

**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](http://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	Standards Unit details changed
		All	Minor wording corrections (not flagged)
		2	
		3	
		4	requirements changed
		5	
		9	
		12	New conversion slab system added
		14	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.

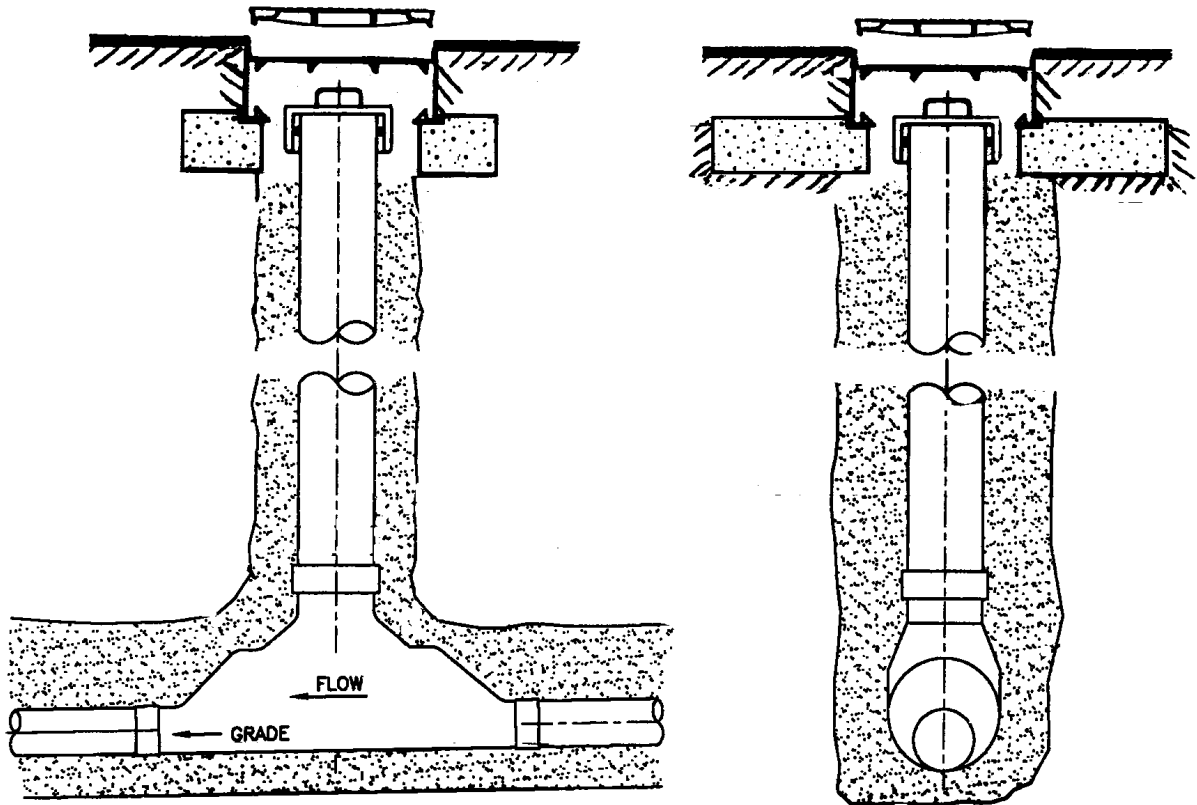
NOTE: Some suppliers may offer Package Assemblies, but items are listed separately to allow purchase of the most appropriate components.

