

**TECHNICAL STANDARD****PVC WATERSTOP**

Issued by:                      Manager Engineering

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## APPROVAL TO DEVIATE FROM THIS STANDARD

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Approval may be granted by the Asset Owner to deviate from the requirements as stipulated in this Standard if the functional requirements (e.g. Asset Life) for the asset differs from those stated in the Standard, but is assessed as still being acceptable by the Asset Owner's nominated representative.

Any approval to deviate from the stated requirements of this Standard will not be seen as creating a precedent for future like project. Any request to deviate from this Standard must be carried out on a project by project basis where each alternate proposal will be individually assessed on its own merit.

## NO CHANGES REQUIRED IN THE JANUARY 2007 EDITION

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The following lists the major changes to the November 1987 edition and published in the September 2004 edition of TS 2:

1. Reformatted from DS to TS (Departmental Standard to Technical Standard), and updated referenced Australian Standards.
2. Conversion to a technical standard by removal of contractual conditions (to be included in the contract that references this standard).
3. Specific material performance properties and requirements have been replaced by a specific product known to provide satisfactory performance.
4. Inclusion of specific training requirements for welding of PVC water stop.

5. Jointing, storage and care and installation requirements have been updated.

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# REFERENCED DOCUMENTS

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**ASTM D 412:** Standard test methods for vulcanized rubber and thermoplastic elastomers - tension

## SECTION 1: DESCRIPTION

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### 1.1 General

This Technical Standard (TS) details the type, jointing and installation requirements of PVC Waterstop for use in the construction of retaining structures for water and wastewater.

### 1.2 SA Water's Representative

SA Water's Representative in this Technical Standard will be nominated by SA Water.

### 1.3 Material

The authorised product shall be 150 mm wide Supercast Hydrofoil plasticised PVC supplied by Parchem.

The use of alternative waterstop types and profiles may be considered and approved by the SA Water's Representative.

## SECTION 2: JOINTING

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### 2.1 General

Where PVC waterstop is required to be built into concrete, it shall be jointed continuously including bends and curves. Waterstop shall be in lengths requiring the minimum number of joints.

### 2.2 Jointing

#### 2.2.1 Factory Joints

Intersections and branches shall be mitred and fused in the factory of the manufacturer of the waterstop material, or in the factory of an approved plastics fabricator by a competent welder.

#### 2.2.2 Field Joints

The field joints shall be fused using jigs and an electric thermostatically controlled jointing tool supplied by or approved by the manufacturer of the PVC waterstop.

### 2.2.3 Competency of Welder

The welding of components shall be carried out, and supervised by approved qualified and/or accredited personnel, who have successfully undertaken the following Units of Competence of the Plastics, Rubber and/or Cablemaking Training Package PMB01 appropriate to the welding processes used:

- (a) PMBPROD287A—Weld plastics materials
- (b) PMBPROD387A—Produce welded plastics materials
- (c) PMBWELD309A—Weld plastics using extrusion and injection techniques

“Successfully undertaken” shall mean “Statement of Attainment” for all those appropriate Units of Competence. Qualifications from Training Packages must be awarded by a registered training organisation listed by the National Training Information Service for the provision of training or assessment services as required.

Before any field joints are made each operator shall make six test joints all of which shall meet the following test requirements:

- Butt welded joints when tested in accordance with ASTM D 412, using die "C", shall obtain a tensile strength not less than 11.5 MPa and an elongation not less than 180 percent.
- A least three of the test joints shall be branches and/or intersections.

The above testing requirements for operators may be waived if the operator can provided documented evidence of successful welding of PVC waterstop in the prior 12 months.

Straight butt welds and welds in three way and four way intersections shall be water-tight. All joints shall be free from visible holes, porosity, burns or charring of the PVC and any other defect that may affect the performance of the welded joint.

### **2.3 Joint Tolerances**

The maximum tolerances for field or factory joints shall be 1 mm for both longitudinal and transverse misalignment.

## **SECTION 3: STORAGE AND CARE**

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Waterstops shall be stored in as cool a place as practicable and in no case shall waterstops be stored in the open or exposed to the direct rays of the sun. The waterstop shall be installed in approximately the chronological order in which they are delivered from the manufacturer.

If the waterstop is installed in the concrete on one side of a joint more than 2 weeks before the scheduled date of placing concrete on the other side of the joint, the exposed waterstop shall be shaded from direct sunlight in an approved manner, and if the exposed leg or a waterstop is in a position where mechanical damage could occur, the exposed leg shall be protected with a suitable shield.

The waterstop shall not be subject to contact with oil, kerosene, petrol, curing compound or any other substance that may have a deleterious effect on the waterstop. Any waterstop damaged by contact with such materials shall be removed and replaced by the Contractor at their expense.

## SECTION 4: INSTALLATION

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### 4.1 General

PVC waterstop shall be installed in the concrete in the following manner.

- The waterstop shall be carefully and accurately fixed in position with the bulkhead of the forms slotted and shaped to hold the waterstop in alignment and prevent leakage of mortar or damage to the waterstop. Provision shall also be made to hold that portion of the waterstop being built in accurately in position during placing and compaction of concrete.
- After removing forms and before placing the second part of the joint concrete, waterstop shall be cleaned of mortar or other debris.
- Where required, joint filler or removable inserts for joint filler shall be placed and fixed as shown on the Drawings.
- The second part of the joint concrete shall then be placed. Provision shall again be made to hold that portion of waterstop being built in accurately in position during placing and compaction of concrete.

### 4.2 Entrapment of Air

Care shall be taken to ensure that no air is trapped between the concrete and waterstop.

In locations where the waterstop is installed horizontally or near horizontally and the top face is not formed, the waterstops shall be bent upwards while concrete is placed in the lower part of the joint to within 10 mm of the underside of the waterstop and compacted. An excess of 1:2 cement:fine aggregate mortar shall then be placed under the turned up waterstop and the waterstop then straightened into position on a full bedding of mortar. No further concrete shall be poured on top of the waterstop until the bedding of the waterstop has been inspected and passed as satisfactory by the SA Water's Representative. Excess mortar squeezed out when straightening the waterstop shall be spread on top of the waterstop and the balance of the concrete for the joint placed and compacted.