

AUTHORISED ITEMS for SEWER SYSTEM

MAINTENANCE STRUCTURES

- **Maintenance Shafts**
- **Maintenance Holes**
(also called Access Chambers and Manholes)

***ALL MINOR ITEMS NOT COVERED IN DETAIL IN THIS CATALOGUE TO BE
IN ACCORDANCE TO APPROPRIATE AUSTRALIAN STANDARD.***

**Further information on products and materials is available on the WSAA web site
www.wsaa.asn.au**

AUTHORISED ITEMS for SEWER SYSTEM

Document Update Information

Date	Change Type	Page Number(s)	Details
1 Dec 2009	Revision 1	All All 2 3 4 5 9 12 14	Standards Unit details changed Minor wording corrections (not flagged) requirements changed New conversion slab system added Pre-cast MH bases added
June 2014	Revision 2	5 - 7	New M/S Manufacturer added
September 2014	Revision 3	18, 21 and 22	New M/H risers and base added

AUTHORISED ITEMS for SEWER SYSTEM

Maintenance Shafts

Non-physical entry - Maintenance Structures

Maintenance Shaft (MS) Information

Maintenance shafts (commonly expressed as MS) can be used as an alternative to Maintenance Holes. The enlarged base section has been shaped to allow access by water jet cleaners, root cutters and coloured closed circuit TV (CCCTV). The riser pipe is a nominal 225-300 mm diameter (depending on manufacturer).

These products are part of a Water Services Association of Australia (WSAA) Product Development initiative. All products have been reviewed under the WSAA Product Appraisal System.

The figures on the follow pages illustrate acceptable arrangements for installation of Maintenance Shaft assemblies.

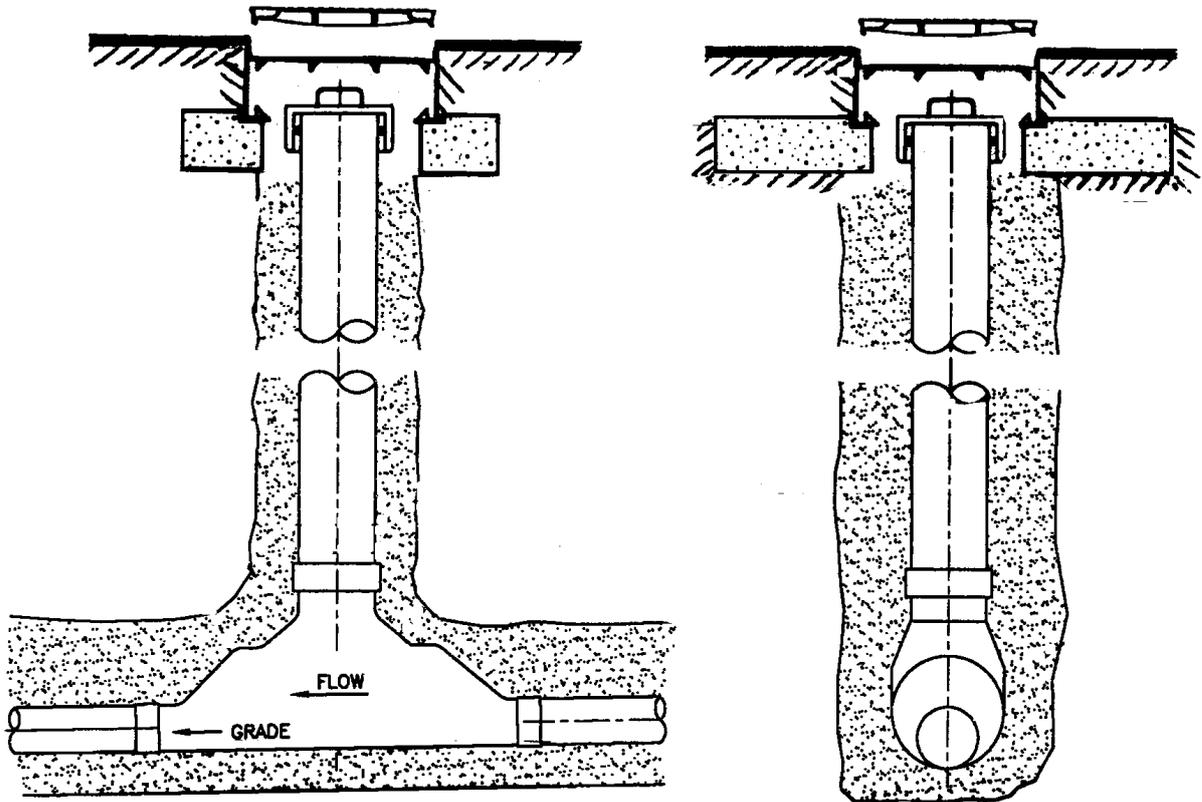
NOTE: Some suppliers may offer Package Assemblies, but items are listed separately to allow purchase of the most appropriate components.

