

# **Supplementary Manual to the WSAA Sewage Pumping Station Code of Australia (WSA 04-2022:3.1)**

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# INTRODUCTION

## Acknowledgement

Greater Western Water (GWW) acknowledges the following document source in the preparation of this standard:

Sewage Pumping Station Code of Australia WSA 04-2022:3.1

## Disclaimer

The standards and supplement information are not a prescriptive standard. The responsibility for design is the designer who is required to comply with the Victorian Registered Engineers Act.

## Information

For information and advice or to notify GWW of possible errors or omissions, please contact [standards@gww.com.au](mailto:standards@gww.com.au) (Note any errors or omissions may be addressed in future revisions where such omission or error is deemed to be minor).

## Intended Audience

This GWW Supplementary Manual is intended for GWW personnel, consultant engineers and contractors engaged in the design, construction and maintenance of GWW's Sewage Pump Stations.

## Preface to the GWW Supplement

This Supplement is a supporting document to the Sewage Pumping Station Code of Australia, WSA 04:2022 (the SPS Code) and contains additional (supplementary) information to provide:

- GWW detailed requirements for specific matters
- Variations to the SPS Code where its requirements are not compatible with GWW current requirements.

Where there are any discrepancies or inconsistencies between the SPS Code, this Supplementary Manual or other documents, standards, or practices these shall be discussed with GWW prior to proceeding.

Designers and constructors are responsible for the design and construction process and the justification of any variations from the requirements set out in WSA 04:2022 and this Supplementary Manual.

This document is a guideline only and is not intended to be a detailed specification for the purposes of the design and construction of sewage pump stations.

This edition applies to all sewage pumping station design projects unless otherwise stated by GWW.



# PART 0: GLOSSARY, ABBREVIATIONS AND REFERENCES

## II ABBREVIATIONS

### Additional items:

L/s	Litres per second
GWW	Greater Western Water

## III REFERENCED DOCUMENTS

### Additional documents:

- MRWA Backfill Specification 04-03.2.

### Additional Section:

Pumping stations shall be designed and constructed in accordance with all relevant GWW standards and requirements, including but not limited to:

- GWW Gravity Sewerage Design Standard: Supplement to WSA 02-2014-3.1 WSAA Sewerage Code of Australia Melbourne Retail Agencies Edition V2
- GWW Approved Products Catalogue as displayed on MRWA Products Web Portal
- GWW Bushfire Season Preparation Procedure
- GWW Bushfire Season Emergency Response Plan
- GWW Baseline Security Standards (note: titled "Western Water Security Standards" currently)
- GWW SCADA Standards
- GWW Technical Standard for Electrical, Instrumentation and Controls (including GWW Preferred Equipment List). This document is referred to in this Supplement as the GWW Electrical Standard.
- GWW Flow meter Standard

**For a copy of the above standards that are not available on GWW external website, please contact your Greater Western Water project manager or email [standards@gww.com.au](mailto:standards@gww.com.au).**

GWW are to be contacted regarding any disparity between noted documents and this standard document.

# **PART 1: PLANNING AND DESIGN**

## **1. GENERAL**

### **1.5. PLANNING AND DESIGN RESPONSIBILITIES AND INTERFACES**

#### **1.5.4 CRITICAL INFRASTRUCTURE PROTECTION**

##### **1.5.4.3 ALL HAZARDS – INFRASTRUCTURE PROTECTION**

###### **Additional Requirements:**

GWW does not have a formalised list of approved risk assessors, please contact the relevant GWW PM for advice.

### **1.6. SEWER SYSTEM DESIGN APPROACH**

#### **1.6.3. INSTRUMENTATION AND CONTROL SYSTEMS**

###### **Additional Requirements:**

Designer to refer to GWW SCADA Standard(s), and the GWW Electrical Standard which includes the Preferred Equipment List in Part E.

## **2. CONCEPT DESIGN**

### **2.1. LIFE CYCLE CONSIDERATIONS**

###### **Replace point (f) with the following:**

Anticipated future growth of catchment volumes and compliance over the life-cycle period, e.g. managing odours at low inflow to the SPS, increasing operating costs (including energy), any future capital upgrade costs and the GED (General Environmental Duty).

The overarching pump station design shall consider ultimate development of the site and staging. Designers to consult with GWW regarding this approach.

### **2.2. FUNCTIONALITY**

###### **Additional Requirements:**

For further details refer to GWW Typical Site Layout Drawings (6586260-SPS-C-001 and 6586260-SPS-C-002) located in GWW Addendum 2 of this Supplement.

### **2.5. DUE DILIGENCE REQUIREMENTS**

###### **Replace second paragraph with the following:**

Suitable preventive provisions shall be included to eliminate any likelihood of discharges of raw sewage to the environment under normal operating conditions.

During dry weather events there are to be no spills to the environment. All occurrences of dry weather surcharge shall be contained, on site and/or within the sewerage system, for the minimum time as stated in this Supplement or otherwise agreed with GWW.

Pumping and storage capacity shall as a minimum provide for incoming flow due to wet weather with an 18.13% Annual Exceedance Probability (AEP) (previously known as 1 in 5 ARI) rainfall event in addition to peak dry weather flow. Consideration of greater containment is to be made in the event where the ERS (Emergency Relief Structure) discharges to a sensitive receiving environment, such as habitat with a wetland, a native fish population, cultural or spiritual values.

The ERS shall comply with the sewer system overflow licence requirement dictated by the Environmental Regulator and Melbourne Water. The ERS shall be provided with a flow meter and alarm in accordance with GWW requirements.

Designers must consider the full design life and how changes in inflow may be accommodated. The Designer shall inform GWW of any change in changing spill points to the environment from the sewerage infrastructure as soon as practical.

## **2.10. NOISE CONTROL**

### **Additional Requirements:**

No "unreasonable noise", in accordance with Environment Protection Regulations 2021 (Part 5.3, Division 3), is to occur. The Designer is to obtain agreement from GWW having determined what noise investigation or mitigation methods are required.

## **2.14. SIGNAGE**

### **Additional Requirements:**

Site ID and Security signage will be provided by GWW. WHS (Work Health and Safety) signage is to be provided by the Contractor. Additional site-specific signage is to be provided by the Contractor where further signage is requested by GWW e.g. "No Parking".

## **2.15. SUPPORTING SYSTEMS**

### **Additional supporting systems:**

- f. Alternative power sources (e.g. Generator)
- g. Dosing and Odour services
- h. Vehicle access from the public road to the site of the SPS for O&M purposes
- i. GWW Baseline Security Standards

## **3. GENERAL DESIGN**

### **3.8. CROSSINGS**

#### **3.8.1. GENERAL**

##### **3.8.1.1. REQUIREMENTS FOR ENCASED PIPE INSTALLATIONS**

### **Additional Requirements:**

Steel encasing pipe is not preferred.

### **Additional Requirements for Paragraph 2 Sentence 2:**

Any departures from this sentence are to be based on advice from a trenchless specialist and submitted to GWW for approval.

### **3.11. OBSTRUCTIONS AND CLEARANCES**

#### **3.11.7. LOCATION MARKERS**

##### **Additional Requirements:**

Refer to GWW SPS Supplement Drawing 6586260-SPS-C-004 in GWW Addendum 2 for location marker requirements.

## **4. MATERIALS DESIGN**

### **4.2. PROTECTION AGAINST DEGRADATION**

#### **4.2.2. PROTECTIVE COATINGS**

##### **Additional Requirements:**

Coatings to meet the current version of WSA 201:2021 or as otherwise amended for GWW specific requirements. All nominated coatings must be submitted to GWW for approval.

Where chemical dosing is required the pipework shall be Industrial PVC Schedule 80 grade (to ASTM 1784) and exposed pipework shall have one coat of PVC etching paint and two coats of Solagard type paint.

#### **4.2.4. METALLIC MATERIALS**

##### **Additional Requirements:**

Metal work within all pumping station structures shall ONLY be grade 316 stainless steel for non-fabricated / non-weldable items, and grade 316L for fabricated / weldable items.

## **5. PRODUCTS AND MATERIALS**

### **5.1. GENERAL**

##### **Additional Requirements:**

Refer to:

- Preferred Equipment List in Part E of the GWW Electrical Standard
- GWW Approved Products Catalogue
- WSA 02-2014-3.1 (MRWA EDITION) Version 2.0

Submissions for inclusion can be made via:

<https://www.mrwa.com.au/references>

### **5.2. IDENTIFICATION OF SEWER SYSTEMS**

**Replace Table 5.1 with the following:**

Refer to Table 4.1 from WSA 02-2014 MRWA. Note GWW also allow PE pipe for pressure sewers that is coloured black with a cream stripe.

### **Additional Requirements:**

Water component colouring to comply with Table 4.1 in WSA 03 - 2011-3.1 MRWA for water reticulation systems within the SPS site.

Requests for deviations, including reasons for the requested dispensation from component colouring requirements, are to be submitted to GWW for review and approval obtained.

## **5.5. PE PIPELINE SYSTEMS**

### **5.5.2. SIZE AND CONFIGURATION**

#### **Additional Requirements:**

Designers must allow for suitable PE pipeline de-rating in accordance with WSA 04:2022 Clauses 11.5-11.6, and relevant POP guidelines including:

- POP006 – PE Fabricated Fittings for Pressure Applications: Derating Requirements
- POP010A – Polyethylene Pressure Pipes Design for Dynamic Stresses
- POP013 – Temperature Rerating of PE Pipes

## **5.11. ACCESS COVERS AND FRAMES**

### **5.11.8. SIZE AND CONFIGURATION**

#### **Additional Requirements:**

Access covers shall be provided with four-sided fall protection. Permanent on-site fall protection systems are preferred over portable systems. Access Covers and their parts are to be suitable for their intended use (including trafficable or non-trafficable) and shall not exceed 20kg in manual handling weight. These systems are to be selected from the GWW Approved Products Catalogue.

As a minimum, all covers are to comply with AS3996 Clause 1.4.18. For areas which may be trafficable, circular ductile iron access covers and frames are required (e.g. for Emergency Storage Tanks). For non-trafficable areas, aluminium access covers and frames may be used.

Access covers shall not restrict open access to less than 600mm in any one direction. Cover colour to be Dulux Wilderness Green or equivalent.

Aluminium covers should not exceed manual handling weight requirements. Typically, each aluminium cover total surface area should not exceed 1.2 Sqm at any given time so to prevent them being too heavy for manual handling, based on using 6mm thick aluminium checker plate.

If the total area to be covered exceeds 1.2 Sqm it should be subdivided through use of cross beams so no individual cover exceeds 1.2 Sqm.

## 5.12. VENT SHAFTS

### 5.12.2. APPLICATION

#### Additional Requirements:

For educt vent shafts refer to Standard Drawing MRWA-S-402B (where required).

