



WATER SERVICES ASSOCIATION  
*of Australia*

**ACO POLYCRETE PTY. LTD**  
**PRODUCT APPRAISAL 03/01**  
**CLASS 'B' & 'D'**  
**DN 600**  
**ACCESS COVERS & FRAMES**  
**(REPLACES & EXTENDS PA 01/14)**

**Issue 3**

**29 January 2004**

This report consists of cover pages, 8 pages of report, a disclaimer and 4 Appendices.

## Note 1

This appraisal applies to the product(s) as submitted. Any changes to the product(s) either minor or major shall void this appraisal. To maintain the recommendations of this appraisal any such changes shall be detailed and notified to the National Codes Manager for consideration and review of the appraisal report and appropriate action. Appraisals and their recommendations will be the subject of continuous review dependent upon the satisfactory performance of products. WSAA reserves the right to undertake random audits of product manufacture and installation. Where products fail to maintain appraised performance requirements the appraisal and its recommendations may be modified and reissued. Appraisal reports will be reviewed and reissued at regular intervals not exceeding five (5) years.

## Note 2 Disclaimer

**The Disclaimer on page 12 explains a number of very important limits on your ability to rely on the information in this Product Appraisal Report.**

**Please read it carefully and take it into account when considering the contents of this Product Appraisal Report.**

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## 1 EXECUTIVE SUMMARY

Issue 3 of this report has included updated ISO 9001 Certificates for both ACO Polycrete and the Chinese foundry. Corresponding changes have been made to Section 6.1 'Compliance with Quality Requirements' and Section 14, Future Work has now been deleted. The name of the Chinese foundry has been changed from 'Weifang Yucai School of Foundry' to 'Weifang Deren Yucai Casting Co. Ltd'. The StandardsMark certificate remains under the old name.

ACO Polycrete Pty Ltd (ACO) supplies DN 600 Class 'B' & 'D' ductile iron access covers and cast iron frames under the brand name "RhinoCast". The covers and frames are manufactured in China by Weifang Deren Yucai Casting Co. Ltd (Weifang YuCai School of Foundry) under a StandardsMark licence to AS 3996 - Metal access covers, road grates and frames.

ACO has acquired D. J. Muller Enterprises Pty. Ltd and the Class 'B' access cover and frame appraised and reported in PA 01/14 has been redesigned and added to the ACO product range.

The ACO DN 600 covers have a 25 mm square pattern raised by 3 mm. The Class 'B' cover weighs 30 kg and the Class 'D' cover weighs 44 kg, both well within the requirements of WSA 104.

ACO covers have two keyholes conforming AS 3996 to accept the industry standard key lifter and a bridged cleaning opening at one end. Standard covers are available with 2 X M 12mm hexagon head Grade 304 stainless steel bolts. Plastic bolthole and keyhole covers are supplied with all access covers. The covers have a locating mark on the cover and frame for visual orientation.

Issue No. 2 of this report has extended the Scope to include optional frames with a 615 mm clear opening and 8 equi-spaced bolt down lugs with 15 mm bolt holes. Issue No. 1 of the report included only plain frames with a 604 mm clear opening and no bolt down facility.

The ACO DN 600 Class 'B' and 'D' access covers and frames meet the requirements of WSA-104 and are recommended as 'fit for purpose'.

### 1.1 RECOMMENDATION

It is **recommended** that WSAA members and associates accept/authorise the ACO Polycrete DN 600 Class B and Class D ductile iron access covers and cast iron frames, which should be installed in accordance with the requirements outlined in WSAA Codes, as adopted by individual Water Agencies.

## 2 THE COMPANY

The product supplier, ACO Polycrete Pty Ltd (ACO) is part of the ACO Group established in 1946 and has manufactured products for the construction industry for over 50 years. The ACO Group operates on a global basis through its subsidiaries and manufacturing facilities in over 25 countries in 3 continents.

ACO manufacture products from ductile iron, polymer concrete and other corrosion resistant materials. ACO employs more than 3,200 people and has sales in excess of \$A800 million.

ACO has acquired D. J. Muller Enterprises Pty. Ltd and the Class 'B' access cover and frame appraised as PA 01/14 has been redesigned and added to the ACO product range.

The manufacturer, Weifang Deren Yucai Casting Co. Ltd (Weifang Yucai School of Foundry) was founded in 1995 and specialises in manufacturing and exporting grey cast iron and ductile iron.

The foundry has a working area of 13,000 square metres and has the capability of producing 8,000 tonnes of castings per year. The foundry is well equipped with more than 30 sets of cast iron-processing machinery complete with testing facilities and technical inspection equipment. Products manufactured from the foundry include access covers, road grates, hand wheels and seatings for road signs/lamps.

Weifang Deren Yucai Casting exports grey cast iron and ductile iron products to Australia, United States of America, South Korea, Germany and several other European countries, and employs more than 100 people with sales in excess of \$US 2 million.

## 3 THE PRODUCT

ACO produce DN 600 Class 'B' & 'D' ductile iron access covers and cast iron frames under the brand name "Rhinocast". The covers and frames are manufactured in China by Weifang Deren Yucai Casting Co. Ltd at 981 Yuanfei Road, Kuiwen District, Weifang, Shandong Province, P.R. China (ZIP: 261041).

The DN 600 Class 'B' & 'D' ductile iron access covers and cast iron frames have StandardsMark certification to AS 3996. The cover and frame bearing areas are fully machined to ensure stability and fit between cover and frame. Marking includes the word 'SEWER' in raised letters 25 mm high cast into the upper surface. Standard covers are available with 2 X M 12mm hexagon head Grade 304 stainless steel bolts. Grade 316 stainless steel bolts are optional. For security applications F4 Barri bolts (zinc plated plain carbon steel) may be supplied.

Covers have a 25 mm square pattern raised by 3 mm and the Class 'B' cover weighs 30 kg and the Class 'D' cover weighs 44 kg both well within the requirements of WSA 104.

Covers have two keyholes conforming to AS 3996 with a bridged cleaning opening at one end. The keyhole will accept the industry standard key lifter. Plastic bolthole and keyhole covers are supplied with all access covers. The covers have a locating mark on the cover and frame for visual orientation.

ACO provide optional plain frames with a 604 mm clear opening and no bolt down facility or a frame with a 615 mm clear opening and 8 equi-spaced bolt down lugs with 15 mm bolt holes. The resultant four drawings are shown in Appendix 'A'

## 4 SCOPE OF THE APPRAISAL

The following products are included in this appraisal:

DESCRIPTION	Class	Model ID	Material
DN 600 Solid Top Access Cover & optional plain or bolt down Frame	B	M60B/SW	Cover -DI 600/3 Frame - CI T220
DN 600 Solid Top Access Cover & optional plain or bolt down Frame	D	600SD	Cover -DI 600/3 Frame - CI T220

## 5 APPRAISAL CRITERIA

### 5.1 QUALITY ASSURANCE REQUIREMENTS

The WSAA product appraisal network accepts certification by a Certification Body at the manufacturing site of strategic products and services to appropriate Australian or internationally recognised standards. The network also accepts certification by a Certification Body of manufacturing and supply quality systems to ISO 9001:2000. Certification Bodies should be accredited for the appropriate purpose by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) or by an equivalent international accreditation system that is recognised by JAS-ANZ.

### 5.2 PERFORMANCE REQUIREMENTS

The products have been appraised for compliance with WSA-104 Access Covers and Frames. To view or download a copy of WSA-104 visit the [WSAA website](#).

### 5.3 WSAA AGENCY NETWORK REQUESTS

The appraisal also considers the requests and comments of the WSAA agency network and individual observations of the appraiser.

## 6 COMPLIANCE WITH APPRAISAL CRITERIA

### 6.1 COMPLIANCE WITH QUALITY REQUIREMENTS

ACO Polycrete Pty Ltd is a Quality Endorsed Company registered by Quality Assurance Services (QAS) with Certificate No. QEC1883 for compliance with AS/NZS 9001:2000. The capability includes: 'for the manufacture of metal products for the building industry'. A new certificate was issued by SAI Global on 14 January 2004 and the expiry date is now 6 May 2006.

ACO has submitted copy of the SAI Global StandardsMark Licence and Schedule No.2646 dated 25 November 2002 issued to WeiFang YuCai School of Foundry in association with ACO Polycrete Pty. Ltd. for products manufactured to AS 3996 - Metal access covers, road grates and frames.

ACO has submitted an updated Certificate of Registration No. 0105023 from Moody International Certification for the Weifang Deren Yucai Casting Co. Ltd for compliance with ISO 9001:2000. The product area assessed being: "*Production and Sales of Casting Access Covers and Grates*". The Certificate is valid until 29 July 2006.

