

# 11-00- Kerbs, Footways and Paved Areas

## 11-01 Kerbs and Channels

All kerbs and channels irrespective of type shall be laid, bedded and backed in accordance with this specification. They shall be laid true to line and level, shall provide a flowing alignment and be to the satisfaction of the Engineer. No longitudinal fall shall be less than 1 in 150. For block paved roads no longitudinal fall shall be less than 1 in 100.

## 11-02 Precast Concrete Kerbs and Channels

- a. Precast concrete kerbs shall generally be 125 mm x 255 mm half battered, and shall comply with BS EN 1340, and shall be hydraulically pressed. Precast radius kerbs shall be used on all radii up to 10 m.
  - Precast concrete dropped vehicular crossing kerbs (Centre Kerbs) shall be 125 mm x 178 mm and shall comply with BS EN 1340, except dimensionally and shall be hydraulically pressed. They shall be used in conjunction with the correct transition Kerbs to BS EN 1340 and shall be hydraulically pressed.
  - Precast concrete pedestrian crossing kerbs (Bullnosed) shall be 125 mm x 150 mm and shall comply with BS EN 1340, except dimensionally and shall be hydraulically pressed. They shall be used in conjunction with the correct transition Kerbs to BS EN 1340 and shall be hydraulically pressed
- b. Precast concrete channels shall be 150 mm x 150 mm and shall comply with BS EN 1340, except dimensionally and shall be hydraulically pressed.
- c. Precast concrete channels laid on radii up to 10m shall be cut to a maximum length of 33% or 50% of a full kerb as appropriate. On some occasions, the Engineer may require 225 mm x 125 mm radius channels to be used. (Standard Detail B3)
- d. Precast dished channels shall be 150 mm x 125 mm or 255 mm x 125 mm and shall comply with BS EN 1340, except dimensionally and shall be hydraulically pressed.
- e. NYC expect Developers to use Pre-made Internal and External corner units and Cut Quadrants shall be used for all corners with an angle of 45° or greater. In some locations the use of tight radius kerbs may be permitted subject to prior written approval by the Engineer.

## 11-03 Natural Stone Kerbs for Conservation Areas

Natural stone kerbs shall comply with BS EN 1341 and be made of igneous rock of a size 200 mm x 150 mm x 75 mm. Samples shall be submitted to and approved in writing by the Engineer prior to their use. The kerbs used shall be equivalent to or superior to the approved sample.

#### 11-04 Setts

Setts for use in the highway shall be natural stone granite, whinstone or York stone. Samples shall be submitted to and approved in writing by the Engineer prior to their use. The setts used shall be equivalent to or superior to the approved sample.

#### 11-05 Blue Brick Channels

Where approved by the Engineer, a Staffordshire blue brick channel (often referred to as scoriae blocks) complying with the requirements of BS EN 771 -1 or Class A engineering bricks may be used. It shall be laid as shown on Standard Detail B4 on a concrete foundation bedding of ST2 concrete. The Engineer may permit the use of charcoal 200mm x 100mm x 80mm concrete blocks laid upside down to be used as a substitute.

#### 11-06 Combined Kerb and Drainage systems

- a. Where systems using gullies and standard kerbs are not practical, the Engineer may consider the use of combined kerb and drainage units. The use of combined kerb / drainage units shall not be permitted without the prior written approval of the Engineer.
- b. The kerbs shall be suitable for use in any kerb location as defined in BS EN 1433, and SHW with a Loading Classification E600. A sample of the unit to be used shall be provided to the Engineer before works start.
- c. A built-in trapped gulley shall be provided, the design of which shall be approved in writing by the Engineer prior to works commencing.
- d. They shall be wet laid on a bed of ST2 concrete 200 mm deep. The joints of the lower units shall be sealed with the manufacture's approved sealant.
- e. The upper units shall bed on to the manufacture's approved bedding and laid to line and level. The line and level shall be approved by the Engineer before backing.
- f. Once the line and level has been approved, the completed units shall be backed with a minimum 150 mm of ST2 to within 100 mm of the top of the upper unit. The lower unit shall be held in place at the front with ST2 concrete.
- g. Combined drainage systems will attract a commuted sum for the additional maintenance required.

#### 11-07 Raised Bus Kerbs

- a. When asked for by the Engineer, raised bus kerbs shall be "Kassel" type units to provide 160mm high kerb face. Generally, they will be laid with four full units and proprietary transition units at each end.
- b. They shall be laid on a widened raft to provide 150 mm in front of the kerb and 150 mm behind the kerb.

