



PIPELINE & DRAINAGE SYSTEMS PLC
DEVELOPING PIPELINE & DRAINAGE SOLUTIONS



PIPELINE & DRAINAGE SYSTEMS PLC
DEVELOPING PIPELINE & DRAINAGE SOLUTIONS



Reputation built through innovation
Composite Technology has arrived in the world of Bridge Drainage Systems

**first 100% composite lightweight
combined kerb bridge drainage system**

**Pipeline & Drainage Systems PLC continues
its policy of continual product development**

Already market leaders in the design, manufacture and supply of bridge drainage systems, we are now introducing Envirodeck – A lightweight high quality composite combined deck drainage system, which maintains all the benefits of the continuous combined

kerb bridge drainage concept, but also addresses system component quality, aesthetics and Health & Safety issues for the end user.

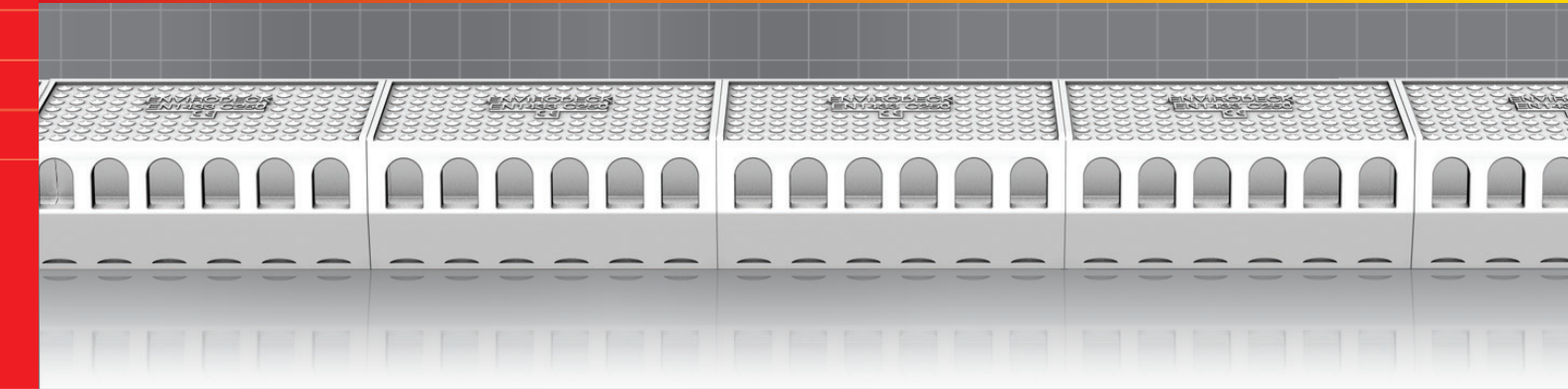
PIPELINE & DRAINAGE SYSTEMS PLC
Sales and Distribution Centre
12A, Flanshaw Way, Flanshaw
Wakefield WF2 9LP, UK
Tel: +44 (0)870 754 1200
Fax: +44 (0)870 754 1201
www.pds-plc.com

Accounting and Finance Department
12 Whitbarrow Road, Lymm
Cheshire WA13 9AF, UK
Tel: +44 (0)870 754 1300
Fax: +44 (0)870 754 1301

Registered No: 3787712 (England)



Envirodeck



- Lightweight Non Metallic
- Precision Manufacturing
- Colour Coding Options
- Half Battered And 45 Degree Splayed
- New Anti Slip Top Surface
- Wide Range of Widths & Depth Available
- Fully Compliant to BS EN1433
- Surface and Subsurface Drainage Capability

Combined Kerb Drainage System

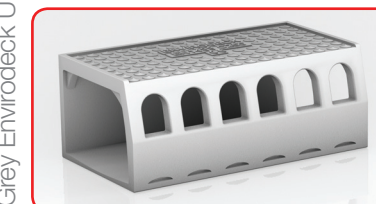
Combined kerb drainage units are now widely used and specified on bridge decks whether they are new build or part of a refurbishment scheme. Drainage is an essential requirement on all bridges. Deck mounted systems provide continuous surface & sub surface drainage and easily accessible maintenance.

Existing systems are traditionally metallic, which are heavy, raising Health & Safety issues for the installers. Metallic units place additional weight on the structure.

In addition, metallic units are prone to oxidization which can spoil the appearance of a structure, particularly as the systems are a highly visible element of the completed project. This results in on-going expensive maintenance. In addition the standard black coating (standard in all metallic systems) provides no de-marcation between the carriageway and the kerb line.



Grey Envirodeck Units on Porth Relief Rd



Design, Manufacture and Distribution of Specialist Bridge and Kerb Drainage Products.

P.D.S. operates a policy of continuous development and whilst the enclosed specification is correct at time of publication, we reserve the right to change it without notice.



