

# Pipex Drainage and Civils Products Ltd

[a trading division of Pipex Ltd (www.pipexlimited.com)]

Pipex House  
Devon Enterprise Facility  
1 Belliver Way, Roborough  
Plymouth  
Devon PL6 7BP

Tel: 01752 581200 Fax: 01752 581209  
e-mail: sales@pipexlimited.com  
website: www.pipexdrainageandcivils.com



Agrément Certificate

No 02/3927

Product Sheet 1

## PIPEX UNIVERSAL MANHOLES AND INSPECTION CHAMBERS

## PIPEX CIRCULAR MANHOLES AND INSPECTION CHAMBERS

### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Pipex Universal Circular Manholes and Inspection Chambers, manufactured from welded polypropylene.

#### AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information 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

**Strength** — the products are designed to meet the stiffness requirements at the depths involved. Where heavy loads are envisaged, a reinforced slab must be placed to transmit the loads (see section 5).

**Flow characteristics** — the products will have equivalent flow characteristics to thermoplastic pipes (see section 6).

**Durability** — the products will have a life equivalent to that of the system to which they are connected (see section 8).



The BBA has awarded this Agrément Certificate to the company named above for the product described herein. This product 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

Brian Chamberlain  
Head of Approvals — Engineering

Greg Cooper  
Chief Executive

Date of First issue: 9 December 2008

Originally certificated on 10 June 2002

*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](http://www.bbacerts.co.uk)*

*Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.*

British Board of Agrément  
Bucknalls Lane  
Garston, Watford  
Herts WD25 9BA

©2008

tel: 01923 665300  
fax: 01923 665301  
e-mail: [mail@bba.star.co.uk](mailto:mail@bba.star.co.uk)  
website: [www.bbacerts.co.uk](http://www.bbacerts.co.uk)

# Regulations

In the opinion of the BBA, Pipex Universal Circular Manholes and Inspection Chambers, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



## The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	H1	Foul water drainage
Comment:		The products will convey the flow of foul or surface water and minimise the risk of blockages or leaks. See sections 6.1 and 6.2 of this Certificate.
Requirement:	H3(3)	Rainwater drainage
Comment:		The products will convey the flow of rainwater and minimise the risk of blockages or leakage. See sections 6.1 and 6.2 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The products are acceptable. See section 8 and the <i>Installation</i> part of this Certificate.



## The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The use of the products can satisfy the requirements of this Regulation. See sections 7 and 8 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	3.6(a)	Surface water drainage
Standard:	3.7(b)	Wastewater drainage
Comment:		The products will meet the relevant requirements of these Standards, with reference to clauses 3.6.1 <sup>(1)(2)</sup> to 3.6.3 <sup>(1)(2)</sup> , 3.6.7 <sup>(1)(2)</sup> , 3.7.1 <sup>(1)(2)</sup> , 3.7.3 <sup>(1)(2)</sup> , 3.7.4 <sup>(1)(2)</sup> , 3.7.9 <sup>(1)(2)</sup> and 3.7.10 <sup>(1)(2)</sup> . See sections 6.1 and 6.2 of this Certificate. (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



## The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The products are acceptable. See section 8 and the <i>Installation</i> part of this Certificate.
Regulation:	B(3)2	Suitability of Certain materials
Comment:		The products are acceptable. See section 7 of this Certificate
Regulation:	N4	Underground foul drainage
Comment:		The products will meet the relevant requirements of this Regulation. See sections 6.1 and 6.2 of this Certificate.
Regulation:	N5	Rain-water drainage
Comment:		The products will meet the relevant requirements of this Regulation. See sections 6.1 and 6.2 of this Certificate.

### Construction (Design and Management) Regulations 2007

### Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 9 *Installation* (9.4).

# Non-regulatory Information

## NHBC Standards 2008

NHBC accepts the use of Pipex Universal Circular Manholes and Inspection Chambers when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 5.3 *Drainage below ground*.

## Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Pipex Universal Circular Manholes and Inspection Chambers, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual*, Section 3 *Substructure*, Sub-section *Drainage*.

# General

This Certificate relates to Pipex Universal Circular Manholes and Inspection Chambers, manufactured from welded polypropylene.

