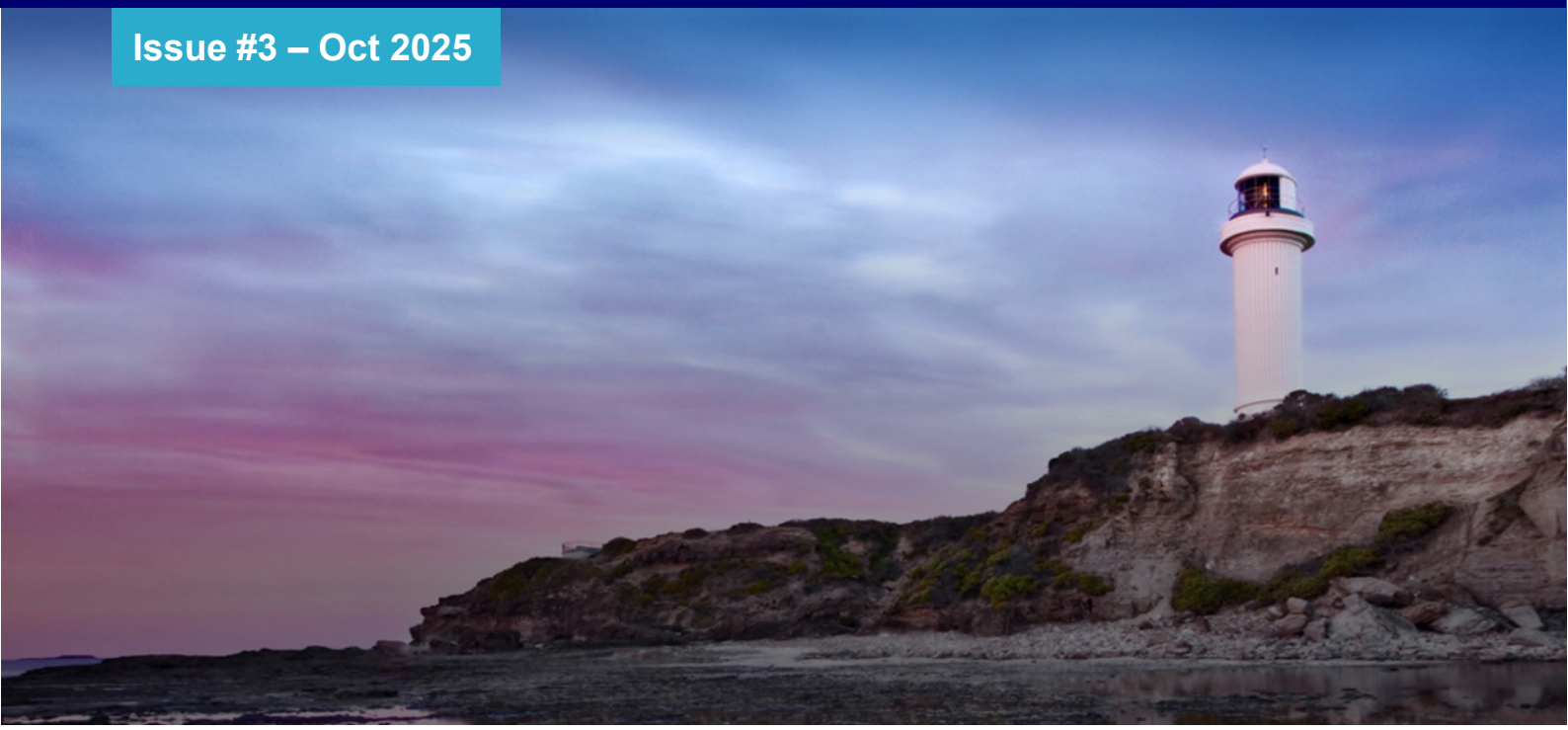
Sydney Water Standards Newsletter

Issue #3 – Oct 2025



Welcome!

This newsletter is your go-to source for updates, insights, and innovations in engineering standards at Sydney Water.

This edition offers valuable information on how our standards are evolving to meet user needs, support capital delivery, and align with our strategic goals - including sustainability and net-zero commitments.

