

DS.202

Delineating pedestrian space from and vehicle space

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Summary

This design standard explains requirements about how different areas within streets and spaces should be delineated from each other, paying particular attention to that between areas that are for pedestrians only (e.g. footways and footpaths) and those that vehicles can access (e.g. carriageways and cycle tracks). The following provides a summary of the key points.

Some method of delineation is nearly always required between pedestrian only areas and any areas that vehicles can access. This is important so that vulnerable people can identify the limits of safe space. However, in many locations it is also necessary to prevent or deter vehicles from overrunning pedestrian areas. This may put pedestrians at risk or damage pavements. Though not addressed in this document (see instead standard DS.219) surfaces for pedestrians only and those used by vehicles must always be designed to be visually distinct from each other. This applies to nearly all the features discussed below (with the exception of vehicle crossings). Normally this should be achieved by making one surface of distinct contrasting appearance to the other. However, in some instances a wide contrasting strip between the two could also be acceptable (with the surfaces to either side appearing the same). That contrast does not necessarily have to be 'loud' but it does need to be appreciable.

The standard interface required between footways and carriageways is a 100mm+ high upstand kerb step (or 125mm+ in new streets) with a 10mm bullnose to separate these areas onto different levels. In quieter and primarily residential streets a lower 60mm high kerb step (again with a bullnose) may be acceptable, though this is subject to the amount of vehicle traffic using the street, likelihood of vehicle overrun of footways (e.g. illegal parking by delivery vehicles) and possible pavement strengthening measures. However, a strongly supported alternative to kerb steps are linear tree pits or planting beds with two rows of natural stone trim. Where these are used to separate pedestrian only and vehicle access areas then these surfaces may be at the same

grade as each another. This is a useful means of achieving Level Surface designs whilst providing clear delineation for vulnerable people. The beds are also likely to be useful for meeting other important design requirements – from bio-remediation treatment of pavement surface water runoff to providing large rooting zones to support street trees.

Occasionally, kerbs with upstand steps > 150mm may be permitted or required in order to prevent or deter vehicles from overrunning footways else allow for storage of flood water. If the objective is to prevent vehicle overrun then designers will normally be required to explore the use of increased height kerbs before introducing bollards for these purposes will be permitted.

In certain limited circumstances in narrow streets with restricted access, it may be permitted to delineate pedestrian only areas for vehicle access areas using closely spaced items of street furniture whilst keeping the surfaces flush with one another. However, commuted sums will be required given the risk of regular vehicle strike, whilst many other caveats also apply.

Level Surface street designs that include no raised edge distinction between pedestrian only and vehicle access areas are not currently supported. Neither is use of corduroy tactile paving. Such approaches will only be considered where Design Pilot schemes to do so are agreed during the proposal phase. Before considering such approaches designers are strongly urged to review whether pedestrian only areas could not be defined from vehicle access areas by using low 60mm high kerb steps or linear tree pits or planting beds (as above).

Similar to the previous point on Level Surfaces, designers should note that (as per standard DS.201) leaving out pedestrian only routes altogether from streets and creating instead Total Shared Surface environments is not currently supported. This again will only be considered if a Design Pilot to do so is agreed during the Proposal phase. However, subject to appropriate design and traffic conditions there is no objection to some parts a street being Shared Surface – providing that convenient and continuous pedestrian only

routes are retained to either edge of the Highway for the minority of more vulnerable pedestrians. By careful design using linear tree pits or planting beds (see above) it will be possible to create Level Surface streets that have Shared Surface carriageways (or cycle tracks) to their centres and pedestrian only routes for vulnerable people to either side. This approach is likely to result in green, pedestrian and cycle friendly environments and is strongly encouraged for all new street and spaces.

Where 'adjacent use' Cycle Tracks are introduced then the side for pedestrians must be delineated from that for cyclists by either a raised profile 'camden kerb' feature or an upstand kerb step of $\geq 60\text{mm}$. linear edge tree pits or planters and brief lengths of street furniture may also be used. Flush delineation using a flat white line or change in surface material only is not acceptable. Designers should note that 'shared use' Cycle Tracks are not generally supported and so should not be viewed as a way around this.

Design of Raised Table features in carriageways requires great care - particularly if these span entire intersections. Whilst the move to omit guard railing from the footways surrounding these features has benefitted the majority of pedestrians it has complicated design for vulnerable people who typically relied on rails for safe space delineation. Given the current absence of nationally agreed alternatives, a strict 25mm upstand kerb (not 10mm or 15mm) must be retained around these features to all edges not defined by either:

- (a) blister tactile paving associated with pedestrian crossing points or
- (b) linear tree pits or planting beds.

Use of corduroy tactile paving is not acceptable. However, designers must take steps to minimise the extent of lengths of kerb defined by 25mm upstands alone by making blister tactile defined crossing points as wide as possible and locating these close to side roads so as to limit the extent of corners. If extended lengths of 25mm high kerb are unavoidable then introducing brief

lengths of street furniture to provide additional delineation may be acceptable (e.g. benches or cycle stands). However, this should generally be avoided as it often appears contrived and adds to street clutter. The furniture itself is also at risk of being struck by turning vehicles. Notwithstanding all these features, where Raised Tables are applied to entire intersections (or in other instances when they extend significantly beyond defined Formal Crossings) Accessibility Audits must be undertaken to confirm whether proposals are acceptable for blind and partially sighted people. Subject to the findings of the Accessibility Audit it may be necessary to introduce supplementary measures. In some instances all these concerns may make introducing a Traffic Carpet in place of the Raised Table a more practical solution.

