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Intelligent Access & Drainage Solutions™

**Sub-surface channel drainage system for use on bridges and elevated highways.**

For use with **Aqua**Deck™ bridge deck kerb drainage units or as a stand-alone sub-surface drainage system.

Independently third party tested
**D400** load class.

# SubDrain™

# SubDrain™

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**Sub**Drain™ is a high strength channel bridge drainage system that provides sub-surface water collection at deck level.

An essential element of any bridge deck design, **Sub**Drain™ provides a sub-surface drainage solution in accordance with National Highways guidance CD 537.

The system has been designed and engineered to operate in conjunction with the **Aqua**Deck™ bridge deck kerb drainage system, or can be used as a stand-alone sub-surface collection system.

- Provides sub-surface water collection at deck level
- Fully compatible with the Eccles' **Aqua**Deck™ bridge deck kerb drainage system
- Manufactured from high-strength spheroidal graphite (ductile iron)
- Independently third party tested D400 load class
- Stress resistant to withstand point loadings
- Heat and road salt resistant to enhance longevity and reduce remedial activity
- Modular pipework and fixings to suit any configuration
- Quick and easy installation
- Convenient maintenance access via kerbline and/or carriageway adjustable rodding units

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## Loading

**Sub**Drain™ channels and through deck outlets have been independently third party tested for D400 load class.

This means the units are more than capable of withstanding the point loads they will encounter during asphalt laying operations.

## Size & Material

**Sub**Drain™ **channels are manufactured from a high strength spheroidal graphite iron, which is incredibly strong and durable and stress-resistant to any damage or deformation caused by surface pressures and machinery laying the tarmacadam layers.**

**The units are also heat and frost resistant so will not crack or weaken in time.**

**Sub**Drain™ **units are 500mm long x 35mm high. This universal size allows installation in standard 120mm construction depths. Where asphalt depths are lower a minimum of 25mm of asphalt above the top of the channels is desirable.**

**The 500mm length dimension ensures the channels can follow any curvatures on the structure, keeping the drainage holes as close to the bridge deck as possible and prevent 'rocking' on the channels, which can occur on longer lengths.**

**Sub**Drain™

# SubDrain™

## How does SubDrain™ work?

**Sub**Drain™ offers a practical and economical solution to collect sub-surface water.

**Sub**Drain™ recessed base units and slotted cone cover units drain the asphalt layers and pick up sub-surface water at waterproofing level, as well as providing a discharge point  through the deck into a carrier pipe system.

The cover unit features inlet holes on its top and bottom which enables drainage from above and below the waterproofing protective layer, offering a drainage solution on two fronts:

- **Water collection immediately above the waterproofing membrane, including from the regulating course**
- **Continuous sub-surface water collection along the kerb lines Installation is a simple process; using SubDrain™ Adhesive to bond the channels directly onto the waterproofing layer.**

