

DS.219

General pedestrian accessibility issues related to surface design and street furniture

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1 Introduction

1.1 Notes

- a. This standard explains requirements about the design of walking surfaces and street furniture in order that these are accessible for pedestrians of all abilities. It applies both to footway surfaces and areas of the carriageway likely to be regularly used by pedestrians (e.g. at Formal Crossings).
- b. See the SSDM webpages at [Southwark SSDM](#) about the design of streets and spaces.

1.2 Discussion

- a. It is important that any areas that are intended to be used by pedestrians provide safe and comfortable conditions for vulnerable people (including those who may use mobility or cognitive aids like canes, crutches, wheel-chairs or guide dogs). The evenness and comfort of the surface under-foot is a particular concern for pedestrians with mobility difficulties whilst the visual appearance of the surface and how distinct it is from areas used by vehicles is important to visually impaired people and some other user groups who require clear delineation of safe space (like young children or people with learning difficulties). Any items of street furniture within these areas also need to be adequately designed in terms of height and visibility to prevent them becoming a hazard or annoyance to partially sighted people and – where appropriate – to allow them to be used as informal seating opportunities for less mobile pedestrians (like older people) who may require regular rests along their route.

2 Requirements for pavement surfaces

2.1 Comfort under foot

2.1.1 General

- a. Areas that are intended to be used by pedestrians and wheel chair users

should provide comfortable, level and even surfaces (see note 1). Consequently If surfaces are

- i. modular unit paved then
 - units should have a flat face so not to destabilise or discomfort users. Faces *may* however be texturised (e.g. fine picked, flamed or shot blasted)
 - joints widths and height differences between neighbouring units should meet the requirements of BS 8300:2009, c.5.5.1
- ii. bound or unbound granular mixture paved (see note 2) then they should be dense enough to prevent high heels penetrating or sinking into them. Approving officers have discretion to require tests to demonstrate this or instruct that materials are not used if they have reasonable concerns that do not meet this requirement.

Any surface not meeting these requirements is non-accessible. Consequently it may not form part of the effective width for pedestrians and wheel-chair users that is required. If existing such surfaces are encountered within a project area and it is not possible to provide a route with an adequate effective width to that side of the street away from these then they should be removed. See however section 2.1.2 for further information about the potential use of riven or cropped face units, including reusing or relaying existing heritage slabs, setts and cobbles.

NOTE 1: In addition to footways, the above also applies to (a) sides of 'adjacent use' Cycle Tracks that are for pedestrians (b) areas in the carriageway at Controlled and Uncontrolled Formal Crossings. In the exceptional event that entirely 'shared surface' streets are permitted (e.g. streets that are shared to their entire width between pedestrians and vehicles – without any defined pedestrian only areas) then it will apply to the residual safe space corridors provided to either side of the street.

NOTE 2: Examples of bound and unbound granular surfaces include asphalts, resin bound gravel and self-binding gravel.

2.1.2 Using riven and cropped face paving units - including reclaimed/reused heritage slabs and setts

NOTE: Riven and cropped face units are those with undulating surfaces and/or joint widths/depths exceeding the permitted maximums recommended in BS 8300:2009. As a general principle, units should be as flat (and joints as narrow and shallow as) as possible. Those advertised as having either riven or cropped upper faces (or similar treatments) or creating wide joints should not be introduced within areas intended to be used by pedestrians and wheel chair users except for in special circumstances.

General

- a. Subject to meeting the requirements of providing adequate effective widths for pedestrians and wheel chair users within areas intended to be used by them, there is no objection on accessibility grounds to either new or reclaimed riven and cropped faced units being used
 - i. within footways (and other non-carriageway areas) as trim to provide informal delineation for blind and partially sighted people of either
 - vertical obstructions (like tree pit edges or items of street furniture)
 - the edge of the footway in the absence of an upstand kerb check (see section 2.2.1)
 - ii. to the side of any 'adjacent use' Cycle Track that is for pedal cyclists (see note 1)
 - iii. within the carriageway away from Formal Crossings (see note 2)

However, such surfaces should not be used as substitutes for formal tactile surfaces (for which see section 2.2.3)

NOTE 1: The light tactile and audible feedback created by riven units can encourage modest speed reductions by cyclists and may also help pedestrians hear cyclists approaching, increasing their comfort.

NOTE 2: They may be beneficial in this respect in helping to define crossing limits for blind and partially sighted people. The tactile and audible feedback created by the units is also likely to encourage slower speeds amongst vehicle users, though care must be taken to consider impact upon pedal cyclists.

