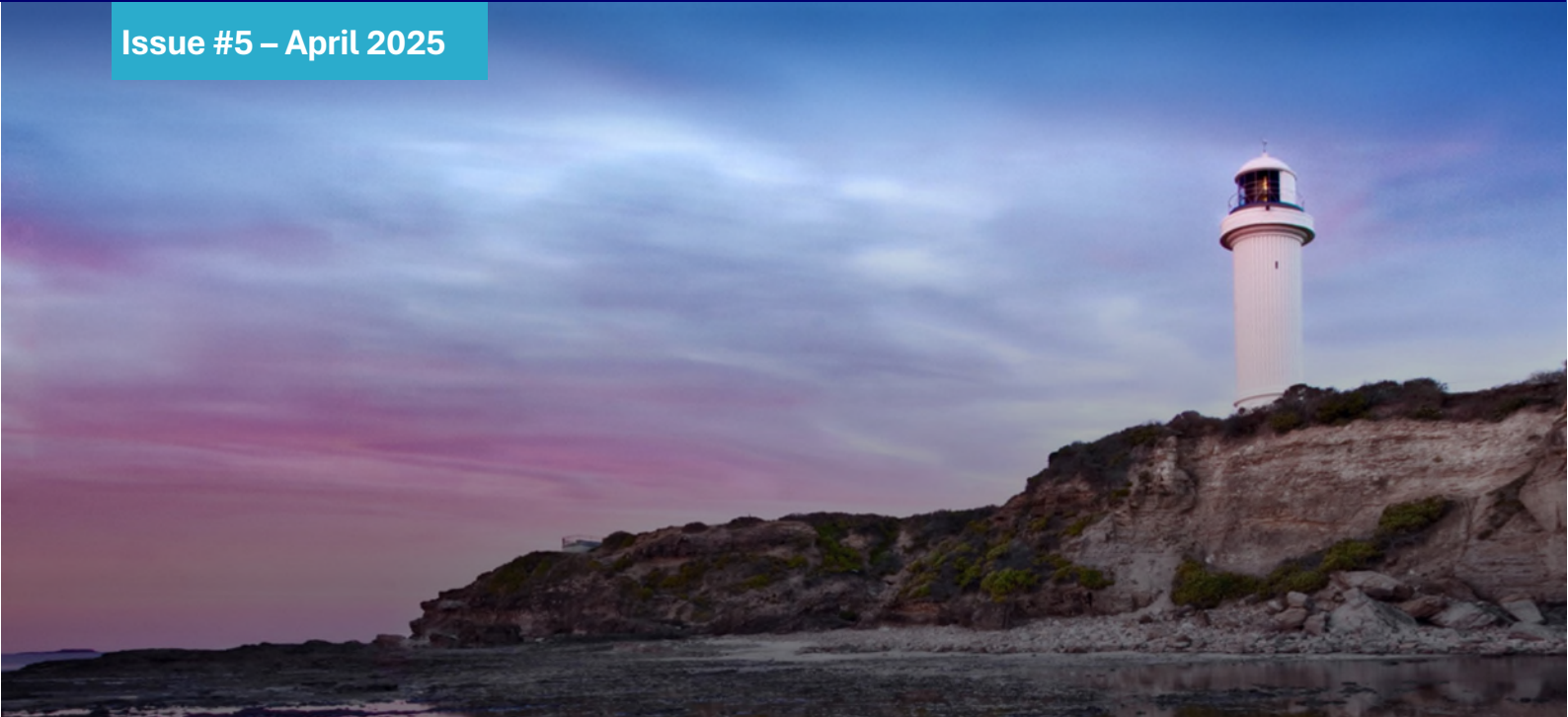


Issue #5 – April 2025



Welcome!

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

Inside this issue, we showcase how deviations from standards are being used to drive smarter, risk-balanced engineering outcomes.

