

Purpose

This technical bulletin provides supplementary information to SA Water Technical Standard TS 0720 which covers safe access infrastructure, clearances, and provisions for SA Water valve chambers (both new and existing). The aim of the bulletin is to provide greater clarity on SA Water's requirements and preferences to improve safety outcomes for works constructed prior to an update to TS 0720 being released in 2024.

Background

SA Water owns and operates a variety of below-ground infrastructure across South Australia, many of which are valves housed within buried chambers. Despite the significant number of valve chambers historically installed, a set of standardised criteria has not been implemented, leading to a high number of requests for information and many unique designs and arrangements.

Advances in technology, work health and safety (WHS), operational practices, and maintenance capabilities have developed and changed over the last several years. Coupled with continuing network growth, and required upgrades of existing chambers, the number of valve chambers across the state is expected to escalate.

As a result, there is a need to standardise safe access requirements for both new and existing valve chambers to provide consistent benefits to stakeholders, customers, people, and communities.

Current Situation

The current scope of Technical Standard TS 0720 (Access Infrastructure for Water Tanks) covers safe access infrastructure for water tanks only. SA Water recognises that this situation is not ideal, and that many other asset types require greater detail on SA Water's safe access requirements/preferences.

Actions

SA Water is currently undertaking the following actions in response to the situation described above:

Updating Technical Standards

SA Water is currently taking the opportunity to revise and update TS 0720 to:

- Include generalised criteria applicable to all assets
- Expand specific requirements to encompass valve chambers, elevated liquid storage structures, wet wells, and maintenance holes.
- Reflect the advances, developments and changes highlighted above.

This work is expected to take approximately 12 months, with the release anticipated to be in the first half of 2024.

Providing Interim Guidance

Prior to these updated being published, it has been identified that interim guidance, in the form of this Technical Bulletin, is required

To reduce confusion and rework during projects undertaken prior to TS 0720 being updated, this technical bulletin is provided to supplement the requirements of TS 0720 (and is to be considered part of TS 0720 until the updated standard is published) and details:

- General requirements for valve chambers, both new and existing.
- Detail for typical valve chamber arrangements.

The following items are not included in the scope of this technical bulletin

- Valve chambers housing complex infrastructure.
- Below-ground valve chambers associated with submersible sewage pumping stations (refer SA Water Standard Drawing 94-01 63, and accompanying technical bulletin)

1 Valve Chamber Access – Technical Bulletin

This technical bulletin outlines SA Water's preferences/requirements for safe access infrastructure to both the exterior and interior of a valve chamber. Any variations to this document must be approved via SA Water's Dispensation Procedure, which is available on the SA Water [website](#).

1.1 General Requirements

The following general requirements for valve chambers are to be adopted (noting the requirements of Section 1.4), as a minimum, for all new installations and/or modifications of existing infrastructure:

- Permanent access infrastructure shall preferably be incorporated, as required, to allow external access to the exterior of the valve chamber (Refer to Section 1.2).
- No permanent access infrastructure shall preferably be installed within the valve chamber interior, except for multi-level chambers (Refer Section 1.3).
- Where required, 900mm clearance between adjacent elements shall preferably be maintained to allow unhindered foot traffic. Where not possible due to physical space constraints (which are not reasonably practicable to overcome), the minimum clearance shall be 600mm.
- All permanent or possible openings to preferably have full perimeter guardrails and a self-closing gate (temporary or otherwise), separating the opening from adjacent walkways, platforms, or other work areas.
- Permanent edge protection is not required where personnel are not required to work within 3m of the unprotected edge during normal operation.
- Anchor points and fall arrest PPE are not permitted to be used as the primary means of permanent access.

1.2 External Access

The area immediately around all chambers shall be made as safe as reasonably practicable for all people who may approach, work on, or work around the chamber. Where the chamber is covered and acts as a work area, adequate infrastructure shall be installed to make the area safe for workers.

