



**WMTS-498:2014**  
**Plastic Fittings - Overflow Relief**  
**Waste Outlet (ORWO) with**  
**Integral Cap-stopper**

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WaterMark Technical Specification

2014







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## IMPORTANT NOTICE AND DISCLAIMER

On 25 February 2013 management and administration of the WaterMark Certification Scheme transferred to the Australian Building Codes Board (ABCBC). From this date all new technical specifications will be named WaterMark Technical Specifications (WMTS). Within two years all existing ATS will be renamed WMTS. During this initial period both terms may be used and accepted. All new and recertified Certificates of Conformity will reference WMTS. Certificates of Conformity that currently reference ATS will be re-issued referencing the equivalent WMTS during this initial period. The WaterMark Schedule of Specifications lists all current WMTS and, where appropriate, the former ATS name.

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The ABCBC welcomes suggestions for improvement in the WMTS, and encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact the ABCBC via phone on 1300 134 631, email at [watermark@abcb.gov.au](mailto:watermark@abcb.gov.au) or write to the WaterMark Administering Body, ABCBC, GPO Box 9839, Canberra ACT 2601.

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## PREFACE

This WaterMark Technical Specification was originally prepared by the Joint Standards Australia/Standards New Zealand Committee WS-031, Technical Procedures for Plumbing and Drainage Products Certification.

The objective of this WaterMark Technical Specification is to enable product certification in accordance with the requirements of the Plumbing Code of Australia (PCA).

The word 'VOID' set against a clause indicates that the clause is not used in this WaterMark Technical Specification. The inclusion of this word allows a common use clause numbering system for the WaterMark Technical Specifications.

The term 'normative' has been used in this WaterMark Technical Specification to define the application of the appendices to which they apply. A 'normative' appendix is an integral part of a WaterMark Technical Specification.

The test protocol and information in this WaterMark Technical Specification was arranged by committee members to meet the authorization requirements given in the PCA.

The WaterMark Schedule of Specifications and List of Exempt Products are dynamic lists and change on a regular basis. Based on this function, these lists have been removed from the WaterMark Certification Scheme document known as AS 5200.000 Technical Specification for Plumbing and Drainage Products and are now located on the ABCB website ([www.abcb.gov.au](http://www.abcb.gov.au)). These lists will be version controlled with appropriate historic references.



## ACKNOWLEDGEMENTS

WaterMark Technical Specification WMTS-498:2013 was prepared by Standards Australia Committee WS-031, Technical Procedures for Plumbing and Drainage Products Authorisation. It was approved by the ABCB on 8 November 2013.

The following organisations were represented on Committee WS-031 in the preparation of WMTS-498:2014:

- Australian Building Codes Board
- Australian Industry Group
- Australian Stainless Steel Development Association
- Copper Development Centre—Australia
- CSIRO Manufacturing and Infrastructure Technology
- National Plumbing Regulators Forum
- Plastics Industry Pipe Association of Australia
- Plumbing Products Industry Group
- South Australian Water Corporation
- Water Services Association of Australia



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## 1 SCOPE

This WaterMark Technical Specification sets out requirements for a plastic bodied DN 100 overflow relief waste outlet (ORWO) with integral cap-stopper.

The intended function of the waste fitting is to limit stormwater entry to sewer systems in order to prevent flood water damage to Network Utilities Operator infrastructure yet provide overflow relief in the event of sewer surcharge when installed in conjunction with an overflow relief gully.

ORWOs with integral cap-stoppers require certification to WaterMark Level 2.

NOTE: These products can only be used where approved by the authority having jurisdiction.

## 2 APPLICATION

Appendix A sets out the means by which compliance with this WaterMark Technical Specification shall be demonstrated by a manufacturer for the purpose of product certification.

## 3 REFERENCED DOCUMENTS

The following documents are referred to in this WaterMark Technical Specification:

ABCB	Procedures for certification of plumbing and drainage products
AS	
2888	Methods of testing of plastics waste fittings
2888.6	Method for load testing of plastics waste outlets
AS/NZS	
1260	PVC-U pipes and fittings for drain, waste and vent application
1462	Methods of test for plastics pipes and fittings
1462.1	Method for determining the dimensions of pipes and fittings
3500	Plumbing and drainage
3500.0	Glossary of terms
3500.2	Sanitary plumbing and drainage
3500.5	Domestic installations

## 4 DEFINITIONS

For the purpose of this WaterMark Technical Specification, the definitions given in AS/NZS 3500.0 and the one below apply.

