



# Xylem Water Solutions Australia Ltd

## PRODUCT APPRAISAL REPORT 1512 Issue 3

Flygt Precast Concrete Sewerage Pump Stations

Issue 1 Published: 30 November 2015

Issue 2 Published: 18 February 2021

## Document History

The following information indicates the changes made to this document.

Date	Version
28 October 2015	Issue 1 Peer Review
30 November 2015	Issue 1 Publication
10 July 2017	Issue 2 Publication
18 February 2021	Issue 3 Client Review
18 February 2021	Issue 3 Publication

## Peer Reviewers

Name/Title	Organisation	Date
Product Appraisal Technical Advisory Group	WSAA	18 November 2015
WSAA Expert Panel	WSAA	18 November 2015
Carl Radford, Product Appraisal Manager	WSAA	30 November 2015
Mohamed H M Yoosuf Consultant	WSAA	10 May 2017
Carl Radford, Product Appraisal Manager	WSAA	11 July 2017
Peter Pittard, WSAA Consultant	WSAA	14 January 2021
Carl Radford, Product Appraisal Manager	WSAA	18 February 2021

## Overview of WSAA

The Water Services Association of Australia (WSAA) is the peak industry body representing the urban water industry. Our members provide water and sewerage services to over 20 million customers in Australia and New Zealand and many of Australia's largest industrial and commercial enterprises.

Based around our vision of 'customer driven, enriching life', WSAA facilitates collaboration, knowledge sharing, networking and cooperation within the urban water industry. We are proud of the collegiate attitude of our members which has led to industry-wide approaches to national water issues.

WSAA can demonstrate success in the standardisation of industry performance monitoring and benchmarking, as well as many research outcomes of national significance. The WSAA Executive retains strong links with policy makers and legislative bodies and their influencers, to monitor emerging issues of importance to the urban water industry.

WSAA was formed in 1995 as a non-profit organisation to foster the exchange of information between industry, government and the community, and to promote sustainable water resource management.

The urban water industry is committed to anchoring its services to customers' values, and to enrich communities where water services have broad economic, environmental and social values. In line with this our main activities focus on four areas:

1. influencing national and state policies on the provision of urban water services and sustainable water resource management
2. promoting debate on environmentally sustainable development and management of water resources and the community health requirements of public water supplies
3. improving industry performance and establishing benchmarks and industry leading practices for water service processes; and
4. fostering the exchange of information on education, training, research, water and wastewater management and treatment and other matters of common interest.

## Copyright

This document is copyrighted. Apart from any use as permitted under the Copyright Act 1968, no part of this document may be reproduced or transmitted in any form or by any means, electronically or mechanical, for any purpose, without the express written permission of Water Services Association of Australia Limited.

© Copyright 2021 by WATER SERVICES ASSOCIATION of Australia Limited **All rights reserved.**

**CONTENTS**

1 EXECUTIVE SUMMARY .....	5
1.1 Recommendations .....	5
2 THE APPLICANT .....	6
2.1 The Supplier .....	6
2.2 The Manufacturers .....	6
3 THE PRODUCT .....	6
4 SCOPE OF THE APPRAISAL .....	8
5 APPRAISAL CRITERIA .....	8
5.1 Quality Assurance Requirements .....	8
5.2 Performance Requirements .....	8
6 COMPLIANCE WITH APPRAISAL CRITERIA .....	8
6.1 Compliance with Quality Assurance Requirements .....	8
6.2 Compliance with Performance Requirements .....	8
6.2.1 Precast components .....	8
6.2.2 Concrete .....	9
6.2.3 Jointing material .....	9
6.2.4 Coatings .....	9
6.2.5 Access covers .....	9
6.2.6 Design verification .....	10
7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION .....	10
8 PRODUCT MARKING .....	10
9 PACKAGING AND TRANSPORTATION .....	11
10 PRODUCT WARRANTY .....	11
11 WATER AGENCY EXPERIENCE WITH THE PRODUCT OR FIELD-TESTING REPORT .....	11
12 OUTCOMES OF EXPERT PANEL PRODUCT REVIEW .....	11
13 FUTURE WORKS .....	12
14 DISCLAIMER .....	12
14.1 Issue of Report .....	12
14.2 Limits on Reliance on Information and Recommendations .....	12
14.2.1 Disclaimer of liability .....	12
14.2.2 Intellectual Property and other rights .....	12
14.2.3 Need for independent assessment .....	13
14.3 No Updating .....	13
14.4 No Warranty .....	13
APPENDIX A – PRODUCT LITERATURE .....	14
APPENDIX B - QUALITY CERTIFICATIONS .....	17
APPENDIX C - SUPPLIER CONTACTS .....	21

## 1 EXECUTIVE SUMMARY

Xylem Water Solutions Australia Ltd (Xylem) is part of a global water technology provider offering a portfolio of products and services to meet the demands of water and wastewater treatment. The company operates from approximately 360 locations in 40 countries around the world and employs some 16,500 people. Its market segments include utilities, industrial, commercial and residential.

This Appraisal is for a range of Flygt packaged precast concrete sewerage pump stations with nominal diameters of 1.8m, 2.2m, 3.0m and 3.8m. The 3.8m equivalent diameter pump station is a patented elliptical design branded VOLYM.

The pump stations are pre-fabricated and supplied complete with necessary accessories including valves, pipes and supports to facilitate installation with minimum civil works and installation times. A wide range of pumps and controls are available to suit individual water agency requirements.

This Issue 3 is to replace the original Appraisal that had reached its expiry date.

The VOLYM pump station is offered with an external valve chamber only whilst the other sizes can be supplied with either an external or internal valve chamber.

