



AquaDeck™

CONTINUOUS COMBINED KERB BRIDGE & CHANNEL DRAINAGE SYSTEMS
Plus AQUADECK SUB-DRAIN for sub surface water collection



UK
CA

BSEN1433 MIN D400 LOADING - HIGH STRENGTH DUCTILE IRON

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Intelligent Access & Drainage Solutions™

For over 30 years the importance of positive and effective drainage on bridges has long been recognised. As critical to the many design aspects of the structure, effective drainage is essential to the longevity of the bridge.

By providing effective drainage, bridges are safer for road users removing dangerous surface water from the carriageway. Positive drainage also protects both expansion joint and waterproofing installations.



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Eccles (UK Foundries FE) Ltd established in 1955 has over 30 years of experience in assisting in the design and manufacture of combined bridge drainage systems.

Our new **AquaDeck** Bridge Drainage System has been developed to compliment our existing range of civil engineering products.

EST.

1955



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HYDRAULIC FLOW TABLES

CONTACT

sales@aquadeck.co.uk

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AquaDeck is fully compliant to the Harmonised European Standard **BSEN1433**.

AquaDeck is CE marked and also carries the new UKCA mark (which is required from 1st January 2023).

The UKCA mark will become mandatory for all previously CE marked products being placed on UK projects from 1st January 2023.

***BSEN1433 CE marked products can still be used on UK projects from the 1st January 2021, providing that the CE certification is still current and has been issued by a Notified Body who still holds Notified Body status for BSEN1443.**

(System 3 Attestation of Conformity level 3)

***Engineers and end users should check this carefully, as the UK left the European Union many Notified Bodies reduced the number of harmonised standards for which they had previously offered CE marking, products in this situation must be re-certified/tested by a new NB.**

For additional quality and assurance **AquaDeck** has also been certified and awarded the prestigious BSI Kitemark, meaning the product has been checked against all aspects of the standard, not just the minimum requirements for **CE/UKCA** certification and is subject to on-going surveillance and checks (Product Certification) – Equivalent to AoC system 1 throughout manufacture and supply.

Clients are welcome to visit our purpose built test facility at Walsall where they can witness load testing of **AquaDeck** units from our stock products or their own site specific production runs.

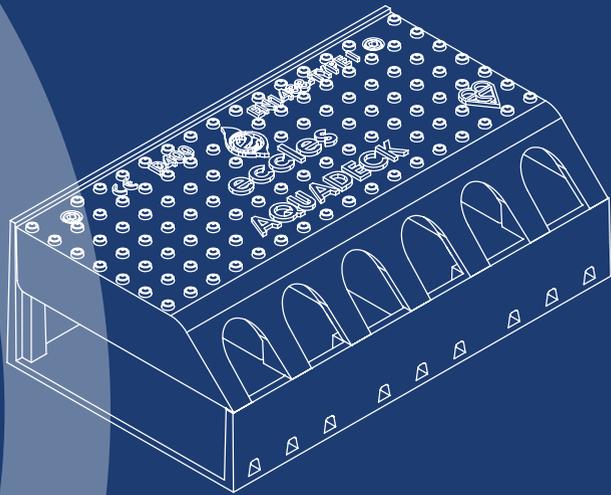


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Eccles **AquaDeck** is a high strength Ductile Iron Combined Kerb Drainage System, specifically designed for use on Bridges and elevated Highways or where construction depths are limited.



AquaDeck™



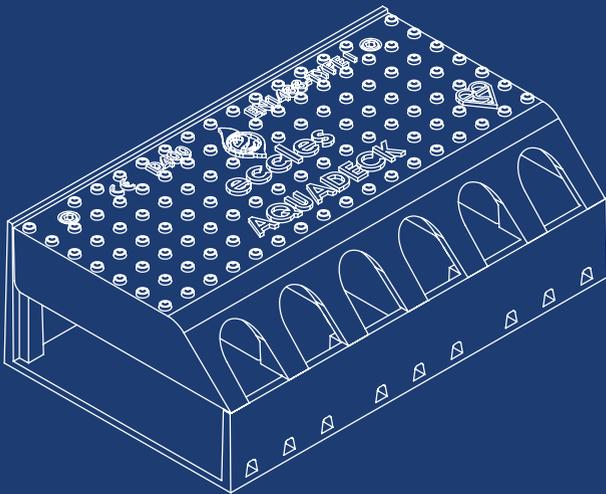
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Available in both Half Battered and 45 Degree Splay Design. AquaDeck is manufactured in a wide range of width and depth combinations to suit the specific hydraulic design of your project.

Please contact our technical design team for help and assistance.



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TESTING - D400 SPECIFICATION +10%

AquaDeck is designed and FPC tested to a Min design load of **D440kN**
(Group 4) **BSEN1433**.

Tested free standing as a Type 1 unit.
(BSEN1433 Clause 6.1.1) AquaDeck requires no additional on-site support to withstand compressive loads.

INSTALLATION

AquaDeck installation is simple and the units are fast to install, the whole process can be carried out by experienced kerb layers. The system is laid on AquaDeck Bedding Compound and adjusted to line and level. AquaDeck sealant is gun applied to the ends of the unit to form a watertight seal.

PLEASE REFER TO OUR AQUADECK INSTALLATION GUIDE FOR MORE INFORMATION.