### 4.1 Overflow relief waste outlet (ORWO) with integral cap-stopper

A fitting that is designed for use in conjunction with an overflow relief gully, and operates to provide relief from a surge of sewage, whilst restricting inflow of stormwater under flood conditions. The waste outlet fitting includes a cap-stopper as an integral part of the design.

## 5 MATERIALS

### 5.1 General

This Clause specifies requirements for materials utilised in the construction of the product.

### 5.2 Plastics materials

#### 5.2.1 General

Plastics materials shall comply with the relevant Standard for the product type or type of plastics material used.

#### 5.2.2 UV resistance

The plastics material formulation shall include suitable ultraviolet light stabilizers to provide an outdoor exposure design life of 20 years. PVC materials containing 1.5 parts of rutile titanium dioxide (TiO<sub>2</sub>) per 100 parts by mass of PVC content shall be deemed to comply with this requirement.

### 5.3 Metallic materials

#### 5.3.1 Stainless steel

Stainless steel complying with the relevant ASTM standard for product form shall have a recognised corrosion resistance equivalent to or greater than grade 316.

### 5.4 Other materials

Other materials utilised in the product shall be suitable for use in the intended environment, and, in particular, provide resistance to corrosion and outdoor exposure (UV resistance).

## 6 MARKING

Each waste fitting shall be permanently and legibly marked with the following:



- a) Manufacturer's name, brand or trademark.
- b) Warnings on the cap that include the following:
  - (i) 'Not to be obstructed so that overflow relief is inhibited'.
  - (ii) 'Replace cap after overflows'.
  - (iii) 'Introduce water regularly to maintain water seal'.
- c) WaterMark Logo
- d) Licence number.
- e) The number of this WaterMark Technical Specification, i.e. WMTS-498.

NOTE: Where space is limited, the number of the WaterMark Technical Specification may be in an abbreviated form (i.e. S498).

## **7 PACKAGING**

The fitting shall be packaged in such a manner so as to avoid damage during transportation and handling and in a manner that will maintain the physical and dimensional integrity of the fitting is maintained.

## **8 DESIGN**

### **8.1 Connection ends**

#### **8.1.1 Solvent cement socket end**

Sockets for solvent cement jointing to PVC-U pipe shall be tapered and, when measured in accordance with AS/NZS 1462.1, shall comply with the dimensions specified in AS/NZS 1260.

#### **8.1.2 Plain spigot end**

When measured in accordance with AS/NZS 1462.1, plain spigots intended for connection to PVC-U pipe shall comply with the dimensions specified in AS/NZS 1260.

### **8.2 Integral cap-stopper**

The waste fitting shall include an integral cap-stopper that—

- a) has means for prevention of dislodgement under operational conditions;
- b) has an outside diameter at least 2 mm smaller than the internal diameter of the collar of the waste fitting;
- c) is domed upward to not less than 10 mm above the flat surface;



- d) includes at least two vent holes of 4.0 mm minimum diameter;
- e) upon overflow from the relief gully, remains open to enable effective relief; and
- f) utilises compatible materials and a design that does not pose a risk of adhesion to the main body of the waste fitting.

## **9 PERFORMANCE REQUIREMENTS AND TEST METHODS**

### **9.1 Load test**

When tested in accordance with AS 2888.6, the cap-stopper shall withstand a force of 1.0 +0.1, –0 kN for 60 +5, –0 mins without cracking, breaking or being otherwise rendered unserviceable.

### **9.2 Foot ventilation test**

When tested in accordance with Appendix B, the foot ventilation for an overflow-relief gully fitted with an ORWO equal to or greater than shall be—

- a) an overflow relief gully located external to a building and fitted with a standard overflow relief gully grate; and
- b) disconnector gully located internal to a building and fitted with a DN 50 breather vent.

At the completion of the test the water seal in the gully shall not be less than 25mm.

### **9.3 Functional test**

When tested in accordance with Appendix C, the cap-stopper shall—

- a) when subject to simulated flood conditions, operate to limit the entry of water to a maximum of 5 L/min; and

NOTE: Minor inflows through the vents and minor leakage around the cap stopper are not considered a failure if the cap stopper has seated correctly.

- b) when subjected to simulated sewage discharge, lift off relieving the surcharge and preventing the surcharge rising higher than 150 mm in the adjacent riser pipe.