Applicable Standards

WSAA Industry Standard for PVC - U MSs (WSA 100-2002)
AS/NZS 4999 - PVC - U Maintenance Shafts (2006)

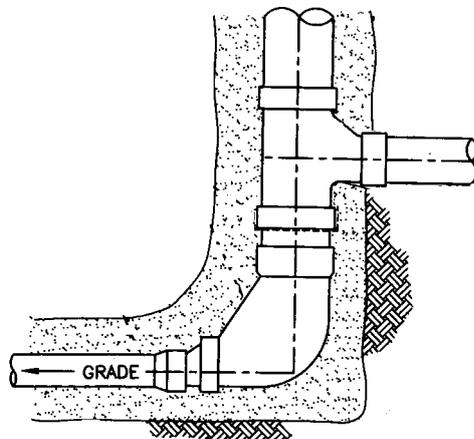
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AMROO MAINTENANCE SHAFT (MS)



ELEVATIONS

TERMINAL MAINTENANCE SHAFT (TMS)



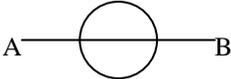
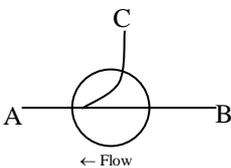
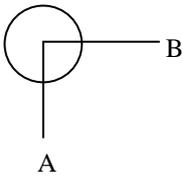
ELEVATION

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SA Water Product Description

Aymroo Maintenance Shafts

 Alternate Description
Shaft Junction

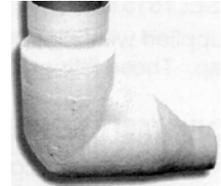

Item Symbol	Size	Aymroo	Wormald Poo-Pit <u>PE pipe connections</u> <u>only</u>
STRAIGHT			
A x B			
	150 mm x 150 mm	MSIL151500	
	225 mm x 225 mm	MSIL252500	★
	300 mm x 300 mm	MSIL303000	★
TEE			
A x B x C x Angle (°)			
	150 mm x 150 mm x 150 mm x 45°	MSJN11145	★
	225 mm x 225 mm x 150 mm x 45°	MSJN22245	★
	300 mm x 300 mm x 300 mm x 45°	MSJN33345	
	150 mm x 150 mm x 150 mm x 90°	MSJN11190	★
	225 mm x 225 mm x 150 mm x 90°	MSJN22290	★
	300 mm x 300 mm x 300 mm x 90°	MSJN33390	
BENDS			
A x B x Angle (°)			
	150mm x 150mm x 90°	MSBD151590	★
	225mm x 225mm x 90°	MSBD252590	★
	150mm x 150mm x 45°	MSBD 51545	★
	225mm x 225mm x 45°	MSBD252545	★
	150mm x 150mm x 30°	MSBD151530	★
	225mm x 225mm x 30°	MSBD252530	★
	150mm x 150mm x 22.5°	MSDB151522	★
	225mm x 225mm x 22.5°	MSBD252522	★
	150mm x 150mm x 15°	MSDB151515	★
	225mm x 225mm x 15°	MSBD252515	★

Note: May be moulded or fabricated fittings

AUTHORISED ITEMS for SEWER SYSTEM

SA Water Product Description

Terminal MS



Alternate Description

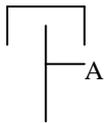
Symbol	Size	Aymroo
	A x Riser Dia	
	150	MSTE1590
	225	MSTE2590