This Certificate covers the use of the manholes and chambers for drain and sewer applications where they are used for maintenance to depths of 6 m.

# Technical Specification

## 1 Description

1.1 Pipex Circular Manholes and Access Chambers are factory made from polypropylene, with internal diameters ranging from 600 mm to 1200 mm. The basic types of pipework arrangements in the chambers are shown in Tables 1 and 2. The shaft of the chambers has stiffening ribs equally spaced at 400 mm centres along its length (see Figures 1 and 2).

Figure 1 Rib detailing

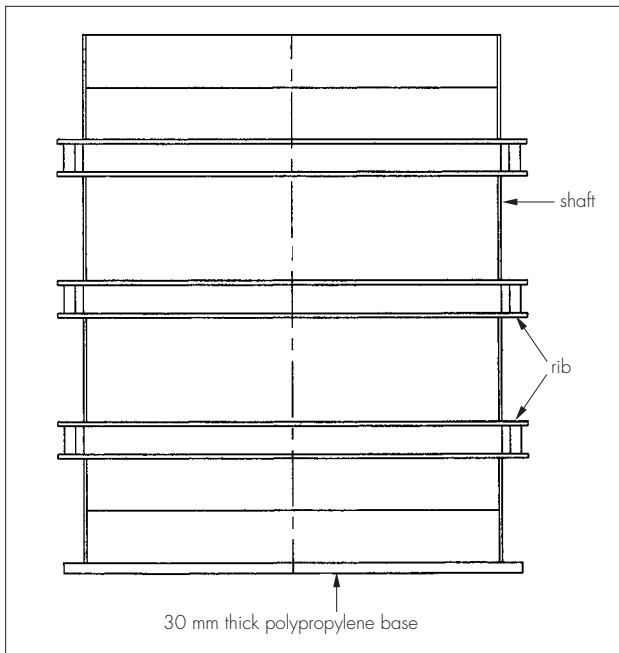
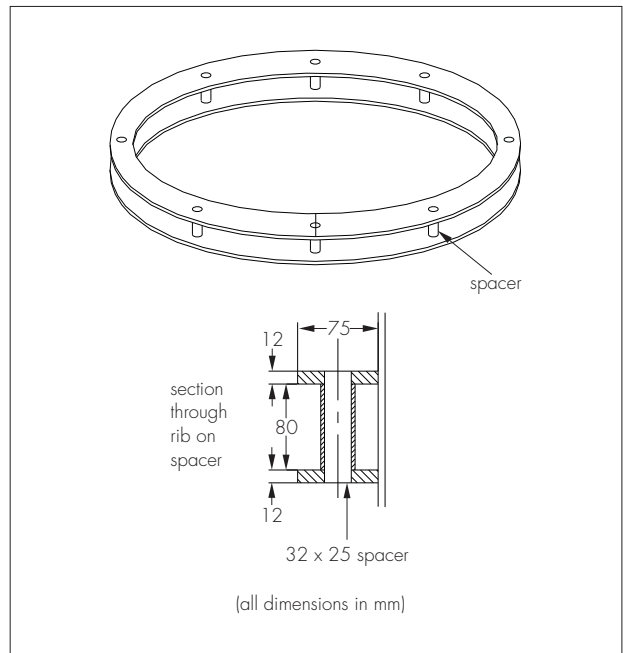


Figure 2 Detail of stiffening rib



1.2 The shallow inspection chambers (see Table 1) are suitable for inverts with a depth of 1.2 m maximum and are not designed for personnel entry. The base is formed from polypropylene sheet 30 mm thick welded to the shaft, and reinforced with four diametrical polypropylene ribs (120 mm by 20 mm) (see Figure 3).