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* Plus 10% follows Kitemark protocol for Manhole Cover testing to BSEN124 for Kitemark accreditation.

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AquaDeck D400

REAR OR END OUTLETS
100mm

BASE OUTLETS*
150mm/200mm/225mm/300mm

* Subject to unit width.

Alternatively simple square or rectangular base openings can be specified.

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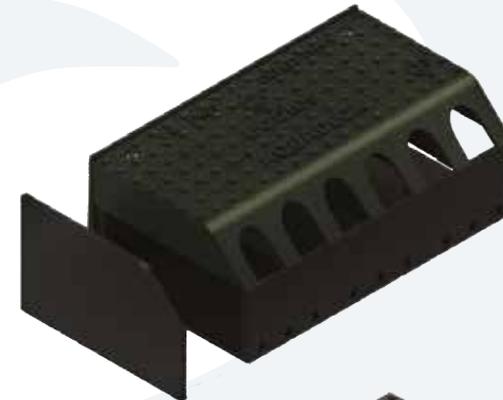
STANDARD UNITS

2-PIECE SO ACT AS
RODDING/INSP UNITS



END UNITS IN RH/LH

LEFT HAND FORMAT SHOWN



OUTLET UNITS

BASE POSITION
AS SHOWN VARIOUS DIA AVAILABLE



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AquaDeck E600

AquaDeck can be specified with an upgraded cover.

E600 Option available.

Tested free standing as a Type I unit.

(BS EN 1433 Clause 6.1.1).

AquaDeck E600 requires no additional on-site support to withstand compressive loads, awarded the prestigious BSI Kitemark (Product Certification).

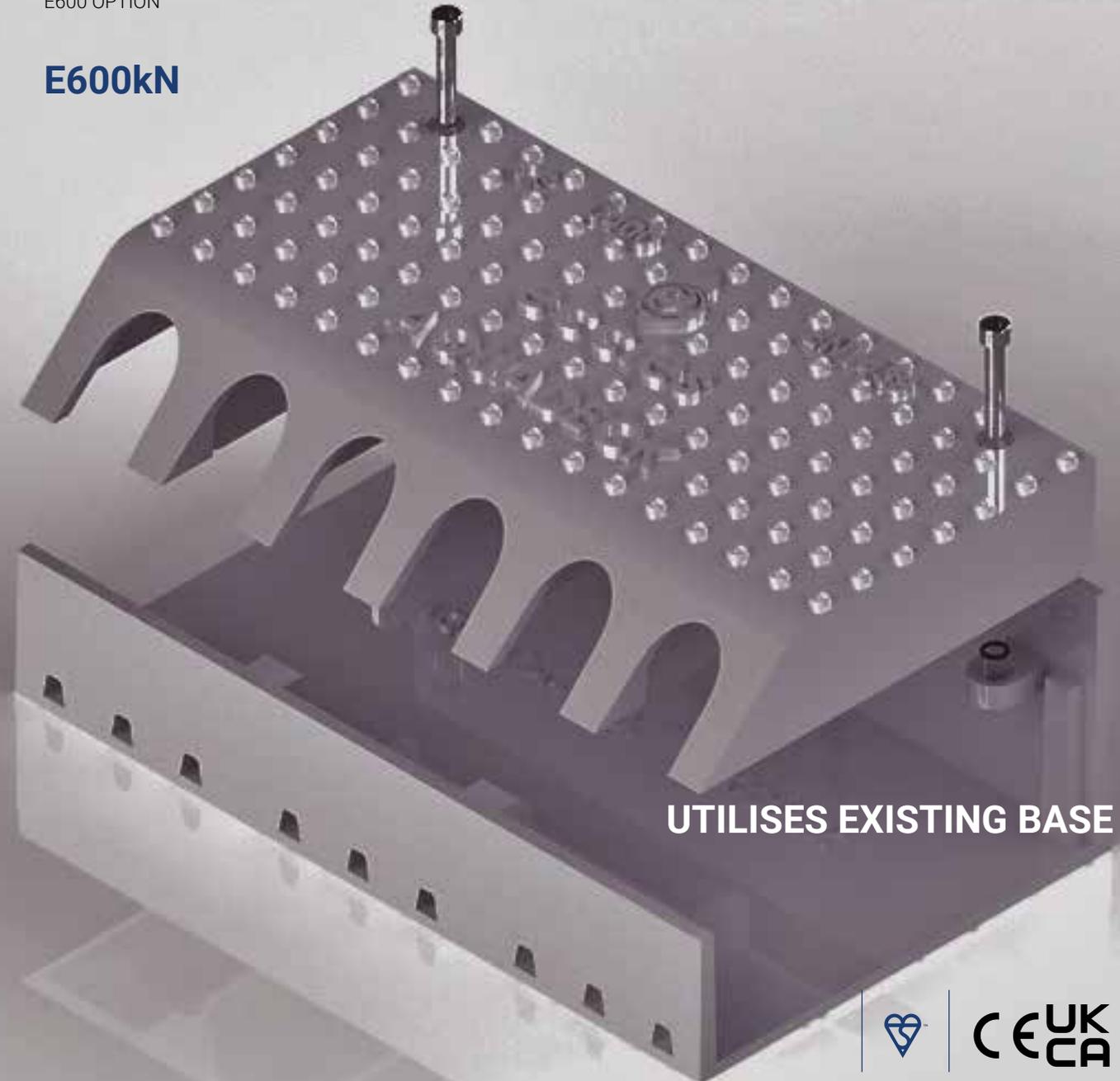
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UPGRADED

E600 OPTION

E600kN

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UTILISES EXISTING BASE



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DESIGN FEATURES

Surface & Sub surface drainage in one unit.