## 6. PUMPING STATION DESIGN

### 6.2. SITE SELECTION, LOCATION AND LAYOUT

#### 6.2.1 SITE SELECTION

##### Replace Paragraph 1 with the following:

Unless otherwise directed by GWW, the order of preference for land choice for pumping stations shall be:

- (a) GWW owned land (freehold).
- (b) GWW owned land (reserve vested to GWW as a public use reserve).
- (c) Council land with easement benefitting GWW.
- (d) Melbourne Water land with easement benefitting GWW.
- (e) Vacant Crown land with easement benefitting GWW or appropriate license as agreed with GWW.
- (f) Road reserve.
- (g) Vacant private property with easement benefitting GWW.
- (h) Developed Crown land with easement benefitting GWW.
- (i) Developed private property with easement benefitting GWW.

Site selection to be determined in consultation with GWW during concept design.

For temporary pump stations the Designer is to consult with GWW to agree the proposed land use, after the SPS is decommissioned.

#### 6.2.3. LOCATION AND LAYOUT

##### Additional Requirements:

Where an amendment or departure from the GWW Typical Site Layout Drawings 6586260-SPS-C-001 to 6586260-SPS-C-002 is sought and/or where the layout constraints preferences cannot be achieved, the Designer shall:

- Submit a request for a Departure to GWW which includes,
  - The reason / justification for the Departure
  - A proposed layout clearly indicating where it amends the GWW typical site layout. Any submitted drawings must be to the same level of detail as the GWW SPS Layout Standard Drawings as a minimum.

Typical SPS Layout guidance and requirements are provided in the GWW Typical SPS Site Layout Drawings in GWW Addendum 2. The first point of contact to discuss any departures shall be the relevant GWW Project Manager.

## 6.3. INLET MH

### 6.3.2. DESIGN

#### **Additional Requirements:**

Internal exposed concrete surfaces of the inlet maintenance hole structure and interconnecting sewer with the wet-well shall be coated with epoxy lining systems conforming to the requirements of Section 4.2 of WSA 04:2022 and the GWW SPS Supplement.

### 6.3.3. PUMPING STATION WET-WELL ISOLATING VALVE

#### **Additional Requirements:**

The incoming sewer-isolating valve shall be a grade 316 SS knife gate valve housed either:

- In the wet well, or;
- If this is not practicable, on the inside of the inlet maintenance hole subject to GWW approval.

A grade 316 SS electrically actuated full bonneted knife gate valve is required for all instances when either:

1) The inlet is DN375 and above

- OR

2) The operating force required exceeds 230Nm.

Calculations and assumptions for valve operation to be provided to GWW for approval.

Refer to Section 10.2.1 for additional isolating valve requirements.

## 6.4. WET-WELL DESIGN

### 6.4.1. GENERAL

#### **Additional Requirements:**

GWW Infrastructure Quality and Planning are to be consulted to determine the following:

- Whether a single (with or without a divide wall) or dual wet well is required
- Wet Well Diameter
- Wet Well Depth

The preferred wet well material for permanent pump stations is FRP. Proposed wet well designs are to be provided to GWW for approval prior to fabrication, with constructability and QA considerations clearly addressed.

### 6.4.2. SIZING

#### **Replace criteria (b) with the following:**

b. Where person-entry is required, there shall be sufficient room to work safely and effectively, and evacuate / rescue personnel if necessary. The wet-well shall be large enough to accommodate future pumps sized for the ultimate development.

#### 6.4.4. CONTROL LEVELS

##### **Additional Requirements:**

Deviations from the default control levels in Table 6.1 of WSA 04:2022 may be submitted to GWW for review. For pump stations where it is anticipated future upgrades may be required the design cut in levels are to be presented and agreed with GWW on a case-by-case basis.

Where three or more pumps are proposed in an SPS, the Designer is to consult with GWW regarding control levels and level alarm structure and submit the proposed settings to GWW for review.

GWW to be consulted regarding the use of VSD control ramp up or ramp down function for pumps.

#### 6.4.7. WASHERS

##### **Additional Requirements:**

A McBerns rotary well washer or approved equivalent is required with **min 32mm** potable water connection into wet well. Designer to factor in available and sufficient water pressure and flow to the site to ensure suitable washing. The Designer shall consider maintenance and access requirements in the design. Installation of washers onto the pump rail is not preferred.

The project and site-specific control requirements e.g. frequency and duration shall be proposed in the design, construction and commissioning for GWW review and acceptance.

### 6.5. WET-WELL VENTILATION

#### 6.5.1. GENERAL

##### **Additional Requirements:**

All pumping stations shall have, as a minimum, passive ventilation provided by a single induct / educt vent stack. Its purpose is to provide passive odour management as well as accommodate air displacement within the wet well due to pump operation.

The invert level of the vent pipe, within the wet well, shall be located as close as practicable to the underside of the wet well roof, and at least above the emergency relief level.

The vent pipe shall have a diameter of 0.5 x the diameter of the incoming sewer or 150mm, whichever is greater.

An odour assessment is to be carried out during detailed design in any of the following instances:

- If there is a rising main currently, or anticipated will be built in the future within the catchment area, discharging to the SPS.
- There are regular and extended periods of sewage detention.
- If the total incoming flow exceeds 200L/s.

The need for additional ventilation apparatus, for current and ultimate odour control, in the form of carbon filters or similar shall be determined by the Designer in consultation with GWW following completion of the odour assessment. Typically carbon-based filters with forced ventilation is preferred where additional



ventilation is required. The control philosophy is to be discussed and agreed with GWW.

Provision for retrofitting forced ventilation and odour treatment system shall always be considered. The Designer is to ensure a suitable location and area is provided within the SPS site for the equipment required for ventilation.

Designers shall comply with statutory Environment Protection Regulations 2021 S.R. No. 47/2021.

## **6.6. OVERFLOW CONTAINMENT**

### **6.6.2. EMERGENCY STORAGE**

#### **6.6.2.2. CONFIGURATIONS**

##### **Replace first Paragraph with:**

Emergency storage volume as calculated shall be provided between high-level alarm and the SPS overflow weir crest level and shall be in:

- a) the wet-well, and/or
- b) a separate storage structure inclusive of the sewerage system between the wet well and the storage structure

The Designer must obtain written approval from GWW to consider storage available in the upstream gravity sewerage system to reduce the volume of emergency storage provided at the pump station.

The Designer must also consider the lowest cover levels in the upstream sewer network and the lowest customer property connection points when designing the storage level.

##### **Additional Requirements:**

GWW prefers the emergency storage to contain the ultimate development SPS Design Flow for a minimum response time of **three** hours, unless otherwise agreed or stated by GWW. If a pumping station is likely to pose a high risk to sensitive receiving waterways or environments, a formal request shall be submitted to GWW and relevant authorities for guidance and approval.

In instances where future emergency storage may be upgraded, the Designer is to consider specifying backfill materials to facilitate unencumbered construction of future Works. Cast in situ emergency storage tanks are not preferred by GWW, all cast in situ designs must be submitted to GWW for approval.

A float switch for fill and spill indication, along with level indication, is required in each storage tank.

The Designer is to refer to MRWA-S-404 and MRWA-S-406 and Section 6.6.4 of the GWW SPS Supplement.

#### **6.6.2.3. DESIGN**

##### **Additional Requirements:**

Emergency Storage is to be in a non-trafficable location, unless otherwise approved by GWW. For constrained sites the Designer may consider options

where the emergency storage is trafficable. For storage tank entry points, where trafficable installation is unavoidable, use a Class D min 600mm cover with safety grill or approved equivalent, refer WSA 04:2022 Clause 5.11 and Supplement.

Vehicle access for the nominated design vehicle shall be provided to the emergency storage storages unless otherwise agreed with GWW.

Ladders, for entry to emergency storage, are to be located at the elevated end of the graded base of the tank. Ladders to comply with Clause 6.7 of WSA 04:2022 and the SPS Supplement. GWW don't allow marine grade aluminium alloys in any of the emergency storage structures as mentioned in WSA 04:2022 Clause 6.7.

Austral or equivalent 4-sided protection access covers are required for all storage vessels.

Colour to be Dulux Wilderness Green or equivalent.

For additional safety systems requirements refer to Section 6.9.

#### **6.6.4. EMERGENCY RELIEF SYSTEM**

##### **Replace Paragraph 4 with the following:**

The overflow pipe shall be designed with depth of pipe cover requirements as specified for sewers (Refer to WSA 02) and, in order of preference, shall discharge to a GWW nominated discharge point such as:

1. A formed stormwater drain e.g. pipe, channel etc.
2. An unformed drain, creek, or watercourse.
3. A harbour or river.
4. Tidal waters.

##### **Additional Requirements:**

The ERS shall be designed in accordance with the provisions of the Sewerage Code of Australia WSA 02-2014 Melbourne Retail Water Agencies Edition.

The Designer shall obtain approval from the receiving waterways controlling authority (such as Melbourne Water) for the new asset and provide evidence of such to GWW. Unless the Designer can satisfactorily demonstrate to GWW that an ERS is not required for an SPS which has a bypass arrangement, an ERS shall be designed and constructed for all SPS sites. The ERS is to be located within the SPS site unless otherwise agreed with GWW.

Whilst the minimum design requirements are for the storage to retain 3 hours at ultimate design flow to provide an adequate response time to a pump station failure, the Designer shall also assess the impact upon the environment and waterway of any spill, and the associated approval from waterways controlling authorities. GWW and/or the waterways controlling authorities may require more than 3 hours of inflow sewage containment, the Designer shall confirm minimum hours storage requirements with GWW at design stage.

The Designer shall also investigate and report on any alternative means that might be available to avoid or reduce the risk of spill from the system during or due to an event equal to or greater than 18.13% AEP event coinciding with a pump station failure. After completing all relevant investigations, the Designer shall forward a complete set of computations, drawings, and all other relevant materials together with a summary document detailing the investigations and findings to GWW. Where appropriate this summary document shall be forwarded

by the Designer to the EPA for information and comments. GWW will refer any recommendations of the EPA back to the Designer for consideration in the final detail designs.

## **6.7. LADDERS AND PLATFORMS**

### **Additional Requirements:**

A single access ladder is required for all pit openings, wet wells, valve chambers and storage vessels unless otherwise specified by GWW. Ladders to be stainless steel 316L, fitted with extendable stanchions and compliant with AS1657. Ladder positioning must be considered by the Designer to avoid material build up.

Refer to the GWW Approved Products Catalogue for approved ladders, plastic encapsulated step irons and prefabricated landing platforms. Ladders, plastic encapsulated step irons and landings shall be installed as per MRWA-S-314. The designer is to note the requirements for landing installation set out in MRWA-S-314.

Marine Grade Aluminium alloy products are allowed only for wet well and valve access pits in non-trafficable areas.

Suitable alternatives, in place or in addition to ladders, where ladders are not considered practicable to be discussed and agreed with GWW.