We also share a standards improvement update that outlines how your feedback is being turned into concrete initiatives, tools, and a prioritised roadmap.

This edition's Innovation Spotlight explores the history, design, and ongoing performance of Sydney Water's Deepwater Ocean Outfalls.

Rounding out the issue are summaries of newly released and updated standards, guidance on applying them to new and in-flight projects, and a look at standards currently in development.

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.

Here's what's inside:

News Stories [p 2](#)

Innovation Spotlight [p 4](#)

Recent Releases [p 7](#)

Coming Soon [p 10](#)

Connect with us [p 10](#)

Driving Innovation through Deviation from Standards

Deviation from standards unlock innovation to solve engineering problems while balancing risk, cost and time consequences. The deviation below has led to changes in our standards so future projects can benefit from the time and cost savings.

Installation of Soak Pit for Drainage of Electrical Pit

Justification and Need

Electrical pits are a common feature across our water and wastewater facilities. The pits are required to manage long cable runs, conduit entries and junction boxes.

A common issue with electrical pits is effective stormwater drainage. Draining electrical pits to the nearest stormwater systems can be expensive if long pipe routes are needed.

Due to the difficult terrain, in this instance the standard gravity drain to stormwater solution was not feasible.

Our engineering standards team worked with Confluence Water to assess the viability of using a soak pit to avoid the costly alternative of connecting to the plant drainage system. The following risks were assessed:

- Poor drainage resulting in flooding of the soak pit and electrical assets.
- Surrounding clayey sand at 2 – 2.5m depth.
- Height of ground water levels.
- Water return from soak pit back into the electrical pit.

Risk Mitigation

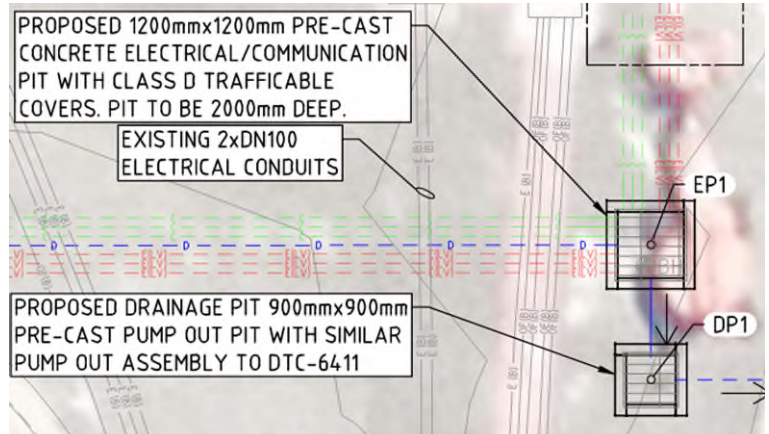
A risk management plan was put together by the standards engineering team and Confluence Water to ensure that all risks were eliminated or mitigated.

A buried soak pit was selected to remove the need for excavation work to run a stormwater pipe. The pipework to the soak pit was fitted with non-return valve and vermin mesh to prevent water and rodents returning into the electrical pit.

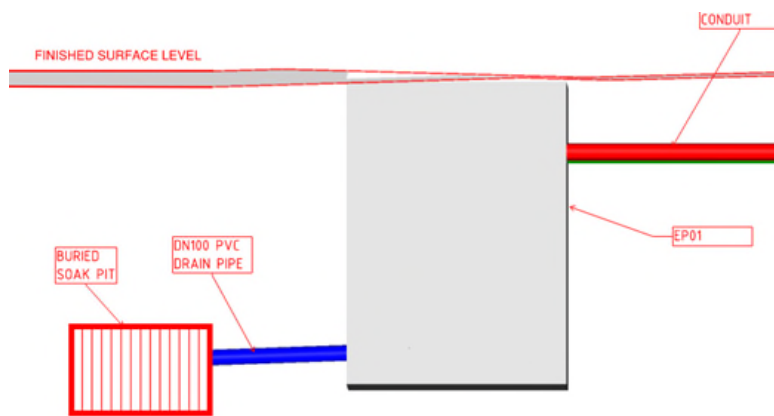
Benefits of Deviation

The selection of a soak pit in lieu of gravity drainage reduced the construction footprint required for drainage.