Standard flat bottom sump and TOP (The Optimal Pumping) benched sump options are available in all pump station sizes; however, Xylem recommends TOP benching to assist with sedimentation. See Appendix A for further details.

Design review and verification has been completed by appropriately qualified consulting engineers for the pump stations included in this Appraisal. Structural computations have been based on maximum installation depths as follows:

Diameter	Maximum Depth
1.8m	8m
2.2m	14m
3.0m	14m
3.8m	15m

Each pump station can be designed to accommodate single or multi part ductile iron Class B or Class D access covers and Class A or Class B aluminium access covers.

The precast concrete components are manufactured exclusively for Xylem by RI-Industries Developments Pty Ltd using pre-mixed concrete with a minimum of 50 MPa ultimate compressive strength, supplied by SA Premium Cement & Concrete Pty Ltd. The wet well segments are sealed with a flexible mastic joint sealant, Butyl Mastic, supplied by C-Tech Rubber Pty Ltd.

Xylem and each of its major component suppliers hold an ISO 9001:2015 Quality Management System Licence.

There is currently no Australian or International standard that provides specific criteria for the manufacture of pre-cast concrete pump stations for sewerage applications.

This Appraisal has determined that the Flygt range of packaged precast concrete sewerage pump stations as detailed in this report meet the requirements of WSAA and are considered as 'fit-for-purpose'.

### 1.1 Recommendations

It is recommended that WSAA members, subject to any specific requirements of the member, accept or authorise the Flygt packaged precast concrete sewerage pump stations as detailed in this report for use in sewerage networks provided the design installation, testing and commissioning are in accordance with relevant WSAA Codes and manufacturer's requirements.

## **2 THE APPLICANT**

The Applicant is Xylem Water Solutions Australia Ltd.

### **2.1 The Supplier**

Xylem Water Solutions Ltd (Xylem) emerged from the USA based International Telephone and Telegraph Corporation (ITT) in 2011. Its 2019 revenue was in excess of \$US5.5bn.

Xylem is a global water technology provider offering a portfolio of products and services to meet the demands of water and wastewater treatment. The company operates from approximately 360 locations in 40 countries around the world and employs some 16,500 people.

The company is structured into three segments; Water Infrastructure, Applied Water and Measurement and Control Solutions servicing utilities, industrial, commercial and residential customers. Some of its well-known brand names include Flygt, Godwin, Wedeco, Sanitaire and Leopold.

Xylem has been servicing Australia for more than 40 years with a national network of sales, rental and services, providing solutions in pumping, mixing, water disinfection, filtration and aeration.

### **2.2 The Manufacturers**

RI-Industries Developments Pty Ltd, based in South Australia, has been manufacturing precast concrete products including septic tanks, waste water treatment tanks and rainwater tanks since 1947. RI-Industries Developments is an exclusive manufacturer of the precast concrete components for the Flygt sewerage pump stations to Xylem designs; base casting, standard increments, internal and external valve chambers and the cover slab.

RI sources their premixed concrete supply from SA Premium Cement & Concrete Pty Ltd based in South Australia.

## **3 THE PRODUCT**

This Appraisal is for a range of Flygt packaged precast concrete sewerage pump stations with nominal diameters of 1.8m, 2.2m, 3.0m and 3.8m. The 3.8m equivalent diameter pump station is a patented elliptical design branded VOLYM.

The pump stations are pre-fabricated and supplied complete with necessary accessories including valves, pipes and supports to minimise civil works and installation times. A wide range of optional accessories including pumps and valves installed with either PE or DI pipework, well washers, ladders (fibre reinforced plastic or Grade 316 Stainless Steel) platforms, lifting chains, support brackets, guide rails and level controls are available to suit individual water agency requirements. Electrical controls including the main switchboard and remote communications can also be supplied by Xylem to water agency specifications where required.

The moulded precast concrete components of the pump stations consist of a base unit, wet well segments, fully enclosed internal valve chamber or external valve chamber and a cover slab. The precast concrete has a minimum of 50 MPa ultimate compressive strength with a minimum internal cover to reinforcement of 45mm. Calcareous aggregate is used. The wet well segments are sealed using a flexible mastic joint sealant, Butyl Mastic.

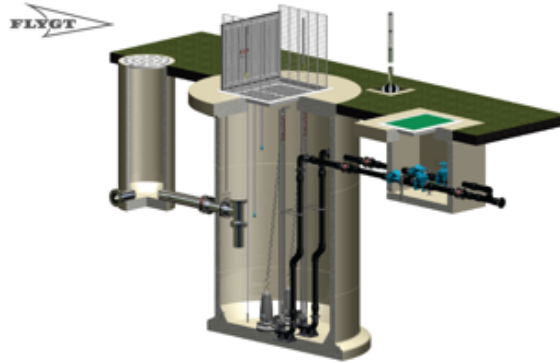
Single or multipart access covers for the wet well and valve chamber may be Class A / Class B aluminium or Class B / Class D ductile iron. Hinged aluminium safety grates are mounted beneath the access cover on the wet well to prevent operators from accidentally falling in.

The VOLYM pump station is offered with an external valve chamber only whilst the other sizes can be supplied with either an external or internal valve chamber.