## **6.8. WET-WELL ACCESS COVERS**

### **Additional requirements:**

Pump wet well covers providing access to the wet-well shall have minimum clear opening of 900mm x 900mm. The covers shall be of sufficient size and orientation to facilitate installation and removal of pumps and equipment as well as personnel access to the wet-well. Access covers shall be sized to accommodate the maximum size pump over a pump station's life cycle, accounting for future changes including staging and catchment growth.

## **6.9. SAFETY SYSTEMS**

### **Additional requirements:**

Austral or approved equivalent 4-sided protection is required for all pits/chambers.

Fall protection grids for the wet well shall be provided with cut-out section to retrieve floats, junction boxes, and lifting chains without the need for lifting the fall protection arrangements.

A risk assessment for machinery safety is to be completed by the Designer in accordance with AS/NZS 4024 and provided to GWW.

Safety signage is to be provided in accordance with AS 1319 and regulatory requirements.

For fall prevention refer to statutory requirements and the Model Code of Practice: Managing the risk of falls at workplaces published by Safe Work Australia. GWW requirements are (as reasonably practicable) 1 x Stainless steel fall arrest anchorage point and 1x Stainless Steel flush mounted davit base with cover, provided at each pit opening. These are to be selected from the GWW Approved

Products Catalogue and in accordance with AS/NZS 5532 and AS/NZS 1891.4. The Designer shall ensure the size / area required from edge of slab is sufficient to accommodate this.

## **7. PUMPING SYSTEM**

### **7.2. HYDRAULIC DESIGN**

#### **Additional Requirements:**

The Designer shall provide hydraulic calculations to GWW Planning for review and approval as soon as practicable in the design stage.

### **7.4. PUMP SELECTION**

#### **Additional requirements:**

The preferred pumps are Flygt (Xylem) or approved equivalent alternative pumps from the GWW Approved Products Catalogue. Final selection of the pump model and size is subject to approval from GWW. Pumps shall be capable of passing a minimum sphere size of 75mm.

### **7.6. SUBMERSIBLE PUMPS**

#### **7.6.1. GENERAL**

##### **Additional requirements:**

A spare pump shall be provided as part of the requirements detailed in Clause 2.5 of WSA 04:2022 and the SPS Supplement.

Any proposal that varies from a N+1, 100% standby configuration (i.e. one pump duty, one pump standby) must be approved in writing by GWW.

#### **7.6.5. MOTOR CABLES**

##### **Additional Requirements:**

Motor cables shall either extend for the full distance to the motor starter cabinet or to an above ground cable pit. Electrical conduits going into the electrical control cabinet shall be sized at least 25% greater than the size of the largest cable and facilitate replacement of any cable in the conduit without any need to excavate. Cables and conduits shall also comply with the GWW Electrical Standard.

#### **7.6.6. PUMP LIFTING EQUIPMENT**

##### **Additional Requirements:**

The lifting chain shall be tethered to facilitate retrieval of the pump lifting chain within 200mm below the chamber opening reduced level. The lifting chain supplied for pump removal must comply with AS 4797. Refer to WSA 04:2022 Clause 13.2.1, WSA 101 and additional requirements located in this supplement.

## **7.8. PUMP STARTERS AND VARIABLE SPEED DRIVES**

### **7.8.1. GENERAL**

#### **Additional Requirements:**

GWW require soft starters as a minimum for all pump stations or VSDs subject to the requirements of the specified pump size or the control requirements of the pump station.

### **7.8.2. MOTOR STARTERS**

#### **Additional Requirements:**

Pump start/stop frequency shall be a maximum of 8 starts per hour at ultimate design capacity of the pump station. Designing to a higher start/stop frequency is subject to GWW approval. The ultimate design capacity shall be used to size the wet well as stated in WSA 04:2022 section 6.4.3. Motor starters shall comply with the GWW Electrical Standard.

### **7.8.3. SOFT STARTERS**

#### **Additional Requirements:**

Refer to the Preferred Equipment List in Part E of the GWW Electrical Standard for recommended components. The selected component to be the most recent model of recommended equipment or conform to the highest performance specifications compared to other models.

### **7.8.4. VARIABLE SPEED DRIVES**

#### **Additional Requirements:**

Low harmonic VSDs to be selected where practicable. Where practicable for larger pump stations, direct ventilation to be installed to vent VSDs directly outside pump station building. Refer to the GWW Electrical Standard.

## **7.10. EMERGENCY STOP**

#### **Additional Requirements:**

Refer to the GWW Electrical Standard for additional emergency stop provision requirements.

## **8. POWER SYSTEM**

### **8.2. POWER SUPPLIES**

#### **8.2.1. GENERAL**

#### **Additional Requirements:**

The Contractor is responsible for opening an account with the power provider. The Contractor is to consult with the relevant GWW PM when undertaking power account creation to confirm correctness of account information and account setup.

### **8.2.3. PRIMARY SUPPLY**

#### **Additional Requirements:**

The connection for a new power supply for the SPS pump station shall comply with the power provider including considerations associated with harmonics and power factor requirements.

The Designer shall consider and may present an option of renewable power source such as Photovoltaic System installation at a SPS to GWW as part of the basis of design for consideration. The option presented might differ from project to project.

### **8.2.5. EMERGENCY POWER**

#### **Additional Requirements:**

As part of the standard requirements for a sewage pump station, there shall be provision for generator connection or a permanent on-site generator. A permanent on-site generator shall be installed where specified by GWW or at sites where a load is greater than 110kVA. For all other sites, full provision shall be made for mobile generator use, including a designated area on site for the generator to be positioned during operation. The Designer is to consult with GWW to determine site specific design requirements to suit the required trailer size for a mobile generator.

The pump station shall have a plug for direct metered installation for generator connection (Refer to PEL). For CT metered installations, copper bars shall be provided for termination of generator cables. Development builds within kerbsides shall consider site location when proposing trailer-mounted connections.

If site is in known area of frequent/widespread power outages, or sensitive areas, Designer to consider permanent generator. Sensitive areas include areas that are bushfire prone, near a water body or environmentally sensitive areas.

Noise investigations shall be conducted where permanent generator installations are required, especially for instances with close neighbouring properties. For instances with close neighbouring properties, the Designer shall also consider noise control philosophy and generator activation and may propose for GWW approval utilising emergency storage defined under Section 6.6.2 of WSA 04:2022 and the SPS Supplement to prevent noise.

## **8.3. POWER AND CONTROL CUBICLE**

### **8.3.1. DESIGN**

#### **Additional Requirements:**

Designer must comply with GWW's Electrical Standard and refer to the GWW Preferred Equipment List. The designer must ensure that all electrical components are safeguarded against vermin and hydrogen sulphide, e.g. through preventing ingress via connecting conduits.

### **8.3.3. METER REQUIREMENTS**

#### **Additional Requirements:**

Meter compartments must be lockable, with locks to be arranged by the power provider. Typically, the electrical utility will equip its own lock to the metering, and GWW locks shall be arranged for all other items. Refer to GWW Preferred Equipment List for approved meter compartment locks.

## **9. CONTROL AND TELEMETRY SYSTEM**

### **9.1. GENERAL**

Designer to comply with GWW's SCADA Standard(s), GWW Electrical Standard and refer to the GWW Preferred Equipment List.

### **9.3. PUMPING CONTROL**

#### **9.3.1. CONTROL DESIGN**

##### **Additional Requirements:**

Level transmitter/sensor range to be configured to pump start/stops. The storage requires filling and spill level notifications provided by level transmitters. A backup spill level float is required in case of notification failure.

#### **9.3.3. CONTROL SYSTEMS**

##### **Additional Requirements:**

Refer to the GWW SCADA Standard(s) for control system information.

### **9.4. ALARMS**

#### **9.4.1. GENERAL**

##### **Additional Requirements:**

Alarming to include off site related assets, for example alarming for an ERS located off site. Suitable and reliable power and communication connectivity (e.g 4g) is to be provided to these alarms.

#### **9.4.2. LOCALLY DISPLAYED ALARMS**

##### **Additional Requirements:**

Refer to the GWW Electrical Standard.

### **9.5. ALARM, STATUS MONITORING AND CONTROL TELEMETRY**

#### **9.5.3. ALARM CREATION FUNCTION**

##### **Additional Requirements:**

Alarm set points within the wet well shall be based on the following:

Level Transmitter: Low, High Level (calc), Spill Level (calc)

Level Switches:

High level (Off Vega), 200mm Above High level set point - High High Level (Off float). Spill level notification separate.

Alarm Set Points in Storage tank:

Level Switches: Storage Tank Fill (float), Spill Level (float)

#### **9.5.4. STATUS MONITORING FUNCTION**

##### **Additional Requirements:**

Designer to comply with GWW's Electrical Standard and refer to the GWW Preferred Equipment List and Electrical Template Drawings.

#### **9.6. TELEMETRY HARDWARE**

##### **9.6.1. GENERAL**

##### **Additional Requirements:**

Designer to comply with GWW's SCADA Standard(s), GWW Electrical Standard and refer to the GWW Preferred Equipment List.

#### **9.7. OPERATING LEVELS AND DEFAULT SETTINGS**

##### **9.7.3 ALARM LEVELS**

##### **Additional Requirements:**

Refer to Section 9.4 of this Supplement.

#### **9.8. EQUIPMENT AND DEVICES**

##### **9.8.1. GENERAL**

##### **Additional Requirements:**

Designer to comply with the GWW Electrical Standard and refer to the GWW Preferred Equipment List and Electrical Template Drawings.

##### **9.8.2. FLOW MEASUREMENT**

##### **Additional Requirements:**

Refer to GWW Addendum 1 of this Supplement for Flow Meter Design Requirements.

##### **9.8.5. LEVEL SENSORS**

##### **Additional Requirements:**

Level Sensors shall comply with the GWW Approved Products Catalogue.

The Level transmitter Stilling Tube shall comply with the following requirements:

- To be in an accessible position for easy removal of the sensor without the need to enter the wet well.
- 100mm ABS minimum diameter
- Avoid placing slots over cut-in, cut out levels where the fat builds up, potentially blocking the tube.



- One or two sets of slots shall be located below the cut in level and 4 sets located above the standby cut in level.

All level transducers shall have a range of 0-10m as standard. A wider range shall be adopted in cases where the wet-well or emergency storage tank depth exceeds 9m. Primary level measurement in the wet-well and any emergency storage tank shall be by a Vega pressure transducer with connection to SPS Proface HMI, unless otherwise approved by GWW. Radar based level sensors may be considered on a case-by-case basis.

Floats shall be used for backup level sensors and control. Refer to GWW Electrical Standard for further guidance on wet well level measurement and backup control.

### **9.8.6. FLOAT-SWITCH OR FAIL-SAFE LEVEL PROBE**

#### **Additional Requirements:**

An entire site failure alarm is to be included in design, signalled from an independent level transmitter in the wet well.