### ***Applicable Standards***

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

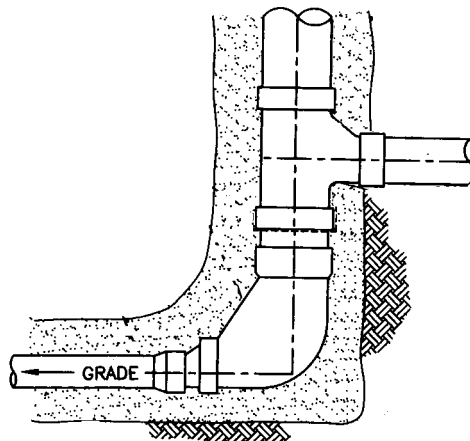
## AUTHORISED ITEMS for SEWER SYSTEM

### AMROO MAINTENANCE SHAFT (MS)



ELEVATIONS

### TERMINAL MAINTENANCE SHAFT (TMS)



ELEVATION

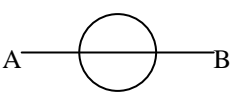
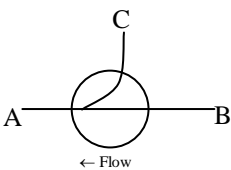
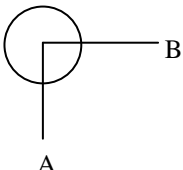
## AUTHORISED ITEMS for SEWER SYSTEM

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>
<b>STRAIGHT</b>			
	<b>A x B</b>		
	150 mm x 150 mm	MSIL151500	
	225 mm x 225 mm	MSIL252500	★
	300 mm x 300 mm	MSIL303000	★
<b>TEE</b>			
	<b>A x B x C x Angle ( ° )</b>		
	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	
<b>BENDS</b>			
	<b>A x B x Angle ( ° )</b>		
	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	★

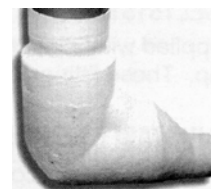
Note: May be moulded or fabricated fittings

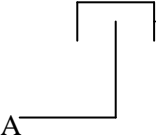
## AUTHORISED ITEMS for SEWER SYSTEM

SA Water Product Description

### *Terminal MS*

Alternate Description



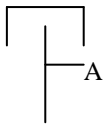
Symbol	Size	Aymroo
	<b>A x Riser Dia</b>	
	150	MSTE1590
	225	MSTE2590

