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**Agrément Certificate**  
**03/3979**  
Product Sheet 1

## RIDGISEWER GRAVITY SEWER SYSTEM

### RIDGISEWER 400 mm, 450 mm, 500 mm and 600 mm FITTINGS

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Ridgisewer 400 mm, 450 mm, 500 mm and 600 mm Fittings, for use in domestic drains and public and private sewers at depths of up to 10 metres.

(1) Hereinafter referred to as 'Certificate'.

#### 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 have adequate strength for the intended application (see section 6).

**Performance of joints** — the joints remain watertight under normal use (see section 7).

**Flow characteristics** — the products will have normal flow characteristics associated with polypropylene underground sewerage systems (see section 8).

**Resistance to chemicals** — the products have adequate resistance to the type of chemicals likely to be found in domestic sewage (see section 9).

**Resistance to elevated temperatures** — the products have adequate resistance to temperatures likely to be found in domestic sewage (see section 10).

**Durability** — the material from which the products are manufactured will not deteriorate significantly and the anticipated life of the products will be in excess of 50 years (see section 12).



The BBA has awarded this Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate

On behalf of the British Board of Agrément

Date of Second issue: 27 February 2017

Originally certificated on 10 January 2003

Brian Chamberlain  
Head of Technical Excellence

Claire Curtis-Thomas  
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](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.

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## Regulations

In the opinion of the BBA, Ridgisewer 400 mm, 450 mm, 500 mm and 600 mm Fittings, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



### The Building Regulations 2010 (England and Wales) (as amended)

<b>Requirement:</b>	<b>H1(1)</b>	<b>Foul water drainage</b>
Comment:		A system incorporating the products will convey the flow of foul water and minimise the risk of blockages or leaks. See sections 6, 7 and 8 of this Certificate.
<b>Requirement:</b>	<b>H3</b>	<b>Rainwater drainage</b>
Comment:		A system incorporating the products will convey the flow of rainwater and minimise the risk of blockages or leaks. See sections 6, 7 and 8 of this Certificate.
<b>Regulation:</b>	<b>7</b>	<b>Materials and workmanship</b>
Comment:		The products are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.



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

<b>Regulation:</b>	<b>8(1)</b>	<b>Durability, workmanship and fitness of materials</b>
Comment:		The products are acceptable. See sections 11.1 and 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	3.6	Surface water drainage
Standard:	3.7	Wastewater drainage
Comment:		A system incorporating the products will satisfy the relevant requirements of this Standard, with reference to clauses 3.6.3 <sup>(1)(2)</sup> , 3.6.8 <sup>(1)(2)</sup> , 3.6.10 <sup>(1)(2)</sup> , 3.7.1 <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 section 8 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		A system incorporating the products can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
Comment:		Comments in relation to the products under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> .

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).



### The Building Regulations (Northern Ireland) 2012 (as amended)

<b>Regulation:</b>	<b>23(a)(i)(iii)(b)(i)</b>	<b>Fitness of materials and workmanship</b>
Comment:		The products are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>81</b>	<b>Underground foul drainage</b>
Comment:		A system incorporating the products will convey the flow of foul water and minimise the risk of blockages or leaks. See section 8 of this Certificate.

**Regulation:** 82  
**Comment:**

**Rainwater drainage**

A system incorporating the products will convey the flow of rain water and minimise the risk of blockages or leaks. See section 8 of this Certificate.

**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: 1 *Description* (1.1 and 1.2).

**Additional Information**

**NHBC Standards 2017**

NHBC accepts the use of Ridgisewer 400 mm, 450 mm, 500 mm and 600 mm Fittings, provided they are installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 5.3 *Drainage below ground*.

**Technical Specification**

**1 Description**

1.1 Ridgisewer 400 mm, 450 mm, 500 mm and 600 mm Fittings comprise polypropylene bends, junctions, end caps and socket plugs, brown in colour, and rubber sealing rings made from ethylene propylene diene monomer (EPDM) to BS EN 681-1 : 1996, Type WC. The range of fittings covered by this Certificate is shown in Figure 1.

