DETAILING
PERMEABLE PAVING & SUDS
WITH PRECAST CONCRETE PRODUCTS
INTRODUCTION

‘Sustainable Drainage Systems’ (SuDS) intercept, convey, store and treat surface water by attenuation and filtration with the aim of replicating, as closely as possible, the natural drainage from a site before development. This approach is characterised by low flow rates and water management on or near the surface using multifunctional SuDS techniques.

Precast concrete paving products from Interpave manufacturer members play important roles in SuDS, ranging from complete permeable pavements to standard components helping other SuDS techniques work more effectively. This document brings together a variety of construction details, demonstrating best practice to make SuDS robust and durable over the long-term.

Produced by SuDS designers Robert Bray Associates (sponsored by Interpave and Sheffield City Council), these details have been successfully applied to SuDS projects, demonstrating their effectiveness on the ground. They are intended as generic solutions to assist designers in developing their own project-specific details.

The detail drawings are arranged in three sections: concrete block permeable paving (CBPP); features for CBPP or SuDS; features with precast concrete products. Further examples are illustrated with photographs here and also in Interpave case studies, available to download via www.paving.org.uk

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CONCRETE BLOCK PERMEABLE PAVING

More than 25 years of use has proven concrete block permeable paving (CBPP) to be a key SuDS technique.

CBPP allows water to pass through the surface – between the paving units and the permeable laying course – into the underlying permeable construction where it is stored and, dependent on the system type, released slowly into the ground, to the next SuDS management stage or to a drainage system. At the same time, many pollutants are substantially removed from the water and treated within the CBPP itself.

For comprehensive information on CBPP, refer to Interpave’s ‘Design & Construction of Concrete Block Permeable Pavements’ and other guidance, available at www.paving.org.uk
CBPP Details

Detail 1 - Permeable Paving (System A) with Total Infiltration

Concrete block permeable paving pattern to suit

2-4.3mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compacted and repeat process after 3-4 months and also upon final completion to allow for settlement.

Haunch to front of concrete kerb to finish a minimum of 25mm from proposed base of block paving. Allow full grit joint at edge.

Topsilt 100mm at kerb 150mm generally. Grass surface to fall away from kerb edge.

Precast concrete kerb

Sub-base depth to consider structural and hydraulic requirements

40mm Coarse Graded Aggregate sub-base to BS EN 13242:2002. Lightly compact in 150mm layers

Existing ground. Any low points filled with compacted ShW Type 3 - BS EN 13242. Clause 805 sub-base.

Needle-punched polypropylene geotextile to base and sides of construction

50, 80, T.B.C
CBPP Details

Detail 2 - Permeable Paving (System B) with Partial Infiltration

Concrete block permeable paving pattern to suit

2-6.3mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compacted and repeat process after 3-4 months and also upon final completion to allow for settlement.

Haunch to front of concrete kerb to finish a minimum of 25mm from proposed base of block paving. Allow full grit joint at edge.

Precast concrete kerb

Example outlet to Flow Control Chamber

Topsoil 100mm at kerb
150mm generally, Grass surface to fall away from kerb edge

Sub-base depth to consider structural and hydraulic requirements

Needle-punched polypropylene geotextile to base and sides of construction

Existing ground. Any low points filled with compacted SHW Type 3 - BS EN 13242: Clause 805 sub-base.

4-20mm Coarse Graded Aggregate sub-base to BS EN 13242:2002. Lightly compact in 150mm layers

150mm Fin drain connected to pipe (160 or 110mm diameter PP or PE) with proprietary connector sleeve and top hat seal to pipe at liner penetration
CBPP Details

Detail 3 - Lined Permeable Paving (System C) No Infiltration - with Sealed Outlet to Flow Control

2-6.3 mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compacted and repeat process after 3-4 months and also upon final completion to allow for settlement.

Concrete block permeable paving pattern to suit.

Haunch to front of concrete kerb to finish. Minimum of 25mm from proposed base of block paving, allow full grit joint at edge.

Topsoil 100mm at kerb. 150mm generally. Grass surface to fall away from kerb edge.

