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Pr10661 - Specification for Sewer Temporary Pumped Bypass

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Documents Details

This document is only valid on the day it was printed.

Document Sponsor	Infrastructure Standards and Product Approvals Committee
Document Owner	Manager Network Operations, Customer Delivery
Subject Matter Expert	Operational Engineer, Customer Delivery
References	Refer to Appendix B of this document

Version Review/History

Revision	Reviewed by	Approved by	Date approved	Change	Reason for Change
1	B. Maule S. Slack	R. Duncan	08/11/2019	First Revision	New document to address consistency in approach to sewer temporary pumped bypass
2	L. Kerr L. Bryson	N/A	N/A	Minor admin amendment 20/05/2021	Replace PDS and Project Description Statement with CBC and Concept Business Case as part of the Capital Works Reform program. Update to align with current template.
3	C. Timms	C. Timms	14/09/2021	No changes	Periodic review
4	L. Bryson Y. Skinner	N/A	N/A	Minor admin amendment 02/06/2022	To update legislation title *Queensland Building Services Authority Act 1991* to *Queensland Building and Construction Commission Act 1991* (Qld).
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6	L. Bryson	N/A	N/A	Minor admin amend 12/06/2023	To update doc reference title for Pr8996.
7	D. Chellachamy L. Bryson	D. Chellachamy Manager Network Operations	14/09/2023	Periodic review – changes to align with template	Periodic review
8	L. Bryson	N/A	N/A	Minor admin amend 25/03/2025	To update M&E Engineer with Operational Engineer as per position title change
9	D. Chellachamy	D. Chellachamy Manager Network Operations	05/08/2025	Periodic review	Periodic review
10	C. Colombo	N/A	N/A	Minor admin amend 14/10/2026	To update Pr8996 from Network Permit to Work Procedure to Permit to Work Procedure

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1. Purpose

The purpose of this Specification is to outline Unitywater's minimum requirements for the design, installation, maintenance and removal of a temporary pumped bypass system for diverting sewage flows around a work area for the duration of a project.

This Specification will provide a consistent approach to sewer temporary pumped bypass systems, enabling Unitywater to maintain its reputation as a water industry leader in customer service, health and safety.

2. Scope

This Specification nominates Unitywater's operational and technical requirements for a sewer temporary pumped bypass system that would be required when sewer flows cannot be addressed using mobile tankers or where flows will be interrupted for an unacceptably long time.

This Specification applies to gravity sewers or sewage pumping stations requiring temporary pumped bypass.

Unitywater will audit the installation and maintenance of the sewer temporary pumped bypass system to ensure it complies with this specification.

3. Technical Details

3.1. Technical Scope

- The scope of the works for sewer temporary pumped bypass shall be the submission to Unitywater for approval of a Flow Management Plan (FMP) certified by an RPEQ.
- The FMP shall include but not limited to, the design, supply, install, test/prove, commission, operate, maintain and decommission of the sewer temporary pumped bypass system.
- The scope shall include pumps, pipework, any odour control system, any temporary noise controls and all other controls required to successfully conduct a sewer temporary pumped bypass.
- The Contractor shall be responsible for all Statutory and Unitywater approvals required to successfully complete the pumped bypass.

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3.2. Bypass Design/Flow Management

- In addition to other contract documentation requirements, the sewer temporary pumped bypass shall comply with the SEQ Water Supply and Sewerage, Design and Construction Codes.
- The Contractor shall be responsible to schedule and perform the work in a manner that does not cause or contribute to incidence of overflows, or spills of sewage from the gravity sewer or the pumped bypass system.
- In designing the bypass pump system, the Contractor shall consider appropriate work procedures to mitigate any hazards associated with the pumped bypass design. These work procedures must form part of the bypass operation and shall be submitted to Unitywater as part of the documentation required for the FMP.
- The bypass shall be designed to be in place for the full duration of the works.
- Pumping criteria shall be as per SEQ Design criteria or Detention Test results.
- Pumps shall be capable of delivering a range of flows from ADWF to PWWF for the duration of the pumped bypass, either through the existing sewer rising main for a SPS bypass, or delivery to the downstream gravity sewer system for a sewer over-pumped bypass. Calculations shall include but not limited to static lift, friction losses, flow velocity, including pump curves showing pump operating range.
- For over-pumped bypass of sewer, downstream sewer capacity to be confirmed.
- The number of pumps shall be either of the two (2) arrangements below:
  a. 2 pumps operating in a duty/assist arrangement plus one (1) spare pump on site (typically used on larger sites, PWWF over 500 L/s), or
  b. 2 pumps operating in a duty/standby arrangement (typically used on smaller sites, PWWF under 500 L/s).

