bars running transversely across the direction of pedestrian travel. The bars shall be 6 mm ± 0.5 mm high, 20 mm ± 1.0 mm wide and spaced 50 mm ± 2 mm from the centre of one bar to the centre of the next. Dimensions and pattern-repeat of corduroy hazard warning surfaces shall be in accordance with Figure E.5 (for module type 1) and Figure E.6 (for module type 2).

4.4 Platform edge (off-street) warning surface

4.4.1 Colour

The colour of platform edge (off-street) warning surface products shall be any colour other than red, as red is restricted to the blister surface at controlled crossings (see 4.2.1), and a colour that provides a contrast with the surrounding area to assist visually impaired people.

4.4.2 Profile

The profile of the platform edge (off-street) warning surface shall comprise offset rows of flat-topped domes 5 mm ± 0.5 mm high, spaced according to the module type conforming to Table E.1 (see Figure E.7 and Figure E.8). The dimensions and pattern-repeat of platform edge (off-street) warning surfaces shall be in accordance with Figure E.7 (for module type 1, and Figure E.8 (for module type 2).

4.5 Platform edge (on-street) warning surface

4.5.1 Colour

The colour of platform edge (on-street) warning surface products shall be any colour other than red, as red is restricted to the blister surface at controlled crossings (see 4.2.1).

4.5.2 Profile

The profile of the platform edge (on-street) warning surface shall comprise rows of lozenge shapes. The lozenge shapes shall be $6 \text{ mm} \pm 0.5 \text{ mm}$ high and have rounded edges. The dimensions and pattern-repeat of platform edge (on-street) warning surfaces shall be in accordance with Figure E.9 (for module type 2 and 3 only).

4.6 Segregated shared cycle track/footway surface and central delineator strip

4.6.1 Colour

The colour of segregated shared cycle track/footway surface products shall be any colour other than red, as red is restricted to the blister surface at controlled crossings (see 4.2.1).

The central delineator strip shall have a white finish.

4.6.2 Profile

The profile of the pedestrian side of the segregated shared cycle track/footway surface shall comprise flat topped bars each $5 \text{ mm} \pm 0.5 \text{ mm}$ high, $30 \text{ mm} \pm 2 \text{ mm}$ wide and spaced $70 \text{ mm} \pm 2 \text{ mm}$ apart. The dimensions and pattern-repeat of segregated shared cycle track/footway surfaces shall be in accordance with Figure E.10 (for module type 2 only).

The surface profile of the central delineator strip shall comprise a raised trapezoidal shape of height of between 12 mm and 20 mm, having sloping sides and a flat top 50 mm wide, running from end to end of the unit. The overall width of the unit shall be 150 mm (see Figure E.10).

4.7 Guidance path surfaces

4.7.1 Colour

The colour of guidance path surface products shall be any colour other than red, as red is restricted to the blister surface at controlled crossings (see 4.2.1).

4.7.2 Profile

The profile of the guidance path shall comprise flat topped bars running transversely to the direction of pedestrian travel each $5.5 \text{ mm} \pm 0.5 \text{ mm}$ high, $35 \text{ mm} \pm 2 \text{ mm}$ wide. The dimensions and pattern-repeat of the guidance path surfaces shall be in accordance with Table 1 and Figure E.11 (for module type 1) and Table 1 and Figure E.12 (for module type 2).

5 Engineering properties

Paving products shall conform to the following product standards.

- a) Precast concrete paving units shall conform to BS 6717, BS 7263-1 or BS 7263-3, as appropriate.
- b) Natural stone paving units shall conform to BS EN 1341, BS EN 1342 or BS EN 1343, as appropriate.
- c) Clay paving units shall conform to BS EN 1344.

6 Installation

The installation of products for tactile paving surface indicators shall be in accordance with BS 7533-3, BS 7533-4 or BS 7533-6.

NOTE Guidance on the installation of products is given in *Guidance on the use of tactile paving surfaces*, DTLR [1].

Annex A (informative)

The nature of visual impairment

The nature of visual loss varies considerably between individuals. The overall condition is a complex one, but generally the result of different eye conditions leads to the following types of impairment:

- a limited field of vision, being unable to see to the sides or up and down;
- some loss of central vision limiting the ability to see fine detail;
- acute short-sightedness, seeing the world as a continuous blur;
- uncontrollable oscillations of the eyeball leading to an inability to see objects clearly;
- night blindness, a sensitivity to light and a tendency to be dazzled by glare.

Visually impaired people detect information about the environment by the use of non-visual features, for example audible and tactile features. A loss of sight is not accompanied by an increase in the effectiveness of other non-visual senses. However, visually impaired people generally place more emphasis on information received via other senses, for example the sense of touch (see [1]).

Annex B (informative)

The use of tactile information

When moving around the pedestrian environment, visually impaired people actively seek and make use of tactile information underfoot, particularly detectable contrasts in surface texture (see [1]).

The ability to detect contrasts in texture underfoot varies from one individual to another. For example, older visually impaired people and people who have lost their sight through certain medical conditions, such as diabetes, may have reduced sensitivity in their feet. It is, therefore, important that tactile warning of potential hazards, for example a road crossing or a stair, are rigorous enough to be detectable by most people but do not constitute a trip hazard or cause extreme discomfort.

Annex C (informative)

Guide to the application of tactile surfaces

Table C.1 provides guidance on the application of tactile surfaces. For further information see [1].

