HAPAS

Instarmac Group plc

Head Office
Danny Morson Way
Birch Coppice Business Park
Dordon, Tamworth
Staffordshire B78 1SE

Tel: 01827 872244 Fax: 01827 285386

e-mail: email@instarmac.co.uk

website: www.instarmac.co.uk

HAPAS Certificate
05/H104
Product Sheet 1

INSTARMAC REPAIR MORTARS

ULTRACRETE IRONWORK INSTALLATION SYSTEM

This HAPAS Certificate Product Sheet(1) is issued by the British Board of Agrément (BBA), supported by National Highways (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Government and the Department for Infrastructure, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years.
(1) Hereinafter referred to as 'Certificate'.

This Certificate relates to the UltraCrete Ironwork Installation System, used for the installation and reinstatement of ironwork, up to and including installation Group 4 of BS EN 124-1 : 2015, in footways, footpaths, cycle tracks and Types 2, 3 and 4 carriageways where rapid trafficking is required.

CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Performance — the bedding mortars meet the requirements for compressive strength in accordance with the MCHW, Volume 1, Series 500, Clause 507 Chambers, 44. UltraCrete PY4 meets the compressive strength requirements for a bedding material in accordance with the MCHW, Volume 1, Series 500, Clause 507 Chambers, 24 (iii). UltraCrete Envirobed(1) CD 534 and UltraCrete CD 534 Flowable both satisfy the requirements of the MCHW, Volume 1, Series 500, Clause 507 Chambers, 24 (i) to (iv) (see section 6).

(1) Envirobed is a registered trademark

Durability — provided the surrounding pavement remains structurally sound, the system will have an anticipated service life of up to five years (see section 8).

The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Sixth issue: 4 August 2022

Originally certificated on 24 March 2005

Hardy Giesler
Chief Executive

The BBA is a UKAS accredited certification body – Number 113.
The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk
Readers MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.
Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

Requirements

In the opinion of the BBA, the UltraCrete Ironwork Installation System, when manufactured and installed in accordance with the provisions of this Certificate, is satisfactory for use as an ironwork installation system. The system meets the relevant requirements for bedding mortars of the Manual of Contract Documents for Highway Works (MCHW)(1), Volume 1 *Specification for Highway Works* (SHW), Series 500, Clause 507.44, and the requirements for bedding material of the MCHW, Volume 1 SHW, Series 500, Clause 507.24. The system contributes to meeting the requirements of BS EN 124-5 : 2015.

(1) The MCHW is operated by the Overseeing Organisations: National Highways, Transport Scotland, the Welsh Government and the Department for Infrastructure (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See section: 3 *Delivery and site handling* of this Certificate.

Technical Specification

1 Description

The UltraCrete Ironwork Installation System comprises:

- UltraCrete Envirobed CD534 — a two component, non-shrink, fast setting, cementitious mortar, used to bed and level ironwork in highly trafficked locations, such as junctions and turning areas
- UltraCrete Envirobed CD 534 Flowable — a two component flowable non-shrink, fast setting and cementitious mortar, specifically used for bedding large section manholes and frames
- UltraCrete PY4 SG and UltraCrete PY4 WG (summer and winter grades) — two component, fast setting, polyester resin-based mortars used to bed and level ironwork in highly trafficked locations, such as junctions and turning areas
- UltraCrete M60 and UltraCrete M60F rapid-set bedding mortars — fast setting, cementitious mortars, used to bed and level ironwork. UltraCrete M60F is a fibre reinforced version of Ultrarete M60
- UltraCrete QC10 Rapid Strength Concrete — a two part, fast-setting cementitious concrete, used for backfilling around ironwork installations
- UltraCrete QC10F Rapid Strength Concrete (Flowable) — a two part, flowable, fibre reinforced, fast setting cementitious concrete, used for backfilling around ironwork installations
- UltraCrete Instant Road Repair — graded Permanent Cold-lay Surfacing Materials (PCSMs) available in 6 and 10 mm surface course grades. The 6 mm grade is available in both black and dark red colours, and 10 mm in black only
- UltraCrete Seal and Tack — a spray-applied, cold joint sealant, applied to the vertical edges and surfaces at joint interfaces.

2 Manufacture

2.1 The system components are manufactured using typical batch-blending processes for producing resin and powder blends.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control being operated by the manufacturer are being maintained.