*Figure 1 Ridgisewer fittings (all measurements in mm)*

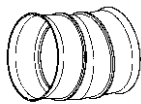
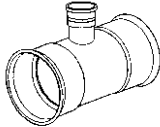
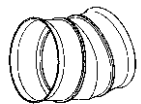
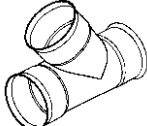
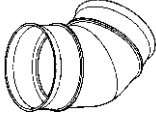
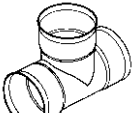

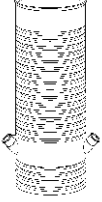
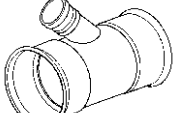
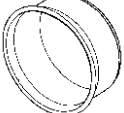
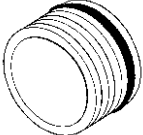

<p><b>Short radius bends</b> 11.25°</p>  <p>400 to 600</p>	<table border="1"> <thead> <tr> <th>Nominal size</th> </tr> </thead> <tbody> <tr> <td>400</td> </tr> <tr> <td>450</td> </tr> <tr> <td>500</td> </tr> <tr> <td>600</td> </tr> </tbody> </table>	Nominal size	400	450	500	600	<p><b>Unequal junctions 90°</b></p>  <p>400 to 600</p>	<table border="1"> <thead> <tr> <th colspan="2">Nominal size</th> </tr> </thead> <tbody> <tr> <td>400 x 110</td> <td>500 x 110</td> </tr> <tr> <td>400 x 160</td> <td>500 x 150</td> </tr> <tr> <td>400 x 150</td> <td>500 x 160</td> </tr> <tr> <td>450 x 110</td> <td>600 x 110</td> </tr> <tr> <td>450 x 150</td> <td>600 x 150</td> </tr> <tr> <td>450 x 160</td> <td>600 x 160</td> </tr> </tbody> </table>	Nominal size		400 x 110	500 x 110	400 x 160	500 x 150	400 x 150	500 x 160	450 x 110	600 x 110	450 x 150	600 x 150	450 x 160	600 x 160
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Figure 1 Ridgisewer fittings (all measurements in mm) (continued)

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1.2 The fittings shown in Table 1 are certified to WIS 4-35-01 : 2000 (Issue 2) and BS EN 13476 : 2007 under BSI Kitemark licence No KM 636505, issued to Charnwood Business Park, North Road, Loughborough, Leicestershire LE11 1LE.

Table 1 Kitemarked fittings to BS EN 13476-3 : 2007

Fitting	Product code			
	400 mm	450 mm	500 mm	600 mm
Plain ended pipe: 6 m (Class 8) 3 m (Class 8)	RSW400X6PE8 RSW400X3PE8	RSW450X6PE8 RSW450X3PE8	RSW500X6PE8 RSW500X3PE8	RSW600X6PE8 RSW600X3PE8
Socketed pipe: 6 m (Class 8) 3 m (Class 8)	RSW400X6IS8 RSW400X3IS8	RSW450X6IS8 RSW450X3IS8	RSW500X6IS8 RSW500X3IS8	RSW600X6IS4 RSW600X3IS8
Pipe couplers	RSWC4008	RSWC4508	RSWC5008	RSWC6008
Slip couplers	RSWSC4008	RSWSC4508	RSWSC5008	RSWSC6008
Rocker pipes	—	—	—	—
Stub pipe	—	—	—	—

## 2 Manufacture

2.1 The fittings are fabricated from Ridgisewer pipe, socketed pipe and couplers, which are cut to the appropriate length and angle, and welded together by extrusion welding to form the desired fitting. The sealing rings are injection-moulded from EPDM.

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 Polypipe Ltd t/a Polypipe Civils has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI (Certificate Q06225).

## 3 Delivery and site handling

3.1 Each fitting carries a label bearing the BBA logo incorporating the number of this Certificate and the angle of the bends and junctions.

3.2 Fittings must be handled with care.

3.3 When long-term storage is envisaged, the fittings must be protected from direct sunlight.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Ridgisewer 400 mm, 450 mm, 500 mm and 600 mm Fittings.