Table C.1 — Application of tactile surfaces

Tactile surface type	Application
Blister	For installation in the absence of a kerb upstand at both controlled and uncontrolled crossing points: <ul style="list-style-type: none"> a) where the footway has been dropped to be flush with the carriageway b) where the carriageway has been raised to the level of the footway
Corduroy	For installation where visually impaired people need to be warned of a hazard and advised to proceed with caution, for example: <ul style="list-style-type: none"> a) at the top and bottom of steps b) at the foot of a ramp to an on-street light rapid transit (LRT) but not at any other ramp c) at a level crossing d) where people could inadvertently walk directly on to a platform at a railway station e) where a footway/footpath joins a shared route NOTE 1 The surface should not be used to warn of obstacles, e.g. cycle stands, where people need to change direction. NOTE 2 The surface is not recommended for use at raised bus stops.
Platform edge (off-street)	For installation at off-street rail platforms including: <ul style="list-style-type: none"> a) heavy rail platforms b) off-street light rapid transit (LRT) platforms
Platform edge (on-street)	For installation at on-street (LRT) platform edges Not used at off-street platform edges (see above) NOTE The surface is not recommended for use at raised bus stops.
Segregated shared cycle track/footway	For installation on a track/footway where there is no physical barrier or level difference between the pedestrian and cyclist
Central delineator strip	For installation on a track/footway to indicate the boundary between pedestrian and cycle sides of segregated shared routes
Guidance path	For installation: <ul style="list-style-type: none"> a) where traditional guidance given by a standard footway between the property line and carriageway does not exist, for example in a pedestrian precinct b) where pedestrians need to be guided around obstacles, for example in a pedestrian precinct c) where a number of visually impaired people need to find a specific location d) in transport terminals to guide people between facilities

Annex D (normative)

Colour evaluation for red products

Colour for red blister surface products at controlled crossings shall be evaluated in accordance with the colour spectrum data in Table D.1.

Measurement of the surface colour shall be determined using a colour meter.

Table D.1 — Colour range

Colour values	Range
<i>L</i>	50–38
<i>a</i>	21–13
<i>b</i>	18–10
<p><i>L</i> is the lightness (0 = black and 100 = white). <i>a</i> is the red green range (+<i>a</i> = red and –<i>a</i> = green). <i>b</i> is the yellow blue range (+<i>b</i> = yellow and –<i>b</i> = blue).</p>	

Annex E (normative)

Profile and shape

Module types shall conform to Table E.1.

Blister surfaces shall be in accordance with Figure E.1 (module type 1), Figure E.2 (module type 2) and Figure E.3 (module type 3). The profile of blister surfaces and platform edge blister surfaces shall be in accordance with Figure E.4.

Corduroy hazard warning surfaces shall be in accordance with Figure E.5 (module type 1) and Figure E.6 (module type 2).

Platform edge (off-street) surfaces shall be in accordance with Figure E.7 (module type 1) and Figure E.8 (module type 2).

Platform edge (on-street) surfaces shall be in accordance with Figure E.9 (module type 2).

Cycle track/footway surfaces shall be in accordance with Figure E.10 (module type 2).

Guidance path surfaces shall be in accordance with Figure E.11 (module type 1) and Figure E.12 (module type 2).

Table E.1 — Module types, sizes and pitch dimensions

Module type mm	Pitch dimension	
	<i>A</i>	<i>B</i>
Type 1 450 × 450	(64 ± 2) mm	(31 ± 1) mm
Type 2 400 × 400	(66.7 ± 2) mm	(32.3 ± 1) mm
Type 3 200 × 133	(66.5 ± 2) mm	(32.5 ± 1) mm