SA Water Product Description

Riser Junction

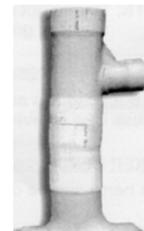


Alternate Description

Symbol	Size	Aymroo
	A x Riser Dia	
	150	MSRJ1590FF
	150	MSRJ1590MF

SA Water Product Description

Kicker Bend

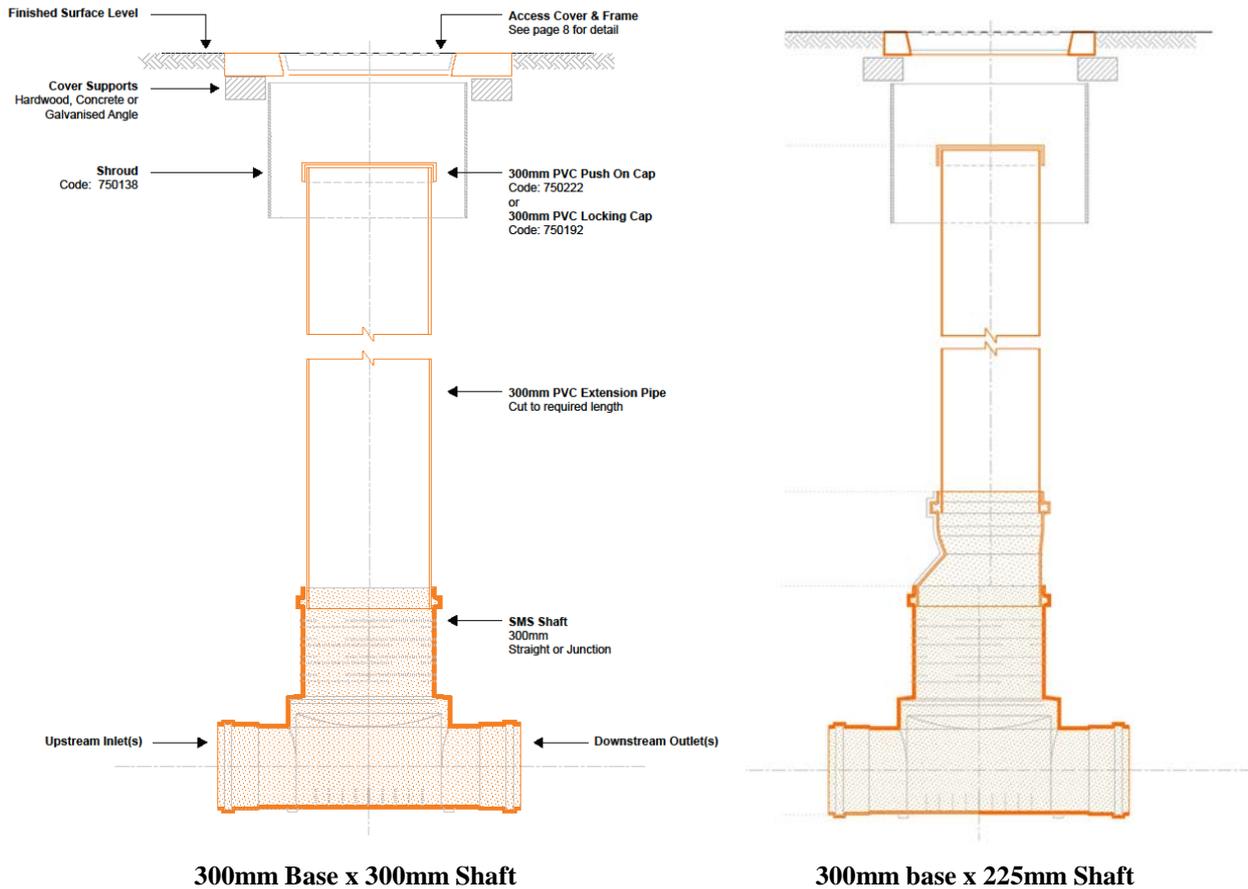


Alternate Description

Size	Aymroo
To suit Riser Dia x 3°	MSKB253

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SMS MAINTENANCE SHAFT (MS)



ELEVATIONS

TERMINAL MAINTENANCE SHAFT (TMS)



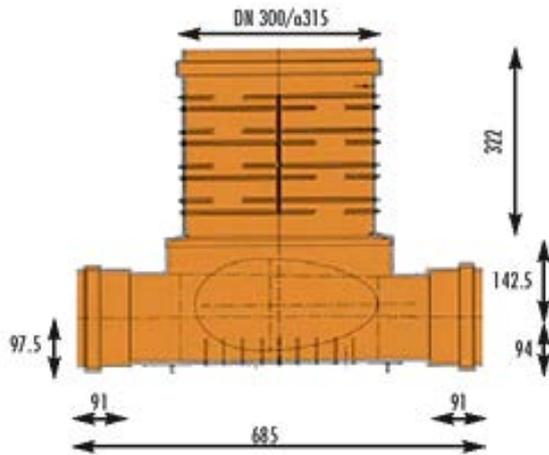
150mm x 225 mm

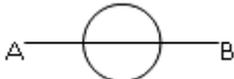
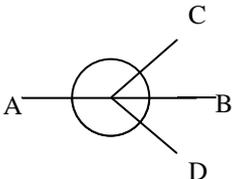
Note: Please be aware that there are other brands of maintenance shaft available, similar in appearance to the SMS Maintenance Shaft. These other brands are not approved for use on SA Water infrastructure.