SA Water Product Description

### *Riser Junction*

Alternate Description

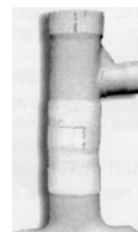


Symbol	Size	Aymroo
	<b>A x Riser Dia</b>	
	150	MSRJ1590FF
	150	MSRJ1590MF

SA Water Product Description

### *Kicker Bend*

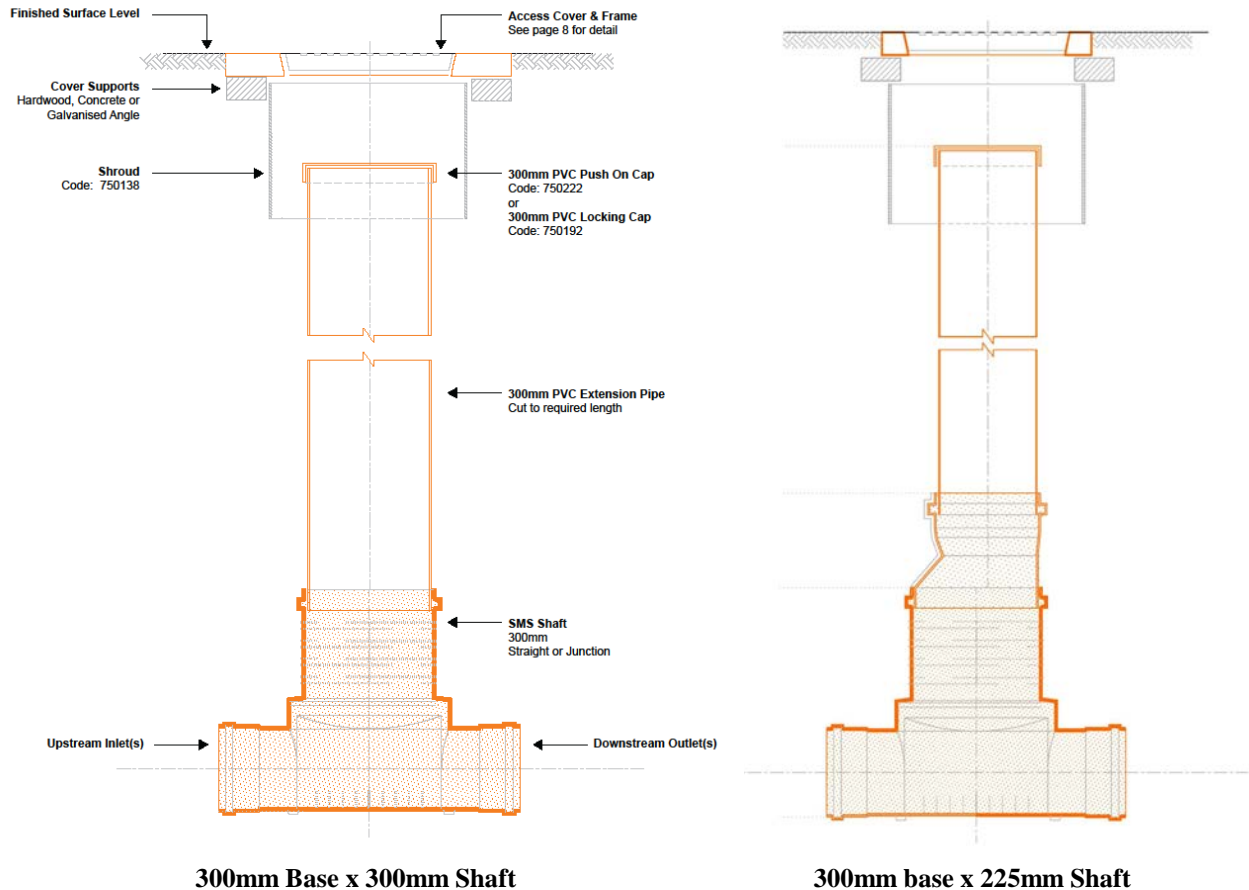
Alternate Description



Size	Aymroo
To suit Riser Dia x 3°	MSKB253

## AUTHORISED ITEMS for SEWER SYSTEM

### SMS MAINTENANCE SHAFT (MS)



### ELEVATIONS

### TERMINAL MAINTENANCE SHAFT (TMS)



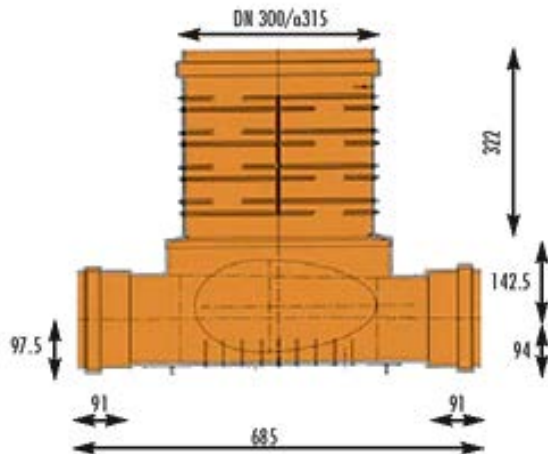
**150mm x 225 mm**

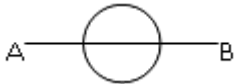
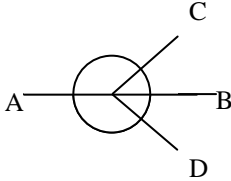
Note: Please be aware that there are other brands of maintenance shaft available, similar in appearance to the SMS Maintenance Shaft. These other brands are not approved for use on SA Water infrastructure.

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

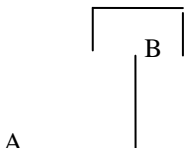


## AUTHORISED ITEMS for SEWER SYSTEM

SA Water Product Description

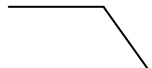
### *Terminal MS*



Item Symbol	Size	Reference
	<p style="text-align: center;"><b>A x B</b></p> <p style="text-align: center;">150mm x 225mm</p>	<p style="text-align: center;"><b>MS5 (PVC)</b></p> <p style="text-align: center;">Min depth required = 850mm</p>

### *Bends*



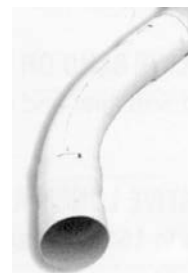
Item Symbol	Size	Reference
	225mm x 45°	<b>B1</b>
	225mm x 30°	<b>B2</b>
	225mm x 15°	<b>B3</b>

