

Pressure Sewer Pump Stations

Greater than 5,000L storage capacity

AM 3008

AM3008 – Pressure Sewer Pump Stations Greater than 5kL

Document History

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1. Introduction

1.1 Purpose

The purpose of this document is to provide South East Water (SEW) requirements to designers for Pressure Sewer Pump Stations with a storage capacity of over 5kL.

1.2 Scope

This document applies when:

- SEW Sewer Planning has determined, in consultation with other teams, that a pressure sewer pump station is the appropriate servicing solution, and
- The required volume, consisting of both operating volume and emergency storage volume, is greater than 5,000L.

Correct functioning of a pressure sewer network requires balanced hydraulic performance. Therefore, the maximum peak daily discharge that is acceptable for a pressure sewer pump station has been set at 28kL. Furthermore, all sites over 10kL require a current hydraulic model of the pressure sewer network and the downstream receiving network. A site requiring a higher capacity will require a sewage pump station (SPS). A SPS can be privately owned or owned by SEW. Refer to SEW's Land Development Policies and Pricing Manual.

This document does not include processes for obtaining a trade waste agreement from SEW.

This document is not intended to be used as a prescriptive standard as defined by the Professional Engineers Registration Act 2019.

1.3 Definitions

Balancing storage – the liquid volume required to store unbalanced flows (inflow greater than outflow) into the pump tank for a short duration. May also include volume to store inflow temporarily to enable peak smoothing which is when SCADA communicates with the pump controller to reduce the number of pumps in the network running simultaneously.

Controller – a cabinet containing logic control and switch gear for pumps

Dead storage – the liquid volume in the bottom of pump tank below pump stop (pump cut out)

Dispensation – formal approval from South East Water to not comply with a standard.

Emergency storage tank – a tank for the sole purpose of providing emergency storage volume

Emergency storage volume – liquid volume to be stored beyond pump high level alarm that is equal to or greater than 24 hours of peak day inflow.

LPSC – low pressure sewer commercial. A term used in various South East Water asset systems. Same as pressure sewer pump station.

Pressure sewer – a sewerage system that consists of a pump tank (pump unit) on each property that macerates the sewage before pumping into a network of pressurised mains and ultimately to a sewage treatment plant.

Pressure sewer pump station – includes all the infrastructure required such as pump tank, emergency storage tank and associated civil, mechanical and electrical components

Property Sewerage Plan – a neatly drawn plan showing the sanitary drains and fixtures installed by the plumber. Also called sanitary drainage plans.

Pump cut in level (pump start) – the liquid level set point at which the pump turns on

Pump cut out (pump stop) – the liquid level set point at which the pump turns off

Pump tank – tank that contains pumps. It may provide none, some or all of the required emergency storage volume

Operating volume – Consists of dead storage, volume between pump start and pump stop, and balancing storage.

Sewage Pump Station – large pump stations up to 200L/s that are designed to WSA04-2022 Sewage Pumping Station Code of Australia and AM2961 SEW Supplement

Spring line – horizontal line through the centre of circular object

Trafficable – Any of the following:

- A location that is intended to be used by cars or heavier vehicles. Includes roads, driveways, shoulders, kerbs, parking areas, crossovers, multi-use paths (pedestrians/cyclist/maintenance vehicles) and informal tracks.
- A location that has evidence of being used by cars or heavier vehicles.
- A location that in the opinion of a SEW officer, is susceptible to unintended use by cars or heavier vehicles. Includes a grassed area with potential for overflow car parking.
- A location that maintenance vehicles of a car size or heavier could be expected to use. Includes a ute tipping mulch onto a garden bed or a tractor over 1000kg mowing.
- Adjacent to a location intended to be used by cars or heavier vehicles. Adjacent is a horizontal distance equal to the vertical depth of a SEW asset.
- A median strip (a strip of land that is usually not sealed between traffic lanes travelling in opposite direction).

1.4 Key References

The following documents provide background information or are directly referenced within this document. Before adopting a requirement within these documents, obtain confirmation from SEW that the requirement is applicable to pressure sewer pump stations greater than 5kL.

- WSAA Pressure Sewerage Code of Australia WSA 07-2007 Version 1.1
- MRWA WSAA Pressure Sewerage Code supplement
- SEW Sewer Servicing Guide
- SEW_PSS_014 On Property Asset Installation
- SEW_PSS_015 Tapping Arrangements and Boundary Kit Installation
- R4 Approval Process
- AM2488 Drafting Specification

The following documents may be of assistance to the designer in some project specific circumstances:

- AM2757 Covers for Underground Structures
- AM2884 Pit Standard
- AM2883 Sewerage Air Valve Standard
- AM2759 Facility Resilience and Security Technical Standard
- AM2714 Electrical Standards
- AM2717 Generator Specification
- AM2832 Instrumentation and Control Standards
- AM2848 Approved EIC Equipment List
- AM2851 EICC Inspection Testing Completion and Decommissioning
- AM2922 Fixed ladder and Stairway Standard
- AM2973 Sewer Scour Standard

1.5 SEW Approved Products

Use only SEW Approved products. Approved civil and mechanical products can be found on [Pages - Home \(mrwa.com.au\)](https://www.mrwa.com.au). Electrical products are in AM2848 Approved Equipment List. Non-approved products require a dispensation.

