

EnduranceTM

Introducing Eccles' **NEW** enhanced **D400** (Group 4) range of ductile iron access covers.



Designed and engineered by Eccles to exceed National Highways' DMRB CD 534 (version 0.1.0). CD534 is a technical regulation (formally HA/104) Kitemarked and surpassing the requirements of BS EN 124-2.

Common Causes of Ironwork Failure

Bedding material failures

BS 7903:2020 underscores the critical engineering considerations pertaining to ironwork within the context of road infrastructure. The document acknowledges that an elevation in both the volume and concentration of loads, particularly arising from inadequately configured frames, can precipitate premature failure of ironwork components. Consequently, the standard accentuates the imperative of implementing robust engineering solutions to mitigate such risks.

Moreover, BS 7903:2020 highlights the necessity for frame designs that integrate bedding-sympathetic features. These features encompass a spectrum of considerations, ranging from frame configuration and flange geometry to the elastic modulus of bedding materials and the stiffness of the frame. Such nuanced design considerations are crucial to ensuring not only compatibility with the bedding material but also resilience against external forces.

The overarching objective of these stringent engineering guidelines is to avert bedding failure, which could pose substantial hazards to road users. By emphasising the incorporation of these technical intricacies into the design and construction processes, BS 7903:2020 aims to establish a framework that prioritises structural integrity and, consequently, the safety of the road network.

Public safety is at risk from non-compliant covers:

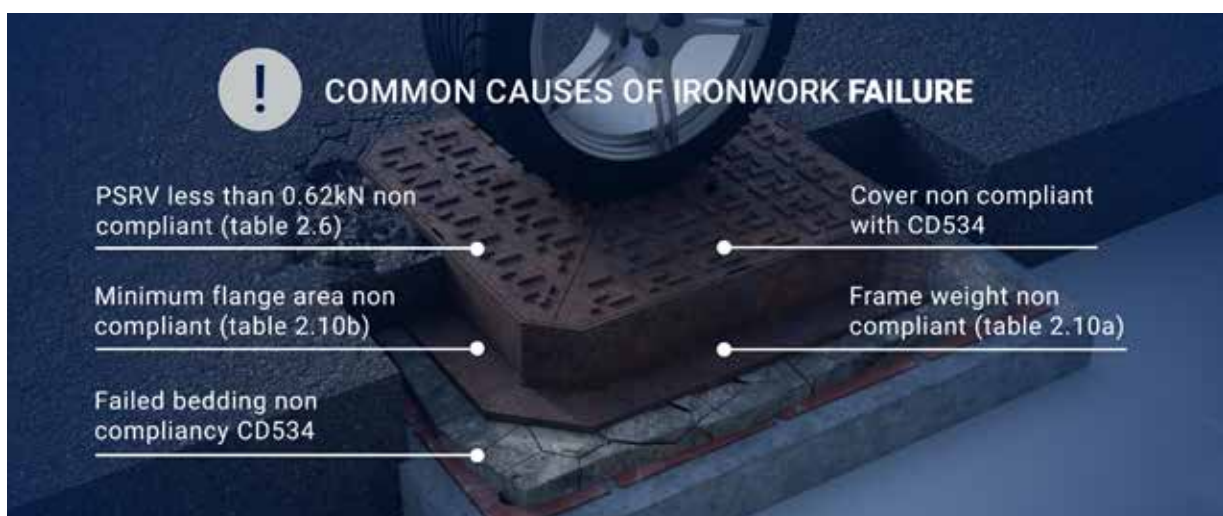
- Premature failure of ironwork and bedding mortar
- Creates inadequate distribution of loads
- Degrades road surfaces with unnecessary wear and tear
- Increases frequency of costly repair and maintenance cycles
- Does not support enhanced load dynamics of next gen road vehicles
- Creates an unsafe road environment for all road users

National Highways' Technical Regulations For Access Covers And Gully Grates



BS EN 124-2 | DMRB CD534 INTEGRITY (VERSION 0.1.0)

National Highways has released version 0.1.0. of its CD534 documentation, which updates the requirements expected for access covers and gully grates installed across its road networks. CD534 is a part of National Highways' Design Manual for Roads and Bridges (DMRB), formally known as HA 104/09. These new updates specify a significant number of technical requirements which access covers and gully grates must adhere to in order to be compliant.