1.2.1 Chamber Height (Above-Ground)

For all chambers where the edge of the chamber is greater than 300mm above the surrounding ground, action shall be taken to:

- Install AS1657 compliant edge protection (perimeter guardrails, etc.) and access infrastructure (step/rung ladder, intermediate step, etc.) to access the top of the chamber or
- Raise the surrounding ground level to reduce the difference in height, in accordance with AS1657 (refer Figure 1) or
- Fully or locally lower the height of the chamber wall

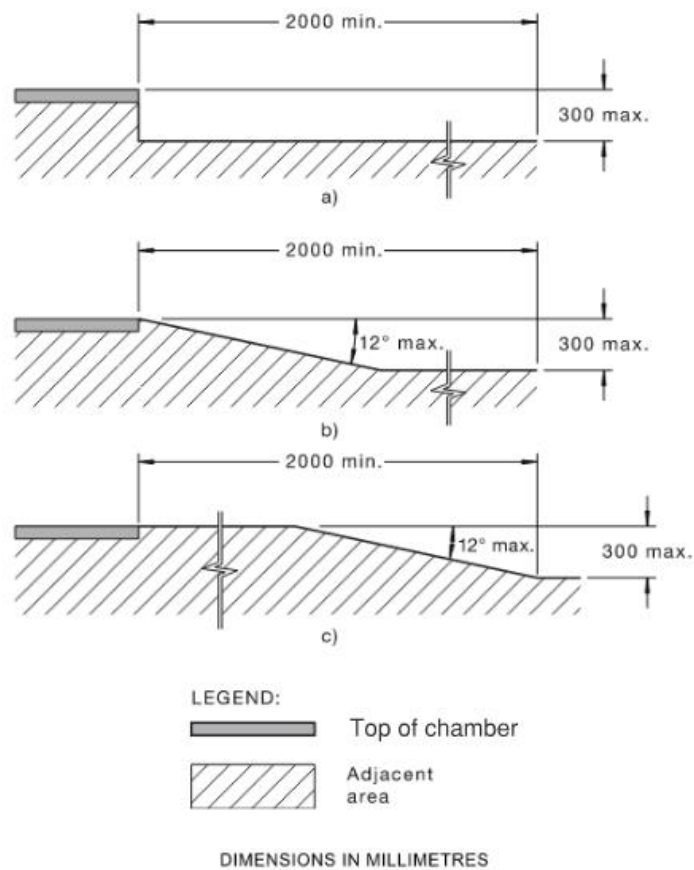


FIGURE 5.2 TYPICAL PROVISIONS OF CLAUSE 5.4.1 WHERE NO GUARDRAIL IS NEEDED

Figure 1 - AS1657 Figure 5.2 Excerpt

1.2.2 Sump Access

Where a chamber has a dedicated sump, provision shall be made to ensure excess water can be removed from the chamber without needing to remove the cover, or otherwise access the chamber interior. This may include:

- Provision of a small access point (hinged hatch or similar) directly above a sump in the bottom of the chamber, to allow a submersible pump or hose to reach the sump
- Provision of hard pipe and couplings to allow connection of a suction pump from ground level

1.2.3 Valve Operation

Access points and/or extended spindles are to be provided to allow operation of valves from outside (above) the chamber. Consideration shall be given to preferred SA Water methodologies for operation of valves, including providing stops and/or mounting brackets for any mechanised valve operating tool.

Valve spindles must not sit proud of the cover, to avoid creating a potential tripping hazard. Where the spindle hole may need to be greater than 100mm in diameter, a removable cover/grate to the spindle hole is to be provided.

1.3 Internal Access

1.3.1 General Requirements

SA Water preference is that no permanent access infrastructure is installed within the valve chamber interior, except for multi-level chambers (Refer Section 1.3.4).

Interior access shall preferably be a planned activity where all safe means of access (scaffold, temporary ladder, etc.) are organised in advance.

The omission of internal permanent access infrastructure has been based primarily on the following criteria:

- Limited available space/clearances within existing valve chambers
- Non-compliances with AS1657 for existing valve chambers
- Safety considerations associated with personnel accessing the interior of a valve chamber (ergonomics, falls, engulfment, etc.)
- Unknown conditions of assets and/or internal access infrastructure (through deterioration throughout the asset life), and the difficulty associated with undertaking an adequate assessment.

Methods of eliminating or substituting the requirement for personnel to access the chamber interior shall be adopted including, but not limited to, the following:

- Where practicable and with approval of SA Water's Operations team, backfilling and/or burying the chamber with an approved backfill material (generally for pipe OD375 or smaller)
- Relocating equipment and instrumentation (i.e., valves, flow meters, etc.) to ground level, through the reconfiguration of pipework, where they are readily accessible without the need to access the interior of the chamber
- Installing remote methods of operating equipment housed within the valve chamber (i.e., extended valve spindles), allowing operation without entering the chamber (e.g., from the top of the chamber).
- Conducting inspections via drone, or other similar Remotely Operated Vehicle (ROV)

Replacement or major refurbishment of equipment and instrumentation are not generally considered to be 'regular access'. However, consideration must be made for these activities to ensure they can be carried out safely and economically. Any activity which will require a project to be set up, or which may require major dismantling of any infrastructure or equipment, shall be considered a planned activity.