### **9.8.8. PROTECTION DEVICES**

#### **Additional Requirements:**

Surge and Lightning protection is to be included for the telemetry antenna.

#### **9.8.8.5 THERMAL-OVERLOAD RELAYS**

#### **Additional Requirements:**

Thermal overload relays shall be sized to minimum 110% of full load motor rating.

## **10. PUMPING STATION PIPEWORK**

### **10.1. PUMP DISCHARGE PIPEWORK**

#### **10.1.1. GENERAL**

#### **Additional Requirements:**

Refer to GWW Typical SPS Site Layout Drawings 6586260-SPS-C-001 and 6586260-SPS-C-002.

The discharge pipe work shall also include a means to bypass the pump station using above ground mobile pumps.

#### **10.1.2. SIZING**

#### **Additional requirements:**

The minimum diameter shall be DN 100 unless otherwise approved by GWW.

#### **10.1.3. TYPE**

#### **Additional requirement:**

All exposed pipe work within the station is to be coated with products approved under the GWW Approved Products Catalogue, and APAS Specification 0213 as applicable. Grouting of penetrations through block outs shall be carried out using non-shrink grout. All weldable SS shall be of Grade 316L. Flanged ductile iron pipe pieces shall be Fusion Bonded Epoxy (FBE) coated and FBE lined. Calcium aluminate lined ductile iron flanged pipe pieces are not permitted.

## **10.2. VALVE APPLICATIONS**

### **10.2.1. ISOLATING VALVES**

#### **Replace Paragraph 2 with the following:**

Isolating valves shall be fitted to the discharge from each pump immediately downstream of the non-return valve, with a thrust type dismantling joint between the two valves.

#### **Additional Requirements:**

All valve closing directions to be clockwise. Designer to consult with GWW to ensure sufficient isolation valves where the rising main is greater than 2km in length.

All isolating valves must be selected from the GWW Approved Products Catalogue. GWW approval is required for all isolating valves which are not listed. Refer to 6.3.3 for additional requirements for pump station wet-well isolating valves.

A bi-directional, grade 316 stainless steel (SS) gate isolating valve shall be used. The following items shall also be included as grade 316 SS:

- Full bonneted
- Mounting flange
- Support brackets

### **10.2.2. NON-RETURN VALVES**

#### **Additional Requirements:**

Direct buried non-return valves are not permitted. Non-return valves are to be selected from the GWW Approved Products Catalogue.

## **10.3. VALVE CHAMBER**

### **10.3.1. GENERAL**

#### **Additional Requirements:**

All pumping stations to be provided with a separate or integral valve chamber. For integral wet-well and valve chamber designs, both the wet well and valve chamber are to be FRP. For split wet-well and valve chamber design, the valve chamber may be concrete (either precast or cast in-situ, as agreed with GWW). Concrete valve chambers shall be coated with a suitable epoxy coating as per SPS Supplement Section 4.2.2.

Internal exposed concrete surfaces of the valve chamber and interconnecting sewer shall be coated with epoxy lining systems conforming to the requirements of Section 4.2 of WSA 04:2022 and the GWW SPS Supplement. The position and

number of access ladders should consider avoiding the need to step over pipe work to undertake any maintenance work, as far as is practicable.

Refer to GWW Addendum 1 for Flow Meter Design Requirements.

### **10.3.2. DESIGN**

#### **Additional Requirements:**

A retractable handgrip stanchions ladder shall be provided in the valve chamber, refer to WSA 04:2022 Clause 6.7 and Supplement.

A Vegabar 18 Pressure Sensor or approved equivalent is to be installed on the outlet upstream of the non-return valve.

### **10.3.3. DISMANTLING JOINTS**

#### **Additional requirements:**

GWW require, where practicable, thrust restrained dismantling joints to be provided in the valve chamber adjacent to the valve assemblies for ease of removal. Thrust restrained dismantling joints are to be in accordance with the GWW Approved Products Catalogue.

### **10.3.6. ACCESS COVERS**

#### **Additional Requirements:**

Access Covers shall comply with Section 5.11 of the GWW SPS Supplement.

## **10.4. EMERGENCY PUMPING ARRANGEMENTS**

### **10.4.1. GENERAL**

#### **Additional Requirements:**

The bypass connections for both gravity (wet well/inlet maintenance hole) and RM sides shall be above ground level and external to the wet well to avoid confined space entry. The bypass points must be positioned for easy access. All above-ground pipework must be installed inside a vandal-proof, lockable steel enclosure to prevent damage or unauthorised access. The emergency suction pipe shall consist of a suitably sized pipe fixed vertically to the wet-well wall terminating at least 300mm above ground level. Refer to SPS Supplement Drawing 6586260-SPS-C-001.

## **11. PRESSURE MAINS**

### **11.2. LOCATION OF PRESSURE MAINS**

#### **11.2.1. GENERAL**

#### **Additional Requirements:**

The location of pressure mains shall be identified with relevant posted signs erected at change of direction, fittings along the pipeline, and nominally at 500m intervals. Refer to Marker Post Standard Drawing 6586260-SPS-C-004 in GWW Addendum 2 for details. GWW will provide the necessary signage to be installed at the Developers/Contractor's cost.

## **11.3. PUMP HEAD CALCULATIONS**

### **11.3.6. VELOCITY IN PRESSURE MAINS (INCLUDING FLUSH CYCLES)**

**Replace the second last paragraph with the following:**

The maximum allowable velocity is 3m/s at ultimate flow. The Designer is to consider and minimise any downstream impacts due to the maximum velocity of flow assumed as part of their design. The Designer is also to consider minimizing head loss as far as practicable.

## **11.4. DESIGN PRESSURES**

### **11.4.3. SURGE**

**Additional Requirements:**

The Designer shall provide GWW with surge calculations and results.

## **11.6. PLASTICS PIPES**

### **11.6.2. FATIGUE DESIGN FOR THERMOPLASTICS PIPES**

**Additional Requirements:**

The Designer shall provide the results of the fatigue analysis in support of their pipe selection.

## **11.8. PIPELINE MATERIALS**

**Additional Requirements:**

Sewer Rising Main (SRM) shall be PE100 SDR11 PN16 as a minimum unless otherwise agreed with GWW, refer to the GWW Approved Products Catalogue. GWW have a preference to, as far as practicable, have a single pipe type and diameter for the full length of the rising mains. GWW Planning team to be consulted for pipeline material selection where the diameter required is greater than listed on the GWW Approved Products Catalogue.

## **11.9. PRESSURE MAIN VALVES**

### **11.9.2. ISOLATING VALVES**

**Additional requirements:**

Isolation valves are required downstream of the flow meter.

The Designer must provide, and agree with GWW, a feasible isolation and scouring arrangement to flush/educt the Sewer Rising Main. The isolation and flushing arrangements shall consider factors including, but not limited to, the pipe diameter, the grade of the Sewer Rising Main, location, time required to empty the Sewer Rising Main, sewer volume in the section and number of eductor trucks required to empty the pipe section.

### **11.9.3. AIR RELEASE VALVES**

**Additional Requirements:**

GWG's preference is for an offset air valve design refer to SPS Supplement Standard Drawing 6586260-SPS-C-005. The Designer must consult with and obtain approval from GWG for deviations from this Standard Drawing.

Air valve locations shall take customer and environmental impacts into consideration, including noise, aesthetics, and odour. Where reasonably practicable, the designer is to avoid placement of air valves adjacent to existing properties. Odour release will need to consider mitigation such as filters to eliminate the risk of complaints.

All air valves are to be within pits. Refer to Section 4.2.2 of WSA 04:2022 and the SPS Supplement for coating requirements.

### **11.9.5. SCOURS**

#### **Additional Requirements:**

For scour design refer to SPS Supplement Standard Drawing 6586260-SPS-C-006. The Designer must consult with and obtain approval from GWG for deviations from this Standard Drawing.

The minimum diameter of scour lines shall be DN 100. Where possible the scour points shall drain to the wet well or a separate reticulation sewer system.

All pits are to be internally coated. For coating requirements refer to WSA 201:2021 in addition to Section 4.2.2 of WSA 04:2022 and the GWG SPS Supplement.

### **11.10. ODOUR AND SEPTICITY CONTROL**

#### **Additional Requirements:**

Even if all reasonably practicable design parameters have been addressed to reduce the septicity of the sewage in the pump station and rising main, all designs shall facilitate the retrofit of odour control/management facilities.

The Designer must consult with GWG on proposed ventilation and/or chemical dosing for management of odours. An independent consultant must undertake safety assessments of the chemical dosing facility's design and installed dosing facility before handover where required. During commissioning, odour loggers shall monitor odour control performance and fine-tune the chemical dosing setup.

Designer to be mindful of distance to closest neighbouring properties, ensuring adequate distance is obtained to remove potential odour or noise complaints. Where reasonably practicable, the Designer is to use air dispersion modelling to determine suitable stack locations and heights.

All designs must be submitted to GWG for review.

### **11.11. RECEIVING SYSTEM**

#### **11.11.2. DISCHARGE MHS**

#### **Additional requirements:**

The receiving structure shall be as far as reasonably practicable located away from residential properties.

The receiving structure including the cover shall have a protection system to minimise corrosion. Venting requirements are to be discussed and agreed with

the GWW Planning team. The designer should also consider the requirements outlined in Appendix F.

Internal exposed surfaces of the receiving structure and sewer shall be coated with epoxy lining systems conforming to the requirements of Section 4.2 of WSA 04:2022 and the GWW SPS Supplement.

## **12. STRUCTURAL DESIGN**

### **12.2 STRUCTURES**

#### **Additional requirements:**

Backfilling shall be as per MRWA Backfill Specification 04-03.2 for all structures and pressure mains.

### **12.3. STRUCTURAL DESIGN OF PRESSURE MAINS**

#### **12.3.9. TRENCHLESS TECHNOLOGIES**

#### **Additional requirements:**

Designer to comply with the requirements of Section 5.2.5 of WSA 02:2014 Ver 3.1 MRWA for trenchless pipeline installation. In addition to MRWA-S-207 and MRWA-S-208 referenced in WSA 02:2014 MRWA, the Designer is also to refer to MRWA-S-208B.

## **13. SUPPORTING SYSTEMS**

### **13.1. SERVICES**

#### **13.1.2. WATER**

#### **Additional Requirements:**

GWW's minimum requirement is for DN32mm or equivalent, to suit the meter connecting pipework to the site.

GWW's preference is for a permanent potable water main connection to the site and avoid the use of water tanks, to be arranged prior to commissioning. GWW shall be consulted where tanks are proposed to determine requirements.

For remote sites the typical approach is to install a temporary Water Service sized to accommodate the required use & flow rate for the site. As soon as reasonably practicable a connection should be made to the permanent network for permanent pump stations.