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

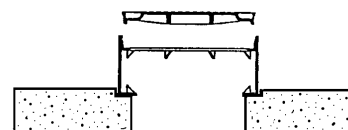
Size	Aymroo
DN225	MSAC225
DN300	★

**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

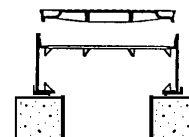
Item	SA Water Stock Number	Cooke Pre Cast (WASA)	Bianco Precast (BIA)	Webforge
Concrete Support Slab (1200 x 800 x 170 mm high)	5680-0050	★	400044	
Cover	5680-0407	★	400601	★
Frame (1/2 Height?)	5680-0230	★	400586	★

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 coarse 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 (H<sub>2</sub>S) and Sulphuric Acid (H<sub>2</sub>SO<sub>4</sub>).

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***

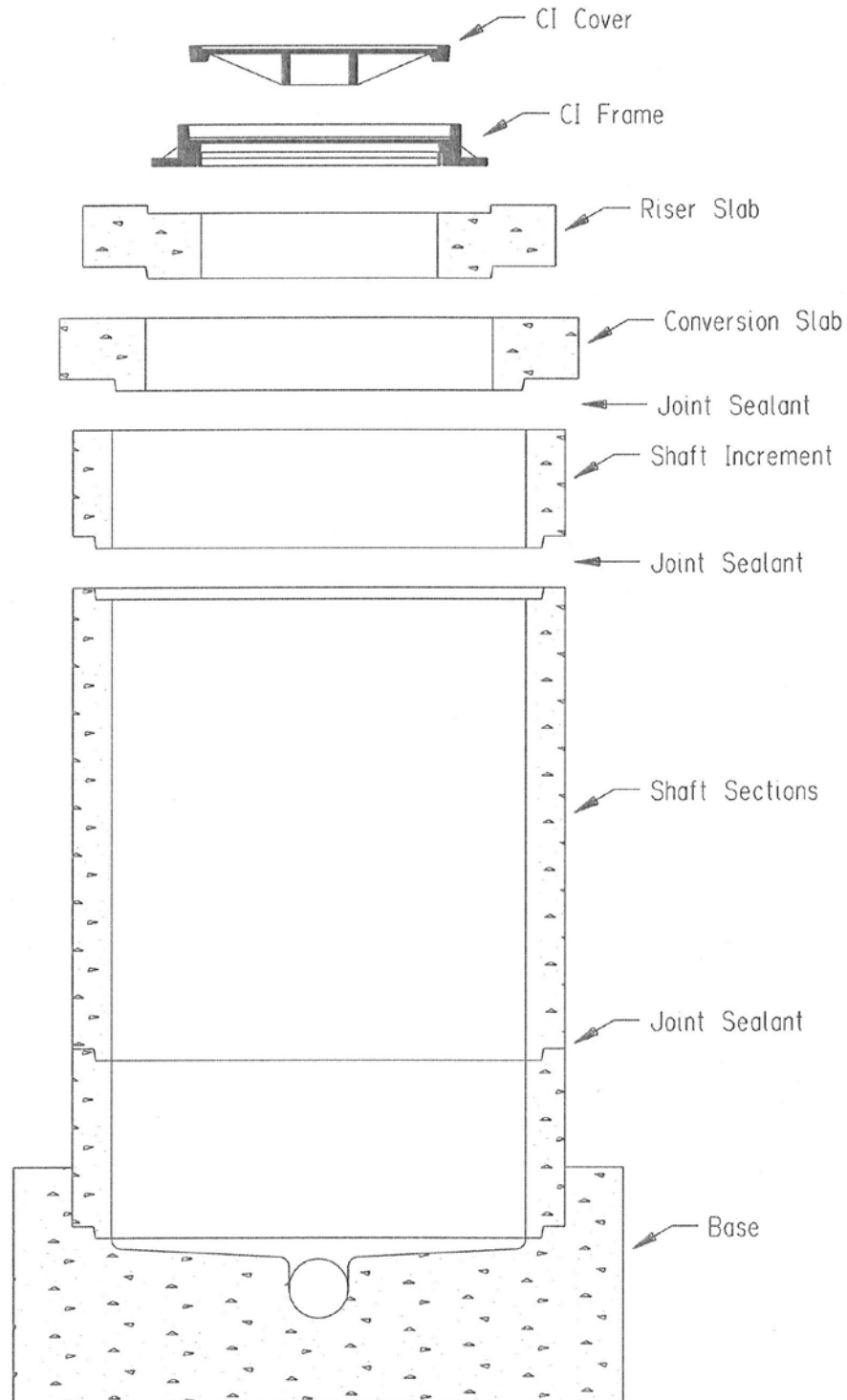
AS 4198 - Precast Concretes for Sewerage Works