NOTE: ACO is required to ensure that registrations remain valid and any change of supplier notified to the WSAA National Codes Manager.

ACO has provided extracts from their Quality Plan (QPS-01) to demonstrate the written procedures that ensure continued compliance with the StandardsMark Licence and the requirements of WSA-104. The extracts include:

- Appendix 4.2 – Process Flow Chart – describing each stage of the product handling from receipt of imported product to delivery to customer.
- Appendix 4.3 – Activities Plan – itemising each required activity in the process, listing the responsible person and the compliance requirements.
- Appendix 4.4 – Inspection and Test Plan itemising each required activity in the process, listing the method, frequency, document references, acceptance criteria and the required evidence of compliance.
- Standard Operating Procedure No 9-01 – Product Testing and Compliance as adopted by DJ Muller Enterprises. This 6 page document sets out the procedure details to be followed to ensure the goods received from China meet the specifications and remain compliant with AS 3996.
- Standard Operating Procedure No 9-03 – Ordering, Purchasing, Receiving & Delivering Materials as adopted by DJ Muller Enterprises. This 9 page document sets out the procedure details to be followed to ensure that products will only be sourced from the certified site.
- Letter from the Managing Director of the Foundry to confirm that WeiFang YuCai School Casting Foundry will be supplying all products to ACO.

ACO has also advised that the castings have permanent markings on the top surface of the cover including company name, and on the underside of the cover including date of manufacture and foundry identification as described on the company product drawings.

The licenses have been accepted by WSAA product appraisal network resulting in a QA clearance being granted for the products.

## **6.2 COMPLIANCE WITH APPRAISAL REQUIREMENTS**

### **6.2.1 Load Testing**

ACO has provided ETRS Test Report No NHM01-0016 demonstrating compliance of their Class 'B' DN 600 cover and frame when load tested in accordance with AS 3996-1992 Appendix 'C'.

ACO has provided Structural Testing Services (STS) Test Report No. STS 03\_075 demonstrating compliance of their Class 'D' DN 600 cover and frame when load tested in accordance with AS 3996-1992 Clause 4.2.6.1 (b).

### **6.2.2 Sealing**

ACO has provided test Report No. 5450 from the NATA Accredited (No. 2078) Queensland University of Technology (QUT) for watertightness and gastightness testing in compliance with AS 3996-1992, clauses 4.2.6.4 and 4.2.6.5 for their M60B/SW – DN 600 Class 'B' Access Cover and Frame.

This Report in part states:

*“The hold-down bolts were removed from the test unit prior to testing and Castrol LM multipurpose grease applied to the joint between the cover and frame. No visible leaks occurred during the watertight test and there was no drop in air pressure or visible escape of air during the gastight test.”*

ACO has provided Structural Testing Services (STS) Test Report No. STS 03\_075 demonstrating compliance of their Class 'D' DN 600 cover and frame for watertightness and gastightness testing in compliance with AS 3996-1992, Clauses 4.2.6.4 and 4.2.6.5 for their DN 600 Class 'D' Access Cover and Frame.

This Report in part states:

*“The hold-down bolts were removed from the test unit prior to testing and Castrol LM multipurpose grease applied to the joint between the cover and frame. No visible leaks occurred during the watertight test and there was no drop in air pressure or visible escape of air during the gastight test.”*

ACO Polycrete provide to order and recommend Denso Manhole Sealing Grease to form the seal between the cover and frame. The Denso Manhole Sealing Grease is available in 4 kg and 20 kg drums and has been specifically developed for sealing manhole interfaces. The Denso product specification sheet (supplied) describes the product characteristics as; waterproof and highly corrosion resistant, unaffected by atmospheric conditions, not harmful to steel, cast iron, brass, copper and most other metals, plastics and rubbers. The temperature range is -10°C to 120°C.

### **6.2.3 Coating**

Black bitumen coating on cover and frame complies with BS 3416 Type II (cold applied) and conforming to the requirements of AS 3996 as confirmed by the StandardsMark Licence.

### **6.2.4 Bolting Down (Cover)**

ACO covers are manufactured bolt down as standard. (Covers are available to order without bolt down.) The two bolts are M 12 hexagon head set in a recessed area on each side of the cover. ACO standard grade of stainless steel is Grade 304. However, Grade 316 is available as an option. For security applications F4 Barri bolts (zinc plated mild steel) may be supplied. Sydney Water has previously advised that the bolts are not exposed to a hydrogen sulphide laden environment and that Grade 304 stainless steel is performing satisfactorily on MH covers in the Sydney sewer system.

### **6.2.5 Bolting Down (Frame)**

ACO provide optional frames for both Class 'B' and 'D' to suit customer requirements. One option is for a plain frame with a 604 mm clear opening and no bolt down facility. The second option is a frame with a 615 mm clear opening and 8 equi-spaced bolt down lugs with 15 mm bolt holes. All four drawings are shown in Appendix 'A'.

### **6.2.6 Cover Lifting Systems**

DN 600 ACO covers have two diametrically opposed lifting keyholes. The standard ACO cover is provided with an extended keyhole for easy cleaning with a screwdriver and with a bridge section for hooked type lifters. This keyhole is designed to also accept a standard AS 3996 type key lifter. The standard ACO lifting keyhole is shown on the product drawings detailing the shape and sizes of the keyhole. (Refer to Appendix 'A')

The standard AS 3996 type keyhole is available to order for unbolted covers where there may be concerns about easy lifting of covers by inserting fingers or a simple tool under the bar of the ACO standard bridged keyhole and enabling unauthorised access.

ACO Polycrete also supply Rhinocast Lifting keys, as shown on page 41 of the ACO Access Covers brochure.

### 6.2.7 Cover Weight

The ACO DN 600 solid top Class 'B' cover weighs 30 kg and the Class 'D' cover weighs 44 kg, both well within the requirements of WSA 104.

## 6.3 WSA AGENCY NETWORK REQUESTS

One Water Agency has questioned the compliance of many covers with Clause 3.3.1 of AS 3996. The Clause states "preferred sizes" allowing some discretion. AS 3996 is currently under review and this Clause is subject to some debate.

The ACO frames have the following minimum depths:

- Class 'B' = 50 mm – AS 3996 preferred size = 55 mm – Acceptable.
- Class 'D' = 72 mm – AS 3996 preferred size = 100 mm – Considered acceptable as the cover penetration exceeds 50 mm.

The ACO frames have the following minimum bedding widths:

- Class 'B' = 48 mm – AS 3996 preferred size = 55 mm – Acceptable.
- Class 'D' = 48 mm – AS 3996 preferred size = 75 mm – Whilst this is undersize a new draft standard AS 3996 requires: "bearing pressure for the ultimate limit state design load shall not exceed 7.5 MPa. The bearing pressure in this case is calculated at 2.136 MPa and is regarded as acceptable.

All other questions raised have been answered in the general text of this report.

## 7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION

Access covers are traditional products and training or instruction is usually unnecessary for installers with basic experience. ACO provide basic installation and maintenance instructions on pages 40 and 41 of their Access Covers Brochure.

## 8 PRODUCT MARKING

ACO covers have a 25 mm x 25 mm x 3 mm square pattern surface and a 3 mm high locating mark on the cover and frame. ACO covers have the following 3 mm high marking on the upper surface:

- 'SEWER' (or customer requirement) in 25 mm high lettering;
- 'ACO' in 16 mm high lettering;
- 'WEIGHT' in 10 mm high lettering;
- 'CLASS' in 10 mm high lettering;
- 'SEALED' in 10 mm high lettering; and
- Australian Standard Identification box.

ACO covers have the following marking in 5 mm high lettering raised 2 mm on the underside of the cover:

- 'Day/Month/Year';
- 'Ductile 600/3';
- 'AS 3996' Certification Licence Number and
- Foundry identification.

The marking satisfies the requirements of the WSAA Appraisal Criteria except for Vehicle/Non-vehicle identification. This issue is still subject to interpretation and many suppliers are yet to meet this requirement, which is not regarded as mandatory at this time.

## **9 PACKAGING AND DELIVERY**

The cover and frame assemblies are packed in sets of tens held with steel straps to a steel pallet at the foundry. If the customer orders less than ten sets the products are repacked and re-strapped to steel pallets.

## **10 WATER AGENCIES EXPERIENCE / FIELD TESTING REPORT**

Gold Coast Water has provided a field report on the installation of a DN 600 Class D ACO Polycrete Access Cover. Gold Coast Water concluded that the cover and frame was a well-manufactured product for its design purpose. The report is attached at Appendix 'C'.