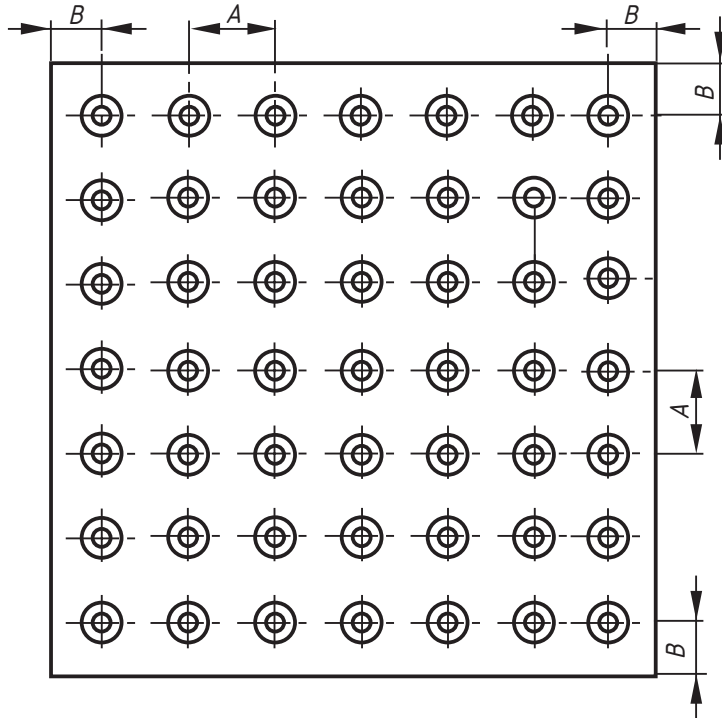


Figure E.1 — Blister surface, module type 1