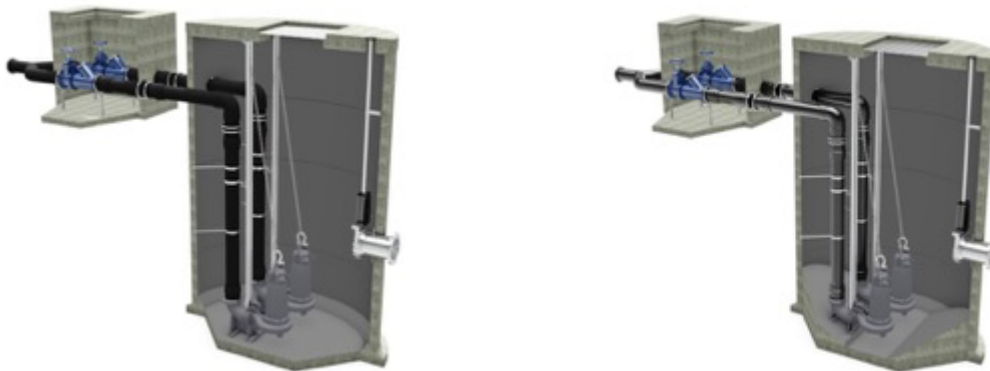
The valve chambers and flow meter chambers are normally supplied with pre-configured sizes but may be custom built to customer requirements.

Standard flat bottom sump and TOP (The Optimal Pumping) benched sump options are available for all pump station sizes; however, Xylem recommends TOP benching to assist with sedimentation. See Appendix A for further details.

See Figures 1 and 2 for typical arrangements.



**FIGURE 1  
TYPICAL PUMP STATION ARRANGEMENT WITH FLAT BOTTOM AND EXTERNAL VALVE CHAMBER**



**FIGURE 2  
VOLYM ELLIPTICAL PUMP STATION ARRANGEMENT WITH FLAT BOTTOM OR TOP BENCHED BOTTOM AND EXTERNAL VALVE CHAMBER**

Design review and verification has been completed by appropriately qualified consulting engineers for the pump stations included in this Appraisal. Structural computations have been based on the installation depths detailed in Table 1. Other assumptions and criteria are contained within the review and available directly from Xylem.

**TABLE 1 PUMP STATION DEPTHS**

Pump Station Diameter m	Minimum Depth m		Maximum Depth m	Available Increment Heights m
	External Valve Chamber	Internal Valve Chamber		
1.8	2.05	3.05	8.0	0.5 to 1.5
2.2	2.02	3.07	14.0	0.5 to 2.2
3.0	1.25	2.25	14.0	0.5 to 2.2
3.8	1.75	N/A	15.0	1.0 to 2.2

## 4 SCOPE OF THE APPRAISAL

This Appraisal is for a range of Flygt packaged precast concrete sewerage pump stations with equivalent nominal diameters of 1.8m, 2.2m, 3.0m and 3.8m.

## 5 APPRAISAL CRITERIA

### 5.1 Quality Assurance Requirements

The WSAA Product Appraisal Technical Advisory Group accepts precast concrete sewerage pump stations where the product and its components are manufactured and supplied under cover of ISO 9001 quality management systems.

There is no applicable Australian or International standard that provides specific criteria for precast concrete sewerage pump stations.

### 5.2 Performance Requirements

Precast concrete for the pump station components is required to comply with AS 1379:2007 *Specification and supply of concrete* and WSA 114:2002 *Industry standard for concrete special class*. A minimum 50 MPa ultimate compressive strength is required.

Access covers are required to comply with AS 3996:2019 *Access covers and grates*.

A design review and structural verification is required to be completed by appropriately qualified independent engineers.

Appraisal criteria is determined by the WSAA Product Appraisal Technical Advisory Group and regularly reviewed to ensure that the criteria reflect the requirements of WSAA members.

The following Product Specification is also relevant to this application:

WSA PS 358 *Concrete, pre-mixed, special class*

A copy of the Product Specification is available at the following link:

<https://www.wsaa.asn.au/shop/product/35716>

## 6 COMPLIANCE WITH APPRAISAL CRITERIA

### 6.1 Compliance with Quality Assurance Requirements

Xylem has submitted the following quality certificates:

- ISO 9001:2015 Certificate of Registration No. 10241565 issued to Xylem Water Solutions Australia Ltd by Lloyds Register.
- ISO 9001:2015 Certificate of Registration No. AU1390-QC-EC-SC issued to RI Industries by TQCS International (Group) Pty Ltd.
- ISO 9001:2015 Certificate of Registration No. 471012021 issued to SA Premium Cement & Concrete Pty Ltd by Quality Control Services (Environmental) Pty Ltd.

Copies of the Quality Assurance licences have been included in Appendix B and are also available from WSAA.

### 6.2 Compliance with Performance Requirements

#### 6.2.1 Precast components

RI-Industries exclusively manufactures the precast concrete components for the Flygt pump stations in accordance with Xylem designs and tooling. These components include the base unit, wet well segments, fully enclosed internal valve chamber or external valve chamber and cover slab. Lifting points and anchors are provided both internally and externally for each of the pump station components.

The most relevant standards for the manufacture of the pump stations are AS 3735:2001 *Concrete structures for retaining liquids*, AS 1302:1991 *Steel reinforcing bars for concrete*,



*AS 1303:1991 Steel reinforcing wire for concrete, AS1304:1991 Welded wire reinforcing fabric for concrete and AS 3610.1:2018 Formwork for concrete specifications.*

AS 3735 nominates the concrete minimum internal cover over reinforcement as 45mm for 50 MPa concrete. The Flygt pump stations are designed with 55mm internal cover for the 1.8m and 2.2m versions, 60mm for the 3m version and 65mm for the 3.8m version.

The dimensions of the pump stations and their components can be sourced directly from Xylem.