Table 1 Circular shallow inspection chamber<sup>(1)</sup> diameter (mm) – depth to invert 1.2 m or less

Main drain size NB	Branch size NB	600	600	600	600	700	700	1000	1000	1200	1200
100	100										
150	100										
	150	600	600	600	600	900	900	1200	1200	—	—
200	100			600	600	800	800	1000	1000	1200	1200
	150			600	600	900	900	1200	1200	—	—
	200	600	600	900	900	1000	1000	—	—	—	—
250	100			600	600	800	800	1000	1000	1200	1200
	150			600	600	900	900	1200	1200	—	—
	200			900	900	1000	1000	—	—	—	—
	250	600	600	900	900	1000	1000	—	—	—	—
300	100			800	800	800	800	1200	1200	—	—
	150			800	800	1000	1000	1200	1200	—	—
	200			1000	1000	1200	1200	—	—	—	—
	250			1000	1000	1200	1200	—	—	—	—
	300	700	700	1200	1200	—	—	—	—	—	—

(1) Shallow inspection chambers must have a minimum clear opening size of 430 mm where the depth to invert is ≤ 1 metre or a maximum clear opening of 350 mm diameter or 300 mm by 300 mm where depth to invert is > 1 m, and are restricted to 'no personnel entry' as defined in BS EN 752 : 2008, Table NA.21.

Table 2 Circular manhole<sup>(1)</sup> diameter (mm) — depth to invert from 1.5 m to 6.0 m

Main drain size NB	Branch size NB										
100	100	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
150	100			1200	1200	1200	1200	1200	1200	1200	1200
	150	1200	1200	1200	1200	1200	1200	1200	1200	1200	—
200	100			1200	1200	1200	1200	1200	1200	1200	1200
	150			1200	1200	1200	1200	1200	1200	1200	—
	200	1200	1200	1200	1200	1200	1200	—	—	—	—
250	100			1200	1200	1200	1200	1200	1200	1200	1200
	150			1200	1200	1200	1200	1200	1200	—	—
	200			1200	1200	1200	1200	1200	—	—	—
	250	1200	1200	1200	1200	1200	1200	—	—	—	—
300	100			1200	1200	1200	1200	1200	1200	—	—
	150			1200	1200	1200	1200	1200	1200	—	—
	200			1200	1200	1200	1200	—	—	—	—
	250			1200	1200	1200	1200	—	—	—	—
	300	1200	1200	1200	1200	—	—	—	—	—	—

(1) Circular manholes are suitable for man entry and must have a minimum clear opening of 600 mm and a minimum diameter of 1200 mm as defined in BS EN 752 : 2008, Table NA.22.

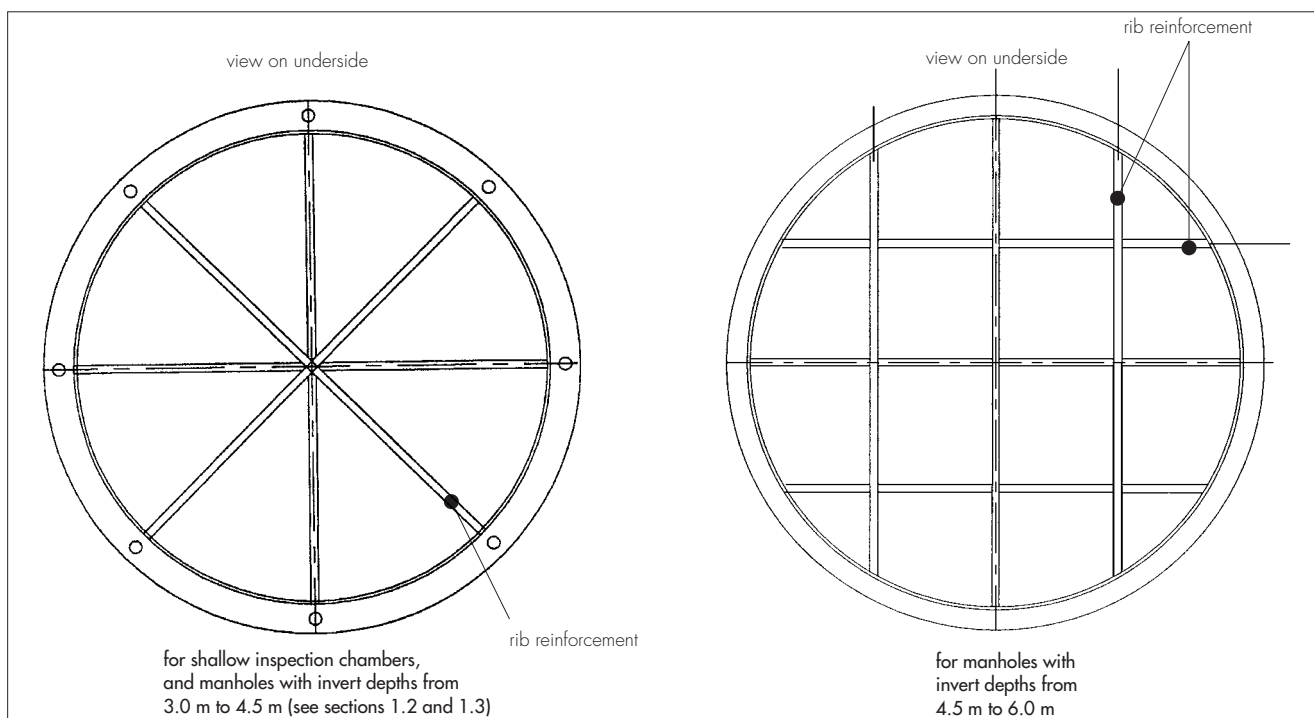
1.3 The manholes (see Table 2) have steps (steel encapsulated in polypropylene kitemarked to BS EN 13101 : 2002) welded up the side of the chamber (see section 1.1), and are available in three base specifications depending on the invert depth (see Figure 3):

