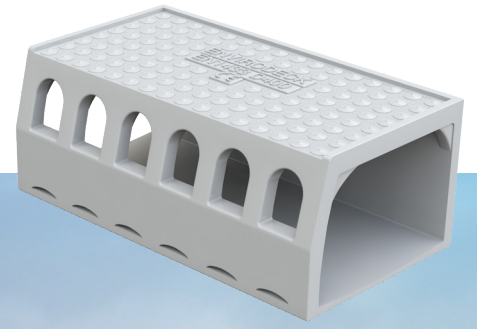


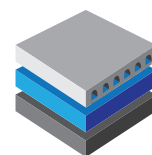
# ENVIRODECK



The Original 100% Composite  
Lightweight Combined Kerb  
Bridge Drainage System



[www.pdsenviro.com](http://www.pdsenviro.com)



**PDS**

SURFACE WATER MANAGEMENT

# WELCOME TO PDS

**Envirodeck** is the number one selling bridge drainage system for the UK and Ireland.

A combination of innovative design and a composite non-metallic material gives a one-piece unit that is lighter and stronger than traditional systems.

Envirodeck provides both surface drainage and sub-surface drainage. As advised by the Highways Agency this is recommended to prevent serious damage to the waterproof membrane and pavement, and helps you to avoid costly and disruptive repairs.

## FEATURES & BENEFITS



### HEALTH AND SAFETY

Unit weights are reduced by over 50% to comply with the 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.



### 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.



### 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.



### 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.

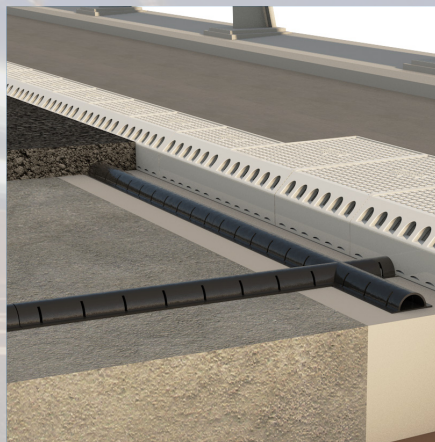
- Lightweight Non Metallic
- Precision Manufacturing
- Colour Coding Options
- Half Battered And 45 Degree Splayed
- Anti Slip Top Surface
- Surface and Subsurface Drainage Capability
- Wide Range of Widths & Depth Available
- Fully Compliant to BS EN1433

ENVIRODECK | 02



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| USL Group                  | 03    |
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| Standards & Specifications | 05    |
| Products                   | 06-07 |
| Installation Guide         | 08    |
| Design Service             | 09    |
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The USL Group of companies are market leaders in the provision of specialist civil engineering and construction solutions for virtually any type of new build or refurbishment project.

For almost four decades, the business has been at the forefront of cutting edge resin and cementitious technology, combining high performing innovative products, first class operations, expert technical support and unrivaled customer service.

USL Group specialise in expansion joints, structural and liquid waterproofing, construction chemicals, concrete repair systems, injection resins and specialist safety & anti-slip products. With a comprehensive portfolio of products and a highly developed global network, the business is focused on providing specialist construction solutions on a truly global basis.

## Complementary Product

Dri-deck is a complete solution for the collection of water at the subsurface level that can be used in conjunction with our Envirodeck combined kerb drainage systems.

“

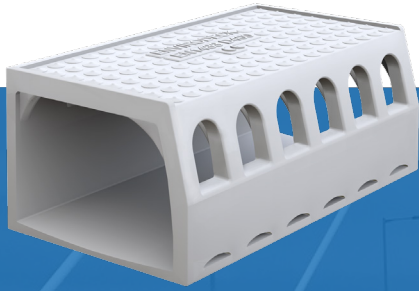
**“The advantage of Envirodeck is that it is a single colour product of high durability, reducing the need for maintenance. Each individual unit can be handled by one man, and it’s fully compliant with the manual handling regulations. Any other product would require a two-man lift or mechanical plant to help lift it into place”**

River Hull Viaduct Project

”

# ENVIRODECK

## COMBINED KERB DRAINAGE SYSTEM FOR BRIDGES



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.

Alternative 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 be of detriment to the appearance of the structure, particularly as the system is 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.

### PDS CONTINUES ITS POLICY OF CONTINUAL PRODUCT DEVELOPMENT.

As market leaders in the design, manufacture and supply of bridge drainage systems, we champion Envirodeck, as 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.

ENVIRODECK | 04



For more information Call +44 (0) 844 848 9400 or Visit [www.pdsenviro.com](http://www.pdsenviro.com)

# ENVIRODECK STANDARDS & SPECIFICATIONS

To ease installation, the Envirodeck units 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.