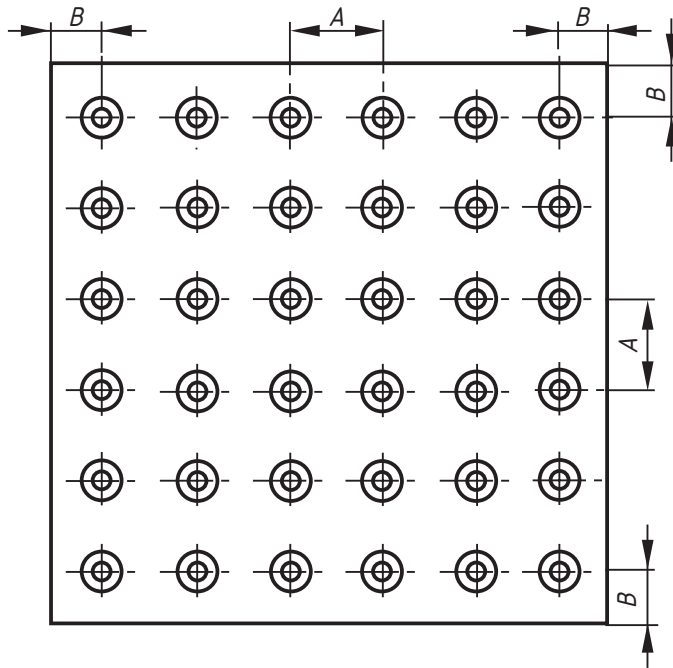
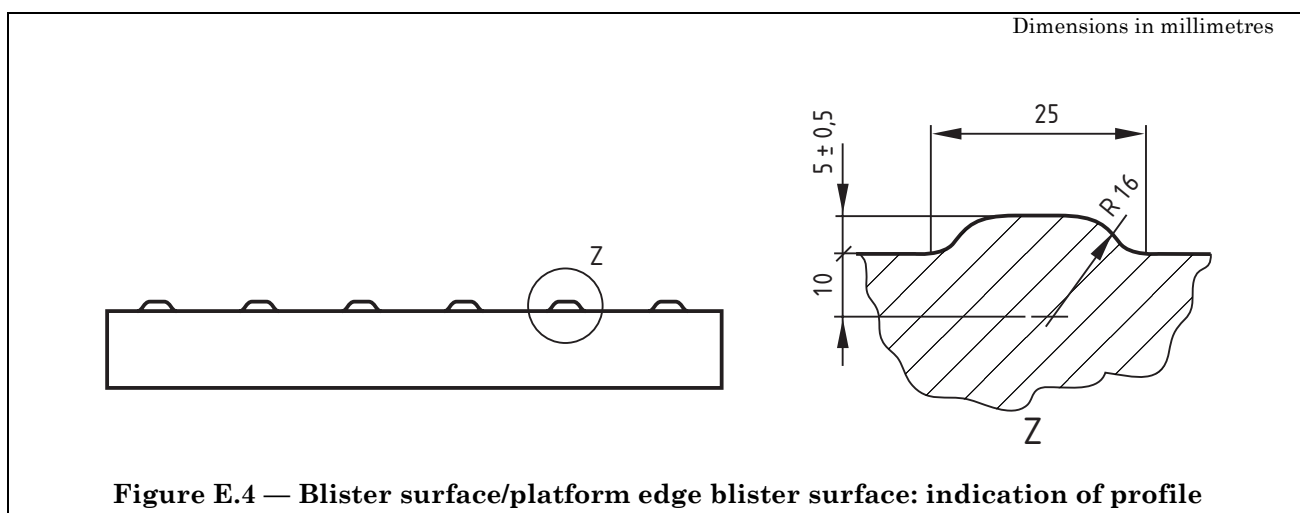
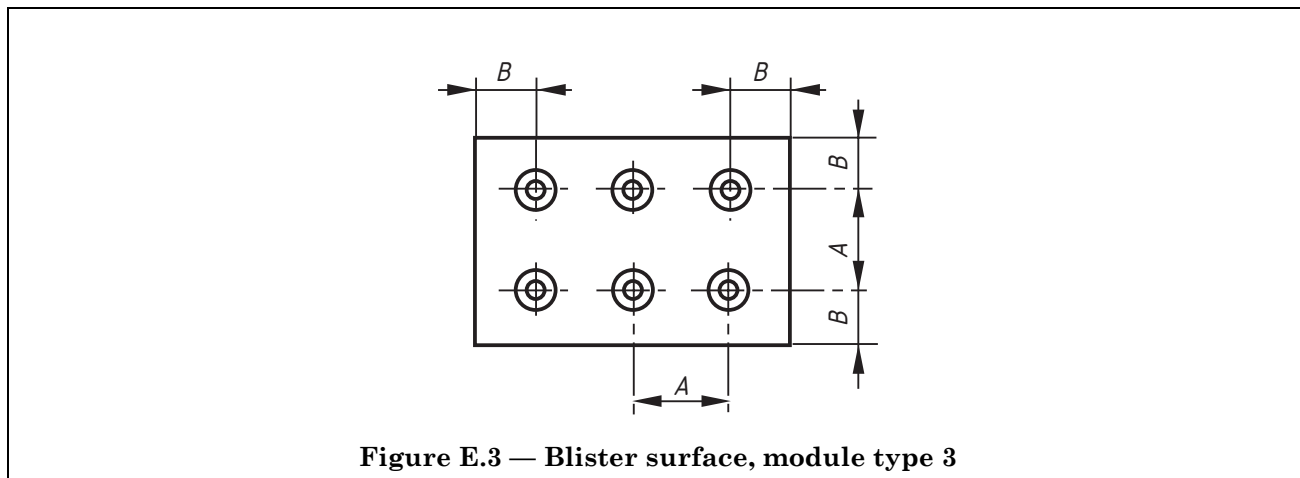