Reusing existing riven slabs, cropped setts and cobbles

- b. Within Heritage SSDM Specification Areas and Heritage Centre Minor Variant Areas (but not elsewhere) it may be permitted by level 1 departure to relay or retain in-situ within effective widths for pedestrians existing riven slab, cropped sett or cobbled surfaces. This is subject to the following.
 - i. If it is proposed to retain the surface in-situ without disturbing it then it must be assessed on-site by the approving officer. They must be reasonably content with its accessibility.
 - ii. If it is proposed to relay existing reclaimed units then a trial panel of not less than 3 x 3 metres must be constructed during Detailed Design. Both the specification for the panel and the gang to be used must be agreed in writing in advance by the approving officer (see note 1). A specialist paving gang must be used (see note 2). The same gang must be retained to carry out the permanent works if the panel is approved. Following its construction, this trial panel must be assessed by the approving officer. They must be reasonably content with the accessibility of the surface. Subject to this, the departure may be granted (see note 3). However, a further on-site assessment must be carried out by the approving officer following completion of the works (as opposed to the trial panel) during Construction. That assessment should be considered as part of the Quality Audit in that stage and should be used to determine the need for any further snagging.

NOTE 1: That specification may include some mixing with new units.

NOTE 2: That specialist gang will need to have previous experience of successfully relaying a number of heritage pavements to high tolerances.

NOTE 3: When granting that departure approving officers should be mindful to carefully record the specification agreed and the tolerances achieved by the trial panel to inform later verification of the works. This is particularly important should the trial panel be intended for removal.

2.1.3 Gradients

- a. The gradients of any surfaces intended to be used by pedestrians and wheel chair users should not exceed the values in Table 1.

Direction of fall in relation to pedestrian path	Maximum (steepest) gradient allowed
Longitudinal fall	1:60 (1:100 target value) May be increased to 1:20 (but not steeper) by level 1 departure. However, any gradient steeper than 1:60 is considered a ramp and consequently requires regular landings along it. The length of those landings and distances between instances will be advised on a case specific basis by approving officers but will generally be as per BS 8300:2009, clause 5.8
Transverse fall (cross fall)	1:40 (1:60 target value) May be increased to 1:33 by level 1 departure or 1:25 by level 2 departure

Table 1 - Maximum gradients for pedestrian surfaces

2.1.4 Drainage

- a. Where introducing them cannot be avoided, then any surface channels within footways and other pedestrian areas for conveyance of surface water should have a flat profile. Dished or deep 'v' profile channels units should not be used. However, where identified in SSDM Surfacing Materials palettes then complimentary surface channel units having very shallow 'v' profiles with transverse gradients not steeper than 1:20 may be used.

NOTE: If adequate falls cannot be provided to prevent water ponding in front of Formal Crossing then linear drainage channels may need to be introduced.

2.2 Visual differentiation and legibility of surfaces

2.2.1 Distinguishing pedestrian only areas for those that vehicles are allowed to use

- a. Areas that are for pedestrians and wheel chair users only (like footways) should be Visually Distinct (as Appendix A) from neighbouring areas that vehicles are allowed to use (like carriageways and Cycle Tracks) (see notes 1-2). This should be achieved by using one of the following methods (as appropriate).

i. Method A – Contrasting side by side surfaces

Distinction between the surfaces is achieved by making each visually distinct from the other using two contrasting colours or tones. See also 'b' about potentially introducing some physical textural difference too.

ii. Method B – Contrasting strip between two similar surfaces

Distinction between the surfaces is achieved by locating a contrasting strip between them. The surfaces to either side of this may be identical or similar to one another. The width of the strip should be

- $\geq 450\text{mm}$ if it follows an upstand kerb step that is $\geq 60\text{mm}$ high
- $\geq 600\text{mm}$ if it follows an upstand kerb step that is $< 60\text{mm}$ high

.See also 'b' about the potential introduction of physical textural difference.

This requirement is considered to be Equalities Sensitive. Given this, a EqS Departure is required if it proposed to vary from it.

NOTE 1: This difference provides visual warning to pedestrians about the possibility of conflict.

NOTE 2: This does not always apply to Vehicle Crossings. As per standard DS.132, if these are 'occasional use' only (see standard for definition) then their plateaus are normally surfaced with the same materials as the neighbouring footways. However, if they are 'frequent use' then plateau surfaces are normally different (whilst blister tactile surfacing is also normally required to their edges).