Envirodeck Features and benefits

Health & Safety

Unit weights are reduced by over 50% to comply with the new manual handling guidelines and save precious dead weight on both new and refurbishment structures.

Anti slip surface

A new anti-slip pattern is incorporated to comply with anticipated new legislation. The top surface has a "low tendency to slip" reading – impossible to achieve with metallic units and a health & safety benefit on Bridges

with pedestrian access where units may be subjected to pedestrian traffic. With growing concerns over the slip resistance of Manhole Covers many manufacturers have investigated how a "low tendency to slip" reading can be achieved.

Aesthetics

Envirodeck is a composite unit and will not oxidize or corrode unlike metallic units. Supplied as standard in concrete grey to match kerb lines and provide demarcation. They can be can also be

manufactured in any RAL/BS colour to complement the bridge design and surroundings.

Hydraulics

The composite material produces a smooth high quality channel invert. This creates improved co-efficiencies, reduces drag gives higher flows and increases velocity to improve the self cleansing ability of the system. This "glass like" invert prevents weed growth and silting - saving costs in unscheduled maintenance.

Chemical Resistance

Envirodeck is fully resistant to all types of chemicals in petrol, diesel and oil etc In addition Envirodeck is not effected by UV

Impact Resistance

Envirodeck is highly resistant to side impact. While EN1433 has no side impact test requirements, it is the main cause of failure in many kerbside type installations.

Unit Quality

Envirodeck is a precision made product, Unit finish, tolerances and aesthetics far exceeds that of metallic systems. Smooth edges make the unit user friendly to handle.

Quality Assurance

PDS have full ISO9001 Accreditation (Management Systems), In addition and essential for full compliance to the EN1433 standard, our manufacturing facilities have full ISO 9000 series Accreditation and Quality Assurance.

EN1433

Envirodeck is fully compliant to the EN1433 specification (kerbside installations) Group 3 C250 min loading capacity. Envirodeck units are tested to the higher Group D400 loading class

Specification clause

The Combined Kerb Bridge Drainage System shall be a one piece Composite lightweight unit.

Having a maximum 500mm unit weight of (14Kg example) to aid installation.

It shall be compliant to BSEN1433 and withstand loadings of Group 3 (Kerbside Installations) min C250. (or D400)

Unit shall be light grey to match concrete kerbs (or in RAL ref number "as specified by the engineer").

Manufacturers shall be accredited to both ISO9001 (MANAGEMENT) AND ISO9000 (MANUFACTURING) quality assurance systems.

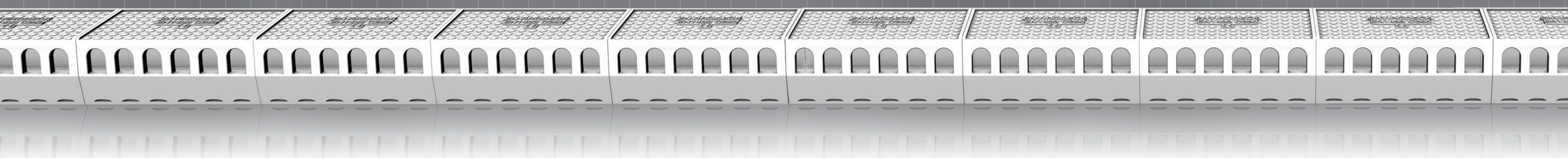
The units shall have 6No surface and 6No sub surface drainage slots which allow high water collection but restrict the entrance of large debris.

The top surface shall have a "low potential to slip" (SRV) skid resistance value reading of between 40 – 74 in both wet and dry one minute polish cycle tests.

