

DS.118

Build Outs

Rev.	Status	Created by	Date	Approved by	Date
A	Final	D.Farnham/D.Vasquez-Rossainz	27.02.12	D.Waters	27.03.12
B	Final	D.Farnham	23.04.13	D.Waters	08.05.13
C	Final	D.Farnham	05.11.13	D.Waters	14.11.13

1 Introduction

1.1 Notes

- a. This standard explains requirements about the use and design of Build Outs and other extensions of footways into the carriageway. It applies equally to Build Outs that are used to enclosed Inset Parking Bays.
- b. See standard DS.900 for definitions of terms used in this design standard. Note in particular the definitions for 'should', 'will', 'may', and 'approving officer' as used to describe requirements.
- c. See SSDM/PR procedure PC.082 about the status of any revised version of this standard that may be issued during the active life of a project.
- d. See the SSDM webpages at www.southwark.gov.uk/ssdm for a list of frequently asked questions about the design of streets and spaces.

1.2 Discussion

- a. Build Outs are local widenings of footways, verges or other areas that run beside the carriageway. They might be proposed for a variety of purposes including
 - i. narrowing the carriageway to slow vehicles and make crossing easier for pedestrians
 - ii. introducing chicanes or other horizontal deflection features to slow vehicles
 - iii. providing sufficient shelter to allow Inset Parking Bays to be created
 - iv. preventing vehicles from parking along a section of kerb by restricting carriageway space
 - v. providing more room for people, planting or street furniture.
- b. The above purposes are not mutually exclusive. A Build Out provided to achieve one will often achieve others too.
- c. Build Outs may be added to existing footways or created as part of entirely new (or substantially redesigned) streets or spaces.
- d. The principal concerns when designing Build Outs typically include
 - i. their successful visual integration with the existing footway (or other area adjoining the carriageway)
 - ii. management of carriageway surface water drainage issues (as a result of possible interruption of positive drainage paths at kerb side)
 - iii. road safety issues related to how users of the carriageway negotiate around them (particularly pedal cyclists who often track along the kerb edge).

Inevitably, there is often some tension between these concerns.

- e. Build Outs can be used to improve ease and safety of crossing for pedestrians in a number of ways. Whether the intention is to narrow the carriageway, reduce crossing distances, or to slow vehicle traffic to make crossing easier in general, they have a number of advantages over the use of traffic islands in the centre of the carriageway (which may be provided for similar purposes). See standard DS.113 for further discussion on this point.

2 Use requirements

NOTE: Whilst reclaiming existing under utilised carriageway space is strongly encouraged (see standard DS.100) introducing Build Outs is not generally a requirement. Except for the specific instances discussed in this section, when to do so is left largely to the discretion of designer's. Where introducing Build Outs is proposed than it is likely to be in order to assist in achieving another aim like widening the footway, discouraging inappropriate kerb side parking, making space street trees or creating opportunities for pedestrians to cross the street.

2.1 Improving ease of crossing carriageways for pedestrians

- a. Where works under section 38 or 278 of the Highways Act 1980 are undertaken to existing or new streets then
 - i. if there would be inadequate visibility of Controlled Crossings or Uncontrolled Crossings (see standard DS.114) and this cannot otherwise be addressed by relocating the crossing or obstructions to visibility (see note 1) then the crossing should be located on a Build Out to resolve the issue
 - ii. if works are undertaken to create or amend junctions Build Outs should be provided to all corners and through the junction space (see note 2)

Variation from the above requires level 1 departure.

NOTE 1: An example of where this could be necessary is where parking along the carriageway edge would obscure visibility of a crossing point. Bringing forward the crossing by locating it on a Build Out might assist with addressing this issue whilst retaining the parking.

NOTE 2: This is in order to prevent parking within the junction space, assist in maintaining visibility of crossing pedestrians (who will often cross informally away from defined facilities) and improve overall ease of crossing.

- b. The measures described in 'a' should be implemented in other circumstances wherever budgets allow.