Data supplied to the Contractor shall be in the form below:

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Data Required	Typical Format
Detention time of upstream network	*3.5 hours*
Number of installed pumps on site	*2 pumps set up Duty/standby*
Number of spare pumps on site	*Nil*
Type of pump	*Diesel powered self-priming pumps OR Submersible electric pumps*
Pump duty flow – single pump OR 2 pumps Duty/standby	*90 L/s*
Pump suction point	*Fit suction pipes into maintenance hole 2677797. Insert plugs into upstream DN500 sewer. Maintenance hole depth 4.34 m.*
Pump discharge point	*Connect discharge line into pump station SPS-KAW052 discharge maintenance hole 2677792. Insert plugs into upstream DN200 sewer rising mains.*
Preferred bypass pumping SRM size and material	*DN150 (min) flexible hoses with Bauer fittings*
Bypass pumping SRM line route	*Pipe laid on surface parallel to sewer line*
Discharge flow meter required	*No*
Remote monitoring system	*Stand-alone auto dialler reporting to Contractor OR Control / level / metering, signals hard-wired to RTU within SPS-KAW052 switchboard, reporting to Unitywater Control Room*

The Contractor shall submit a relevant Certified FMP for approval by Unitywater.

A FMP is to be created for which the Contractor will adhere to for the duration of construction works. The FMP shall provide comprehensive details of how all flows will be managed throughout the pumping operation, and shall include, but not be limited to:

a. Design drawings showing:
   i. Full layout, fencing/barricading, design of pipe/pump support/restraint, temporary/permanent alterations of existing infrastructure.
   ii. Driveway, footpath, road and other crossings impacted by the works.
b. FMP report including:
   i. Detention testing results
   ii. Trial Interventions results
   iii. Lock out and tag out of any upstream SPS's
   iv. The type of pumps and number of pumps required
   v. Redundant pump (where applicable), availability of spares
   vi. Bypass pump duty including:
      1. Single pump duty flow
      2. Single pump duty head
      3. Static head
      4. Suction lift assuming diesel driven pump suction centreline at 1 m above pump hard-stand level
   vii. System resistance calculations, including system resistance curve

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viii. Bypass pumping sewer rising main size, material, design pressure, test pressure, thrush restraint calculations

ix. Pump suction and discharge connection arrangements, including valves and fittings

x. Power supply (where applicable)

xi. Sewer isolation plug details (size, location, double isolation, etc.)

xii. Start / Stop / alarm levels including pre-overflow alarm and overflow levels

xiii. Method of monitoring of the bypass system – control / level / metering

xiv. Communication protocols, including 24-hour Contractor contacts lists and liaisons with Unitywater Control Room

xv. Fuel requirements and re-fuelling programs (where applicable)

xvi. Overflow management

xvii. Odour management

xviii. Noise Management

xix. Weather monitoring

xx. Statutory approvals including Environmental Compliance

xxi. Operational methodologies for Planned Network Intervention including emergency response, rain events etc

xxii. Risk assessment using Unitywater risk assessment template and risk calculator

xxiii. Contingency measures and procedures, including, but not limited to:

1. Mechanical failure / breakdown / power failure
2. Pump blockages
3. Hoisting equipment for each pump
4. Monitoring upstream sewer network for back-up impacts
5. Wet weather
6. Incoming flow exceeding pump capacities
7. Tankering.

3.3. Planned Network Intervention

A Planned Network Intervention (PNI) application shall be submitted to Unitywater in accordance with Pr8996 - Permit to Work Procedure.

The approved and certified FMP will form the basis of the PNI. (PNI required to be submitted to Unitywater 28 days prior to planned shutdown/bypass/intervention).

3.4. Bypass Installation/Operation

- For a SPS bypass, where a flanged valve connection to the sewer rising main is installed within the scope of the project, it shall remain as a permanent connection point for future sewer pumped bypass operations.
- Sewers shall be plugged to provide double isolation to the upstream network and to

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provide a safe workplace for workers within the bypassed site. The section of sewer between double plugs shall be continuously monitored for leakage (level monitoring) to ensure plugs are operating as required and to provide a safe workplace downstream of the isolation.