AUTHORISED ITEMS for SEWER SYSTEM

SA Water Product Description
 (Available in PVC and PP)

SMS Maintenance Shafts (RRJ)
Max Depth 4m



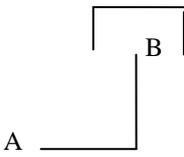
Item Symbol	Size	Reference
STRAIGHT	A x B	(Min depth required = 850mm)
	150mm x 150mm x 300mm Riser	MS8 (PP)
	225mm x 225mm x 300mm Riser	MS4 (PVC)
	225mm x 225mm x 225mm Reducer	MS3 (PVC)
	150mm x 150mm x 225mm Reducer	MS1 (PP)
JUNCTIONS	A x B x C x D (Angle = 45°)	MS9 (PP)
	150mm x 150mm x 150mm x 150mm (300mm Riser)	(300mm Riser - no reducer) Min depth required = 850mm
	A x B x C x D (Angle = 45°)	MS2 (PP)
	150mm x 150mm x 150mm x 150mm (225mm reducer)	(300mm Riser – 225mm reducer) Min depth required = 1000mm

AUTHORISED ITEMS for SEWER SYSTEM

SA Water Product Description

Terminal MS



Item Symbol	Size	Reference
	<p>A x B</p> <p>150mm x 225mm</p>	<p>MS5 (PVC)</p> <p>Min depth required = 850mm</p>

Bends



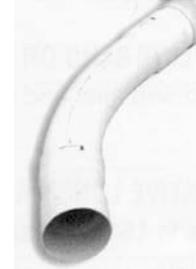
Item Symbol	Size	Reference
	225mm x 45°	B1
	225mm x 30°	B2
	225mm x 15°	B3

For angles $\leq 45^\circ$ a straight MS and variable bend may be used.

AUTHORISED ITEMS for SEWER SYSTEM

SA Water Product Description

Adjustable Bend



Alternate Description

Radius Pipe cut to suit bend required

Size	Radius (mm)	Aymroo
150	675	MSABS1545
150	3000	★

SA Water Product Description

Riser Shaft Cap



Alternate Description

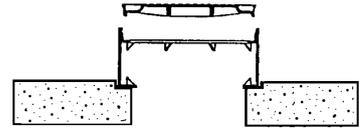
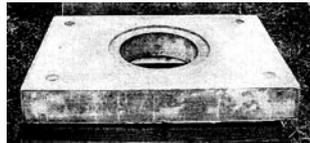
Size	Aymroo
DN225	MSAC225
DN300	★

AUTHORISED ITEMS for SEWER SYSTEM

MS Cover Arrangements

SA Water Product Description

Trafficable MS Cover System



Alternate Description

Class "D" MS Cover to AS 3996

Note: Purchased as a unit from Concrete Manufacturer

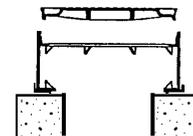
Item	SA Water Stock Number	Cooke Pre Cast (WASA)	Bianco Precast (BIA)	Webforge
Concrete Support Slab (1200 x 800 x 170 mm high)	5680-0050	★	400044	
Cover	5680-0407	★	400601	★
Frame (1/2 Height?)	5680-0230	★	400586	★

SA Water Product Description

Non-trafficable MS Cover System

Alternate Description

Easement Cover System



Note: Purchased as a unit from Concrete Manufacturer

Item	SA Water Stock Number	Cooke Pre Cast (WASA)	Bianco Precast (BIA)	Webforge
Concrete Support Ring 600ø x 140 mm thick	5680-0049	★	400223	
Cover	5680-0407	★	400601	★
Frame (1/2 Height)	5680-0230	★	400586	★

AUTHORISED ITEMS for SEWER SYSTEM

Maintenance Holes

Man-entry Maintenance Structures

Previously called

- **Manholes**
- **Access Chambers**

Maintenance Hole Information

All authorised components listed for the construction of Precast Concrete Maintenance Hole (PCMH) are in accordance with Corporation Standard Product Specifications, which cover the manufacturing and performance requirements to ensure long life and performance. SA Water has a requirement that the fine and course aggregate used in pre-cast MH component construction is Calcareous Aggregate (marble) in accordance with TS 3c. This provides long term protection against the breakdown of the concrete when exposed to Hydrogen Sulphide (H₂S) and Sulphuric Acid (H₂SO₄).

The figure on page 9 illustrates a Precast Concrete Maintenance Hole and gives the typical names of the components.

NOTE : Some suppliers may offer Package Precast Concrete Maintenance Hole, but items are listed separately to allow the purchase of the most appropriate components.

Cast Iron Products Information

Only Authorised cast iron components of Maintenance Holes to be used. The main objective being interchangeability and adequate performance and life.

AUTHORISED ITEMS for SEWER SYSTEM

Concrete Products Information

Manufacturing and Testing requirements for the Cover Slab and Conversion Slab is covered by AS 4198.

Where a Control Maintenance Hole is to be used in conjunction with a Sewer Pumping station the cover slab shall be manufactured in accordance with SA Water Drawing 95 - 0435. This Cover Slab may be Precast or poured in-situ.