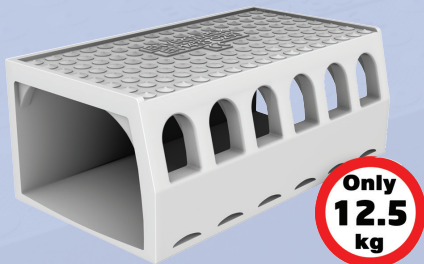
These should be placed in their respective positions first. If required for any non-standard lengths or make up pieces, Envirodeck units may be cut using a Stihl saw.

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

## REPUTATION BUILT THROUGH INNOVATION

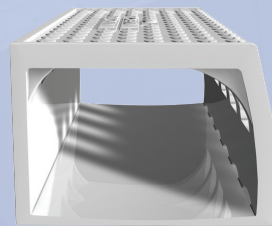
### Composite Technology utilised in the world of Bridge Drainage Systems

- 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.

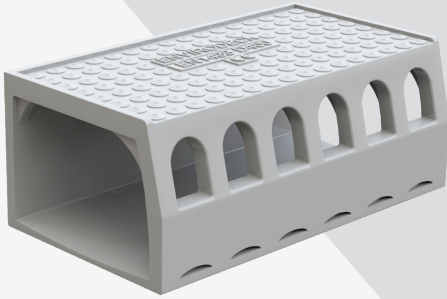


## ENVIRODECK STANDARDS & SPECIFICATIONS

- **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).



# COMBINED KERB DRAINAGE FOR BRIDGES



Standard unit. Low potential slip top surface.  
Material - 100% Composite.

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

## STANDARD UNIT

### 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.

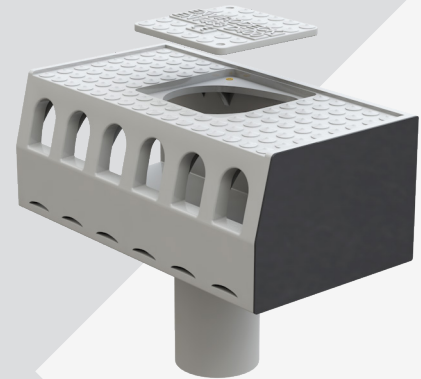
| Length       | Width  | Weight           | Depths  | Weir Height    |
|--------------|--|------------------|---|----------------|
| <b>500mm</b> | <b>175mm</b><br><b>275mm</b><br><b>335mm</b><br><b>500mm</b> | <b>&gt;9.5kg</b> | <b>Subject to Weir Heights &amp; Asphalt Construction</b> | <b>Various</b> |

## LH/RH END RODDING ACCESS AND OUTLET UNIT

### Design Features

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

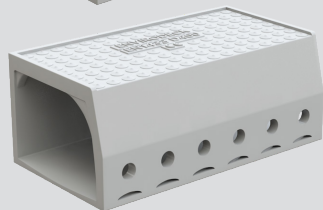
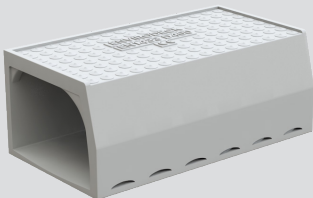
End Units – Available in Right hand or Left hand formats. The units arrive on site with end plates attached (no on site works are required).



| Product Code                     | Length       | Width                   | Additional Features  | Weight           | Depths  | Weir Height    | Depths           |
|----------------------------------|--------------|-------------------------|----------------------|------------------|---|----------------|------------------|
| <b>EN-LHEU</b><br><b>EN-RHEU</b> | <b>500mm</b> | <b>As Standard Unit</b> | <b>Removable Lid</b> | <b>&gt;9.5kg</b> | <b>Subject to Weir Heights &amp; Asphalt Construction</b> | <b>Various</b> | <b>See table</b> |

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

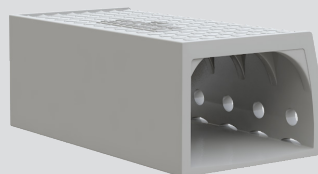
## ASPHALT DRAINAGE & BLIND UNITS



### Blind Unit 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 surcharging back onto the carriageway and hold the water within the units prior to discharging at the outlet.

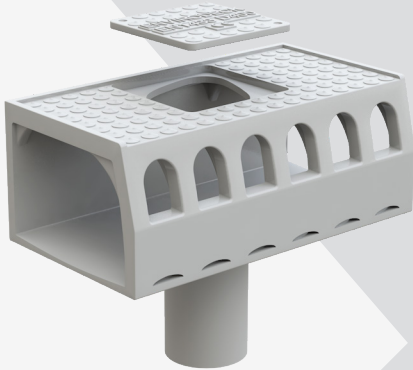


### Asphalt Drainage Design Features

As an option, additional drainage holes can be provided to drain the wearing course.