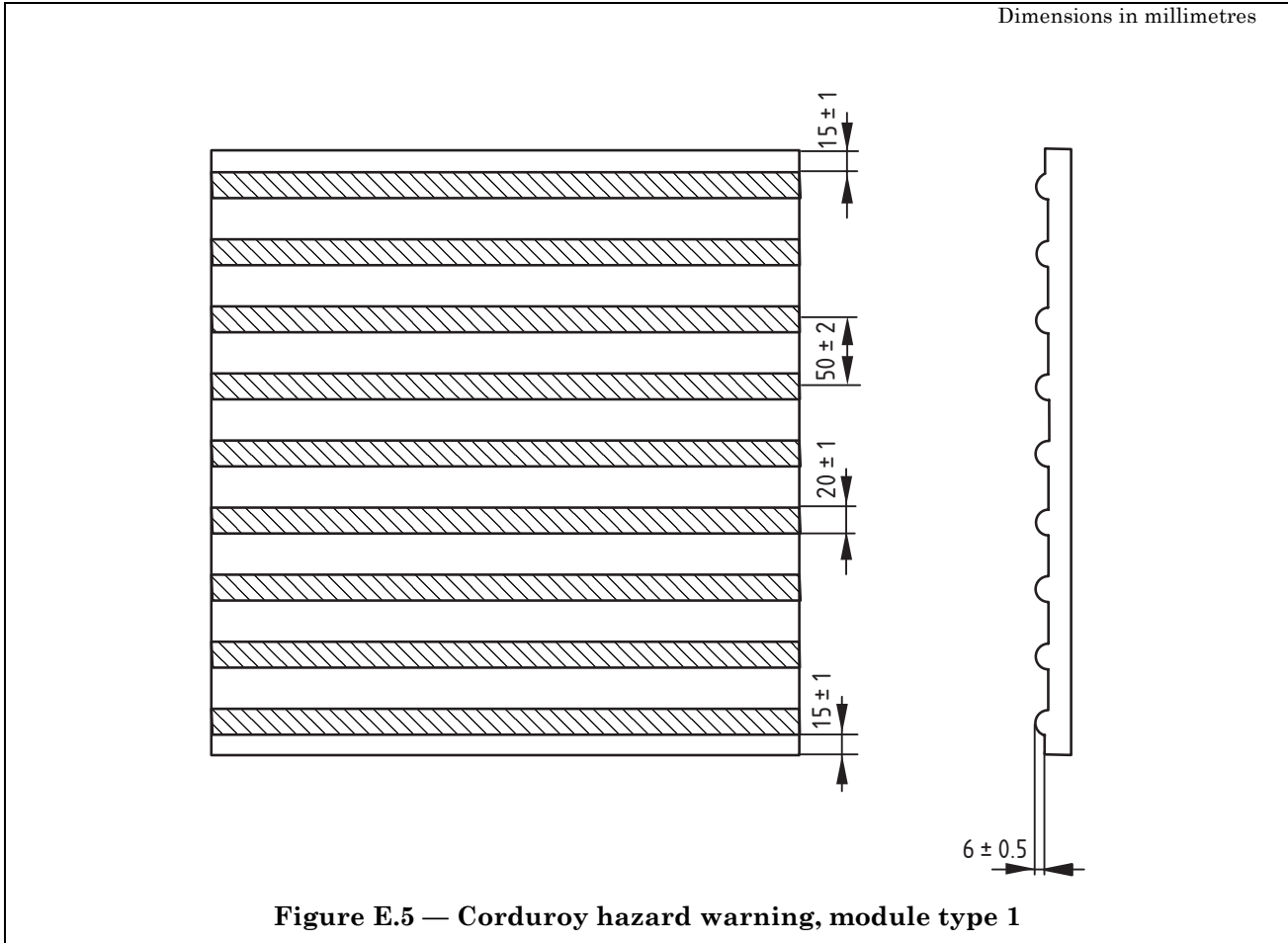
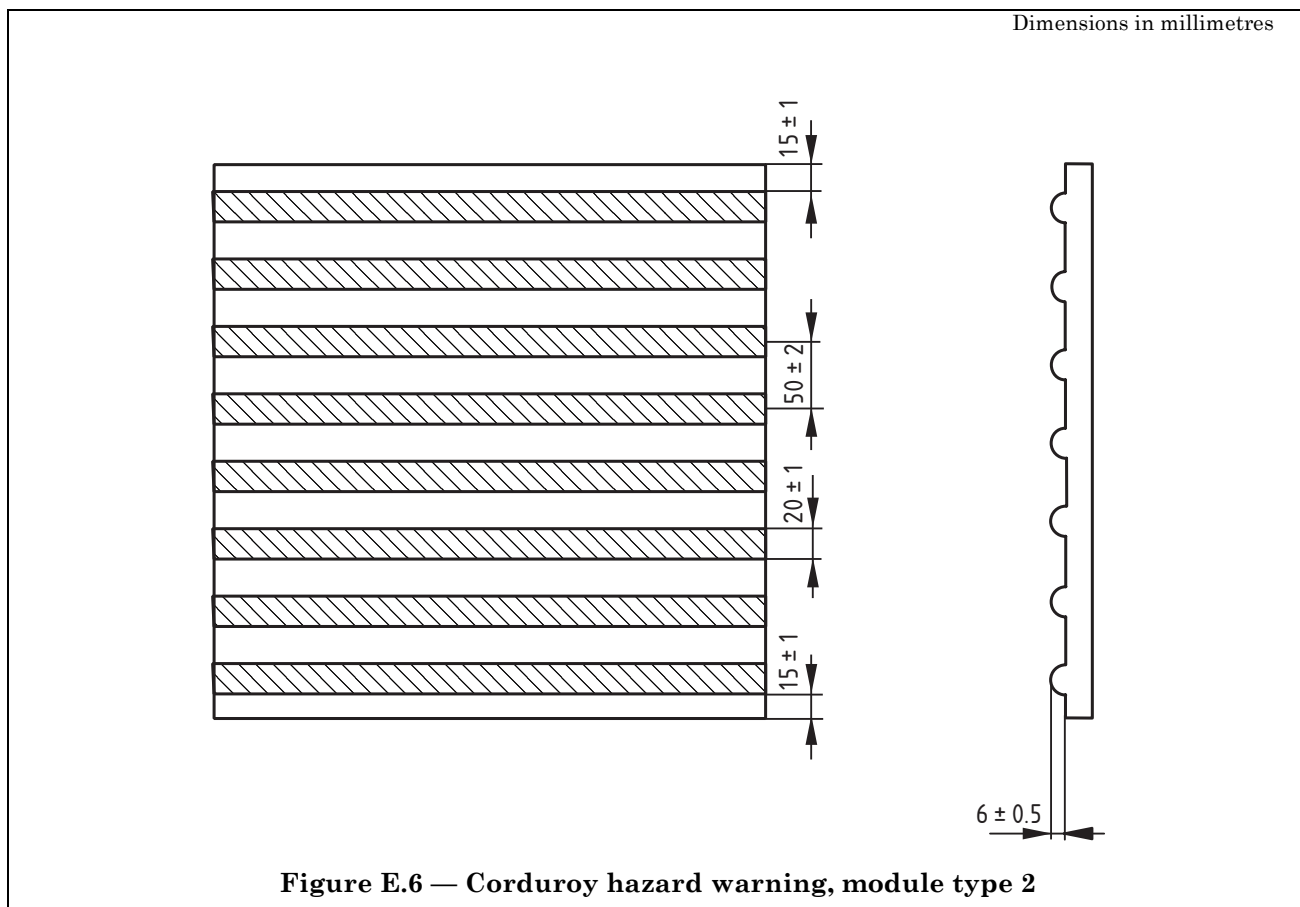