### **6.2.2 Concrete**

The premixed concrete is supplied by SA Premium Cement & Concrete Pty Ltd in accordance with Xylem requirements. The concrete for the pump station components complies with AS 1379:2007 *Specification and supply of concrete* and WSA 114:2002 *Industry standard for concrete special class*. The design specifications are for a minimum 50 MPa ultimate compressive strength however the concrete supplied by Premium is minimum 55 MPa. Calcareous aggregate with a maximum size of 20mm is used.

The SR cement complies with AS 3972 *Portland cement*, the aggregates comply with AS 2758.1 *Aggregates and rock for engineering purposes – Concrete aggregates* and the admixtures comply with AS 1478.1 *Chemical admixtures for concrete, mortar and grout admixtures for concrete*.

Routine testing is undertaken by Lab SA (NATA Accreditation No 375) to ensure compliance with the specifications. A copy of a typical test report has been submitted by Xylem.

### **6.2.3 Jointing material**

The concrete wet well segments and cover slab are jointed using a Butyl Mastic Joint Sealant complying with ASTM C990 manufactured by C-Tech Rubber Pty Ltd. Details are provided in Appendix A.

### **6.2.4 Coatings**

The pump stations are normally supplied unlined and uncoated; however, linings can be supplied in accordance with customer requirements.

Common linings include high build epoxy or other paint systems (refer to WSA 201 *Manual for the selection and application of coatings*.) Flygt recommends Megapoxy MC Epoxy coating as a suitable lining material. The lining can be independently tested and certified by a coating inspector. Further details are available at the following link: <http://megapoxy.com/wp-content/uploads/2017/05/Megapoxy-MC.pdf>

Xylem also offers a mechanically anchored polyethylene lining that is integrated into the concrete at the time of manufacture. This lining is reported to extend the life of the pump station beyond 100 years. Further details of the BluSeal Anchor Knob HDPE Concrete Protection Membrane can be accessed at the following link: <http://www.bluey.com.au/wp-content/uploads/2012/02/BluSeal-AKS-LR-R3.pdf>

### **6.2.5 Access covers**

Single or multiple part ductile iron access covers complying with AS 3996:2019 *Access covers and grates* are sourced from suppliers with ISO Type 5 product certification and assembled by RI-Industries. The access covers may be Class B for non-trafficable areas or Class D for trafficable areas.

Grade 5005 aluminium gas and water tight Class A or Class B access covers are provided for the wet well and valve chambers. The covers are manufactured from 4mm checker plate for Class A covers and 6mm checker plate for Class B covers. They incorporate recessed hinges and lifting handles and are not suitable for vehicle loadings. Hinged safety grates are located below the access covers to prevent the operators from falling into the wet well.

The aluminium lids can also be supplied with post/rail inserts built into the frame.

Access covers can be supplied to suit individual water agency requirements.

### **6.2.6 Design verification**

The pump stations are required to have a design review and verification completed by appropriately qualified and independent consulting engineers. The review includes verification of structural adequacy and buoyancy checks up to the depths nominated in Table 1.

The review for the 1.8m, 2.2m and 3m pump station versions was undertaken by Cox Consulting Engineering and validated by Peter H Cox. Peter is registered as a Chartered Professional Engineer on the National Professional Engineers Register (NPER), Fellow Member of Engineers Australia and a Registered Professional Engineer of Queensland (RPEQ 13603).

The review for the Volym 3.8m pump station was undertaken by TMK Consulting Engineers and validated by Michael Talladira. Michael, a director of TMK Consulting Engineers, is a Chartered Professional Engineer with Engineers Australia (Membership No. 230607) and a Registered Building Practitioner, Engineer EC 2164.

The standards utilised to complete the reviews include AS 3735 *Concrete Structures for Retaining Liquids*, AS 3600 *Concrete Structures*, AS 1170.0 *Structural design actions-general principles*, AS 1170.1 *Minimum design loads on structures*, AS 5100.2 *Bridge Design- Design Loads*, AS 4678 *Earth retaining structures*.

Copies of the design and construction reviews and associated drawings may be obtained directly from Xylem.

## **7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION**

Xylem provides customers with proforma documents for submission of their pump station requirements including diagrams for customers to nominate pipeline positions for location factory cored apertures. Xylem also provides a checklist of items required to be completed prior to commissioning of the pump station.

Xylem recommends that a site investigation is completed to establish indicative subsurface conditions prior to the commencement of construction. Recommendations are available from Xylem for construction and backfill requirements.

Xylem advise that installation is usually carried out by experienced civil contractors but the pre-packaged design provides a simple and trouble-free assembly. A Xylem representative can be made available to provide specialised assistance or to oversee the installation. The pump station is delivered in numbered segments fully pre-cored in accordance with design requirements and with general assembly instructions for the civil contractor. The pump station concrete components are fitted with swift lift anchors 'cast in' for ease and security of slinging, lifting and placement. Location keys moulded in each increment ensure no rotational misalignment can occur.

Xylem provides a general installation guideline to enable agencies to follow the assembly and ensure the installation proceeds in accordance with the manufacturer's expectations. These guidelines are for use with specific instructions provided for each pumping station. If required, Xylem can also supply on-site supervision and technical assistance through to complete installation and commissioning in most regional areas.

At the completion of commissioning Xylem provides the asset owner with Operation and Maintenance Manuals.

## **8 PRODUCT MARKING**

The Flygt nameplate is embossed into the concrete cover slab and also stencilled on the side of the increments. Traceability is not an issue with pumping stations as their

manufacture and specification is normally well documented in records held by the water agency.

Each segment is numbered and arrows are provided to assist with installation.

## **9 PACKAGING AND TRANSPORTATION**

Xylem is responsible for delivery of the precast concrete components to site. The precast components are loaded onto a truck using timber chocks between and beneath each component.