- c. Proprietary transition units shall be provided at each end of the raised kerbs. The kerbs they shall have a fall to the road. Where the proprietary transition units meet the standard kerb units the first kerb at either end shall be adjusted as necessary to provide a smooth transition.
- d. They shall be backed with ST2 concrete to within 100 mm of the top.
- e. If they are in a channel line, a channel will need to be cast to the front of the kerbs, this shall be ST5 concrete or stronger.

#### 11-08 Kerb and Channel Foundation or Raft

- a. Typical sections giving full details of the rafts and kerb backing are shown in the Standard Details B Series.
- b. The concrete raft shall be formed on well compacted Type 1 Sub base to a minimum thickness of 150 mm. Soundly fixed formwork or shuttering shall be used, the concrete shall be ST2 and shall be compacted to produce a dense foundation free from honeycombing. The formwork or shuttering shall remain in place for 24 hours before removal. 10 mm diameter Dowel Bars shall be fitted every 600 mm. 10mm diameter hoops are permitted as an alternative, as shown in standard Details B1 & B2. Hoops or dowels shall extend a minimum of 75 mm above the concrete raft and shall be set a minimum of 75mm into the concrete raft. There shall be a minimum of 50mm of cover above the bottom of the raft.
- c. Compressive Strength Testing of Standard and Prescribed mixes will not normally be required unless directed otherwise by the Engineer or his Representative. Where testing is required, the strength target shall be as signified by the grade of concrete being assessed. In such circumstances all testing shall be in accordance with the relevant sections of BS 1881 by an appropriately accredited laboratory.

#### 11-09 Kerb and Channel Laying

- a. Kerbs shall be laid on a concrete raft as specified in Clause 11-08. They shall be laid with a trowel thickness gap on a 25mm thick bed of moist 1:3 cement mortar which shall be able to set in 24 hours (see clause 17-05). Any surplus bedding material shall be thoroughly removed and the raft wetted, if necessary, prior to the placing of the backing concrete. The backing shall be ST2 concrete placed in a soundly fixed road form/shutter, and thoroughly compacted to produce a concrete dense and free from honeycombing, to the section shown in standard Details Series B.
- b. Kerbs shall be laid true to line and level and have a slight fall to the road with a minimum gradient of 1 in 150 to achieve satisfactory drainage.
- c. Channels are only required where the gradient of the carriageway is less than 1:80 (1.25%) unless agreed otherwise in writing by the Engineer prior to kerbing works commencing. Channels shall be laid to line and level with a slight fall toward the kerb. They shall be laid on a 25 mm 1:3 mortar bed that should be moist. They shall be broken joint bond with the kerb, with a trowel edge gap.

- d. All kerbs and channels shall be laid to the satisfaction of the Engineer. They shall be of good line and level. Any kerbs or channels found to be more than 3 mm out of line and level over a 3 m length shall be re-laid.
- e. Any gaps between kerbs and channels must be infilled with Epoxy / Mortar.
- f. The use of extruder kerbs must be agreed with the Engineer.

11-10 Preparation of Formation to Footpaths, Cycleways and Other non- Vehicular Areas

- a. During the course of the works the formations of all footpaths, cycleways and other non- vehicular areas shall be kept free of water.
- b. These formations shall be properly shaped and compacted with an approved smooth-wheeled roller of 2 to 3 tonnes mass or an equivalent approved vibratory roller. Any depressions in these formations shall be filled with Type 1 Sub Base and compacted to the Engineers satisfaction. In certain areas the Engineer may require a weed suppressant membrane to be laid beneath the sub base. All trenches for utilities shall be back filled with Type 1 Sub Base that shall be compacted to a minimum CBR of 20%.

11-11 Base to Footways Footpaths & Cycle-Ways

- a. All formations shall be inspected and approved by the Engineer prior to any fill being placed. Type 1 Sub Base material, in accordance with the approved drawing, shall be spread evenly and thoroughly compacted with a vibratory roller complying with Tables 07-06 and 07-07. The compacted footway sub base shall be checked for compliance with line and level tolerances using a timber template places between the kerb and pin kerb edging. The template shall be notched to the overall depth of the Binder & Surface Course; any discrepancies shall be made good and re-compacted until the top surface of the Type 1 Sub-base complies with line and level tolerances.