As recommended by the UK Slip Resistance Group Issue 2 RAPRA 2000

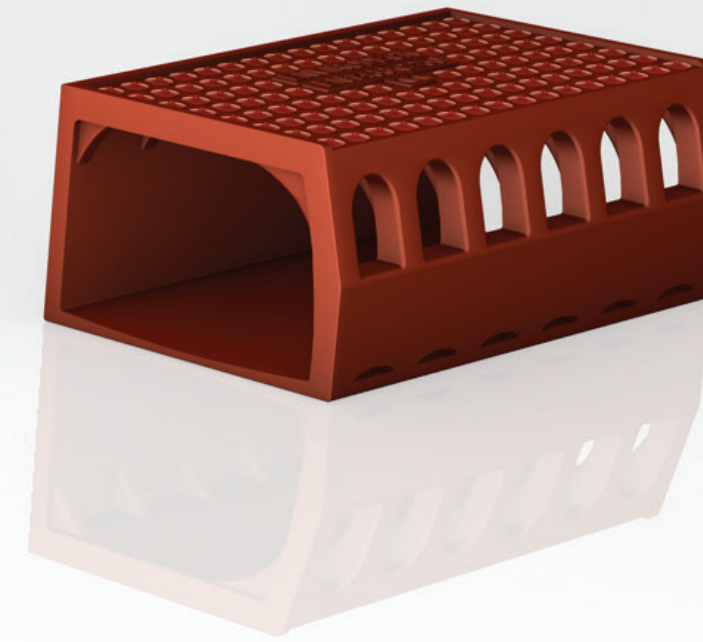
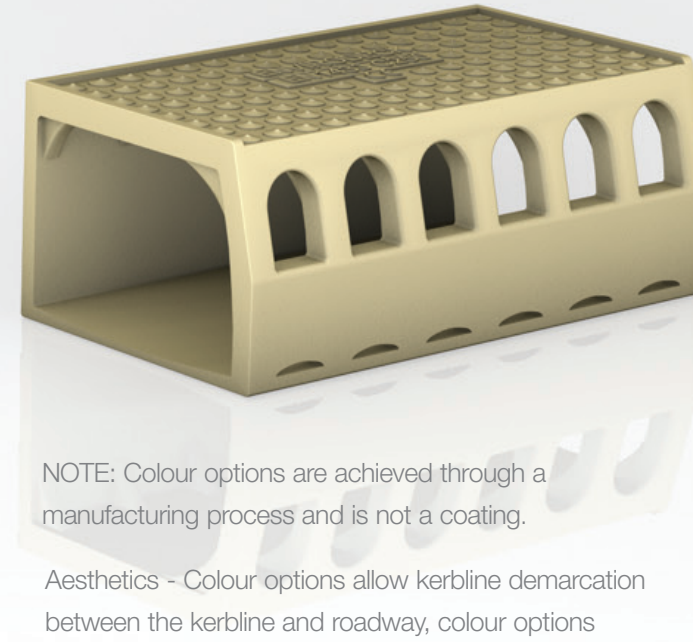
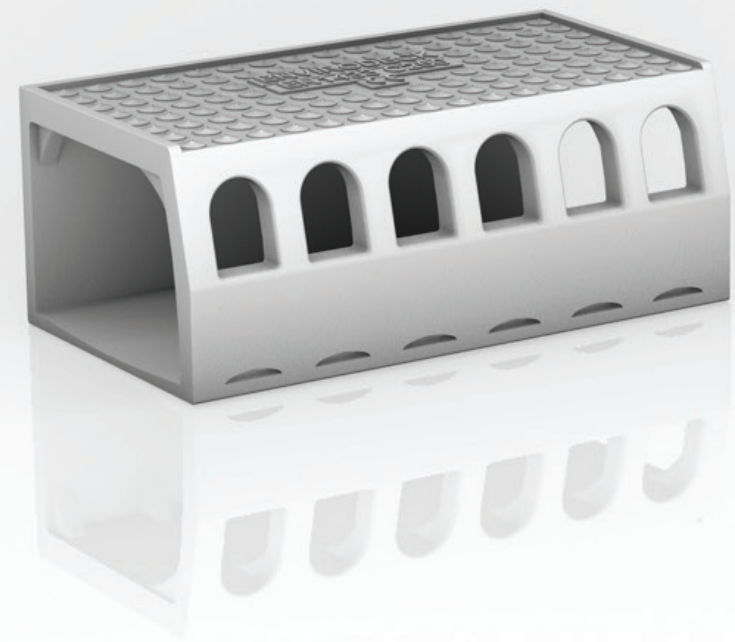
Pipeline and Drainage Systems PLC are proud of the fact that they are able to offer bespoke, cost effective solutions to client's individual projects. We are able to do this through a policy of continuous development, research and gaining customer feedback wherever possible.

We invite customers and clients to consult our Technical team to discuss all your design requirements. PDS PLC are able to offer full hydraulic calculations, CAD detailing on products, site layouts, and CPD seminars to groups who are involved in the Design and Procurement of Combined Kerb Drainage Systems.



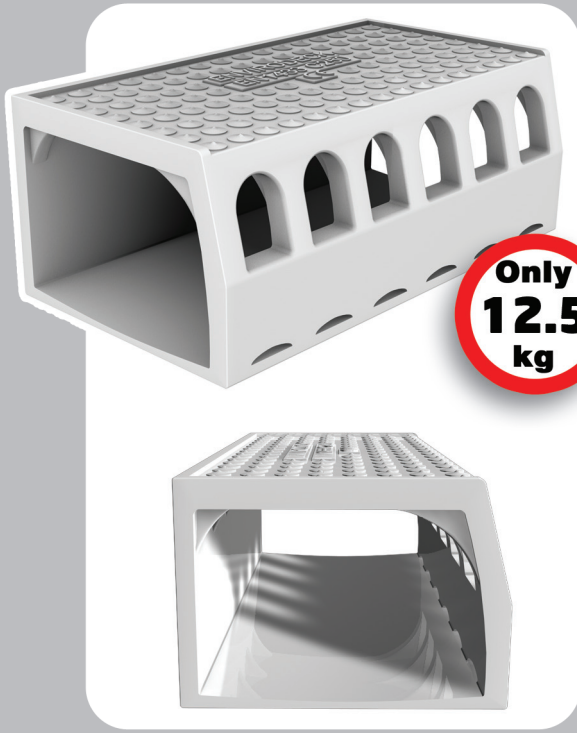
Selection of RAL colours

-  Light Grey (RAL 7035)
-  Buff (RAL 1014)
-  Oxide Red (RAL 3009)
-  Traffic White (RAL 9016)
-  Traffic Black (RAL 9017)