A 32mm water supply is to be provided to the emergency storage structures and well washer. A 32mm hose reel feed with 25mm tap below is to be provided, preference is to mount this to a canopy post.

A RPZD backflow prevention device must be installed for any potable water connection to the site. All RPZDs to comply with GWW Standard arrangements.

The meter & RPZD assembly shall be above ground, located clear of traffic and in a lockable cage. The registered back flow prevention device (RPZD) shall be tested as part of commissioning and a test report to be provided.

Wash down hoses or connections require dual check valves at the meter and a vacuum breaker and removable tap handle.

### **13.1.3. TELEPHONE/TELEMETRY LINES**

#### **Additional Requirements:**

Designer to also refer to the GWW SCADA standard(s) and GWW Electrical Standard for additional requirements.

### **13.1.4. GENERAL LIGHTING AND POWER**

#### **Additional Requirements:**

A permanent power supply is to be arranged to the site prior to commissioning, unless otherwise agreed with GWW. Refer to Section 8.2.1 for additional requirements.

### **13.1.6. WATER CLOSET**

#### **Additional Requirements:**

Typically toilets are required for permanent sites with chemical dosing, or where standalone enclosed buildings are proposed on site. Requirement to be confirmed with GWW for each site.

## **13.2. MATERIALS HANDLING**

### **13.2.1. LIFTING EQUIPMENT**

#### **Additional requirements:**

The Designer shall consider how the pump sets are to be removed from the wet well and refitted.

As a minimum, it is expected that all pumping stations will facilitate suitable access and use of a mobile crane to remove the pump sets. The approach shall be agreed with GWW.

Refer to Clause 7.6.6 in WSA04:2022 and the SPS Supplement.

Pumps lifting chains shall be 316 stainless steel and in accordance with AS 4797.

The following information shall be marked at intervals of not more than 20 links:

- Manufacturer identification,
- Material grade (e.g. 316),
- Quality grade (i.e. 5 or 50)

The lifting chains shall be independently tested and tagged with ratings as appropriate, with testing certificates from an approved provider supplied to GWW.

The minimum chain size shall be 10 mm for small pumps and must be sized appropriately to consider all possible load cases, including pump, chain, and cable weights.

The Dee shackles used shall be 316 stainless steel, manufactured to comply with AS 2741.

Eyebolts provided by the manufacturer as part of the lifting arrangement to equipment shall be manufactured to comply with AS 2317.

Lifting loops to be provided at intervals of no more than 1m intervals.

The lifting chain shall be located at a safe, easily accessible location within 600mm of the maintenance opening.

### **13.3. SECURITY**

#### **Additional Requirements:**

Design to comply with GWW Baseline Security Standards unless otherwise agreed with GWW. Boundary fencing with swing/sliding gate must be provided for a SPS site, refer to the GWW Baseline Security Standards. Keys and locks are to be ordered by the Contractor via GWW's approved locksmith.

The Designer shall contact GWW to determine CCTV security requirements. Refer to the GWW Electrical Standard.

### **14. DESIGN REVIEW**

#### **Additional Requirements:**

It is expected that Safety in Design and HAZOP reviews be conducted at reasonably practicable stages of the design process. A minimum of one Safety in Design review is to be conducted for projects at detailed design.

Once the design has been completed, Design Drawings shall be submitted to GWW for auditing purposes, accompanied by a Sewage Pumping Station Design Checklist prepared and completed by the Designer. A typical Sewage Pumping Station Design Checklist is provided in Appendix J.

It is GWW's expectation that all designs submitted for auditing will comply with the design standards and or agreed departures, and will match the information provided in the accompanying Sewage Pumping Station Design Checklist. Where discrepancies are found, the Designer will be expected to revise the design drawings and/or checklist and re-submit them for auditing.

### **15. DESIGN DOCUMENTATION AND DRAWINGS**

#### **15.2. DESIGN DRAWINGS**

##### **15.2.1. GENERAL**

#### **Additional Requirements:**

GWW Asset Information Team will provide SPS ID on application. Designer to consult with GWW regarding landscaping.

Refer to the GWW Typical SPS Site Layout Drawings 6586260-SPS-C-001 and 6586260-SPS-C-002. Work as Constructed drawings shall be provided in both dwg and PDF format as soon as practicable.



Drawings are to include survey information as reasonably practicable. Drawings and surveys are to be completed to GDA2020 MGA Zone 55.

#### **15.2.4. STRUCTURES**

##### **Add the following Requirements:**

- i. Provision of details for pipe penetrations of structures
- j. Levels of structures as reasonably practicable (e.g. cover level, floor/invert level, overflow level)

#### **15.2.5. PRESSURE MAINS AND SEWERS – GENERAL**

##### **Add the following Requirements:**

- p. Position / offset of sewers relative to property boundaries.
- q. Insets and diagrams (amend as constructed drawings).
- r. Notations and standard labels indicating current status of facilities, e.g. "Existing end to be extended" (to be edited to "Existing end extended" in Work As Constructed drawings and as Constructed documentation).
- s. Offsets/ties and downstream distances
- t. Design assumptions for ancillary structures.
- u. Method and type of construction if boring to be undertaken.
- v. Cultural heritage & ecological assessment works boundaries
- w. Upstream and downstream invert levels

#### **15.2.6. PRESSURE MAINS AND SEWERS – LONGITUDINAL SECTIONS (PROFILES)**

##### **Add the following Requirements:**

- n. Design type of structures e.g. all collection chambers etc.
- o. Special features of structures

### **15.4. DRAFTING STANDARDS**

#### **15.4.1. GENERAL**

##### **Additional Requirements:**

For drafting requirements refer to the GWW 2D Computer Aided Drafting Standards Manual, which can be provided by GWW upon request.

#### **15.4.3. RECORDING OF AS-CONSTRUCTED INFORMATION**

##### **Additional Requirements:**

If a sewer is amended in position and/ or depth, the Designer is to redefine drainage limits (sections of the rising main that cannot be drained) on as constructed drawings.

Recording of as-constructed information must be facilitated using GPS coordinates at key as-constructed points.

# **A – GENERIC INFRASTRUCTURE PROTECTION GUIDANCE**

## **A7 SEWER FAILURE IMPACT ASSESSMENT**

### **Additional Requirements:**

During initial consultation the Designer shall contact GWW to confirm if this is a critical sewer requiring a Sewer Failure Risk Assessment as per Appendix A7 of WSA 04:2022.

## **APPENDIX C - TYPICAL PRECOMMISSIONING SCHEDULE**

### **Additional Requirements:**

During initial consultation the Designer shall contact GWW regarding the pre-commissioning procedure for each site.

## **APPENDIX D - TYPICAL COMMISSIONING SCHEDULE**

### **Additional Requirements:**

During initial consultation the Designer shall contact GWW regarding the commissioning procedure for each site. All commissioning equipment to be provided by the Contractor unless otherwise agreed with GWW.

## **APPENDIX F – GUIDELINES FOR VENTILATION OF RETICULATION SEWERS**

### **Additional Requirements:**

The Designer shall contact GWW to determine the ventilation requirement on sewage pumping/pressure sewer discharge into gravity sewer system.

## **APPENDIX G – PRESSURE MAIN CALCULATIONS**

### **G2 PRINCIPLES AND CRITERIA**

#### **Additional Requirements:**

Refer to Section G1 of WSA 04:2022 for nomenclature applicable to the equations below. Calculations are reproduced from WSA 04:2005 as they are absent from the current version of WSA 04:2022 (at time of publishing this document). If a later version of WSA 04:2022 contains these equations, please consult with the GWW Infrastructure Quality team.

#### **G2.2 DETENTION TIME**

##### **Replace with the following:**

The detention time of sewage in the wet-well and pressure main is determined by:

$$T = \left(\frac{V_w}{Q_p}\right) + \left(\frac{V_{pm}}{Q_d}\right) = \frac{0.25}{S_{max}} + \frac{\pi D^2 L_{pm}}{4Q_d}$$

The calculator ignores detention time in the wet-well since it is not significant for designs conforming to this SPS Code.

If the highest point of the pressure main is not at the receiving sewer, the length of the pressure main is only that length to the high point i.e. the section of pipe beyond the high point will drain by gravity after pump cut-out.

## **G2.3 MINIMUM INTERNAL DIAMETER OF PRESSURE MAIN**

### **Replace with the following:**

The minimum internal diameter of the pressure main is that at which the velocity of flow in the main is the maximum allowable velocity at the minimum allowable pump rate. The minimum internal diameter is:

$$D_{min} = \left(\frac{4Q_{pmin}}{\pi V_{max}}\right)^{0.5}$$

The internal diameter of the pressure main shall not be less than the pump outlet.

## **G2.4 MAXIMUM INTERNAL DIAMETER OF PRESSURE MAIN**

### **Replace with the following:**

The maximum internal diameter of the pressure main is constrained by the maximum allowable detention time. As pressure main diameter increases for a given length of main and dry weather flow, so does detention time. The maximum internal diameter is:

$$D_{max} = \left(\frac{4Q_d \times T}{L_{PM}}\right)^{0.5}$$

## **G2.5 MINIMUM PUMPING RATE**

### **Replace with the following:**

The pumping rate shall not be less than the design wet weather flow ( $Q_w$ ) and not less than required for slime stripping i.e.  $Q_p$ -min is the greater of (a) or (b):

(a) Design wet weather flow constraint on  $Q_p$ -min

The minimum pumping rate to satisfy the design wet weather constraint is:

$$Q(p - min)/w = Q_w$$

(b) Slime stripping constraint on  $Q_p$ -min

For a given diameter, the pumping rate shall ensure that the flow velocity is sufficient to strip slime. The minimum pumping rate to satisfy the slime stripping constraint is:

$$Q(p - min)/S = 325\pi \left(\frac{D}{1000}\right)^{2.15}$$

Each constraint is calculated and the greater of the two adopted.

## G2.6 MAXIMUM PUMPING RATE

### Replace with the following:

The upper limit on the pumping rate is determined by the maximum allowable velocity of flow in the pressure main i.e.

$$Qp - max = Vmax A$$

## G2.7 PUMP CONTROL VOLUME (CUT-IN/CUT-OUT VOLUME) & PUMP STARTS

### Replace with the following:

The pump control volume is:

$$V_{ww} = \frac{900Qp}{S_{max}}$$

This volume ensures that, for any ratio of  $Qd:Qp$ , the maximum allowable number of pump starts is not exceeded. The above equation is derived from the general relationship:

$$S = \frac{3600Qd(Qp - Qd)}{V_{ww}Qp}$$

## APPENDIX J – DETAILED DESIGN CHECKLIST

### Replace Section with the following (informative):

This Section of the SPS Supplement is provided for informative purposes only to outline a typical example of a design checklist for key mechanical and civil items. The Designer must specify the requirements for each item and ensure that these have been met in the design.