Type I Tested in excess of 400kN.

We apply an additional 10% safety factor in both our structural design and FPC testing of the AquaDeck product following the kitemark protocol for BSEN124 (manhole covers and gully gratings).

SmartGrip Technology™ with a PSRV Value in excess of 0.83kN (WRc) High Risk Areas (National Highways CD534 Refers).

2-Part Design allowing access for cleaning at any point along the entire drainage run.

45 Degree Splay or HB Kerb Shape.

Unique 2-part design means special depths can be manufactured with minimal tool costs.

In early 2020 National Highways as part of their updates and revisions of the DMRB and MCHW introduced skid resistance values within CD534. Whilst aimed at manhole covers & frames installed on NH projects, kerb drainage systems on SMART Motorways are now often installed directly adjacent to live running lanes. With a splay kerb face and a low 75mm kerb height its is easy for traffic to mount the kerblines and run for several metres on top of kerb installations. For this reason anti-skid properties should be considered when specifying kerb drainage systems.

See Eccles WRC skid resistance report UC14298.

SmartGrip™
Technology

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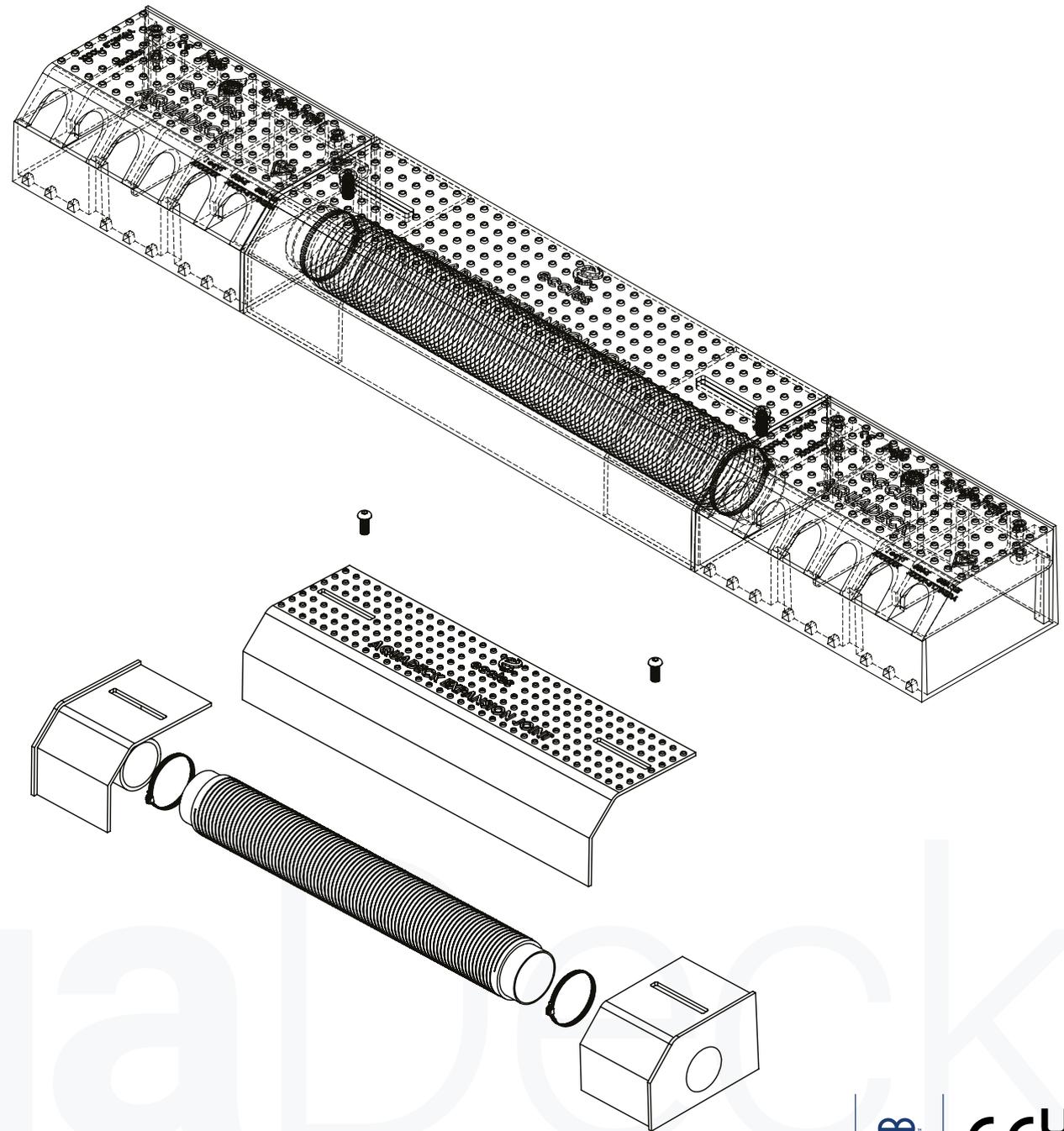
EXPANSION JOINTS

AquaDeck **EXPANSION JOINTS** accommodate longitudinal and transverse movements and work in conjunction with metal runner type joints/asphaltic plugs, buried joints and other mechanical installations.