3 Design requirements

3.1 Visual and physical integration with footways

- a. All Build Outs should be fully integrated into the neighbouring footway (or other area adjoining the carriageway) so that they appear as a natural extension of these (though see 'b' for an exception). Similarly, the main objective in determining the overall plan form of the Build Out should be to ensure that it appears as a natural extension of the footway rather than as a tacked on engineering after-thought. Accordingly Build Outs should
 - i. be surfaced within the same material as the neighbouring footway (as should any longitudinal surface channel between the two should one be required – see 'ii'). The transverse joints in the bonding pattern should continue without interruption from the existing footway, across any surface channel and through the Build Out

- ii. be designed to achieve a surface drainage cross-fall or long-fall to the carriageway in order to avoid the creation of unsightly gull wing details and the potential need for gullies or linear collector channels (see also section 3.9). If direct cross-falls to the carriageway cannot be achieved (see note 1) and introducing a longitudinal surface channel becomes necessary then – as per the requirements of standard DS.219 - this should have a flat profile (though see note 2). Such surface channels should be composed of the same material as used to the neighbouring footway and Build Out in order to provide a direct visual match with these. If a flat profile channel is used its width should be 250-350mm. Where necessary, kerbs should be notched at the point of discharge to the carriageway to allow for outfall of surface water from the channel. See also standard DS.601 about the required underlying construction for surface channel features
- iii. have a start and end Taper designed to appear as a natural development of the existing kerb line (see section 3.2)
- iv. not retain old kerb stones where they are added onto existing footways. These should be broken out and removed through the length of the Build Out.

NOTE 1: Standard DS.202 provides for a reduction in the height of kerb up stands to help with achieving edge drainage for these purposes.

NOTE 2: Standard DS.219 also permits the used of V-profile units where the gradient of the v is not steeper than 1:20 to either side. However, these must be complimentary special units from the same product range as the main footway surfacing.

- b. As an exception from 'a', subject to level 1 departure it may be permitted to allow individual Build Outs to be isolated from the footway by an open channel where both
 - i. the Build Out is not intended for pedestrian use nor would its location or design encourage this (see note 1)
 - ii. either
 - the entire extent of the Build Out will be a tree pit or planting bed
 - the Build Out serves only to enclose an area of kerb-side pedal cycle parking

In these circumstances the Tapers to either end of the Build Out should have 90° returns whilst the open channel must be ≥ 300mm wide and composed of a flat channel stone (see note 2). In order to permit this departure it must be demonstrated to the satisfaction of approving officers that the proposals are appropriate in terms of layout and character. Consistency with detailing of any other Build Outs nearby or which may be introduced in future should be important considerations.

NOTE 1: Where used by pedestrians then the open channel discussed elsewhere in this clause might present a minor trip hazard.

NOTE 2: 90° returns may not be practical in all instances. See section 3.2 for further discussion. The 300mm channel width is necessary to manage the risk of the gutter being blocked by leaves and other detritus. Similarly, the flat channel stones are necessary to achieve a flat profile that will allow surface water to drain positively along the carriageway edge as laying bituminous mixtures evenly is difficult in spaces narrower than 600mm.

3.2 Tapers and corners

NOTE: Tapers describe the change in angle of the edge of kerb line in the horizontal plane provided to create a Build Out. This is usually expressed as a gradient (e.g. 1:5 or 1 metre horizontal shift outwards or inwards for every 5m length measured along the centre line of the carriageway).

- a. If Tapers commence at distances following from the edge of a junction with another road (see note) or a Vehicle Crossing of
 - i. > 7.5 m for 20 mph streets
 - ii. > 12 m for 30 mph streets

then they should use the gradients and corner details in Table 1. Alternative greater or lesser gradients may be permitted by level 1 departure. It must be demonstrated to the satisfaction of approving officers that this is necessary to address an evidenced safety concern else that it will be beneficial to the overall quality of the streetscene and not introduce undue maintenance or safety concerns.

NOTE: The edge of the junction should be taken as the nearest edge of the side road or other intersecting carriageway, projected forward on its likely alignment prior to the commencement of any corner radii.

- b. If the Body section of a Build Out begins at less than the distances given in 'a' from the edge of a junction with another road (see note to 'a') or a Vehicle Crossing, then pronounced Tapers are inappropriate to those ends that face the feature. Instead
- i. those ends should be extended back at approximately their full width to the nearest kerb edge of that junction or Vehicle Crossing so that they can tie naturally into them using an appropriate radius or quadrant kerb (see note)
 - ii. the maximum (most pronounced) gradient used for this interfacial Taper should be 1:10 (5.75°). Slighter gradients than this should be preferred where possible
 - iii. kerb geometry approaching the junction or Vehicle Crossing should be amended where necessary to ensure that road users are correctly positioned approaching the feature (see section 3.5). If the down-stream end of a Build Out (that end not facing traffic approaching in the nearside lane of the carriageway) precedes a vehicle crossing then this requirement may be omitted by level 1 departure. It must be demonstrated to the satisfaction of approving officers that the proposed alternative arrangement is both safe and beneficial to the visual quality of the streetscene.