It should be noted that this approach was only adopted due to the impracticality of gravity drainage from electrical pits in this location. Gravity drainage to the site stormwater system is still the required method for electrical pit drainage on all Sydney Water sites.



Excerpt from Project Map



Excerpt from Soak Pit Diagram

Standards Improvement Update: Turning Your Feedback Into Action

In our last edition, we shared the results of the Standards Improvement Survey in “Standards Made Simple: What You Told Us” (Newsletter #4). Your feedback was clear, consistent, and incredibly valuable. Across Newsletters #1 and #2, we introduced our Human-Centred Design (HCD) approach and our transition to a more user-focused Standards Engineering function. That journey continues. Every insight you’ve shared is helping shape how we improve our standards, strengthen guidance, and support innovation across projects.

We’re acting on what you told us

Over the past year, you’ve told us you need standards that are easier to use, easier to navigate, and easier to apply in real projects. You want clearer guidance, fewer RFIs and DFSs, faster decisions, and better ways to ask questions and close the feedback loop. We agree. And we’re working on it.

We are now progressing improvement initiatives that reflect everything we’ve heard - through user research, workshops, feedback sessions, deviation trends, operational insights, and the Standards Improvement Survey. These insights are helping us build an integrated suite of standards: simpler, clearer, more consistent, and more supportive of innovation.

Building a comprehensive, prioritised improvement plan

We are now working to create one clear plan that brings together what we learned from your feedback, and other insights.

Because we cannot do everything at once, we are developing a prioritised roadmap that focuses effort where it delivers the greatest impact. This plan will help answer key questions such as:

- Which standards should we work on first?
- What support, guidance, and tools will make the most difference?
- Where do we need better engagement and information-sharing?
- How do we streamline processes to reduce churn and support faster delivery?

If you opted in via our recent survey, we may follow up to discuss your feedback in more detail to help shape our plan.



Key initiatives now underway

1. Standards Implementation Guide

We are developing a practical guide to make our standards easier to understand and apply in real projects. It will provide clearer pathways for compliance, deviations, and support—helping reduce uncertainty, rework, and unnecessary DFS and RFIs.

2. Standards Blueprint

This new “how-to-write” guide will improve the quality and consistency of our standards. By setting clearer expectations for structure, decision-making, and user focus, it will make standards easier to use, quicker to update, and better aligned to project and operational needs.

3. Enhanced user and stakeholder engagement

We are strengthening how you engage with us through simpler feedback channels, improved information sessions, and clearer access to standards support. This will make it easier to ask questions, share insights, and close the feedback loop.

4. DFS improvement working group

A dedicated working group is focused on streamlining DFS processes. This will support faster, more consistent decisions, better use of minor deviations, and stronger feedback into standards updates—reducing churn while managing risk.

Keep shaping your standards experience

Your feedback is helping make standards easier to find, easier to apply, and easier to work with on real projects. Keep telling us what works and where friction remains.

- Join upcoming webinars and information sessions
- Share ideas or issues via standards@sydneywater.com.au
- Use the new online feedback channel once launched

Together, we’re building a standards experience that reduces rework, supports faster delivery, and helps you work with confidence.

Sydney Water's Deepwater Ocean Outfalls

Sydney Water has three Deepwater Ocean Outfalls (DOOF's) at Malabar, North Head and Bondi Water Resource and Recovery Facilities.

Recent issues have been encountered with debris balls at Sydney Water DOOF facilities. This article will address the history of these facilities, the benefits they provide to the Greater Sydney Region and the ongoing monitoring required to maintain their performance.