Inside, you'll find insights and innovation from deviation from standards requests. This issue also covers engineering challenges faced on a major SPS upgrade as well as recent releases of new and updated standards.

We're committed to have an integrated suite of standards that are easy to use, responsive to our evolving needs, and enable innovation. Please contact us at standards@sydneywater.com.au if you have any feedback or general queries.

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Driving Innovation through Deviation from Standards

Deviation from standards unlock innovation to solve engineering problems while balancing risk, cost and time consequences. These two deviations will lead to changes in our standards so future projects can benefit from the time and cost savings.

Increase in Manhole spacing for Cosgrove Creek 1.7km Gravity Carrier for 1500mm Pipe

Justification and Need

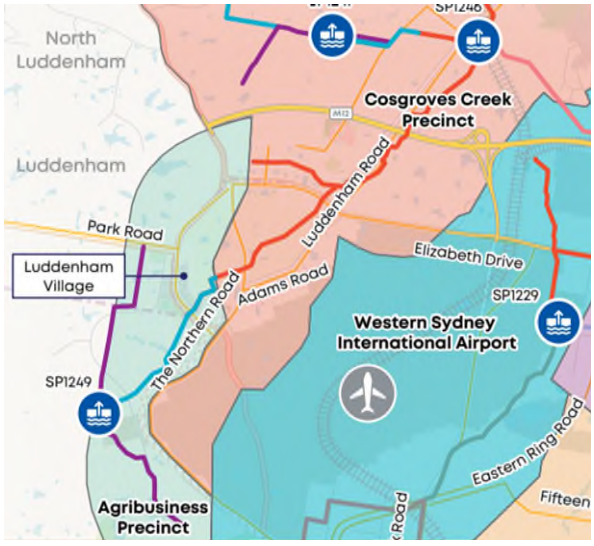
Manholes are required for maintenance access. In this section of pipework, some manholes had a depth to pipe invert of ~18m. For 1500mm pipework, manholes at these depths are have high cost and long construction times. Increasing the spacing between manholes from 180m to ~350m was required based on these site constraints and available budget.

Decreasing the number of manholes was achieved through risk assessment and adjustment of network hydraulics. Several other criteria were assessed as part of this deviation, including:

- Pipe-lining and wall thickness;
- Maintenance and operation;
- Constructability and safety;
- Environment and heritage;

Benefits of Deviation

The total cost saving by making this adjustment was ~$6M. Further savings of $3 – 5M are expected on related growth projects adopting this change. In addition, this deviation resulted in reduced cost, faster delivery time and lowered the total carbon footprint of construction.



Excerpt from Program Precinct Map

Technical Specification - Mechanical (BMIS0209) & Technical Specification - Odour Control Unit (ACP0004)

Justification and Need

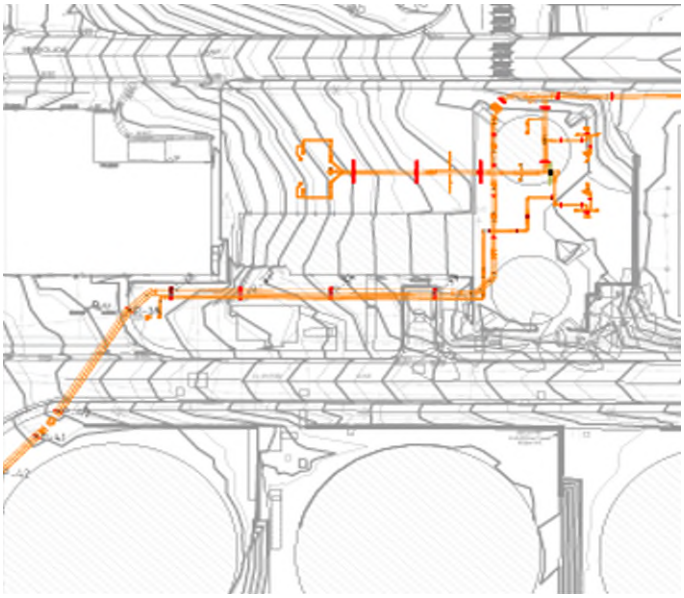
An update to our OCU specification was issued after multiple deviation requests to change the material used for foul air dampers,

These deviations requested a change in material from SS316 to FRP and uPVC (up to DN300). This change was required due to complex site conditions where typical hanger spacing was not possible over road crossings and other areas with space restrictions. These dampers had to accommodate additional test and measurement points with safe access for this deviation to proceed.