1.6 Dispensations

The Designer or Constructor may request a dispensation from a SEW standard. The dispensation request shall include:

- The name and number of standard
- The requirement of the standard
- Explanation of why the requirement of the standard is not applicable
- Alternatives considered to fulfill the likely intention of the standard
- Proposed solution

The dispensation request shall be submitted using the specified Contract method.

The SEW dispensation assessor shall consult with the following SEW teams:

- Engineering and Design
- Trade Waste
- Sewer planning
- Development Connections
- SEW construction team
- Asset Integration
- Operations & Maintenance (via asset integration if applicable)
- Standards Manager
- Other teams if relevant to the topic such as SCADA

1.7 Drawings

Design and installation shall comply with the following drawings to be used in conjunction with this standard:

- Civil / Mechanical
 - Not available this revision
- Electrical
 - Dual OneBox
 - STD.0000.E.100 General Arrangement
 - STD.0000.E.101 Fabrication Details
 - STD.0000.E.102 Weldment Assembly
 - STD.0000.E.103 Circuit Diagram
 - Small PLC
 - Duplex Construction Diagram DPSS-011
 - Duplex 1 Phase Connection Diagram DPSS1.E.001
 - Duplex 3 Phase Connection Diagram DPSS3.E.001
 - Large PLC
 - LPSC.E.001 Title Sheet and drawing index
 - LPSC.E.002 Single line diagram
 - LPSC.E.003 Power distribution
 - LPSC.E.004 24VDV Power distribution and controls
 - LPSC.E.005 Pump 1 Motor starter and controls
 - LPSC.E.006 Pump 2 Motor starter and controls
 - LPSC.E.007 RTU,HMI, Data radio and modem overview
 - LPSC.E.008 RTU slot 1 and 2 – digital inputs
 - LPSC.E.009 RTU slot 1 digital outputs and slot 3 analog inputs
 - LPSC.E.012 Spray solenoids schematic diagram
 - LPSC.E.013 Outer doors and generator box layout
 - LPSC.E.014 Escutcheon layout
 - LPSC.E.015 Equipment layout
 - LPSC.E.016 Side views and section details
 - LPSC.E.017 +ZA.01 equipment layout

- LPSC.E.018 +XA01(A) equipment layout
- LPSC.E.019 +XA.01(B) equipment layout
- LPSC.E.020 +XA.02 and +XA.03 equipment layout
- LPSC.E.022 Installation details
- LPSC.E.023 Switchboard Construction Notes

Project specific drawings shall comply with AM2488 Drafting Specification.

2. Property Connection Application Process

The customer or nominated representative will need to apply to South East Water regarding the proposed connection of the property. A Property Development Officer (PDO)) will be assigned, and as a part of the application process, the customer will be asked to provide the following details:

- Site plans
- Customer preferred location
- Number & type of fixtures
- Maximum number of occupants or staff over a 24hr period
- Type of business, hours of operation
- Trade waste discharge volumes (if applicable)
- Type of flows (gravity or pumped)
- Spill level, eg Overflow Relief Gully, or pressure sewer pump tank lid level
- Patterns of use to support peak hour discharge estimation, such as:
 - Percentage of staff who have showers on-site (where known)
 - Truck wash volume per wash
 - Percentage of staff who eat at cafeteria. (where known)
 - Production batches
 - Seasonal fluctuations

The submitted application is then referred to SEW Sewer Planning team for network capacity analysis and pump tank sizing. In some instances, the SEW Planning Team may need to consult other SEW teams.

The PDO will then follow the approved process for selecting the design and construction (delivery) method.

Where mains extension works are required, Property Development will select an appropriate pathway which may include Minor Sewer Alterations team or Land Development Team either of which may require live sewer accredited contractors to perform the works.

2.1 Detail Design

Detail design is expected to pass through the following phases:

- Phase 1 – Pre-design
- Phase 2 – Preliminary design
- Phase 3 – Detail Design

Further information is contained in Appendix B.

Detail design shall provide all information required by a competent contractor to construct.

The drawings or specification shall stipulate the geotechnical responsibilities of the Constructor.

A design report is to be provided at detail design phase. Refer to Appendix D for further information.

3. Pump Station Requirements

The pressure sewer pump station shall be designed to the following requirements. In the event that any of the requirements or assumptions in this standard including drawings, cannot be met, then a dispensation from the standard shall be requested, refer to Section 1.6.

