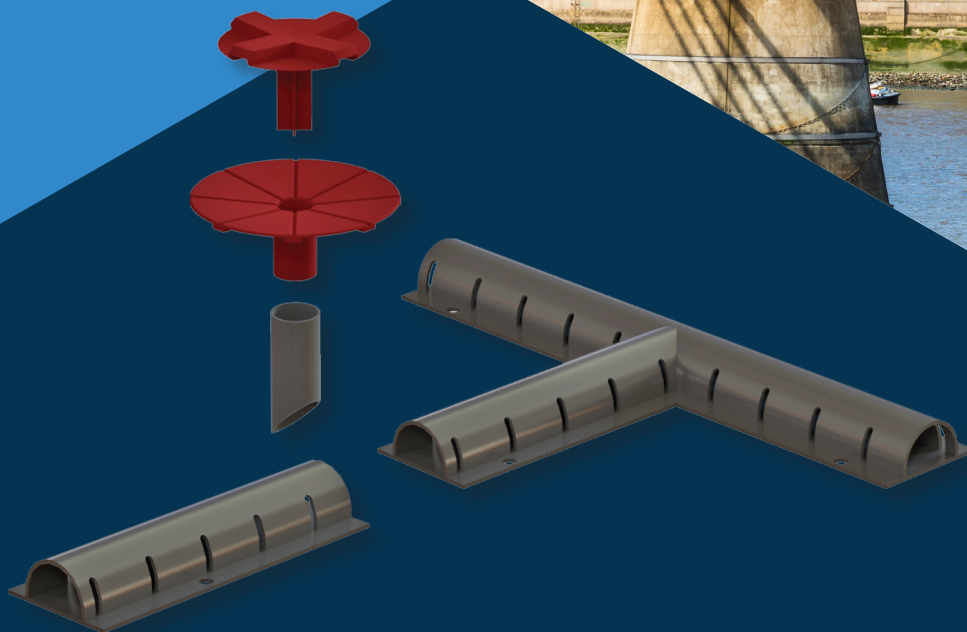




# BRIDGE & SUB-SURFACE DRAINAGE

## Honel 325/302 & ES Seal

EFFECTIVE WATER  
MANAGEMENT SOLUTIONS



# Introduction

## Importance of Effective Water Management

### WATER TRAPPED WITHIN SURFACE LAYERS

Due to seepage and condensation water can collect on top of the structure's waterproof membrane, be it in a bridge deck or road.

Humidity and variations in temperature can cause vapour pressure to build up under the waterproof membrane and over time this can result in breakage of the surfacing as well as causing damage to the internal components of the structure, such as the bearings and expansion joints.

Over time water penetrating the road surface will migrate to the lowest point on the deck, at which point ponding can occur.

### WATER THE COMMON ENEMY OF STRUCTURES

Surface water when left unmanaged can lead to irreversible damage to the structure. It is essential to release seepage water and vapour pressure in order to maintain the integrity of the deck waterproofing and road surface.

### THREE COMMON PROBLEMATIC EFFECTS WATER HAS ON STRUCTURES:

- **High Temperatures** - High temperatures during the day can evaporate trapped water, this generates a pressure gradient within the surfacing matrix.
- **Low Temperatures** - In winter months freezing water trapped within the structure surfacing can result in an increase in water volume, causing damage to the surfacing when the frozen water thaws.
- **Passage of Traffic** - Traffic, especially HGVs cause a pressure wave within the seepage water, much like the effects of ice and water vapour, this can cause breakage of the road surfacing.

### WHY SUB SURFACE DRAINAGE IS REQUIRED

All structures require a comprehensive sub surface drainage system if the maximum design life of the structure is to be achieved.

Special care should be taken to ensure functionality and access for maintenance around key areas of the structure, such as the location of the expansion joints.

Poorly installed, inconsistent or unmaintained drainage can often contribute to failures such as deterioration of the concrete, bar corrosion and concrete spalling.