As most joints are often bespoke and/or have specific details for each structure or installation please contact our technical sales team for help and advice with your chosen joint system.

We can use basic flexible pipe systems, expansion bellows or designs incorporating rectangular box sections to maintain higher flows through the expansion joint location.

Please contact our technical sales teams for advice with your chosen joint system.



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AquaDeck CHANNEL

Establish the drainage run length

Calculate the catchment width from the cross section
(Taking into account single or dual crossfall to kerblines)

Apply Rainfall criteria (Refer to Highways England DMRB HA37-97 as a guide) (UK Projects)

Please contact our technical sales team for help & assistance with Hydraulic Data, Rainfall Levels inc Time of Entry etc which can differ depending on your project location.

Decide upon Kerb Shape

- HB (13.5 Degree kerb slope)
- SP (45 Degree kerb slope)

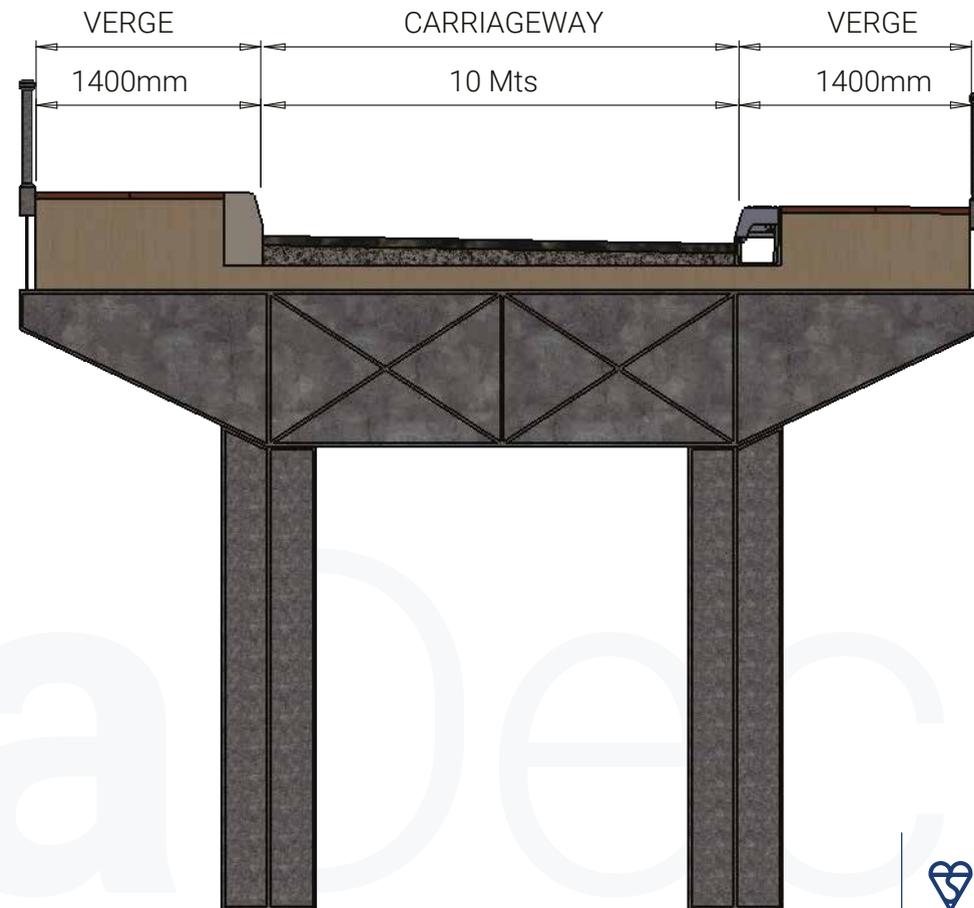
Specify Kerb upstand Dimension

- Top of Kerb to finished road level

*Usually HB are used where pedestrian access is permitted
SP are used where pedestrian access is prohibited (M-Ways).