History of DOOF facilities

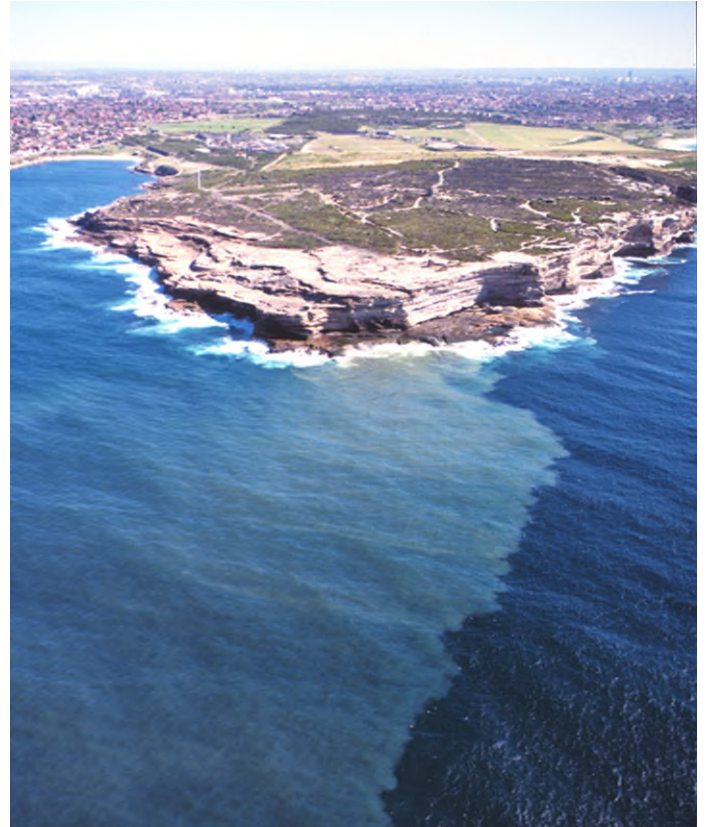
Decision making regarding construction of the DOOF facilities was driven by customer concerns during the 1950's and 1960's. During this time Sydney's population grew and interest in recreational beach activities increased. The sewage pollution and harmful bacterial concentrations at the beaches nearby these discharge points required a solution.

Feasibility studies were conducted during the 1970's to determine the best available infrastructure solution to manage the increased pollution load. Ultimately selection of DOOF facilities was the most efficient arrangement based on the existing layout of Sydney's wastewater network. Other options were excluded on the basis that they required extensive pressure networks with multiple pump stations and high energy costs.

The three DOOF facilities were designed and constructed between 1981 and 1990, with commissioning of the facilities finalised in 1991.



Malabar Beach Pollution Prior to DOOF Construction



Malabar Cliff Face Prior to DOOF installation



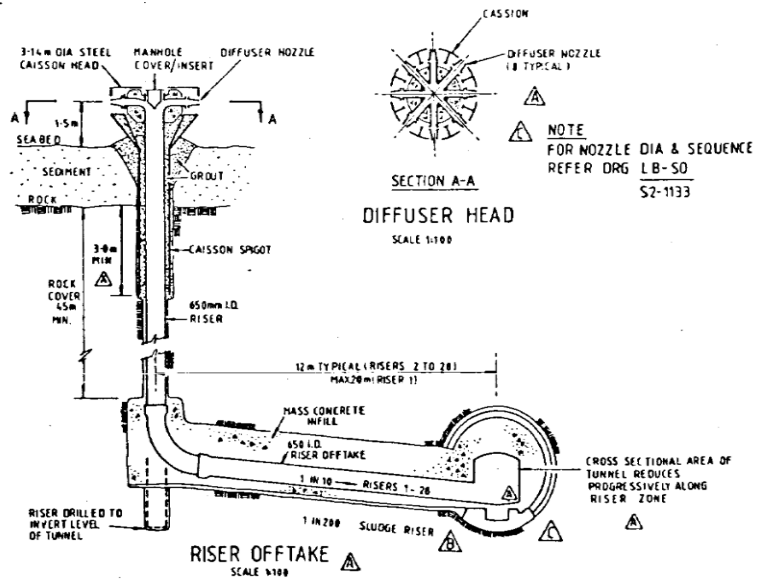
Malabar Cliff Face After DOOF installation