2.3 The management system of Instarmac Group plc has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by NQA (Certificate 6987).

3 Delivery and site handling

3.1 The system components are delivered to site in the packaging and weights given in Table 1.

Table 1 Packaging and weights

Component	Weight	Packaging type	Shelf-life(1) (months)
UltraCrete Envirobed CD 534			
powder	18 kg	Bags	8
liquid	2.5 litre	Bottles	12
powder	2 x 8 kg	Tubs	8
liquid	2 x 1 litre	Tubs	12
UltraCrete Envirobed CD 534 Flowable :			
powder	18 kg	Bags	8
liquid	2.5 litre	Bottles	12
UltraCrete M60 and M60F	25 kg	Bags or tubs	8
UltraCrete QC10 and QC10F	25 kg	Bags	8
UltraCrete Instant Road Repair	25 kg	Bags	6
	25 kg	Tubs	6
UltraCrete Seal and Tack	750 ml	Aerosol cans	12
UltraCrete PY4 SG and PY4 WG	2 x 10.6 kg	Bags	8
	2 x 1.9 kg	Tins	8
	25 kg	External Tubs	8

(1) When stored in frost-free and dry conditions in accordance with the Certificate holder's instructions.

3.2 When handling UltraCrete Envirobed CD 534, UltraCrete Envirobed Cd 534 Flowable, UltraCrete M60, UltraCrete M60F, UltraCrete QC10 and UltraCrete QC10F on site, the normal health and safety procedures associated with cementitious materials should be observed.

3.3 Health and Safety Data Sheets and the Control of Substances Hazardous to Health Regulations 2002 (COSHH) risk assessments for the works should be available to the purchaser and be maintained on site.

3.4 The Certificate holder has taken the responsibility to classify and label the system components under the *CLP Regulation (EC) No 1272/2008* on the *classification, labelling and packaging of substances and mixtures.* Users must refer to the relevant safety data sheet(s).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Ultracrete Ironwork Installation System.

Design Considerations

4 Use

The UltraCrete Ironwork Installation System is satisfactory for use in the installation and reinstatement of ironwork, up to and including installation Group 4 of BS EN 124-1 : 2015 in footways, footpaths, cycle-tracks and Types 2, 3 and 4 carriageways where rapid trafficking is required. UltraCrete PCSM meets the requirements of SROH 2010 and SROH 2020 for use in Types 3 and 4 Roads and Footways.

5 Practicability of installation

Installation of the system must be conducted by the specialist contractors experienced with this type of system.

6 Performance

6.1 UltraCrete Envirobed CD 534, UltraCrete Envirobed CD 534 Flowable, UltraCrete PY4, UltraCrete M60 and UltraCrete M60F can achieve the 20 $N \cdot mm^{-2}$ strength requirement in two hours, in accordance with the MCHW, Volume 1 SHW, Series 500, Clause 507 Chambers, 44.

6.2 In addition, UltraCrete PY4 can achieve 30 $N \cdot mm^{-2}$ compressive strength in one hour and therefore meets the compressive strength requirements for a bedding mortar in accordance with the MCHW, Volume 1 SHW, Series 500, Clause 507 Chambers, 24 (iii).

6.3 UltraCrete Envirobed CD 534 and UltraCrete CD 534 Flowable meet the requirements of a rapid-setting bedding material in accordance with the MCHW, Volume 1 SHW, Series 500, Clause 507 Chambers, 24 (i) to (iv).

7 Maintenance

The system is not subject to any routine maintenance requirements but any damage should be repaired as soon as is practicable (see section 12).

8 Durability

Provided the surrounding pavement remains structurally sound, the system will have an anticipated service life of up to five years.

Installation

9 General

9.1 Installation of the UltraCrete Ironwork Installation System must be carried out in accordance with the Certificate holder's instructions and the procedures described in this Certificate.

9.2 Precast concrete inspection chambers should comply with the requirements of BS 5911-4 : 2002 and BS EN 752 : 2017.

9.3 The system's compressive strength and rapid setting characteristics are affected by temperature and it must not be installed at temperatures below 5°C or above 30°C.