### ***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*

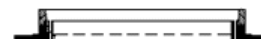

**CLASS B – NON-TRAFFICABLE USE**


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**


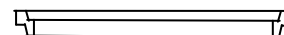
Note : These items are manufactured for DN1050 & DN1200 Maintenance Hole systems  
and have a clear internal opening of 600mm.

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*

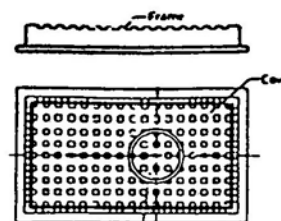


Note : These items are designed to fit both Class B & D Maintenance Hole frames and have a clear internal opening of 600mm.

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

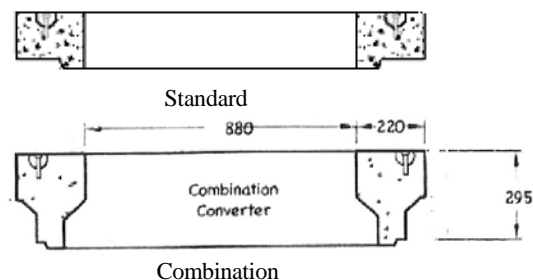
### Conversion Slab



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

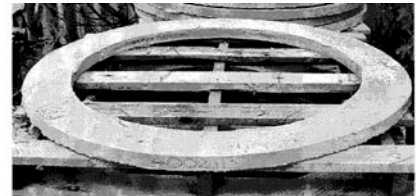
### Cover Slab



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**

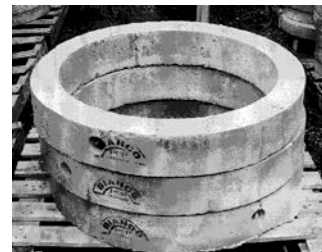
SA Water Product Description

***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

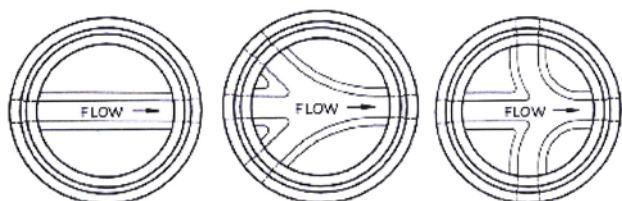
***Height Adjusting Rings  
to Suit DN 1200 MH***


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**

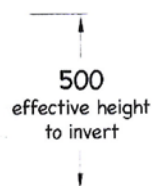
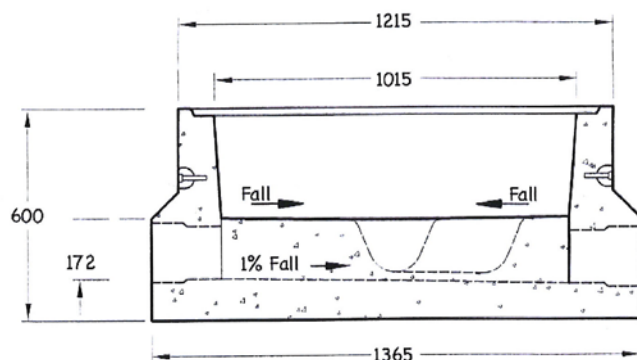
## SA Water Product Description