3.1 Site

The site location and layout shall:

- Minimize hazards for construction, operation, maintenance, and pedestrians including traffic, slips, trips, and falls.
- Include an easement in SEW favour, covering all of the assets owned by SEW.
- Locate tanks on private property, unless servicing public facilities and amenities. Tank, boundary kit and controller must not be installed in a road reserve.
- Locate the boundary kit in private property or the equivalent for public facilities and within 1m of the property boundary facing the road. Boundary kit to be easily accessible.
- Locate the tank in a non-trafficable area. If a non-trafficable location cannot be found, dispensation as per section 1.6 is required.
- Consider that tanks in trafficable areas require additional measures to be specified which may include thicker tank walls and load bearing concrete slab.
- If possible, locate the tank beside a vehicle access area, so the pumps can be lifted from a ute mounted crane (although this is not current practice). Tanks near trafficable areas (horizontal distance between tank and trafficable area is less than tank depth) shall be ordered to suit traffic loads of heavy vehicles.
- Enable parking for a service vehicle (Ute) and an eductor truck (9m rigid) within 15m of the tank. Preference is for parking to be immediately adjacent and at the same level as the pump tank. Parking can be on-street or off-street, with off-street preferred if there is a suitable location. Eduction more than 15m is possible with larger trucks but dispensation is required.
- Include eductor truck parking at a ground level no more than 6m higher than the floor of the tank to achieve adequate suction performance for commonly available trucks.
- Ensure on-street parking locations are legal to park all day and every day.
- Ensure off-street parking is gravel or asphalt. Eductor truck parking in a designated parking bay is preferred but in a vehicle movement lane of a carpark is tolerable if hoses between truck and pump tank are not required to pass between parked vehicles.
- Ensure on-site parking areas for ute and eductor truck will minimise interruption to customer for 8hr duration and provide 24 hour / 7 day a week access.
- Have a concrete slab around each tank lid of minimum 2m x 2m. Unless specified otherwise, in non-trafficable locations, the concrete slab shall be N20, 150mm thick, SL72 mesh, wooden float finish, 1 in 100 fall away from lid. Additional requirements may be triggered by safety equipment or buoyancy.
- Have a formed footpath (gravel, concrete, asphalt) from the pump tank to the service vehicle parking if any part of the slope is steeper than 1:20.
- Locate the tank lid and air vent higher than the ORG, if site levels allow.

3.2 Tank

Both the pump tank and storage tank shall:

- Each have a separate air vent for in and out flow of air as tank levels change. The air vent shall preferably be terminated at waist height to avoid being a trip hazard. Waist high vents to be stainless steel. Alternatives such as a stainless steel ankle height vent with waist high meter cage or two bollards minimum 900mm high may be acceptable. Fix 10mm mesh at opening. All vents shall be placed more than 3m from windows and doorways.

- Have a lid rated for Class B in non-trafficable or Class D in trafficable areas or as approved by SEW. Ductile iron lids larger than 750mm in any dimension shall be two part.
- For lids in trafficable areas, have low slip risk surface such as ductile iron concrete infill. Full ductile iron covers with slip resistance of P4 or better to AS4586-2013 can be submitted to SEW for dispensation consideration.
- Have a removable fall arrest grate underneath the lid. The grate shall:
 - consist of 150mm x 150mm grids
 - be made of aluminum
 - be designed for loads as per AS1657 Clause 5.2 and deflection limit of span/250
 - have a confined space entry sign securely attached
 - have a 20mm cut-out in perimeter frame for pump cables.

In addition, the pump tank shall:

- Be designed for all operating and maintenance tasks to be completed from ground level.
- Not have a ladder.
- Be selected to have tank diameter no less than 1.2m diameter to fit two pumps.
- Have a maximum diameter of 1.5m at floor level. Pump tanks with diameter greater than 1.5m shall have benching at 30 degrees to vertical in same material as tank wall. Benching to extend higher than pump stop level.
- Not be greater than 10kL capacity.
- Have the inlet a minimum of 50mm above pump start level, and a maximum of 300mm. If the property sanitary drain is higher, then use an inspection shaft, at minimum of 500mm clearance from the tank. Refer drawing SEW_PSS_014.

In addition, the emergency storage tank (if required) shall:

- Have a solenoid controlled roof mounted sprinkler system.
- Include a stainless-steel vertical ladder at the higher end of tank.
- Have a DN1050 riser with a 900x900 opening above the ladder.
- Have 750x750 openings with DN900 riser at other locations.
- Have openings at 3m spacing (centre to centre), and no more than 1.5m to end wall, to ensure the tank walls are visible to at least the spring line.
- Have a floor slope no flatter than 1 in 100.
- Have no areas that can pond. If ponding is unavoidable, fill areas with fiberglass resin, with benching slope of approximately 30 degrees to horizontal, in the factory.
- Have an anti-flotation system, usually made of concrete, that does not require tie down points.
- Include a level transducer with level weight and 316SS bracket/hook at the lower end of the tank mounted at an opening. Refer to drawing SEW-STD-030.
- Have fibreglass moulded pipe connectors installed at factory.
- Have a connection to vent near both ends of horizontal tanks.

A nominal 1000mm diameter maintenance hole to MRWA standards is required to enable inflows to be diverted to the emergency storage tank. The preferred arrangement is shown in Figure 1 and Figure 2.