Similar to other features, some kerb step must be provided between Inset Parking Bays and footway surfaces. Totally flush Inset Bays as have been used elsewhere in London (and in the past sometimes in Southwark) are not acceptable. Typically a 50mm high 60° battered kerb profile should be used. This helps retain a check to vehicles whilst still assisting pedestrian use of bays when they are not occupied. Where new Vehicle Crossings are created then a reasonable upstand kerb step of 50-75mm using a 50mm high 60° battered profile kerb is typically required. This helps take up the level difference between the footway and carriageway in a reasonably short distance, so limiting the intrusion of associated ramps into the footway (and in turn maximising the width of the level pedestrian plateau).

Pedestrian dropped kerbs should be flush (0mm). Other types of dropped kerb (e.g. for wheelie bin, cage or pedal cycle access to the footway) should use a 50mm high 60° battered kerb.

At bus stops, a special bus border kerb must be used to provide level access for passengers and avoid damage by vehicles as they pull up. This should be 140mm high.

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1 Introduction

1.1 Notes

- a. This standard explains requirements about edge delineation between footways (or other pedestrian only routes) and carriageways (or other routes used by vehicles). This includes upstand heights for kerbs where these are used.
- b. See the SSDM webpages at www.southwark.gov.uk/ssdm about the design of streets and spaces.

1.2 Discussion

- a. See Appendix A for background discussion.

2. General Requirements

2.1 Nominal heights and tolerances

- a. Unless explicitly stated otherwise, all the upstand step heights and other values stated in this standard are nominal values. Acceptable \pm tolerances for construction work on site can be found in Southwark Highway Specification series 1100 clauses. However – these tolerances are not available to the designer.

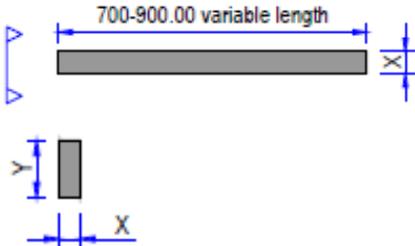
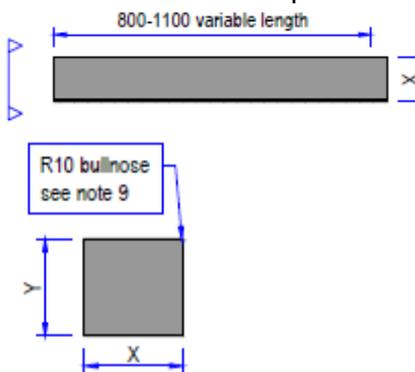
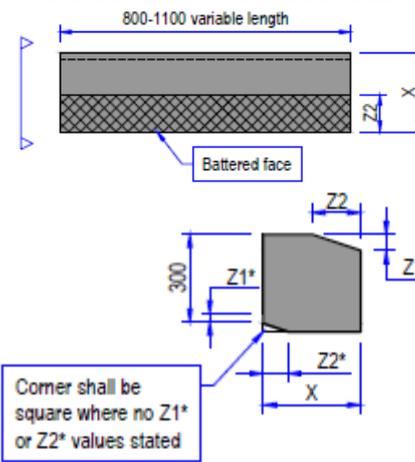
2.2 Southwark Standard Kerb profiles, Unit Types and Design Details

- a. As per standard DS.603, designers are required to use Southwark Standard Kerb Unit Types and Design Details wherever practical.
 - i. Standard Kerb Unit Types can be found in SSDM/TDR drawing LBS/1100/01 - 49. Related material requirements can be found in Southwark Highway Specification Series 1100 Clauses (see note)

NOTE: The vast majority of kerb units are required to be granite natural stone.

- c. Table 1 explains the five different kerb profiles typically used in Southwark. SSDM/TDR drawings LBS/1100/01 - 07 clearly states which of these profiles apply to the various Southwark Standard Kerb Units described in that drawing. The step heights that these profiles may be used at in different circumstances are explained elsewhere in this design standard.
- d. As per standard DS.603, Kerb Units will normally be Silver Grey in colour. However, Approving Officers have discretion to require use of other Colours (e.g. Mid-Grey or Dark-Grey as per Southwark Highway Specification Series 1100 Clauses) if this is necessary to satisfy standard DS.219 requirements in relation to visual contrast (see note).

NOTE: For instance, were raised edge tree pits or planting beds as section 3.13 introduced into a footway that had a light grey modular unit surface, then their edge kerbs may need to be Mid-Grey or Dark-Grey in order to be visible to blind and partially sighted people.

	Profile	Typical upstand heights	Typical applications
Type 0	Flat to all faces with square edges 	Flush (0mm)	<ul style="list-style-type: none"> - Edging kerb to rear of footway boundaries with landscaped areas - Vehicle Crossing interfaces with private hard standings - Carriageway edge channels
Type 1	Flat to all faces with 10mm rounded bull nose to top aris. 	Flush (0mm)	- Pedestrian dropped kerbs
		25mm	- Between the footway and Raised Tables (for very limited lengths only)
		60mm	<ul style="list-style-type: none"> - Between the footway and carriageway (in areas where there is a low risk of commercial vehicle overrun) - Between the footway and Traffic Carpets - Between sides of 'adjacent use' Cycle Tracks
		90-150mm	- Between the footway and carriageway (general use)
Type 2	60° batter (from vertical) to upper 25 or 50mm of upstand face. Vertical face beneath this 	25mm	- Between Inset Parking Bays and the carriageway (if a slight kerb check is required for drainage or other purposes)
		50-75mm	<ul style="list-style-type: none"> - Between Inset Parking Bays and the footway - To the base of ramps to Vehicle Crossings, cycle access dropped kerbs and service access dropped kerbs - To the edges of sections of Traffic Islands that accommodate pedal cycle stands.