## **10 PRODUCT WARRANTY**

The products are covered by the normal commercial and legal requirements of the *Competition and Consumer Act 2010 (Cth)*, which covers manufacture to the relevant standard, and details of Xylem's warranty is included in their terms and conditions of sale.

Xylem's offer can include a complete turnkey operation including a long-term service contract. Specific warranty conditions should be discussed with Xylem.

## **11 WATER AGENCY EXPERIENCE WITH THE PRODUCT OR FIELD-TESTING REPORT**

More than 1000 Flygt packaged precast concrete sewerage pump stations have been installed within Australia over the last 25 years. The following major water agencies are listed among its users: South East Water, Yarra Valley Water, City West Water, SA Water, Barwon Water and Goulburn Valley Water.

## **12 OUTCOMES OF EXPERT PANEL PRODUCT REVIEW**

The following queries were raised in the previous issues and have not been addressed in the body of this Appraisal report.

Q1: Is a cored hole in a reinforced component likely to expose any steel? If so, what assurance is there that the steel will be adequately covered by epoxy or mortar and be prevented from corrosion?

A1: When reinforcement is exposed due to core drilling, the wall penetration is sealed with a recommended epoxy compound, Megapoxy P1. When dry the epoxy is harder than concrete, sealing the penetration and covering any cut reinforcement. See further details at the following link: <http://megapoxy.com/wp-content/uploads/2019/10/Megapoxy-P1.pdf>

Q2: Does Xylem offer a pump station design and drafting service or is it outsourced?

A2: Xylem has a team of internal engineers who design each pump station specifically for the customers' requirements and create drafted 3D and 2D drawings. Flygt have booklets published on general pump station design guidelines that are available from Xylem.

Q3: How does Xylem address vapour attack on the underside of the cover slab?

A3: Sulphide corrosion is minimised with the use of calcareous concrete, typically the concrete is designed for a 50-year life in a domestic sewer application. Further protection can be applied with the use of coatings. See Section 6.2.4.

Q4: Can block outs instead of core penetrations be used and is it possible to specify an integrally cast embedded pipe connector into a precast concrete segment.

A4: Block outs are used on the inlet and outlet of the valve chambers saving time instead of drilling coring holes. The pump chamber can also be cast with block outs if the pipe positions are predetermined. Pipes cannot be precast into either the valve or pump chambers; they must be inserted after casting is completed. Pipe can be fitted into the block out or cored hole and epoxy sealed in the factory. Puddle flanges can also be fitted to the pipework; these are not cast into the concrete but can be epoxy sealed in the factory.

### **13 FUTURE WORKS**

No future works have been identified.

### **14 DISCLAIMER**

This Product Appraisal Report (Report) is issued by the Water Services Association of Australia Limited on the understanding that:

This Report applies to the product(s) as submitted. Any changes to the product(s) either minor or major shall void this Report.

To maintain the recommendations of this Report any such changes shall be detailed and notified to the Product Appraisal Manager for consideration and review of the 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.

The following information explains a number of very important limits on your ability to rely on the information in this Report. Please read it carefully and take it into account when considering the contents of this Report.

Any enquiries regarding this report should be directed to the Program Manager, Carl Radford, Phone: 03 8605 7601 email [carl.radford@wsaa.asn.au](mailto:carl.radford@wsaa.asn.au).

#### **14.1 Issue of Report**

This Report has been published and/or prepared by the Water Services Association of Australia Limited 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.

#### **14.2 Limits on Reliance on Information and Recommendations**

##### **14.2.1 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 anything) 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.

##### **14.2.2 Intellectual Property and other rights**

The Water Services Association of Australia Limited does not undertake any assessment of whether the importation, manufacture, sale or use of the Product the subject of this Report infringes the intellectual property rights or proprietary rights of any person. Recipients of the report should undertake their own assessment of whether (as relevant) the importation, manufacture, sale or use of the relevant Products infringe the intellectual property rights or other proprietary rights of any person. If the Product infringes intellectual property rights or other proprietary rights there is potential for the supply of the Products to be interrupted.

From time to time the Water Services Association of Australia Limited and the other Publishers may receive notice of allegations that the importation, manufacture, sale or use

of the Product infringes intellectual property rights or other proprietary rights. The Water Services Association of Australia Limited's policy is to not refer to such allegations in its reports or take any other steps to put Recipients on notice of such allegations, unless and until it is aware that the allegations have been admitted or proved in Court. As such, Recipients acknowledge, agree and accept that the Water Services Association of Australia Limited may have information in its possession about intellectual property rights infringement allegations or other infringement allegations in relation to the Product which are not referred to or disclosed in this Report and which are not otherwise communicated to Recipients.

#### **14.2.3 Need for independent assessment**

The information and any recommendation contained (expressly or by implication) in this Report are provided in good faith (and subject to the limitations noted in this Report). 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.

WSAA has not evaluated the extent of the product liability and professional indemnity insurance that the provider of the product maintains. Recipients should ensure that they evaluate the allocation of liability for product defects and any professional advice obtained in relation to the product or its specification including the requirements for product liability and professional indemnity insurance.