BRIDGE HYDRAULIC DESIGN PRINCIPALS

SINGLE CROSSFALL EXAMPLE

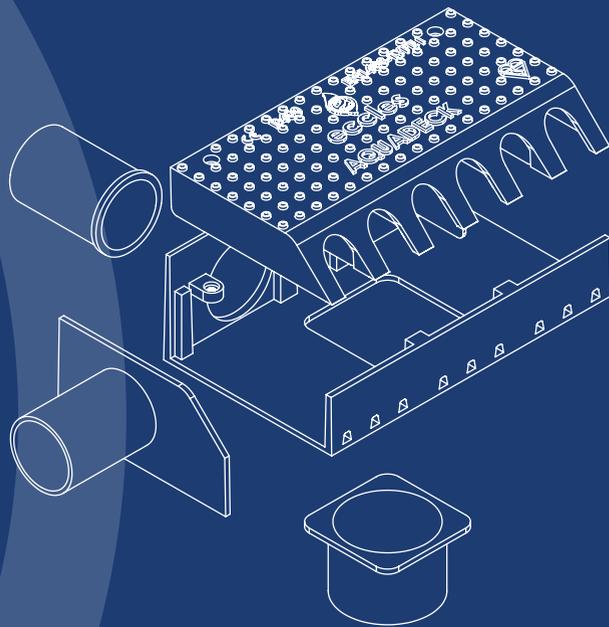
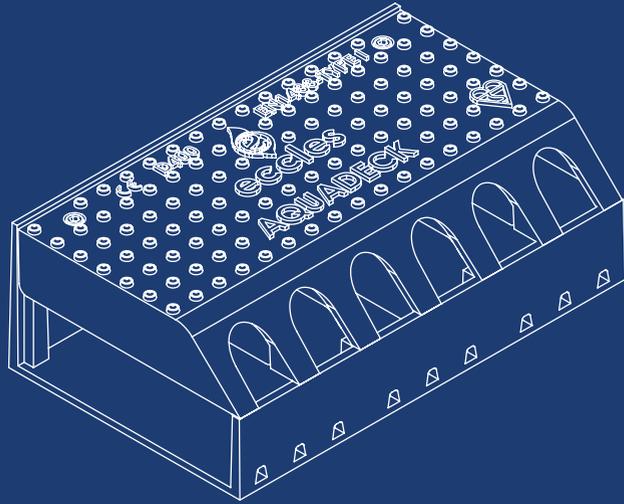


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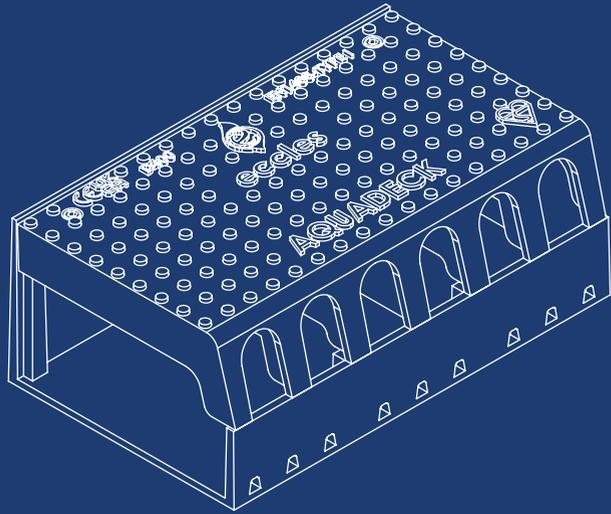
UNIT SIZE CHART

SPLAY PROFILE

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LENGTH	WIDTH	DEPTH	KERB SHAPE	KERB HEIGHT
500MM	150MM	165MM	45 DEGREE SPLAY	75MM 100MM
500MM	150MM	190MM	45 DEGREE SPLAY	75MM 100MM
500MM	165MM	165MM	45 DEGREE SPLAY	75MM 100MM
500MM	165MM	190MM	45 DEGREE SPLAY	75MM 100MM
500MM	240MM	165MM	45 DEGREE SPLAY	75MM 100MM
500MM	240MM	190MM	45 DEGREE SPLAY	75MM 100MM
500MM	300MM	165MM	45 DEGREE SPLAY	75MM 100MM
500MM	300MM	190MM	45 DEGREE SPLAY	75MM 100MM
500MM	400MM	165MM	45 DEGREE SPLAY	75MM 100MM
500MM	400MM	190MM	45 DEGREE SPLAY	75MM 100MM
500MM	450MM	165MM	45 DEGREE SPLAY	75MM 100MM
500MM	450MM	190MM	45 DEGREE SPLAY	75MM 100MM
500MM	500MM	165MM	45 DEGREE SPLAY	75MM 100MM
500MM	500MM	190MM	45 DEGREE SPLAY	75MM 100MM

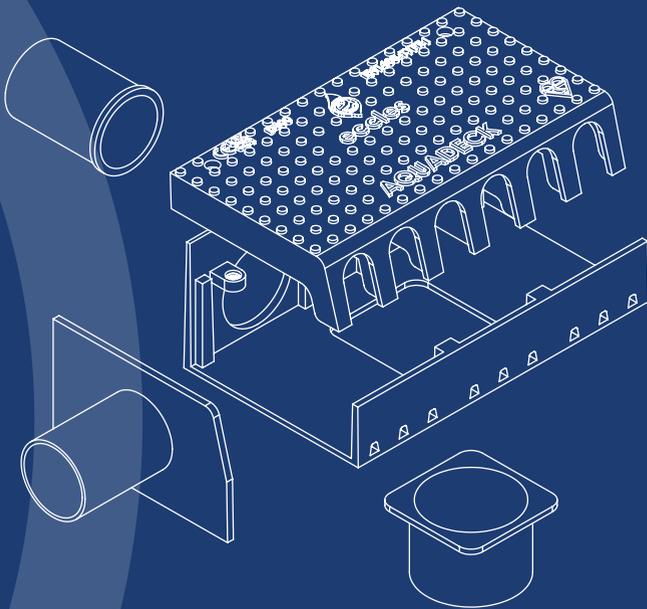
*Please contact our sales office for non standard sizes or bespoke requirements