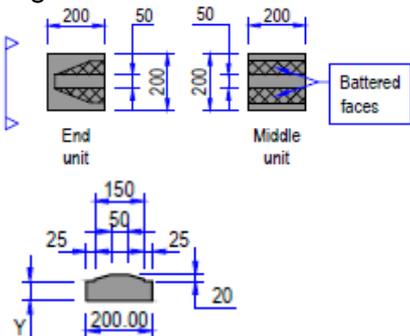
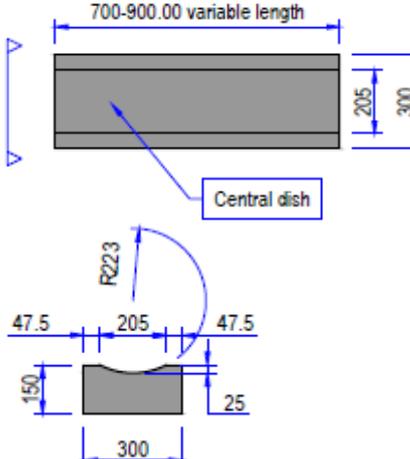
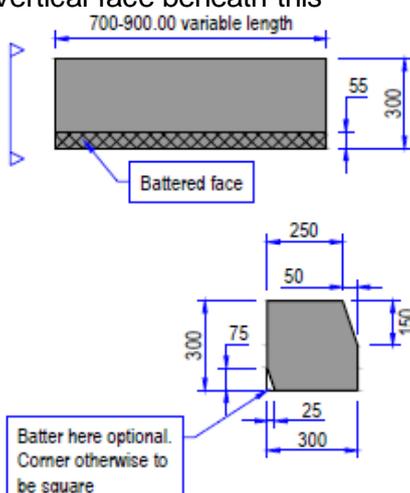
<p>Type 3</p>	<p>Camden kerb to TSRGD diagram 1049</p> 	<p>20mm above footway level</p>	<p>- Between the different sides of 'adjacent use' Cycle Tracks</p>
<p>Type 4</p>	<p>25mm deep shallow dish to upper face</p> 	<p>Flush (0mm)</p>	<p>- Carriageway edge channels</p>
<p>Type 5</p>	<p>20° batter (from vertical) to upper 120mm of upstand face. Vertical face beneath this</p> 	<p>120-140mm</p>	<p>- Between the footway and the carriageway at bus stops</p>
<p>Notes: See SSDM drawing LBS/1100/01</p>			

Table 1 - Kerb profile types and typical applications

3. Delineation requirements for different features and circumstances

3.1 Interfaces between the carriageway and footways

- a. Upstand kerb heights between the footway and carriageway away from the various features described in other sections of this standard should be
 - i. 100-150mm high in existing streets and spaces (see note)
 - ii. 125-150mm high in new streets and spaces (see note)
 A Type 1 profile should be used in both instances (see Table 1).

NOTE: Heights of around 125mm are desirable in most instances. This strikes a good balance between deterring casual vehicle overrun and avoiding an onerous step that might be difficult for less agile pedestrians to negotiate (else require a pronounced ramp).

- b. On non-principle roads
 - i. use of 60mm high upstand Type 1 profile kerbs may be permitted by level 1 departure. This will generally only be permitted
 - on primarily residential Road Category 3 or 4 streets (see note)
 - where it is demonstrated to the satisfaction of approving officers that there is no significant risk of vehicular overrun of neighbouring footways that might either
 - pose a risk to pedestrian safety or access
 - damage the footway pavement and/or require the use of non-standard methods of pavement design to prevent this
 - where it is demonstrated to the satisfaction of approving officers that mean average vehicle speeds are ≤ 22 mph or can be reduced to this by improvements associated with the proposed works
 - ii. if tree pits or other planting beds are defined by linear edges as section 3.13

then they may be used to delineate between footways and carriageways in place of the conventional upstand kerb steps in 'a' and '3.1.b.i' (see note 2).

NOTE 1: See standard DS.601 for further information about Road Category designations and the levels of traffic associated with these.

NOTE 2: Using tree pits and planting beds in this way is an acceptable and strongly encouraged means of achieving a Level Surface design permitting footways and carriageways to be at grade with each other.

3.2 'Adjacent use' Cycle Tracks

NOTE: See standard DS.203 for information about when cycle tracks may be introduced and in what format.

- a. One or a combination of the options in Table 1 should be used to delineate the side for pedestrians from the side for cyclists.
- b. The height of the upstand kerb step used between an 'adjacent use' Cycle Track and the main carriageway should be the same as required between the footway and carriageway as section 3.1.

NOTE: Street furniture to delineate the between cyclists and pedestrians can be considered but may generate visual clutter and appear contrived. as well as posing a maintenance liability.

3.3 Formal Crossings (pedestrian crossing points)

NOTE: See standard DS.206 for general requirements about the design of Formal Crossings. Formal Crossings may be Uncontrolled or Controlled.

- a. A flush interface (0mm upstand) should be provided between the footway and carriageway. A Type 0 kerb profile should be used (as Table 1). This treatment should be continued for 300-500mm either side of each side of each blister tactile surfaced area provided with the crossing – but not any further (see notes 1 and 2).

NOTE 1: See standard DS.207 about the maximum permissible length of kerb to which blister tactile surfacing may be used. Continuing the flush interface a little beyond this helps reduce the risk of blind and partially sighted users of crossings tripping on nearby upstand kerb steps should they wander off course slightly when crossing.