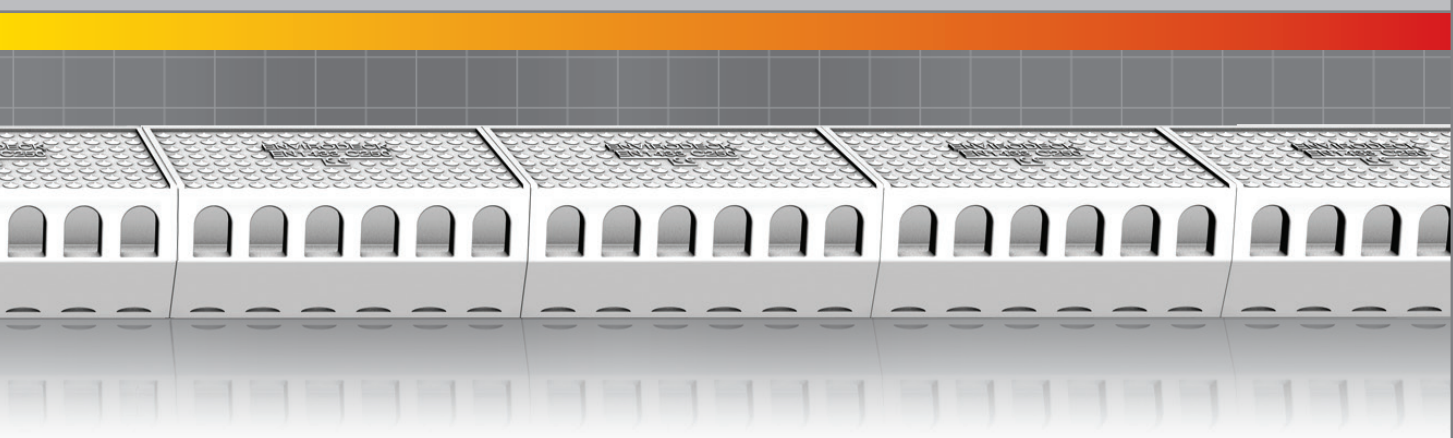


NOTE: Colour options are achieved through a manufacturing process and is not a coating.

Aesthetics - Colour options allow kerblines demarcation between the kerblines and roadway, colour options improve aesthetics and can be used to compliment the bridge design



- Lightweight yet strong.
- Manual installation.
- Significant weight savings to structure.
- High quality finish & appearance.
- Non rusting (no oxidization like metallic units). “Glass finish” invert for high hydraulic flows, reduction in silting and associated weed growth that causes system blockages, therefore less unscheduled maintenance.
- RAL colour option to compliment bridge construction (supplied as standard in concrete grey). Anti slip top surface for additional pedestrian safety.



Envirodeck standards & specifications

- EN1433 is the new European Standard for all Linear Drainage Systems.
- Published in June 03, mandatory Aug 04.
- Products must be third party accredited.
- Products must carry third party certification (e.g CE mark).
- Manufacturers must be ISO accredited (9001).
- Envirodeck is also compliant with Highways Agency specification Appendix 5/5 Clause 516 (Combined Drainage Systems).
- EN1433 states that kerb units are always group 3 C250 load class (min). (Envirodeck is D400KN).

Design Features

6No Surface Water Windows designed for maximum inlet capacity but also to restrict large debris from entering the drainage channel.

6No Sub – Surface Slots – designed for maximum sub surface water collection but also restricts the asphalt entering the channel during the laying operation.

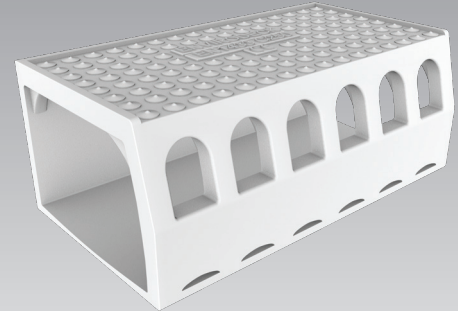
Standard Unit

500mm standard unit.
Low potential slip top surface.
Material - 100% Composite.

Order Ref. 500SU

Length	500mm
Width	175mm/275mm/335mm
Weight	9.5-14kg
Depth	Subject to Wier Heights & Asphalt Construction
Wier Height	75mm/100mm/125mm
Depths	See table

Colour - Light Grey as standard
(see RAL colour chart for other colour options)



Design Features

End Outlet Units – Available in Right and Left hand formats but with the system outlet attached to the unit in either BASE, REAR OR END position.