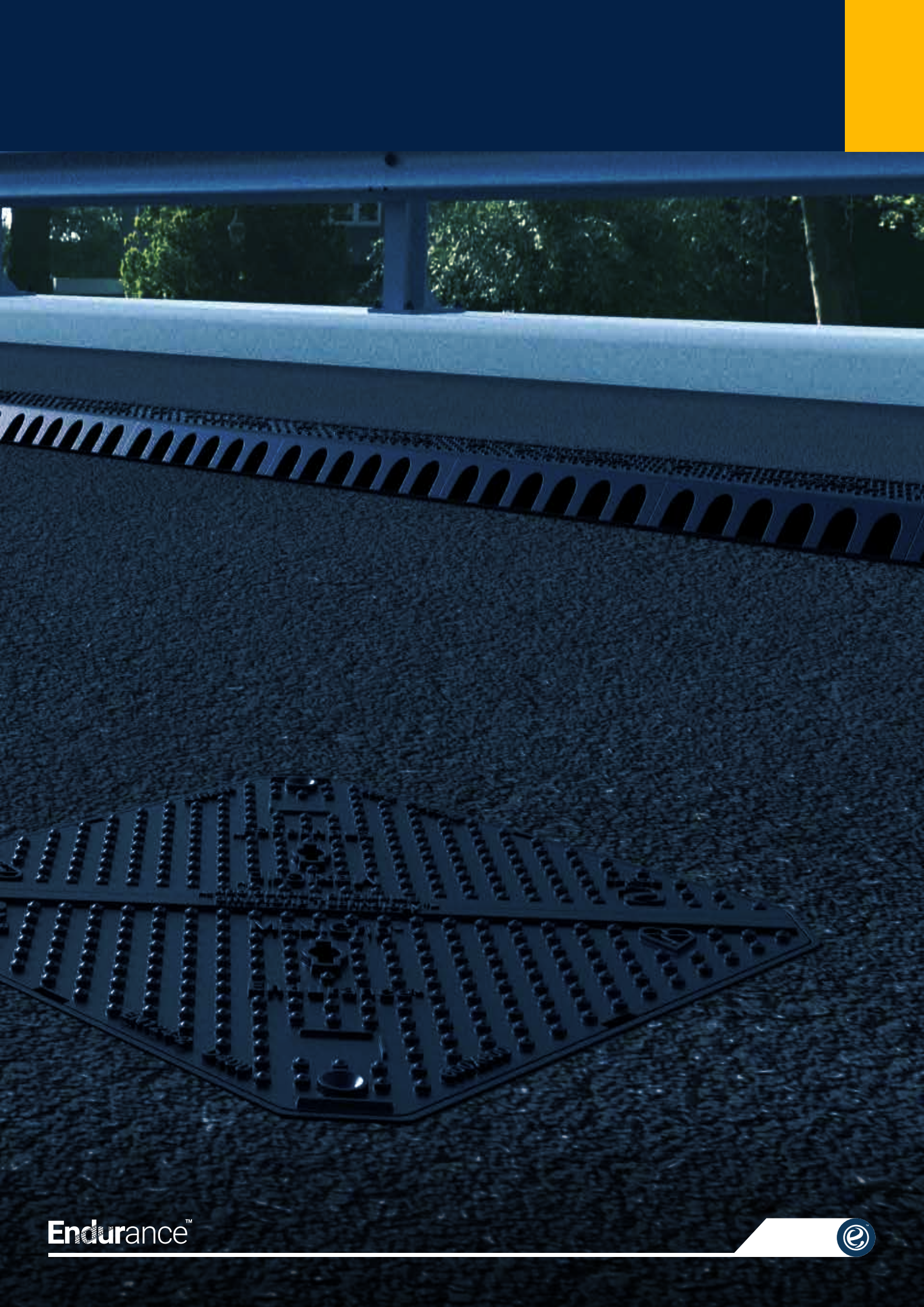


EnduranceTM

CAST TO ENDURE, DESIGNED TO LAST

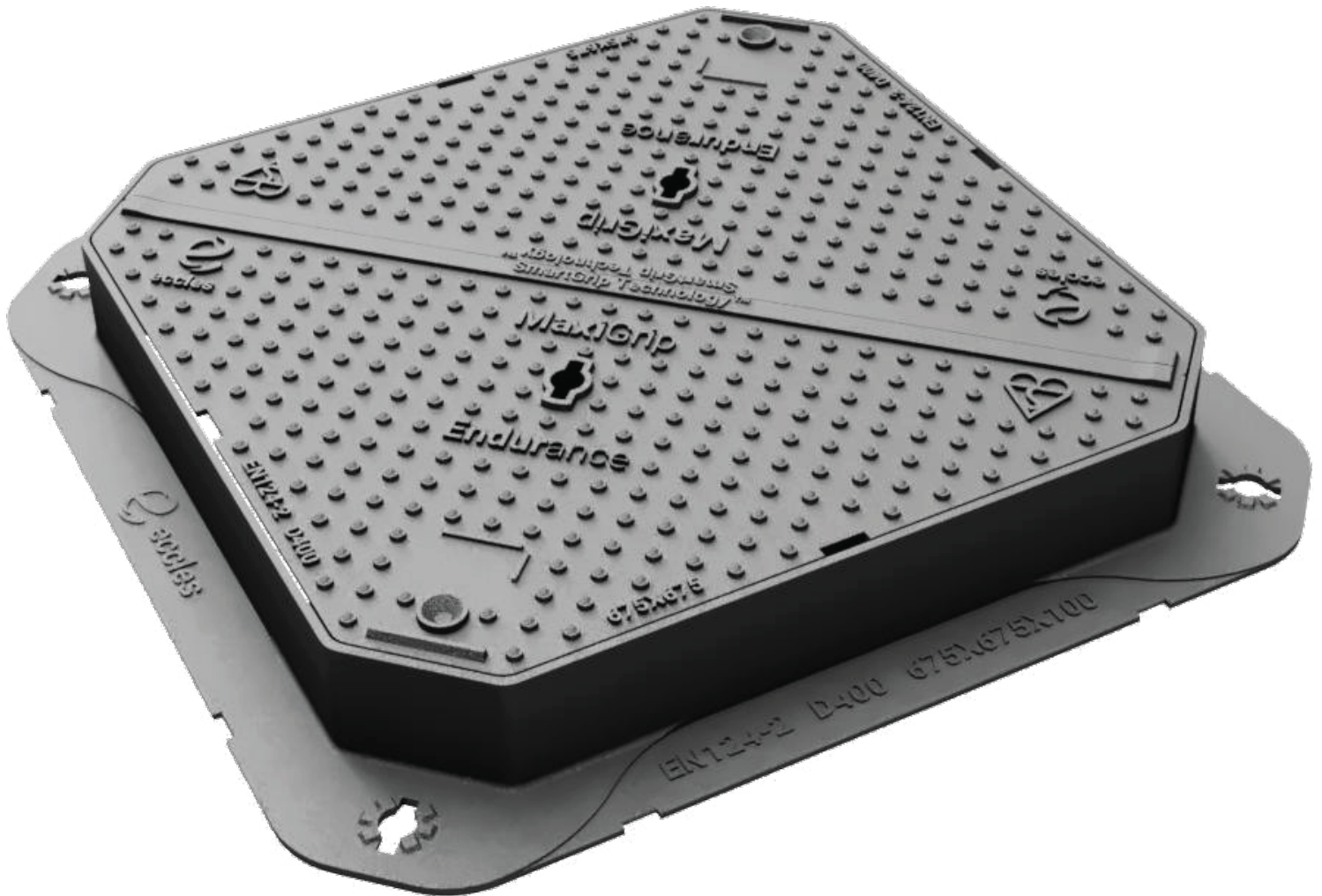
Eccles' new range of EnduranceTM access covers has been meticulously designed and engineered to support public infrastructure with quality, reliability and compliance.