Sydney Water's Deepwater Ocean Outfalls

Learning from Other DOOF Facilities

As part of assessment of the DOOF options, lessons from other DOOF facilities around the world were used to provide the best available engineering solution. The major risk with DOOF's is build up of sediment and blockage of the outlet diffusers. Risks were assessed in the design phase, including:

- Prolonged seawater intrusion leading to marine growth and blocking the outfall outlets.
- Limitations on DOOF outlet flow rates during high wet weather flows
- The density of seawater is higher than sewage effluent. This can cause seawater intrusion and sand sediment entrainment within DOOF's during periods of low sewage flow.
- Design and shape of the outfall diffusers can cause more frequent fouling and build up of sediment within the DOOF.



Design Drawing of DOOF diffusers



De-aeration Scale Model (1:10) to optimise DOOF design

Sydney Water's Deepwater Ocean Outfalls

Development of DOOF design

All engineering risks surrounding the DOOF's had to be considered. Mitigation measures were developed in the design phase and put in place to prevent failures occurring, including:

- Minimum flowrates – to prevent sand sediment embedment and marine growth at the outlets, a minimum flowrate was set for each DOOF.
- High purging flowrates – designed to expel the DOOF of any seawater that has intruded. Due to Sydney's population increase over time, these are generally the peak dry weather flow rates.
- Exclusion Zones – to prevent damage to the DOOF by movement of sea vessels and anchors.
- Internal Outfall Hydraulics – Physical pilot plant models were built to test hydraulics and dissolved air under different flow scenarios. De-aeration chambers were also modelled to release air efficiently and deaerate flows before they enter certain DOOF's.

Conclusion

Sydney Water's DOOF's are critical assets. They have provided significant environmental benefits since construction. Sydney Water continues to work to implement effective treatment solutions to provide robust and cost-effective environmental protection for the Greater Sydney region.



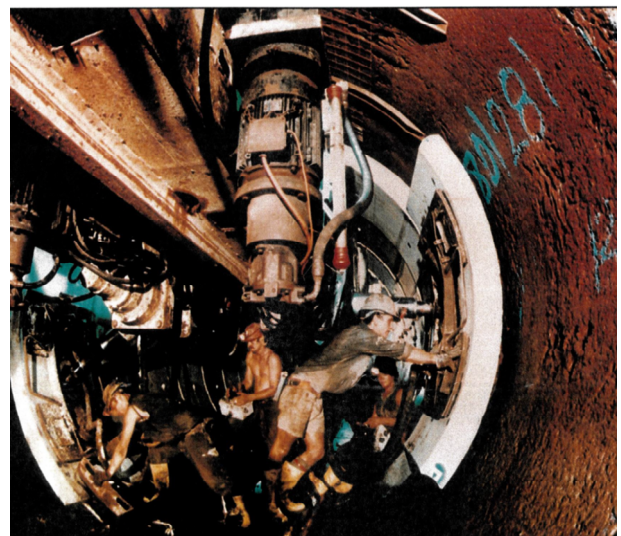
Tunnel Boring Machine used in DOOF Construction



Inspecting Pre-cast Lining in DOOF Tunnel



Erecting formwork for de-aeration chamber



Installation of Pre-Cast Concrete Tunnel Liners on DOOF Tunnel

Recent Releases

These are 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.