Benefits of Deviation

This deviation saved project cost and time. Several criteria were considered as part of this deviation, including:

- Safety in design
- Constructability
- Maintenance access
- Minimum ventilation pressures
- Value and cost of additional bridges and footing.



Excerpt from OCU Ductwork Map

Major Upgrade Underway for Rouse Hill Sewage Pumping Station SP1022

Large diameter micro tunnelling through difficult geotechnical conditions and complex hydraulics were two significant engineering challenges faced when solving wet weather overflow issues in Rouse Hill.

Sewage Pumping Station SP1022 is a critical component of the Rouse Hill Wastewater System. Since 2005 the system has struggled to meet Environment Protection Authority (EPA) requirements, particularly wet weather overflow performance. Overflows from the system impact Caddies Creek, Smalls Creek, and ultimately the Hawkesbury River via Cattai Creek.

DN1800 Intermediate Jack

Tunnelling being carried out from Lot 96 towards SP1022

Project Objectives

By upgrading the SP1022 pump station and its associated pressure mains to the Rouse Hill Water Resource Recovery Facility (WRRF), the wastewater system will have capacity to meet EPA licence requirements and ensure reliable wet weather performance through to the year 2056.

The main components and features of the project are:

- Constructing a new 900m long x DN1000 pressure main within a DN1800 tunnel, running from SP1022 to the proposed new inlet works at Rouse Hill WRRF.
- Associated connection pipework and fittings.
- A scour chamber on the new pressure main to facilitate maintenance of the pressure main.
- Provision of hydropneumatic bladder tanks to prevent water hammer from damaging the pressure main upon unforeseen events such a pump trip.
- Upgrading SP1022 pump station and increasing its capacity to 2,025 L/s.
- All work scheduled for completion by August 2026

Engineering Challenges

The project is complex on a variety of fronts and required comprehensive support from the civil, structural, geotechnical, hydraulic (transient analysis), mechanical, and electrical teams.

The engineering modernisation team provided support for these complex and high risk challenges. Amongst the numerous engineering issues to overcome, the scope of works called for the conversion and connection of existing DN300, DN600 and DN750 pressure and gravity mains to the new tunnel, resulting in complex hydraulic and water hammer issues. A comprehensive computer analysis was undertaken and the mitigation measures that were developed resulted in the provision of 2 x 35 m3 hydropneumatic bladder tanks to solve the water hammer issues and reduce pressures to acceptable limits.

Major Upgrade Underway for Rouse Hill Sewage Pumping Station SP1022

As a notable innovation, the project team also investigated using FRP material for construction of the scour chamber at the pump station, saving both on cost and delivery time.

This is one for the first Sydney Water tunnelling projects where the contract has been set up using a Geotechnical Baseline Report (GBR). This arrangement ensures a transparent allocation of risk of latent ground conditions between all parties, resulting in lower outturn costs.

A thick volcanic dyke was identified during geotechnical investigations before construction and was a concern for micro tunnelling. 100% of the total tunnelling length has been completed without significant issues/claims and without delay to planned schedule.

Complex operating scenarios in the pump station with a misaligned inlet pipe (14m diameter wetwell, DN1350 inlet pipe placed off-centre) also required detailed computational fluid dynamics (CFD) computer simulation to optimize flow patterns, air entrainment, spatial velocity distribution, and swirl angles in the wetwell. In the past, a physical model would have been built to understand these flow patterns, which now was done by computer simulations at a fraction of the cost and time.

Not only do these upgrades represent a significant step forward in ensuring the reliability, compliance, and sustainability of the Rouse Hill wastewater system for decades to come, the challenging design and construction issues were solved by an advanced understanding of the engineering involved and use of innovative engineering methods and products.