Height Adjusting Rings are manufactured to specific Standard Specifications. The main objectives being interchangeability, adequate performance and long life.

All concrete products are to be manufactured using calcareous aggregate.

Applicable Australian Standards

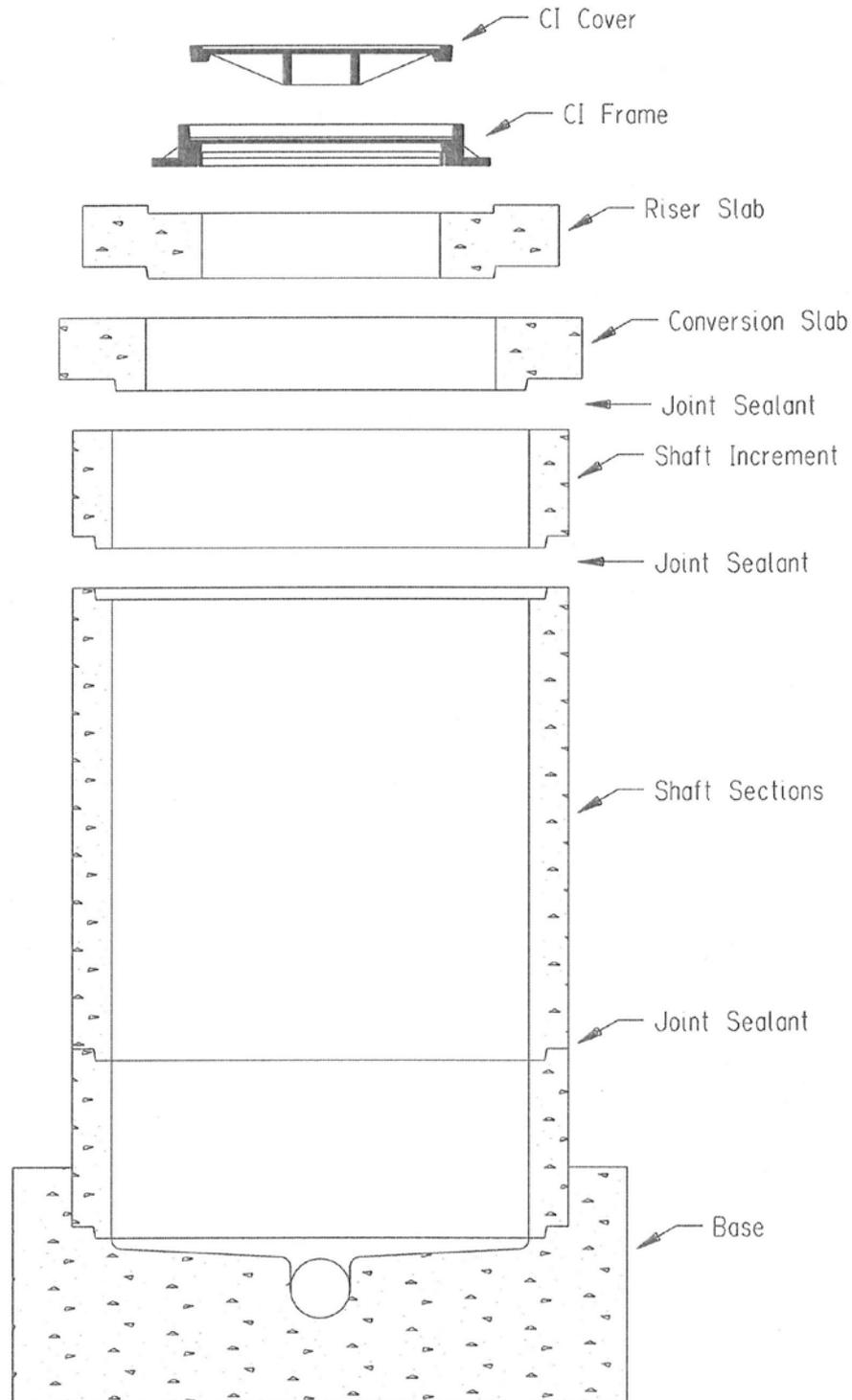
AS 4198 - Precast Concretes for Sewerage Works

Applicable Corporation Standard Specifications

SAW3003 - Height Adjusting Rings

TS 3 (c) - Fine and Coarse Calcareous aggregate (Marble) for concrete in sewerage structures.