Example outlet to Flow Control Chamber.

150mm Fin drain connected to pipe (160 or 110mm diameter, PP or PE) with proprietary connector sleeve and top hat seal to pipe at liner penetration.

1 mm HDPE or PP Liner with 300g fleece protection to each side.

Existing ground. Any low points filled with compacted SuW Type 1 or Type 3 material as per Manual of Contract Documents for Highway Works Vol1; Clause 803 and 805 specification.

4-20mm Coarse Graded Aggregate sub-base to BS EN 13242:2002. Lightly compact in 150mm layers.

Precast concrete kerb.

Sub-base depth to consider structural and hydraulic requirements.

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CBPP Details

Detail 4 - Lined Permeable Paving (System C) Incorporating Asphalt Concrete (Construction Road)

2-6.3mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compacted and repeat process after 3-4 months and also upon final completion to allow for settlement.

Concrete block permeable paving pattern to suit.

Sub-base depth to consider structural and hydraulic requirements.

1mm HDPE or PP Liner within 300g fleece protection to both sides. Note: liner and textiles to be withheld a minimum of 50mm from proposed Asphalt Concrete layer to protect from heat.

Existing ground. Any low points filled with compacted SHW Type 1 or Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 803 and 80S specification.

Asphalt Concrete construction road laid over sub-base as protection against fines entering sub-base. To extend fully with no opportunity for silt/fines ingress at edges. To be cored or punched 75mm dia. at staggered 750mm centres upon completion, prior to laying block paving over grit layers.

Haunch to front of concrete kerb to finish a minimum of 25mm from proposed base of block paving. Allow full grit joint at edge.

Concrete block permeable paving pattern to suit.

Sub-base depth to consider structural and hydraulic requirements.

1mm HDPE or PP Liner within 300g fleece protection to both sides. Note: liner and textiles to be withheld a minimum of 50mm from proposed Asphalt Concrete layer to protect from heat.

Existing ground. Any low points filled with compacted SHW Type 1 or Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 803 and 80S specification.

Asphalt Concrete construction road laid over sub-base as protection against fines entering sub-base. To extend fully with no opportunity for silt/fines ingress at edges. To be cored or punched 75mm dia. at staggered 750mm centres upon completion, prior to laying block paving over grit layers.

Haunch to front of concrete kerb to finish a minimum of 25mm from proposed base of block paving. Allow full grit joint at edge.

Concrete block permeable paving pattern to suit.

Sub-base depth to consider structural and hydraulic requirements.

1mm HDPE or PP Liner within 300g fleece protection to both sides. Note: liner and textiles to be withheld a minimum of 50mm from proposed Asphalt Concrete layer to protect from heat.

Existing ground. Any low points filled with compacted SHW Type 1 or Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 803 and 80S specification.

Asphalt Concrete construction road laid over sub-base as protection against fines entering sub-base. To extend fully with no opportunity for silt/fines ingress at edges. To be cored or punched 75mm dia. at staggered 750mm centres upon completion, prior to laying block paving over grit layers.

Haunch to front of concrete kerb to finish a minimum of 25mm from proposed base of block paving. Allow full grit joint at edge.

Concrete block permeable paving pattern to suit.

Sub-base depth to consider structural and hydraulic requirements.

1mm HDPE or PP Liner within 300g fleece protection to both sides. Note: liner and textiles to be withheld a minimum of 50mm from proposed Asphalt Concrete layer to protect from heat.

Existing ground. Any low points filled with compacted SHW Type 1 or Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 803 and 80S specification.

Asphalt Concrete construction road laid over sub-base as protection against fines entering sub-base. To extend fully with no opportunity for silt/fines ingress at edges. To be cored or punched 75mm dia. at staggered 750mm centres upon completion, prior to laying block paving over grit layers.

Haunch to front of concrete kerb to finish a minimum of 25mm from proposed base of block paving. Allow full grit joint at edge.

Concrete block permeable paving pattern to suit.

Sub-base depth to consider structural and hydraulic requirements.

1mm HDPE or PP Liner within 300g fleece protection to both sides. Note: liner and textiles to be withheld a minimum of 50mm from proposed Asphalt Concrete layer to protect from heat.

