

Pipex Drainage and Civils Products Ltd

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Agrément Certificate

No 02/3927

Product Sheet 2

PIPEX UNIVERSAL MANHOLES AND INSPECTION CHAMBERS

PIPEX RECTANGULAR MANHOLES AND INSPECTION CHAMBERS

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Pipex Universal Rectangular 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 23 September 2005

The BBA is a UKAS accredited certification body — Number 1113. 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 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.

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Regulations

In the opinion of the BBA, Pipex Universal Rectangular 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 ⁽¹⁾⁽²⁾ to 3.6.3 ⁽¹⁾⁽²⁾ , 3.6.7 ⁽¹⁾⁽²⁾ , 3.7.1 ⁽¹⁾⁽²⁾ , 3.7.3 ⁽¹⁾⁽²⁾ , 3.7.4 ⁽¹⁾⁽²⁾ , 3.7.9 ⁽¹⁾⁽²⁾ and 3.7.10 ⁽¹⁾⁽²⁾ . 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 Rectangular 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 Rectangular 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 Rectangular 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 1.5 m.

Technical Specification

1 Description

1.1 Pipex Rectangular Manholes and Inspection Chambers are factory made from polypropylene, with internal dimensions ranging from 450 mm to 1200 mm. The pipework arrangements in the chambers are shown in Tables 1 and 2. The shaft of the chambers is formed from 12 mm thick polypropylene and has stiffening ribs of 20 mm by 50 mm polypropylene equally spaced at 400 mm centres, along its length (see Figure 1), and is welded to a 30 mm thick base.

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.

1.3 The manholes (see Table 2) have steps (steel encapsulated in polypropylene) welded into the side of the chamber (see section 12). The steps are Kitemarked to BS EN 13101 : 2002.

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

Figure 1 Rib detailing

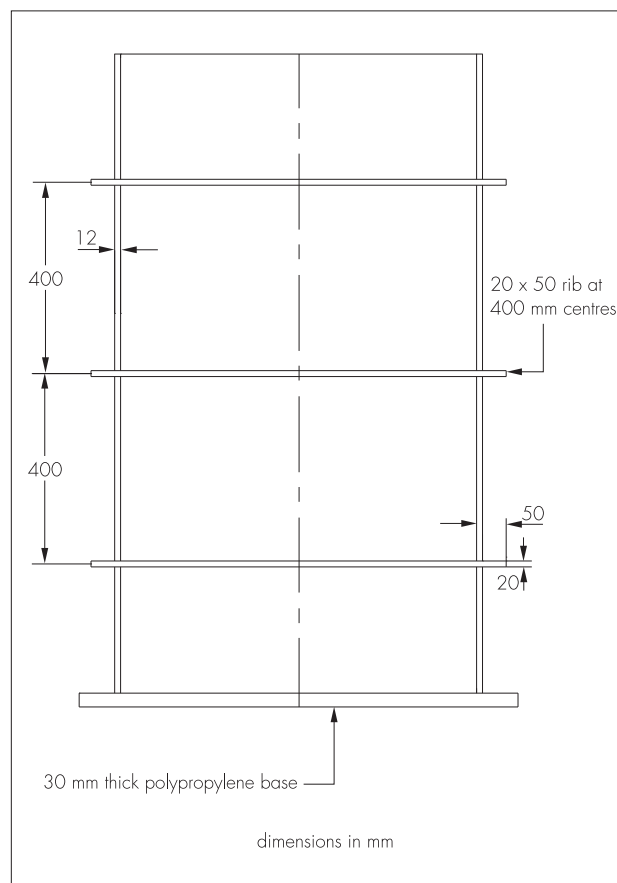
















Table 1 Rectangular shallow inspection chamber⁽¹⁾ internal diameter (mm) — depth to invert 1.2 m or less

Main drain size NB	Branch size NB						
100	100	450 x 450	450 x 450	450 x 450	450 x 450	750 x 600	750 x 600
150	100	—	—	450 x 450	450 x 450	750 x 600	750 x 600
	150	450 x 450	450 x 450	450 x 450	450 x 450	750 x 600	750 x 600
200	100	—	—	750 x 600	750 x 600	750 x 600	750 x 600
	150	—	—	750 x 600	750 x 600	750 x 600	750 x 600
	200	750 x 600	750 x 600	750 x 600	750 x 600	750 x 600	750 x 600
300	100	—	—	750 x 600	750 x 600	—	—
	150	—	—	750 x 600	750 x 600	—	—
	200	—	—	750 x 600	750 x 600	—	—
	300	750 x 600	750 x 600	—	—	—	—

(1) Shallow inspection chambers must have a minimum clear opening size of 430 mm and are restricted to 'no personnel entry' as defined in BS EN 752 : 2008, Table NB.21.

Table 2 Rectangular manhole⁽¹⁾ internal diameter (mm) — depth to invert 1.5 m or less

Main drain size NB	Branch size NB								
100	100	—	—	—	—	1200 x 675	1200 x 675	1200 x 675	1200 x 675
150	100	—	—	—	—	1200 x 675	1200 x 675	1200 x 675	1200 x 675
	150	—	—	—	—	1200 x 675	1200 x 675	—	—
200	100	—	—	—	—	1200 x 675	1200 x 675	—	—
	150	—	—	—	—	1200 x 675	1200 x 675	—	—
	200	—	—	1200 x 750	1200 x 750	1200 x 750	1200 x 750	—	—
300	100	—	—	1200 x 750	1200 x 750	1200 x 750	1200 x 750	—	—
	150	—	—	1200 x 750	1200 x 750	1200 x 750	1200 x 750	—	—
	200	—	—	1200 x 750	1200 x 750	1200 x 750	1500 x 750	—	—
	300	1200 x 750	1200 x 750	—	—	—	—	—	—

(1) Rectangular manholes are suitable for man entry and must have a minimum clear opening of 1200 mm by 675 mm and a minimum length and width of 1200 mm by 675 mm respectively, as defined in BS EN 752 : 2008, Table NB.22.