AUTHORISED ITEMS for SEWER SYSTEM



**Typical Precast Maintenance Hole
 DN 900 / 1050 / 1200**

AUTHORISED ITEMS for SEWER SYSTEM

CAST IRON PRODUCTS

SA Water Product Description

***Maintenance Hole Cover & Frame
Light Duty***



CLASS B – NON-TRAFFICABLE USE

Note : These items are manufactured for DN 900, DN1050 & DN1200 Maintenance Hole systems
 They are for use in off-road and have a clear internal opening of 600mm.

Item	SA Water Stock Number	Cooke Pre Cast (WASA & Havestock)	Bianco Precast (BIA)	Webforge
Cover		★		
Frame		★		
Cover and Frame Assy		★	400042	★

SA Water Product Description

***Maintenance Hole Cover & Frame
Heavy Duty***



CLASS D – TRAFFICABLE USE

Note : These items are manufactured for DN1050 & DN1200 Maintenance Hole systems
 and have a clear internal opening of 600mm.

Item	SA Water Stock Number	Cooke Pre Cast (WASA & Havestock)	Bianco Precast (BIA)	Webforge
Cover		★		
Frame		★		
Cover and Frame Assy		★	400040	★

AUTHORISED ITEMS for SEWER SYSTEM

SA Water Product Description

Maintenance Hole Raiser Rings

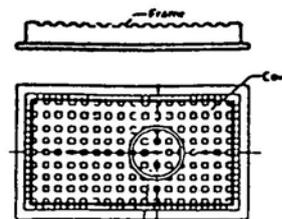


Note : These items are designed to fit both Class B & D Maintenance Hole frames and have a clear internal opening of 600mm.

Raiser Height	SA Water Stock Number	Cooke Pre Cast (WASA & Havestock)	Bianco Precast (BIA)	Havestock
50 Provided as part of Class D Frame		★		★
75 (25 mm height increase)		★	400037	★
90 (40 mm height increase)		★	400038	★
105 (55 mm height increase)		★	400039	★

SA Water Product Description

Special Covers and Frames
No. 5 Access Cover
(Cast Iron)



For Control Maintenance hole (DN 1500) only

No. 5 Cover and Frame

Description & Application	Stock Number	Bianco Precast
No 5 Cover - Control MH	5680 - 0033	400598
No 5 Frame - Control MH	5680 - 0037	400599
No 5 Insert lid - Control MH	5680 - 0039	400600

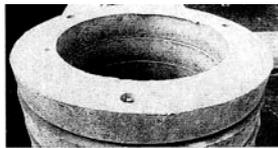
AUTHORISED ITEMS for SEWER SYSTEM

CONCRETE PRODUCTS

DN 900, DN 1050 & DN 1200 Maintenance Holes

SA Water Product Description

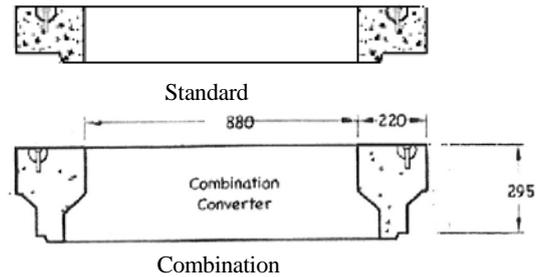
Conversion Slab



DN 1050



DN1200



Amdt
Jun09

MH size	Stock Number	Bianco PCP	Cooke Pre-Cast	
			Standard	Combination
DN 900	-	To Suit	To Suit	
DN 1050	5680 - 0225	400192	★	★
DN 1200	5680 - 0224	400191	★	

SA Water Product Description

Cover Slab

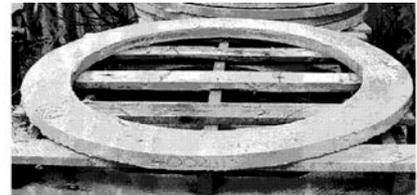


To Suit MH size	Stock Number	Size (OD mm)	Bianco PCP	Cooke Pre-Cast
DN 1050		900	400192	★
DN 1200		750	400191	★

AUTHORISED ITEMS for SEWER SYSTEM

SA Water Product Description

***Height Adjusting Rings
to Suit DN 1050 MH***

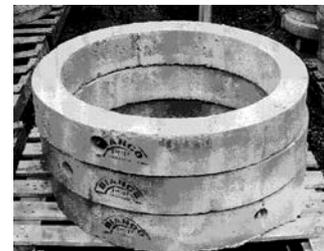


Note : For use with DN 1050 MH (900 OD Cover Slab)

Stock Number	Thickness	Bianco PCP	Cooke Pre-Cast
5680 - 0154	38 - 40mm	400211	★
5680 - 0153	75mm	400210	★