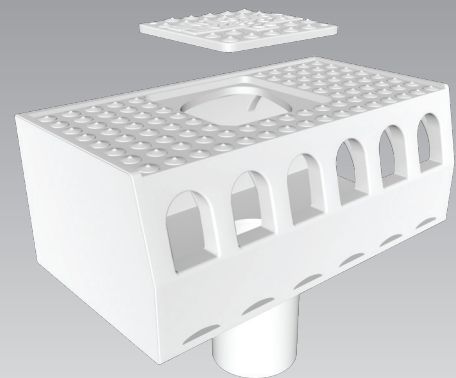
*Cover above the outlet pipe should be checked, where end or rear outlets are proposed.

LH/RH End Rodding Access and Outlet

End Units – Available in Right hand or Left hand formats. The units arrive on site with end plates attached (no on site works are required)

Order Ref.	EN-LHEU EN-RHEU
Length	500mm
Width	As Standard Unit
Weight	9.5-14kg
Additional Features	Removable lid for inspection
Wier Height	75mm/100mm/125mm
Depths	See table
Profile	HB or Splay

Colour - Light Grey as standard



LH Shown

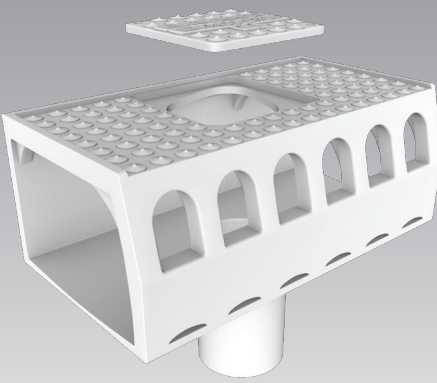
Handage of outlet system subject to direction of Hydraulic flow

Rodding Access and Outlet Unit

500mm Intermediate Rodding / Access Unit with or without outlet.

Order Ref.	EN-RA
Length	500mm
Width	As Standard Unit
Weight	9.5-14kg
Additional Features	Removable lid for inspection
Weir Height	75mm/100mm/125mm
Depths	See table
Profile	HB or Splay

Colour - Light Grey as standard



Design Features

Inspection/Rodding Units located at 20Mtr centres (minimum) along the drainage run and standard at all End/Outlet and Expansion Joint Locations.

A removable inspection plug secured to the body of the unit by stainless steel cable allows inspection/rodding of the system.

1.

Profile	HB/Splay
Weir Height	75mm
Unit Depth	165mm

100mm Asphalt + 20mm RSA (Laid Parapet to Parapet)

2.

Profile	HB/Splay
Weir Height	100mm
Unit Depth	190mm

100mm Asphalt + 20mm RSA (Laid Parapet to Parapet)

3.

Profile	HB/Splay
Weir Height	125mm
Unit Depth	210mm

100mm Asphalt + 20mm RSA (Laid Parapet to Parapet)

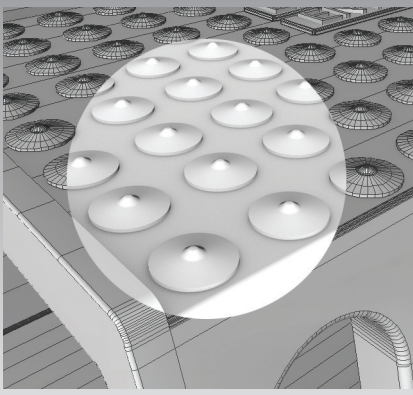
* Where units are laid directly onto the waterproofing, unit depths are increased by 20mm.

Anti slip over view

Anti-slip surface

Order Ref.	Standard spec
	Anti slip surface as standard supplied on Envirodeck Units.

Colour - Light Grey as standard



Design Features

Anti slip surface

All Envirodeck units come as standard with a new Anti-Slip top surface, (*Registered Design).

The unique tread pattern design gives a "low tendency to slip" reading when tested in both wet & dry test cycles.

Typical installation details



1. Envirodeck bedding mortar is mixed in accordance with the recommendations and trowelled to an approx line and level.

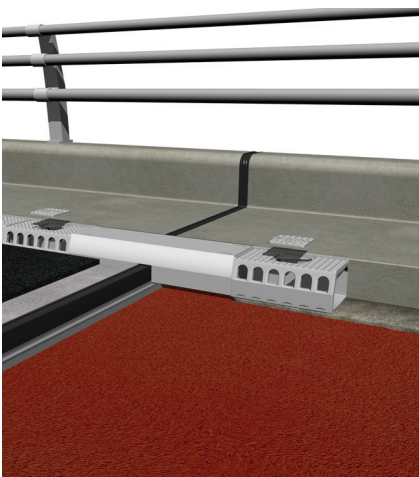
To ease installation, the Envirodeck should be strung out along the deck.