Launch Shaft at Lot 96

Size comparison of DN1800 Concrete Jacking Pipe

Driving Efficiency and Sustainability: The New Concrete Mix Register

Initiative: A New Register for Standardised Concrete Mixes

A new Concrete Mix Register is now available to streamline the approval of concrete mixes for all Sydney Water projects. This initiative was created to address previous inefficiencies, such as repetitive efforts and duplicated lab testing and ensure we maintain high-quality, compliant, and cost-effective concrete use. The register eliminates the time and resource burdens that delivery teams and suppliers previously faced. This is projected to save a minimum of 8 hours of assessment time per concrete mix.

What We've Achieved & Key Benefits

Developed in close collaboration with key concrete suppliers and delivery partners, this initiative delivers substantial benefits across several key areas. The register is available in EPS501 - List of Approved Non-Standard Products for Networks.

- **Time and Cost:** The register allows for the rapid selection of pre-approved mixes, which reduces lead times and accelerates project commencement. It also reduces administrative overhead and promotes cost-effective mixes, mitigating delays and rework.
- **Improved Performance**: The register ensures all concrete adheres to consistent, high-quality standards, providing robust quality assurance and simplifying compliance with Australian Standards.
- **Meeting Net Zero**: This initiative promotes mixes with lower embodied carbon by optimising the use of Supplementary Cementitious Materials (SCMs). It also enables the tracking and reporting of concrete-related carbon emissions to support our net-zero targets.
- **Security of Supply**: Standardised data facilitates consistent supplier benchmarking, which enhances commercial decisions and buying power.

Access to Register

The new Concrete Mix Register is available on iConnect, the SW Delivery Portal and Sydney Water website. Alternative mixes from any suppliers can still be used, with acceptance in accordance with the Sydney Water Civil Technical Specification.

> "*The accepted concrete mix register exemplifies the trust and collaboration between Sydney Water and their concrete suppliers. SW project teams and their delivery partners will benefit immensely by eliminating onerous administration and enable their focus to be on delivering quality assets for Sydney Water.*"
>
> – Alan Leones, SWC Senior Project Manager

Recent Releases

We've outlined the latest updates to our existing standards, along with newly introduced standards. There are links for accessing all our standards on the last page of this newsletter.

Technical Specification – Power Transformers (DOC0019)

This technical specification has been updated to improve clarity, safety, and long-term reliability.

The main changes include :

- Updated transformer materials and environmental specs, including a shift to natural ester-based oil and improved containment systems to meet climate and protection requirements.
- Standardised requirements for oil water separation and new sizing criteria to improve technical clarity and alignment with other electrical specifications.
- Enhanced reliability through added requirements for On-Load Tap Changers, cooling systems, and updated deliverable requirements for all project phases.

Updated technical specifications for sewer rehabilitation

SS 201 – Linings for Circular Non-Person-Entry Sewer Pipes
SS 202 – Localised Sewer Repairs from Inside
SS 203 – Lining of Circular Person-Entry Concrete Pipes
SS 207 – Junction Sealing for Circular Non-Person-Entry Sewer Pipe
SS 209 – Lining Repairs of Non-Person-Entry Oviform Sewers

Minor changes have been made to address stakeholder feedback, including:

- Post-installation testing requirements relaxed or removed.
- Standardisation of chemical resistance requirements across all specifications.
- Execution/installation requirements amended to focus on outcome over method.

Building Design Specification (D0002084)

This specification outlines the requirements for the design of Sydney Water buildings associated with operational facilities. The document:

- Specifies the structural requirements,
- Clarifies the National Construction Code (NCC) requirements, and
- References specifications for other disciplines related to the buildings.

Technical specification - Reticulation Sewers in Basements (CPDMS0026)

The specification sets the minimum requirements for planning, design, and construction of Sydney Water reticulation sewers in basements to facilitate growth and development. We would also like to acknowledge input and understanding from developers and operations teams into these changes. Key changes include:

- further minimise the risk of sewer overflows inside buildings.
- provide safer and effective access for operations and maintenance activities.
- streamline design acceptance through clearer submission requirements.