Digital Engineering Standard

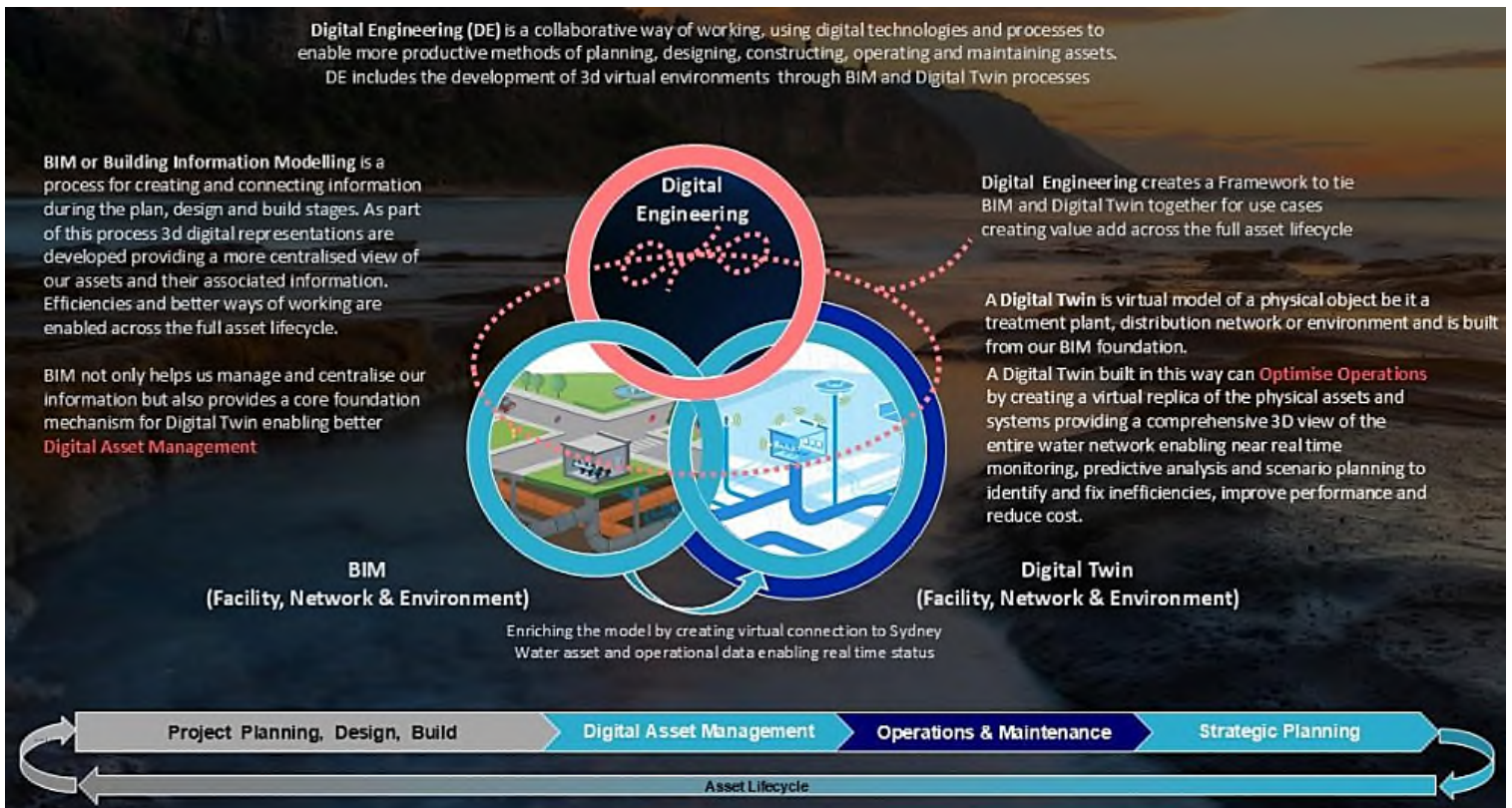
The updated Digital Engineering Standard future-proofs our investment in 3D digital assets, fine tuning and embedding their use across the asset lifecycle and enabling the foundation for Digital Twin.