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.

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 Rectangular Manholes and Inspection Chambers.

Design Considerations

3 General

3.1 Pipex Rectangular 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 *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 requirements that may apply to the specific site, for example, the Highways Agency (HA)⁽¹⁾ 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 1.5 m for the manholes.

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 The manholes and 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 Rectangular 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

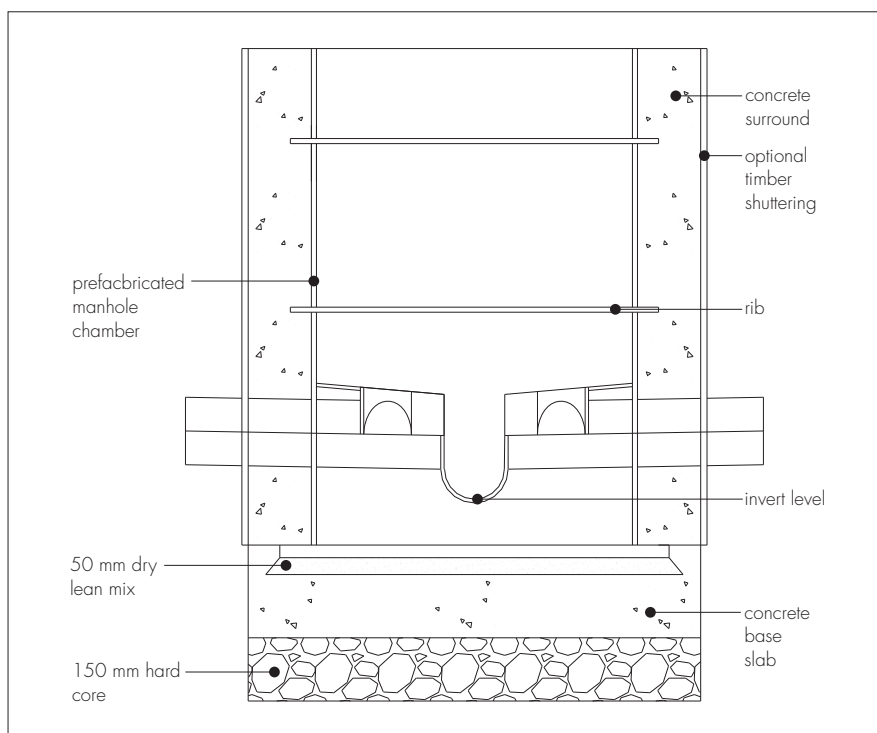
- a well pit is formed for pumping groundwater. It must be ensured that the pump outlet is well away from the manhole liner and is downhill of the excavation
- the pump must be operated continuously to ensure that groundwater is below the base of the excavation at all times during installation
- a minimum 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 2).

Figure 2 Typical installation

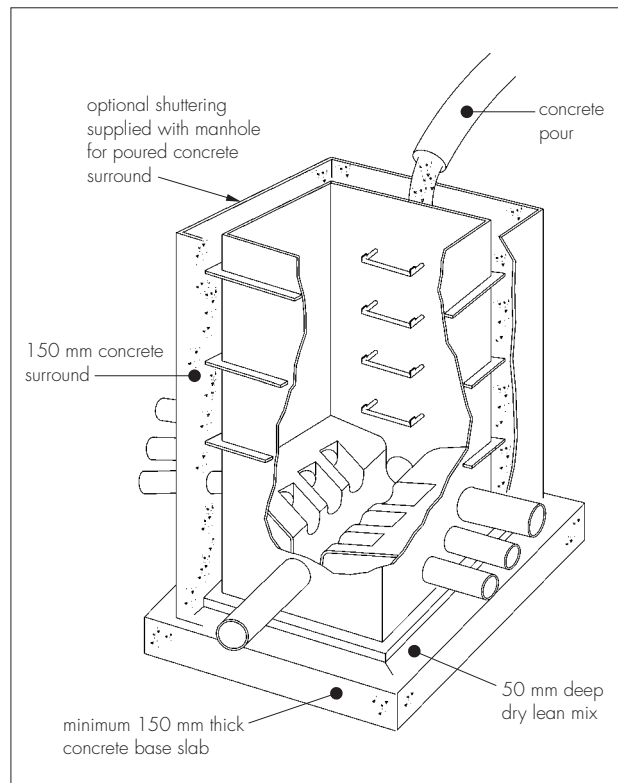


Manholes supplied with optional high density polyethylene (HDPE) or timber shuttering

10.3 Optional HDPE or timber 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. Prior to pouring the concrete into the manhole shuttering, the contractor is responsible for checking the timber struts, if supplied inside the manhole or chamber, are in place.

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 3).

Figure 3 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
- STIS, (BS 7158 : 2001, Clause 7.6) and Appendix F
- negative internal pressure test, (BS 7158 : 2001, Clause 7.8) and Appendix I.

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
- resistance to thermal cycling, (BS 7158 : 2001, Clause 7.5) and Appendix E
- 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).

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*

Conditions of Certification

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.