## Design Considerations

### 4 General

4.1 Ridgisewer 400 mm, 450 mm, 500 mm and 600 mm Fittings are satisfactory for use as sewerage systems designed in accordance with BS EN 752 : 2008 for the conveyance of surface water and domestic sewage. The products can be used in combined or separate systems, as is permitted to be discharged into public sewers by the Water Industry Act 1991, Chapter 50, and surface water and sewage as is permitted and defined by the Sewerage (Scotland) Act 1968 and the Water and Sewerage Services (Northern Ireland) Order 2006.

4.2 The fittings have not been assessed for use with untreated trade effluents and such use is outside the scope of this Certificate.

4.3 The products are suitable for use where pipe to WIS 4-35-01 : 2000 (Issue 2) and BS EN 13476 : 2007; and fittings to BS EN 1401-1 : 2009 are normally used, and can be used individually or in combination, as described in this Certificate.

## 5 Practicability of installation

The products are designed to be installed by a competent general builder, or a contractor, experienced in below-ground drainage work.

## 6 Strength



6.1 The fittings have adequate strength for use in situations when pipe to WIS 4-35-01 : 2000 (Issue 2) is suitable.

6.2 The nominal short-term stiffness is not less than  $8 \text{ kN}\cdot\text{m}^{-2}$ .

## 7 Performance of joints



7.1 The performance of joints, when correctly made, will not be adversely affected by thermal expansion or contraction.

7.2 Joints on the pipeline remain watertight under conditions of pipeline movement in excess of those expected to occur in normal good drainage practice.

## 8 Flow characteristics



8.1 The products will have the normal flow characteristics associated with polypropylene underground sewerage systems.

8.2 Full bore velocities are available from *Tables for the Hydraulic Design of Pipes, Sewers and Channels*, Volume 2, 8th Edition by H R Wallingford and D I H Barr. The values are based on the Colebrook-White equation.

## 9 Resistance to chemicals

9.1 The products have adequate resistance to the type and quantities of chemicals likely to be found in domestic sewage.

9.2 Details of the chemical resistance of polypropylene is given in CP 312-1 : 1973, and for EPDM rubber in PD/TR ISO 7620 : 2005.

## 10 Resistance to elevated temperatures

The products have adequate resistance to the temperatures likely to be found in domestic sewage.

## 11 Maintenance



11.1 Drains incorporating the products can be rodded easily using conventional flexible drain rods. Toothed root cutters, as used with some mechanical cleaning systems, could damage the fittings and should not be used.

11.2 The products have adequate resistance to water cleansing using pressure jetting equipment. It is recommended that low-pressure, high-volume systems are utilised in accordance with WIS 4-35-01 : 2000 (Issue 2).

## 12 Durability



No significant deterioration of the products will take place and installations will have a life in excess of 50 years.

## 13 Reuse and recyclability

The products contain polypropylene, which can be recycled.

## Installation

### 14 General

14.1 Underground drain and sewer systems incorporating the fittings must be installed in accordance with the *Ridgisewer Technical Brochure* and, when appropriate, BS EN 752 : 2008 and the Water UK/WRc plc document *Sewers for Adoption*, July 2001, 5th edition.

14.2 Precautions must be taken to protect the fittings from damage during construction.

### 15 Procedure — jointing

15.1 The pipe is cut midway between the corrugations, as shown in Figure 2a.

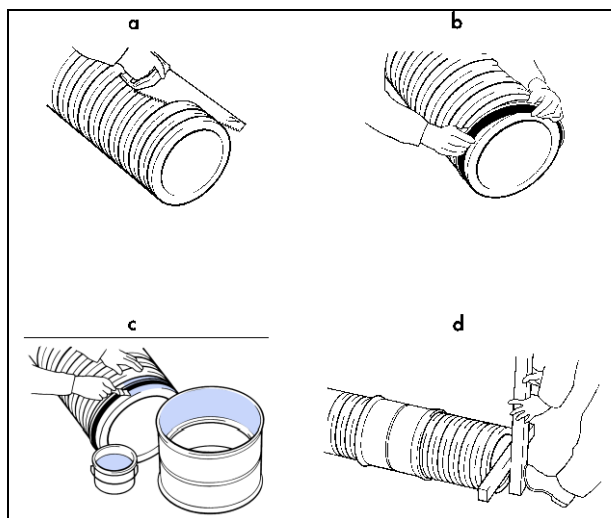
15.2 Swarf is removed from the pipe end; a chamfer is not required.