It is the responsibility of the Designer to ensure the accuracy of the requirements provided below before relying upon what is provided.

The Designer is to first seek clarification from GWW before relying upon this informative checklist. This typical informative checklist does not provide a full list of requirements and the Designer shall rely on this checklist at their own risk.

SPS No or Identifier  
(supplied by Planning):

Location:

Design Team:

Reviewer: Date:

ITEM	REQUIREMENTS
<b>GENERAL</b>	
Levels	Show levels referenced to AHD

Drawing numbering	Use standard drawing numbering, refer to the GWW 2D Computer Aided Drafting Standards Manual or the GWW PM.
Drawing title block	Standard title block to be used
Labelling of drawings	Everything to be labelled either "new" or "existing"
Services	Existing and new water, telephone, gas, electricity and any other applicable other authority services to be shown on site plan
Vehicle access	Truck to be able to back up to wet-well and bypass pump insertion openings Refer to WSA 04:2022 and Supplement Clause 6.2 and Typical SPS Site Layout Drawings 6586260-SPS-C-001 and 6586260-SPS-C-002
Vehicle turning	Crane truck (and tanker where chemical dosing provided) to be able to turn around and leave site forwards Turning circle to be provided for nominated vehicle type. Refer to Typical SPS Site Layout Drawings 6586260-SPS-C-001 and 6586260-SPS-C-002
Site drainage	To be shown on drawings Refer to Typical SPS Site Layout Drawings 6586260-SPS-C-001 and 6586260-SPS-C-002
Water service with RPZD.	Refer to WSA 04:2022 and Supplement Clause 13.1.2 and Typical SPS Site Layout Drawings 6586260-SPS-C-001 and 6586260-SPS-C-002
RPZD on water service	If water is to be available in building structure and chemical dosing units, then additional min DN 32 RPZDs to be provided
Hydrant	To be spring type and located close to the wet-well
Vent shaft	Connected to inlet MH, wet-well and emergency storage (where separate from wet-well)
External lighting	To be shown on site plan
Fencing	Refer to WSA 04:2022 and Supplement Clause 13.3
Flood level	1% AEP flood level to be shown on all sectional elevations or note stating that site is not subject to flooding
Terminology	Terminology to be as per WSA 04:2022 Part 0
Land acquisition details	Survey coordinates of new acquisition to be shown
Scope of work	All items in approved concept. Needs Spec included in the design
Inlet MH structure	Diameter at invert to be not less than 1200 mm

Protective coating	Concrete surfaces in accordance with WSA 201:2021. Refer to WSA 04:2022 and Supplement Clause 4.2.2
Asset Information	Drawings and asset information to be provided in line with GWW requirements, refer to Section 15 of WSA 04:2022 and the SPS Supplement.
<b>INLET MH</b>	
Low-level fill/drain line connecting inlet MH to additional emergency storage	Size to be not less than size of inlet line to wet-well IL at inlet MH to be minimum 150 mm above obvert of outlet of inlet MH
Connecting pipe to emergency relief gas check MH or ERS (if emergency relief or ERS is off inlet MH)	Obvert of pipe at inlet MH to be a minimum of 300 mm below the weir crest level where possible Size of pipe to be one size greater than the inlet line into the wet-well
Scum baffle on emergency relief pipe (if that pipe is off inlet MH)	Baffle to extend 50 mm above and 300 mm below pipe outlet Note: if obvert of connecting pipe is min 150 mm below the weir-crest level, then no need for scum baffle in inlet MH
Level sensors	Refer to WSA 04:2022 and Supplement Clause 9.8.5 & GWW Electrical Standard
Float level switches	Refer to WSA 04:2022 and Supplement Clause 9.8.6 & GWW Electrical Standard
Grit Collection	Refer to WSA 04:2022 Clause 6.10
Personnel access	Access ladders to be installed. For Ladders refer to WSA 04:2022 and Supplement Clause 6.7
Covers	Refer to WSA 04:2022 and Supplement Clause 5.11
Material for trafficable covers	Refer to WSA 04:2022 and Supplement Clause 5.11
Location of Inlet MH	Located within SPS site and to be minimum of 3 m away from edge of wet-well or else be integral part of wet-well Refer to Typical SPS Site Layout Drawing 6586260-SPS-C-001 and 6586260-SPS-C-002
Permanent survey marker and survey label plate (Refer to SPS-1508)	To be located in the concrete surround of the Inlet MH cover Label plates to be engraved SS
Inlet MH	For inlet MH protective coating refer to WSA 04:2022 and Supplement Clause 4.2.2

<b>WET-WELL</b>	
Top of wet-well	Slab/roof level of wet-well to be min 300 mm higher than 1% AEP flood level
Inlet valve	Refer to WSA 04:2022 and Supplement Clause 6.3.3
Inlet line drop tube	To end minimum of one pipe size above the cut-out level
Valve spindle	To be vertical To be 316 SS To have 316 SS support brackets
Wet-well floor	Provide self-cleansing benching all around
Induct vent	Locate 1 m above O/F level and max 1000 mm away from inlet
Educt vent	Pipe size to be not less than DN 150 or half the size of the inlet line to the wet-well (whichever is the larger) but not larger than DN 300  Locate as close as possible to top slab and diagonally opposite to induct vent and connect to educt vent shaft
Induct / educt vent position	Not to permit short-circuiting and not to obstruct laying of access cover flat on the ground
Inlet line (including valve) from inlet MH	On roof above inlet valve provide standard surface box  For large valves provide access opening  Puddle flange should be provided at the wall penetration
Low-level line from emergency storage	Size to be not less than size of inlet line from Inlet MH to wet-well  Wet-well end of line to have isolating valve
Discharge pipe lengths on material schedule	Need to identify one short piece (closing pipe) as 'cut to suit' or use packer flanges
Discharge pipe work (existing stations)	Need to identify and notes to state 'Make good existing pipework'
Design of discharge pipe work	Minimise number of bends
Sump	Confirm sump shown, located between pumps.
Hydraulic flush valve	To be fitted to at least one unit. Where not feasible, need to review use of separate mixer or return flush pipe off main
Access covers	Show required number of covers. Lifting arrangements compliant with manual handling

	<p>requirements (e.g. not to exceed 20kg). For example, a 1.2m<sup>2</sup> based on a 6mm aluminium checker plate.</p> <p>All covers to be lightweight aluminium and fitted with safety grilles</p> <p>When referring to standard SPS drawings, provide sufficient dimensions to enable manufacture of frames and covers</p> <p>Hinge positioning to be such that covers and safety hinges can lie flat when fully open.</p> <p>Refer to WSA 04:2022 and Supplement Clause 5.11</p>
Person access cover	<p>Show ladder tie points, safety harness points etc.</p> <p>Also show ability for person entry and egress, the mass of each cover, its unobstructed operation in opening the cover etc.</p>
Pump access and electrical covers	<p>To be aligned above pumps and to provide adequate clearance when flush valve is fixed to pump</p> <p>Cover over level sensing equipment to be 450 mm square</p>
Permanent survey marker and survey label plate (Refer to SPS-1508)	<p>To be located on wet-well roof slab</p> <p>Label plates to be engraved SS</p>
Guide rails	<p>To be grade 316 stainless steel, and to allow removal of pumps through access cover</p>
Float switches	<p>Refer to WSA 04:2022 and Supplement Clause 9.8.6 &amp; GWW Electrical Standard</p>
Level sensors	<p>Refer to WSA 04:2022 and Supplement Clause 9.8.5 &amp; GWW Electrical Standard</p>
Operating levels	<p>Show levels and weir crest levels</p>
Protective coating	<p>Concrete and pipework in accordance with WSA 201:2021</p> <p>Refer to WSA 04:2022 and Supplement Clause 4.2.2</p>
Repainting	<p>Any existing pipe and metalwork which is to remain to be noted on drawings</p> <p>Notes to detail painting requirements</p>
Wet Well Location	<p>Not in trafficable area</p>
<b>PUMPING UNITS</b>	
Pump selection	<p>Refer to WSA 04:2022 and Supplement Clause 7.4</p>



Standard	Ensure unit complies with WSA 101 Complete purchaser requirements schedule
Guide rails	Show distance from edge of access cover to centre of guide rail
Pump mounting	Show minimum permissible distance between base of pump and wet-well floor
Pump and motor capacity	Details to be shown on drawing
Pump pedestal/discharge connection	Installation details to be shown in notes Comply with Water Authority's standard
Taper on discharge line	Any tapers next to pump footstep bend to be eccentric
<b>VALVE CHAMBER/BY-PASS CHAMBER</b>	
Valve Chamber Location	Not in trafficable area
Pipework clearances	In accordance with SPS Code and relevant drawing(s)
Valve sequence	In direction of flow, sequence to be non-return valve, load bearing dismantling joint then isolating valve
Double isolation valve	To be downstream of any dismantling joint(s)
Valve extension spindles	To be provided with support brackets
Valve support blocks	Support blocks to be provided under valves
Scour line	Scour stop valve to be positioned next to branch off tee to avoid/ minimise solids accumulation
Drain line	Outlet to be fitted with a P-trap, flap gate or non-return valve Valve chamber to be graded towards drain line Benching to be flush with drain line invert
Dismantling joints	To be thrust restraining type only
Puddle flanges	For all pipe materials, provide at all wall penetrations
Access covers	Refer to WSA 04:2022 and Supplement Clause 5.11
Personnel access	Permanent inclined access ladders with retractable stanchions to be installed
Bypass Pumping Arrangement	Refer to Supplement Clause 10.4 and Typical SPS Site Layout Drawing 6586260-SPS-C-001
Pressure tapping points	Provide DN 15 SS Grade 316 tapping upstream of each non-return valve and one downstream of

	pressure main double isolation valve plus another between bypass line isolating valves
<b>BYPASS ARRANGEMENT</b>	
Bypass pump connection point	Quick-disconnector type coupling with stop valve and non-return valve DN 15 SS Grade 316 bleed valve at base of coupling (outlet facing floor of chamber) Secured dust caps on coupling to prevent unauthorised removal Stop valve on bypass line positioned next to branch off tee to avoid solids accumulation Refer to Typical SPS Site Layout Drawings 6586260-SPS-C-001 and 6586260-SPS-C-002 and 10.4.1 of WSA 04:2022 and Supplement
Bypass size, No and type	In accordance with WSA 04:2022 and Typical SPS Site Layout Drawings 6586260-SPS-C-001 and 6586260-SPS-C-002
Valve support blocks	Concrete support blocks to be provided under valves
Security enclosure	Provide security enclosure if determined necessary by site specific risk assessment
<b>PRESSURE MAIN</b>	
Velocity	Minimum velocity to control slime and solids build-up
Surge	The Designer shall provide GWW with surge calculations and results.
Scour	Scours to be provided at lowest point(s) where practicable
Air release valves	Automatic gas relief valves to be provided at high point(s) Automatic gas relief valves to be connected to odour control unit(s) and/or vent stack(s)
Marker Plates	Refer GWW Standard Marker Plate Drawing
<b>EMERGENCY STORAGE</b>	
Access covers	Refer to WSA 04:2022 Clause 6.6.2.4 and WSA 04:2022/SPS Supplement Clause 5.11
Personnel access	Refer WSA 04:2022 and Supplement Clause 6.7
Head room inside storage vessels	Minimum 2.2 m headroom between the floor and the underside of the roof structure to allow work to be carried out safely If cannot achieve 2.2 m additional access covers shall be included to improve safety and operational