SA Water Product Description

***Height Adjusting Rings
to Suit DN 1200 MH***



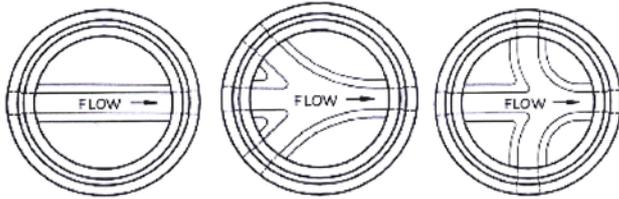
Note : For use with DN 1200 MH (750 OD Cover Slab)

Stock Number	Thickness	Bianco PCP
5680 - 0096	25mm	400209
5680 - 0095	38mm	400208
5680 - 0094	50mm	400207
5680 - 0093	75mm	400206
5680 - 0092	100mm	400209
5680 - 0091	150mm	400209

AUTHORISED ITEMS for SEWER SYSTEM

SA Water Product Description

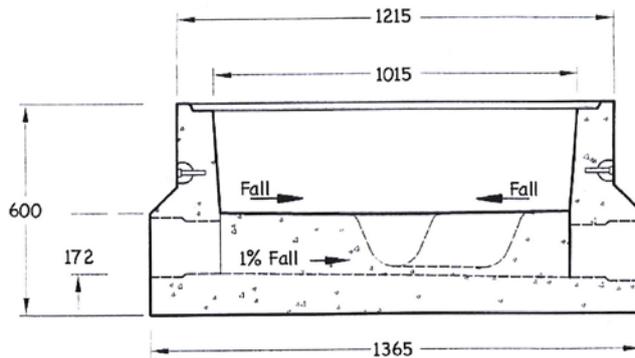
***DN 1050 Pre-cast MH Base
(Pre - benched)***



