



WATER SERVICES
ASSOCIATION OF AUSTRALIA

WSA 137:2019

Industry standard for Uplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and Polyethylene (PE) maintenance shafts, maintenance chambers and maintenance holes for sewerage

(Incorporating Amd 1, 2 and 3)

Issue 3.3



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ABOUT 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 24 million customers in Australia and New Zealand and many of Australia's largest industrial and commercial enterprises.

ACKNOWLEDGEMENT OF COUNTRY

The Water Services Association of Australia acknowledges and pays respect to the past, present and future Traditional Custodians and Elders of this nation. We recognise their continuing connection to land and waters and thank them for protecting our waterways and environment since time immemorial.

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PREFACE

This Standard was prepared by the Water Services Association of Australia (WSAA). It was published on 23 February 2024 and incorporates WSA 137:2019 Amd 1, 2 and 3:2023.

The objective of this Standard is to provide material and performance requirements for manufacturers and purchasers of plastics maintenance shafts, maintenance chambers and maintenance holes for sewerage and sanitary drainage systems. Typically, a maintenance shaft, maintenance chamber or maintenance hole assembly comprises:

- (a) a base;
- (b) a vertical riser;
- (c) a cone, where required to reduce the opening at the top of a large diameter riser or placed immediately above the base to allow a smaller diameter riser to be used;
- (d) a sealed riser cap below, but close to the finished ground surface level.

The diameter range of the base and riser has been extended to DN 1000. Maintenance holes complying with this Standard can be supplied with or without steps or fixed ladders. This Standard does not provide detailed requirements for ladders or steps to facilitate person entry but appropriate EN Standards are referenced.

Other revisions include

- (i) loading testing on upper assembly components of maintenance shafts, maintenance chambers and maintenance holes
- (ii) provision of slip resistant raised surface patterns on maintenance hole benching and testing requirements.

NOTE: Maintenance shafts, maintenance chambers and maintenance holes complying with this Standard may also be suitable for other applications such as stormwater drainage.

In-service performance of a maintenance shaft, chamber or hole is strongly dependent on a supportive embedment. It should be recognised that it is extremely difficult to anticipate soil types, soil loadings and future soil movement in all possible locations and conditions. Specific types of embedment and backfill materials and compaction standards for various depths and soil types should be adopted in order to minimise the risk of long-term failure. Thus, even with compliance with these performance requirements, installation conditions will have a significant influence on the long-term performance of maintenance shafts, maintenance chambers and maintenance holes.

The design criteria of AS/NZS 2566.1, Buried flexible pipelines, Part 1: Structural design, provide guidance. Installation should be in accordance with design drawings and the Gravity Sewerage Code of Australia—WSA 02.

This Standard adopts the same means of determining structural integrity of maintenance shafts, maintenance chambers and maintenance holes and durability of materials as ISO 13272. The elastomeric seal joint requirements are similar to ISO 13272 except that the base-to-pipe and base-to-riser joints are required to additionally comply with interface pressure and contact width as specified in, for example, AS/NZS 1260 and the infiltration / exfiltration test pressures are higher.

The plastics materials covered by this Standard include PVC-U, PE, PP and PP-MD. This document recognises that materials demonstrated to comply with the requirements of some AS/NZS and ISO Standards are suitable for the manufacture of maintenance shaft risers and/or bases, provided the structural integrity and durability requirements are satisfied. Other PVC-U, PE, PP or PP-MD materials need to satisfy additional durability requirements in order to demonstrate suitability. Maintenance shaft, maintenance chamber and maintenance hole bases are typically manufactured by injection moulding, rotational moulding or fabrication.

Provided that installation, embedment support and operating conditions conform to the guidelines in this Standard, maintenance shaft, maintenance chamber and maintenance hole

life expectancy are expected to exceed 50 years¹. A riser stiffness as low as SN4 may be considered, subject to and supported by structural analysis based on AS/NZS 2566.1. The structural analysis shall consider buckling stability of the riser in different soil types with a water table to full installation depth.

This Standard provides for an indicative accessibility test, using proving tools of two standard shapes. Notwithstanding this and for the purposes of product appraisal, the ease of ingress and egress of maintenance and condition assessment equipment – particularly at higher installation depths and for base configurations that involve smaller diameter vertical shafts and sewer connection diameters, “fit-for-purpose” accessibility should be demonstrated by means of installation trials, using the type of equipment that is routinely used by WSAA member utilities.

It is recognised that low surface energy acrylic structural adhesives may be used to joint dissimilar plastics such as PE and PVC in some maintenance shaft, chamber and hole products. Test requirements for PE to PVC joints using low surface energy acrylic structural adhesives are specified in WSA PS 287.

The Appendices are identified as ‘normative’ and, as such, form integral requirements of this Standard.

Where a WSAA ruling to this Standard is of public significance and has been authorised for issue, it will be available from the WSAA website www.wsaa.asn.au. When the substance of a ruling has been included in an amended standard, the ruling will be withdrawn at the time of publication of the amendment.

¹ It should be noted, maintenance shafts, chambers or holes complying with this standard are often designed on the basis of 50 year extrapolated test data. This is established international practice but is not intended to imply the service life of maintenance shafts, chambers or holes is limited to 50 years. For correctly manufactured and installed structures, the actual life can not be predicted, but can logically be expected to be well in excess of 100 years before major rehabilitation is required.

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