- Aligning with Industry Best Practices, ISO19650, ISO55000, and improved collaboration.
- Builds a foundation of verified 3D assets for use and re-use by projects.
- Concise 3D asset deliverable guidance and data with a lightweight minimum data 3D BIM Model.
- Reduced requirements prior to WAC and more succinct and concise guidance on project requirements with additional supporting guidelines and templates.

Networks Electrical Template Drawings Access and Management

This new procedure was developed to improve efficiency and cost outcomes for typical Networks/IICATS controlled sites. It explains how to access the new template drawings through EDMS OCP. The procedure, and associated templates, provide:

- A centralised repository, with clear version control.
- A self-service, high availability access portal with reduced bottlenecks.
- Updated CAD files aligning with Sydney Water CAD standards and electrical drafting best practice.
- Look out for new Template Drawing Sets. They are added regularly and are available through the portal as they are released.



Purpose and Vision for Digital Engineering

Technical Specification - Electrical

This update incorporates several technical changes, enhances project delivery and long-term asset value. The main changes include:

- A new structured power reliability assessment validates critical loads early, reducing the risk of late-stage design changes.
- Clarified requirements for pits, conduits, and drainage eliminate common interpretation errors, leading to fewer site issues and lower correction costs. This includes addressing electrical pit drainage as discussed earlier in this newsletter.
- Introduction of a dedicated power supply system for low voltage switchboards. This ensures protection and control systems remain online during disturbances, minimising outage-related failures over the asset's life.
- Strengthened interlock schemes and switchroom sealing requirements to directly reduce safety risks associated with power changeovers, water ingress, and fire spread.



High Voltage Pump Station and Switchgear

EPS 500 – Engineering Product Specification for Standard Pipes and Fittings for Networks

This minor update includes:

- Updates to align with WSA-PS332 Maintenance chambers.
- Updates to polyvinylchloride pipework requirements.
- Details on un-plasticised sewerage pipework for non-pressure applications to align with the WSAA product specification v7.8.

Technical Specification – Mechanical

This update provides a series of key changes to reduce cost and improve delivery timeframes, including:

- Improved maintenance costs for bearings by aligning minimum basic rating lifespan with existing codes and industry practice.
- Reduced performance risks for resilient seated gate valves by restricting use in inclined and vertical pipelines.
- Reduced delivery timeframes by implementing progressive cavity pumps factory tests requirements.
- We have listened to your feedback regarding shorter and more specific standards. As a result, the rotary drum thickener, sludge dewatering and waste gas burner sections removed – now covered in separate standalone specifications.

Dewatering Equipment – Design Specification

This new standard provides clarity on new mechanical assets and reduces cost in several areas including:

- Rotary Screw Thickener technology review to provide cost and layout savings during design and construction with less civil/structural works and operational cost savings.
- Clearer requirements for flushing, vibration control to reduce centrifuge operating costs, improve reliability, and reduce safety risk associated with pipe blockages.
- Clarification of polymer dosing injection to improve dewatering process performance and lower lifecycle costs.
- New safety device to reduce the risk of crush injuries while cleaning and inspecting thickener drums

Fibre Polymer Composite Specification

FPC is an alternative to traditional materials like steel and concrete. It offers benefits including faster construction, reduced project and lifecycle cost, and lower embodied carbon.

This specification sets the requirements for Fiber Polymer Composite (FPC) products when they are being used for:

- Wastewater maintenance holes and inspection chambers;
- Vent shafts;
- Shafts; and
- Structural components such as beams and gratings.