## **11 PRODUCT WARRANTY**

The fittings are covered by the normal commercial and legal requirements of The Trade Practices Act 1974, which covers manufacture to the relevant standard.

## **12 SUMMARY**

ACO has acquired D. J. Muller Enterprises Pty. Ltd who had designed and manufactured a new Class 'B' DN 600 access cover and frame. The components are fully machined and have a diametral clearance of 0 mm to 1 mm with tapered interface to ensure a close fit.

The ACO covers have a locating mechanism with the frame for visual orientation and the standard lifting keyhole has an extended version of the AS 3996 lifting keyhole for ease of cleaning with a screwdriver and is also bridged for lifting with a hook type lifter. The ACO keyhole will also accept the industry standard key lifter. ACO covers without bolt down are available with standard AS 3996 keyholes to order.

The ACO DN 600 Class 'B' and 'D' access covers and frames meet the requirements of WSA-104 and are recommended as 'fit for purpose'.

## **13 LIFE EXPECTANCY RATING**

The life expectancy of the ACO ductile iron circular access covers and cast iron frames when used on reticulation sewers in non-aggressive locations has been determined 'B' – Life expectancy in excess of 50 years.

This rating is only a general guide to life expectancy and may increase or decrease as a result of the quality of installation, system maintenance and operating conditions, operating environment and other geographical and site specific factors.

For guidance on the aggressiveness of various locations around Australia visit the [Corrosion Map of Australia](#) for further guidance, which The new Corrosion Map of Australia, on which the Corrosion Mapping System is based, can estimate the corrosion rate in every locality of Australia, including all 14,700 towns and suburbs.

## 14 RECOMMENDATION

It is **recommended** that WSAA members and associates accept/authorise the ACO Polycrete DN 600 Class B and Class D ductile iron access covers and cast iron frames, which should be installed in accordance with the requirements outlined in WSAA Codes, as adopted by individual Water Agencies..

This appraisal was carried out by Leith Forbes & Associates Pty. Ltd. on behalf of WSAA.  
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Tel (03) 9803 2313. Fax (03) 9803 1521. E-mail [lforbes@hotkey.net.au](mailto:lforbes@hotkey.net.au)

## **15 DISCLAIMER**

### **15.1 ISSUE OF REPORT**

This Product Appraisal Report (*Report*) has been published and/or prepared by the Water Services Association of Australia, Inc and nominated Project Manager and peer group of technical specialists (the *Publishers*).

The Report has been prepared for use within Australia only by technical specialists that have expertise in the function of products such as those appraised in the Report (the *Recipients*).

By accepting this Report, the Recipient acknowledges and represents to the Publisher[s] and each person involved in the preparation of the Report that the Recipient has understood and accepted the terms of this Disclaimer.

### **15.2 LIMITS ON RELIANCE ON INFORMATION AND RECOMMENDATIONS**

#### **15.2.1 *Disclaimer of liability***

Neither the Publisher[s] nor any person involved in the preparation of the Report accept[s] any liability for any loss or damage suffered by any person however caused (including negligence or the omission by any person to do any thing) relating in any way to the Report or the product appraisal criteria underlying it. This includes (without limitation) any liability for any recommendation or information in the Report or any errors or omissions.

#### **15.2.2 *Need for independent assessment***

The information and any recommendation contained (expressly or by implication) in this Report are provided in good faith. However, you should treat the information as indicative only. You should not rely on that information or any such recommendation except to the extent that you reach an agreement to the contrary with the Publisher[s].

This Report does not contain all information that a person might require for the purposes of assessing any product discussed or appraised within it (*Product*). The product appraisal criteria used in preparing this Report may not address all relevant aspects of the Product. Recipients should seek independent evidence of any matter which is material to their decisions in connection with an assessment of the Product and consult their own advisers for any technical information required. Any decision to use the Product should take into account the reliability of that independent evidence obtained by the Recipient regarding the Product. Recipients should also independently verify and assess the appropriateness of any recommendation in the Report, especially given that any recommendation will not take into account a Recipient's particular needs or circumstances.

#### **15.2.3 *No updating***

Neither the Publisher[s] nor any person involved in the preparation of this Report [has][have] any obligation to notify you of any change in the information contained in this Report or of any new information concerning the Publisher[s] or the Product or any other matter.

#### **15.2.4 *No warranty***

The Publisher[s] do[es] not, in any way, warrant that steps have been taken to verify or audit the accuracy or completeness of the information in this Report, or the accuracy, completeness or reasonableness of any recommendation in this Report.

# APPENDIX A

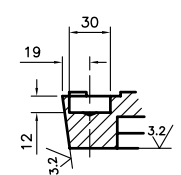
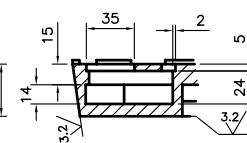
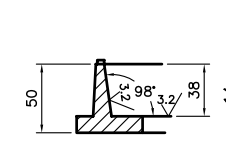
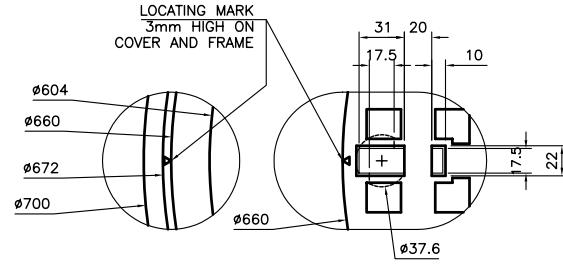
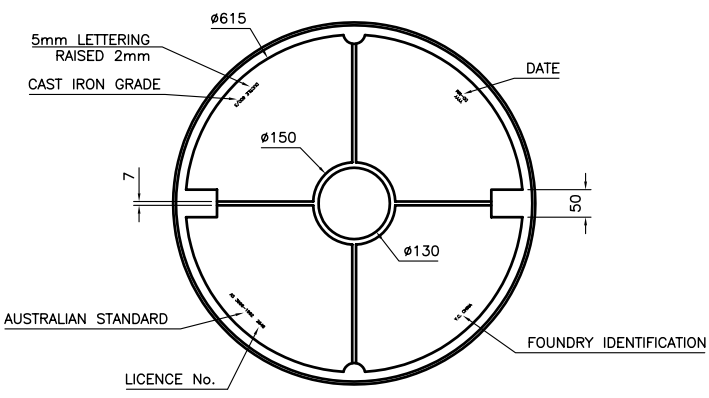
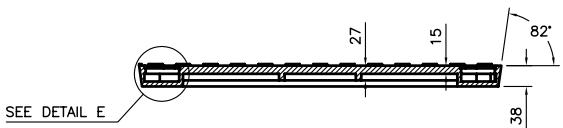
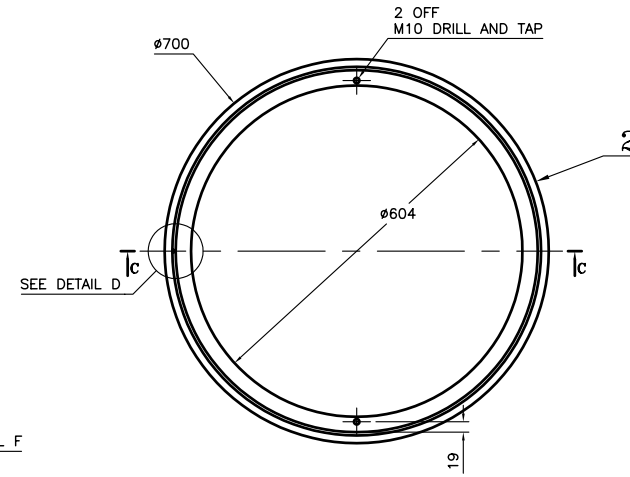
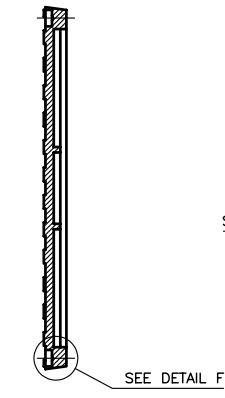
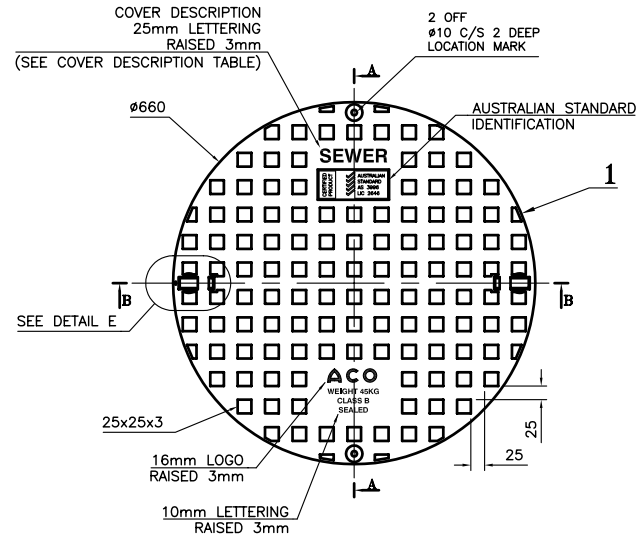
## TECHNICAL MANUAL

ACO Access Cover Manual is available from ACO Polycrete Offices – see Appendix 'C'.