NOTE 3: This width could be achieved either through a single feature (e.g. one very wide kerb stone) or a combination of two or more features (e.g. a kerb stone and an edge channel).

- b. Subject to the other requirements of this and other standards, introducing some informal physical textural difference may also be considered at boundaries between areas for pedestrians and wheel chair users only and those that vehicles are allowed to use as a supplement to the Visual Distinction required by 'a'. See '2.1.2a' for related discussion.

2.2.2 Patterned surfaces

- a. If patterns are introduced in pavement surfaces using intermediary restraints or other changes in materials (including potentially by mixing similar modular units of different colours or tones) then care should be taken to ensure that this will not confuse or inconvenience visually impaired people. Designers and approving officers should use their judgement in developing and assessing the suitability of proposals (see note 1). Approving Officers have discretion to require trial panels or areas to be produced or constructed to satisfy themselves about acceptability. However, if they are in any doubt over this then they also have discretion to require that an Accessibility Audit (ACA) of the proposals or constructed works is conducted (see also note 2). The suitability of patterns should be identified as a Point Of Enquiry within the Audit Brief for this.

NOTE 1: Subtle patterns and tonal variations may be acceptable. However, stronger contrasts will likely not. Particular care should be taken within carriageways and at Formal Crossings as partially sighted people are likely to pause to investigate any considerable contrast in materials to determine what this indicates.

NOTE 2: If the patterned surface is also intended to make that surface Visually Distinct from another then the requirements of section 2.2.2 also apply

- b. Conversely to 'a', in very wide expanses of surfaces that lack interrupting kerbed carriageways (such as in squares or large public spaces) providing clear patterns in surfaces can be beneficial to visually impaired users. This can help them to navigate across spaces away from the 'shorelines' created by buildings and kerbs. Such features should therefore be included. Designers and approving officers should use their judgement in developing and assessing the suitability of proposals (see note). However, approving officers have the same additional discretionary powers and responsibilities described in 'a'.

NOTE: To be effective, patterns should create clearly defined paths for users to follow that avoid potential obstructions. Reinforcement with textural surface differences may again be beneficial. Usefulness is likely to be undermined where an intended path is but one of many lines within a surface (the majority only being there for visual reasons). As such, the number of lines should be minimised. This is likely to require very careful design in order to ensure that the pattern integrates in a visually sympathetic way with the remainder of the space.

2.2.3 Tactile surfaces

- a. See standard DS.207.

2.2.4 Visual design of Cycle Tracks

- a. See standard DS.203 for further guidance on the visual design of cycle tracks.

2.2.5 Raised lip kerbs

- a. If raised lip kerbs, low walls, or similar are introduced within or to the edges of areas intended to be used by pedestrians (see note) then these should be Visually Distinct (see Appendix A) from the main walking surface of those areas. This requirement is considered to be Equalities Sensitive. Consequently, EqS Departure is required if it proposed to vary from it.

NOTE: This includes to raised edge planting beds and tree pits.

3 Requirements for upright street furniture

3.1 Visibility for partially sighted people

a. Items of street furniture should stand out from the ground surfaces of the areas in which they are located (and any other surfaces against which they will be seen) so that they can be identified by partially sighted people. This should be achieved by one of the methods below.

i. Method A – Total Contrast

Ensuring that the majority of item is finished in a colour or tone that is Visually Distinct (as Appendix A) from the background surface.

ii. Method B – Contrasting Band

Locating a horizontal band on the item of street furniture that is Visually Distinct (as Appendix A) from the background surface (and/or ground surface) against which it will be seen. This band should be

- $\geq 150\text{mm}$ wide if it is flush with the main surface of the item of street furniture or rebated into it by $< 8\text{mm}$
- $\geq 100\text{mm}$ wide if it is rebated by $\geq 8\text{mm}$ into the main surface of the of street furniture by $\geq 8\text{mm}$

Where achievable, the centre of the band should be located at 1.5m above ground level. However, if the total height of the item of street furniture is $\leq 1.6\text{m}$ then it should be located within approximately 200mm of the top of the item. Reflectorised bands should not be used unless this is either

- advised otherwise by approving officers
- permitted under other standards
- specifically permitted within SSDM/SER street furniture palettes for particular items.

3.2 Height

a. The height of item of upright street furniture should be as appropriate to their width.