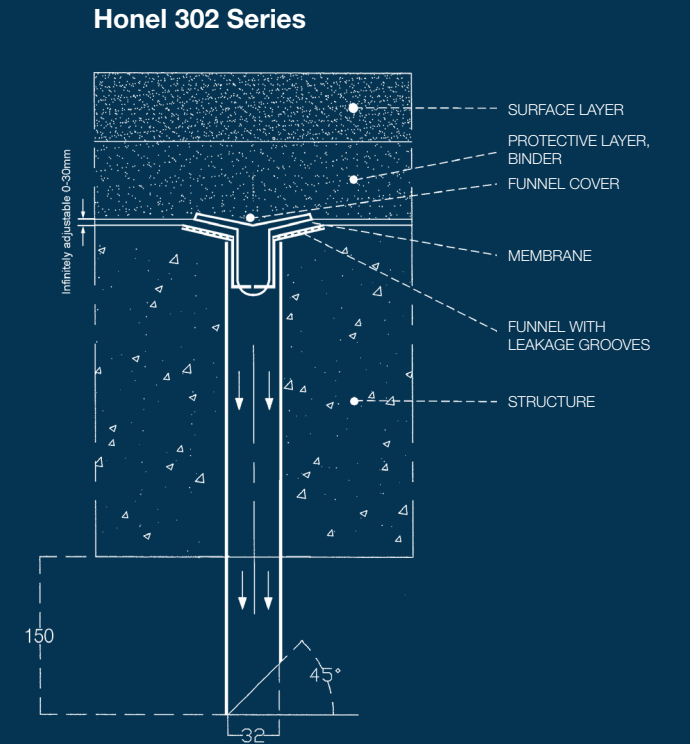


### THE SOLUTION

The HONEL 300 Series Sub-Surface Drainage System is designed to prevent the common issues caused by poor drainage, hence eliminating the requirement for costly repairs.

### HONEL 325 Series

Use of Honel 325 system enables collection and direction of water flow at the membrane surface where it is required. This minimizes the need for through deck drain points and subsequent collection pipes.