15.3 The pipe spigots and sockets are cleaned, and the sealing ring is checked to ensure that it is correctly seated (not twisted) between the first and second corrugations of the pipe end, as shown in Figure 2b.

15.4 The Certificate holder's lubricant is applied generously to the whole of the inside area of the socket and to the sealing ring, ensuring that it does not subsequently become contaminated with dirt, as shown in Figure 2c.

15.5 The pipe is offered to the socket, and is aligned and pushed fully home, as shown in Figure 2.

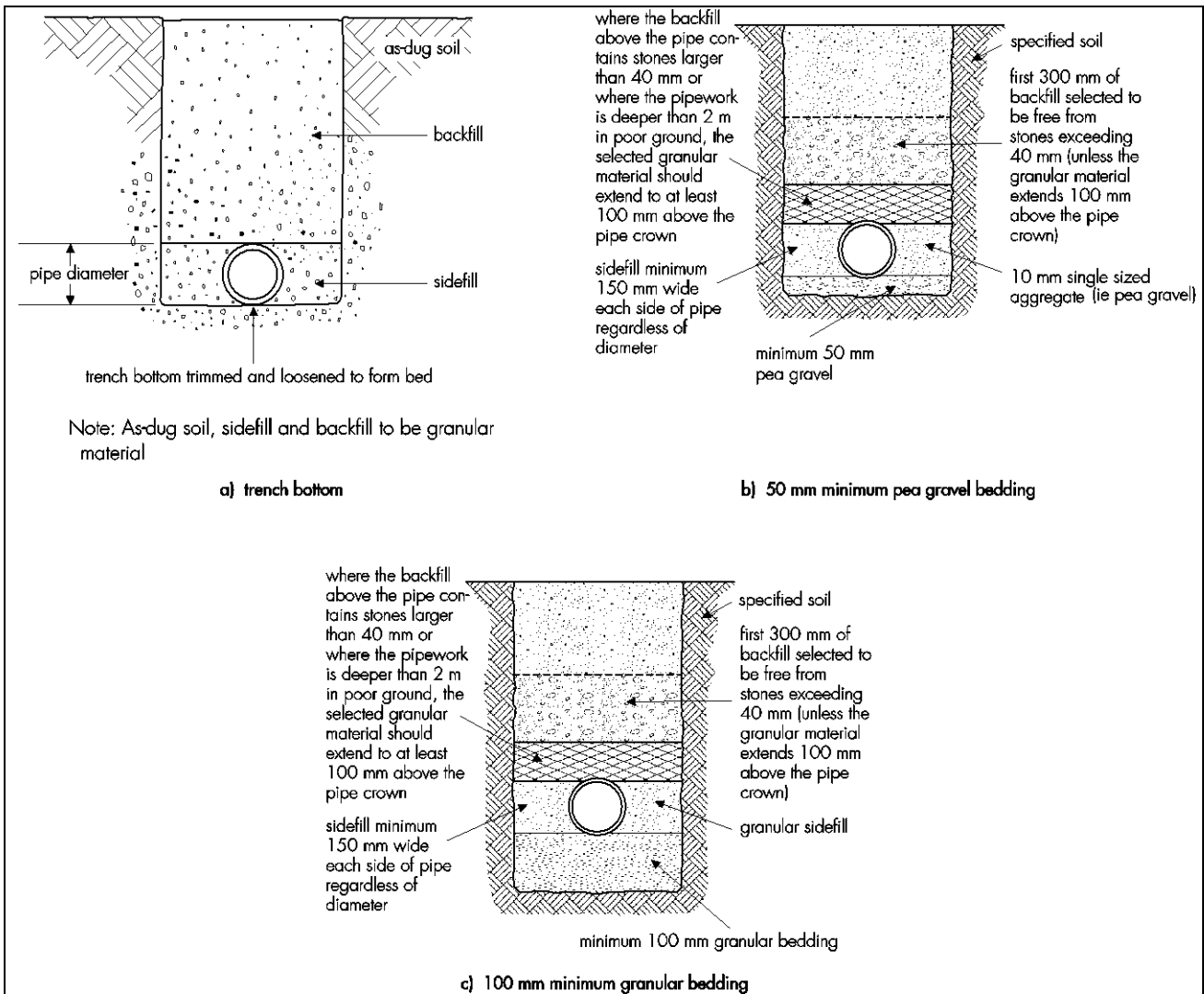
Figure 2 Joint details



15.6 Jointing to other materials must be carried out in accordance with the *Ridgisewer Design and Installation Guide*.

## 16 Procedure — pipe-laying (see Figure 3)

Figure 3 Pipe-laying specifications



### Pipe laying on trench bottom in granular material

16.1 Where the as-dug material is suitable<sup>(1)</sup> for use as bedding, the bottom of the trench may be trimmed to form the pipe bed.