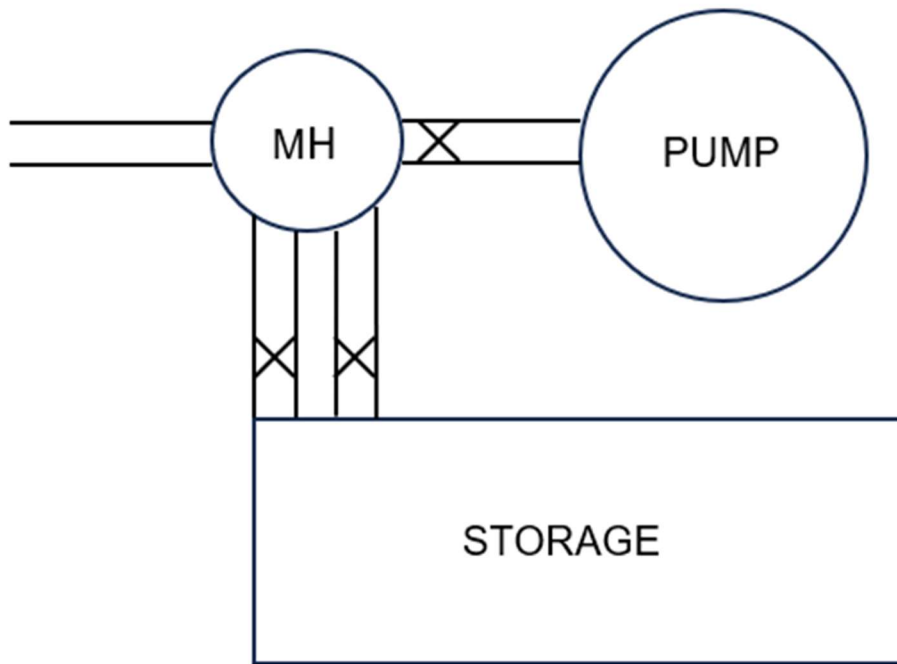


Figure 1 – Plan view-emergency storage configuration

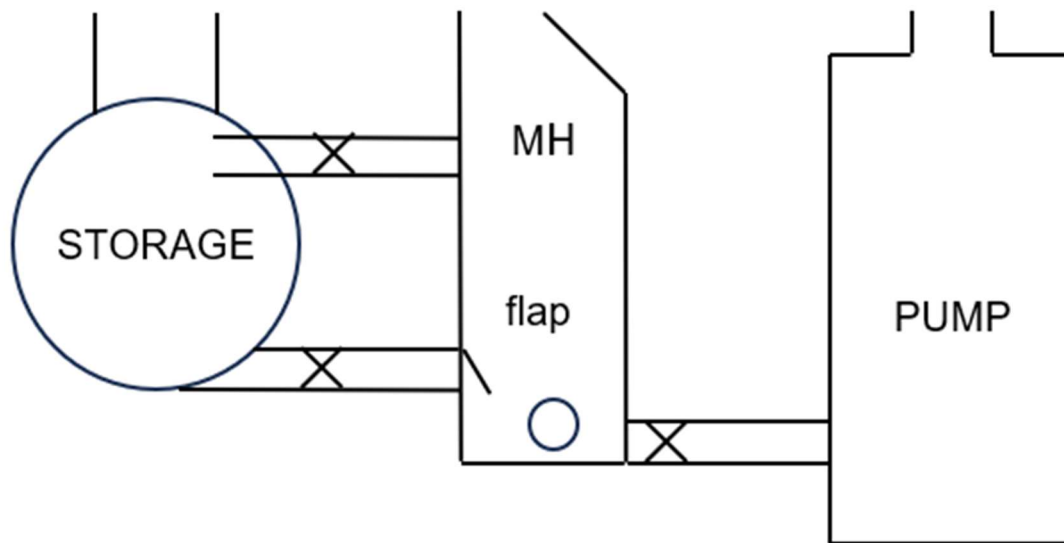


Figure 2 – Section view-Emergency storage configuration

Pipework for the emergency storage tank shall:

- Have a low-level drain line DN150 PVC SN8 RRJ that returns sewage from the emergency storage tank to maintenance hole.
 - The invert level in the maintenance hole shall be a minimum of 50mm above pump start level.
 - Pipework shall fall toward maintenance hole no flatter than 1 in 100.
 - Install a resilient seated gate valve adjacent to the emergency storage tank to PSS-1010-M.
 - Install a DN150 flap valve in the maintenance hole. The flap valve shall have an EPDM seal, be weighted, have only SS316 exposed, installed at 3 degrees from vertical.
- Have a high-level fill line DN150 PVC SN8 RRJ that enables sewage to flow from the maintenance hole to the detention tank.
 - Pipework will fall towards maintenance hole at no flatter than 1:100.

- Extend pipe into emergency storage tank to the edge of the riser and provide pipe support bracket(s).
- Install a resilient seated gate valve adjacent to the emergency storage tank to PSS-1010-M.
- Have a non-thrust type mechanical coupling (gibault) adjacent to each tank on each section of pipework to cater for ground movement. Bolts shall be SS 316, body shall be polymeric coated. Wrap the coupling using Denso petrolatum tape system or equivalent.

3.3 Mechanical

Mechanical requirements are:

- Provide two pumps that are identical in duty/standby configuration.
- Pump model shall be either EOne or Aquatec Barnes OGP.
- Pumps will be three phase when power supply available.
- All items required to be reached from finished surface level are positioned as close as possible to ground level, and no more than 400mm below finished surface level.
- Discharge pipe within tank to be flexible with camlock fitting, non-return valve and isolation valve. Isolation valve to have pressure bleed such as Zetco Series 4045 2 piece stainless steel self venting lockable ball valve.
- Pump to have lifting rope/sling, secured on hook near lid.