	outcomes. Where space is limited, storage is under road and has small footprint, headroom can be reduced as agreed with GWW.
Wash-down capability	Storage must be provided with a wash down sprinkler system
Floor	Grade towards outlet so solids not retained
Vent arrangements	Vent/air release line to be provided
Level sensors	Details to be shown on electrical drawings only
Permanent survey marker and survey label plate (Refer to SPS-1508)	To be located on roof slab of storage structure Label plates to be engraved SS
<b>ELECTRICAL EQUIPMENT</b>	
Arc Flash requirements	Electrical equipment to be affixed with Arc Flash warning labels, and have an incident energy less than 8 cal/cm <sup>2</sup> (CAT 2 or below)
Cabinet - position and orientation	Refer Typical SPS Site Layout Drawings 6586260-SPS-C-001 and 6586260-SPS-C-002 and Canopy Drawings 6586260-SPS-C-007
Electrical turrets and pits	To be min 300 mm above 1% AEP flood level
Electricity metering panel	To be positioned so that no entry is required into confined spaces Not to be located inside a building
Telecommunications pit	To be located within 5 m of cabinet
VSD	Located in cabinet if ≤22 kW and in mechanically ventilated or air-conditioned building if >22 kW
<b>MISCELLANEOUS</b>	
Location of pumps in relation to access covers	Dimensions to be shown on drawings
Pressure main(s)	Thrust blocks/thrust forces to be shown on drawings
Pipe set-out within valve chamber	Dimensions to be shown on drawings
Level sensing instruments	Support details to be shown on drawings
Machine safety risk assessment	Machine safety risk assessment to be completed
Materials schedule	Materials and parts listed to be included in GA Drawings

	<p>Numbers and description to match what is shown in drawings</p> <p>Numbers not to be duplicated. For pipes that include puddle flanges, show total length, length from puddle flange to each end and whether pipe ends with a flange or spigot</p>
Permanent survey marker and survey label plate (Refer to Drawing SPS-1508)	To be located on wet-well, inlet MH and emergency storage roof slab adjacent to access covers
Pipe connection details	To be specified in notes.
Pipework	Flange fasteners to be SS 316
Emergency relief headwall	Scour protection of headwall to be specified in notes.
MHs and inlet MH	Standard Drawings in WSA 02 Gravity Sewerage Code of Australia to be referenced as appropriate to diameter and depth of sewer
Discharge MHs	For discharge MH protective coating refer to WSA 04:2022 and Supplement Clause 4.2.2
Signage	Signage requirements to be specified in notes
Electricity supply for by-pass pumping	If preferred emergency by-pass location (i.e. Inlet MH or emergency storage) is more than 10 m from cabinet, an additional electrical connection to be provided within that limit
Electrical and civil/mechanical drawings	All drawings to be consistent
Materials schedule	<p>Bleed line at by-pass to be called up as "DN 15 tapping with SS 316 ball valve and pipe"</p> <p>Tapping points to be called up as "DN 15 tapping with SS 316 ball valve"</p> <p>For pipes that include puddle flanges, show total length, length from puddle flange to each end and whether pipe ends with a flange or spigot</p>

## **PART 2: CONSTRUCTION**

### **17. GENERAL CONSTRUCTION**

#### **17.1. GENERAL**

##### **Additional Requirements:**

Please invite GWW staff to site work kick-off and weekly toolboxes, GWW staff will attend when they can. To notify GWW of Faults and Emergencies contact 13 44 99, for all non-urgent queries please contact the relevant GWW Project Manager.

### **28. PIPE LAYING AND JOINTING**

#### **28.17. WELDING OF PE PIPELINES**

##### **28.17.3. CONNECTIONS TO PIPES OF OTHER MATERIALS**

##### **Additional Requirements:**

Refer to AS 4087 for the following flange dimensions:

- PN16 refer to Figure B5 for ductile iron and Figure B7 for stainless steel.
- PN35 refer to Figure B6 for ductile iron and Figure B9 for stainless steel.

Joining preference shall be as per Table 103-D for PE pipes in MRWA-W-103.

To connect two PE pipes of same size, same SDR or two different SDR, jointing two PE stub flange with Stainless Steel 316 backing ring is not permitted. The PE stub flange with backing ring is only allowed to join with flange end of a valve, DI flanged fittings, Dismantling joint or Flange adaptor.

To connect two different SDR PE100 PE pipes of same size (for example PN16 to PN20), butt welding is not allowed, a transient piece is required. Alternatively an Electrofusion Coupler can be used to connect two different SDR pipe of the same size.

### **34. ACCEPTANCE TESTING**

#### **34.7. DEFLECTION (OVALITY) TESTING OF FLEXIBLE GRAVITY SEWERS**

##### **34.7.4. FLEXIBLE SEWERS >DN300**

##### **Additional Requirements:**

For > DN 300 sewers typically electronic ovality testing and CCTV inspection is preferred. Refer to WSA 02 MRWA for Acceptance Testing.

### **35. COMMISSIONING**

## **35.1. GENERAL**

### **Additional Requirements:**

The Designer shall contact GWW regarding the commissioning procedure for each site as soon as practicable. Refer to the GWW Electrical Standard.

## **37. WORK AS-CONSTRUCTED DETAILS**

### **37.1. GENERAL**

#### **Additional Requirements:**

The following information is to be provided with the pump station prior to GWW's preliminary acceptance of the pumping station:

- 2 electronic copies are to be provided; 1 in Microsoft Word format (.docx) and 1 in Portable Document Format (.pdf) of an operation and maintenance manual for the asset, in accordance with GWW's requirements. An example can be provided upon request.
- Paper and electronic AutoCAD (.dwg) and Portable Document format (.pdf) drawings produced in accordance with 'As constructed' detailed plans, including coordinate system with reference.
- As constructed drawings provided are include survey information provided by a registered surveyor.
- Drawings and surveys are to be prepared to GDA2020 MGA Zone 55.
- Location and position of all existing and new underground services confirmed by potholing.
- Asset list (GWW can provide an example on request).
- Functional description of the site control philosophy
- Description of all codes and supporting information required for electrical equipment.
- All appropriate as-constructed information must be annotated on the original design plans and be clearly distinguished from design values, by prefixing the characters "A/C" (i.e. A/C 2.4).
- Where Works haven't been constructed in accordance with original design (such as a significant change to alignment) complete new plans must be submitted.
- Designer to contact GWW Asset Information team to confirm latest requirements prior to commencing detailed design.
- This applies to renewals and construction activity.

## **PART 3: STANDARD DRAWINGS**

### **DEFINITIONS**

**Add the following sentence to the definition for “Designers”:**

Such person(s) must be suitably qualified or under the direct supervision of such suitably qualified person(s). If providing professional engineering services in a prescribed area of engineering, suitably qualified persons must be a registered professional engineer as defined in the Professional Engineers Registration Act 2019.

## **PART 4: GWW ADDENDUMS**

### **GWW ADDENDUM 1 – FLOW METER DESIGN REQUIREMENTS**

#### **GENERAL**

A flow meter (Electromagnetic Type) is required on the pressure main following the valve chamber as specified unless otherwise agreed with GWW. The flow meter location is to be marked with a marker post, refer to the GWW SPS Supplement Marker Post Drawing, alternatively a buried detectable electronic device shall be used.

The Designer must also refer to the GWW Electrical Standard, the GWW Typical SPS Site Layout Drawings 6586260-SPS-C-001 and 6586260-SPS-C-002, GWW Flow meter Installation Standard and the GWW SCADA Requirements for Flow meter Installations during the development of flow meter design. Compliance with the flow meter requirements provided in this GWW Addendum does not relieve the Designer of their responsibilities to provide appropriate engineering judgement.

A flow meter is required at the start of all rising mains, unless discussed and agreed otherwise with GWW. The need for a flow meter at the end of the rising main is to be determined in consultation with GWW on a case-by-case basis.

The need for a bypass and bypass sizing is to be discussed and agreed with GWW. Note: Typically flow meter bypasses may not to be required.

#### **CONFIGURATIONS**

There are two configurations for electromagnetic flow meters, described as follows:

- (1) Remote or separate type: where flow sensor and transmitter are separated and connected by a communication cable; and
- (2) Integral or combined type: where flow sensor and transmitter are connected together.

GWW preference is for flow meters of the remote type, supplied by AC power. For remote type flow meters the flow sensors are to be installed underground (either direct buried or within a concrete pit) and the transmitter is installed aboveground within a Control cabinet or Pillar box together with other electronic and communication devices including the RTU, Pressure Transducers and power sources (typically AC, Battery and Solar or combination of battery and solar).

Integral type flow meters are to be installed above ground.

#### **FLOW METER SELECTION**

Proper sizing of the pump station flow meter is critical for accurate measurement of the flows delivered. For each site, the flow meter shall be sized in accordance with manufacturers recommendations such that it can accurately read station instantaneous flow rate up to a maximum 20% higher than the designed maximum flow rate. Another requirement is to maximise the ability of the meter to read low flows for situations such as a non-return valve not functioning as intended.



While selecting a suitable flow meter (i.e. flow sensor), the ID of flow sensor and ID of adjoining straight pieces either side must be in line with manufacturer recommendations, to ensure turbulence does not impact meter accuracy.

The factory setting is to be forward flow for pumped flows and reverse for flows draining from the rising main back to the wet well. All flow meters shall allow continuous monitoring of flows. The flow direction must correspond to the identification plate.

Earthing rings shall be installed depending on whether the adjoining pipes of flow sensor is metallic or non-metallic to record bi-directional flow accurately.

The flow meter sensor must have a IP68 degree of protection, including potting of the flow meter terminal box as per manufacturer's recommendations. One side of the pipe flange shall be a dismantling flange such as flange adaptor or dismantling joint for easy removal for maintenance. For PE pipe it must be a restrained type and for non-PE it may be a non-restrained type.