NOTE: See standard DS.106 for further information about corner radii at junctions.

- c. If the end of a Build Out encloses
- i. either a(n)
 - Inset Parking Bay for motor vehicles
 - similar prescribed or informal space for motor vehicle waiting or loading at the carriageway edge

then 600mm outer radius kerbs should be used to the convex (outer) corners to the taper returns at that end.
 - ii. either a(n)
 - Inset Parking Bay for pedal cycles
 - similar Inset Bay for storage or waste and/or recycling bins

then 300 or 450mm radius quadrant units should be used to the convex (outer) corners to the taper returns at that end.

See Table 1 about the geometry to be used to corners to other ends of Build Outs and in other circumstances.

No. of motor vehicles using nearside lane in the peak hour	Does end of Build Out abut kerb side parking or waste/recycling bin storage bay?	Required Taper gradient range – see notes 1 and 2		Kerb geometry to be used for corners	
		Minimum (slightest)	Maximum (most pronounced) – though see '3.2b'	External (convex)	Internal (concave)
< 600	No	1:1 (45 degree) or ≥1:12 (4.75°) or shallower - see note 3	1:0 (90°) – see note 4	600mm outer radius kerb	Angle intersection between straight kerbs. Pre-cut Angle units as SSDM/TDR drawing LBS/C/005 should be used wherever possible
	Yes	1:0 (90 degree) – see note 4		As '3.2c'	
> 600 but ≤ 1000	No	None	1:5 (11.25°)	600mm outer radius kerb	
	Yes	1:0 (90°) – see note 4		As '3.2c'	
> 1000	No	None	1:8 (7°)	600mm outer radius kerb	
	Yes	1:0 (90°) – see note 4		As '3.2c'	

NOTES

1) If a range is specified in this Table then the value used within this is left largely to the discretion of the designer and should be selected appropriate to the context (see note 2). However, approving officers may require the use of specific values where they consider proposals to be inappropriate to context (see note 2).

2) Broadly, sharper gradients (e.g. closer to perpendicular) are to be preferred wherever possible since they are more likely to result in successful visual integration of the detail and convey a lesser sense of highway dominance of the street scene. Where designers wish to extend the length of the Build Out then this is generally better achieved by extending the Body of the feature (see section 3.3) rather than providing extended Tapers. Use of shallower gradient values is most likely to be appropriate when traffic would be moving close to the kerb in advance of the Build Out (there being no parking or other features to keep it further out into the carriageway). In such circumstances, drivers and riders might have difficulty negotiating around too sharp a Taper whilst care must be taken to ensure that pedal cyclists are not squeezed dangerously together with other vehicle users as they pass. However, providing visibility of the feature is good, traffic conditions light and road users have plenty of advanced warning of the need to divert out (and opportunity to do so) then this may not always necessitate shallow Tapers.

3) Taper gradients of 1:12 or shallower are considered to appear visually as a natural development of the existing footway and are therefore acceptable. However in retro-fit situations, extending tapers in this way is likely to increase overall costs.

4) Standard DS.601 include provisions for local structural reinforcement of Build Out pavements at the ends of Inset Parking Bays to avoid damage to these from likely occasional vehicle overrun. See section 3.8 for further information.

Table 1 – Requirements for lead-in/out Tapers and associated corner details

3.3 Length along street of fully developed section of Build Out (Body)

NOTE: The fully developed section of a Build Out (referred to here as the 'Body') is that section excluding start and end Tapers when the Build Out is at its characteristic width.

- a. The length of the Body section of a Build Out (measured along the line of the carriageway) excluding Tapers should be as Table 2, appropriate to use.