3.4 Electrical and Controls

Electrical requirements are:

- If the customer has chosen to install and own a permanent backup generator for part or all of its premises, the generator shall provide power to pressure sewer pump station in event of power failure. The customer shall be informed of the start current characteristics of the pumps and ensure that their generator is appropriately sized to accommodate the phase imbalance that may cause a potential fault of the generator.
- Lockable isolation switch shall be provided for all controller types that isolates both mains and customer generator, and comply with SEW BS1882 Lock Out, tagging procedure.
- Controller type to be as Table 1.
- Controller to be easily accessible and installed within line of sight of the tank. Line of sight shall be walkable distance between 2.0m and 10m from the tank lid. Inside of controller shall be visible from the pump tank.
- Controller to achieve minimum clearances as per AS3000.
- All conduits must be rigid to AS 61386.21 and straight as possible from the controller to the tank. Major changes in direction must be sweep bends or within a pit. Minor changes by curving straight conduit at a minimum bending radius of 160 times outside diameter may be accepted if shown on design drawings. Only one change of direction is permitted between pits, excluding vertical bend into controller. Minimum conduit size is DN32 for pumps and DN25 for instruments. Provide one conduit for each pump cable (incl thermistor), and one for each instrument cable. Conduit depth to AS 3000.
- Pump tank shall have a high-level float and hydrostatic level sensor.
- Detention tank shall have a hydrostatic level sensor.
- Comply with AM2560 Abloy Key Procedure.

SEW has three pump controller options. These are to be used for the scenarios described in Table 1

Table 1 – Controller type

Scenario	Controller	Drawing Set
Single tank, single phase pumps	Dual Onebox	STD.0000.E.100 to STD.0000.E.103
Single tank, three phase	Small PLC.	DPSS-011 to DPSS3.E.001
Two tank (pump tank and separate emergency storage) or complex	Large PLC	LPSC.E.001 to LPSC.E.023

A complex scenario is determined by SEW and is typically based on the inclusion of additional instruments such as level sensors, flowmeter, tank washer.

SEW will supply Dual Onebox and Small PLC complete cabinet. Large PLC shall be designed and constructed by proponent.

3.5 Odour

The designer shall assess the risk of odour at the pressure sewer pump station by considering:

- Site plumbing configuration
- Discharged chemicals (trade waste)
- Low use periods (detention time)
- Ventilation arrangement

SEW may require additional measures in the design to enable standard maintenance activities and processes to be safely used.

4. Testing, Commissioning, Completion and Handover

4.1 AM2755

Use AM2755 Testing, Commissioning, Completion and Handover.

- Further to AM 2755:Table 4
 - Step 1 Preparation of commissioning requirements not required
 - Step 2 Preparation of TCCH Outline is not required
 - Step 3 TCCH Plan to be approved by SEW prior to commencement of construction
 - Step 4 SCADA Points Testing, refer to Section 5.2. This is SCADA pre-commissioning in AM 2980
 - Step 5 Construction walk. The Constructor shall undertake its own inspection, remedy all defects, unless accepted by SEW, and submit a completed checklist prior to arranging Construction Walk with SEW
 - Step 6 Single System Testing is not required
 - Step 7 Performance testing. Includes SAT. In AM2980, this is the 4 boxes starting with “Conduct UAT”
 - Step 8 is not applicable

- Step 9 Information handover
 - Refer to Section 5.3 for as-constructed requirements.
- Step 10 Training. Not required due to standardised equipment and arrangements.
- Table 5
 - FAT is required only for PLC controllers
- Table 6
 - Stakeholders:
 - Constructor
 - SEW Representative
 - SEW Sewer Planning
 - SEW Engineering & Design
 - SEW Property Development
 - SEW Asset Integration
 - SEW Operations & Maintenance
 - SEW SCADA
 - SEW Trade Waste
- Section 5 Post TCP Activities
 - Hazard and Risk Control information is required for all emergency storage tank sites or unusual situations
 - Vendor information not required for approved products
 - Recommended maintenance arrangements not required for approved products
 - Spare parts and special tools are not required for approved products

4.2 SCADA Commissioning

Commissioning of Onebox sites is completed by the Liveable Water Solutions Commissioning and Handover team. Commissioning of PLC sites is completed in accordance with AM2980 SCADA Commissioning Process Network Assets.

Further to AM2980:

- The Project Manager is SEW project representative
- The Integrator is engaged by the Constructor from SEW approved list
- The commissioning engineer is a SEW employee from SCADA team
- The Constructor is required to provide notifications to SEW Representative, and to provide requested information in timely manner as per agreed construction schedule
- The Constructor shall initiate the process by providing completed asset information and SCADA points and thresholds to the SEW project representative for SEW review and approval
- Once documentation is accepted, SEW SCADA team requires 30 calendar days to configure SCADA. Changes in documentation may result in time extension
- Site specific calibration certificates must be completed by the Constructor for all instrumentation prior to commissioning

4.3 As-constructed information

The Constructor shall provide the following information to the SEW representative, who will then ensure it is correctly loaded. All drawings shall be prepared using CAD, and supplied in both pdf and dwg format in compliance with AM2488 Drafting Specification.