NOTE 2: Where Formal Crossings are located on Raised Tables then the above requirements mean particular care is needed when determining the length of the Table plateau. If it is wished to extend this for a distance greater than the maximum length of blister surfacing permitted by standard DS.207 then designers must use either or a combination of

- *street furniture to create informal barriers to the carriageway edge whilst retaining a flush kerb (see section 4.2)*
- *linear tree pits or planting beds as ‘3.1.b.ii’ to provide formal delineation to the carriageway whilst retaining a flush transition elsewhere.*

If neither of the above are achievable/acceptable then introducing a Traffic Carpet rather than a Raised Table may need to be considered.

3.4 Raised Tables

NOTE: See standard DS.111 for further requirements about the design of these features.

- a. Other than at associated Formal Crossing points for pedestrians (for which see section 3.3 and note 1), one or a combination of the following measures should be provided where footways interface with the plateaus of Raised Tables.
 - i. A 25mm high upstand kerb step. A Type 1 profile should be used (as Table 1) (see note 2). See however ‘b’ for further requirements
 - ii. Raised edge linear tree pits or planting beds as ‘3.1.b.ii’.

NOTE 1: This includes both the blister surfaced area of that Formal Crossing and the additional 300-500mm of flush kerb that is normally required to either side (as per section 3.3).

NOTE 2: This is the traditional method of delineating interfaces with Raised Tables. Though research has recently cast doubt upon its

suitability for visually impaired pedestrians, there is currently not a practical alternative suitable for widespread use. Given this, see ‘b’ about further check requirements to confirm acceptability for visually impaired pedestrians.

- b. If it is proposed to use a 25mm high upstand kerb step as ‘a.i.’ to delineate Raised Table plateaus from neighbouring footways then the following further requirements also apply.
 - i. Designers should minimise the extent of footway interfaces having this 25mm upstand by
 - maximising the width of blister tactile surfaced Formal Crossing waiting areas against the length of the Raised Table plateau (within the acceptable ranges for each – see note 1)
 - (where Raised Tables are introduced at junctions) locating Formal Crossings on these as close to the main junction space/corners as possible (see note 2). See standard DS.206 for some related requirements about maximum permissible crossing set-backs from the edges of junctions

Approving officers have discretion to instruct modifications to be made to design proposals in accordance with the above requirements (or to reject these altogether when they are submitted for Design Review) if they consider that designers have unreasonably failed to implement them.

- ii. If Raised Tables are applied to entire intersections (e.g. Intersection Tables) then - except if their interfaces with neighbouring footways are wholly defined by linear edge planting areas as ‘3.1.b.ii’ - the additional procedural requirements in Table 2 apply (see note 3). Based upon the findings of Table 2 activities, the need to introduce one or both of the following further delineation measures should be reviewed.
 - 2-4 rows of small cropped face modular cube units behind the kerb edge to provide further

informal physical textural emphasis.

- Upright street furniture to the kerb edge as section 4.2.2. Using cube/sphere bollards or seating plinths should generally be preferred wherever possible, but conventional bollards and other items may also be considered if it can be demonstrated that these features are inappropriate (see note 4)

This review will normally take place as part of a following Quality Audit.

Note that use of either measure requires level 1 departure.

If an acceptable design cannot be developed despite the above then it may be necessary to abandon introducing a Raised Table and consider instead an alternative feature like a Traffic Carpet (for which see section 3.5).

NOTE 1: See standard DS.207 about the maximum width of blister tactile surfaced areas at Formal Crossings. See standard DS.111 about the maximum length of plateaus to Raised Tables.

NOTE 2: This will help minimise the extent of corners and the possibility that blind and partially sighted pedestrians may not intercept areas of blister surfacing and so stray into the carriageway without realising they have left the footway.

NOTE 3: Approving officers may also require safety audits and accessibility audits to apply in other instances where they have doubt about the acceptability of proposals in terms of accessibility. For example: Where a side road Raised table is to be introduced and it is proposed to extend the plateau of the feature substantially beyond the defined Formal Crossing, using street furniture to delineate this additional area.

NOTE 4: Using street furniture to delineate the edges of Raised Table plateaus is likely to generate visual clutter and may also appear contrived. In addition, items are likely to pose a maintenance liability due to the risk of them being struck by turning vehicles. For these reasons use of street furniture in these ways should be avoided wherever possible and may not always be permitted.

1. Accessibility Audits

Unless agreed in writing otherwise by the approving officer, an Accessibility Audit must be undertaken during both the Detailed Design and Post Completion Workstages. The acceptability of Raised Table delineation proposals must be raised as a Point Of Enquiry within the Audit Brief. Proposals should be reviewed in light of the findings in the resulting Audit Report and modified if necessary. That review will normally take place as part of a following Quality Audit.

2. Consultation with vulnerable people

Unless agreed in writing otherwise by the approving officer, Vulnerable Persons should be consulted on the proposals as part of any public consultation and invited to comment in particular on this aspect of the proposals. Where no such consultations are to take place (for instance, if the project is associated with proposals to create an entirely new street under section 38 of the Highways Act 1980) then a Stakeholder Design Workshop with input from Vulnerable Persons is advised as part of any Quality Audit

3. Monitoring arrangements

Unless agreed in writing otherwise by the approving officer or Board Administrator, Quality Plans must be updated to include provisions for monitoring the effectiveness for visually impaired pedestrians of the implemented proposals during the Monitoring phase.

Table 2 - Procedural requirements where 25mm kerb upstands are used beside raised tables

3.5 Traffic Carpets

NOTE: See standard DS.111 for further requirements about the design of these features.