Includes:

- ACO Drawing No. A 100 Issue G – RHINOCAST CLASS 'B' DN 600 COVER & FRAME.
- ACO Drawing No. A 101 Issue K – RHINOCAST CLASS 'D' DN 600 COVER & FRAME
- ACO Drawing No. A 117 Issue C – RHINOCAST CLASS 'B' DN 600 COVER & BOLT DOWN FRAME.
- ACO Drawing No. A 097 Issue C – RHINOCAST CLASS 'D' DN 600 COVER & BOLT DOWN FRAME

DRAWING NO. **A100**



COMP No.	ASSEMBLED COVER AND FRAME WITH COVER DESCRIPTION	WEIGHT
85196	CLASS B Ø604 SOLID TOP COVER & FRAME - STORMWATER	45KG
85142	CLASS B Ø604 SOLID TOP COVER & FRAME - SEWER	45KG

BILL OF MATERIALS					
ITEM	DRG No.	COMP No.	DESCRIPTION	QTY	MATERIAL
1	SEE CHART		CLASS B MALL DUCTILE IRON SOLID TOP COVER	1	G
2	-	Ø1002	CLASS B MALL GREY CAST IRON SOLID TOP FRAME	1	G

COMP No.	COVER COMPONENT CHART
87108	CLASS B Ø604 SOLID TOP COVER - STORMWATER
87006	CLASS B Ø604 SOLID TOP COVER - SEWER

- NOTES**
- ALL EDGES TO BE SQUARE
  - CASTING TO BE FREE OF BURRS AND PITS
  - MACHINE SURFACE SYMBOL  $\sqrt{}$
  - MATERIAL TO BE:  
FRAME: GREY CAST IRON TENSILE STRENGTH T220 (AS1830)  
COVER: DUCTILE CAST IRON TENSILE STRENGTH 600-3 (AS1831)  
HARDNESS: 145 - 185 (HB)  
ULTIMATE DESIGN LOAD: 210 kN (AS3996)
  - TOLERANCES:  
CAST DIMENSIONS: ±1.0mm  
ANGLE PROFILE: ±0.25°  
MACHINED DIMENSIONS: ±0.5mm  
DIAMETER OF COVER: ±0.5mm  
OVERALL ASSEMBLY HEIGHT ±0.5mm
  - ASSEMBLED UNIT SHALL BE COATED WITH BITUMEN BASED COATING (COLD APPLIED) TO B.S. 3416 TYPE 2.
  - AS3996-Lic 2646 STANDARDS MARK SCHEDULE MODEL I.D. M60B/SW

ISSUE	DESCRIPTION	BY	DATE	CHK
G	LOCATING MARK NOW PIN TAPPED, IE 90 NOTE 1 ADDED, AND B491 WEIGHT ADDED	CD	21.03	-
F	NOTES, MACHINE MARKS (G, T, H) AND COVER MARKING UPDATE	CD	24.03	-
E	Ø10 C/S 2 OFF HOLE NOW Ø10 C/S 2 DEEP & 1.5 OFF TOP MM/MIN C/S 2MM DEEP	CD	28.10	GB
D	ALL BILL OF MATERIALS ADDED, I/E COMPUTER NUMBER TABLE UPDATED	CD	9.03	GB
C	COVER CHART ADDED, I/E ALL KEYHOLE DIMENSIONS ADDED	CD	28.10	GB
B	RESUBMITTED AS STANDARD PRODUCT DRAWING NUMBER WAS 2104	CD	28.10	GB
A	NAME DESCRIPTIONS (STORMWATER & SEWER) WITH PART NUMBERS ADDED	CD	28.10	GB
B	Ø6 FRAME CLEAR OPENING SIZE ALTERED WAS 60mm NOW 64mm	CD	21.10	GB
A	Ø6 Ø10 HOLE IN FRAME AND COVER REPOSITIONED MOVED 7mm	BD	27.02	-
A	IE 30 COMPANY LOGO AND TEXT HEIGHT ALTERED WAS 25mm NOW 30mm	BD	27.02	-

**ACO Polycrete Pty Ltd**  
A.C.N. 050 102 942  
185 Brims Road  
Northmead, NSW, 2152  
Telephone: +61 2 9630 2788 - Facsimile: +61 2 9630 2733

THIRD ANGLE PROJECTION

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ACO POLYCRETE PTY LTD  
DO NOT SCALE

DRAWN: BRIAN DEVOY DATE: 7.8.02 DEPT: ACCESS

MATERIAL: SEE NOTE 4 FINISH: SEE NOTE 6

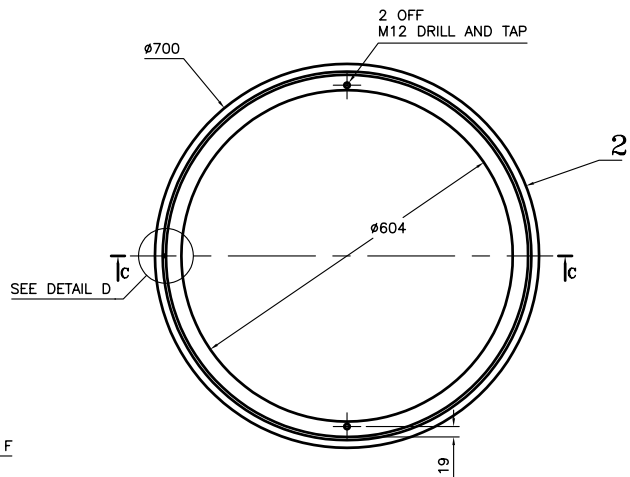
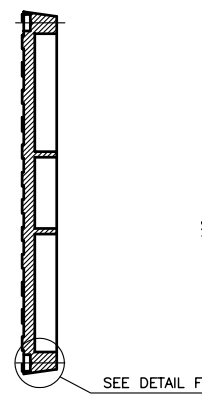
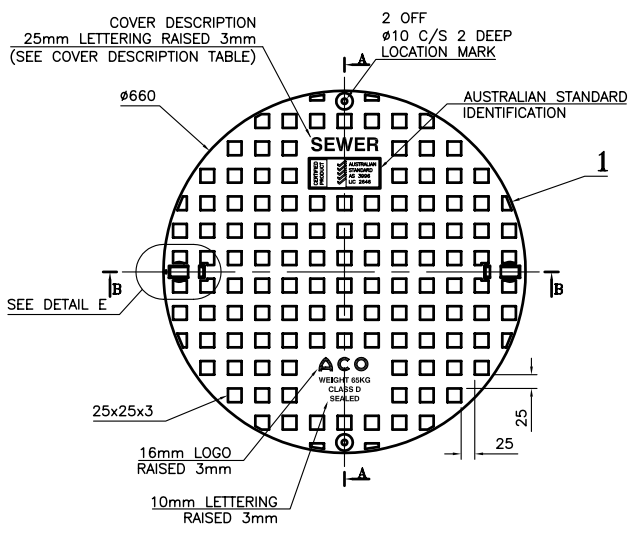
TITLE: **CLASS B CIRCULAR DUCTILE IRON  
Ø604 SOLID TOP RHINOCAST  
Ø660x38mm Ø604 CLEAR OPENING**

SCALE: 1:5  
1:2 UNITS: mm COMPUTER NO.: SEE TABLE DRAWING NO.: A 100 ISSUE: G

LINEAR TOLERANCE EXCEPT WHERE OTHERWISE STATED			
OVER	UP TO	TOLERANCE	
	10	±0.25	
	10	25	±0.50
	25	100	±0.75
	100	500	±1.00
	500		±2.00
ANGULAR		±1°	

BILL OF MATERIALS					
ITEM	DRG No.	COMP No.	DESCRIPTION	QTY	MATERIAL
1	SEE CHART		CLASS D #604 DUCTILE IRON SOLID TOP COVER	1	G
2	-	89193	CLASS D #604 GREY CAST IRON SOLID TOP FRAME	1	G