UNIT SIZE CHART

HB PROFILE

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LENGTH	WIDTH	DEPTH	KERB SHAPE	KERB HEIGHT
500MM	150MM	165MM	HALF BATTERED	75MM 100MM 125MM
500MM	150MM	190MM	HALF BATTERED	75MM 100MM 125MM
500MM	150MM	210MM	HALF BATTERED	75MM 100MM 125MM
500MM	165MM	165MM	HALF BATTERED	75MM 100MM 125MM
500MM	165MM	190MM	HALF BATTERED	75MM 100MM 125MM
500MM	165MM	210MM	HALF BATTERED	75MM 100MM 125MM
500MM	240MM	165MM	HALF BATTERED	75MM 100MM 125MM
500MM	240MM	190MM	HALF BATTERED	75MM 100MM 125MM
500MM	240MM	210MM	HALF BATTERED	75MM 100MM 125MM
500MM	300MM	165MM	HALF BATTERED	75MM 100MM 125MM
500MM	300MM	190MM	HALF BATTERED	75MM 100MM 125MM
500MM	300MM	210MM	HALF BATTERED	75MM 100MM 125MM
500MM	450MM	190MM	HALF BATTERED	75MM 100MM 125MM
500MM	450MM	210MM	HALF BATTERED	75MM 100MM 125MM

*Please contact our sales office for non standard sizes or bespoke requirements



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AquaDeck CHANNEL

Shallow construction depth

Can be used in conjunction with AquaDeck kerb units for additional system capacity.

Locations

In front of Extruded concrete barriers.

Central reservations.

Ideal where road construction depths are limited.

Min D400 Load Class BSEN1433.

UKCA Marked*

Kitemarked*

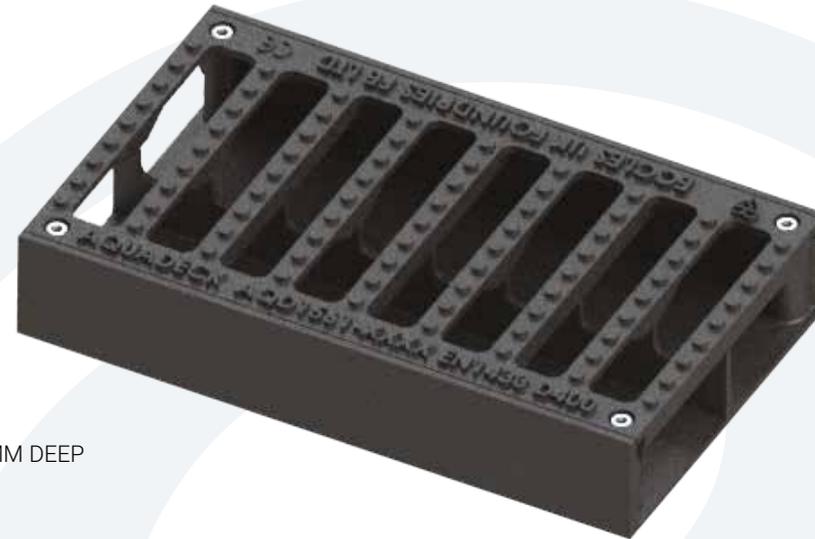
CE Marked*

Optional E600 upgrade cover.

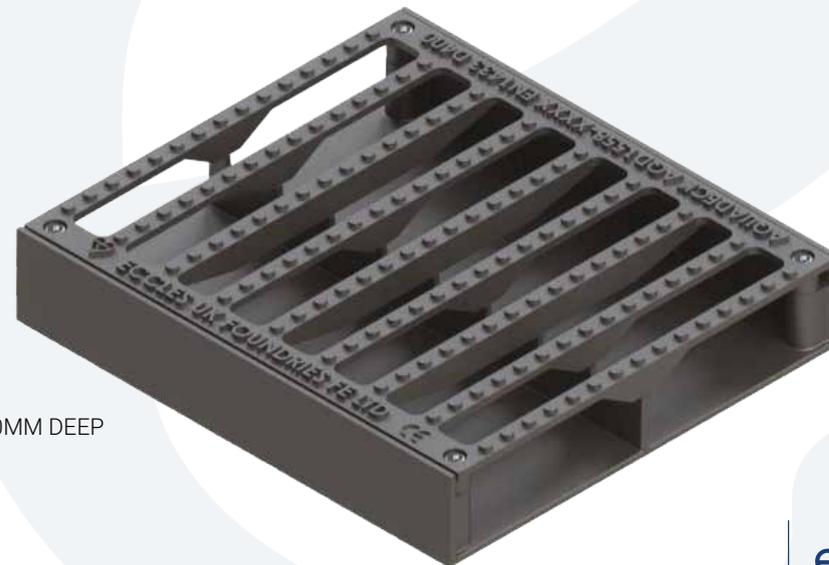
Unique Anti-skid Top Pattern.

PSRV Values in excess of high risk areas (CD534).

End Units c/w Base Outfall Pipes complete the systems.