- Where over-pumping of a gravity sewer is to be conducted, the discharge maintenance hole will require double isolation plugs upstream of the maintenance hole to provide a safe workplace upstream of the operational sewer.
- Maintenance hole/s which will be acting as the temporary pumping station may require to be fitted with a removable top slab. Allowance should be made to excavate around the top of the maintenance hole, saw-cut or lift off the top slab and replace with a new removable top slab suitable for the bypass pump and pipework configuration. This new maintenance hole top slab to have PE soffit lining and shall remain in place when the works are complete and as such shall be fitted with standard maintenance hole access cover/s.
- Prior to the pumped bypass being operational, all pump pipework must be restrained, and a NATA certified pressure test on the bypass system conducted in accordance with the FMP certified design.
- The Contractor shall be responsible for the supply, installation and operation of all materials (incl. fuel if required) and equipment needed for the temporary pumped bypass and for the duration of works.
- The Contractor shall be responsible for all traffic/pedestrian control required for the temporary pumped bypass.
- The design shall include continuous '24/7' remote level monitoring of upstream gravity sewer system, the plugged section and bypass pumps including 'High Level' and 'Pump Fault' communications to the Contractor and Unitywater Control Room.
- A proving period of 24 hours (min.) is required for the temporary pumped bypass and is to be clearly identified on the Construction Management Plan as a 'Hold Point' requiring Superintendent acceptance and approval to commence the temporary pumped bypass operation.
- The temporary pumped bypass shall remain in place and fully operational during the SPS or the gravity sewer commissioning reliability trial period.

3.5. Materials

- All materials used as part of the temporary pumped bypass, connections and related appurtenance's must be compliant with *SEQ WS&S D&C Infrastructure Products and Materials List (IPAM)*.
- Pumps selected shall be compatible with pumping raw sewage.
- Preferred pipe material for bypass lines DN200 and over is Polyethylene Pipe (PE100) with minimum PN16 pressure rating. Alternative materials may be offered, subject to meeting the design pressure stated in the FMP.
- The use of lay flat hoses require approval by the Superintendent.
- Where existing pipework is to be removed, any gasket, nut and bolt sets shall be replaced with new materials.
- The Contractor shall take all care to maintain the materials and equipment in good

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condition during the pumped bypass to ensure correct operation.

3.6. Road Crossings (if applicable)

Roads shall not be crossed by open cut construction method unless otherwise approved by the Superintendent and the relevant Road Authority.

3.7. Other Considerations

Other items for the Contractor to consider include the provision of additional valves to assist in the efficient and economical use of the temporary pumped bypass.

For certain situations, tankers or tankers in addition to temporary pumped bypass may be considered by Unitywater where considered appropriate.

3.8. Maintenance

The Contractor shall be responsible for the safety, protection, maintenance and for carrying out inspections of the operational bypass pumping system. As a minimum this is to be undertaken on a twice daily basis whilst work is being performed on the site, and on a daily basis, regardless of whether works are occurring on site, i.e. weekends, rostered days off, etc.

The inspections shall check for safety and trip hazards, leaks, damage, and that the system is operating as intended. Documentation of each inspection shall be made available to the Superintendent immediately on request.

Any repairs or rectifications necessary for the operation of the bypass pumping operation are to be performed by the Contractor and must commence within 1 hour of identification when the site is active and within 4 hours at other times.

The primary and secondary contacts nominated on the PNI application must be contactable by the Unitywater Control Room ‘24/7’.

3.9. Removal

The Contractor shall be responsible for the complete removal of all materials and equipment used for the temporary pumped bypass and the full replacement and/or reinstatement of all disturbed or damaged existing infrastructure and surface areas.

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4. Appendices

Appendix A – Definitions/Acronyms

The following definitions, abbreviations and acronyms are used throughout this specification.

Term	Meaning
24/7	Twenty-four hours a day, seven days a week.
Bypass design	The design of a sewer temporary pumped bypass to ensure Unitywater's desired level of service to customers and other parts of the reticulation is maintained.
CBC	Concept Business Case
ITP	Inspection and Test Plan
Flow Management Plan (FMP)	Provides comprehensive details on how flow will be managed during the duration the works. A FMP is to be RPEQ Certified.
PNI (Planned Network Intervention)	Unitywater's planned process for managing activities impacting on Unitywater's infrastructure. Required to be submitted to Unitywater 28 days prior to the planned shutdown/intervention.
PWWF	Peak wet weather flow
RPEQ	Registered Professional Engineer of Queensland
SEQ WS&S D&C Code	South-East Queensland Water Supply and Sewerage Design and Construction Code including: • Water Supply Code • Design Criteria • Infrastructure Products and Materials • Asset Information Specification.
Sewer temporary pumped bypass system	An approved pumping system which provides temporary sewer bypass across a work area within the gravity sewer system or a sewage pumping station. The pumped bypass is designed and operated to manage all anticipated flows.
SPS	Sewage Pumping Station