Identify all special units i.e Expansion Joints (if applicable) Intermediate Rodding Access points and any End or End Outlet Units.

These should be placed in their respective positions first. If required for any non-standard lengths or make up pieces, Envirodeck units may be cut using a Stihl saw.

We recommend that if possible these units should maintain full inlet windows in any cut length.

2 Where Expansion Joint Assemblies are to be used these should be placed first over the Expansion/movement Joint position.



3 Envirodeck sealant is applied around the end of the unit prior to placement.

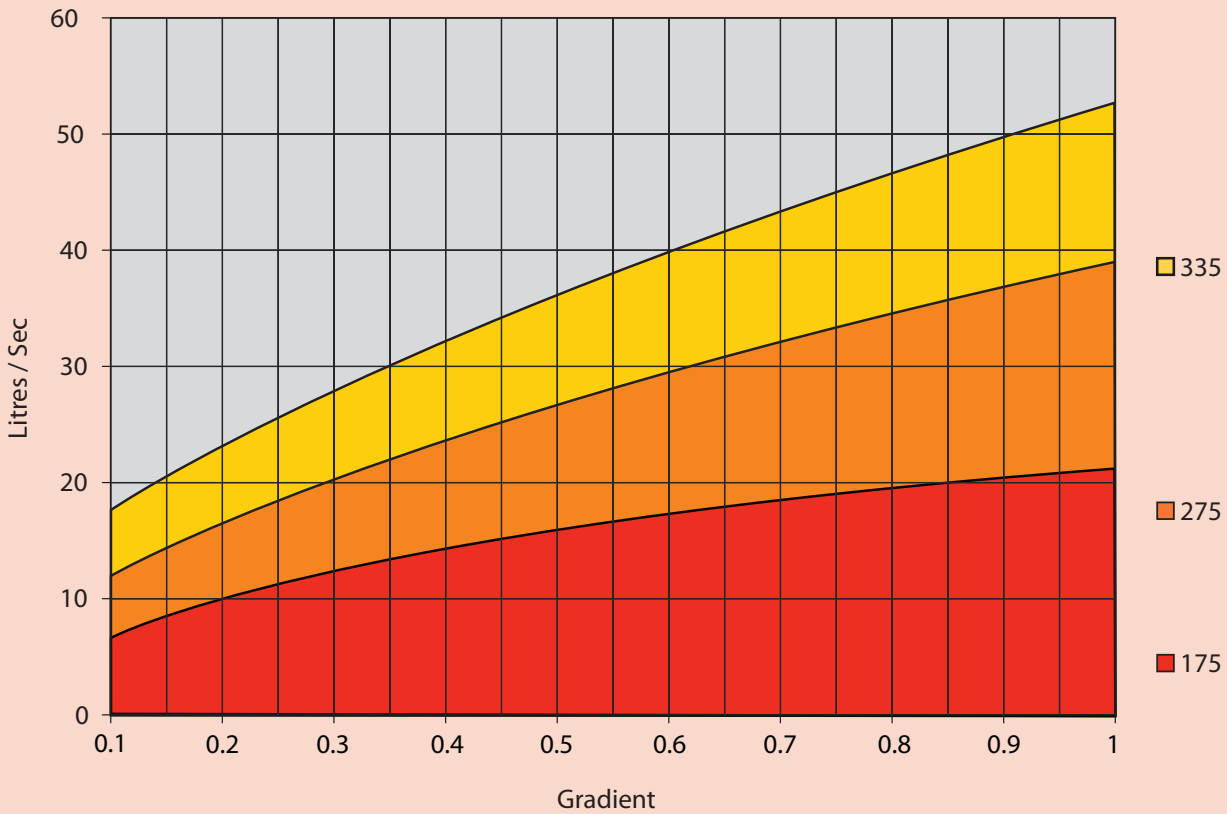
(see separate data sheets on Envirodeck sealant)