1.3.2 Chamber Cover Design

Valve chamber covers shall be grid mesh grating (steel, aluminium, FRP or similar) which allows line of sight into the chamber for visual inspection purposes only. Covers for valve chambers shall:

- Comply with the requirements of AS1657
- Be designed to be in small sections of manageable sizes to suit the lifting capabilities of Operations and Maintenance personnel
- Be fully secured such that cover panels cannot be easily opened or moved. Grating shall be preferably secured using proprietary clips/clamps, fastener discs, permanent bolts, or padlock mechanisms.
- Incorporate extension spindle access holes to allow valves to be operated without entering the chamber (refer Section 1.2.3).
- Where applicable, have clearly identified safe lifting points.

1.3.2.1 Emergency Access

Where required, a lockable chamber access hatch shall preferably be incorporated within the chamber cover design, for emergency access purposes only. The access hatch should typically be 750mm min. square and hinged along one edge. The chamber access hatch shall preferably have a dedicated 900mm square landing area, full perimeter guardrails, and a self-closing gate.

Consideration shall also be given to providing securing points or rung cradles at the top of the chamber to allow for the fastening of portable ladders which can be lowered into the chamber. Where such provision is provided, a suitable solid landing area should preferably be provided adjacent the securing point.

1.3.3 Specific Requirements for New Chambers

1.3.3.1 Internal Clearances

The layout of pipework within the chamber shall be individually designed such that there is sufficient clearance for operation, maintenance, and repair of any installation. Minimum preferable clearances between the chamber and the nearest component are shown below in Table 1:

Table 1 - Permanent Safe Access Method Selection Preferences

Chamber Element	Clearance to Nearest Component
Floor	300mm
Non-working side wall	600mm
Working side wall	900mm
End wall to near flange face	400mm
End wall to nearest weld or dismantling joint	300mm ¹
Head room under support beams	2000mm

¹ Where pipework or fitting removal is facilitated by cutting and banding the pipework, an additional 600 mm of straight pipe is required.

1.3.3.2 Location

In road reserves the chamber shall preferably be in the road verge to allow:

- Safer personnel access, away from the traffic
- Minimum interruption to traffic

In other locations, including reservoir or tank sites, the chambers should preferably be located:

- To allow for future expansion of the facilities
- To allow for vehicle access (inclusive of trucks, cranes etc.) to all facilities

1.3.3.3 Chamber Drainage

Chambers shall be provided with drainage facilities.

Where incorporated, a concrete floor graded to a cast-in (i.e., watertight) sump shall be provided. The sump should be large enough to hold some debris and the suction of a portable pump. A 450mm square by 300mm deep sump is considered acceptable.

All sumps shall preferably be fitted with a removable grate/lid. Where pump sump access is required, consideration shall be given to allow removal and replacement of grate/lid from the exterior of the chamber at ground level (i.e., a lifting chain or similar). Refer Section 1.2.2.

1.3.3.4 Chamber Depth

The overall depth of the valve chamber shall be minimised. Installation of deep chambers which require multi-level access arrangements are to be avoided.

Where the overall chamber depth exceeds 3000mm, additional access provisions may be required (refer Section 1.3.4).

1.3.4 Multi-Level Chambers

Where the overall depth of the chamber exceeds 3000mm, and all other alternative solutions/modifications have been considered as per Section 1.3.1, the incorporation of one or multiple internal, intermediate working platforms shall be adopted. Platforms shall be sized to allow for all anticipated works (including rescue requirements) and, where deemed necessary, shall incorporate access provisions to the base of the chamber.

Provisions for multi-level chambers shall be made to ensure all equipment and instrumentation is operable from the uppermost working platform. Access to lower platforms shall be appropriately protected by a lockable self-closing gate.

1.4 Safety in Design

Designers are reminded that in applying the requirements of this Technical Bulletin to SA Water projects, they are not absolved of any Safety in Design (per TS 0101 (Safety in Design)), detailed design or statutory obligations to which they may be subject.

Version History

Version	Date	Author	Comments
1.0	24/08/2023	Matthew Davis	Final.