Straight

4 Way x 45°

4 Way x 90°



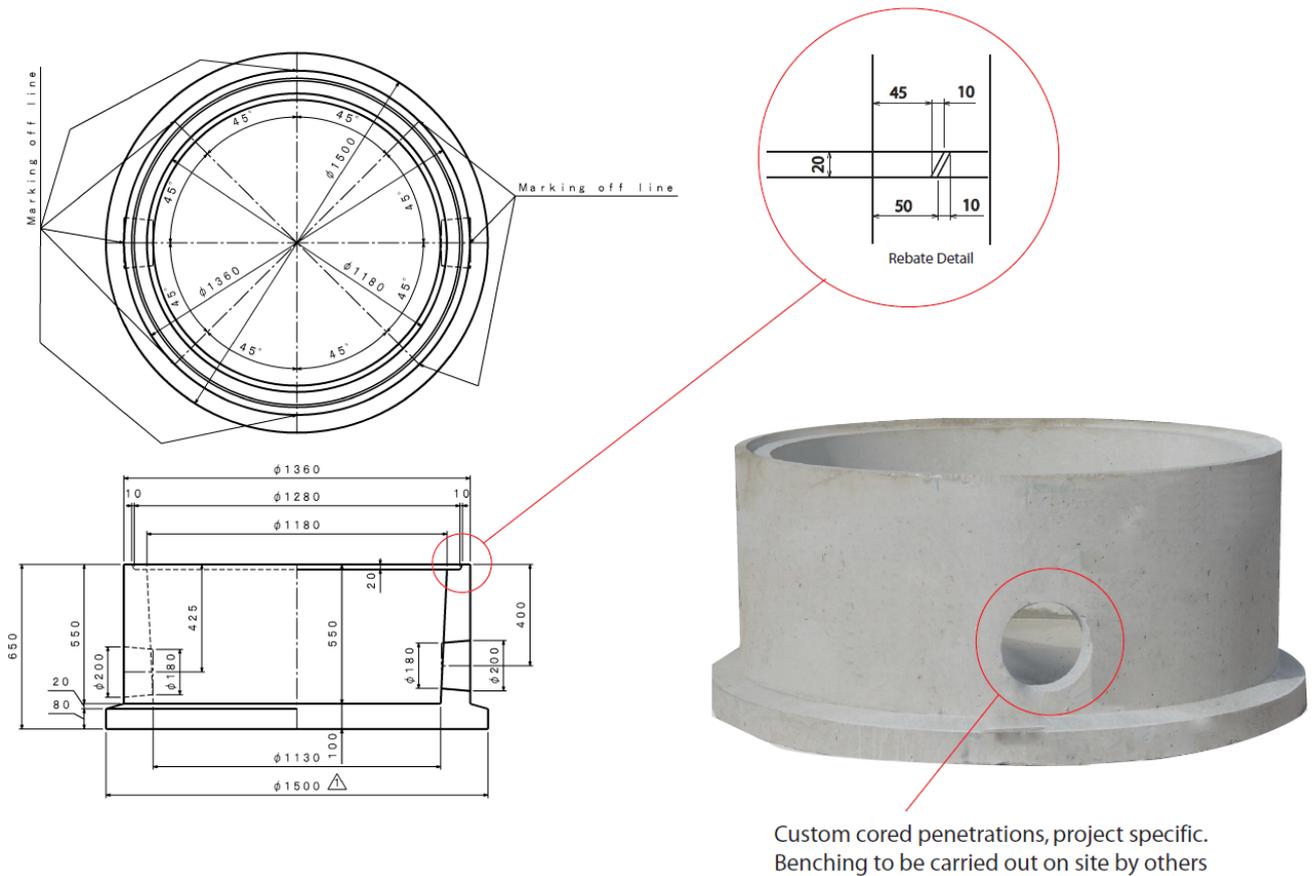
Amdt
Jun09

Base Configuration	Stock Number	Cooke Pre-Cast	Rocla
Straight	-	★	★
4 Way x 45°	-	★	★
4 Way x 90°	-	★	★

AUTHORISED ITEMS for SEWER SYSTEM

SA Water Product Description

***DN 1180 Pre-cast MH Base
 to Suit DN 1200 MH
 (PRC - Calcareous Concrete, Not pre - benched)***



Sizes	Cooke Precast Concrete (CPC)
DN 1180	★

AUTHORISED ITEMS for SEWER SYSTEM

Control Maintenance Hole

SA Water Product Description

Conversion Slab & Cover



Note : Designed specifically for use on DN 1500 Control Maintenance Holes

Item	Stock Number	Bianco PCP	Cooke Pre-Cast
Conversion Slab	SAWSPS	400197	★
No 5 Meter Box Cover and Frame		To be purchased separately	

AUTHORISED ITEMS for SEWER SYSTEM

Shaft Sections Information

The diameter of the shaft section is dependant on the application and is covered in the Sewer Construction Manual (Section L). The shaft sections shall be manufactured using Calcareous Aggregate in accordance with TS 3c.

The top shaft section of DN1050 Maintenance Hole system is precast to a minimum height of 300mm with a flat top to provide a suitable base for the conversion slab. No cutting of shaft sections shall be permitted. The overall required height of the system shall be achieved by using incremental shaft sections. Refer to the Sewer Construction Manual (Section L) for final adjustments and slopes.

The top Shaft Section of other sizes should be factory or diamond saw cut to the required height to provide a suitable base for the Conversion / Cover Slab.

Applicable SA Water Standards

TS 3c Fine and Coarse Calcareous aggregate (Marble) for concrete in sewerage structures.

Applicable Australian Standards

- AS1302 Steel reinforcing bars for concrete
- AS1303 Steel reinforcing wire for concrete
- AS1304 Welded wire reinforcing
- AS1379 The specification and manufacture of concrete
- AS2758.1 Aggregates and rock for engineering purposes
-Concrete Aggregates
- AS3600 Concrete structures
- AS3996 Metal access covers, road grates and frames
- AS3735 Concrete structures for retaining liquids
- AS3972 Portland and blended cements

AUTHORISED ITEMS for SEWER SYSTEM

Shaft Sections

SA Water Product Description

DN 900 Shaft Sections
 - Shallow Maintenance Holes Only

Segment Height	CSR Humes	Rocla
300mm	★	★
450mm	★	★
600mm	★	★

SA Water Product Description

DN 1050 Shaft Sections

Segment Height	CSR Humes	Rocla	Cooke Precast Concrete (CPC)
300mm	★	★	★
450mm	★	★	★
600mm	★	★	★
750mm			★
900mm	★	★	★
1050mm			★
1200mm	★	★	★

AUTHORISED ITEMS for SEWER SYSTEM

SA Water Product Description

DN 1200 Shaft Sections

Segment Height	CSR Humes	Rocla	Cooke Precast Concrete (CPC)
300mm	★	★	★
450mm	★	★	★
600mm	★	★	★
750mm			★
900mm	★	★	★
1050mm	★	★	★
1200mm			★
1220mm	★	★	
1350mm	★	★	

SA Water Product Description

DN 1500 Shaft Sections

- Generally used for Control Maintenance Holes

Segment Height	CSR Humes	Rocla
300mm	★	★
450mm	★	★
600mm	★	★
750mm	★	★
900mm	★	★
1050mm	★	★
1220mm	★	★
1350mm	★	★

AUTHORISED ITEMS for SEWER SYSTEM

Joint Sealing Compounds Information

Joint sealing compound usually is supplied by the shaft manufacturer with the shaft sections. The sealing compounds supplied has been assessed as the most suitable for their product and shall be used in all joints. In high ground water conditions special purpose sealant must be used.

Additional sealing coatings for sealing leaks are available, but these vary in type and formulation. These should be assessed individually to suit the application.

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Maintenance Hole

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