Existing ground. Any low points filled with compacted SHW Type 1 or Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 803 and 80S specification.

Asphalt Concrete construction road laid over sub-base as protection against fines entering sub-base. To extend fully with no opportunity for silt/fines ingress at edges. To be cored or punched 75mm dia. at staggered 750mm centres upon completion, prior to laying block paving over grit layers.

Haunch to front of concrete kerb to finish a minimum of 25mm from proposed base of block paving. Allow full grit joint at edge.

Concrete block permeable paving pattern to suit.

Sub-base depth to consider structural and hydraulic requirements.

1mm HDPE or PP Liner within 300g fleece protection to both sides. Note: liner and textiles to be withheld a minimum of 50mm from proposed Asphalt Concrete layer to protect from heat.

Existing ground. Any low points filled with compacted SHW Type 1 or Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 803 and 80S specification.

Asphalt Concrete construction road laid over sub-base as protection against fines entering sub-base. To extend fully with no opportunity for silt/fines ingress at edges. To be cored or punched 75mm dia. at staggered 750mm centres upon completion, prior to laying block paving over grit layers.

Haunch to front of concrete kerb to finish a minimum of 25mm from proposed base of block paving. Allow full grit joint at edge.

Concrete block permeable paving pattern to suit.

Sub-base depth to consider structural and hydraulic requirements.

1mm HDPE or PP Liner within 300g fleece protection to both sides. Note: liner and textiles to be withheld a minimum of 50mm from proposed Asphalt Concrete layer to protect from heat.

Existing ground. Any low points filled with compacted SHW Type 1 or Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 803 and 80S specification.
CBPP Details

Detail 5 - Lined Permeable Paving (System C) Incorporating Hydraulically Bound Aggregate

2-4.3mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compacted and repeat process after 3-4 months and also upon final completion to allow for settlement.

Modified sub-base as 4-20mm Hydraulically Bound Aggregate to BS EN 14227-1:2004.

Concrete block permeable paving pattern to suit.

Sub-base depth to consider structural and hydraulic requirements.

1mm HDPE or PP Liner with 300g fleece protection to each side.

Existing ground. Any low points filled with compacted SHW Type 1 or Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 803 and 805 specification.

4-20mm Coarse Graded Aggregate sub-base to BS EN 13242:2002. Lightly compact in 150mm layers.

150mm Fin drain connected to pipe (160 or 110mm diameter, PP or PE) with proprietary connector sleeve and top hat seal to pipe at liner penetration.

Topsoil 100mm at kerb 150mm generally, Grass surface to fall away from kerb edge.

Precast concrete kerb.

Example outlet to flow control chamber.

Haunch to front of concrete kerb to finish a minimum of 25mm from proposed base of block paving. Allow full grit joint at edge.
CBPP Details

Detail 6 - Landscape Adjacent to Paved Surface - Shown with System A

- 2-6.3mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compacted and repeat process after 3-4 months and also upon final completion to allow for settlement.

- Haunch to front of concrete kerb to finish a minimum of 25mm from proposed base of block paving. Allow full grit joint at edge.

- Precast concrete kerb

- 4-20mm Coarse Graded Aggregate sub-base to BS EN 13242:2002. Lightly compact in 150mm layers.

- Where slope falls towards permeable paving include shallow underdrained grass surface channel to intercept surface flow.

- If planted, topsoil to finish 50mm below top of kerb and fall away from kerb at 1:20 - 1:50.

- Backfall to adjacent landscape (1:20 - 1:50 for 1 metre)

- Topsoil 100mm at kerb 150mm generally. Grass surface to fall away from kerb edge.

- Concrete block permeable paving pattern to suit.

- Needle-punched polypropylene geotextile to base and sides of construction.