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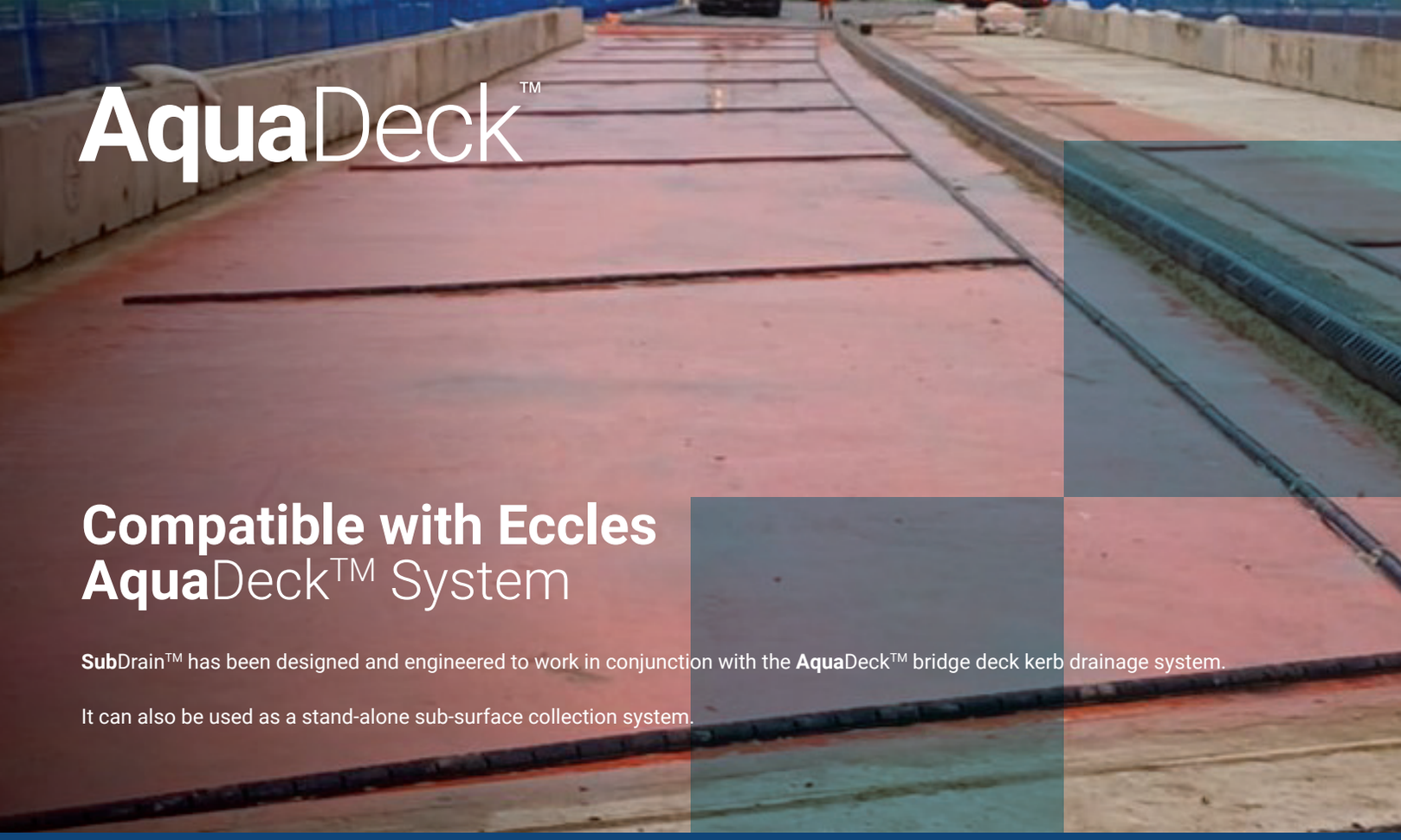

# AquaDeck™

## Compatible with Eccles AquaDeck™ System

**Sub**Drain™ has been designed and engineered to work in conjunction with the **Aqua**Deck™ bridge deck kerb drainage system.

It can also be used as a stand-alone sub-surface collection system.

The ability of kerb systems to drain water at deck level can sometimes be compromised if the collection holes in the kerb unit become unintentionally raised due to increased asphalt depths, uneven decks and the mortar bed the drainage units are laid on.

These sub-surface holes can be raised to undesirable dimensions above the deck level.

In these scenarios, whilst draining the asphalt layers and providing pressure release for water trapped in the road construction, often a secondary system is desirable to collect water beneath these layers at deck level.

As such, **Sub**Drain™ has been designed as the ideal solution to combat this issue, providing a secondary system that drains and collects this sub surface water, quickly and efficiently.

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# SubDrain™

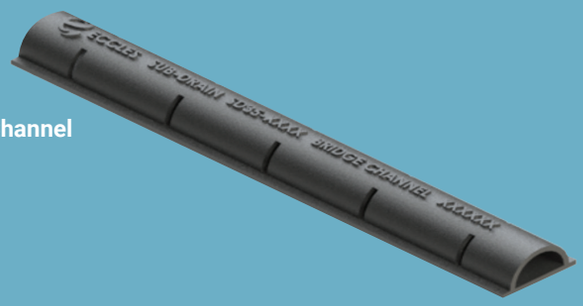
## Modular Pipework

The **Sub**Drain™ system has a modular design with T-pieces, angled bends and cross sections, and is supplied with a complete range of compatible pipework, including expansion joints, hangers and supports.