Designed and engineered using the latest parametric software to exceed the requirements of EN124:2015 and National Highways' DMRB CD 534 (version 0.1.0), the new Endurance™ range of access covers encompasses a host of innovative features and benefits that have been installed and rigorously tested before being awarded the prestigious BSI Kitemark. Manufactured from EN- GJS-500-7 ductile iron, Endurance™ is a strong and durable design enhanced with structural integrity at its core.

Endurance™ has been engineered to last!



PRODUCT TYPE: Access Cover
MATERIAL: Ductile Iron
FINISH: Black Coated
LOADING: D400 (Group 4)
CERTIFICATION: BSI Kitemark
STANDARD: BS EN 124-2:2015
COMPLIANCY: CD534 Compliant
OPTIONAL EXTRAS: Badged | Locked | Vented | Sealing Plate | Security Plate | Security Locking | Safety Grids



Engineered to meet the roads of the future

Specifically designed to withstand the increase in demands of today's busy road networks, Endurance™ provides a long-term solution to the selection of ironwork that will meet the demands that our roads will endure in the coming years. Featuring enhanced structural integrity and exceptional strength, Endurance™ has been engineered to help eliminate sub-surface movement and effectively prevent the deterioration of the top road surface.

- Adheres to, and exceeds the latest technical requirements
- Combats the issue to bedding mortar and ironwork failure
- Reduces road surface wear and tear
- Minimises public spend on road repair and maintenance
- Supports the enhanced load dynamics or next generation road vehicles
- Creates a safer road environment for all road users



Adam Eccles, Managing Director

"We've seen an increase in non-compliant products enter the marketplace recently, and frankly taking a chance on these is simply not worth the risk."

"National Highways' CD 534 specification clearly lays out the stringent requirements for chamber tops and gully tops to legally adhere to."

"With this firmly in mind, our exciting new Endurance™ range has been designed and engineered with enhanced structural integrity, offering a stronger, more durable and long-lasting solution for the roads of tomorrow."

EXCEEDING THE REQUIREMENTS OF NATIONAL HIGHWAYS' CD534

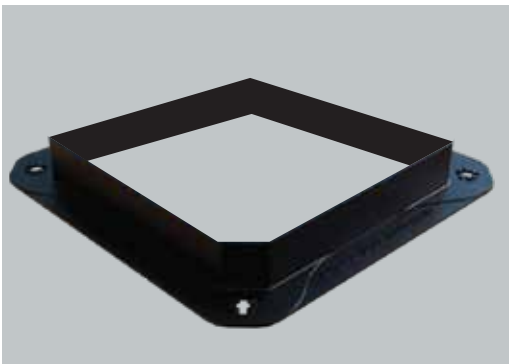
Endurance™ is Kitemarked to the BS EN 124-2 British Standard and exceeds the new requirements of CD534 (version 0.1.0), which include:



Weight of Frame (kg)

Exceeds the requirements of Highways England - DMRB CD534 V0.01

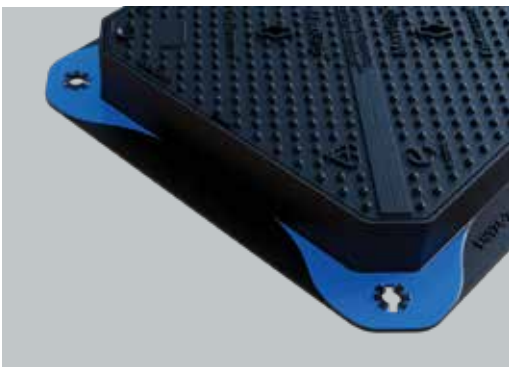
Shape	Nominal opening size and depth (mm)	Minimum frame weight (kg)
Square	600x600x150 deep	27
Square	600x600x100 deep	21
Square	675x675x150 deep	33
Square	675x675x100 deep	26



1.