- Existing ground. Any low points filled with compacted SHW Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 805 specification.
CBPP Details

Detail 7 - Infiltrating Permeable Paving (System A) - Edge Detail Between Infiltrating Permeable Paving and Service Strip, Incorporating Asphalt Concrete

- Topsoil 100mm at kerb 150mm generally. Grass surface to fall away from kerb edge.
- Haunch to front of concrete kerb to finish a minimum of 25mm from proposed base of block paving. Allow full joint at edge.
- 2-6.3mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compacted and repeat process after 3-4 months and also upon final completion to allow for settlement.
- Concrete block permeable paving pattern to suit.
- Asphalt Concrete construction road laid over sub-base as protection against fines entering sub-base. To extend fully with no opportunity for silt/fines ingress at edges. To be cored or punched 75mm diameter at staggered 750mm centres upon completion, prior to laying block paving over grit layers.

- Precast concrete kerb.
- SHW Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 805 specification.
- Needle-punched polypropylene geotextile to base and sides of construction. Note: Textile to be withheld a minimum of 50mm from proposed Asphalt Concrete layer to protect from heat.
- 4-20mm Coarse Graded Aggregate sub-base to BS EN 13242:2002. Lightly compacted in 150mm layers. Sub-base depth to consider structural and hydraulic requirements.
- Existing ground. Any low points filled with compacted SHW Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 805 specification.
CBPP Details

Detail 8 - Lined Permeable Paving (System C) - Edge Detail Between Lined Permeable Paving and Service Strip, Incorporating Asphalt Concrete

- Topsoil 100mm at kerb 150mm generally. Grass surface to fall away from kerb edge.
- Haunch to front of concrete kerb to finish a minimum of 25mm from proposed base of block paving. Allow full griot joint at edge.
- 2-6.3mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compacted and repeat process after 3-4 months and also upon final completion to allow for settlement.
- Asphalt Concrete construction road laid over sub-base as protection against fines entering sub-base. To extend fully with no opportunity for silt/fines ingress at edges. To be cored or punched 75mm diameter at staggered 750mm centres upon completion, prior to laying block paving over grit layers.

- Precast concrete kerb
- Concrete block permeable paving pattern to suit
- Needle-punched polypropylene geotextile to base and sides of construction
- SHW Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 805 specification
- 1mm HDPE or PP Liner with 300g fleece protection to both sides. Note: Liner and textiles to be withheld a minimum of 50mm from proposed Asphalt Concrete layer to protect from heat.
- 4-20mm Coarse Graded Aggregate sub-base to BS EN 13242:2002. Lightly compact in 150mm layers. Sub-base depth to consider structural and hydraulic requirements.
CBPP Details

Detail 9 - Edge Detail Between Impermeable and Permeable Paving

- 2-6.3mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compact and repeat process after 3-4 months and also upon final completion to allow for settlement.
- 4-20mm Coarse Graded Aggregate sub-base to BS EN 13242:2002. Lightly compact in 150mm layer. (Additional storage in sub-base below impermeable areas where required)
- Needle-punched polypropylene geotextile to base and sides of construction
- Concrete block permeable paving pattern to suit
- Asphalt concrete
- 20mm drop from precast concrete reverse bullnose kerb to permeable paving. A flush kerb here may result in slit buildup.
- Haunch to finish 25mm from base of block paving.

Sub-base depth to consider structural and hydraulic requirements
CBPP Details

Detail 10 - Permeable Paving (with no Contributing Surface) Adjacent to Building

- 2-6.3mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compacted and repeat process after 3-4 months and also upon final completion to allow for settlement.
- 4-20mm Coarse Graded Aggregate sub-base to BS EN 13242:2002. Lightly compact in 150mm layers.
- Sub-base depth to consider structural and hydraulic requirements.
- Concrete block permeable paving - pattern to suit.
- NOTE: Infiltration into ground similar to grass surface, i.e., existing condition.
- Sub-grade to fall at 1 in 100 away from building in all directions for a minimum of 1.2 metres.

Existing ground. Any low points filled with compacted SHW Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 805 specification.
CBPP Details

Detail 11 - Internal Baffles with Controls - Cross-section System C - Non Infiltrating

Concrete block permeable paving pattern to suit

2-6.3mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compacted and repeat process after 3-4 months and also upon final completion to allow for settlement

Asphalt Concrete construction road laid over sub-base as protection against fines entering sub-base. To extend fully with no opportunity for silt/fines ingress at edges. To be cored or punched 75 dia. at staggered 750mm centres upon completion, prior to laying block paving over grit layers

Sub-base depth to consider structural and hydraulic requirements

Existing ground. Any low points filled with SHW Type 1 or Type 3 material as per Manual of Contract Documents for Highway Works Vol1: Clause 803 and 805 specification.