- Other than at associated Formal Crossing points for pedestrians (for which see section 3.3), where footways interface with Traffic Carpets a 60mm high upstand kerb should be provided. A Type 1 profile should be used (as Table 1).

3.6 Service access dropped kerbs (for containers, cages and wheelie bins)

NOTE: See standard DS.205 for further requirements about the design of these features.

- a. A Type 2 profile kerb with a 50mm high battered face should be used (as Table 1). The base of the battered face should be flush (0mm upstand) with the carriageway surface.

3.7 Cycle access dropped kerbs

NOTE: See standards DS.205 and DS.203 for further requirements about the design of these features.

- a. A Type 2 profile kerb with a 50mm high battered face should be used (as Table 1). The base of the battered face should be flush (0mm upstand) with the carriageway surface.

3.8 Vehicle Crossings

NOTE: See standard DS.132 for further information about the design of the features.

- a. Where footways interface with Vehicle Crossings no upstand kerb step should be provided. The footway should simply continue flush (0mm upstand) across the feature.
- b. Where ramps associated with Vehicle Crossings interface with carriageways, then requirements are as Table 3.

Type of premises served by vehicle crossing	Height of upstand kerb step used to the interface between Footway/ cycleway and carriageway in the vicinity (as section 3.1)	Requirements for interface between Vehicle Crossing ramp and carriageway			
		Kerb Profile (as Table 1)	Height of battered upstand face of kerb	Height of vertical upstand face of kerb below base of battered face	Total upstand height
Residential	>60mm	Type 2	50mm	0-25mm	50-75mm
	≤60mm		25mm	Flush (0mm)	25mm
Commercial	>60mm		50mm		25mm
	≤60mm		25mm	25mm	

Table 3 - Kerb requirements for interfaces between ramps to Vehicle Crossings and the carriageway

3.9 Cycle Tracks and carriageways for pedal cyclists only through spaces that are otherwise pedestrian only

- a. Where routes for pedal cyclists pass through spaces that are otherwise pedestrian only (see note) then - unless consent is obtained to introduce a 'shared use' Cycle Track - the limit of the route should be delineated to either edge using one or a combination of the methods described in section 3.2.

NOTE: The route for cyclists could be created either by defining an 'adjacent use' Cycle Track (the route being the side of this along which cyclists have a right of way) or by creating a carriageway signed as a prohibited 'route for use by pedal cyclists only'. The later is likely to generate less clutter in most instances.

3.10 Heights beside areas of kerb side parking

NOTE: See standard DS.128 for further information about the design of Inset Parking Bays.

3.10.1 Non-Inset Bays

- a. Requirements are the same as in section 3.1.

NOTE: The above applies to all interfaces with the footway – including kerb returns and tapers.

3.10.2 Inset Parking Bays

- a. Except where 'a' applies, all interfaces between Inset Bays and neighbouring footways (including end returns) should be delineated using either
 - i. a Type 2 profile kerb with a 50mm high battered face (as Table 1). The base of the battered face should be flush (0mm upstand) with the surface of the bay. See however standard DS.128 about the potential introduction of a narrow strip of modular cube units (or similar) immediately to the rear of the kerb if the bay is designated for (or likely to be used nonetheless) for loading
 - ii. linear planting beds as section 3.13. In some instances this may need to use a double-step design to deter overrun
- b. If Approving Officers reasonably consider that there is risk of significant overrun of the neighbouring footway by vehicles using the Bays that might compromise pedestrian safety then they have discretion to require that one or both of the following is used to all interfaces between the bay and the footway (including end returns).
 - i. A Type 1 profile kerb (as Table 1). The upstand presented by this should be as per that used to the general footway edge elsewhere (as per section 3.1)
 - iii. A raised edge linear tree pit or planting bed as section 3.13. This should have a total upstand height

of $\geq 180\text{mm}$. This is likely to necessitate the use of a double step detail.

3.11 Bus stops

- a. At boarding and alighting areas, upstand kerb steps at the footway edge should be 140-150mm high in new streets and spaces. A Type 5 profile kerb should be used (as Table 1). Approving officers have discretion in existing streets and spaces to permit the use of 120mm high upstand kerb steps using Type 1 profile kerbs (as Table 1) for less frequently used bus stops where the existing kerb height and profile is as such.

NOTE: Even where Level Surface streets are permitted, pavements must be built up to these heights at bus stops to provide level access to vehicles for passengers.

3.12 Traffic Islands (including those accommodating staggered crossings)

NOTE: See standard DS.113 for further information about Traffic Islands

3.12.1 General

- a. The end sections of Traffic Islands should be raised above carriageway level. The kerb upstand step to their edges with the carriageway should be 150-175mm high. If Traffic Islands are located on Raised Tables then this may be increased to 200mm for parts of those areas that overlap with ramps to those features. The difference in upstand step height within a section of an Island should not vary by more than 25mm. A Type 1 profile should be used in all instances (as Table 1). If traffic Islands do not accommodate pedestrian crossing paths or pedal cycle stands then this detail should be applied to all other edges of the Island too (e.g. not just the ends)
- b. If a pedestrian crossing route passes through an island then – unless the route is staggered (for which see section 3.12.2) that section of island should be:

- i. set at approximately the level of the neighbouring carriageway (see note 1). The points of entry and exit to the Island for pedestrians should be treated as Formal Crossings as per section 3.7 - unless no blister tactile is provided to them (see note 2) in which case they should be simply flush with the carriageway
- ii. internally separated from the end sections of the Island (and any sections that accommodate pedal cycle stands) by a minimum 60mm high upstand kerb step or interspacing section of raised pavement. A Type 1 profile should be used for this.