#### **14.3 No Updating**

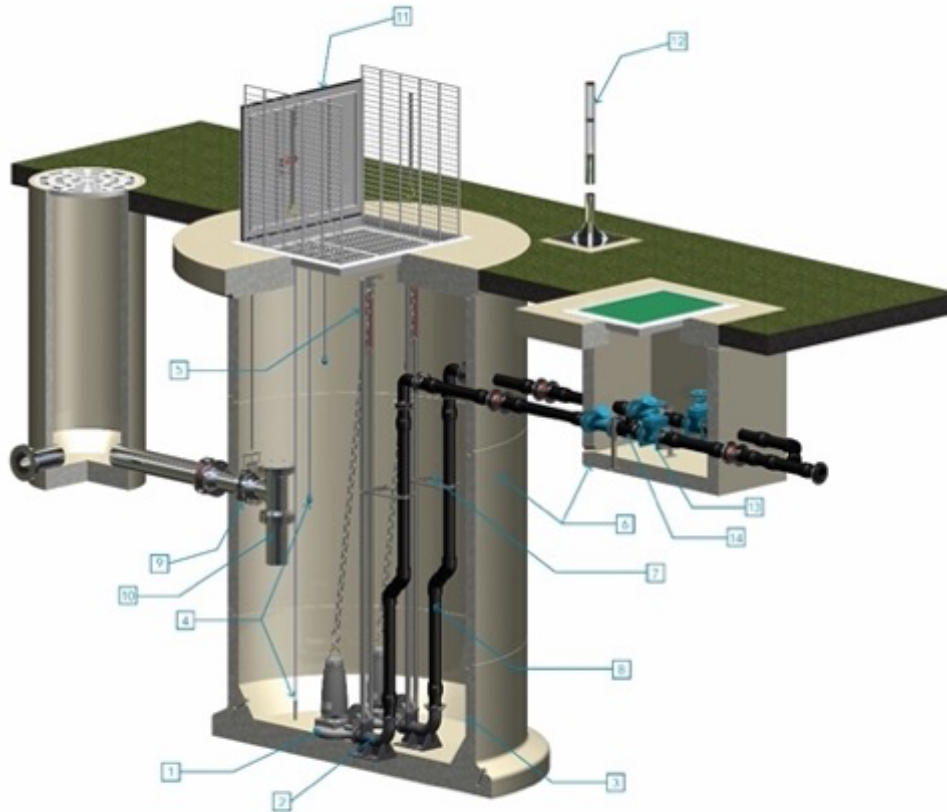
Neither the Publisher(s) nor any person involved in the preparation of this Report [has] [have] any obligation to notify you of any change in the information contained in this Report or of any new information concerning the Publisher(s) or the Product or any other matter.

#### **14.4 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 – PRODUCT LITERATURE

A comprehensive suite of product literature including drawings and other support information is available directly from Xylem



**1 - Flygt Pumps** – is the heart of Flygt Packaged Pump Station

**2 - Flygt Discharge Pedestal** – specially designed to reduce vibration & turbulent flow while allowing for easy connection to the Flygt pump.

**3 - Flygt Calcareous Aggregate Concrete Base Unit** – Cast as one complete reinforced unit with a 50 MPa structural strength, the base design allows for an ingress free active volume.

**4 - Flygt Monitoring & Control Equipment** – engineered to make the pumping station perform at its optimum.

**5 - Flygt Upper Guide Rail Brackets & Guide Rails** – engineered to allow for quick & easy installation of the Flygt pump onto the Flygt pedestal; just slide the pump down the rails & you're ready to go.

**6 - Flygt Calcareous Aggregate Concrete Components** – precast reinforced concrete made to a 50 MPa structural strength; easily transported to site & designed to withstand what any pump station project may entail.

**7 - Flygt Intermediate Guide Rail Brackets** – for the deeper stations where more support is needed, we've got the engineered equipment to fulfil your requirements.

**8 - HDPE PN16 Pipework** – inert to the toxic gasses present in a closed sewage environment, making it ideal for use within the Flygt Packaged Pump Station.

**9 - 316SS Unidirectional Knife Gate Valve** – specially designed with a 316SS Inlet Spool & Extended Spindle to allow for trouble free installation & quick operation from ground level.

**10 - Inlet Diffuser** – designed to create more efficient pump operation by allowing for less turbulent inflow from the incoming gravity line to the pump station.

**11 - Aluminium Access Cover with Safety Grates** – Xylem prides itself on safety. We offer safe methods of entrance and inspection to our pump station internals, with safety grates supplied as standard for the pump access cover.

**12 - Vent Stack Assembly** – engineered to prevent the build-up of toxic gasses within the station.

**13 - Ball Check Valve & Gate Valve** – designed to the Australian Standards & built for the Australian market.

**14 - Bypass Tee Piece** – enables a temporary bypass connection to a Godwin pumping unit to allow for inspection & service to the Packaged Pump Station.



## TOP Sump Bottom



### PRODUCT FEATURES

- Flygt TOP patented geometry for a clean sump
- Sediments are cleared by water turbulence
- Discharge connection with MULTI-JOINT® pipe connection
- Twin guide bars ensure correct pump position
- Automatic pump hook-up to the discharge pipe

### FLYGT TOP GEOMETRY FOR A CONCRETE PUMP STATION WITH SELF-CLEANING SUMP

A concrete pump station works better with the patented Flygt TOP sump geometry. The sump stays clean, which minimizes unscheduled maintenance calls.

The optimized geometry leaves no space for sludge to accumulate. The small remaining water volume at the end of every pumping cycle gives high water velocity in the sump. The high velocity combined with the turbulence suspends sedimentation and floating solids in the wastewater so that they are pumped away.

The Flygt TOP sump bottom can be used in new pump stations or for retrofitting existing sumps.

The Flygt submersible pump is easy to install and to remove for service. Just lower it onto the discharge connection, and it hooks up automatically. When you need to lift it, it disengages automatically.

The twin guide bars make sure that the pump is in correct position for hooking onto the submerged discharge connection. The integrated lower guide bar support, together with the sliding bracket of the pump, ensures a perfect fit when the pump is lowered into position. The pump flange slides vertically down along the discharge connection flange. The robust metal-to-metal contact between the flanges allows the pump to clear away any debris that might get caught between the flanges and cause leakages.