150mm fin drain with proprietary end sleeve to take inlet pipe [110/160mm diameter] from Flow Control Chamber

150mm fin drain with proprietary end sleeve to take outlet pipe [110/160mm diameter] PP or PE to Flow Control Chamber (in verge)

1mm HDPE or PP Liner within 300g fleece protection to both sides forming baffles at 45°

Note: liner and textiles to be withheld a minimum of 50mm from proposed Asphalt Concrete layer to protect from heat
**CBPP Details**

**Detail 12 - Internal Baffles with Controls - Cross-section Type A - Fully Infiltrating**

Concrete block permeable paving pattern to suit

2-6.3mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compacted and repeat process after 3-4 months and also upon final completion to allow for settlement.

150mm fin drain with proprietary end sleeve to take outlet pipe (110/160mm diameter PP or PE) to Flow Control Chamber (in verge)

Sub-base depth to consider structural and hydraulic requirements

Inlet

Outlet

150mm fin drain with proprietary end sleeve to take inlet pipe (110/160mm diameter) from Flow Control Chamber

Existing ground. Any low points filled with compacted SHW Type 3 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 805 specification

1mm HDPE or PP Liner within 300g fleece protection to both sides forming baffles at 45°

Note: liner and textiles to be withheld a minimum of 50mm from proposed Asphalt Concrete layer to protect from heat

Needle-punched polypropylene geotextile to base and sides of construction

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CBPP Details

Detail 13 - Downpipe with Shoe onto Permeable Paving - Type A - Fully Infiltrating

Concrete block permeable paving pattern to suit

2-6.3mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compacted and repeat process after 3-4 months and also upon final completion to allow for settlement

Sub-grade to fall at 1in100 away from building in all directions for a minimum of 1.2 metres

Needle-punched polypropylene geotextile to base and sides of construction

4-20mm Coarse Graded Aggregate sub-base to BS EN 13242:2002. Lightly compacted in 150mm layers

Existing ground. Any low points filled with compacted SHW Type 3 material as per Manual of Contract Documents for Highway Works Vol1: Clause 805 specification

1mm HDPE or PP Liner with 300g fleece protection to both sides. Width of impermeable protection to be subject to geotechnical assessment

Sub-base depth to consider structural and hydraulic requirements

Concrete slab to suit with 1:40 forward fall to prevent wash out of grit

Mortar bedding

SHW Type 1 material as per Manual of Contract Documents for Highway Works Vol1: Clause 803 specification

Optional 10mm drop

Footing

T.B.C.
CBPP Details

Detail 14 - Diffuser Box with Upstream Silt Trap

Sub-base replacement boxes within voided stone with sealed geotextile around them to diffuse roof water and water from control chambers into voided stone.

More boxes may be required in some locations. Approximately 2 boxes required for each 500 sq.m of roof area.

Preformed side inlet/outlet connector 150 or 100mm to suit pipes

Geotextile sealed around storage boxes

NOTE: The boxes are structural and designed to be in the road construction. Inlet silt trap with needle punched polypropylene geotextile protection around inlet to prevent silt getting into the box.

2-6.3 mm granite grit laying course and jointing aggregate to BS EN 13242:2002. Lightly compacted and repeat process after 3-4 months and also upon final completion to allow for settlement

80mm concrete block permeable paving. Pattern to suit

2mm mesh sealed around sub-base replacement boxes

Sub-base depth to consider structural and hydraulic requirements

Existing ground. Any low points filled with compacted SHW Type 3 - BS EN 13242: Clause 805 sub-base.