(1) Suitable material is defined as granular material in accordance with the relevant Water UK IGN (4-08-01) and WIS (4-08-02).

16.2 Small depressions should be made to accommodate the pipe sockets or couplings. After the pipe has been laid, these should be carefully filled to ensure that no voids remain under, or around, the socket.

16.3 When the formation is prepared, the pipes should be laid upon it true to line and level within the specified tolerances. Each pipe should be checked, and any necessary adjustments to level made by raising or lowering the formation, ensuring that the pipes finally rest evenly on the adjusted formation throughout the length of the barrels. Adjustment should never be made by local packing.

16.4 Where the formation is low and does not provide continuous support, it should be brought up to the correct level by placing and compacting suitable material.



## Pipe laying on granular beds

16.5 When the as-dug material is not suitable for use as a bedding, a layer of suitable granular material (see section 16.1) must be spread evenly on the trimmed trench bottom before the pipes are installed. The trench should be excavated to allow for the thickness of granular bedding under the barrels.

16.6 The trench formation is prepared, the bedding placed and the pipes are laid.

16.7 Where the as-dug material can be hand trimmed by shovel and is not puddled when walked upon, a 50 mm depth of bedding material may be used. In this case the material must be a nominal 10 mm, single-sized aggregate with no sharp edges, ie pea gravel.

16.8 When the pipes are to be laid on rock, compacted sand or gravel requiring mechanical means of trimming, or in very soft or wet ground, the bedding should be a minimum of 100 mm.

## Sidefill

16.9 In all cases, the sidefill must be of the same specification as the bedding material, and extend to the level of the crown of the pipe and be placed and compacted.

## Backfill

16.10 Specifications for backfill above the level of the crown of the pipe are shown in Figure 3.

## Technical Investigations

### 17 Tests

Tests were carried out and the results assessed to determine:

- leaktightness whilst under angular deflection
- diametric distortion
- ring stiffness
- strength and flexibility of fabricated fittings
- ease of jointing
- dimensional accuracy.

### 18 Investigations

18.1 Existing data was assessed in relation to:

- impact resistance
- resistance to internal puncture
- resistance to internal pressure.

18.2 An assessment was made of data relating to:

- resistance to damage before installation
- resistance to damage from sharp aggregate
- practicability of installation
- chemical resistance
- design method
- flow capacities.

18.3 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 EN 681-1 : 1996 *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Vulcanized rubber*

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

BS EN 1401-1 : 2009 *Plastics piping systems for non-pressure underground drainage and sewerage — Unplasticized poly(vinyl chloride) (PVC-U) — Specifications for pipes, fittings and the system*

BS EN 13476-3 : 2007 + A1 : 2009 *Plastics piping systems for non-pressure underground drainage and sewerage. Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE). Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B*

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

PD/ TR ISO 7620 : 2005 *Rubber materials — Chemical resistance*

CP 312-1 : 1973 *Code of practice for plastics pipework (thermoplastics material) — General principles and choice of material*

IGN 4-08-01 February 1994 : Issue 4 (Amendment November 2008) *Water Industry Information and Guidance Note IGN 4-08-01 February 1994: Issue 4 — Bedding and sidefill materials for buried pipelines*

Water Industry Specification WIS 4-08-02 : 1994 (Issue 1) *Specification for bedding and sidefill materials for buried pipelines*

Water Industry Specification WIS 4-35-01 : 2000 (Issue 2) *Specification for thermoplastic structured wall pipes, joints and couplers with a smooth bore for gravity sewers for the size range 150 to 900 inclusive*

### 19 Conditions

19.1 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 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.

19.2 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.

19.3 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.

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

19.5 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.

19.6 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.