Weight of frame

Exceeds the requirements of Highways England DMRB CD534 V0.01 (table 2.10a).



2.

Rigid frame design

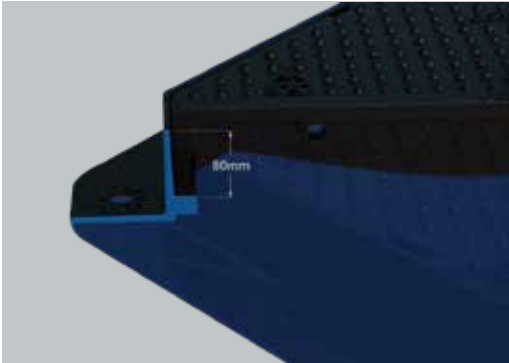
Frame requires no gussets and has reinforced corner areas to increase the structural integrity and rigidity of the frame.



3.

Frame bearing area

Exceeds the minimum frame bearing area of 190,000mm² as specified in DMRB CD534 V 0.1.0 (table 2.10b)



4.

Depth of Insertion

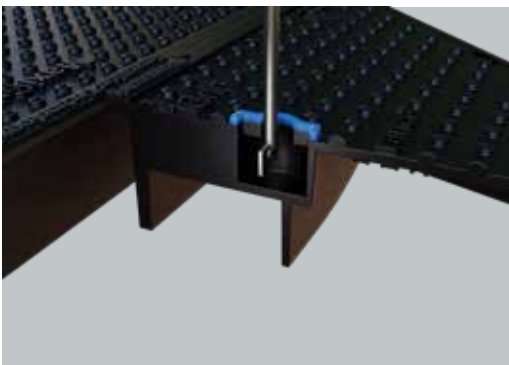
Compliant to CD534 V 0.1.0 (table 2.11)



5.

Low wear inverted 'V' seatings

Engineered to allow dynamic loads to be distributed more evenly across the frame geometry, preventing concentrated stress and increasing in-service durability.



6.

SmartGrip™ keyways

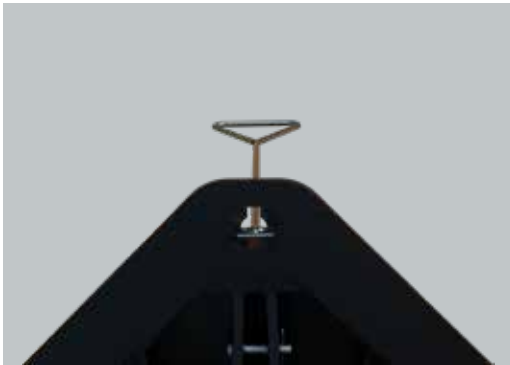
Keyways engage with standard large type BS497 lifting keys to prevent disengagement of the key during the removal and replacement of the cover into the frame.



7.

Integrated bedding mortar indicator

Ensures that the bedding material envelops the flange to the minimum manufacturer requirements, this can be used in conjunction with our Elev8™ levelling system when using flowable bedding mortars.



8.