This is particularly useful when porous SMA is used.

# COMBINED KERB DRAINAGE FOR BRIDGES



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

## RODDING ACCESS AND OUTLET UNIT

### 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.

| Product Code | Length | Width                            | Additional Features | Weight | Depths   | Weir Height | Depths    |
|--------------|--------|----------------------------------|---------------------|--------|--|-------------|-----------|
| EN-RA        | 500mm  | 175mm<br>275mm<br>335mm<br>500mm | Removable Lid       | >9.5kg | Subject to Weir Heights & Asphalt Construction | Various     | See Table |

## UNIT DEPTH TABLE

### Examples of Unit Depth 1.

| Profile | Weir Height | Overall Unit Depth |
|---------|-------------|--------------------|
| Splay   | 75mm        | 165mm              |

### Examples of Unit Depth 2.

| Profile   | Weir Height | Overall Unit Depth |
|-----------|-------------|--------------------|
| HB/ Splay | 100mm       | 190mm              |

### Examples of Unit Depth 3.

| Profile | Weir Height | Overall Unit Depth |
|---------|-------------|--------------------|
| HB      | 125mm       | 210mm              |

## ANTI SLIP SURFACE OVERVIEW

### Design Features

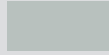




All Envirodeck units come as standard with a new Anti-Slip top surface, (\*Registered Design). The unique tread pattern design gives a "low tendency to slip" reading when tested in both wet & dry test cycles.



## AESTHETICS

### Design Features

Selection of RAL colour options

|   |                               |
|---|-------------------------------|
|  | <b>Light Grey</b> RAL 7035    |
|  | <b>Buff</b> RAL 1014          |
|  | <b>Oxide Red</b> RAL 3009     |
|  | <b>Traffic White</b> RAL 9016 |
|  | <b>Traffic Black</b> RAL 9017 |

All diagrams are for illustration purposes only, and should not be used as a technical reference.

# TYPICAL INSTALLATION DETAIL

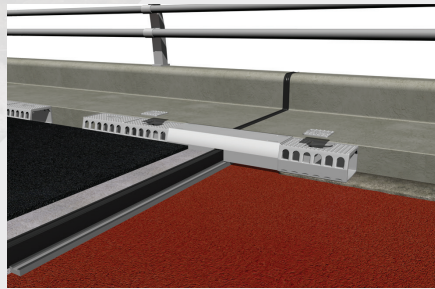
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These should be placed in their respective positions first. If required for any non-standard lengths or make up pieces, Envirodeck units may be cut using a Stihl saw.

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



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



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.



5. The installation is now ready for the asphalt to be laid.

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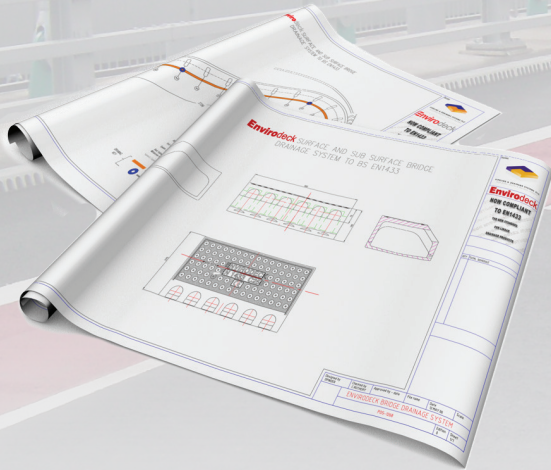
## OTHER PRODUCTS

PDS manufacturer and supply a number of products for the Civil Engineering Industry. These include ENVIROCHAMBER, ENVIROCOVER, ENVIROGRATE, DRIDECK sub-surface drainage. Please see our website [www.pdsenviro.com](http://www.pdsenviro.com) for further information.





# DESIGN AND HYDRAULICS



## HYDRAULIC CALCULATION

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

## CPD SEMINARS

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.

## SYSTEM DESIGN

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

## CAD SERVICE

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

**This is a free of charge service!**

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## SPECIFICATION CLAUSE

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

Having a maximum 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.