Type of Build Out		Required length of Body section (see notes 1 and 2)
A.	Build Out accommodating a street tree or other amenity planting	≥ 3.5m (see note 3)
B.	Build Out not accommodating a street tree (or other amenity planting) but including a controlled or uncontrolled pedestrian crossing facility	As long as the blister tactile defined pedestrian crossing waiting area (see standard DS.206) plus a further 0.3m to each side of this. However, its overall length should be ≥ 3.0m in all instances
C.	Build Out not accommodating a street tree (or other amenity planting) and not including a controlled or uncontrolled pedestrian crossing facility	≥ 2.0m
D.	Build Out that accommodates a Vehicle Crossing	Not less than the length of the dropped kerb along the street (see standard DS.132) plus a further 1.5m to either side of this
E.	Build Out that is separated from the footway (or other adjoining non carriageway area), that includes none of the features as (A) or (B) and which serves only to protect Inset Bays within the carriageway that are provided for pedal cycle parking or waste and recycling bin storage	≥ 0.7m
<p>NOTES</p> <p>1) The term 'Body section' refers to the fully developed section of a Build Out (excluding start and end Tapers) when it is at its characteristic width.</p> <p>2) Much greater lengths than the permitted minimums are likely to be necessary in many instances in order to accommodate proposed activities or items on the feature else to secure highway visibility. The later point is likely to be of particular concern where Build Outs accommodate pedestrian crossing facilities, vehicle crossings, or cycle access dropped kerbs. See standard DS.114 for further information about Highway visibility requirements.</p> <p>3) This may be reduced to 2.5m for Build Outs enclosing perpendicular parking bays – provided that the width of Build Out extends to shelter the entire bay.</p>		

Table 2 - Minimum length of Body section of Build Out in different circumstances

3.4 Width across street of fully developed section of Build Out (Body)

NOTE: The fully developed section of a Build Out (referred to here as the 'Body') is that section excluding start and end Tapers when the Build Out is at its characteristic width.

3.4.1 Build Outs that enclose Inset Parking Bays

- a. See standard DS.128 about the width of Build Outs that enclose Inset Parking Bays.

3.4.2 Build Outs that are used to limit areas of kerbside parking in other instances

- a. Except where 'b' applies, if a Build Out precedes or follows a length of kerb side parking that is not within an Inset Parking Bay (see note) then it should protrude from the existing kerb line at least as far as that parking in order to fully shelter it. This also applies if those Build Outs continue through nearby junctions.

NOTE 1: As per standard DS.128, parking bays are only considered to be Inset when a Build Out is provided to either end of them. This may not always be the case. Sometimes parking may be permitted at kerb side (either as designated space or informally) with a Build Out provided at one end only. A common example of this is around junctions where Build Outs are often provided through them to deter vehicles from parking too close to the junction space (where they might obstruct visibility) and to improve crossing facilities for pedestrians). Lone Build Outs adjoining lengths of parking may also be introduced for similar reasons at isolated pedestrian crossing facilities located between junctions.

- b. As an exception from 'a' – but subject to agreement to a level 1 departure - if the width of the carriageway after narrowing would be less than the values in Table 3 then the width of the Build Out may be reduced down to a minimum of 1.0m (see note 1). It must be demonstrated to the satisfaction of approving officers that this will not encourage inappropriate parking behaviour and that it is generally appropriate in respect to street form. Use of such reduced width Build Outs by level 1 departure may also be acceptable in other circumstances where it can be demonstrated either (a) that this would be beneficial to street form and not create any safety or parking enforcement issues or (b) that the width restriction would impact unacceptably on traffic flow (see note 2).

NOTE 1: This may permit Build Outs to be provided where this would not otherwise be possible. For instance, in some circumstances the introduction of 2m wide Build Outs to all sides of a junction may narrow the carriageway to such an extent that vehicles would not be able to turn acceptably. Reduced width Build Outs are likely to be preferable to none given the road safety and ease of crossing benefits they offer.

NOTE 2: This will generally require the submission of a computer simulated vehicle autotracking assessment. Vehicle and lane use assumptions should be agreed with approving officers before undertaking this.

Street type (see notes)		Minimum width (metres)
A	Streets accommodating traffic equivalent to that on Road Category 1 and 2 and 3A roads (see note)	6.3m
B	Streets that form part of the Strategic Road Network	
C	Streets accommodating bus routes (excluding diversionary routes)	
D	All circumstances other than A-C above	5.0m
NOTES See standard DS.601 for details of the level of trafficking associated with different Road Categories. Alternatively, this can be advised by approving officers upon request. Where new streets are proposed then the appropriate Road Type will be advised by approving officers. This will be determined by scaling of the estimated vehicle trafficking.		