11-12 Coated Macadam to Footways Footpaths & Cycle-Ways

- a. All flexible footway surfacing shall comply with BS EN 13108 & be laid & compacted in accordance with BS 594987 to Clause 5.10a
- b. Footways and cycleway construction has been categorised into five tables as depicted below:

Table 11-12 - C – ‘Segregated’ Footway and Cycleway

Layer	Material	MCHW Specification
<b>Surface Course</b>	20mm Compacted Thickness of AC6 dense surf 70/100 or 100/150 pen bitumen binder laid in accordance with BS594987	Series 900 : Clause 909

<b>Binder Course</b>	50mm Compacted Thickness of AC20 dense bin 40/60 or 100/150 pen bitumen binder laid in accordance with BS594987	Series 900 : Clause 906
<b>Basecourse</b>	-	
<b>Sub-Base</b>	100mm of Type 1 Unbound Sub-base or Cement Bound Granular Material (CBGM)	Series 800
<b>Sub-Grade</b>	>=2.0% CBR	
<b>Comments</b>	Typically used within Residential Estates, and shall only be used where the footway is physically segregated from the carriageway with a physical barrier or other permanent obstruction (eg bollards / walls) where vehicles cannot mount the footway/cycleway. Specification can also be utilised where separation from carriageway is by a verge of width 3m or greater.	

Table 11-12-D - 'Standard Duty' Footway and Cycleway

<b>Layer</b>	<b>Material</b>	<b>MCHW Specification</b>
<b>Surface Course</b>	20mm Compacted Thickness of AC6 dense surf 70/100 or 100/150 pen bitumen binder laid in accordance with BS594987	Series 900: Clause 909
<b>Binder Course</b>	50mm Compacted Thickness of AC20 dense bin 40/60 or 100/150 pen bitumen binder laid in accordance with BS594987	Series 900: Clause 906
<b>Basecourse</b>	-	
<b>Sub-Base</b>	150mm of Type 1 Unbound Sub-base or Cement Bound Granular Material (CBGM)	Series 800
<b>Sub-Grade</b>	>=2.0% CBR	
<b>Comments</b>	Typically used within Residential Estates, where occasional overrun is likely i.e. overrun might occur two or three times a year by delivery vehicles or the occasional 'bumping up' and parking on the pavement.	

Table 11-12-E - 'Medium Duty' Footway and Cycleway

<b>Layer</b>	<b>Material</b>	<b>MCHW Specification</b>
<b>Surface Course</b>	20mm Compacted Thickness of AC6 dense surf 70/100 or 100/150 pen bitumen binder laid in accordance with BS594987	Series 900: Clause 909
<b>Binder Course</b>	60mm Compacted Thickness of AC20 dense bin 40/60 or 100/150 pen bitumen binder laid in accordance with BS594987	Series 900: Clause 906
<b>Basecourse</b>	-	
<b>Sub-Base</b>	225mm of Type 1 Unbound Sub-base or Cement Bound Granular Material (CBGM)	Series 800
<b>Sub-Grade</b>	>=2.0% CBR	
<b>Comments</b>	Typically used within Residential Estates, where occasional HGV overrun is likely (i.e overrun might occur two or three times a year by delivery vehicles), where the footway/cycleway gives access to a <u>vehicular private drive crossing</u> .	

Table 11-12-F - 'Heavy Duty' Footway and Cycleway

<b>Layer</b>	<b>Material</b>	<b>MCHW Specification</b>
<b>Surface Course</b>	40mm Compacted Thickness of AC10 close graded 70/100 or 100/150 pen bitumen binder laid in accordance with BS594987	Series 900: Clause 912

<b>Binder Course</b>	60mm Compacted Thickness of AC20 dense bin 40/60 or 100/150 pen bitumen binder laid in accordance with BS594987	Series 900: Clause 906
<b>Basecourse</b>	-	
<b>Sub-Base</b>	320mm of Type 1 Unbound Sub-base or Cement Bound Granular Material (CBGM)	Series 800
<b>Sub-Grade</b>	>=2.0% CBR	
<b>Comments</b>	Typically, construction shall be used where there is regular vehicular overrun and pavement parking, for example commercial High Streets and streets where regular footway parking is known to occur.	