**ABCBC**

## **10 VOID**

## **11 PRODUCT DOCUMENTATION**

### **11.1 Product data**

As minimum, the following information shall be provided with the product:

- a) Product characteristics.
- b) Application and limitations of use.

### **11.2 Installation instructions**

Installation instructions shall be provided and shall include full details of installation procedures for the waste fitting, as follows:

- a) That the ORWO and overflow relief gully (ORG) be located outside the building and be able to be primed by either—
  - (i) discharge from a fixture; or
  - (ii) other approved discharge.

NOTE: A hose tap is not a suitable method of priming the gully.

- b) References to AS/NZS 3500.2 and AS/NZS 3500.5, where applicable.
- c) Detailed step-by-step instruction.
- d) Contact details for after-sales service.

**(Normative)**

**A.1 SCOPE**

This Appendix sets out the means by which compliance with this WaterMark Technical Specification shall be demonstrated by a manufacturer under the WaterMark product certification scheme.

**A.2 RELEVANCE**

The long-term performance of plumbing systems is critical to the durability of building infrastructure, protection of public health and safety, and protection of the environment.

**A.3 PRODUCT CERTIFICATION**

The purpose of product certification is to provide independent assurance of the claim by the manufacturer that products comply with this WaterMark Technical Specification.

The certification scheme serves to indicate that the products consistently conform to the requirements of this WaterMark Technical Specification.

The frequency of the sampling and testing plan, as detailed in Paragraph A5, shall be used by the WaterMark Conformity Assessment Body. Where a batch release testing program is required, it shall be carried out by the manufacturer as detailed in Paragraph A5 and Table A2.

**A.4 DEFINITIONS**

**A.4.1 Sample**

One or more units of product drawn from a batch, selected at random without regard to quality.

NOTE: The number of units of product in the sample is the sample size.

**A.4.2 Sampling plan**

A specific plan that indicates the number of units of components or assemblies to be inspected.

**A.4.3 Type test batch**

Schedule of units of the same type, identical dimensional characteristics, all the same nominal diameter and wall thickness, from the same compound. The batch is defined by the manufacturer.

**A.4.4 Type testing**

Testing performed to demonstrate that the material, component, joint or assembly is capable of conforming to the requirements given in the WaterMark Technical Specification.

**A.5 TESTING**

**A.5.1 Type testing**

Table A1 sets out the requirements for Type Testing and frequency of reverification.

**A.5.2 Batch release testing**

Table A2 sets out the minimum sampling and testing frequency plan for a manufacturer to demonstrate compliance of product(s) to this WaterMark Technical Specification on an ongoing basis. However, where the manufacturer can demonstrate adequate process control to the WaterMark Conformity Assessment Body, the frequency of the sampling and testing nominated by the manufacturer’s quality plan and/or documented procedures shall take precedence for the purposes of WaterMark product certification.

**A.5.3 Retesting**

In the event of a batch release test failure, the products within the batch may be retested at a frequency agreed to with the WaterMark Conformity Assessment Body and only those batches found to comply may be claimed and/or marked as complying with this WaterMark Technical Specification.

**TABLE A1  
TYPE TESTS**

Characteristic	Clause	Requirement	Test method	Frequency
Materials	5	Relevant Standard	Review materials parts lists and data/test reports	At any change in materials specification
Marking	6	Marking	Review against documentation/physical examination	At any change in design/specification
Packaging	7	To avoid damage during transportation and handling		
Design	8.1.1	Connection ends—Solvent cement socket end	AS/NZS 1462.1	At any change in design/specification
	8.1.2	Connection ends—Plain spigot end	AS/NZS 1462.1	

Characteristic	Clause	Requirement	Test method	Frequency
	8.2	Integral cap-stopper	Review of documentation/ physical examination/ AS/NZS 1462.1/Appendix B	
Performance	9.1	Load test	AS 2888.6	At any change in materials, formulation or design or every five years whichever occurs first
	9.2	Foot ventilation test	Appendix B	
	9.3	Functional test	Appendix C	
Product documentation	11	Product data/ Installation instructions	Documentation review	Any factor that requires a change in documentation, e.g. amendments to AS/NZS 3500 series of Standards

**TABLE A2**  
**BATCH RELEASE TESTS**

Characteristic	Clause	Requirement	Test method	Frequency
Materials	5	Relevant Standard	Delivery acceptance tests or supplier's test data	Each delivery batch
Markings	6	Marking	Visual examination	100%
Design	8.1	Connection ends	AS/NZS 1462.1	Once per batch

**(Normative)**

**B.1 SCOPE**

This Appendix sets out the method for verifying that the foot ventilation for an overflow relief gully fitted with an Anti-Infiltration Overflow Relief Point, will be equal to or superior to—

- a) an overflow relief gully located external to a building and fitted with a standard overflow relief gully grate; and
- b) a disconnector gully located internal to a building and fitted with a DN 50 breather vent.