- 1.5 m to 3.0 m — identical arrangement to that of the shallow access chamber
- 3.0 m to 4.5 m — polypropylene sheet 40 mm thick, welded to the shaft and reinforced with four diametrical polypropylene ribs (150 mm by 30 mm)
- 4.5 m to 6.0 m — polypropylene sheet 20 mm thick, welded to the shaft and reinforced with a lattice of six polypropylene ribs (125 mm by 20 mm).

1.4 The inlets and outlets of the chambers may be made to suit attachments to any type of drainage pipes. The connections required should be stated when ordering the chambers.

1.5 The chambers are available either with or without a gasket access cover. This 20 mm thick polypropylene cover incorporates a 3 mm thick EPDM rubber gasket to act as an airtight seal and is bolted to the chamber using grade A2 stainless steel nuts, bolts and washers.

Figure 3 Reinforcement of bases



## 2 Delivery and site handling

- 2.1 The manholes and chambers should be handled with care at all times and as instructed by the manufacturer.
- 2.2 The manholes and chambers should be inspected for damage on delivery and should be stored in a safe area, away from site traffic, ready for use.
- 2.3 When long-term storage is envisaged, the chambers must be protected from direct sunlight.

# Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Pipex Universal Circular Manholes and Access Chambers.

## Design Considerations

### 3 General

- 3.1 Pipex Circular Manholes and Inspection Chambers are suitable for use in underground drains and public and private sewers designed in accordance with BS EN 752 : 2008.
- 3.2 Part of the range of manholes and chambers can meet the requirements of Water UK/WRc PLC's *Sewers for Adoption* (Sixth edition, March 2006), but due consideration must be made to the requirements of Clauses 2.9 and 5.2.31 of that document and, in Scotland, the requirements of Water UK/WRc PLC's of *Sewers for Scotland* (Second edition, November 2007), but due consideration must be made to the requirements of Clauses 2.17 and 5.2.31 of that document.

### 4 Practicability of installation

- 4.1 The manholes and chambers should be installed in accordance with the manufacturer's instructions.
  - 4.2 Connecting pipework to the manholes and chambers should be installed using traditional drain-laying methods in accordance with normal good practice and any special arrangements that may apply to the specific site, for example, the Highways Agency (HA)<sup>(1)</sup> requirements.
- (1) The HA acts on behalf of the Department for Transport; Transport Scotland; the Welsh Assembly Government; and the Department for Regional Development, Northern Ireland.

### 5 Strength

- 5.1 The manhole and chamber shafts and bases are designed to meet the stiffness requirements for installation up to the specified invert depth — up to 1.2 m for shallow inspection chambers and up to 4.5 m or 6.0 m for the manholes (depending on the base design).
- 5.2 When the manholes and chambers are sited in a position where superimposed loads are likely, eg traffic loads, a reinforced concrete slab must be built over to transmit the load to the concrete surround (see section 9.5).