4 Place Envirodeck unit on the prepared mortar bed using a rubber hammer for adjustment to line and level.



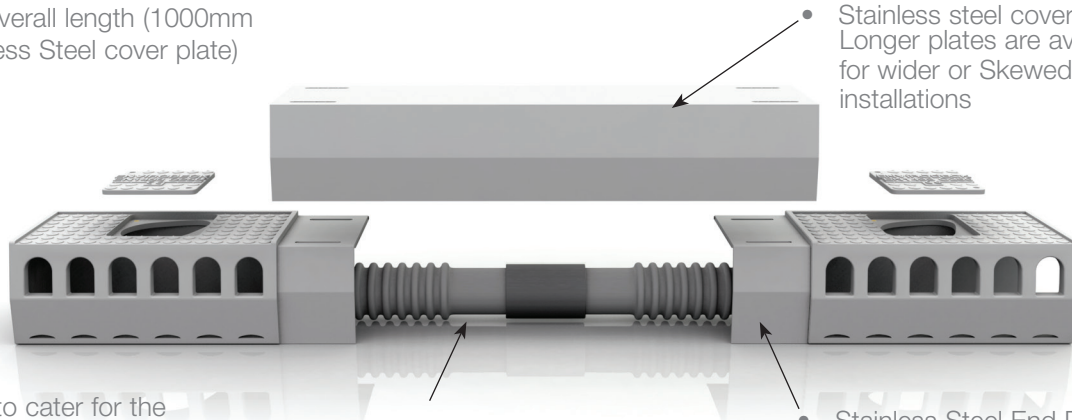
Envirodeck hydraulic flowchart



- All Hydraulic calculations are based on 50mm/hr rainfall levels.
- This is an expected intensity to use in surface water drainage design. Even though the UK has consistent rain, it very rarely hits levels above 35mm/hr. On the occasions that we experience higher levels than 35mm/hr, they are of very short duration, and the system will quickly drain all areas.
- It is a common misconception that larger channels and systems well over capacity will be more effective in draining rainfall. The above figures will enable the product to produce self-cleansing velocities.
- Figures are based on units installed on top of the RSA, the unit depth and hydraulic flows increase when installed directly on the waterproofing.
- The above table is supplied as a guide - PDS are happy to carry out all hydraulic calculations for each specific structure and offer advice on product selection.
- Please contact our sales office for further assistance. Figures allow for 100% of rainfall in a given area to reach the channel. In reality there will always be absorption into the hard standing or wearing course material, especially as the surfacing become aged and worn.
- The charts are for standard layouts. For complicated run layouts, or for any clarification please contact our sales office.
- All hydraulic designs can be carried out by our sales office, if any doubt please ask.

Expansion Joint

- 2000mm overall length (1000mm long Stainless Steel cover plate)



Stainless steel cover plate. Longer plates are available for wider or Skewed Joint installations

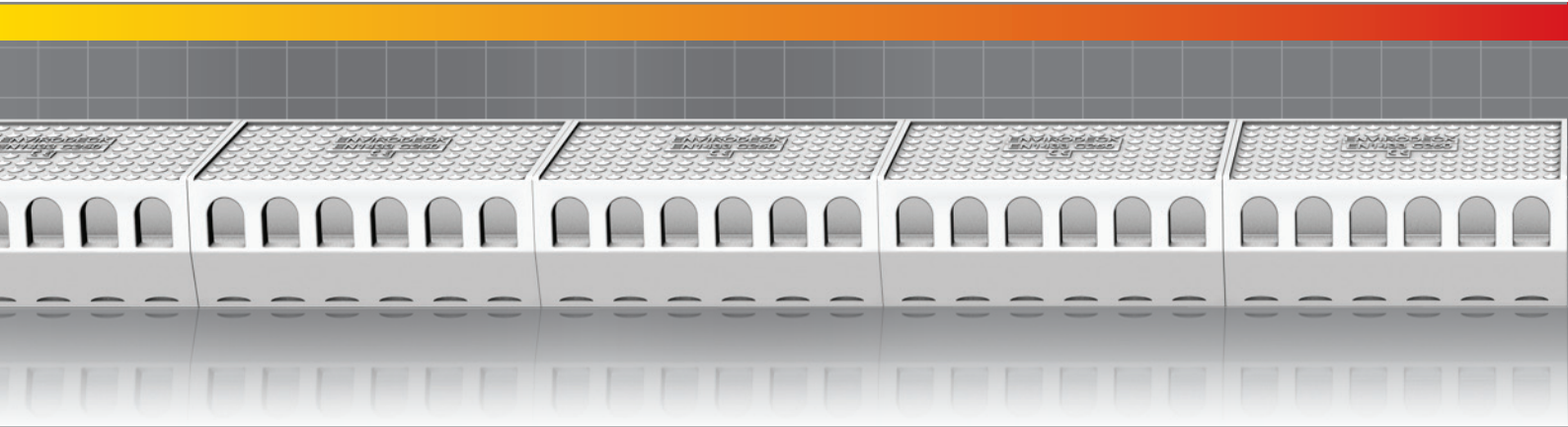
- Designed to cater for the expansion/contraction of expansion joint installation (Asphaltic Plug & Metal Runner type joints)
- Please contact our sales office for advice on your particular Expansion Joint specification

Flexible carrier pipe

Stainless Steel End Plate & Stainless Steel Spigot

Compatible with:-

- Metal Runner Joints
- Asphaltic Plug Joints

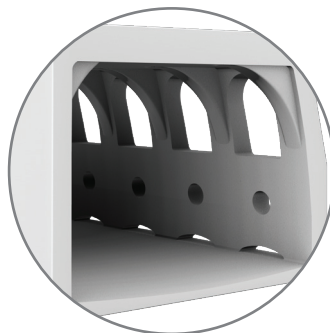
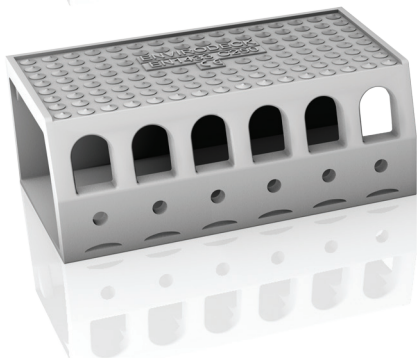


Design Features

Blind Units are available.