COMP No.	COVER COMPONENT CHART
87040	CLASS D #604 SOLID TOP COVER - STORMWATER
87050	CLASS D #604 SOLID TOP COVER - SEWER
-	CLASS D #604 SOLID TOP COVER - HUMECEPTOR

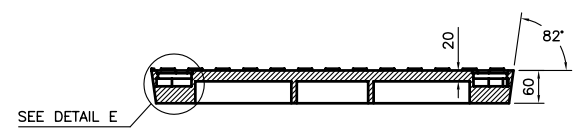


**SECTION A-A**

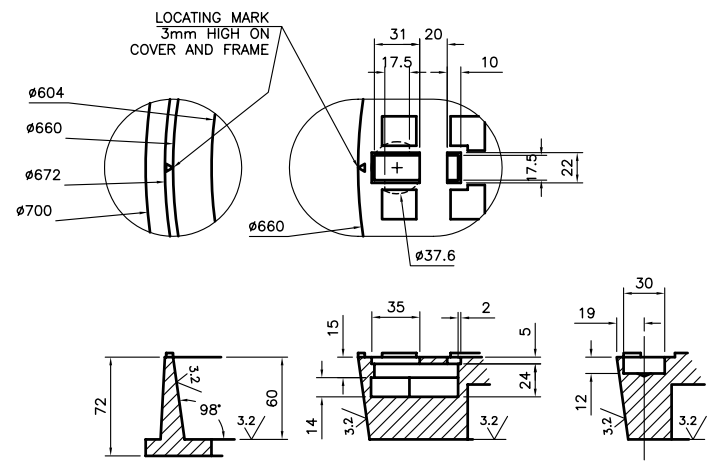
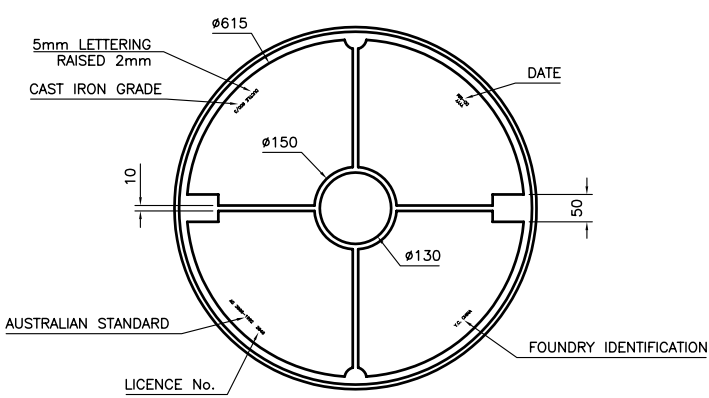
**SECTION C-C**

**NOTES**

- ALL EDGES TO BE SQUARE
- CASTING TO BE FREE OF BURRS AND PITS
- MACHINE SURFACE SYMBOL 3.2
- MATERIAL TO BE:  
 FRAME: GREY CAST IRON TENSILE STRENGTH T220 (AS1830)  
 COVER: DUCTILE CAST IRON TENSILE STRENGTH 600-3 (AS1831)  
 HARDNESS: 145 - 185 (HB)  
 ULTIMATE DESIGN LOAD: 210 kN (AS3996)
- TOLERANCES:  
 CAST DIMENSIONS: ±1.0mm  
 ANGLE PROFILE: ±0.25°  
 MACHINED DIMENSIONS: ±0.5mm  
 DIAMETER OF COVER: ±0.5mm  
 OVERALL ASSEMBLY HEIGHT ±0.5mm
- ASSEMBLED UNIT SHALL BE COATED WITH BITUMEN BASED COATING (COLD APPLIED) TO B.S. 3416 TYPE 2.
- AS3996-Lic 2646 STANDARDSMARK SCHEDULE MODEL I.D. 600SD



**SECTION B-B**



**DETAIL D**  
SCALE 1:2

**DETAIL E**  
SCALE 1:2

**DETAIL F**  
SCALE 1:2

OVER	UP TO	TOLERANCE	
	10	±0.25	
	10	25	±0.50
	25	100	±0.75
	100	500	±1.00
	500		±2.00
	ANGULAR		±1°

COMP No.	ASSEMBLED COVER AND FRAME WITH COVER DESCRIPTION	WEIGHT
89183	CLASS D Ø604 CIRCULAR DUCTILE IRON SOLID TOP - SEWER	65KG
89155	CLASS D Ø604 CIRCULAR DUCTILE IRON SOLID TOP - STORMWATER	65KG
89199	CLASS D Ø604 CIRCULAR DUCTILE IRON SOLID TOP - HUMECEPTOR	65KG

REV	DESCRIPTION	DATE	CHK	
K	[A] 91 LOCATING MARK NOW M12 TAPPED, [B] 91 NOTE 1 ADDED, AND [H] 91 WEIGHT ADDED	02.04.03	-	
J	[D] 91 COVER DIAMETER TOLERANCE WAS ±1mm NOW ±0.5mm	28.03.03	-	
I	NOTES, MACHINE MARKS [G], [H] AND COVER MARKING UPDATE	30.03.03	DM	
H	[A] 91 & [G] 91 HOLE NOW Ø10 C/S 2MM DEEP & [A] 91 M12 TAP NOW Ø10 C/S 2MM DEEP	28.03.03	GB	
G	ASSEMBLED PART No. CORRECTED 89183 & 89155	17.03.03	GB	
F	[A] 91 BILL OF MATERIALS ADDED, [D] 91 COMPUTER NUMBER TABLE UPDATED	04.03.03	GB	
E	[B] 91 COVER CHART ADDED, [E] 91 [C] 91 TOLERANCES ADDED	20.02.02	JE	
D	HUMECEPTOR COVER APPROVED FOR MANUFACTURE	11.02.02	GB	
C	HUMECEPTOR COVER DESCRIPTION ADDED	11.02.02	DM	
B	PREVIOUS AS STANDARD PRODUCT DRAWING NUMBER WAS 208-1. COVER DESCRIPTIONS STORMWATER & SEWER WITH PART NUMBERS ADDED	28.10.02	DM	
A	[C] 91 FRAME CLEAR OPENING SIZE ALTERED WAS 60mm NOW 64mm. [E] 91 [G] 91 HOLE IN FRAME AND COVER REPOSITIONED 7mm	21.02.02	GB	
	[E] 91 COMPANY LOGO AND TEXT HEIGHT ALTERED WAS 20mm NOW 15mm	27.02.02	-	
ISSUE	DESCRIPTION	BY	DATE	CHK

**ACO Polycrete Pty Ltd**  
 A.C.N. 050 102 942  
 195 Brivens Road  
 Northmead, NSW, 2152  
 Telephone: +61 2 9630 2788 - Facsimile: +61 2 9630 2733

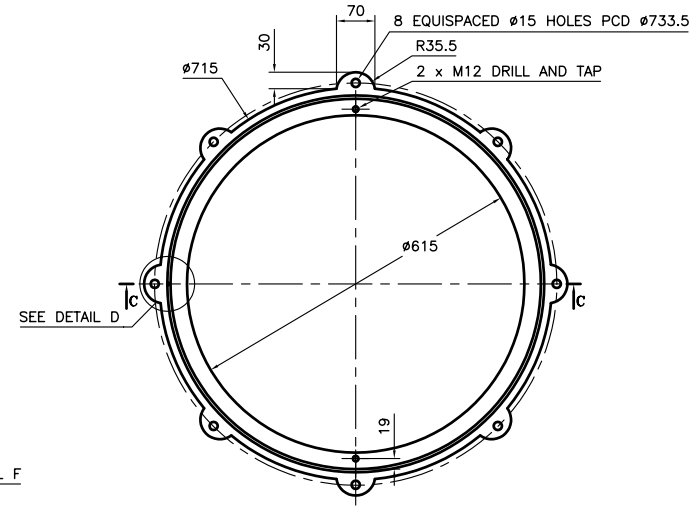
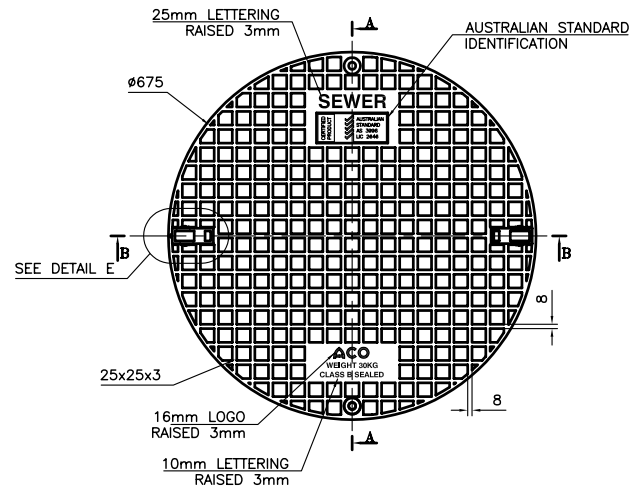
THIRD ANGLE PROJECTION