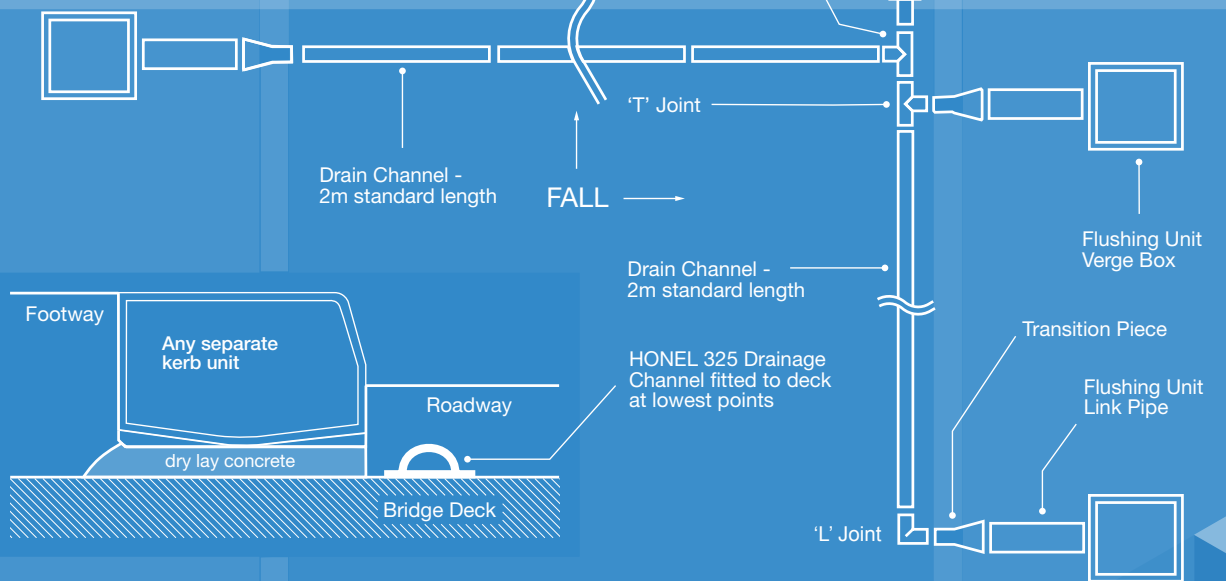


### FOOTPATH

### CARRIAGEWAY

### FOOTPATH

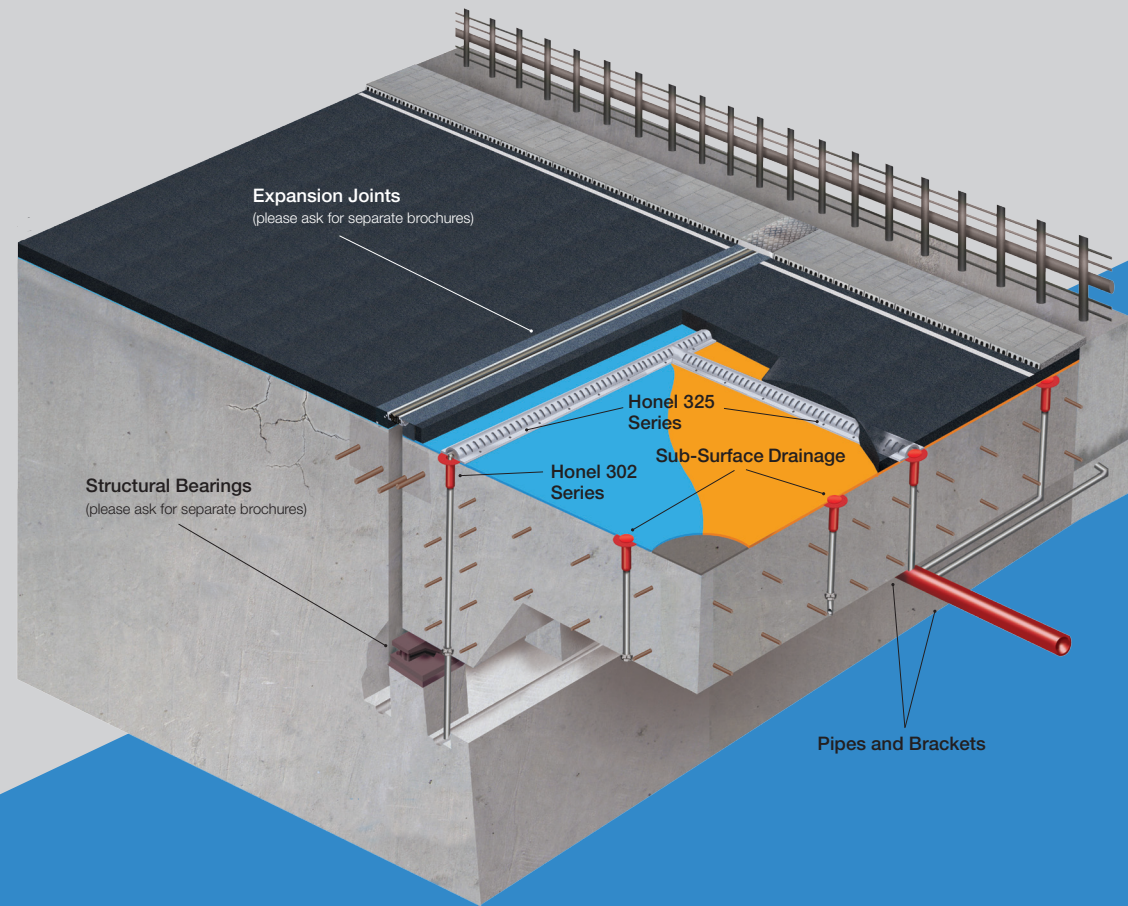
### ASPHALTIC PLUG JOINT



A 90 degree outlet at this point could drain into a 302/51 through deck pipe.