Minimum depth of item in the horizontal plane in any direction (mm)	If the change in surface level to either side of item $\leq 250\text{ mm}$ then the required height of item above ground level on sides used by pedestrians – see note 4 (millimetres)	If the change in surface level to either side of item $> 250\text{mm}$ then the required height of item above ground level on sides used by pedestrians – see note 4 (millimetres)
< 450	≥ 1000	≥ 1100
≥ 450	≥ 575 - see note 4	≥ 1100

NOTE

- 1) *The requirements in this Table do not apply to formal benches and seats.*
- 2) *Alternative arrangements may be permitted by level 1 departure on an item by item basis. Careful consideration should be given to the possible trip/tumble hazard that may be posed to blind and partially sighted people and the possible consequences in the event of this or a collision.*
- 3) *The Highway Authority has considered the recommendation in ‘Inclusive Mobility’ (Department for Transport, 2005) that street furniture should be 1m high or greater in order to avoid risks to blind and partially sighted people. However, it is mindful of the need to provide informal seating opportunities for less mobile pedestrians for accessibility reasons. Where features are higher than 600mm it becomes difficult for older people (and other less agile people) to use them in this way. It is also mindful of the need to avoid features obscuring visibility of small children for other road users. 600mm is the height at which this becomes a concern. The Highway Authority reasons that, providing features are at least 450mm wide and 575mm high then, in the event that pedestrians unknowingly walk into them, they will have the opportunity to steady themselves from tumbling by placing their hands on top of the item (or similar). On the balance of these considerations it concludes that a height of 575mm is a reasonable minimum for wider items providing significant drops do not exist beyond them.*

Table 2 – General height requirements for vertical items of street furniture

3.3 Chains and ropes

- a. Except where 'b' applies, items of upright street furniture should not be linked to each other by chains, ropes or similar. Any existing instances encountered within project areas should be removed or designed out.
- b. In the Village SSDM Specification Area and Dulwich SSDM Minor Variant Area then – within publicly adopted and maintained areas of the Highway - chains may be provided between bollards if they are located to or around the edges of grassed or planted verges. However, they may not be provided in other circumstances and any existing instances encountered within project areas should be removed or designed out.

NOTE: The Highway Authority has given due considerations to the recommendation in Section 3.7 of 'Inclusive Mobility' (Department for Transport, 2005) that chains and ropes should not be used between items of street furniture owing to the trip risk they can pose to blind and partially sighted people. It agrees that this is generally avoidable in most locations. However, in the Village Specification Area and Dulwich Minor Variant Area (most of which are also designated Conservation Areas) chained bollards form an important and long established part of local character and identity. The Highway Authority notes that Inclusive Mobility does acknowledge that its recommendations should be viewed in the context of local heritage issues. Given this, the Highway Authority concludes that using chains remains appropriate in these limited areas providing it is restricted to edges to soft landscaped areas (as opposed to the edges of hard footways where these directly adjoin carriageways). It considers this an appropriate balance between heritage, safety and equalities concerns.

Appendix A - Visual Distinction between surfaces

- a. Surfaces are Visually Distinct from each other if they have a Light Reflectance Value (LRV) difference in dry conditions under natural daylight of
 - i. ≥ 30 if both surfaces are planar and one extends for only a small area (e.g. a visibility band on an item of street furniture or raised lip kerb that is not located in a substantial rebate)
 - ii. ≥ 25 if both surfaces are planar and extend for considerable areas (e.g. a footway surface and a carriageway surface at a Raised Table)
 - iii. ≥ 20 if both surfaces extend for considerable areas but one will be seen against the other in 3D form (e.g. a bollard or post viewed against a wall or pavement surface)

The surfaces should also have a LRV difference of ≥ 15 when both are wet. This does not exclude one or both of the surfaces from being composed of a mix of different colours or tones (though see below).

NOTE: Whilst Annex B of BS 8300:2009 suggests that slightly lower LRV values than those required above could be acceptable in some circumstances, this assumes well-lit, clean and controlled internal conditions. These are seldom found in Highway environments where lighting levels differ and pavements and other surfaces tend to quickly develop grey patinas due to heavy use and weathering. A more conservative approach is therefore appropriate.

- b. Advice on LRV values can be found in BS 8300:2009. In the absence of LRV information from product suppliers, this will be estimated by approving officers using either
 - i. one of the methods recommended in Annex B of that standard
 - ii. the 'grey scale photo comparison' method recommended in 'Inclusive Mobility' (Department for Transport, 2005)

See also however section 2.2.2 in the main design standard if one or both of the surfaces is composed of a patterned mix of colours or tones.