Table 11-12-G - 'Industrial Estates' Footway and Cycleway

<b>Layer</b>	<b>Material</b>	<b>MCHW Specification</b>
<b>Surface Course</b>	40mm Compacted Thickness of AC10 close graded 70/100 or 100/150 pen bitumen binder laid in accordance with BS594987	Series 900 : Clause 912
<b>Binder Course</b>	60mm Compacted Thickness of AC20 dense bin 40/60 or 100/150 pen bitumen binder laid in accordance with BS594987	Series 900 : Clause 906
<b>Basecourse</b>	120mm Compacted thickness of AC32 dense base 40/60 laid in accordance with BS594987	Series 900 : Clause 948
<b>Sub-Base</b>	280mm of Type 1 Unbound Sub-base or Cement Bound Granular Material (CBGM)	Series 800
<b>Sub-Grade</b>	>=2.0% CBR	
<b>Comments</b>	Specification for use in Industrial Estates where commercial vehicles operate and where overrun and pavement parking are likely to occur.  Footway Crossings on Industrial Estates and other areas subject to regular HGV traffic shall be built with full road construction to match adjacent carriageway (See Standard Detail A2)	

- h. Binder course that is not to receive surface course within three days of laying shall be sealed with sealing grit 1-3mm. The sealing grit shall be spread evenly and brushed into all areas.
- i. Footway crossings on Industrial Estate and other areas subject to regular HGV traffic shall be built with the full road construction of the adjacent carriageway. (See Standard Detail A2)
- j. All footway Sub base shall be inspected by and approved by the Engineer prior to the Binder-Course being laid. The surface of the sub-base shall be laid to +/- 6 mm tolerance of line and level.
- k. Prior to the laying of Surface-Course the Binder-Course shall have been thoroughly cleaned using a pressure washer. Where the Binder-course has been laid for less than three days including the day it was laid the surface course may be laid without the use of a Tack-coat. Where the Binder-course has been laid for more than three days including the day it was laid a Tack-coat K1340 or equivalent in accordance with Clause 07-19 shall be applied using a sprayer, which shall give a minimum of 85% coverage at 0.5Lt per m<sup>2</sup> coverage.

- l. The Surface-Course shall be laid to provide a smooth flowing alignment and shall be within +/- 6 mm of the agreed line and level.
- m. The Surface-Course shall be compacted using a roller of minimum category 700-1300 Kg/per m roll. Vibrating-plate compactors shall only be used as a finishing aid.
- n. Where 6 mm Dense Surface Course is to be laid particular care will need to be taken with weather conditions due to the materials being sensitive to adverse weather conditions when being laid. Compaction shall be completed before the minimum rolling temperature of 85°C is reached. The material on site shall have a minimum temperature of not less than 110°C prior to being laid.
- o. The Engineer may require surface testing for irregularities at locations identified by the Engineer. This shall be undertaken using a 1.5 m straight edge, placed parallel with or at right angles to the footway edges. The maximum deviation of the surfaces below the straight edge shall be :-
  - a. For Surface-Course 3 mm
  - b. For Binder-course 6 mm
  - c. Where these allowable deviations are exceeded, the area shall be made good as required by the Engineer.
- p. Where any surfacing is found to be defective the minimum patch shall be 4 m in length, for the full width of the path. If multiple areas have failed or are defective the Engineer may require multiple patches to be joined into a single area to be repaired. In extreme cases the Engineer may require the whole of the path to be resurfaced.

#### 11-13 Tactile Paving

- a. All tactile paving shall be laid in accordance with the latest national guidance and any superseding advice. The current guidance is:
- b.
  - DDA - '*Inclusive Mobility*', 2005, Department for Transport (UK Gov).
  - Tactile paving - '*Traffic Signs Manual Chapter 6 - Traffic Control*', 2019,
  - '*Guidance on the use of Tactile Paving Surfaces*', 2007, DETR - Dept of the Environment, Transport & Regions, PPU 1622RB.
- c. Tactile paving shall be used at pedestrian crossing points to identify the appropriate place to cross and at other locations required by the advice.
- d. Where there is conflict between the DfT Guidance and this specification the DfT guidance shall take precedence. Any such matters shall be identified to the Engineer before works are undertaken on site.
- e. Red blister paving shall only be used at controlled crossings, i.e. pelican, puffin, toucan signal controlled crossings and zebra crossings plus crossings points for pedestrian phases on signal controlled junctions.
- f. Buff blister paving shall be used at all other crossings.