Lifting points on frame

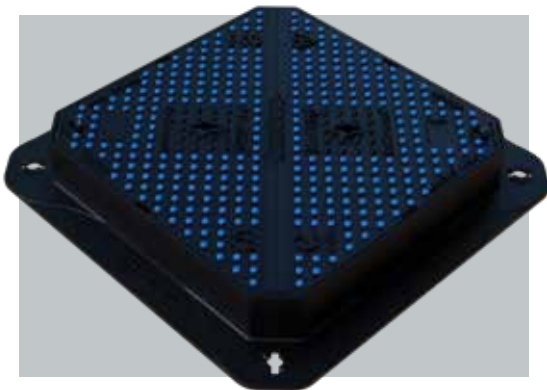
Incorporated lifting points provide a balanced lift as specified in BS7903:2020 (clause 6.19), the underside of the lifting points are recessed to engage with the bedding material and encourage superior adhesion.



9.

Elev8™ frame levelling system

Provides adjustment of the frame during installation to facilitate bedding mortar from 10mm to 50mm depths.



10.

SmartGrip Technology™

Includes SmartGrip Technology™ as standard; a unique registered raised pattern which provides an enhanced skid resistance exceeding the minimum requirements for high-risk areas of $> 0.83\text{kN}$ as specified in DMRB CD534 V 0.1.0 (table 2.6).

FreeFlow™

D400 (Group 4) Ductile Iron Gully Gratings also
CD 534 compliant



Endurance™ Standard Features

Endurance™ standard features

Endurance™ has been specially designed and engineered to solve all these technical challenges in compliancy with National Highways' CD 534 specification.



SmartGrip Technology™ - A unique registered raised pattern which provides as standard an enhanced skid resistance exceeding the minimum requirements for high-risk areas of > 0.83kN as specified in DMRB CD534 V 0.1.0 (table 2.6).



Ratio - Ductile iron for improved weight to strength ratio.



Kitemark - Exceeds the requirements of BS EN124-2:2015, tested and certified by BSI.



Strong & Durable - Spheroidal graphite cast iron according to EN 1563:2018, as per the requirements of BS EN124-2:2015.



Recyclable - Long life asset with high circularity contributing to the reduction in carbon footprint.



Complies with MCHW - Manual for Contract Highway Works, Series 500.



Complies with DMRB - Meets the requirements of Highways England specification CD534.



Coating - Black coated finish.



Three Point Suspension - Three point suspension for non rock stability.



Depth of Insertion - Meets the depth of insertion requirements of BS EN124-2:2015, CD534 and BS7903.

Endurance™ Additional Features



Weight of Frame (kgs) - Exceeds the requirements of Highways England DMRB CD534 V0.01 (table 2.10a). CD534 is a technical regulation replacing HA/104.



SmartGrip Keyways™ - Keyways engage with standard large type BS497 lifting keys to prevent disengagement of the key during the removal and replacement of the cover into the frame.



Ergonomic Frame Design - The geometry of the frame incorporates reinforced corner areas providing increased structural integrity, designed to compliment high strength bedding mortars.



Integrated Bedding Mortar Indicator* - Ensures that bedding material envelops the flange to the minimum requirements, can be used in conjunction with our Elevg™ levelling system when using flowable bedding mortars.



Flange Bearing Area - All Endurance™ D400 (group 4) products exceed the minimum specified flange area of 190,000mm² as specified in DMRB CD534 V 0.1.0 (table 2.10b).



Lifting Points on Frame - Incorporated lifting points to provide a balanced lift as specified in BS7903:2020 clause 6.19; the underside of the lifting points are recessed to engage with the bedding material and encourage superior adhesion.



Low Wear Inverted 'V' Seatings - Allows the dynamic loads in service to be distributed more evenly across the frame geometry, preventing concentrated stress points.



Elev8™ Frame Levelling System - Provides easy adjustment of the frame during installation to facilitate bedding mortar from 15mm to 50mm depth.

*Ultracrete Envirobred range of bedding mortars are recommended in accordance with the properties required under CD534. The material must be non-shrink and have a compressive strength of 30N/mm² and tensile strength of 5N/mm² in 3 hours. The material should have a minimum workable life of 15 minutes. Mechanical mixing of the material is preferred however manual mixing is permitted. The material must hold a third party PAS accreditation such as BBA HAPAS for example.



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