Table 2 – As-constructed information

Data	Storage
Property Sewerage Plan	ICE
Tank location	GT Viewer and OneAsset
Power supply position to pump control board	Hard copy in property's main electrical switchboard cabinet and stored in Drawing Management System.
Conduits between pump control board and pump tank	Hard copy in pump control board and stored in Drawing Management System.
Tank size	Asset register (Maximo)
Pump details	Asset register (Maximo)
Civil / Mechanical drawings ^(Note 2)	Hard copy in pump control board and stored in Drawing Management System
Electrical drawings	Hard copy in pump control board and stored in Drawing Management System
Dispensation	Approval to be recorded and stored on Sharepoint.
Spill level, GPS coordinates	Asset register (Maximo)
Customer phone number (if site has restricted access)	Montage

Note 1: Drawings to include from pump tank to pressure sewer main

Appendix A – Concept Design Checklist

Purpose

The purpose of this checklist is to enable designers to consider the requirements of a pressure sewer pump station at development concept design phase.

Requirements

1. Peak day discharges above 28kL per pump tank are not suitable for pressure sewer.
2. Peak instantaneous inflows into the pump tank greater than 1.4L/s are generally not accepted.
3. 24 Hour emergency storage (equal to peak day discharge) is required. This is usually provided in a horizontal tank separate to the pump tank.
4. SEW will own and maintain the pump tank and emergency storage. We require 24Hr, 7 day a week access, without site induction.
5. SEW requires parking for maintenance vehicles including one ute and one education truck (9m rigid) nearby to pump tank and storage. These vehicles may be parked for 8hours, so high traffic flow locations are not suitable.
6. Non-trafficable location for pump tank and storage is preferred for safety of maintenance workers
7. Electricity and potable water supply required.
8. Smaller sites are generally installed by SEW. Larger sites are to be designed and installed by SEW accredited design consultants and constructors.

Appendix B – Expectations for Designer

Purpose

The purpose of this document is to set out South East Water's expectations for the accredited design consultant for all pumping station design projects delivered through the land development process. This includes:

- Sewage Pumping Station (SPS)
- Water Pumping Station (WPS)
- Pressure Sewer Pump Stations

Due to the relative complex nature of these projects, additional work is required compared to standard land development projects for water supply and sewerage reticulation.

Design Phases

The following phases apply to Pressure Sewer Pump Station projects greater than 5KL unless otherwise agreed with South East Water.

Phase 1 - Pre-design

The pre-design phase should include the following activities:

- Consultant reviews functional design requirements provided by South East Water
- Consultant identifies any queries relating to the functional design requirements or any additional information needed from South East Water and provides these to the Property Development Officer by email.
- A pre-design meeting is held to discuss the functional requirements, queries, and general arrangement for the facility.

Phase 2 - Preliminary Design

The preliminary design phase should include the following activities:

- Consultant submits Preliminary Design to South East Water
- South East Water reviews the Preliminary Design
- South East Water comments are provided to Consultant in Design Comments Register
- Consultant reviews comments and if needed arranges a meeting to discuss comments
- Consultant responds to comments in the Design Comments Register and submits any required updated drawings and/or report
- South East Water reviews updated documentation and responses in the Design Comments Register and confirms whether each comment is 'closed' or remains 'open' for further discussion.
- Upon closing out of all comments in the Design Comments Register (or agreed otherwise by the South East Water Property Development Officer) the Preliminary Design phase is considered closed.

Phase 3 - Detail Design

The detail design phase includes the following activities:

- Consultant submits Detail Design to South East Water (via Property Development Officer)
- South East Water reviews the Detail Design
- South East Water comments are provided to Consultant in Design Comments Register

- Consultant reviews comments and if needed arranges a meeting to discuss comments
- Consultant responds to comments in the Design Comments Register and submits any required updated drawings and/or report
- South East Water reviews updated documentation and responses in the Design Comments Register and confirms whether each comment is 'closed' or remains 'open' for further discussion.
- The above process of comments and responses/resubmission continues until all South East Water comments are closed out in the Design Comments Register.
- Consultant submits all design documents and completed Design Comments Register to Manage Developer Works.

Phase 4 - Construction

The construction phase is undertaken in accordance with the normal land development works process. The consultant is responsible for supervision and construction verification of the works. South East Water undertakes a field auditing role only.

General Items

Timing for South East Water reviews and attendance at workshops/meetings shall be agreed on a case-by-case basis with the South East Water Property Development Officer for each submission, however there shall be a minimum of 2 weeks for reviews.

It should be noted that South East Water reviews or acceptance of any item or close out of any comment do not constitute acceptance of responsibility for any aspect of the design. Under the Developer Agreement full responsibility remains with the Accredited Consultant for all aspects of the design.

Design Submission

General

Under the Developer Agreement and Accreditation Deed, the Accredited Consultant is fully responsible for the design. Whilst aspects of the design may be undertaken by other organisations, the Accredited Consultant remains fully responsible for these.