**B.2 PRINCIPLE**

Adequate foot ventilation is provided to an overflow relief gully so that the discharge time of fixture or fixtures connected to the gully, meets requirements of AS/NZS 3500.2.

**B.3 APPARATUS**

The following is required:

- a) Water supply system.
- b) Three equal containers each with a minimum capacity of 10.65 litres to simulate fixtures connected to an ORG.
- c) A test rig to allow each container to discharge through a 50 cm fixture trap to an ORG (refer to Figure B1).
- d) A stop watch to measure the fixture discharge time of each test.
- e) An instrument in order to measure trap seal depth  $\pm 1$ mm.

**B.4 PROCEDURE**

**B.4.1 General**

Three tests shall be conducted:

- a) Test A—ventilation through an open gate.
- b) Test B—ventilation through a connector gully located internal to a building and fitted with a DN 50 breather vent.
- c) Test C—ventilation through an Anti-Infiltration Overflow Relief Point.

Each test shall be performed for discharges from a single container, then two containers simultaneously, and finally three containers simultaneously. Each discharge test shall be repeated seven times.

NOTE: Put simply, perform the Test A seven times discharging a single container, then perform Test A seven times discharging two containers, then perform Test A seven times discharging three containers. Repeat the same process for Test B and C. A testing schedule, and example of a results form, is given in Table B1.

#### **B.4.2 Test A**

The procedure shall be as follows:

- a) Fit the ORG riser pipe with a standard grate.
- b) Discharge the container(s) through the fixture trap (see Figure B1).
- c) Record the time between the start of the discharge of the container(s) to when the last container(s) has drained.

NOTE: All trap seals are measured prior to and after conduct of the test.

#### **B.4.3 Test B—Riser pipe**

The procedure shall be as follows:

- a) Fit the ORG riser pipe with a screwed sealed cap fitted with a DN 50 breather vent which extends vertically three metres to the atmosphere.
- b) Discharge the container(s) through the fixture trap (see Figure B1).
- c) Record the time between the start of the discharge of the container(s) to when the container(s) has drained.

NOTE: All trap seals are measured prior to and after conduct of the test.

#### **B.4.4 Test C—Overflow relief point**

The procedure shall be as follows:

- a) Fit the ORG riser pipe with an anti-infiltration overflow relief device.
- b) Discharge the container(s) through the fixture trap (see Figure B1).
- c) Record the time between the start of the discharge of the container(s) to when the container(s) has drained.
- d) The slowest individual recorded test time for this test shall be within four (4) seconds of the slowest recorded test times of Tests A and B.



- e) The average tests time for all this test shall be within four (4) seconds of the average recorded test times of Tests A and B.