Alternatively, an asphaltic plug joint can be bridged using a 325 expansion unit.





### HONEL 302 SYSTEM

The 302/51 and 302/2 through deck drain units are designed to provide 'spot drainage' points wherever needed or to be used in conjunction with Honel 325 channel system to provide a wider area of water collection. Corresponding 325 straight outlets will fit into the 302/51 or 302/2 funnels to create a comprehensive sub surface drainage solution.

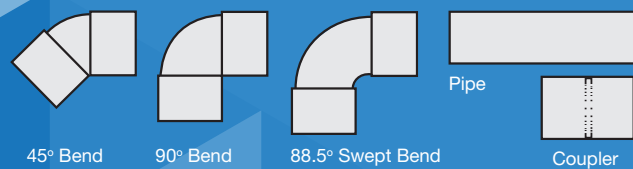
The through deck system is provided in two sizes, 50mm and 32mm diameter. The 32mm 302/02 system is ideal for retrofit applications to overcome ponding or to drain a bridge deck between pre-stressed beams.

Most highways applications favour the 50mm diameter 302/51 system due to its increased discharge capacity.

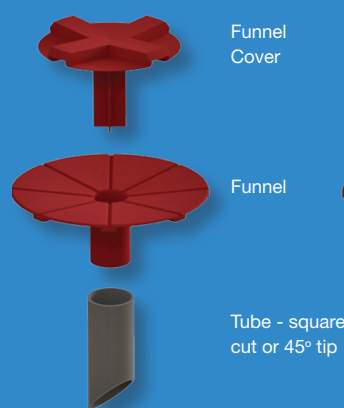
### HONEL 302/2 & 302/51 PIPE COMPONENT AND ACCESSORIES

A number of component uPVC bends and fittings are available for use with the Honel 302 through deck system.

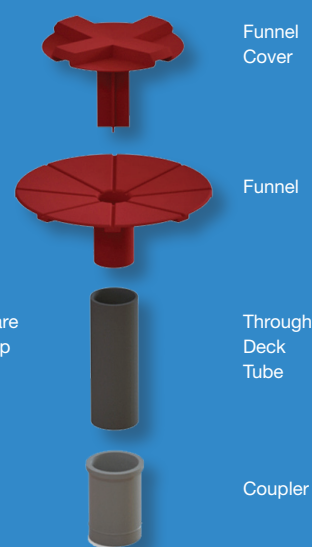
Please contact us for further information.



### RETROFIT



### NEW DECKS



### HONEL 325 CHANNEL

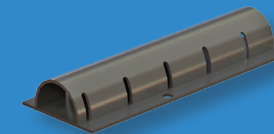
Honel 325 is a durable galvanised mild steel section designed to efficiently remove water away from the bridge deck. The channel is supplied in two-metre lengths for ease of installation and is compliant with the Highways England BA26/94.

The 325 channel is installed directly onto the waterproofing layer using a polyester resin to prevent any voids forming during installation. The channel is blacktop heat proof and we recommend coverage of a minimum of 80mm.

A compatible flushing box is also available to ensure that the 325 channel is easily maintainable, ensuring the system's integrity and life time operation.

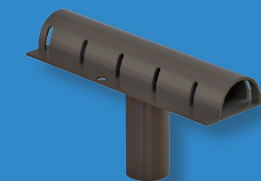
### DRAIN SECTION

Can be fitted to any required length. The standard unit is 2m long. Channel end caps are used at all open ends to prevent ingress of blacktop and debris.