It is a South East Water requirement that all project drawings are submitted under the logo of the Accredited Consultant and signed off by the Accredited Key Design Personnel. Drawings produced primarily by others should be acknowledged as such on the relevant drawings, however the drawings must present as those of the Accredited Consultant and be clear of the Accredited Key Design Personnel taking responsibility for these. Drawings should also be presented as a combined, consistent drawing set with common drawing numbering and single drawing list.

Drawings should be prepared in accordance with South East Water's drawing standard (including numbering) unless it can be demonstrated that these requirements are not appropriate to the work being produced.

Preliminary Design Submission

The Accredited Consultant shall submit to South East Water a preliminary design of the proposed Pressure Sewer Pump Station. The preliminary design submission as a minimum shall include:

- Site plan
- Site access plan (i.e. vehicle turning movements)
- Detail plan
- Pump tank plan and section
- If applicable, emergency storage tank plan and section

- Design basis register and dispensations
- Safety in Design documentation

Detail Design Submission

Following completion of the Preliminary Design, the Consultant shall submit to South East Water the detail design. The detail design submission shall be complete, fully checked and as a minimum shall include:

- Locality Plan, Drawing Index
- Site Plan
- Site access plan (i.e. vehicle turning movements)
- Detail Plan
- Pump Tank plan and section
- Pump Tank concrete details
- Pump Tank backfill details
- Detail design report
- If applicable:
 - Detention Tank plan and section
 - Detention tank concrete details
 - Detention tank backfill details
- Electrical drawing set
- Testing and Commissioning Plan

Safety In Design

As the designer of a facility, under the Occupational Health and Safety (OHS) Act 2004 (Victoria) and OHS Regulations 2017 (Victoria) the designer is responsible for safety in design relating to the entire lifecycle of the facility (e.g. construction, operation, maintenance and demolition activities). It is expected that designers understand these responsibilities and have their own systems in place to meet these requirements and deliver a safe asset.

Drawing reviews undertaken by South East Water do not constitute a safety review and cannot be deemed to be consultation with the operators/users with regard to safety.

It is expected that safety is considered throughout the preliminary and detail design process and that the designer fully consults with and advises South East Water of any residual safety risks that remain in the design.

At the commencement of the project, the designer should inform South East Water of the proposed Safety in Design (SiD) procedures and activities to be applied to the design. In particular the consultant should advise if there will be any Safety in Design or HAZOP style workshops that will be facilitated by the consultant and if not explain how the designer will still meet their Safety in Design responsibilities. South East Water does not dictate to the Consultant how safety workshops shall be done, however in the absence of any other process or system is suggested that the CHAIR process from NSW be considered for guidance.

Appendix C – Basis of Design Register sample

Item	Topic	Value	Comments
1	Flows		
1.1	Peak Day	TBD	
1.2	Peak Day trade waste	TBD	
1.3	Peak Hour from trade waste	TBD	
1.4	Peak Hour from non-trade waste	TBD	
1.5	Peak Hour Total	TBD	
1.6	Instant Peak from trade waste	TBD	
1.7	Instant peak from non-trade waste	TBD	
2	Network capacity		
2.1	Connection main size		
2.2	Network capacity	TBC	
3	Hydraulics		
3.1	Spill point and level	TBD	
4	Pump		
4.1	Pump power phase	TBD	Three phase if available
4.2	Pump configuration	duty/assist	
4.3	Pump brand		EOne or OGP
4.4	Pump lift rope/sling		
4.5	Pump discharge	flexible pipe to valve	
4.6	discharge check valve	TBC	in addition to check valves included within pumps
4.7	Isolation valve	ball valve with pressure bleed	
5	Site layout		
5.1	Private property	Yes	
5.2	Non-trafficable	TBD	
5.3	Ute crane access	TBD	
5.4	Eductor/ute parking	TBD	
5.5	Eductor within 15m	TBD	
5.6	Eductor <6m higher than invert	TBD	
5.7	Concrete slab around pump tank lid	Required	
5.8	Formed path if slope >1:20	TBC	
5.9	Tank Lid above ORG?	TBD	
5.10	All lids above 1 in 100 year flood level	TBD	
5.11	Surface drainage away from lids	TBD	
6	Pump Tank		
6.1	Ladder	No	
6.2	Vent	Yes, waist high, 316SS, to match inlet sewer size. Fine SS mesh to prevent small animal entry	316SS ankle high with trip prevention acceptable, depending on spill level