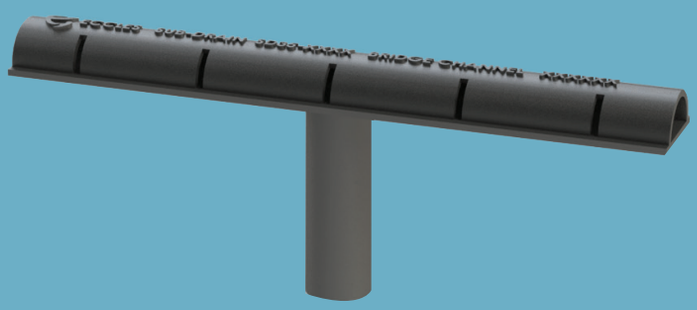
This supporting pipework is flexible to suit any configuration, enabling ease of installation and helping optimise the collection of the sub-surface water.

The system is cleaned and maintained via a choice of inspection boxes, either adjustable for use in the carriageway or within the verge (where **Aqua**Deck™ kerb drainage units are being used it is sometimes possible to access the channels via the **Aqua**Deck™ units - subject to asphalt/construction depths).

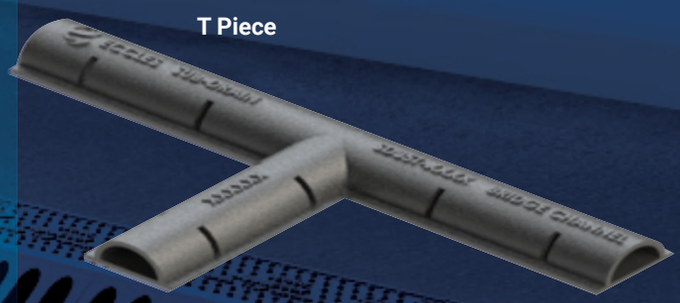
**Standard Channel**



**Channel Base Outlet**



**T Piece**



**90 Degree Bend**

## Sub-Surface Drainage Layouts

The **Sub**Drain™ system has been designed to be highly configurable so that any drainage layout design is possible.

Standard **Sub**Drain™ channels can be laid in front of the kerb lines for the entire length of the bridge.

Additionally, 90 degree bends, tee sections and 4-way cross pieces allow the layout to be installed transversely across the carriageway next to expansion joints*

** transverse drainage is essential where expansion joints are present mid span and/or at the abutments.*

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# SubDrain™

## Expansion Joints

Constant trafficking above causes a ‘pumping’ action within the asphalt road construction, which can eventually lead to carriageway materials breaking up if this trapped water is not removed.

**Sub**Drain™ channels have been designed to collect sub-surface water that has ponded at the expansion joint, preventing the asphalt and expansion joint nosing materials to become saturated.

**Sub**Drain™ expansion joints are available so that collected sub-surface water can cross movement joints.*

** Please contact our technical sales team for help and advice based on your specific expansion joint detail.*

**Expansion Joint**

**Expansion Joint Expanded**

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SubDrain™

# Adjustable Inspection Boxes

To clean or access the system, **Sub**Drain™ adjustable height inspection boxes are available for location within the carriageway.

These high strength D400 class units have an internal clear opening of approximately 250mm.

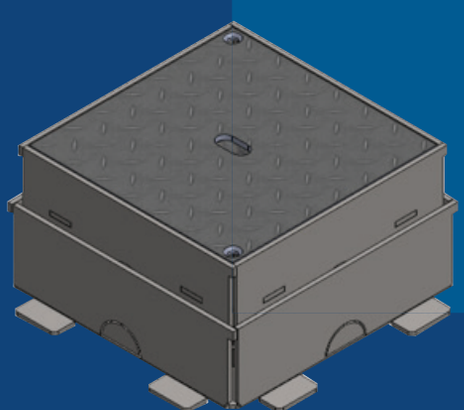
The boxes incorporate pre-paned inlets in the shape of **Sub**Drain™ channels – these are provided on all four sides of the unit.