300MM WIDE x 90MM DEEP



450MM WIDE x 90MM DEEP

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“SUB DRAIN”

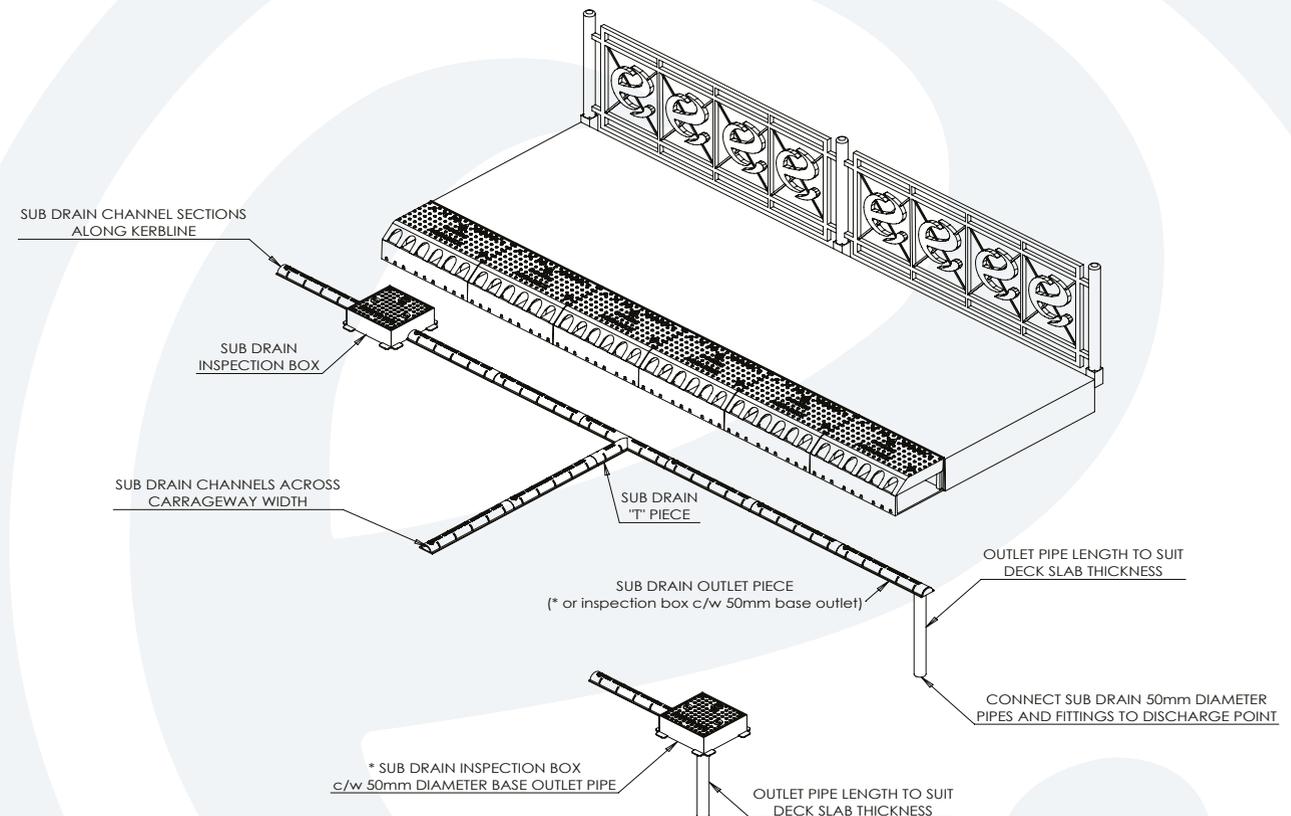
AquaDeck **“SUB DRAIN”** is a secondary sub surface drainage system for use on bridges or any elevated road structure.

Manufactured from high strength Ductile Iron to withstand heavy loadings from asphalt laying plant and machinery, the channels can also be cut to length or mitred on site without compromising the corrosion resistance of the system.

SUB DRAIN can be used in conjunction with AquaDeck kerb drainage units or as a stand alone positive sub surface drainage system.

Supplied in 500mm lengths so the channels can follow closely any curvature on the deck slab.

This ensures the system can be laid flat and as close to the deck as possible preventing deep bedding **“hot spots”** which can result in isolated ponding at waterproofing level and rocking of the channels, leading to premature bedding failure under heavy trafficking.



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“SUB DRAIN”

SYSTEM COMPONENTS

As well as standard 500mm long channels, a range of fittings/shapes are available (Tees/Bends/Angles etc etc) enabling a wide range of drainage layouts to maximise sub surface water collection.

SUB DRAIN can be discharged through the bridge deck via 50mm dia vertical outlets into a 50mm dia carrier pipe system under the structure, or by using **SUB DRAIN** expansion joints, water can be carried across bridge expansion joints and discharged off deck into a soakaway or manhole chamber.

Inspection and cleaning of the system is possible via surface mounted **SUB DRAIN D400** inspection points which are manufactured to match the exact road construction.

INSTALLATION

Installation of the **SUB DRAIN** channels and components is a simple process, the channels are fixed to the surface of the deck using **Eccles SUB DRAIN** fixing compound.