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 DO NOT SCALE

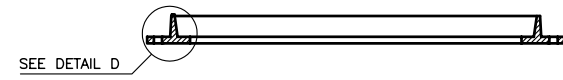
DRAWN: BRIAN DEVOY DATE: 7.8.02 DEPT: ACCESS  
 MATERIAL: SEE NOTE 4 FINISH: SEE NOTE 6

TITLE: **CLASS D CIRCULAR DUCTILE IRON Ø604 SOLID TOP RHINOCAST Ø660x60mm Ø604 CLEAR OPENING**

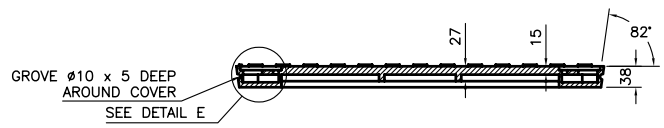
SCALE: 1:5 UNITS: mm COMPUTER NO. SEE TABLE DRAWING NO. A 101 ISSUE: K



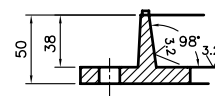
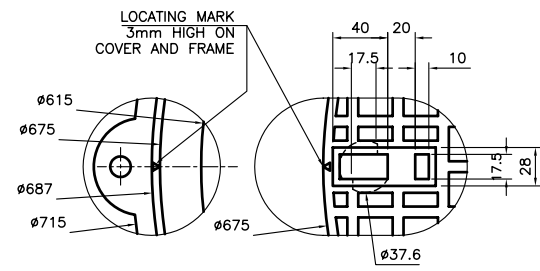
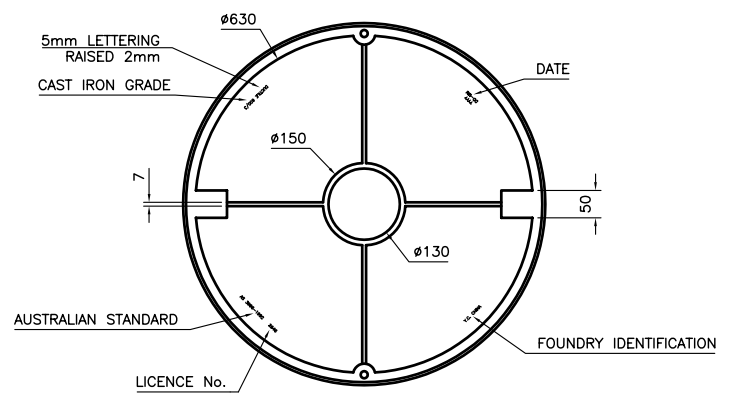
**SECTION A-A**



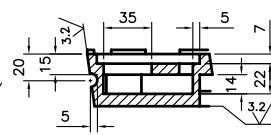
**SECTION C-C**



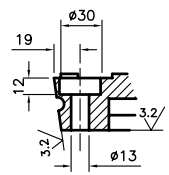
**SECTION B-B**



**DETAIL D**  
SCALE 1:2



**DETAIL E**  
SCALE 1:2



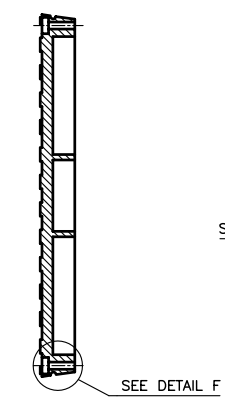
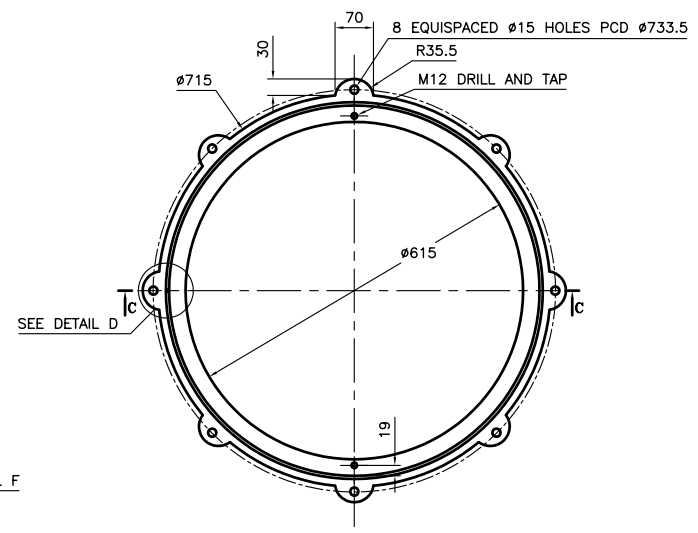
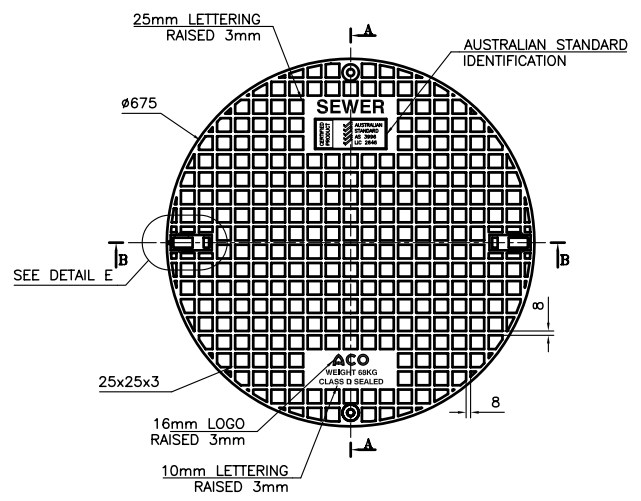
**DETAIL F**  
SCALE 1:2

**NOTES**

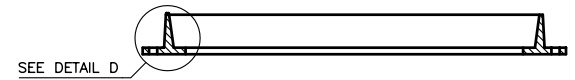
- ALL EDGES TO BE SQUARE
- CASTING TO BE FREE OF BURRS AND PITS
- MACHINE SURFACE SYMBOL 3.2
- MATERIAL TO BE:  
FRAME: GREY CAST IRON TENSILE STRENGTH T220 (AS1830)  
COVER: DUCTILE CAST IRON TENSILE STRENGTH 600-3 (AS1831)  
HARDNESS: 145 - 185 (HB)  
ULTIMATE DESIGN LOAD: 80 kN (AS3996)
- TOLERANCES:  
CAST DIMENSIONS: ±1.0mm  
ANGLE PROFILE: ±0.25°  
MACHINED DIMENSIONS: ±0.5mm  
DIAMETER OF COVER: ±0.5mm  
OVERALL ASSEMBLY HEIGHT ±0.5mm
- ASSEMBLED UNIT SHALL BE COATED WITH BITUMEN BASED COATING (COLD APPLIED) TO B.S. 3416 TYPE 2.

LINEAR TOLERANCE EXCEPT WHERE OTHERWISE STATED		
OVER	UP TO TOLERANCE	
	10	±0.25
10	25	±0.50
25	100	±0.75
100	500	±1.00
500		±2.00
ANGULAR		±1°

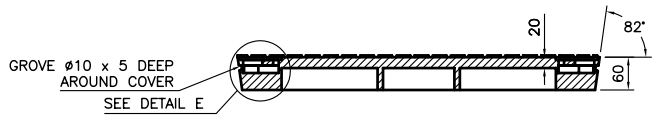
C	BY NEW NOTES ADDED; GENERAL UPDATE	CD	19/11/05	-	
E	CORRECTED DIMENSION REFERENCE POINT FROM C/D TO INNER T-FRAME (C/D)	CD	27/10/05	DM	
A	APPROVED FOR MANUFACTURE	CD	17/02/03	DM	
ISSUE	DESCRIPTION	BY	DATE	CHK	
<b>REVISIONS</b>					
<b>ACO Polycrete Pty Ltd</b> A.C.N. 050 102 942 185 Briens Road Northmead, NSW, 2152 Telephone: +61 2 9630 2788 - Facsimile: +61 2 9630 2733					
THIRD ANGLE PROJECTION		THIS DRAWING IS COPYRIGHT OF ACO POLYCRETE PTY LTD DO NOT SCALE			
DRAWN	CHAU DUONG	DATE	17.2.03	DEPT	ACCESS
MATERIAL	SEE NOTE 4	FINISH	SEE NOTE 6		
<b>TITLE</b> CLASS B CIRCULAR DUCTILE IRON Ø615 RHINOCAST SOLID TOP Ø675x38mm Ø615 CLEAR OPENING					
SCALE	1:5 1:2	UNITS	mm	COMPUTER NO.	85134
DRAWING NO.		A 117		ISSUE	C