These have no surface water entry points and can be located where exceptionally high flows are anticipated at the low point of the deck.

These can prevent surface water flooding back onto the carriageway and hold the water within the units prior to discharging at the outlet.



Design Features

Asphalt drainage.

As an option, additional drainage holes can be provided to drain the wearing course. This is particularly useful when porous SMA is used.

Designservice

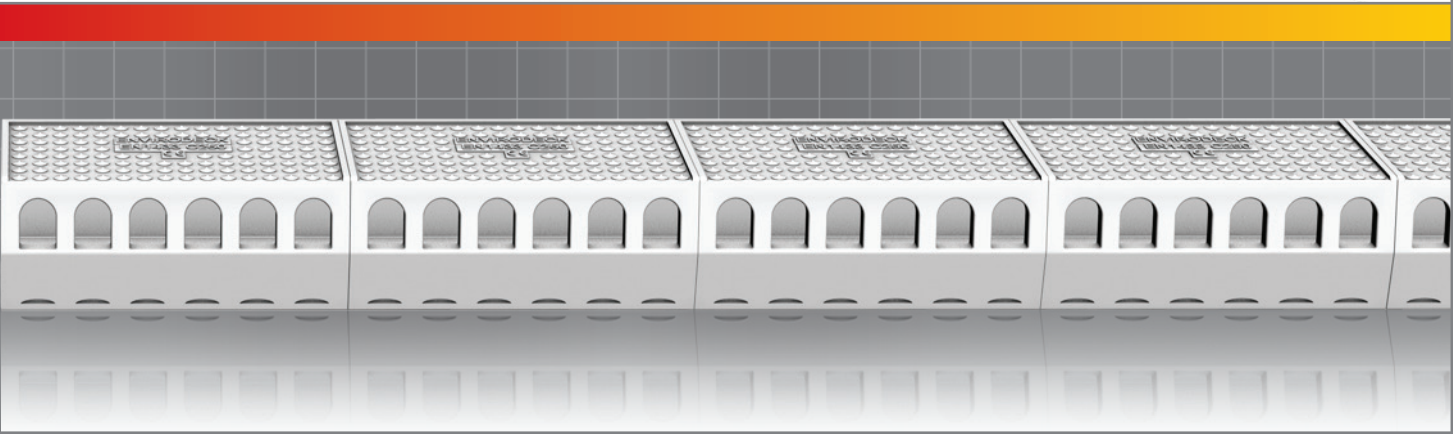


CAD service

Product drawings and full schematic layout drawings showing the positions of each Envirodeck component.

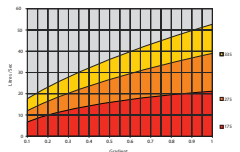
Technical CD-ROM

This gives access to Technical Drawings in both CAD and PDF format, virtual guides through technical aspects of the product range, video, brochures and technical drawings available to download.



HydraulicCalculation

- We offer a full hydraulic design service to ensure the most cost effective solution is chosen for each structure.



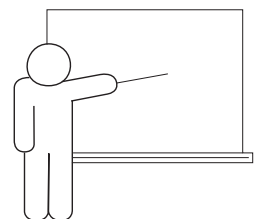
SystemsDesign

- This includes full schematic layout design and drawings including material scheduling to assist in the design process.



CPDSeminars

- PDS are pleased to offer presentations to Bridge Engineers. This philosophy of working closely with the design engineers ensures that the correct size of systems are installed and we gain valuable on-going feedback from the product installation. This assists us in our policy of continuous product development.





Manualhandling

All types of kerb products have recently been the subject of intense investigation by the Health & Safety Executive.

All manufacturers, designers and specifiers now have a duty of care to design out risk for the end user.

Envirodeck weights start at just 9Kg for the 175 system to a maximum of 15Kg for the 335. This allows manual installation, removes the need for lifting equipment and follows the Health & Safety recommendations to design out or limit the risk for the installer.

Bridgecare

Traditionally all metallic bridge drainage units weigh in excess of the recommended one man safe lift, use of heavy lifting equipment is therefore essential which leads to unwanted site traffic on freshly prepared bridge decks. This can lead to early damage to the waterproofing layer.

Many of the UK's older bridges are adopting thinner surfacing to reduce dead weight on the structures. A 100Mtr run of Envirodeck units would equate to a weight saving of over 4 tonnes when compared to existing metallic systems.