#### Traditional Wet-well design.

#### FLYGT TOP Sump design

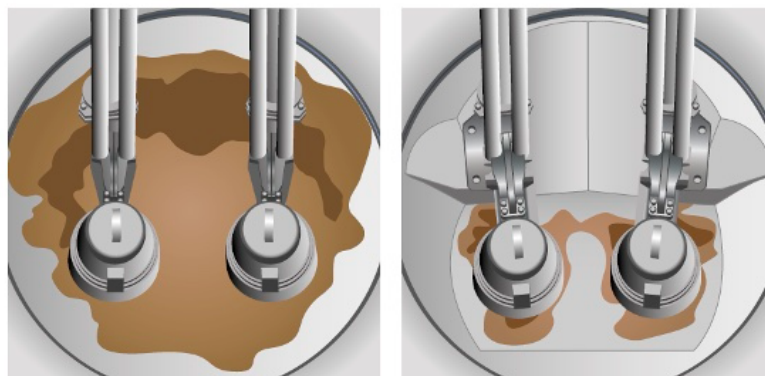


Figure 5. Back-to-back test - sand and plastic bead deposits (contour marked by a red line) in the standard and TOP sumps after a total of 40 pumping cycles. The mass of sediment in the standard sump was 94kg and in the TOP sump, 4kg



# Butyl Mastic Joint Sealant

Direct from manufacturer

**For Use in Concrete Joints**

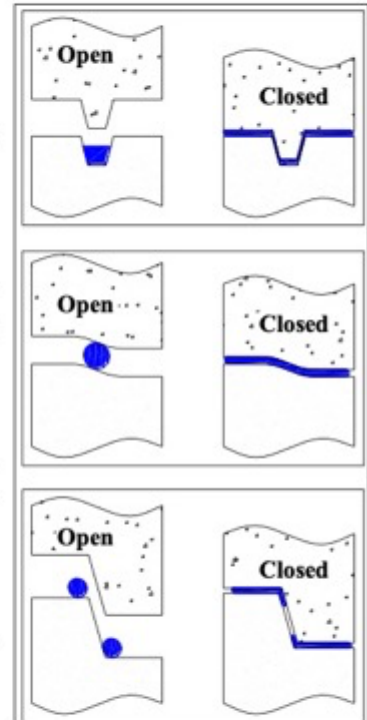
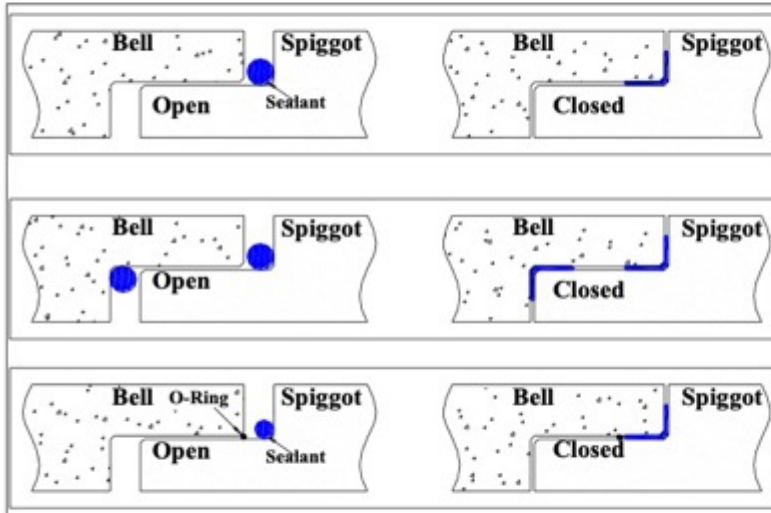
- Meets ASTM C-990
- Seals quickly and effectively
- Excellent adhesion to surfaces
- Large working temperature range
- Stays permanently bonded yet maintains flexibility
- Non-toxic
- Will not oxidize or shrink
- If required can have a root inhibitor mixed into compound



**How to Apply**

1. Brush down sealing surfaces to remove foreign material.
2. Ensure sealing surface is free of moisture.
3. Press the tip of the exposed sealant against bottom of the jointing surface, then wrap the sealant around the joint and but the ends together.
4. Remove paper wrapper and couple the joint.
5. Wet or unusual conditions may require a primer.

**Various Profiles Available**



**C-Tech Rubber USA LLC**

7206 Peppermill Parkway Phone: 843 552 4496  
 North Charleston SC 29418 Fax: 843 552 0040  
 USA Cell: 843 822 0664  
 Email: stevesuttie@homesc.com

**C-Tech Rubber Pty Ltd**

17 Devon Road Ph: 61 2 9829 3022  
 Ingleburn NSW 2565 Fax: 61 2 9829 4085  
 Australia  
 Email: sales@ctech-rubber.com.au



Web: [www.ctech-rubber.com.au](http://www.ctech-rubber.com.au)



## APPENDIX B - QUALITY CERTIFICATIONS

Copies of the following Quality Certification Certificates are available for downloading from the WSAA Members Website.