NOTE 1: A slight increase in level from the carriageway may sometimes be necessary to prevent surface water run-off from the carriageway ponding within the island.

NOTE 2: Blister tactile may be omitted where islands form part of a Through Crossing arrangement. See standard DS.113 for further information.

- c. If pedal cycle stands are provided in a section of an Island then
 - i. that section should be set at approximately 50mm above the level of the neighbouring carriageway
 - ii. the edges that section that bound the carriageways should be delineated using a Type 2 profile kerb with a 50mm high battered face (as Table 1). The base of the battered face should be flush (0mm upstand) with the carriageway surface
 - iii. that section should be separated from the end sections of the island (and any sections that accommodate pedestrian crossing routes) by a minimum 60mm high upstand kerb step or interspacing section of raised pavement. A Type 1 profile should be used for this.

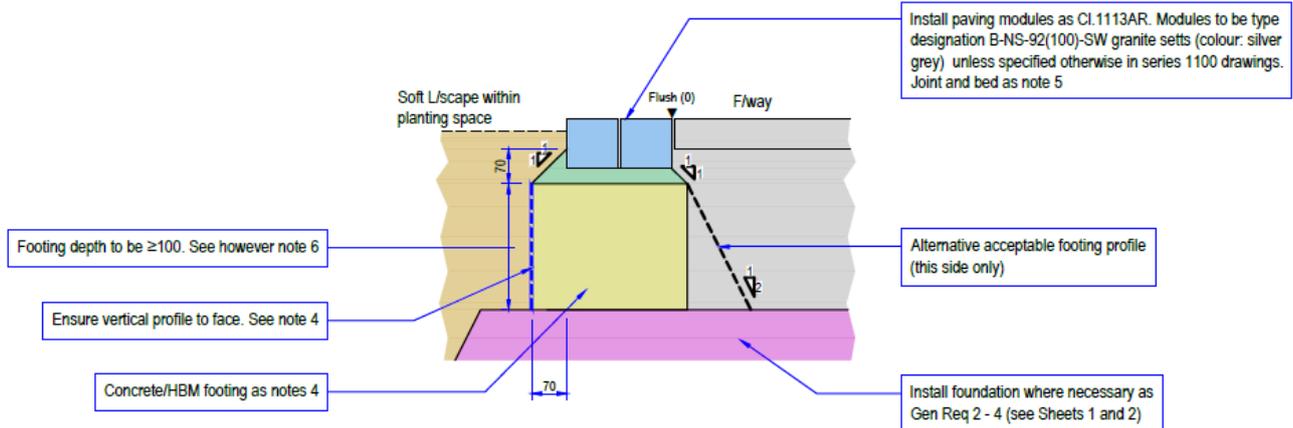
3.12.2 Additional requirements for islands that include Staggered Crossings

- a. If sections of Traffic Islands accommodate staggered pedestrian crossing routes then that section of the island should be raised above carriageway level by a minimum ≥ 90 mm high upstand kerb step. A Type 1 profile kerb (as Table 1) should be used for this. However, the end sections of the island (and any areas that accommodate pedal cycle stands) should be internally separated from it by a minimum 60mm high upstand kerb step or interspacing section of raised pavement.

NOTE: It is important that pedestrians should follow the stagger as the carriageways to either side of the island may operate to separate signal timings. It does not therefore follow that just because a green man is showing for the first carriageway, this will also be the case for the second.

3.13 Raised edge tree pits and planting beds

- a. If linear tree pits or planting beds are used to delineate pedestrian areas as '3.1.b.ii' then two courses of natural stone cubes are preferred laid flush to all edges of the tree pit (see Type M detail below and on drawing LBS/1100/29). However, raised edge tree pits are permissible and upstand kerb steps that are ≥ 150 mm high should be provided to all their edges (see note). Type 1 profile kerbs should be used to all outer edges (as table 1). The minimum width of the raised edging and the level difference to the rear of this into the planted area should be as Table 4. See also standard DS.129 about achieving visual contrast between the top of the edging and the surrounding pavement.



NOTE : If a tree pit is located in a Build Out along the carriageway edge, then the requirement to provide an upstand kerb step applies not only to those sides of the pit that interface with the carriageway, but also those which interface with the footway. An exception to this is if the Build Out is isolated from the footway by an open channel feature and associated upstand kerb steps.

- b. If tree pits or planting beds are located in
- Build Outs between Inset Parking Bays
 - other locations within or close to carriageway edges where they are at heightened risk of vehicle overrun (see note 1)

then a Type K double-step kerb detail as SSDMTDR drawing LBS/1100/26 (see extract below) should be used to those edges of the planted area that are exposed to potential vehicle overrun (see notes 2 and 3). Approving Officers have discretion to instruct use of this detail where they reasonably consider that there is such a risk. See also 'c'.

Height of edge restraint above ground level (mm)	Width of top of edge restraint (mm) see note 1	Maximum level difference between top of edge restraint and surface grade within planting area (mm)
< 225	< 450	≤ 50
	≥ 450	≤ 100
≥ 225 but <575	< 450	≤ 100
	≥ 450	≤ 300 (but \leq the height of the edge restraint above ground level on the paved side)
≥ 575	As per standard DS.219 height requirements for vertical items of street furniture	

NOTE
1) If double kerb step details are used then this value is the combined width of both kerbs.