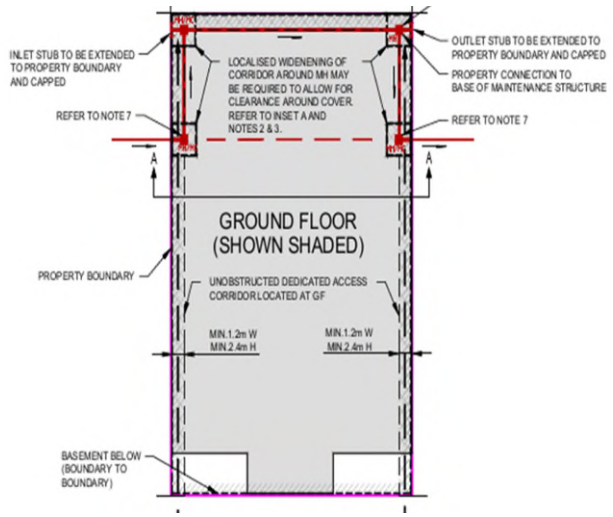


Diagram from the Reticulation Sewers in Basements Specification

Safety in Design Procedure (D0000653) – FAQ's

This FAQ document outlines the requirements for the Safety in Design Procedure. An FAQ has been developed to address questions which have arisen on a number of projects, including:

- How to get hazards addressed during design reviews?
- What are designers' duties under the Work Health and Safety Act?
- What are project managers responsible for in relation to Safety in Design?

Supplementary design guideline for sewer pressure mains (D0002508)

This new standard was developed to address identified vulnerabilities with sewer pressure mains, including lessons learned from recent pressure main failure incidents and outcomes from environmental audits.

This standard provides planners and designers with:

- Additional requirements and guidance for the planning and design of new sewer pressure mains (to supplement other Sydney Water standards)
- Clarification of Sydney Water's expectations for these assets

Network Rechlorination Plant Specification (D0000389)

Changes include:

- Improve safety through addressing known risks e.g. slip and trip hazards, signage and training
- Reduce lifecycle cost by relaxing material requirements where safety and reliability performance can be maintained.
- Improve reliability by updating control and communication requirements
- Improve usability through clarification on Sydney Water and Contractor requirements.

Operational Requirement Specification – Wastewater Treatment (D0002481)

The Operational Requirement Specification captures operational requirements early in the project lifecycle to help avoid scope variations, commissioning delays, and inconsistencies between sites.

It consolidates both mandatory and recommended requirements to support safer, more reliable assets and efficient project delivery.

Loading IBC into storage container

Technical Guideline - Building Over and Adjacent to Pipe Assets (ACP0254)

The updated technical guideline focuses on reducing time and cost associated with building over pipe assets. This is designed to facilitate growth and development. Changes include;

- Expanding the scope of work eligible for a streamlined approval process.
- Reduce time and cost for developers undertaking the building over and adjacent process.
- Provide clarification on asset requirements to further minimise the risk of asset failures.

Technical specification – prefabricated (kiosk) substations

Minor updates were made to this specification, including:

- Categorised and defined applicable types of prefabricated substation
- Streamlined the changes introduced in the Power Transformer spec document to remove confusion
- Updated sheet metal surface preparation requirement and applicable installation conditions.
- Streamline earthing requirement with the recently updated Earthing and lightning spec document.
- Reviewed and updated prefab kiosk auxiliary equipment requirements based on lessons learnt through projects.
- Updated wiring requirements to be aligned with Elec spec and I&C standard changes.

Technical specification – HV overhead line equipment

Updates to this specification include:

- Prohibited the use of SF6 insulation gas in high voltage overhead line equipment.
- Inclusion of locking point and switch handle requirements to make equipment in public areas more safe and secure
- Introduced the use of more durable and reliable cable (Covered Conductor Type, commonly referred to as CCT).

SF6 is a gas used to insulate electrical equipment. It has 23,500 times greater global warming potential (GWP) than CO2 as a greenhouse gas (over a 100-year time-frame). This change supports our Net Zero target.