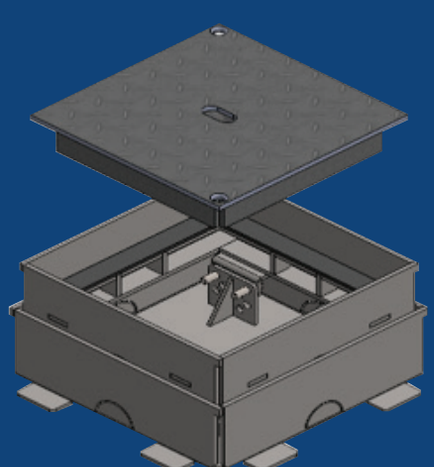
Inside the box is a unique system of support angles and brackets. These have been designed and engineered to enable height adjustment of the box in 10mm increments, anywhere from 90mm to 150mm.

This enables the **Sub**Drain™ channels to line up with the lower inlets and then the box adjusted to suit the asphalt depths so they finish level with the carriageway.

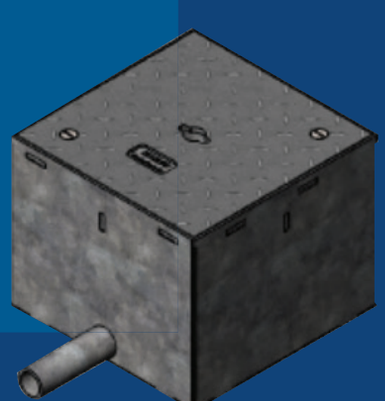
A gasket beneath the lid ensures the unit is watertight, with locking bolts to secure the cover in place. Where access is located within the verge, standard depth Inspection boxes are supplied.

**Sub**Drain™ adjustable inspection box – carriageway location





**Sub**Drain™ adjustable inspection box – verge location



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# SubDrain™

## SubDrain™ ‘Through Deck’ Drainage Outlets

The **Sub**Drain™ Through Deck Outlet System’ can be used as isolated discharge points strategically placed at low points of the deck and/or where possible ponding might occur at deck level.

Engineered from high strength spheroidal graphite iron, and tested to a min load class of D400, the system is more than capable of withstanding point loads from tarmacadam laying machines.

It can also be used in conjunction with any **Sub**Drain channel drainage layout.

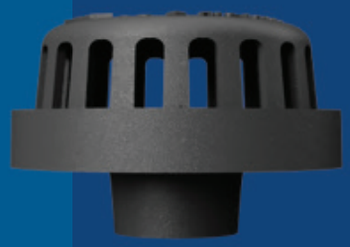
The **Sub**Drain™ Base unit is installed first with a temporary cap in place. Once the regulating course is laid the temporary plug is removed and the SDCONE installed into the SubDrain base unit, a twist lock design secures the two sections together in preparation of the tarmacadam being laid on the deck.

Where **Sub**Drain™ channels are used these simply terminate at, or close to, the SDCONE and SubDrain™ base unit discharge point. All collected sub-surface water has a path via drainage slots around the circumference of the SDCONE.

The **Sub**Drain™ base unit is recessed into the deck level along with the waterproofing, which ensures sub-surface water removal at the lowest possible point.

An outlet on the base of the **Sub**Drain™ base unit locates into a 50mm bore **Sub**Drain outlet deck, which can be either cast into the deck (new build) or into new drainage holes core drilled through the deck (refurbishment works). These outlet points then connect into a **Sub**Drain™ 50mm diameter carrier pipe layout below the structure.

The **Sub**Drain™ Through Deck Outlet System



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# SubDrain™

## HS2 Banbury Road Bridge

**Aqua**Deck™ kerb drainage units and **Sub**Drain channel installation.

## Llandudno Flyover

**Sub**Drain™ installation along the kerbline and in front of expansion joints.

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# SubDrain™

## Tay Bridge

**Sub**Drain™ Through Deck drainage outlets in situ

## River Ouse Bridge

700 **Sub**Drain™ channels installed as part of a joint refurbishment scheme.

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**For more information please contact:**

Eccles (UK Foundries FE) Ltd
Portland Street, Walsall,
West Midlands, WS2 8AA, UK

**Tel:** +44 01922 613 222
**Fax:** +44 01922 613 444
**Email:** enquiries@ecclesproducts.com