Figure E.2 — Blister surface, module type 2







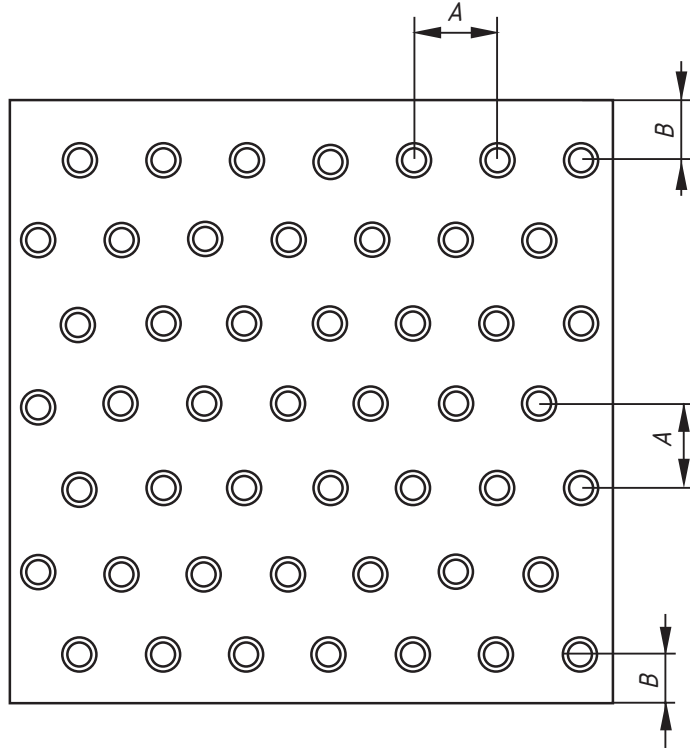


Figure E.7 — Platform edge (off-street), module type 1