Implementing new standards

When new or updated engineering standards are published, they apply to projects commenced after the publication date. There is no requirement to apply them retrospectively.

Where changes are driven by regulation or other critical risk, they may need to be applied to inflight projects – that would be a special case with dedicated communication.

Standards apply to construction of new assets and do not automatically trigger upgrades to existing assets.

When upgrading existing assets, full compliance to current standards may not be practical or cost-effective. Instead, a value engineering and risk-based approach should be adopted to determine the optimal upgrade scope—balancing performance, cost, and risk.

Adopting new standards early can be beneficial where they offer streamlined requirements that reduce costs or other benefits. Project managers have the discretion to apply new requirements to in-flight projects where they see benefit. In these circumstances, the Sydney Water Project Manager will issue an instruction.

Look out for communication material such as 'Standards Alerts' that will outline benefits and other implications of the new or updated standard to help you make an informed decision.

Coming Soon

The Engineering Modernisation standards team is working on new and updated standards to ensure they support you in delivery of our capital program, meeting our customer outcomes and to help achieve our commitment to achieve net carbon zero emissions.

If you wish to contribute to development of these standards or provide feedback at any time, please email standards@sydneywater.com.au.

Q4 2025

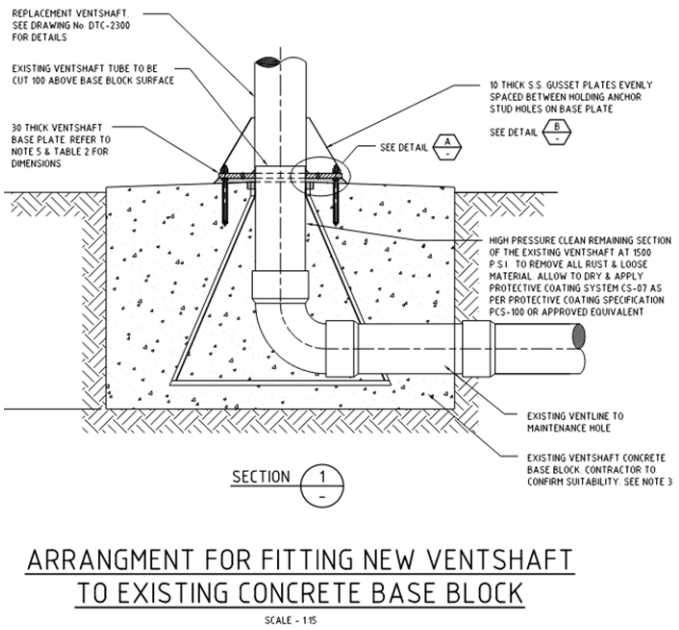
- Earthing and Lightning Technical Specification
- HV Batteries and Charger Technical Specification
- Specialist Engineering Assessment Procedure
- Fibre Polymer Composite Specification

2026

- Vent Shaft DTC's
- Sydney Water Edition of the Sewage Pumping Station Code of Australia (WSA-04)
- Technical Specification - High Voltage Motors
- Technical Specification - HV Motor Starters
- Water Reservoir Technical Specification

Withdrawn Standards

- Technical Specification – Permanent Gas Engine Driven Generator (D0002097)



Excerpt from Ventilation Shaft DTC

Connect with us

Accessing Sydney Water Standards

Our standards and alertrs are available to our staff through our iConnect page.

For our design and delivery partners, they are available through SW Delivery Portal.

For public users, our standards are available for free through our website

Past newsletters can also be found on our website..

Accessing WSAA Codes

WSAA publishes Codes of Practice, which include Sydney Water versions.
These are available through their website.

Sydney Water has purchased access for our staff. These documents are available through the links below. Instructions for setting up an account and accessing WSAA codes is available here: Welcome to WSAA's New Website: Easy steps to set up your account

WSAA Codes
Sydney Water WSAA Codes

Contact Us

standards@sydneywater.com.au is back!

Providing feedback on our engineering standards is key to ensuring they meet user needs and are continuously improved. We welcome constructive feedback at any time.

Please use this email address if you have any feedback or general queries. For general Sydney Water enquiries please follow this link. All project enquiries should be made through your project manager.