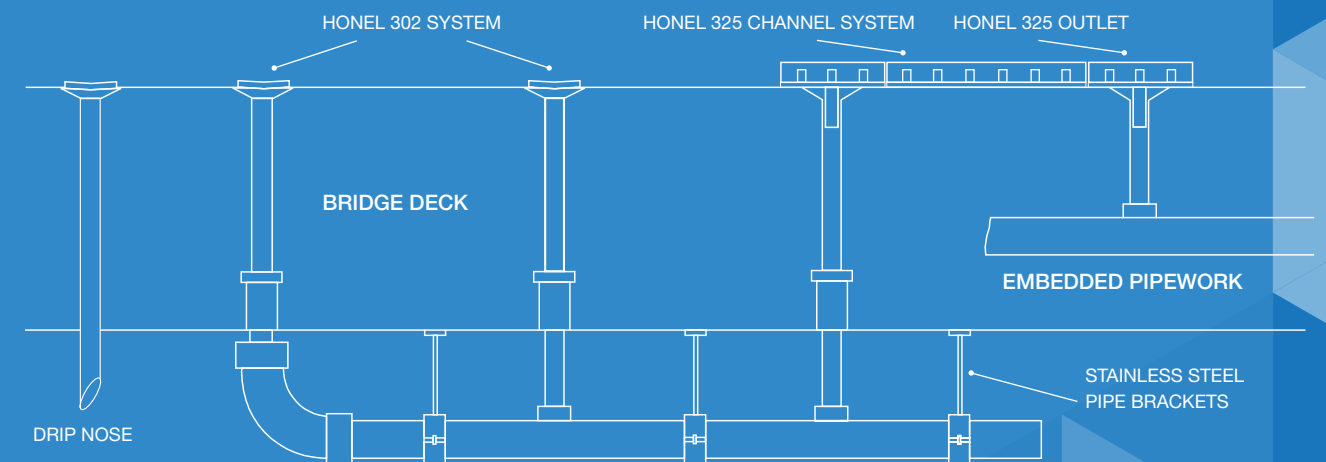
### OUTLETS

All of our outlets are designed to be compatible with the 325 sub-surface channel and the 302 through decks. They are available in a straight outlet format as shown, or at a 90 degree crank as well as a four-way X piece.



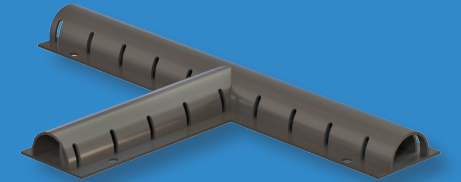
### OUTLET ARRANGEMENTS

Below the bridge deck the drain units can be linked to water collection pipes or allowed to drain free below via the drip nose attachment. e.g. over non navigable rivers and streams.



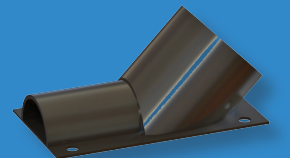
### JOINTS

We provide a number of different joints to enable interconnectivity of the channel throughout the deck surface. Joints available are the T joints as shown, as well as left and right hand 90 degree cranked, and left hand and right hand 45 degree Y joints.



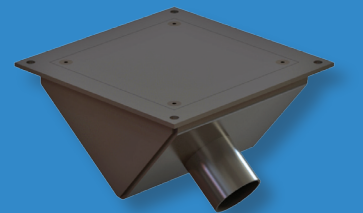
### TRANSITION PIECES

The transition piece as shown connects the 325 channel to the flushing unit.