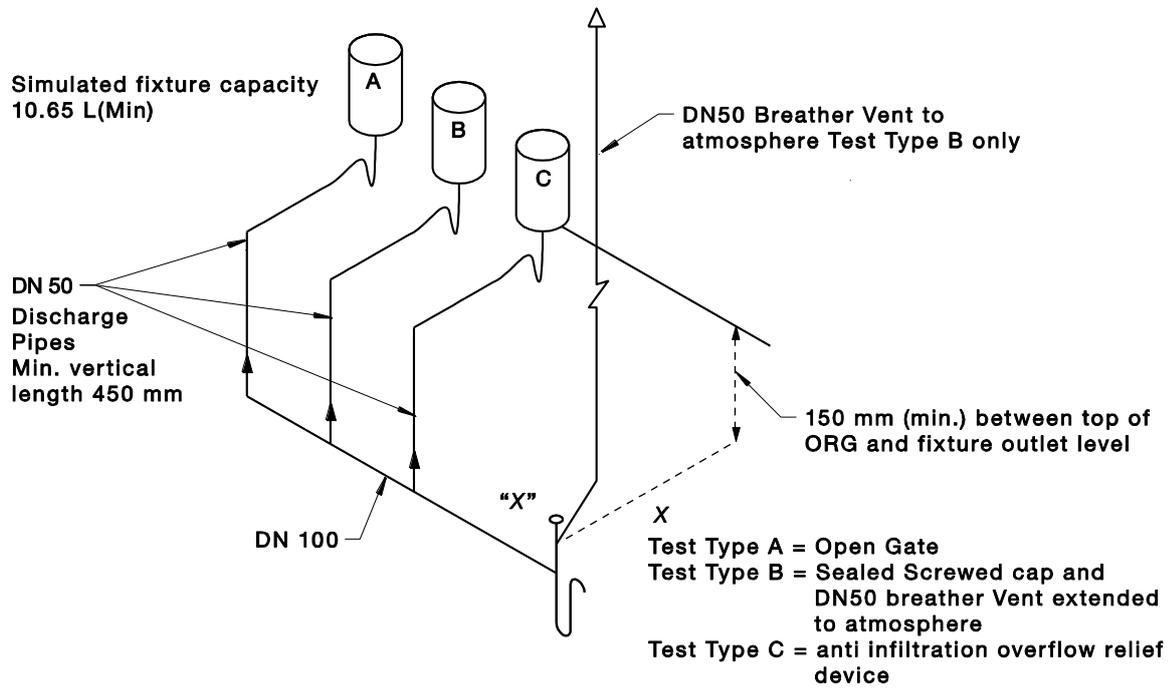
NOTE: All trap seals are measured prior to and after conduct of the test.

## **B.5 TEST REPORT**

The following shall be reported for each test listed in Paragraph B4:

- a) The time taken in each test for the fixture(s) to drain.
- b) The average time taken in all tests for the fixtures to drain.
- c) The slowest individual recorded test time for Test Type C.
- d) The average test time for all Type C tests.
- e) Water seal height in all traps before and after testing.
- f) Reference to this test method, i.e. WMTS-498, Appendix B.

**TEST RIG**



**FIGURE B1 TEST RIG TO SIMULATE FIXTURES DISCHARGING INTO AN ORG**

**TABLE B1  
TESTING SCHEDULE AND SAMPLE RESULTS FORM**

<b>Test A Open grate</b>		
<b>Test No.</b>	<b>No. of containers discharged</b>	<b>Discharge time(s)</b>
A1	1	
A2	1	
A3	1	
A4	1	
A5	1	
A6	1	
A7	1	
<b>Average of 7 tests</b>		
A8	2	
A9	2	
A10	2	
A11	2	
A12	2	
A13	2	
A14	2	
<b>Average of 7 tests</b>		

**TABLE B1 (continued)**

<b>Test No.</b>	<b>No. of containers discharged</b>	<b>Discharge time(s)</b>
A15	3	
A16	3	
A17	3	
A18	3	
A19	3	
A20	3	
A21	3	
<b>Test B Riser pipe</b>		
B1	1	
B2	1	
B3	1	
B4	1	
B5	1	
B6	1	
B7	1	
<b>Average of 7 tests</b>		
B8	2	
B9	2	
B10	2	
B11	2	

**TABLE B1 (continued)**

Test No.	No. of containers discharged	Discharge time(s)
B12	2	
B13	2	
B14	2	
<b>Average of 7 tests</b>		
B15	3	
B16	3	
B17	3	
B18	3	
B19	3	
B20	3	
B21	3	
<b>Average of 7 tests</b>		
<b>Test C Anti-infiltration device fitted to ORG</b>		
C1	1	
C2	1	
C3	1	
C4	1	
C5	1	
C6	1	
C7	1	

**TABLE B1 (continued)**

<b>Average of 7 tests</b>		
<b>Test No.</b>	<b>No. of containers discharged</b>	<b>Discharge time(s)</b>
C8	2	
C9	2	
C10	2	
C11	2	
C12	2	
C13	2	
C14	2	
<b>Average of 7 tests</b>		
C15	3	
C16	3	
C127	3	
C18	3	
C19	3	
C20	3	
C21	3	
<b>Average of 7 tests</b>		

**TABLE B1 (continued)**

Comparison of averages

Test type	Average discharge time (A)	Tests type	Average discharge time (B)	Test type	Average discharge time (C)
A(1—7)		B(1—7)		C(1—7)	
A(8—14)		B(8—14)		C(8—14)	
A(15—21)		B(15—21)		C(15—21)	

**(Normative)**

**C.1 SCOPE**

This Appendix sets out the method for determining the function of an Overflow Relief Waste Outlet (ORWO) in restricting inflow of surface water in the event of flooding and relieving the drainage system in the event of a sewage surcharge. The waste outlet would be able to be returned to the normal position after either function.