4-20mm Coarse Graded Aggregate sub-base to BS EN 13242:2002. Lightly compact in 150mm layers

Varies - minimum of 50mm from base of voided stone

4-20mm Voided stone

Flow

400m Range

Varies
Features for CBPP or SuDS

Detail 15 - Flow control chamber with a protected orifice within a removable plate, suitable for any SuDS technique outlet. For CBPP, flow controls do not need protection from blockages, as the water passing from the CBPP will be free of debris.
Features for CBPP or SuDS

Detail 16 - Stainless Steel Basket Inlet from CBPP or Other SuDS.

- 100-120g needle punched polypropylene geotextile protection to basket to all sides including the top face which is to be lapped providing minimum 100mm lap to prevent siltation during construction and grass establishment. Cut down to 50mm above top face of basket until full establishment and then flush to top of basket at final completion.

- Stainless steel 50mm mesh basket 900 (TBC) x 600 x H450mm hinged at the top. Basket set at 1:3 flush with bank profile.

- Temporary geotextile protection to be kept in place during construction.

- 100mm depth top layer of ornamental stone TBC e.g water worn cobbles.

- 110mm PP pipe

- 110mm diameter stainless steel mesh guard. Guard 3mm rod 50mm square mesh

- 80-150mm crushed stone - recycled concrete

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Kerb quadrants direct water straight off the impermeable access road into a swale, softened by a concrete flag. Rainwater downpipes from the building roof discharge directly over ribbed concrete flags which channel the water across a footway.

Bullnose kerbs to the road and edgings to the footpath allow runoff to flow gently into a swale without erosion. A simple pedestrian crossing is formed with concrete paving flags.

Here, a standard dropped kerb disperses runoff from impermeable asphalt onto concrete block permeable paving, as well as providing wheelchair access.
High quality finish, standard precast concrete paving products can be used in interesting ways to form rills and other features to convey water on the surface.
Rainwater runoff from impermeable paving simply enters this roundabout rain-garden/bio-retention basin through gaps between concrete kerbs, where it is diffused on concrete flags with inner kerb baffles preventing erosion.
SuDS with Precast

Detail 17 - Concrete Drop Kerb Inlet to Swale

Inlet swale (900mm wide) to be at minimum 1:100 fall, 150mm topsoil with amenity turf laid to base. Base to be 25mm below erosion protection paving slab.

2 no. 450x450x50mm concrete paving slabs on minimum 25mm mortar bed above 100mm C20 concrete.

Minimum 450mm x 1800mm reprofiled inlet apron with 1 in 40 falls onto concrete bullnosed kerb in all directions.

New concrete drop kerb unit installed adjacent to flush concrete bullnosed kerb.

Existing kerb cut as required to create opening.

Topsoil

Subsoil

Min. 1:100

1:20

SHW Type 1 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 803 specification. Minimum 150mm depth.

125x91x255mm concrete bullnosed kerb laid flush with new road surface with bullnose facing toward inlet swale. 25mm drop from bullnosed kerb to slab, then 1 in 20 fall and 25mm drop to swale base.

Min. 100mm C20 concrete foundations to new concrete bullnosed kerb.
SuDS with Precast

Detail 18 - Filter Strip with Reverse Bullnosed Kerb Edge

- Impermeable surface flush with concrete kerb top or 0-5mm above kerb
- 125x250mm concrete bullnosed kerb
- Slopes that are to accept runoff are to be turfed
- Flow to swale or other SuDS feature
- Turf set 25mm lower than kerb top with minimum of 100mm topsoil at kerb face
- Grass filter strip minimum width 1m
- C20 concrete haunch
- Slope to 1:30 to 1:40 foe
- SHW Type 1 material as per Manual of Contract Documents for Highway Works Vol 1: Clause 803 specification. Minimum 150mm depth

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SuDS with Precast

Detail 19 - Mitred Concrete Headwall

150mm diameter polypropylene single-wall black pipe cut accurately at 1:3 (18°) angle. Cut end to be cleaned of all burr/sharp edges and free of mortar.

10mm chamfer to all outside edges

Minimum 100mm topsoil cover to top of pipe

Concrete - Grade C20 for external use. Aggregate size of 20mm. Incorporate polymer fibres to manufacturers instructions. Smooth float finish and foot mitre visible edges and corners. Use timber former to design profile.