### FLUSHING UNIT VERGE BOX

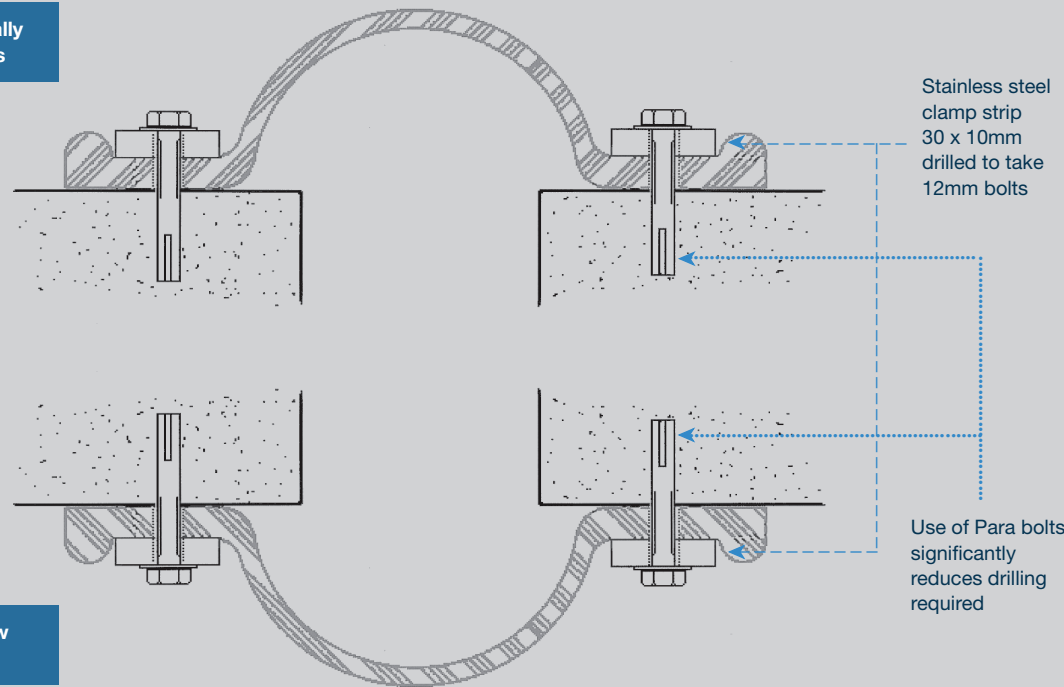
The flushing box allows access to the installed 325 sub-surface drainage system to enable jetting equipment to remove any silt build-up. This ensures that the system is working to its full capacity throughout its service life.



### ES SEAL SYSTEM

The ES Seal system is designed to provide a flexible water seal connection between adjacent structures. The clamping profile used to fix the system into place is offered in corrosion resistant stainless steel and the robust fibre reinforced seals are manufactured to any required length.

Seal fitted longitudinally between bridge decks



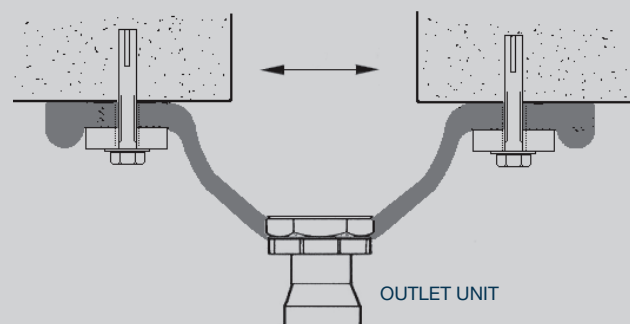
Seal suspended below expansion joint

### ES SEAL SELECTION TABLE

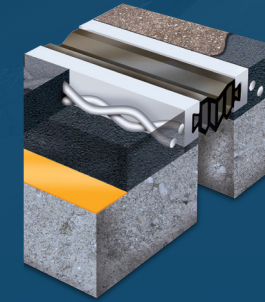
Type	Nominal Gap (mm)	Movement Range (mm)	Overall Width (mm)	Bolts (standard capacity)	Weight (kg/m)
ES200-25	≤ 50	-50 to +40	200	M8 / M10	2.8
ES240-40	80	-40 to +60	240	M10	4.5
ES300-70	140	-70 to +65	300	M12	5.4
ES360-100	200	-100 to +90	360	M12	7.1
ES400-100	200	-100 to +90	400	M12	8.8

### ES SEAL USED AS A GULLEY ACROSS EXPANSION JOINT IN BRIDGE STRUCTURE

An outlet unit can be added to the gulley should it be required. 90 degree corners can also be vulcanised into the seal to allow the seal to be fitted around corners and vertically up the structure.