Table 4. Height/width requirements for linear delineation features to tree pits and planting beds

NOTE: As per the requirements of standard DS.213, designers should note that increased kerb heights are amongst the various preferred solutions to overrun problems that must be fully explored and discounted before departure to introduce bollards will generally be considered.

- b. Increased height upstand kerb steps should be as per Type A or K details as SSDM drawings LBS/1100/10 and LBS/1100/26, being either single step or double step. Alternative details may also be permitted by level 1 departure if good reason to do so can be demonstrated.

4.2 Delineation of pedestrian areas using upright street furniture only

4.2.1 Use to significant lengths within quiet new residential streets and spaces

- a. This section applies only to streets and spaces that meet the following criteria.
 - i. The street or space is
 - either entirely new or a comprehensive redesign/construction of an existing street or space
 - overwhelmingly residential
 - ii. Access for motor vehicles through the street or space is restricted to waste and recycling collection vehicle access only and/or limited access to ≤ 50 off-street parking spaces. The latter should be overwhelmingly residential
 - iii. No access or through-route is provided or permitted through the street or space for other motor vehicles than those as 'ii.' (see note 1).
 - iv. One or other of the following measures is provided for waste and recycling collection vehicles (and any other large vehicles requiring access) so that no complex manoeuvring by these is necessary within the Highway (see note 2)
 - A direct through-route
 - An off-Highway turning space

- ii. Waiting and loading is formally prohibited within the Highway, with no spaces/bays provided for this.

NOTE 1: This will require statutory access prohibitions implemented by Traffic Management Orders. In some instances, physical restrictions on access may also be required. Where access to off-street parking spaces is to be provided then this should be primarily for residential vehicles. However, very minor commercial vehicle access may also be permitted.

NOTE 2: This is both to reduce the likelihood of street furniture being struck by turning vehicles (and the subsequent repair and reinstatement costs that would follow) and to minimise risk to pedestrian users of the street.

- b. If the criteria in 'a' are met then – subject to agreement to a level 1 departure - upright items of street furniture and associated measures arranged as 'c' may be used to delineate pedestrian only areas from vehicle access areas for any length.
- c. Using upright items of street furniture only for delineation purposes as 'a' is subject to the following further requirements.
 - i. Use should be to a single side of the street at a time with raised edge linear tree pits or planting beds as '3.1.b' providing delineation to the other. Approving officers have discretion to permit very brief lengths where street furniture is used to both sides at the same time in order to achieve pleasant landscaped street scapes. However this should be the exception rather than the rule with the majority of the length of the street being as described above
 - ii. Commuted sums are required owing to the likelihood of occasional vehicle knockdown and subsequent need for straightening or replacement of items. These will be determined on a case specific basis
 - iii. Where such details are used then an Accessibility Audit of design proposals must be carried out in the Detailed Design phase (see note 1).

- The effectiveness of delineation proposals should be made a Point of Enquiry in the Audit Brief. Within the following Quality Audit, the proposals should be reviewed in light of the findings of the resulting Accessibility Audit Report and modified if necessary
- iv. Arrangements of vertical items of street furniture should read as a natural part of the street scene. They should not appear contrived or create an undue sense of clutter. Approving Officers have discretion to reject proposals if they believe that they fail in these respects
 - be easy to follow and interpret by visually impaired people. Meandering edges with significant undulation and/or varying set backs are unlikely to be acceptable. Gaps between items should not be greater than 1.2m (measured between their edges rather than centre to centre - though see note 2). Temporary items (such as parked pedal cycles) should not be relied on to fill large gaps. Approving officers may instruct designs to be modified if they consider them to be unsuccessful in these respects
 - v. If delineation via upright items of street furniture alone is used for distances > 5m then - unless level 1 departure is agreed or alternative instructions are provided in writing by approving officers - a 25mm high upstand kerb step should also be provided to serve as a surface water check. This should normally adopt a Type 2 profile (as Table 1) – though approving officers have discretion to permit use of Type 1 profiles if kerb radii etc. make use of Type 2 profile units impractical
 - vi. 3 or more rows of cropped face modular cube units should be used in association with the edge established by the vertical street

furniture to provide additional informal delineation of vehicle access areas. This may element may be left out by level 1 departure if a 25mm upstand kerb step as 'v' is provided and it is demonstrated to the satisfaction of approving officer that this works attractively within the landscaping scheme for the wider streetscape.

NOTE 1: This is notwithstanding the provisions made in '4.2.1.a.iv.' to reduce the likelihood of such instances.

NOTE 2: Approving officers have discretion to permit an increased spacing of up to 1.8m between edges by issue of level 1 departure. This should normally only be considered where pedestrian movement is strongly parallel to the line of delineation (e.g. there are no cross movements) and where that line itself is very straight and predictable.

4.2.2 Use to brief lengths in existing streets and spaces

- a. Subject to level 1 departure, in 20mph streets vertical items of street furniture may be used to delineate the edges of footways (or other routes for pedestrians only) from vehicle access areas for a distance of
 - i. $\leq 10\text{m}$ where used to provide delineate interfaces with Raised Table plateaus (see note 1) - but only where applied about the main junction space (see note 2)
 - ii. $\leq 7.5\text{m}$ where used to delineate
 - with 'shared use' Cycle Tracks
 - the different sides of 'adjacent use' Cycle Tracks
 - iii. $\leq 4\text{m}$ in all other circumstances

This is subject to the same requirements as '4.2.1.c.iii.- 4.2.1.c.v.'. However, it is stressed that using street furniture to delineate is to be avoided wherever possible owing both to the nuisance that street furniture causes to blind and partially sighted people and the likelihood of occasional knock-downs by turning vehicles. Approving officers must therefore be satisfied that such measures are necessary and unavoidable and that other alternatives

are not preferable. The Highway Authority reserves the right to require commuted sums to cover increased maintenance liabilities (see note 2).