9.4 The various system components are installed within the thickness limits given in Table 2.

Table 2 Minimum and maximum material thickness

Component	Thickness (mm)	
	Minimum	Maximum
UltraCrete Envirobed CD 534	10	50
UltraCrete Envirobed CD 534 Flowable	10	50
UltraCrete PY4 SG and UltraCrete PY4 WG	5	50
UltraCrete M60 and M60F	10	75
UltraCrete QC10	30	250
UltraCrete QC10F	30	500

9.5 UltraCrete Instant Road Repair is applied in accordance with the Certificate holder's Agreed Installation Method Statement, Appendix A8 *Compaction Requirements of the Specification for the Reinstatement of Openings in Highways,* and sections 11.13 and 11.14 of this Certificate.

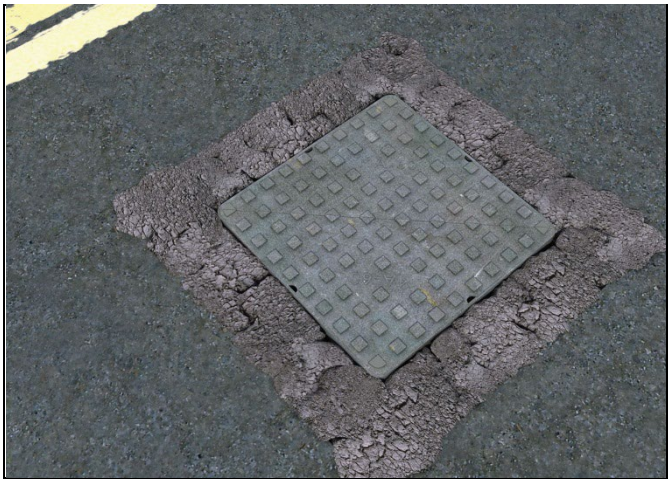
9.6 Where other materials are to be used in conjunction with the system (eg to repair/rebuild the supporting structure), such materials should have a strength commensurate with the reinstatement system in accordance with the MCHW, Volume 1 SHW, Series 500, Clause 507, Chambers 44 and 45.

9.7 The frame and cover should be aligned so as to ensure safe access to the reinstatement.

10 Preparation

10.1 A perimeter area, indicating the minimum width needed for excavation, is marked out around the existing frame of a failed installation (see Figure 1). This area should be extended to include any defects.

Figure 1 Failed ironwork



10.2 The supporting structure must be of adequate size and strength to support the frame, cover and expected loading.

10.3 The marked area is saw cut and excavated to uncover the flange of the existing cover and frame (see Figure 2). The existing cover and frame are removed using a suitable lifting device, taking care to avoid dropping loose materials into the shaft.

Figure 2 Excavating failed ironwork

10.4 All old bedding mortar is removed and the supporting structure cut back or loose bricks removed until a sound base is achieved.

10.5 The newly exposed substrate must be clean and structurally sound prior to commencing the reinstatement work.

10.6 The depth needed to install the frame and cover level to the road surface is determined, taking into account the depth of the frame and the manufacturer's recommended maximum and minimum thicknesses (see Table 3).

10.7 The finishing course of the supporting structure must be adjusted accordingly. For brick structures, levelling should be achieved prior to the installation of the final course.

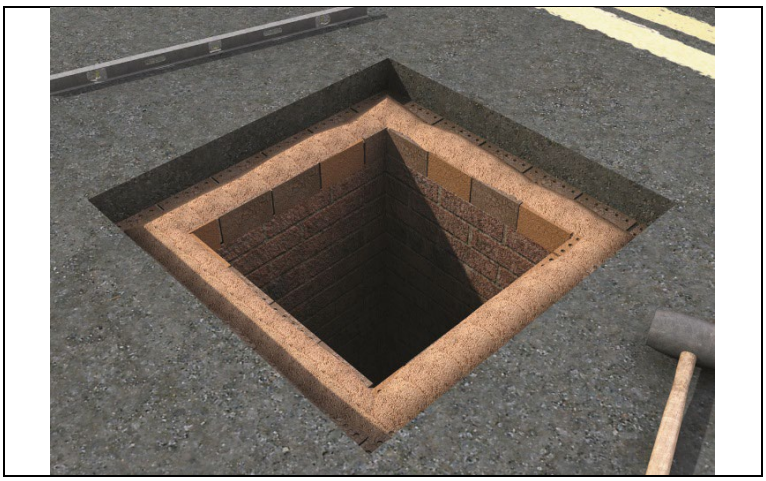
10.8 Concrete structures must be repaired using conventional concrete repair techniques and materials. The Certificate holder can advise on suitable materials.