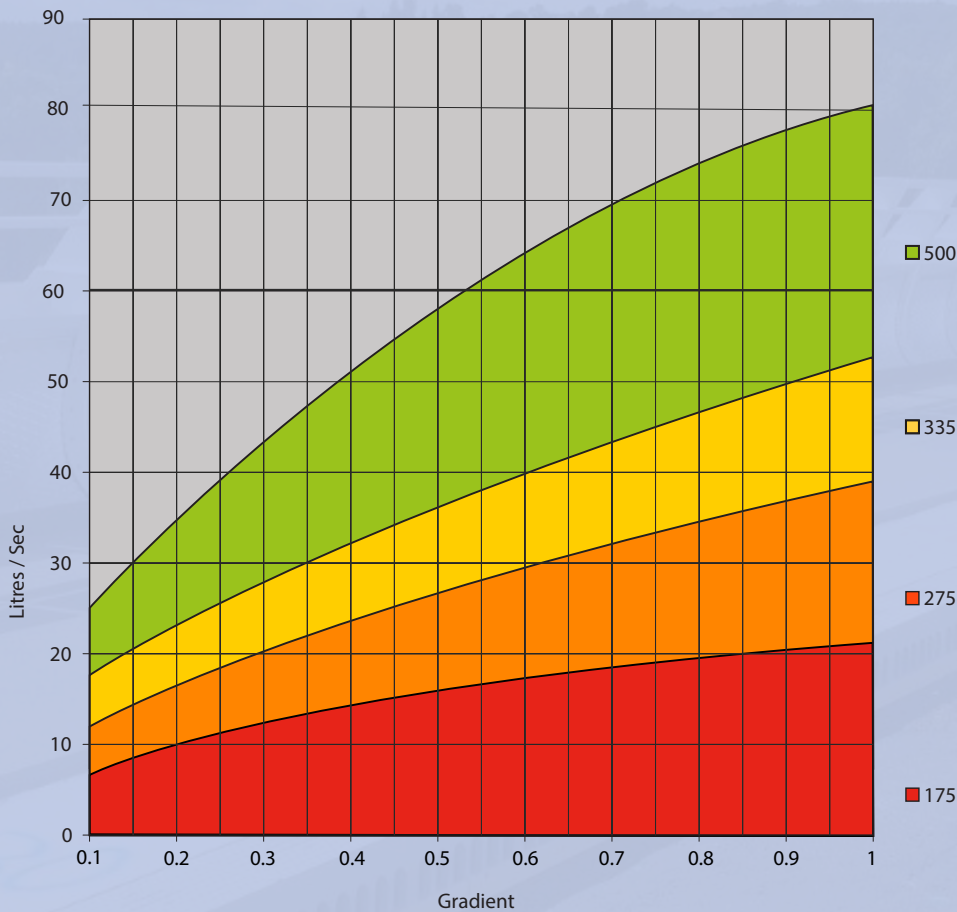
As recommended by the UK Slip Resistance Group Issue 2 RAPRA 2000.

PDS 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 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.

# ENVIRODECK

## ENVIRODECK HYDRAULICS



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### ENVIRODECK HYDRAULIC FLOW CHART

All Hydraulic calculations are based on specific rainfall levels, dependent on the location of the contract and design criteria.

It is a common misconception that larger channels and systems well over capacity will be more effective in draining rainfall, when in fact an appropriately sized unit promotes self cleansing of the system this reduces silting and the need for frequent maintenance. 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 an indicative 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.

# SPECIFICATION

**Bridge Drainage - The Combined Kerb Drainage system shall be as ENVIRODECK. All system components shall be from the ENVIRODECK range.**

## SPECIFICATION CLAUSE

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

The unit should be lightweight

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

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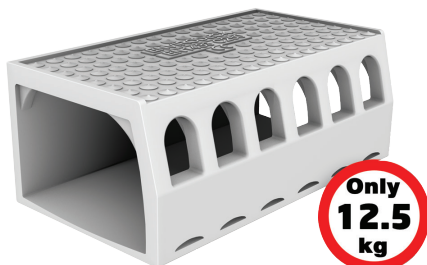
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## MANUAL HANDLING

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.

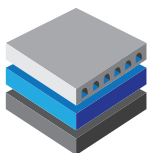
Envirodeck weights start at just 9Kg for the 175 system. This allows manual installation, removes the need for lifting equipment and follows the Health & Safety recommendations to design out or limit the risk for the installer.

## BRIDGE CARE

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.

**Please contact our sales office to discuss you project in detail**



**PDS**

SURFACE WATER MANAGEMENT

**PDS**

Cavendish House, Unit 1 Enterprise 36,  
Tankersley, Barnsley, S75 3DZ, UK

**Tel: +44 (0) 844 848 9400**

**Fax: +44 (0) 844 848 9401**

[www.pdsenviro.com](http://www.pdsenviro.com)