NOTE 1: Normally this will be as an additional fall-back delineation measure owing to concerns about the acceptability of the originally proposed arrangement in terms of accessibility. Other arrangements should normally be explored and tested first before resorting to this. See section 3.4 for further discussion.

NOTE 2: The intended application here is to delineate the junction corners away from Formal Crossings points. This is of particular importance where Intersection Raised Tables that span entire junctions are introduced. Whilst Formal Crossings should be located as tight to the junction space as possible to minimise the extent of those corners, this is not always practical. As such, introducing street furniture here may sometimes be justified to prevent blind and partially sighted people from mistakenly wandering into the carriageway if they do not intercept blister tactile surfaced areas. This is as opposed to using street furniture to delineate sections of the Raised Table plateau that extend beyond Formal Crossings down particular arms of the junctions. This is generally unnecessary and easily avoidable and therefore falls under '4.2.2a.iii'.

NOTE 3: Where vertical items of street furniture are used to delineate areas for pedestrians from areas for pedal cyclists, and no motor vehicle access is permitted (other than for emergency response vehicles), then commuted sums should not generally be required. Where vertical items are used to provide additional delineation to Raised Tables as '4.2.2.a.i', then the need for commuted sums will depend upon the other options available and the preferences of the Highway Authority in respect to that which should be pursued. If the Highway Authority considers that other arrangements that would avoid the need for vertical items are preferable at that location then - should the Project Team wish to proceed with the current arrangement using vertical items – commuted sums will generally be required if

the Highway Authority is content to allow it. Conversely, if the Project Team prefer other options and the Highway Authority insists upon the introducing vertical items – or – where both the Project Team and Highway Authority mutually agree that the use of vertical items is preferable, then commuted sums will not normally be required unless high value items are being used.

4.3 Use of alternative methods of Level Surface delineation

- a. See standard DS.224 about the potential use of alternative methods of delineating Level Surfaces to those permitted in this standard. This includes the proposed use of Corduroy tactile paving.

Appendix A – Background

1 Discussion

- a. Many pedestrians rely on clear visual and tactile delineation of footway edges to help them navigate streets and spaces. This delineation also provides reassurance that they are in an area where they will not encounter vehicles. This is particularly important for vulnerable users such as blind and partially sighted people (who often use kerbs to navigate), young children (who may struggle to understand vague boundaries), and older people (who may not have the agility to safely mix with vehicles).
- b. Delineation of edges is also important to discourage vehicles from overrunning footways. In addition to providing confidence to users of footways that they can move free from harm, this also helps prevent potentially costly damage to pavements.
- c. Traditionally, the above roles have generally been performed by raised upstand kerb steps that serve to place the footway at a different level to the carriageway. The role of kerb steps in marking the limits of safe space is well understood by street users.
- d. More recently, some designers have suggested that other features that would not require a pronounced step might also be appropriate for delineating safe space. It has been suggested that these might be preferable in accessibility terms being easier for less mobile pedestrians to negotiate than a step. The major alternatives explored so far are very low kerbs (with only nominal steps) and various special types of tactile paving. However, it has also been suggested that appropriately arranged street furniture (e.g. lines of bollards, benches or cycle stands) might also be used to provide informal delineation of footway edges.
- e. The appropriateness of alternatives to kerb steps has become a subject of considerable national debate, and much effort has been spent on researching the various implications (see references). Major considerations include the extent to which the alternatives can be followed by blind and partially sighted people (who often use kerb steps to navigate) and whether or not the message they are intended to convey about the edge of safe space can be understood by other people. In addition, there are further engineering considerations such as how alternatives provide for highway drainage (kerb steps are often an important part of this as they direct water towards gullies) and whether they can adequately protect pavement constructions from damaging vehicle overrun. In the absence of effective protection, footway constructions will often need to be strengthened at likely considerable expense.
- f. Summarising broadly, whilst evidence is slowly emerging from the research mentioned above to suggest that certain types of tactile paving may provide acceptable alternatives to pronounced kerb steps¹ that can be adequately followed and interpreted by vulnerable people (including importantly, blind and partially sighted people) there are still considerable gaps in this and some findings are contested². These need to be closed down to ensure that the alternatives to kerb steps are safe and fit for purpose. The fact that the Council is subject to a statutory duty to promote equality for vulnerable people and to avoid discriminating against them provides added impetus³. In addition, many of wider structural and drainage implications of removing kerb steps are yet to be fully considered.

¹ See in particular MVA consultancy, (2010a, 2010b, and 2011).

² See in particular Moody, S. and Melia, S., (2011).

³ See The Stationary Office, (2010).

- g. However, at the same time this research has also drawn partly into question the appropriateness of some of the historic methods of delineating footway edges, such as the use of low 25mm high kerb steps. This is particularly problematic in the case of Raised Tables at junctions as there are not really any functional alternatives to low kerb steps that wouldn't create difficulties in some other respect else defeat the point of having a Raised Table at all. Whilst not introducing Raised Tables at junctions would be one response, these features provide significant benefits for the vast majority of users. Given the absence of alternatives, it is considered appropriate to continue to use 25mm high kerb steps beside Raised Table features for the time being, but to work with organisations representing visually impaired people to monitor these arrangements and consider the need for further additional features. In the absence of further national guidance it is hoped that in the longer term this may allow identification of a durable solution to this difficult design problem.

- h. Further related discussion can be found in the introduction to standard DS.224.

2 References and further reading

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