STANDARD CHANNEL

PRODUCT CODE SDC
BASE OUTLET OPTION –
PRODUCT CODE SDC0



90 DEG BEND

PRODUCT CODE SDC90B



45 DEG BEND

PRODUCT CODE SDC45B



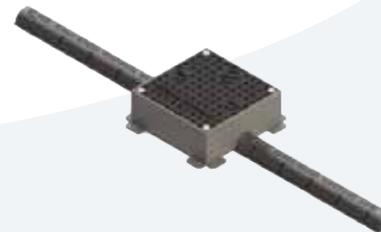
T-PIECE

PRODUCT CODE SDC



INSPECTION BOX

PRODUCT CODE SDCIB
BASE OUTLET OPTION –
PRODUCT CODE SDICBO



EXPANSION JOINT

PRODUCT CODE SDCEJ



50MM DIA NOM BORE CARRIER PIPE SYSTEM BELOW DECK

RANGE OF FITTINGS AVAILABLE



CERTIFICATION

ECCLES HOLD **BSEN1433** KITEMARK CERTIFICATION



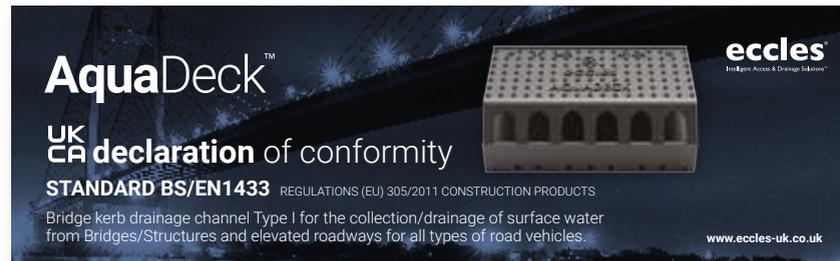
PRODUCT:	AquaDeck Combined Kerb Drainage for Bridges & Elevated Highways
STRENGTH CLASS:	Type I Min D400 in accordance with the manufacturer's installation instructions (Refer to AquaDeck Installation details)
COMPLIANT WITH:	BSEN1433, Annex ZA, Annex A, Annex B, Annex C
MATERIAL AND DURABILITY:	Spheroidal Graphite Iron (Ductile) to BS/EN1561 Grade 500/7
WEATHERING RESISTANCE	+R* (Clause 6.3.3.3 Table 1)
DIMENSIONS:	L=500mm; W=150mm/240mm/300mm/400mm/450mm/500mm
WATER TIGHTNESS:	No Leakage in accordance with 9.3.6 of the standard (Refer to AquaDeck Installation details)
ITT NOTIFIED BODY:	BSI Group Notified Body No 0086

ACCOMPANYING DOCUMENTS:
Available upon request

- Product literature
- Installation Details
- BSI Initial Testing Report

Signed: _____
Position: Chris Rothery
Sales & Project Director
AquaDeck

PORTLAND STREET, WALSTALL, WEST MIDLANDS, WS2 8AA, UK **Test Report No BSI – 2371/3273048** **CE**



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*UKCA/CE DoCs also available for AQUADECK Channel units

Testing Report No BSI – 2371/3273048

CASE STUDY

AquaDeck

M56 Smart Motorway Project

National Highway's program to add capacity to the UK's existing road network, in order to support economic growth and maintain mobility, unearthed a requirement for smarter drainage solutions on parts of the M56 motorway.

Junctions 6-8 on the M56 carry in excess of 100,000 vehicles per day. Such a vast impermeable area has the potential for surface ponding and water runoff, which must be managed properly to prevent unsafe driving conditions for road vehicles, as well reducing the impact of flooding due to overloaded watercourse systems.

Specifically, nine bridge locations required combined kerb drainage with an accurate splay profile, **D400** loading and **BSEN1433** compliancy.

We advised AquaDeck - a high strength combined kerb drainage system - as the ideal solution to drain the structures on this section of the M56 as it provides superior surface and sub-surface drainage all in one unit.

The system is very quick and easy to install; the whole process can be carried out by experienced kerb layers.

Armed with the contract drawings and site details showing the extent of works, we prepared detailed take offs and hydraulic design checks, as well as identifying the best sized units and bridge expansion joints for each location.

We were also able to confirm compliance to the contract specification, including being able to offer a system carrying the new UKCA mark.

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CASE STUDY

PROJECT

M56 Smart Motorway

AquaDeck™



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CASE STUDY

AquaDeck

Staffordshire Western Access Road Improvement Scheme

In the spring of last year we were approached by Amey, working alongside Staffordshire County Council, to take a look at the drainage requirements on a 130m stretch of viaduct, which forms part of the Staffordshire Western Access Road improvement scheme.

Our customers and partners often turn to us for expert consultation and advice, and so the team went down to the site to carry out a full hydraulic design based on DMRB guidelines.

Eccles' AquaDeck Division carried out a full hydraulic design based on DMRB guidelines enabling us to propose our **AquaDeck** 450mm wide system as the most cost-effective solution for the project.

In addition, we designed and manufactured a unique expansion joint assembly to transfer the surface water run-off through the expansion joint at the low end of the deck where the flows would be at their highest.

Our new expansion joint ensured maximum drainage capacity through the joint with minimal restriction of flow, an issue which is often faced with these types of installations.

AquaDeck Project Director, Chris Rothery said:

'The design flows on this structure were quite high so we needed to move away from our traditional flexible pipe design expansion joint to maximize drainage flows across the bridge joint.'

'Our new expansion joint design ensured maximum drainage capacity through the joint with minimal restriction of flow, an issue often faced with these types of installations.'



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CASE STUDY

PROJECT

**Staffordshire Western Access
Road Improvement Scheme**

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