- g. The Blisters shall be laid to ensure that the blisters are in line with the pedestrian's direction of travel in a straight line to the other side of the crossing. Blister crossings shall always be laid as a pair, see detail B3 for guidance.
- h. The size of blister paving to be laid varies in relation to location but shall never be less than 1200 mm wide by 400 mm deep.
- i. Tactile paving flags shall be 75 mm thick unless agreed otherwise by the Engineer. They shall be laid on a 15 mm mortar bed on 150mm of ST2 concrete. They shall be enclosed with a 150 mm x 50 mm pin kerb. The 3 mm joints between flags shall be filled with kiln dried sand comply with BS EN 16236 & BS EN 933-1.
- j. The minimum size of flag to be laid shall be 33% of a full flag. Where part flags are laid the flags may be staggered but the line of blisters shall be unaltered.
- k. Tactile Corduroy / Hazard Warning Flags shall be laid two flags wide from one side of the path to the other as required by the Guidance.
- l. Cycleway Paving / Tramline Paving shall be laid in accordance with the guidance and with the ribs in the direction of travel for cyclists.
- m. Segregated Cycleways and Footpaths shall have an approved demarcation between pedestrian and cycle lanes. This shall be in accordance with the Guidance.
- n. All tactile paving units shall be hydraulically pressed and comply with the requirements of BS EN 1340

#### 11-14 Pin Kerb Edgings

- a. Pin kerb edgings shall generally be 50 mm x 150 mm x 900 mm flat topped pre-cast concrete, complying in all respects with BS EN 1340. The pin kerbs shall be wet laid to line and level in ST2 concrete of no less than 30 mm slump. They shall have a minimum of 100 mm of ST2 concrete bed, but in locations subject to heavier than normal domestic use the Engineer may request a thickness of 150 mm. The backing shall extend to 66% of the height of the pin kerb. The pin kerbs shall be inspected by the Engineer before further works are undertaken. The depth of the concrete haunch shall be such that it is possible to lay the full depth of binder layer and surface course over the concrete haunch.
- b. Timber edgings may be permitted in certain locations subject to the prior written approval of the Engineer. They shall be 3000 mm x 150 mm x 40 mm, of treated / tannalised timber. The use of plastic or recycled units may be substituted with the prior written approval of the Engineer. They shall be supported every 1m with a wooden peg attached with 75 mm galvanised nails or suitable screws. The edgings shall be laid to line and level and inspected by the Engineer before moving to the next stage.
- c. In some locations, to retain ground behind a footpath the Engineer may request the use of oversized pin kerbs. Generally, these will be 50 mm x 300 mm x 900 mm flat topped pre-cast concrete complying in all respects with BS EN 1340, they shall be wet laid in ST2 concrete of no less than 30 mm slump to the agreed line and level. They



shall have a minimum of 150 mm of concrete bed. The backing shall extend to 75% of the height of the oversized pin kerb. They shall be inspected by the Engineer and any subsequent work will be undertaken 'at risk' if undertaken in advance of the formal approval of the Engineer.

- d. Where pin kerbs are to be cut, no unit shall be less than 30% in size of a full unit when cut. When going around radiuses of less than 10 m radius, the pin kerbs shall be cut in half, and on tighter radii, they shall be cut in thirds.
- e. On Industrial estates and in heavy trafficked locations, the pin kerb shall be replaced by a 150 mm x 150 mm concrete channel.

#### 11-15 Hard Margin

A hard margin shall be provided where the carriageway boundary is adjacent wall or fence. The hard margin shall consist of Blockwork with pin kerb edging in accordance with detail A3.

#### 11-16 Concreting in Cold Weather

- a. Concreting shall stop if the ambient temperature drops below 2°C.
- b. Before placing concrete, the Type 1 Sub base and shuttering shall be clear of snow and ice. The Type 1 and the shuttering shall be at a temperature above 0°C before any concrete is poured.
- c. The initial temperature of the concrete shall be at least 5°C. And the poured concrete shall be covered to maintain a temp of 5°C until the concrete has reached 5N/mm<sup>2</sup> this usually takes 48 hours. This shall be done by covering the concrete using plastic or hessian, and the use of thermal insulation blankets if the overnight temperature is expected to drop below -2°C. The shuttering shall be left in place for 48 hours if the temperature remains low.
- d. The Developer should also consider the use of heated water to ensure the mix is at 5°C and remains at that temperature until first set.
- e. Any concrete found to have suffered frost damage shall be removed and replaced by the Developer.