**TABLE B1  
XYLEM WATER SOLUTIONS AUSTRALIA LTD – MANAGEMENT SYSTEMS**

Unit 2 2 Capicure Drive Eastern Creek NSW	
Quality Systems Standard	ISO 9001:2105
Certification Licence No.	10241565
Certifying Agency	Lloyds Register
First Date of Certification	10 October 1994
Current Date of Certification	2 January 2020
Expiry Date of Certification	31 January 2023

**TABLE B2  
RI-INDUSTRIES – MANAGEMENT SYSTEMS**

618 South Road Angle Park SA	
Quality Systems Standard	ISO 9001:2105
Certification Licence No.	AU1390-QC-EC-SC
Certifying Agency	TQCSI
First Date of Certification	7 April 2016
Current Date of Certification	20 June 2018
Expiry Date of Certification	6 April 2021

**TABLE B3  
SA PREMIUM CEMENT & CONCRETE PTY LTD – MANAGEMENT SYSTEMS**

126 Churchill Road North Dry Creek SA	
Quality Systems Standard	ISO 9001:2105
Certification Licence No.	471012021
Certifying Agency	QCSE
First Date of Certification	19 June 2018
Current Date of Certification	21 June 2018
Expiry Date of Certification	18 June 2021



Current issue date: 2 January 2020  
 Expiry date: 31 January 2023  
 Certificate identity number: 10241565

Original approval(s):  
 ISO 9001 - 10 October 1994

# Certificate of Approval

This is to certify that the Management System of:

## Xylem Water Solutions Australia Limited

Unit 2, 2 Capicure Drive, Eastern Creek, 2766, New South Wales, Australia

has been approved by Lloyd's Register to the following standards:

### ISO 9001:2015

Approval number(s): ISO 9001 – 0048295

This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

The scope of this approval is applicable to:

Water solutions provider involved in design, procurement, stockholding, manufacturing, assembly, marketing, integration, installation, commissioning and project management activities. Combined sales, service and rental of mechanical, civil, electrical and instrumentation solutions for water and wastewater applications and associated aftermarket support.

**Luis Cunha**

Area Operations Manager - SAMEA

Issued by: Lloyd's Register Quality Assurance Limited



Lloyd's Register Group Limited, its affiliates and subsidiaries, including Lloyd's Register Quality Assurance Limited (LRQA), and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract. Issued by: Lloyd's Register Quality Assurance Limited, Level 16, 461 Bourke Street, Melbourne VIC 3000, Australia  
 To confirm the validity of the accreditation for this certificate please visit [www.jas-anz.com.au/register](http://www.jas-anz.com.au/register)



Quality Certified

# Certificate of Registration

## Ri Industries

ABN: 81 007 647 323

618 South Road, ANGLE PARK, SA, 5010, Australia  
24 Davis Street, WINGFIELD, SA, 5013, Australia

operates a

### Quality Management System

which complies with the requirements of

### ISO 9001:2015

The registration covers the manufacture and supply of pre-cast concrete products.

**Original Certification:** 7 April 2016  
**Issue/Revised Date:** 20 June 2018

**Registration No:** AU1390-QC-EC-SC  
**Expiry Date:** 6 April 2021

Sean Bates  
Accreditation Manager  
TQCS International (Group) Pty Ltd  
for the TQCSI Certification Approval Panel



Stuart Batchelor  
General Manager  
TQCSI (Australia)

This certificate verifies the original certificate issued and is valid as long as it is displayed as an electronic copy at [www.tqcsi.com](http://www.tqcsi.com) and surveillance audits are satisfactorily completed. TQCS International Pty Ltd (ABN 59 065 953 924) of Quality House, 117A Tapleys Hill Road, Hendon, SA, 5014, Australia issues certification subject to the TQCSI Rules of Certification.



TQCS International Pty Ltd  
[www.tqcsi.com](http://www.tqcsi.com)



[www.aacb.com.au](http://www.aacb.com.au)



[www.iaf.nu](http://www.iaf.nu)



[www.jas-anz.org/register](http://www.jas-anz.org/register)

## CERTIFICATE OF REGISTRATION

# SA Premium Cement & Concrete Pty Ltd

126 Churchill Road North, Dry Creek SA 5094 Australia  
ABN 77 620 729 026

complies with the requirements of

**ISO 9001:2015**

Quality Management Systems – Requirements

and

**ISO 14001:2015**

Environmental Management Systems – Requirements with guidance for use

for the following capability:

This registration covers the Quality and Environmental Management Systems for the supply of cementitious materials and production and supply of pre-mixed concrete.

Registered by:

**Quality Control Services (Environmental) Pty Ltd**

ABN 85 102 935 195

South Australia, Australia

This certificate is subject to the Terms and Conditions for Certification, and relevant program rules. Currency of certification can be validated at [www.qcse.com.au/certified\\_register](http://www.qcse.com.au/certified_register), and [www.jas-anz.org/our-directory/certified-organisations](http://www.jas-anz.org/our-directory/certified-organisations); it remains the property of QCSE Pty Ltd and must be returned upon request.

Certificate Number: 471012021

Issue Date: 21 June 2018

Certification Date: 19 June 2018

Expiry Date: 18 June 2021

*CASTONE*

Cheryl Stone  
Certification Manager



QMS/EMS Certified Company  
Licence Number: Q0471



[www.jas-anz.org/register](http://www.jas-anz.org/register)

## **APPENDIX C - SUPPLIER CONTACTS**

**Xylem Water Solutions Australia Limited**

2 Capicure Drive

Eastern Creek NSW 2766

Phone: 131914

Email: [solve.east@xylem.com](mailto:solve.east@xylem.com)

Website: <https://www.xylem.com/en-au/>



**Melbourne Office**

Level 8, Suite 8.02  
401 Docklands Drive  
Docklands VIC 3008

**Sydney Office**

Level 9 420 George Street  
Sydney NSW 2000  
GPO Box 915  
Sydney NSW 2001

P +61 (0) 3 8605 7666  
email: [info@wsaa.asn.au](mailto:info@wsaa.asn.au)

[www.wsaa.asn.au](http://www.wsaa.asn.au)