10.9 All old bedding material, loose paint, rust and any other debris is removed from the frame/chamber prior to installation.

11 Installation

11.1 When using UltraCrete Envirobed CD 534, UltraCrete Envirobed CD 534Flowable, UltraCrete M60 and UltraCrete M60F, the substrate is wetted prior to application of the mortar (see Figure 3).

Figure 3 Application of bedding mortar to the prepared substrate



11.2 When packing materials are used to support and level the frame, they must be compatible with the bedding mortar to be used. The Certificate holder can advise on suitable materials.

11.3 The appropriate bedding mortar is mechanically mixed as follows:

- UltraCrete Envirobed CD 534— one bag/tub of powder is mixed with one bottle of Envirobed CD 534 liquid to obtain a stiff, non-slump mix with a uniform consistency. The amount of liquid may be adjusted according to the consistency required
- UltraCrete Envirobed CD 534 Flowable(1) — one bag/tub of Ultracrete Envirobed CD 534 Flowable powder is mixed with Envirobed CD 534 liquid to obtain a flowable mortar with uniform consistency. The amount of liquid may be adjusted according to the consistency required
- UltraCrete PY4 SG or WG — the filler is slowly added to the resin in the ratio of one complete tin of resin to one pack of filler/activator and mixed until a homogeneous mix is obtained. Part tins or packs should not be mixed
- UltraCrete M60 or M60F — 25 kg of powder is mixed with approximately 3 litres of potable water to obtain a stiff, non-slump mix with a uniform consistency.

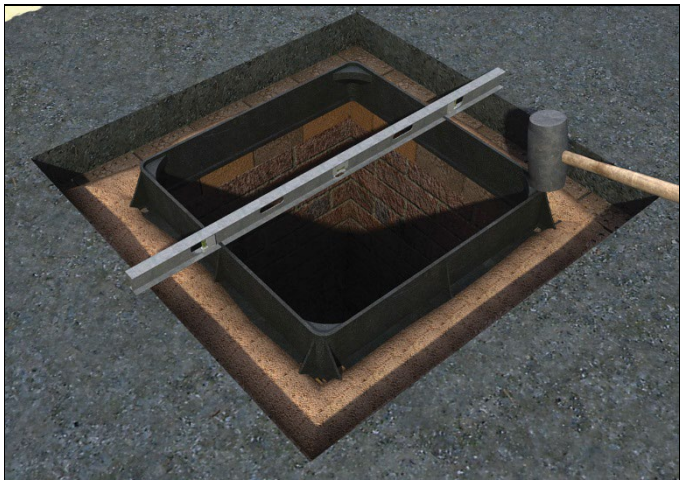
(1) Please note that UltraCrete Envirobed CD 534 Flowable has a different application method – see section 11.9.

11.4 The mixed bedding materials are immediately placed on the supporting structure, allowing a 5 mm excess thickness. They must be used within five minutes of mixing.

11.5 The frame is lowered into position using a suitable lifting device and placed on the bedding mortar, ensuring that it is fully supported and checking that the frame does not overhang the mortar at any point. Care should be taken to eliminate voids in the bedding material under the frame, particularly in the vicinity of the cover seating.

11.6 The frame is tamped down into place, ensuring the correct level is obtained (see Figure 4). This can be checked by placing a straight edge over the frame and surrounding carriageway.

Figure 4 Tamping and levelling of the frame



11.7 Any holes within the frame are infilled and the flanges of the frame enveloped by a minimum thickness of 10 mm of the bedding material.

11.8 Exposed surfaces of the bedding material around the frame are float finished, ensuring any voids or loose material are removed, and the inside surface pointed to a smooth finish.

11.9 Prior to using Envirobed CD 534 Flowable, internal voids of the frame and brickwork should be dammed with Envirobed CD 534 regular mortar. This will prevent Envirobed CD 534 Flowable bedding mortar pouring out into the chamber. It must be ensured that the mortar has stiffened. Once it has stiffened (this can be checked by tapping a hammer into the mortar), Envirobed CD 534 Flowable is then prepared. Application should be within 4 minutes of mixing, by pouring from one side of the pre-levelled frame at a time, working all the way around the frame until it flows over the frame haunching to a depth of 20 mm. Once the bedding material has reached its initial set, the backfill material UltraCrete QC10/F can be poured around the frame. The volume of water required will vary depending on the moisture content of the aggregate. Typically, one to two litres of water will achieve the required workability. UltraCrete QC10F should achieve a flowable consistency.