6.3	Pump Tank volume	TBD	
6.4	Lid rating	TBD	Class B in non-trafficable, Class D in trafficable
6.5	Lid riser	min 900mm	
6.5	Lid size	min 600x900. Lid to open away from vehicle access point.	
6.6	Fall arrest grate	One part. 150x150 grid. Removable. Aluminium	
6.7	Incoming sewer level	TBD	to be nominally 100mm above pump start level
6.8	Inlet inspection shaft/drop required	TBD	
6.9	Inlet isolation valve required	TBD	Yes, for pumped inflows
6.10	Depth surface level to pump tank valves and camlocks	Max 400mm	
6.11	fixed pipework	SS316	
6.12	pump discharge	flexible pipe to valve	
6.13	Anti-flotation	specified by tank supplier	
6.14	Backfill	specified by tank supplier	
7	Storage tank		
7.1	Concrete slab if non-trafficable	Yes	
7.2	Riser size		
7.3	Riser spacing	Nominally 3m, centre to centre	
7.4	Riser position	to achieve line of sight from ground level of all four bottom "corners" of tank	
7.5	Lid rating	TBD	Class B in grass, Class D in trafficable
7.6	Lid size		
7.7	Fall arrest grate	One part. 150x150 grid. Removable. Aluminium.	
7.8	Floor grade	1 in 100	
7.9	Anti floatation	concrete slab above tank	design by tank supplier
7.10	Backfill	specified by tank supplier	
7.11	Roof mounted sprinklers	Yes	solenoid controlled, with manual ball valve within 300mm of surface
7.12	Vent	Yes, waist high, 316SS, to match inlet sewer size. Fine SS mesh to prevent small animal entry	2 vents are required, one per tank.
7.13	Ladder	SS316 at end furthest from pump tank	
8	Safety		
8.1	TBC	TBC	
9	Pipework		

9.1	Pumped line to boundary Kit	DN50 PE PN16 with tracer wire/traceable marker tape	
9.2	Pumped line to boundary Kit		show if pipe is rising or falling on drawings
9.3	Pipework between tanks	min DN150	
9.4	Flexible coupling	at each tank connection.	5 in total. Two pipes between tanks and one on sanitary drain into pump tank
9.5	Low level pipe drain from emergency storage tank	Yes	
9.6	High level fill pipe into emergency storage tank	Yes	
9.7	Reflux valve	Flap valve	
9.8	Isolation valve	Three	spindle to surface
9.9	Low level pipe grade	1 in 100	reflux and isolation valve to be installed flat
9.10	High level pipe grade	1 in 100 towards emergency storage tank	
9.11	Boundary kit	within 1m of property boundary	to PSS-1113-M
10	Electrics		
10.1	Permanent generator	TBC	permanent generator to run pump station
10.2	Controller location		
10.3	High level float in pump tank	Yes	
10.4	Pump tank pressure transducer	Yes	4-20mA with weight. Approved product only
10.5	Storage tank pressure transducer	Yes	4-20mA with weight. Approved product only
10.6	Controller type		Refer standard
10.7	Controller mount	wall or pole	installed by Developer
10.8	Controller position	facing south is best for screen readability	
10.9	Controller position	no trip hazards within 2m of controller doors	
10.10	Controller hardstand	provide pavers or concrete slab in front of controller. Nominally 600 x 600	
10.11	Controller programming		
10.12	Conduits		conduits to extend to perimeter of lid opening
10.13	Flowmeter	TBD	
11	Water supply		
11.1	Hose bib	25mm, within 10m of all lids	
11.2	RPZD	Yes	
12	Commissioning		
12.1	level sensor calibration certificates	by Constructor	

12.2	SCADA points list	draft by constructor	
12.3	SCADA integrator	engaged by constructor	
12.4	Test Plan	by Constructor	
12.5	Testing	by Constructor	pipelines etc
12.6	Commissioning plan	by Designer	
12.7	Inspection & defect identification	by Designer	inspection that contractor has completed the works as designed
12.8	Defect rectification	by Constructor	
12.10	Pre-commission		
12.1	Commission		
13	Documentation		
13.1	As-constructed	AutoCAD and pdf	Supplied prior to commissioning
13.2	Detail Design Report		includes Safety in Design register

Appendix D – Design Report

Example Table of Contents for Design report

1. Background
 - a. Includes location, context
 - b. Approvals (eg. Flora/Fauna, Planning, Heritage)
 - c. Existing conditions (Ground conditions, survey, existing services, stakeholders)
2. Flows
 - a. Land use
 - b. Flow estimation details
 - c. Trade Waste
 - c. Diurnal pattern
 - d. Network hydraulics
 - e. Pump selection
 - f. 24 Hr storage
 - g. Sanitary drains
3. Tanks
 - a. Tank details. Material. Volume etc
 - b. Why location selected
 - c. Access (ground slope, service vehicle parking, turning)
 - d. Trafficability of tanks (Loads and calculations in appendix)
 - e. Flooding (above 1 in 100 year flood level)
 - f. Spill location
 - g. Buoyancy
 - h. Backfill (if not specified on drawings)
 - i. Pump and alarm levels (or show on drawings)
 - j. Interconnecting pipework. Why levels selected. Allowance for settlement, purpose of valves
 - k. Inlet arrangement
 - l. Fall prevention. (safety grates etc)
4. Services
 - a. Water. Backflow prevention, sprinklers, purpose, operation.
 - b. Ventilation.
5. Electrical
 - a. Switchboard position (sun glare, traffic protection, clearance to openings)
 - b. Site Power supply
 - c. Emergency power supply
 - d. Flow meter (if applicable)
6. Control philosophy
7. Safety in Design
 - a. Risk Assessment
 - b. Risks to be passed on to Constructor and Operations / Maintenance
7. Commissioning
 - a. Commissioning plan as appendix
8. References and Departures (design and products)
 - a. Reference standards
 - b. Approved Dispensations
 - c. Departures from referenced standards