**C.2 PRINCIPLE**

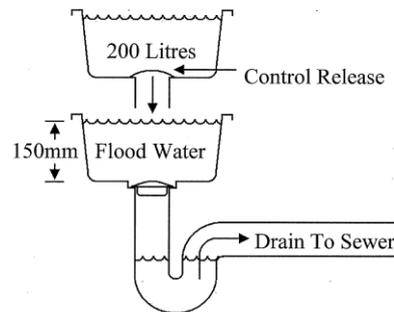
The ORWO is installed in the normal operating condition simulating in field position and a number of conditions are simulated in order to evaluate proper functionality. The following conditions are simulated:

Simulation	Functional performance
Surface flooding/Infiltration	ORWO limits inflows of surface waters into the drainage/sewage system. The ORWO remains functional after being subjected to surface flooding.
Sewage surcharge	The ORWO operates in a manner that relieves the drainage system in the event of a sewage surcharge.

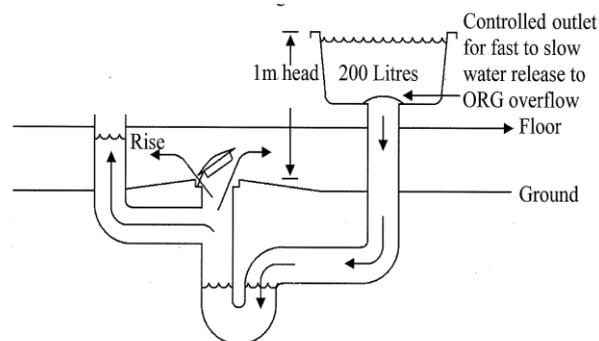
**C.3 APPARATUS**

The following is required:

- a) Suitable test rigs (see Figures C1 and C2) and appropriate equipment to enable simulations and evaluate functional performance of the ORWO. The ORWO is mounted 75 mm above ground level and the lower fixture level (floor level) 150 mm above the ORWO (see Figure C2).
- b) Pressure gauges, flow meters and other equipment in order to establish the simulated conditions during commissioning and evaluation



**Figure C1**  
**Typical Test Rig – Simulated Surface Flooding**



**Figure C2**  
**Typical Test Rig – Sewage Surge**

## C.4 PROCEDURE

### C.4.1 Surface flooding/Infiltration (see ATS 5200.501 Appendix B)

The procedure shall be as follows:

- a) Install the ORWO in a WaterMark certified ORG in accordance with the manufacturer's instructions.
- b) Mount the ORG with the ORWO in the test rig (see Figure C1).
- c) Control release of water to maintain a 150 mm flood level above the ORWO to simulate flood conditions.



- d) Leave in this condition for 60, +5, -0, min and record the volume of water that leaks through the device.
- e) Record the amount of water admitted to the ORWO, in litres per minute, when leakage is established at a constant rate.
- f) Slowly drain the water from the rig.
- g) Repeat Steps (c) to (e) for a further two cycles.

#### **C.4.2 Sewage surcharge**

The procedure shall be as follows:

- a) Install the ORWO in a WaterMark certified ORG in accordance with the manufacturer's instructions.
- b) Mount the ORG with included ORWO in the test rig (see Figure C2).
- c) Introduce water into the gully (200 L in 30 s) by the way of reservoir at 1 m head above the level of the ORG in order to simulate a sewage surcharge. Slowly drain the water and observe the operation of the cap-stopper.
- d) Observe the operation of the ORWO in relieving the surcharge and rise of water in the riser pipe (see Figure C2) adjacent to the ORWO. Record the operations, maximum rise and level changes.
- e) Slowly drain the water and observe the operation of the cap-stopper.
- f) Clean the cap-stopper and reseal.
- g) Repeat Steps (c) to (e) for a further 2 cycles.

#### **C.5 TEST REPORT**

The following shall be reported:

- a) Manufacturer, model, type, size and general description of the ORWO.
- b) Clear description of the equipment used and methods utilised to establish simulations.
- c) For surface flooding simulation, the leakage rate in litres per minute.
- d) For the sewage surcharge simulation the operation of the ORWO and level of rise in the riser pipe.



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- e) Observations noted and general operation of the ORWO when subjected to the individual simulations.
- f) References to the test method, i.e. WMTS-498, Appendix C.



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