150mm depth well-compacted SHW Type 1 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 803 specification.

50mm Class II continuous mortar bed

450x450mm concrete slab with 1:20 forward fall

10mm chamfered edges to top face edges

Top of slope

Concrete headwall facia

Base of slope

50mm Class II continuous mortar bed

450x450mm concrete slab to suit 1:20 forward fall with 10mm tip onto soil

150mm topsoil - minimum 10mm drop to soil level from slab

150mm PP pipe, Min fall of 1 in 100

150
SuDS with Precast

Detail 20 - Mitred Concrete Headwall with Boulder Protection

Central boulder to balance between outer support boulders, elevated approximately 100mm to protect pipe from blockage.

Size of boulders 600-750mm

Concrete Paving slab to be installed as per Detail 20 Mitred Concrete Headwall.

Foremost central boulder to split and reduce flow velocities.

Central boulder positioned on top of outer support boulders, elevated approximately 100mm above discharge pipe.

Foremost central boulder to split and reduce flow velocities.

Erosion control slab may be cut to suit.

150mm PP pipe, Min fall of 1 in 100

100mm spacing below central boulder, to impede ‘human access’ but allow outflow and litter-picking.

150mm depth SHW Type 1 material as per Manual of Contract Documents for Highway Works Vol 1: Clause 803 specification.

Refer to Detail 19 for Mitred Concrete Headwall.
SuDS with Precast

Detail 21 - SuDS Road Edge

150mm depth of topsoil - generally

1:20 fall for minimum 1m to ensure that water flows from hard surface

Turf to finish 25mm below road edge

125x250mm concrete bullnose kerb

Road cross fall 1:40 fall

100mm minimum depth of topsoil next to path edge to ensure good grass growth

C20 concrete haunch

SHW Type 1 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 803 specification. Minimum 150mm depth
SuDS with Precast

Detail 22 - SuDS Path Edge

1:20 fall for minimum 1m to ensure water flows from hard surface

Turf to finish 25mm below road edge

200 x 50mm bullnosed concrete path edge. Bullnose to be facing in direction of flow

1 in 60 min fall

150mm depth of topsoil generally

100mm minimum depth of topsoil above foundations to path edge to ensure good grass growth

C20 concrete haunch

SHW Type 1 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 803 specification. Minimum 150mm depth
SuDS with Precast

Detail 23 - Bioretention Feature

- 225x125mm half battered kerb
- 100mm wide gaps in concrete kerb with brushed finish, with 50mm fall toward bioretention raingarden
- 150mm concrete haunch brushed finish at 450" fall toward bioretention raingarden
- Timber former for concrete haunch construction and remove after fitting
- Concrete slab 50mm depth

- Impermeable concrete block paving
- C20 concrete haunch
- SHW Type 1 material as per Manual of Contract Documents for Highway Works Vol.1: Clause 803 specification. Minimum 150mm depth
- 305grm hessian separation layer with 100mm laps up abutting faces and 300mm laps at joins.
- Perforated section of pipe to allow water through
- Concrete sub-base 100mm
- 125mm depth open storage zone over grit mulch with vegetation
- 350mm depth free-draining topsoil
- 50mm depth mulch
- 150mm diameter stainless steel overflow pipe with lockable, tamper-proof stainless steel dome guard. Pipe to be connected via EPDM flexible couplers and standard 150mm diameter pipes to existing gully connection. Air/vermin trap (U-bend) to Civil Engineers specification.

Detail 23a DETAIL - Opening in kerb and erosion control slab
Scale 1:20 at A4

- 225x125mm half battered concrete kerb with 100-150mm wide gaps in kerb, with 50mm fall toward bioretention raingarden
- 150mm concrete haunch with fall toward bioretention raingarden
- Timber former for concrete haunch construction to be removed after fitting
- Concrete slab 300x300mm
- Vegetation
- Opening 100-150mm

Detail 23b DETAIL - Option to conceal unfinished back of precast kerb - Scale 1:20 at A4

- Detail option to place 225x125mm half battered kerb back to back for ‘fair face’ both sides

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