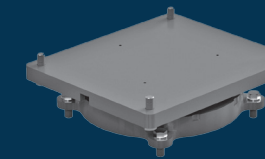


# USL EKSPAN - PRODUCT RANGE



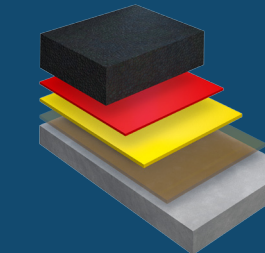
### EXPANSION JOINTS - CD 357

- Uniflex - Buried
- T-MAT - Mat
- Open Type Joint - Rail Joint
- BP1 - Buried
- Britflex BEJ - Modular
- Britflex UCP - Footbridge Joint
- FEBA - Flexible Plug
- Britflex MEJS - Modular
- Finger Joint
- Britflex NJ - Nosing
- LJ - Longitudinal Joint
- Roller Shutter Joint
- EC & EW - Joint Seal
- ES - Joint Seal
- Aqueduct/Immersed Joint
- Transflex & Transflex HM - Mat



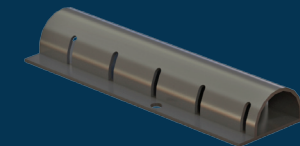
### STRUCTURAL BEARINGS

- EKE - Elastomeric (EN1337-3)
- D - Linear Rocker (BS5400-9)
- EKR - Rubber Pad & Strip
- KE - Pot (EN1337-5)
- F - Restraint & Guide (BS5400-9)
- EQF - Sliding Bearing
- DE - Linear Rocker (EN1337-6)
- GE - Spherical (EN1337-7)
- G - Spherical (BS5400-9)
- Bespoke Bearings
- FE - Restraint & Guide (EN1337-8)
- J - Roller (BS5400-9)
- EA - Sliding Bearing
- K - Pot (BS5400-9)
- Link Bearing (BS5400-9)



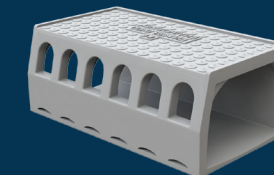
### STRUCTURAL WATERPROOFING - CD 358

- Pitchmastic PmB  
Polyurethane (Pu)  
Waterproofing System
- Britdex CPM Tredseal  
Combined Waterproofing and  
Anti Skid Surfacing (MMA)
- Britdex MDP  
Methyl Methacrylate (MMA)  
Waterproofing System
- Uradeck BC  
Combined Waterproofing and  
Anti Skid Surfacing (Pu)



### SUB-SURFACE BRIDGE DRAINAGE

- Honel 325 Channel
- Honel 302 System
- ES Seal System
- DriDeck



### SURFACE BRIDGE DRAINAGE

- Envirodeck

### GROUP BRANDS



A world wide service offering effective solutions in:-  
**Inspection • Design • Manufacture • Supply • Installation • Commissioning • Planned Maintenance**

USL Ekspan warrants that products described in this brochure are free from defects in workmanship and material, but unless expressly agreed in writing USL Ekspan gives no warranty that these products are suitable for any particular purpose or for use under any specific conditions notwithstanding that such purpose would appear to be covered by this publication. USL Ekspan accepts no liability for any loss, damage or expense whatsoever arising directly or indirectly from the use of their products. All business undertaken by USL Ekspan is subject to their standard conditions of sale, copies of which are available upon request. USL Ekspan products are subject to continual development and USL Ekspan reserves the right to make changes in the specification and design of their products without prior notice.





## CONTACT US

### Head Office

Kingston House, 3 Walton Road, Pattinson North,  
Washington, Tyne & Wear, NE38 8QA, UK

**t:** +44 (0) 191 416 1530 **e:** [info@uslekspan.com](mailto:info@uslekspan.com)

### Sales & Manufacturing

Compass Works, 410 Brightside Lane,  
Sheffield, South Yorkshire, S9 2SP, UK

**t:** +44 (0) 114 261 1126 **e:** [info@uslekspan.com](mailto:info@uslekspan.com)

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