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Precast Concrete for the Building & Civil Engineering Industry:
Drainage
Shafts & Tunnels
Infrastructure & Power
Walling
Fencing
Railway
Agriculture
Room Solutions
Flooring
Specialist Products

Design Certificate

DN1800 Concrete Pipes with Flexible Seals

Pipes are designed, manufactured, inspected and tested in accordance with the conditions and requirements of:

BS5911-1:2002 + A2:2010 Specification for concrete pipes and fittings

Product Details

Nominal Diameter (DN)	*1800mm*
Barrel Diameter	*2140mm*
Internal Diameter	*1830mm*
Barrel wall thickness	*155mm*

Concrete

C50/60 using Cement Group CEM II B-V + SR (minimum 25% cement replacement with PFA to BS EN 450-1)

Reinforcement

Inner cage	*8mm helically wound at 45mm pitch*
Outer cage	*8mm helically wound at 77.5mm pitch*
Longitudinal bars	*24 No @ 7mm diameter*

The pipes are strength tested in accordance with Annex C of BS EN 1916, using the minimum crushing loads outlined in table 8 of BS5911-1; the reinforcement is designed to meet the test requirements prescribed.

Cover	*Nominal 30mm*

Note: The minimum concrete cover to reinforcement is 15mm in accordance with above standards.

Ultimate Limit State

Pipes are strength class 120. The strength class is defined in BS EN 1916 as the minimum crushing load in kN/m divided by the diameter of the pipe in mm BS5911-1. Minimum crushing load (Fn) + 216 kN/m

Serviceability Limit State

BS EN 1916:2002 Proof (crack) Load (Fc) = 0.67 x Fn with a permissible crack width no greater than 0.3mm when stabilised over a continuous length of 300mm.

Factor of Safety

Fn/Fc + 1.5 for reinforced concrete pipes in accordance with BS EN 1295-1, Structural Design of Buried Pipelines.

Certification

Kitemark Licences:	Ellistown, Leicestershire.	No. KM12033
	Alnwick, Northumberland.	No. KM06913
	Knockloughrim, Northern Ireland.	No. KM06893

Signed:

Name: Gareth Hughes
Position: Technical Manager

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Precast Concrete Manhole, Inspection Chambers and Cover Slabs –Data Sheet

Purpose: Enabling access to buried pipeline drain or sewer systems used for the conveyance of sewerage, rain water and surface water under low head of pressure.

Manufactured in Accordance with: BS EN 1917, BS5911-3 and BS 5911-4

Certification: CE marked and Kitemarked where appropriate and within the scope of the relevant Standard.

Strength Class:	Chamber Sections -	Class 15 to 30 governed by nominal size.
	Cover/ Reducing slab	DN900 – DN1200 - 1 x 120 kN load (BS EN 1917)
		DN1350 – DN1800 – 1 x 250 kN loads (BS5911-3)
		DN2100 – DN3000 – 2 x 250 kN loads (BS5911-3)
	Landing slab -	1 x 50kN load (BS5911-3)
	Corbel slab -	1 x 250kN load (BS5911-3)

Jointing materials: The manholes are manufactured to provide accurate joint profiles to be used in conjunction with a polymer modified bituminous jointing strip, described in BS EN1917 as a plastomeric sealant, to construct watertight manholes efficiently to the details prescribed in the following documents:
BS EN 752 Drains and Sewers Systems Outside Buildings.
BS EN 1610 Construction and Testing of Drains and Sewers.
Civil Engineering for the Water Industry.
The Building Regulations.
Specification for Highway Works
Sewers for Adoption.

Water/ cement ratio: Maximum 0.45.

Chloride content: Not exceeding 1.0% where unreinforced and 0.4% when reinforced by mass of cement.

Minimum cement content: 380Kg per cubic metre.

Water absorption of concrete: Not exceeding 6% by mass

Durability: In order to achieve the DC4 design chemical class the raw materials and manufacturing processes meet the design criteria prescribed in BRE Special Digest 1:2005 Concrete in aggressive ground; and are designed for both Surface and foul water applications. It is reasonable to expect a correctly designed, installed and maintained pipe line system to achieve a service life in excess of 100 years.

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Concrete strength class: No less than 40Mpa (N/mm2)

Water-tightness: Units with wall thickness of 125mm or less are routinely batch tested using a hydrostatic test pressure of 0.5 Bar for manholes, 0.3 Bar for inspection chambers and 0.15 Bar for house inspection chambers (Soakaway units excluded)

Manufacturing Tolerances: Internal diameter /length: +/- (3+0.005DN/LN)mm
Internal effective height: +/- 4% of nominal height

Concrete cover to reinforcement: Nominal 25mm for slabs and chamber rings, minimum of 20mm for slabs and 15mm minimum for other products.

Installed steps: Steps conform to BS EN 13101, routinely tested in accordance with BS EN 1916 for pull out and deflection under load.

Installed lifting anchorage: Routinely tested using the pull-out test requirements of BS5911-3.

Signed:

Name: Gareth Hughes
Position: Technical Manager

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FP MCCANN CONCRETE DRAINAGE SYSTEMS

PIPELINE DESIGN — STRUCTURAL DESIGN

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Depth of cover charts - Class 120 Pipes under main roads Fse = 1.25

DN	Bc	Bd	Cover Depth (m)
mm	mm	m	1.0 2.0 3.0 4.0 5.0 6.0 7.0
300	416	0.85	
		Wide	
375	505	1.05	
		Wide	
450	590	1.15	
		Wide	
525	685	1.20	
		Wide	
600	790	1.35	
		Wide	
675	901	1.45	
		Wide	
750	996	1.50	
		Wide	
825	975	1.60	
		Wide	
900	1080	1.90	
		Wide	
1050	1266	2.10	
		Wide	
1200	1460	2.30	
		Wide	
1350	1620	2.50	
		Wide	
1500	1800	2.70	
		Wide	
1800	2130	3.10	
		Wide	
2100	2460	3.40	
		Wide	
2400	2750	3.70	
		Wide	

DN = Nominal diameter Bc = External diameter Bd = Trench width

Class B Class S