### 6 Flow characteristics



6.1 Pipex Manhole and Inspection Chambers with connecting pipework will have normal flow characteristics associated with thermoplastic pipes.

6.2 An appropriate value of roughness coefficient should be selected when designing a drainage system.

### 7 Maintenance



The drain can be rodded through the manhole or chamber using conventional cane rods, polypropylene rods or similar flexible systems.

### 8 Durability



When used within the conditions given in this Certificate, the manhole or chamber will have a life equivalent to that of the system to which it is connected, eg in excess of 50 years.

## Installation

### 9 General

- 9.1 Pipex Circular Manholes and Inspection Chambers must be installed in accordance with the manufacturer's instructions and BS EN 752 : 2008 where applicable.
- 9.2 The designer/consultant is responsible for determining the concrete thickness (minimum 150 mm) and strength required for the ground conditions, taking into account the buoyancy of the unit, external forces exerted by the water

table backfill and all other relevant matters. If the unit is to be installed in acid soil, sulfate-resisting concrete should be used.

9.3 In very poor loadbearing ground, the concrete surround and base may require reinforcement. The structural engineer is responsible for designing reinforced concrete and liaising with the Certificate holder as to what will be provided.

9.4 The contractor should ensure that suitable plant can be made available for lifting, excavating and pumping out, if necessary. Free permanent access to the site should also be available for maintenance purposes.

9.5 When the manholes or chambers are to be installed in areas that could be subject to superimposed loads, eg traffic loads or building foundations, it is the responsibility of the structural engineer to design a reinforced concrete structural surround to ensure that the superimposed loads are not transmitted to the top or side of the unit.

## 10 Procedure

### In wet ground

10.1 Where groundwater lies above the base of the manhole or chamber at any time or in slow draining clay soils, the procedure is summarised as:

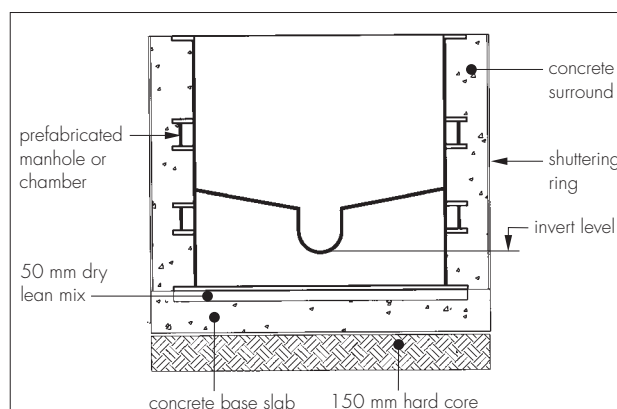
- the hole is excavated at least 300 mm wider than manhole liner overall dimensions, with additional allowances for such features as planking and strutting
- a well pit is formed for pumping groundwater. It must be ensured that the pump outlet is well away from the manhole liner and is downhill of the excavation
- the pump must be operated continuously to ensure that groundwater is below the base of the excavation at all times during installation
- a minimum of 150 mm of hard core is laid over the base of the hole
- concrete is applied over the hard core and manhole or chamber bedded down onto the wet concrete ensuring that 150 mm minimum of concrete is between the hard core and the tank base. A concrete haunch is formed around the base of the unit to stabilise it during the placing of the surrounding concrete
- A displacement cap which is supplied by the Certificate holder, should be positioned on top of the manhole/chamber. The concrete is poured onto the cap and moved into the surrounding shuttering with a spade. Work is carried out evenly around the manhole or chamber, with care being taken to work concrete under branch connections to prevent voids. The process is continued until the manhole or chamber is surrounded by concrete
- groundwater must be continually pumped from the excavation until the concrete surround has set.