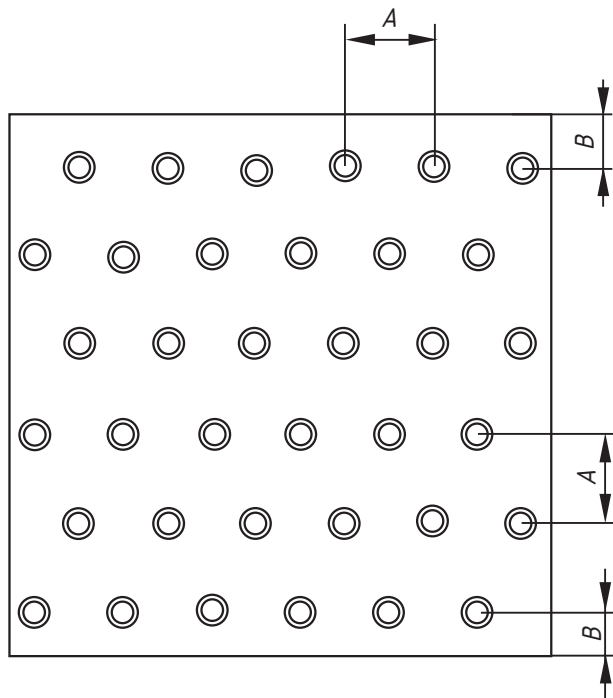
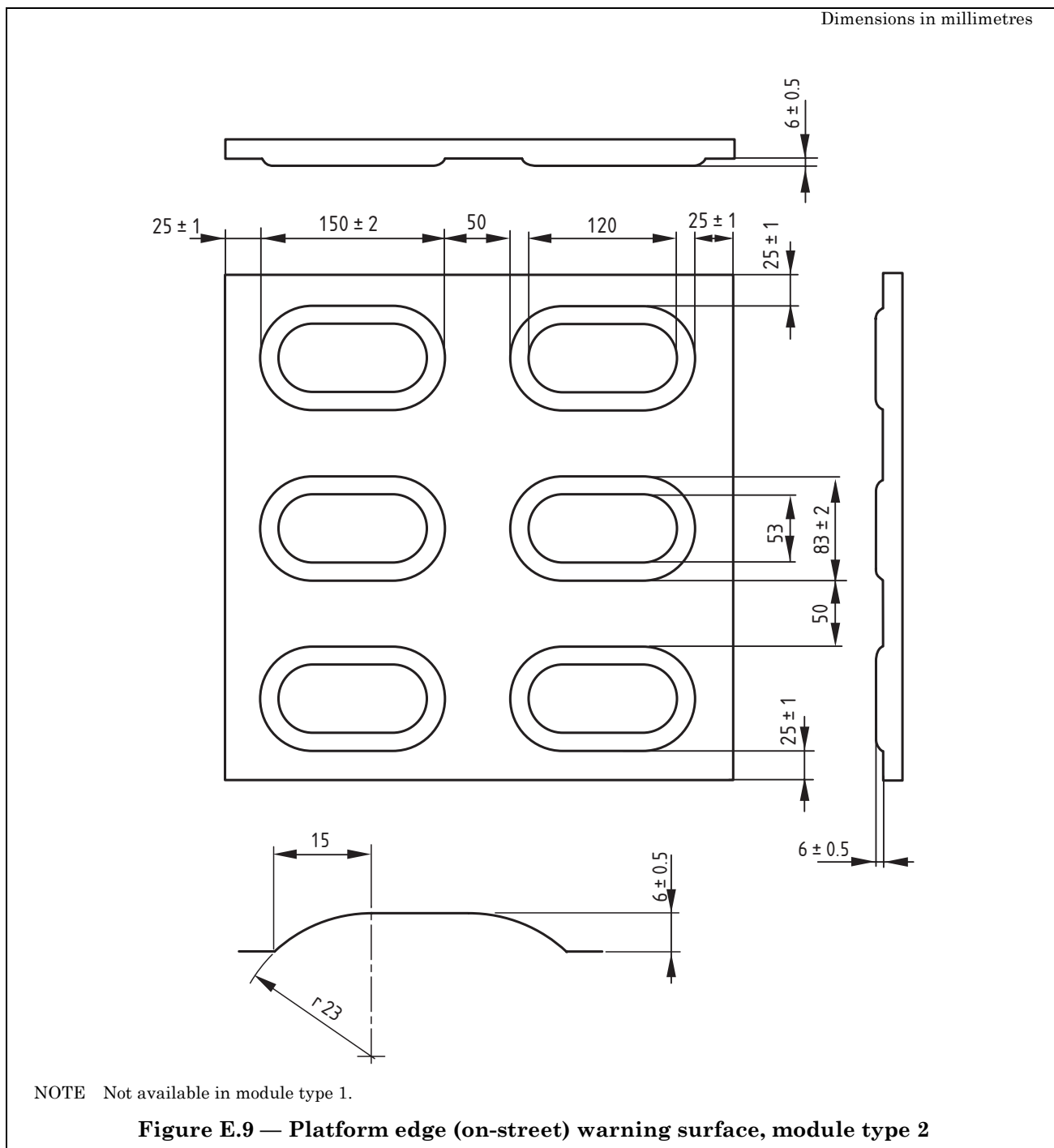
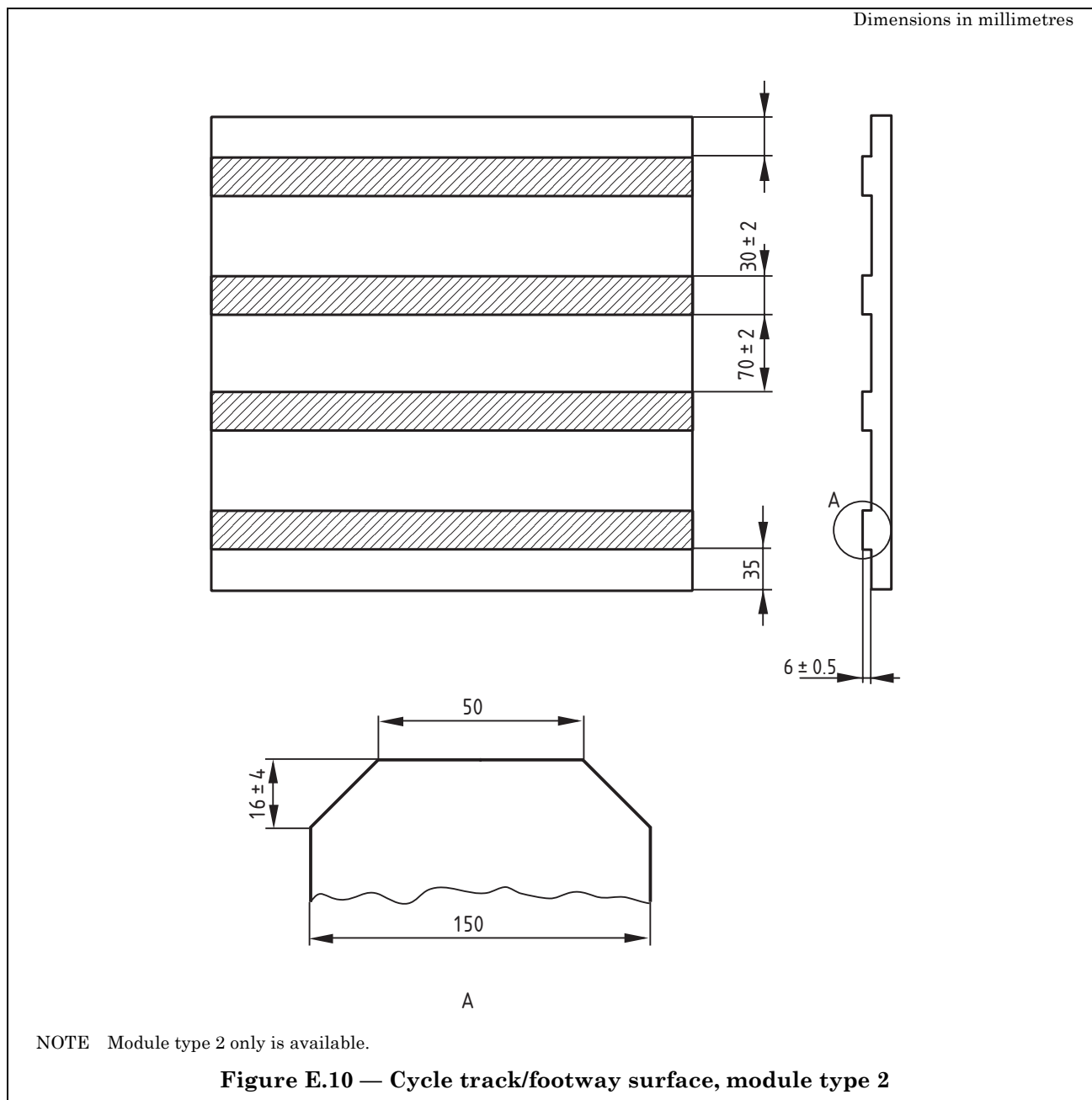
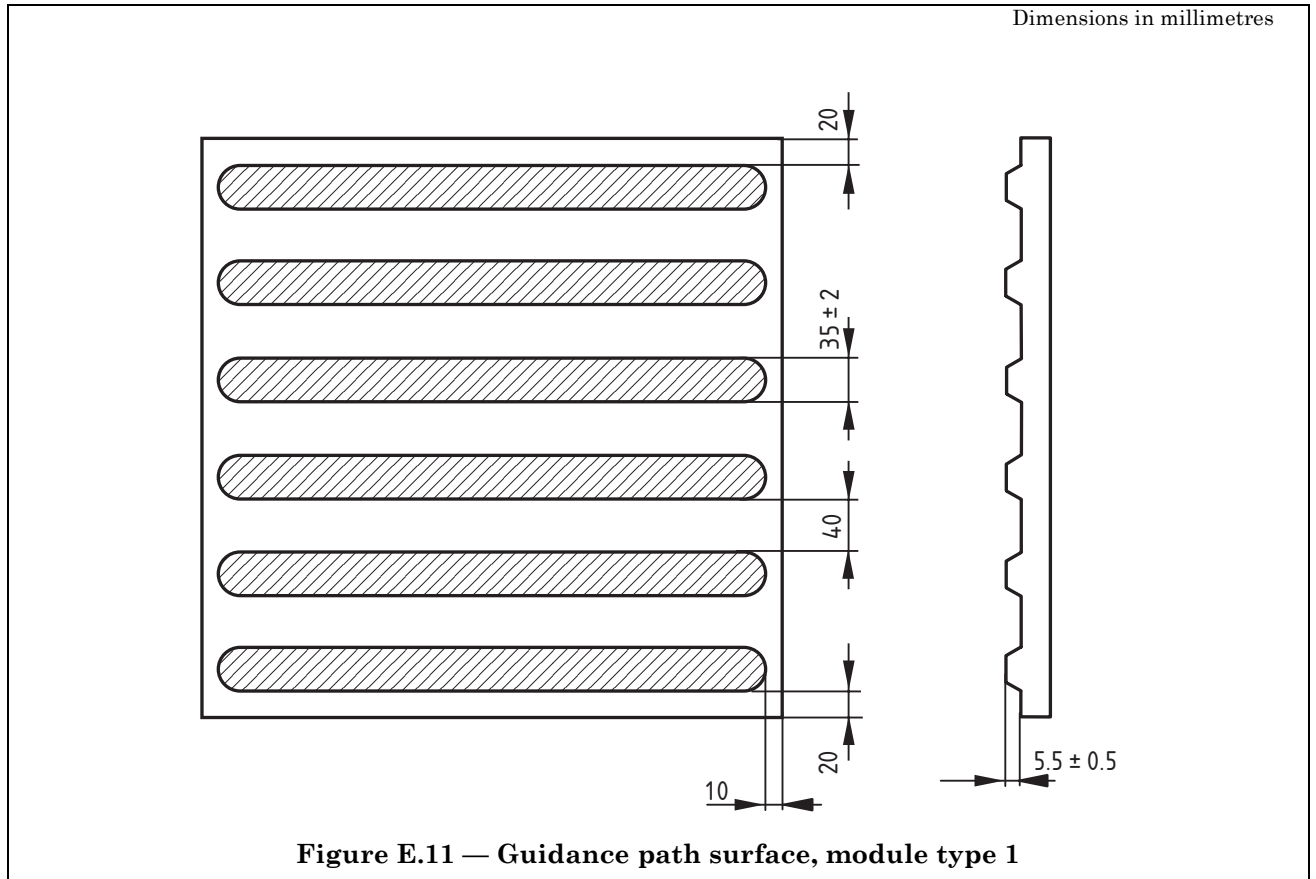