11.10 The area to be infilled is wetted and the material placed immediately to 60 mm or whatever depth is needed to fulfil local compliance below the required surface fill level, then compacted, ensuring no voids are present (see Figure

5). The final surface is then rough floated to achieve a textured level surface ready to receive UltraCrete Instant Road Repair.

Figure 5 Backfilling using UltraCrete QC10 or UltraCrete QC10F

11.11 Once UltraCrete QC10 and UltraCrete QC10F has reached initial set, all vertical edges of the excavated area and the manhole frame are sprayed with UltraCrete Seal and Tack, ensuring all surfaces are covered (see Figure 6).

Figure 6 Application of UltraCrete Seal and Tack

11.12 UltraCrete Instant Road Repair is applied to a depth of approximately 45 mm and compacted to 30 mm (see Figure 7).

11.13 Vertical edges are sprayed again using UltraCrete Seal and Tack, and UltraCrete Instant Road Repair is applied with a 50% excess. The material is then compacted level with the existing surface course (see Figure 8).

Figure 7 Installation of UltraCrete Instant Road Repair

Figure 8 Final compaction of UltraCrete Instant Road Repair

11.14 An UltraCrete Envirobed CD 534, UltraCrete Envirobed CD 534 Flowable or UltraCrete M60 and UltraCrete M60F installation should not be trafficked for a minimum of two hours following completion of the installation. This may be reduced to one hour for an UltraCrete PY4 installation.

12 Repair

In the event that the system is damaged, the ironwork will need to be removed and reinstated as detailed in sections 9 to 11.

Technical Investigations

13 Tests

13.1 Tests were carried out on the following components and the results assessed to determine:

UltraCrete Instant Road Repair

- skid/slip resistance

UltraCrete Envirobed CD 534 and UltraCrete Envirobed CD 534 Flowable

- compression strength
- tensile strength
- workability
- shrinkage

UltraCrete PY4 SG and UltraCrete PY4 WG

- shrinkage
- accelerated ageing
- pot life

UltraCrete M60

- freeze/thaw resistance
- compressive strength
- shrinkage
- pot life

UltraCrete QC10

- freeze/thaw resistance
- shrinkage
- pot life

UltraCrete QC10F

- compressive strength

UltraCrete Seal and Tack

- adhesion and corrosion protection.

13.2 A reassessment was made of the data contained in BBA Certificate 01/H060 relating to UltraCrete Instant Road Repair.

14 Investigations

14.1 An assessment was made of independent test data relating to:

UltraCrete Instant Road Repair

- rut resistance
- PSV and AAV values

UltraCrete PY4 SG and UltraCrete PY4 WG

- flexural strength
- compressive strength

UltraCrete M60

- freeze/thaw resistance
- compressive strength
- chloride content

UltraCrete QC10

- compressive strength
- chloride content

UltraCrete Ironwork Installation System

- full-scale load test
- watertightness.

14.2 A user survey was conducted to investigate the performance of the system in service.

14.3 A visit was made to a site to witness installation of the system.

14.4 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS 5911-4 : 2002 + A2 : 2010 *Concrete pipes and ancillary concrete products — Specification for unreinforced and reinforced concrete inspection chambers (complementary to BS EN 1917 : 2002)*

BS EN 124-1 : 2015 *Gully tops and manhole tops for vehicular and pedestrian areas — Definitions, classification, general principles of design, performance requirements and test methods*

BS EN 124-5 : 2015 Gully tops and manhole tops for vehicular and pedestrian areas – Gully tops and manhole tops made of composite materials

BS EN 752 : 2017 *Drain and sewer systems outside buildings. Sewer system management.*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

New Roads and Street Works Act 1991 : Specification for the Reinstatement of Openings in Highways (SROH), Code of Practice, Third Edition England 2010 and Fourth Edition England January 2020

Manual of Contract Documents for Highway Works (MCHW), Volume 1, Specification for Highway Works (SHW), Series 500 *Drainage and Service Ducts*

15 Conditions

15.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

15.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

15.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

15.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

15.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

15.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.