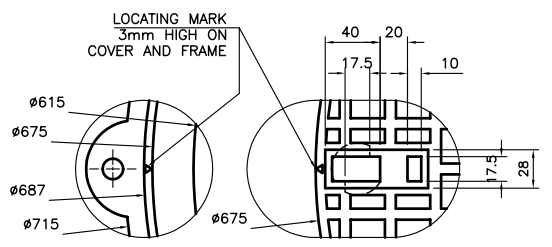
**SECTION A-A**



**SECTION C-C**



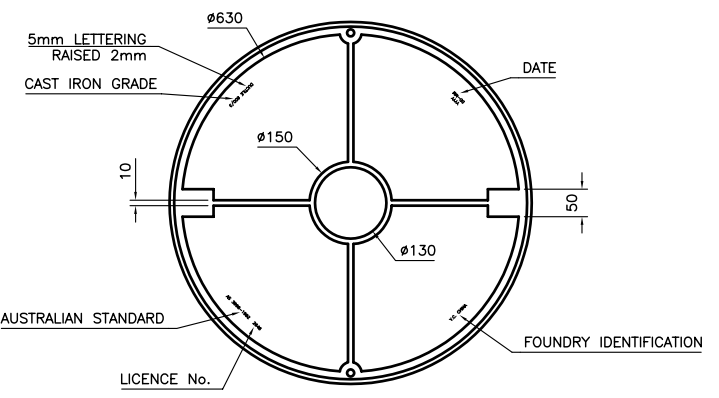
**SECTION B-B**



**DETAIL D**  
SCALE 1:2

**DETAIL E**  
SCALE 1:2

**DETAIL F**  
SCALE 1:2



LINEAR TOLERANCE EXCEPT WHERE OTHERWISE STATED		
OVER	UP TO	TOLERANCE
	10	±0.25
10	25	±0.50
25	100	±0.75
100	500	±1.00
500		±2.00
ANGULAR		±1°

- NOTES**
- ALL EDGES TO BE SQUARE
  - CASTING TO BE FREE OF BURRS AND PITS
  - MACHINE SURFACE SYMBOL 3.2
  - MATERIAL TO BE:  
FRAME: GREY CAST IRON TENSILE STRENGTH T220 (AS1830)  
COVER: DUCTILE CAST IRON TENSILE STRENGTH 600-3 (AS1831)  
HARDNESS: 145 - 185 (HB)  
ULTIMATE DESIGN LOAD: 210 kN (AS3996)
  - TOLERANCES:  
CAST DIMENSIONS: ±1.0mm  
ANGLE PROFILE: ±0.25°  
MACHINED DIMENSIONS: ±0.5mm  
DIAMETER OF COVER: ±0.5mm  
OVERALL ASSEMBLY HEIGHT ±0.5mm
  - ASSEMBLED UNIT SHALL BE COATED WITH BITUMEN BASED COATING (COLD APPLIED) TO B.S. 3416 TYPE 2.

REV	DESCRIPTION	DATE	BY	CHK
C	B.M. NOTES ADDED; GENERAL UPDATE	06.11.02		
B	CORRECTED DIMENSION REFERENCE POINT FROM C/D TO I-FRAME LEG & DIM TO WAS 20 (RHS)	06.11.02		
A	ADDED BOLT DOWN TABS ON FRAME LEG	06.11.02		

**ACO Polycrete Pty Ltd**  
 A.C.N. 050 102 942  
 185 Brims Road  
 Northmead, NSW, 2152  
 Telephone: +61 2 9630 2788 - Facsimile: +61 2 9630 2733

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 DO NOT SCALE

DRAWN: CHAU DUONG DATE: 06.11.02 DEPT: ACCESS  
 MATERIAL: SEE NOTE 4 FINISH: SEE NOTE 6

TITLE: **CLASS D CIRCULAR DUCTILE IRON Ø615 RHINOCAST SOLID TOP Ø675x60mm Ø615 CLEAR OPENING**

# **APPENDIX B**

## **QUALITY ASSURANCE**

### **CERTIFICATES AND PRODUCT SCHEDULES**

Includes:

- ACO Polycrete Pty Ltd - AS/NZS ISO 9001:2000 – SAI Global Certificate of Registration No. QEC1883.
- Weifang Deren Yucai Casting Co. Ltd – ISO 9001:2000 – Moody International Certificate of Registration No. 0105023.
- WeiFang YuCai School of Foundry in association with ACO Polycrete Pty Ltd – StandardsMark Licence No. 2646.
- StandardsMark Schedule for Licence No 2646. (3 pages)



Quality  
Endorsed  
Company

# CERTIFICATE OF REGISTRATION

## ACO Polycrete Pty Ltd

ABN 65 050 102 942

185 Briens Road NORTHMEAD NSW 2152 AUSTRALIA

complies with the requirements of

**AS/NZS ISO 9002:1994**

Quality systems-Model for quality assurance in production installation and servicing

for the following capability

The registration covers the Quality Management System for the manufacture of precast polymer concrete (polycrete) products, steel access covers, gratings and chemical containment products. The registration also covers the supply of glass reinforced plastic (GRP), plastic, polycrete and metal products to the building industry.

Registered by:

Quality Assurance Services Pty Limited (QAS) ACN 050 611 642 286 Sussex Street Sydney NSW 2000 Australia

Subject to the QAS Terms and Conditions for Certification. While all due care and skill was exercised in carrying out this assessment, QAS accepts responsibility only for proven negligence. This certificate remains the property of QAS and must be returned to QAS upon its request.

Certificate No.: QEC1883  
Issue Date: 15 August 2002

Certified Date: 6 May 1996  
Expiry Date: 15 December 2003

**Alex Ezrakhovich**  
General Manager Certification  
for and on behalf of  
Quality Assurance Services Pty. Limited

Authorised Local Signatory, QAS

JAS-ANZ



QAS is Accredited by the  
Joint Accreditation System of  
Australia and New Zealand,  
Acc No. S1250992AS



QUALITY ASSURANCE SERVICES



MEMBER



**ISO 9000 APPROVAL**

## CERTIFICATE OF REGISTRATION

This is to certify that the Quality Management System of  
**Weifang Yucai School Casting Factory**

No. 981, Yuanfei Road, Kuiwen District, Weifang City,  
Shandong Province, P. R. China

*has been assessed by Moody International Certification Limited in respect of their Quality Management Systems and found to comply with ISO 9002:1994.*

*Approval is hereby granted for registration providing the rules and conditions relating to certification are observed at all times. This certification has been accredited by the member of International Accreditation Forum MLA for Quality Management System.*

**CERTIFICATION SCOPE:**

*Production and Sales of Casting Access Covers and Grates.*

**REGISTRATION NUMBER: 0105023**



Registration Number

014

Signed for and on behalf of  
Moody International Certification Limited

**DATE OF ISSUE:** June 25, 2001

**VALID UNTIL:** December 14, 2003



Australian  
Standard

# STANDARDSMARK LICENCE

*SAI Global Limited (ABN 67 050 611 642) hereby grants to.*

## **Weifang Yucai School of Foundry In Association with Aco Polycrete Pty Ltd**

**981 Yuan Fei Road, Kui Wen District, Weifang, Shangdong Province, CHINA**

*"the Licensee" the right to use the STANDARDSMARK as shown above only in respect of the goods described and detailed in the Schedule which are produced by the Licensee and which comply with the appropriate Standard referred to below as from time to time amended. The Licence is granted subject to the rules governing the use of the STANDARDSMARK and the Terms and Conditions for certification. The Licensee covenants to observe all the Rules and these Terms and Conditions.*

*Manufactured to.*

**AS 3996 - Metal access covers, road grates and frames**

The STANDARDSMARK is a registered certification trademark of SAI Global Limited and is issued under Licence by SAI Global Limited. This certificate remains the property of SAI Global Limited and must be returned to SAI Global Limited upon its request. Refer to the Schedule for the list of product models.