Figure E.8 — Platform edge (off-street), module type 2







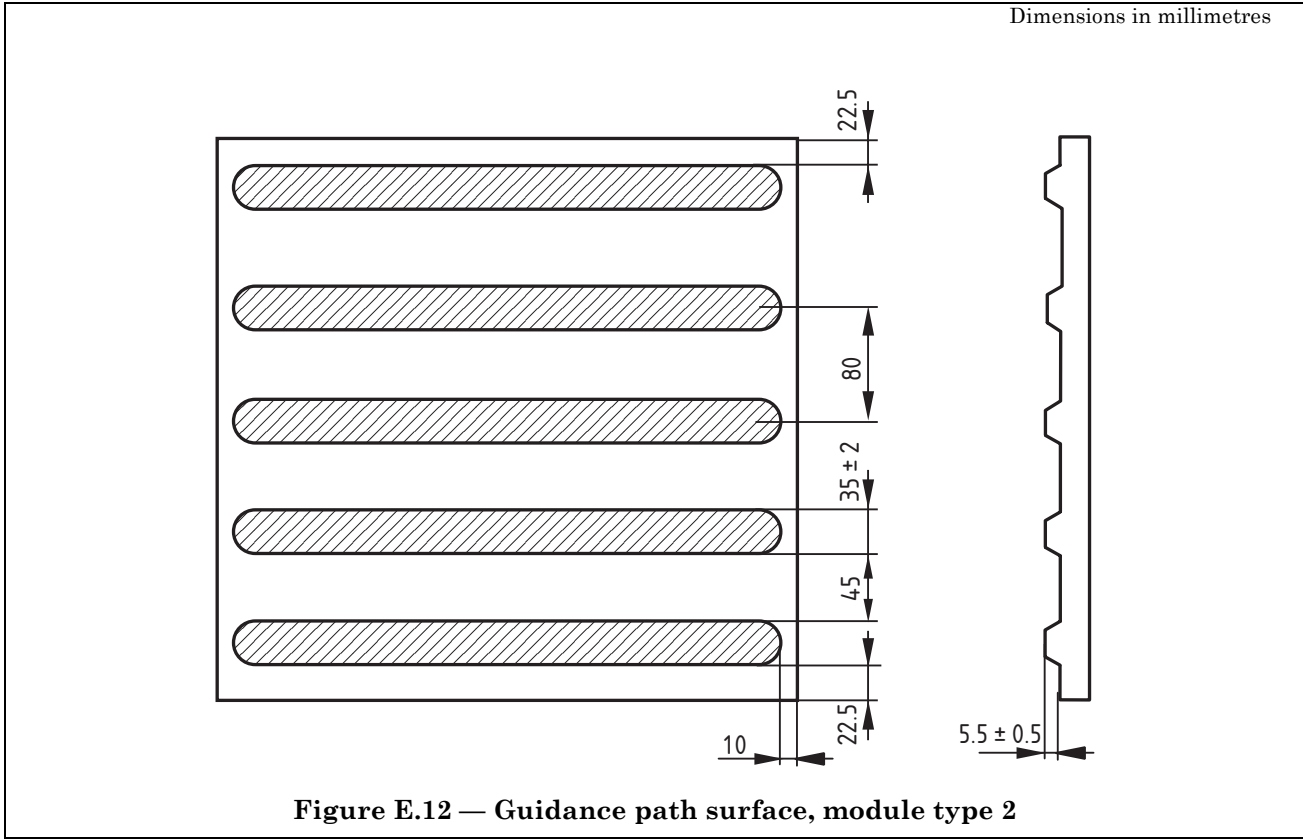


Figure E.12 — Guidance path surface, module type 2

Bibliography

[1] DEPARTMENT OF TRANSPORT, LOCAL GOVERNMENT AND THE REGIONS. *Guidance on the use of tactile paving surfaces*. 1999. London: DTLR Mobility and Inclusion Unit (www.mobility-unit.dft.gov.uk/index.htm).

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