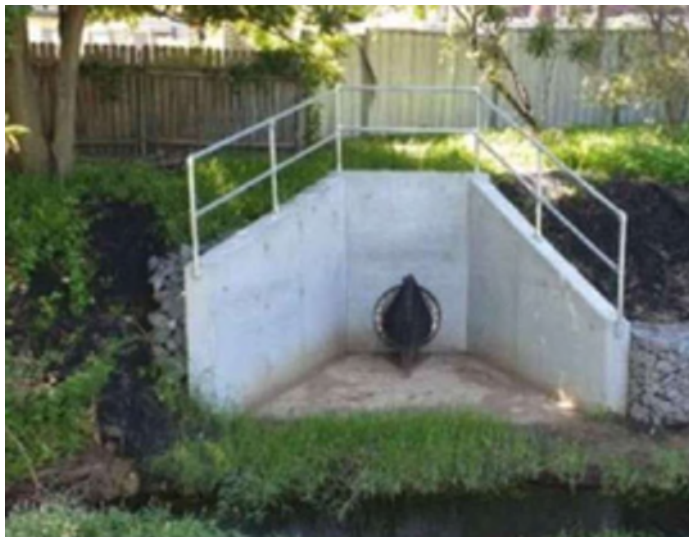
Emergency Relief Structures – DTC drawings and Guideline

Emergency Relief Structures (ERS's) are design to prevent uncontrolled sewer and stormwater overflows during high flows or during blockage of the system. Sydney Water have updated their current suite of ERS DTC drawings. Key changes have been made to DTC 2401 to 2418 to improve delivery outcomes, including:

- Larger diameter inline valve installation at stormwater outlets, now up to DN750.
- Larger diameter inline valve installation within chambers, now up to DN600.
- New integrated chamber design for weirs and valves that accommodates larger check valves and reduce chamber footprint.
- New inline check valve solution for internal clamp installation.

In addition to DTC drawing updates, updates have been made to the Emergency Relief Structure Headwall and Duckbill Check Valve Arrangement Guideline to align with new design outcomes. These changes will improve cost and delivery outcomes, including:

- Reduction in cost and improved sustainability impact by reducing chamber footprint and materials used.
- Reduces time and cost to projects by providing a broader suite of DTC drawings avoid the need for a bespoke design.
- Improved operational performance by reducing risk of ragging and removing sharp edges.
- Inclusion of clamp type inline check valves provides lower associated product and installation cost.



Emergency Relief Structure

WAC Drawing Specifications

The WAC Drawing Specifications have recently been updated to improve clarity, consistency, and alignment across submission and acceptance processes. Updates include:

- Status terminology has been standardised to ensure consistent interpretation and use across teams and systems.
- Clear guidance has been added confirming that red line drawings are not accepted as WAC drawings.
- Enhanced detail has been introduced to ensure consistent application of Title block information and the WAC stamp, supporting compliance and quality assurance outcomes.

Implementing new standards

In-flight projects

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.

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.

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.

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

We're committed to have an integrated suite of standards that are easy to use, responsive to our evolving needs, and enable innovation.

New and updated standards are being developed to support you in delivery of our capital program, meeting our customer outcomes and to help achieve our commitment to achieve net carbon zero emissions.

Standards Nearing Completion

The following standards will be released over the next 3 months.

- Sydney Water Edition of the Sewage Pumping Station Code of Australia (WSA-04)
- Pressure Reducing Valve DTC Checklist
- Technical Specification – Civil
- Diesel Pump Specification
- Technical Specification – Permanent Gas Engine Driven Pump
- HV Installation Specification

Upcoming Standards Development

We are commencing work on the following standards soon. If you wish to contribute to development of these standards or provide feedback at any time, please email standards@sydneywater.com.au.

- Electrical Substation Control and Monitoring Guidelines
- Water Pumping Station Design Specification
- Sydney Water Edition of the Sewerage Code of Australia (WSA-02)
- Sydney Water Edition of the Water Supply Code of Australia (WSA-03)



Engineering Standards Development

Accessing Sydney Water Standards

All our standards and alerts 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](#). Our standards that do not contain sensitive information are available on our website. If you cannot find a standard that you need please reach out to us through our standards inbox.

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.