**Licence No.:** 2646  
**Issue Date:** 25 November 2002

**Certified Date:** 22 August 2001  
**Expiry Date:** 21 August 2006

Alex Eznakhovich - General Manager Certification  
For and on behalf of SAI Global Limited

Authorised Local Signatory, SAI Global Limited





Australian Standard

# STANDARDSMARK SCHEDULE

## Weifang Yucai School of Foundry In Association with Aco Polycrete Pty Ltd

981 Yuan Fei Road, Kui Wen District, Weifang, Shangdong Province, CHINA

AS 3996:1992 - Metal access covers, road grates and frames

*Model identification of the goods on which the STANDARDSMARK\* may be used:*

As per attached StandardsMark Schedule, Dated 25 November 2002 (Total 2 Pages)

“SAI Global Assurance Services registered Document, Dated 25 November 2002,  
Stamp No.1”

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End of Record

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Licence No.: 2646

Issue Date: 25 November 2002

Alex Ezrikhovich - General Manager Certification  
For and on behalf of SAI Global Limited

Authorised Local Signatory, SAI Global Limited

\*Items that do not display the STANDARDSMARK do not comply with the conditions of the Licence



JAS-ANZ



SAI Global is Accredited by  
the Joint Accreditation System  
of Australia and New Zealand.  
Acc.No. Z1440295AS





# STANDARDSMARK SCHEDULE

SAI GLOBAL  
REGISTERED DOCUMENT

25 NOV 2002

STAMP No.1



Australian  
Standard

STANDARD: AS3996

PRODUCT CATEGORY: WATER

PRODUCT GROUP: FIXTURES

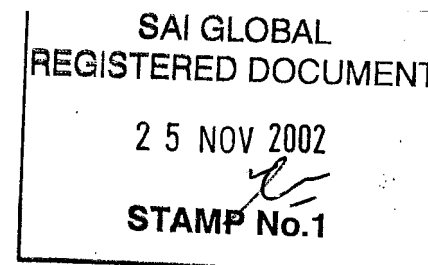
COMPANY : WEIFANG YUCAI SCHOOL FOUNDRY IN ASSOCIATION WITH ACO POLYCRETE PTY LTD.

Model ID	Brand	Class	Type	Material	Nominal Clear Opening
M60B/SW	ACO	B	Access cover & frame sealed (watertight/gastight) solid top	Ductile iron cover/grey iron frame	600mm DIA
600SD	ACO	D	Access cover & frame sealed (watertight/gastight) solid top	Ductile iron cover/grey iron frame	600mm DIA
600RB	ACO	B	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	600mm DIA
600RD	ACO	D	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	600mm DIA
DI44B	ACO	B	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	450mm x 450mm
DI46B	ACO	B	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	450mm x 600mm
DI64B	ACO	B	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	600mm x 450mm
DI66B	ACO	B	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	600mm x 600mm
DI67B	ACO	B	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	600mm x 750mm
DI76B	ACO	B	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	750mm x 600mm
DI77B	ACO	B	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	750mm x 750mm
DI94B	ACO	B	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	900mm x 450mm
DI96B	ACO	B	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	900mm x 600mm
DI97B	ACO	B	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	900mm x 750mm
DI99B	ACO	B	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	900mm x 900mm
DI44D	ACO	D	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	450mm x 450mm
DI46D	ACO	D	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	450mm x 600mm
DI64D	ACO	D	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	600mm x 450mm
DI66D	ACO	D	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	600mm x 600mm
DI67D	ACO	D	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	600mm x 750mm
DI76D	ACO	D	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	750mm x 600mm

DI77D	ACO	D	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	750mm x 750mm
DI94D	ACO	D	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	900mm x 450mm
DI96D	ACO	D	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	900mm x 600mm
DI97D	ACO	D	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	900mm x 750mm
DI99D	ACO	D	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	900mm x 900mm
DI44G	ACO	G	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	450mm x 450mm
DI64G	ACO	G	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	600mm x 450mm
DI66G	ACO	G	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	600mm x 600mm
DI77G	ACO	G	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	750mm x 750mm
DI94G	ACO	G	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	900mm x 450mm
DI96G	ACO	G	Access cover & frame sealed (watertight/gastight) recessed cover	Ductile iron cover/grey iron frame	900mm x 600mm

**Note:**

- (1) Items that do not display the STANDARDSMARK on the packaging do not comply with the conditions of the Licence.
- (2) Licensee to include unique identifier of product, alternative to model no, such as product code, catalogue ref., part no. Acceptable.
- (3) This may be manufacturers name or other name that product is sold under.
- (4) This StandardsMark schedule is incomplete without the preceding two licence pages.
- (5) Only schedules bearing the Quality Assurance Services registered document- Standards Australia Stamp No. 1 are approved, for currency check the Licence



**APPENDIX C**

**GOLD COAST WATER INSTALLATION REPORT**

**DN 600 CLASS D ACO ACCESS COVER**



**GoldCoastWater**

## **Product Appraisal for ACO Polycrete**

### **600 DIA Class D Access Cover**

**Michael Carter**

Service Delivery - Asset Specifications

9 October 2003



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# ACO Polycrete 600 Diameter Class D Access Cover

## 1 ACO Polycrete 600 Diameter Class D Access Cover

This brief report evaluates the use of the ACO Polycrete 600 Diameter Class D Access Cover.

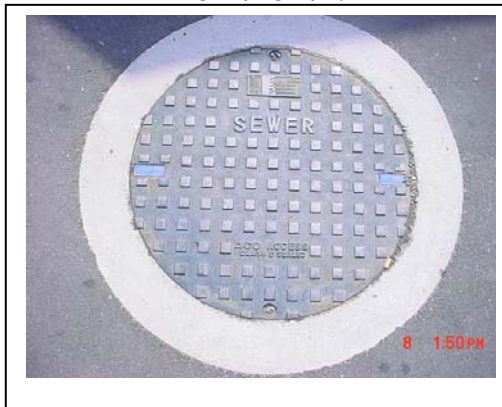
### 1.1 Location of the Class D Access Cover

The Access Cover was located in a shopping centre car park, which received light and heavy vehicle traffic.

## 2 Discussion

### 2.1 Inspection of ACO Polycrete 600 Diameter Class D Access Cover

The ductile iron circular Class D (210kN) cover was installed in a Humes converter slab (factory installed). The cover showed no signs of wear and the installation was flat and level with the surrounding topography. The seal was in good order with no odours evident.



The removing of the cover was easily completed with no exertion required. After close inspection of the cover and frame there were no signs of degradation. The cover had no signs of deflection.

The product and lettering was in accordance with AS 3996-1992 Metal access covers, road grates and frames.



### **3 Maintenance**

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Council may have concerns with the interaction of a different product within the sewer system as it was identified, if a ACO cover was required to be replaced, the same manufactured product would be required. This was identified to be a problem as Council currently purchase another suppliers manhole covers and frames which cannot be used to replace an ACO cover (Non store item), as the frames are different. This would be a rare occurrence as the converter slab would fail before the frame and cover, therefore not an issue.

### **4 Conclusion**

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Gold Coast Waters findings showed that the ductile iron circular Class D (210kN) cover and frame was a well-manufactured product for its design usage.

Council recommends the use of the Class D cover and Frame within the Reticulated Sewerage System, in accordance with Councils Standard Drawing 03-07 205.

## APPENDIX D

# SUPPLIER CONTACT DETAILS

### ACO POLYCRETE PTY LTD OFFICE LOCATIONS

<b>New South Wales</b>	185 Briens Road Northmead NSW 2152 Telephone (02) 9630 2788 Facsimile (02) 9630 2733
<b>Victoria</b>	9 Overseas Drive Noble Park VIC 3174 Telephone (03) 9795 3666 Facsimile (03) 9795 6444
<b>Queensland</b>	467 Tufnell Road Banyo QLD 4014 Telephone (07) 3267 8700 Facsimile (07) 3267 8711

### ACO DISTRIBUTORS

<b>Western Australia</b>	GSE Distributors Unit 1/3 Cobbler Place Mirrabooka WA 6061 Telephone (08) 9344 1566 Facsimile (08) 9344
<b>South Australia</b>	Bianco Building Supplies 178 Gorge Road Newton SA 5074 Telephone (08) 8366 6666 Facsimile (08) 8366 6655
<b>Northern Territory</b>	Brassware Agencies Coonawarra Road Winnellie NT 0820 Telephone (08) 8947 0019 Facsimile (08) 8947 0349
<b>Tasmania</b>	Buildtech 34 Derwent Park Road Derwent Park TAS 7009 Telephone (03) 6273 5800 Facsimile (03) 6273 4977
<b>North Queensland</b>	Raymic Industries Pty Ltd 11 Carmel Street Garbutt QLD 4814 Telephone (07) 4779 1425 Facsimile (07) 4779 1423