Table 3 - Minimum carriageway widths beneath which reduced width Build Outs may be used

3.4.3 All other circumstances

- a. In instances other than those discussed in sections 3.4.1 and 3.4.2, Build Outs may be of any appropriate width subject to the requirements of other design standards and other reasonable considerations.

3.5 Aligning traffic in advance of Build Outs

3.5.1 General

- a. When developing proposals for Build Outs, designers should demonstrate regard to achieving satisfactory comfort in the road layout for pedal cyclists - both when they are passing a feature and in the vicinity of it. The main objective should be to avoid pedal cyclists being squeezed and intimidated by other road users on the approach to a Build Out as they negotiate out to pass it. The appropriateness of proposals in these respects will be considered on a case specific basis by approving officers. In the event that it is not possible to agree acceptable arrangements by consensus with designers then this should be raised as a Point Of Enquiry within an Audit Brief for a Road Safety Audit (RSA). The proposals should be reviewed in light of the findings of the Audit Report. Normally this will take place within a following Quality Audit.

NOTE: See SSDM/PR procedure PC.040 for further information about Road Safety Audits and procedure PC.022 for further information about Quality Audits.

3.5.2 Build Outs located close to junctions and vehicle crossings

- a. If a Build Out is located on the down-stream side of a Vehicle Crossing or junction (e.g. the side of the junction or vehicle crossing furthest away from traffic approaching in the nearside lane of the carriageway) then designers should demonstrate regard to ensuring that traffic will be correctly placed up-stream of the Build Out. If it is suggested by designers that measures other than a further Build Out preceding the junction or Vehicle Crossing would be adequate for these purposes (for instance, kerb side parking) then this may be acceptable subject to level 1 departure. Should the approving officer consider that such proposals are likely to be acceptable and therefore be minded to grant the departure then they should do so initially In Principle Only. The acceptability of this aspect of the proposals should then be raised as a Point Of Enquiry within an Audit Brief for a Road Safety Audit (RSA - see note 1). Any Final Confirmation should be withheld until after review of the related findings of the RSA Audit Report. Normally that review will occur as part of a following Quality Audit (see note 2).

NOTE 1: See procedure PR.040 for further details about Road Safety Audit procedures, including raising Points Of Enquiry within any Audit Brief.

NOTE 2: See procedure PC.022 for further information about Quality Audits.

3.6 Use of hazard awareness features to increase conspicuousness of Build Outs to road users

- a. See standard DS.314 about the potential use of guide posts, traffic bollards, road studs, kerb markers and other hazard awareness measures to improve the conspicuousness of Build Outs.

3.7 Correction of access ramps to vehicle crossings

NOTE: See standard DS.132 for general information about the design of vehicle crossings.

- a. Where Build Outs enclose both sides of a Vehicle Crossing, the base of the ramp to that feature should align with the edge of the Build Out. Existing ramps should be brought forward where necessary. They may not be left recessed.

3.8 Structural design of Build Out pavements

- a. See standards DS.601-603 about the structural design of pavements. The requirements of these standards are equally applicable to Build Outs (including associated surface channel features where these are required). If Build Outs accommodate street trees then reference should also be made to standard DS.501.

NOTE: If Build Outs enclose Inset Parking Bays and other areas of kerb side parking and are to be surfaced with flag or slab units then note in particular the requirement as standard DS.601 that – in most instances - a bound upper layer construction as Section 4 of that standard be used for at least the first few metres of the Build Out after the bay (and sometimes all of it). This is in order to prevent excessive damage to flags/slabs from vehicle overrun. Similar requirements also exist where Build Outs are provided locally through junctions.

3.9 Drainage considerations

- a. If Build Outs interrupt positive drainage paths at the carriageway edge then collector gullies should be introduced within the carriageway immediately in advance of or following them to prevent ponding. Except for in the limited circumstances described in '3.1b' Build Outs should not be isolated from the footway to retain an open drainage channel. Neither should covered drainage channels be introduced between the Build Out and footway.

NOTE: See standard DS.703 for information about the design of collector openings.

- b. As discussed in section 3.1, introduction of yard gullies and linear collector openings in Build Outs should be avoided. Where direct drainage cross falls to the carriageway cannot be provided to allow for edge drainage, then this should be achieved using longitudinal surface channels. Yard gullies may be introduced by agreement to a level 1 departure where it can be demonstrated that surface channels alone would be ineffective. Use of linear collector openings will require agreement to a level 2 departure.