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


Straight

4 Way x 45°

4 Way x 90°

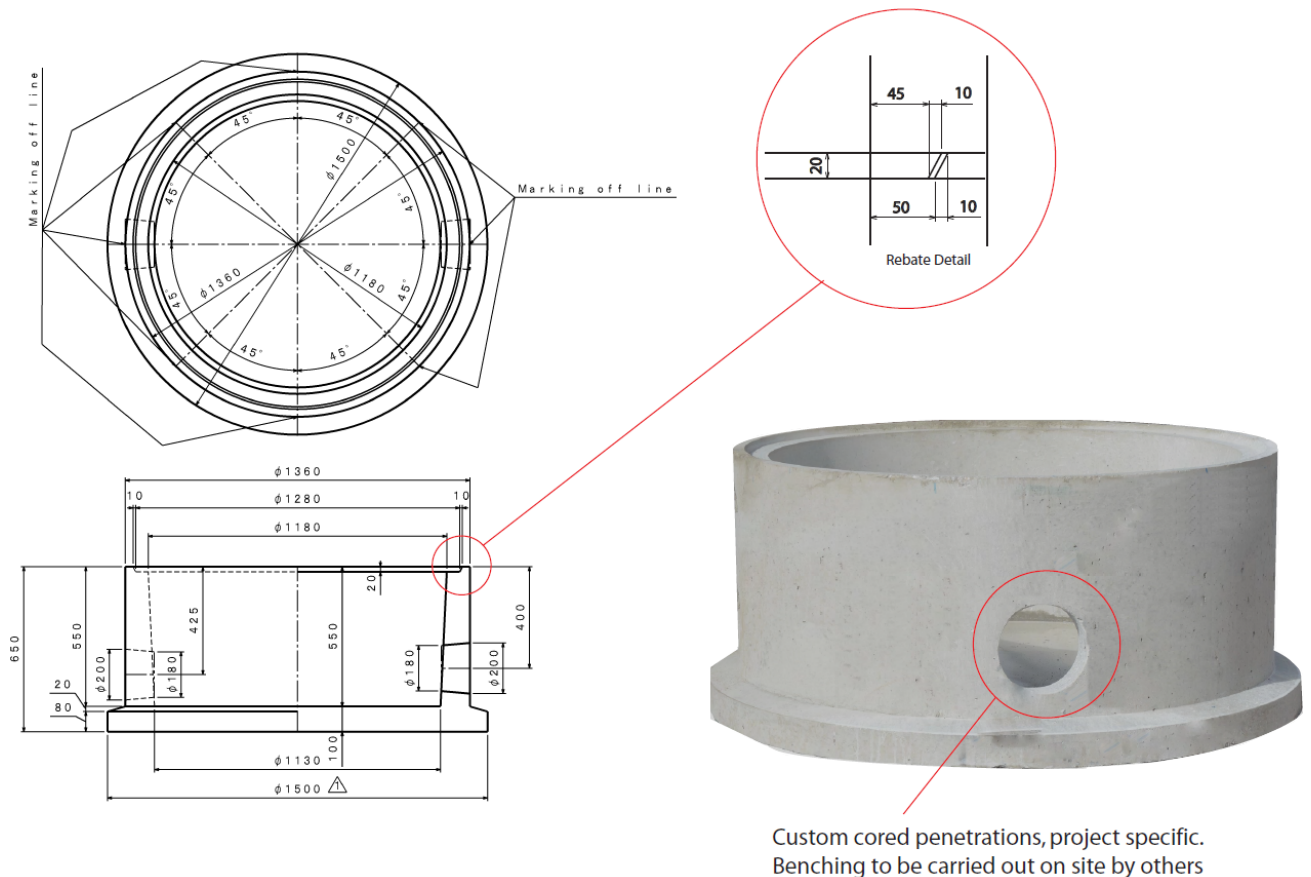

Amdt  
Jun09

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

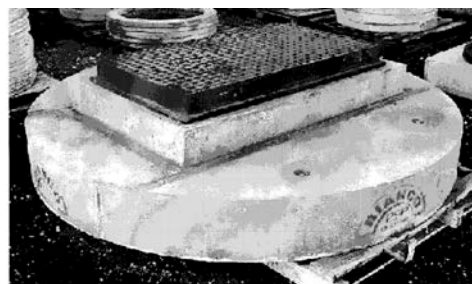


## AUTHORISED ITEMS for SEWER SYSTEM

### *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.

## AUTHORISED ITEMS for SEWER SYSTEM

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