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Appendix B – References

General

All work carried out under this specification shall comply in all aspects (i.e. in design, construction, testing and performance) in accordance with:

- *Work Health and Safety Act 2011* (Qld)
- *Work Health and Safety Regulation 2011* (Qld)
- *Water Supply (Safety and Reliability) Act 2008* (Qld)
- *Environmental Protection Act 1994* (Qld)
- *Queensland Building and Construction Commission Act 1991 (*Qld)
- South-East Queensland Water Supply and Sewerage Design and Construction Code (SEQ WS&S D&C Code - available via the SEQCODE website: www.seqcode.com.au) including:
  - SEQ WSA 02 – Sewerage Code of Australia
  - SEQ WSA 04 - Sewage Pumping Station Code of Australia
  - SEQ Water Supply and Sewerage Design and Construction Code - Design Criteria
  - SEQ IPAM List (SEQ approved Infrastructure Products and Materials List)
  - SEQ Asset Information Specification
- Unitywater's Technical Specifications
- The latest relevant Australian (AS), British (BS) and IEC Standards
- Standards included in the following sections.

Reference to specific clauses of the various codes is intended to highlight those points and shall not be taken to imply a lesser importance for all other applicable clauses.

All the works shall conform to the Rules and Regulations of the Statutory Authorities having jurisdiction over the Site.

If the requirements of this Specification do not articulate the minimum requirements of the statutory regulations and standards, the regulatory requirements are taken to apply. If the requirements of this Specification are more exacting than the minimum requirements of the statutory regulations and standards, the former shall apply.

All Materials, fittings, accessories and equipment supplied by the Contractor shall be new and the best obtainable of their kind and shall comply in all respects with the requirements of the relevant Standards Australia specifications.

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Quality and Standards

Unless otherwise specified, the equipment covered by this Specification shall be designed, manufactured, installed and tested in accordance with the following, listed in order of precedence:

- the Project Contract documents
- requirements of the Statutory Authorities having jurisdiction over all or part of the manufacture, installation or operation of the plant
- the SEQ WS&S D&C Code
- all relevant Australian and governing Queensland standards where applicable
- Water Services Associated of Australia (WSAA) national codes
- Water Services Association of Australia (WSAA) Guideline: Dechlorination of Drinking Water to Discharged Waterways, National Guidance for the Urban Water Industry 2019.

In the absence of relevant SEQ WS&S D&C Code, WSAA or Australian codes or standards, relevant industry, international (ISO), European or British standards shall be followed. International standards shall take precedence over European or British standards. The Contractor shall obtain approval from the Superintendent prior to using any non-Australian standards not nominated in the equipment specifications, schedules, datasheets or associated drawings.

Where local or international standards do not exist, the manufacture and installation of equipment shall be in full compliance with the manufacturer's own recognised standards. Manufacturer's standards, where used, shall be submitted to the Superintendent by the Contractor for review and acceptance shall be obtained by the Contractor from the Superintendent prior to commencement of manufacture.

All equipment shall comply with relevant Federal and State Acts, Regulations and Codes including, but not necessarily limited to, the following:

- *Work Health and Safety Act 2011* (Qld)
- *Work Health and Safety Regulation 2011* (Qld)
- Work Health and Safety Queensland Codes of Practice.

The version of any applicable standard or regulation shall be the revision in place at the date of invitation of contract packages.

The Contractor shall have in place a dedicated quality system that conforms to ISO 9001.

Quality control procedures for management, inspection, review and evaluation of all materials, manufacture, workmanship and testing of all products shall be planned and implemented by appropriately skilled and qualified persons to ensure that requirements of the quality procedures are met and that high quality is maintained.

The Contractor shall ensure that all equipment supplied/installed under this Specification is the product of a manufacturer who is fully experienced, reputable, qualified and regularly engaged for at least five years in the manufacture of the equipment to be supplied/installed.

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Relevant Unitywater documents that relate to this specification:

Document No.	Title
Pr8996	Permit to Work Procedure
Pr9380	Specification for Electrical Installations at Network Sites
Pr9693	Specification for Mechanical Installations
Pr9875	Specification for Non-Pressure Pipeline Construction
Pr9904	Specification for Pressure Pipeline Construction

International and Australian Standards referenced within this specification:

Standard	Title
Various standards	International and Australian Standards as detailed in Pr9693 - Specification for Mechanical Installation

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