### In dry ground

10.2 Where groundwater lies beneath the base of the manhole chamber at all times the procedure is summarised as:

- the hole is excavated at least 300 mm wider than the manhole or chamber overall dimensions with additional allowances for such features as planking and strutting
- a minimum of 150 mm hard core is laid over the base of the hole
- concrete is laid over the hard core and the manhole or chamber is bedded down onto concrete ensuring that 150 mm minimum of concrete is between the hard core and the manhole or chamber base. A concrete haunch is formed around the base of the unit to stabilise it during the placing of the surrounding concrete
- A displacement cap which is supplied by the Certificate holder, should be positioned on top of the manhole/chamber. The concrete is poured onto the cap and moved into the surrounding shuttering with a spade. Work is carried out evenly around the manhole or chamber, with care being taken to work concrete under branch connections to prevent voids. The process is continued until the manhole or chamber is surrounded by concrete (see Figure 4).

Figure 4 Typical installation

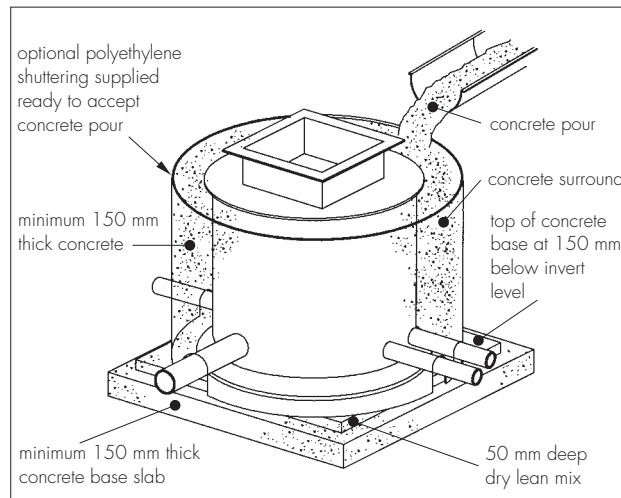


## Manholes supplied with optional high density polyethylene (HDPE) shuttering

10.3 Optional HDPE shuttering is available factory-installed around the manhole or chamber. The shuttering is attached to the manhole or chamber via polypropylene gussets and it is not fabricated to withstand superimposed loads. The shuttering acts as a containment for the concrete poured surround.

10.4 The base of the shuttering is open to allow for the concrete pour within the shuttering to register with the concrete base (see Figure 5).

Figure 5 Concrete pouring into HDPE shuttering



## Technical Investigations

### 11 Tests

Tests were carried out to determine:

- watertightness of manholes and chambers; when full of water and when surrounded by water, (BS 7158 : 2001, Clause 7.2) and Appendix A
- resistance to thermal cycling, (BS 7158 : 2001, Clause 7.5) and Appendix E
- STIS, (BS 7158 : 2001, Clause 7.6) and Appendix F
- negative internal pressure test, (BS 7158 : 2001, Clause 7.8) and Appendix I
- vertical load test A15 class, (BS 7158 : 2001, Clause 7.7) and Appendix G
- step iron pull-out (BS 1247-2 : 1990, Clause 7.3 and Appendix D)
- step iron bending (BS 1247-2 : 1990, Clause 7.2 and Appendix C)
- positive pressure on gasket chamber (in accordance with BS EN 1277 : 1996, Method 2, condition A).

### 12 Investigations

An evaluation of the manhole and chamber was made to assess:

- resistance to chemicals
- durability
- installation detail and practicability of installation
- dimensional accuracy.

## Bibliography

BS 1247-2 : 1990 *Manhole steps — Specification for plastics encapsulated manhole steps*

BS 7158 : 2001 *Specification for plastics inspection chambers for drains*

BS EN 752 : 2008 *Drain and sewer systems outside buildings*

BS EN 1277 : 1996 *Methods of testing plastics — Thermoplastics pipes, fittings and valves — Plastics piping systems — Thermoplastics piping systems for buried non-pressure applications — Test methods for leaktightness of elastomeric sealing ring type joints*

BS EN 13101 : 2002 *Steps for underground man entry chambers — Requirements, marking, testing and evaluation of conformity*

## 13 Conditions

13.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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.

13.2 References in this Certificate to any Act of Parliament, Statutory Instrument, Directive or Regulation of the European Union, British, European or International Standard, Code of Practice, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

13.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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.

13.4 In granting this Certificate, the BBA is not responsible for:

- 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
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

13.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.