## **FLOW METER LAYOUT**

The location of flow meters and all cabling is to be included in the as-constructed information with a location plan fixed to the inside of the control cabinet. The flow meter sensor is to be located at a point where the pipe is always submerged during pump station operation. GWW typically require a minimum of five diameters upstream and downstream of straight pipe lengths from the flow meter sensor, or the minimum distances of straight pipe specified by the manufacturer, whichever is greater as required to ensure the accuracy of flow measurement meets GWW operational requirements (plus or minus 1%) unless agreed otherwise. Diameter refers to the nominal diameter (DN) of the flow meter sensor. The Designer is to consider any additional disturbances that may increase the requirement for additional straight sections of pipe. The Designer is requested to maximise the straight section of pipe either side of the flow meter sensor as far as practicable.

An isolative valve is to be included downstream of the flow meter, refer to Clause 10.2.1 of WSA 04:2022 and GWW Supplement. An upstream isolation valve must be included in the nearby valve chamber.

Flow meters >DN150 and flow meters for permanent pump stations shall be installed in concrete pits, refer to the GWW Standard Details for Flow meters (GWW Addendum 2). For installation of flow meters in concrete pits refer to the Concrete Pit Flow meter Installation Requirements and the GWW Standard Flow Meter Drawings.

DN150 or smaller flow meters for temporary pump stations can be directly buried if GWW approval is obtained and GWW on-site inspection and approval occurs prior to burial. For direct buried flow meter sensor installation requirements see the Direct Buried Flow meter Installation Requirements section below.

## **GENERAL INSTALLATION REQUIREMENTS**

The flow meter sensor shall be completely wrapped with petroleum tape such as DENSO and with plastic tape in preparation for buried installation. There shall be no large air pockets covered by the wrapping where moisture can accumulate. Flanges are to be wrapped with petroleum tape such as DENSO in a manner that does not impact the operation of dismantling joints. There shall be no exposed parts of the flow meter and mating flanges. Flow meter cabling connections are to be protected using a junction box. The devices must be installed without

mechanical tension and a Sling Angle  $<90^\circ$  to prevent excess stresses during installation.

Contactors shall arrange the flow meter supplier to configure and commission the system. A GWW approved integrator shall be engaged to configure and integrate this new flow signal into the SCADA system. Records for installation, commissioning and integration are to be provided to GWW upon completion.

## **CONCRETE PIT FLOW METER INSTALLATION REQUIREMENTS**

The contractor must also ensure:

- a) GWW preference is for concrete pits to be installed in non-trafficable areas, within GWW land, the SPS site easement or other location as agreed with GWW.
- b) The flow sensor concrete pit cover shall be Aluminium, similar to the wet well and valve chamber, for non-trafficable areas. If trafficable then approved Class D ductile iron DN600, DN900 or multipart covers are to be installed.
- c) Concrete pits shall freely drain to the wet well. This drain shall have a "P" trap to prevent gas migration from the wet well to the flow meter pit.
- d) The pit shall be designed as an impermeable structure.
- e) All penetrations through the pit to be sealed.
- f) Note the GWW Standard Details for Flow meters (See GWW Addendum 2) are only suitable where the internal depth of the chamber does not exceed 1.5m. Designs with depth greater than 1.5m shall be submitted to GWW for approval and shall include an appropriate permanent on-site 4-sided fall protection system from the GWW Approved Products Catalogue.

## **DIRECT BURIED FLOW METER INSTALLATION REQUIREMENTS**

The contractor must also ensure:

- a) Embedment around the flow meter shall be Type A as per MRWA Sewer Standard MRWA-S-202. Backfilling shall be as per MRWA Backfill Spec 04-03.2. Only GWW approved embedment and trench fill materials shall be used.
- b) After installation and prior to backfill, the installation must be audited by the GWW Compliance Officer.
- c) Cable protector concrete or a recycled plastic slab shall be placed approximately 300-400 mm above the flow meter for protection from future excavations.
- d) Installing direct buried flow meters in trafficable areas is not preferred. All direct buried flow meters in trafficable areas shall have an engineered structural covering/housing designed that reduces the pressure on top of the sensor of the trench fill material. Flow meters must not be installed under concrete paving.
- e) Marking post, tape and tracer wire are to be placed on top notifying future excavations that a flow meter, pipeline and electrical cables lie below.
- f) Where the pipeline is not flat and there is a possibility that ground water may use the pipeline as a drainage path, suitable stormwater drains shall

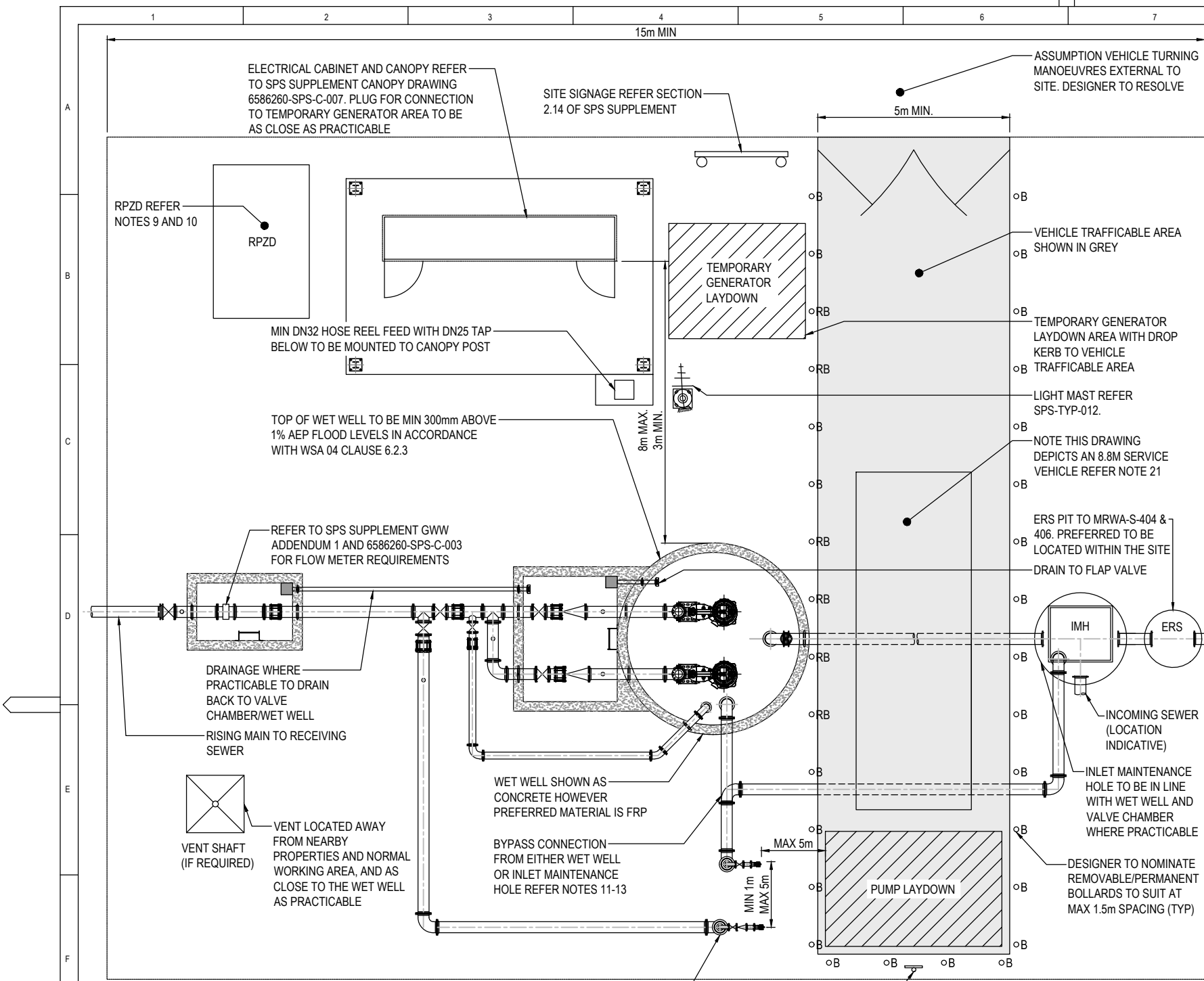
be placed in line with the flow meter to assist the movement of groundwater away from the flow meter.

## GWW ADDENDUM 2 - STANDARD DRAWINGS

### DRAWING REGISTER:

DRAWING NUMBER	TITLE
6586260-SPS-C-001	TYPICAL SPS SITE LAYOUT MINIMUM SPS REQUIREMENTS
6586260-SPS-C-002	TYPICAL SPS SITE LAYOUT PERMANENT SPS REQUIREMENTS
6586260-SPS-C-003	STANDARD CHAMBER FOR MAGFLOW METER (NON-TRAFFICABLE)
6586260-SPS-C-004	MARKER POSTS AND MARKER BLOCKS
6586260-SPS-C-005	OFFSET AIR VALVE INSTALLATION
6586260-SPS-C-006	TYPICAL SCOUR VALVE DETAIL
6586260-SPS-C-007	TYPICAL CANOPY DETAILS
SPS-TYP-012	LIGHT POLE DETAIL

All the above seven drawings are included below and can also be accessed from the below hyperlink by GWW staff: [Combined DWG.pdf](#)



- GENERAL NOTES:**
- THE DRAWING SHOWN HERE ILLUSTRATES THE TYPICAL MINIMUM SPS REQUIREMENTS, FOR ADDITIONAL REQUIREMENTS FOR PERMANENT SITES OR SITES WITH EMERGENCY STORAGE REFER 6586260-SPS-C-002.
  - THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE GWW SPS SUPPLEMENT AND WSA 04:2022.
  - THE PUMP STATION DESIGN SHALL CONSIDER ULTIMATE DEVELOPMENT OF THE SITE AND STAGING. DESIGNERS TO CONSULT WITH GWW REGARDING THIS APPROACH.
  - FOR CONSTRAINED SEWER PUMP STATION SITES DESIGNER TO DISCUSS WITH GWW TO DETERMINE APPROPRIATE FOOTPRINT.
  - TEMPORARY GENERATOR/BYPASS PUMP LAYDOWN AREA TO BE CLEARLY IDENTIFIED.
  - DESIGNER TO UNDERTAKE NOISE ASSESSMENT CONSIDERING THE ENVIRONMENTAL SURROUNDINGS CURRENT AND FUTURE IN ACCORDANCE WITH EPA NOISE GUIDELINES.
  - THE PUMPING STATION SHALL BE LOCATED SUCH THAT CRANES OPERATING ON SITE ARE CLEAR OF OVERHEAD ELECTRICAL CABLES IN ACCORDANCE WITH THE "NO GO ZONES" REQUIREMENT OF ENERGY SAFE VICTORIA AS FAR AS PRACTICABLE AND OR UNLESS OTHERWISE AGREED WITH GWW.
  - ALL DIRECT BURIED FLANGES TO BE PROTECTED USING DENSO OR APPROVED EQUIVALENT.
- ROADS AND DRAINAGE**
- CONTRACTOR TO PROVIDE REMOVABLE/PERMANENT BOLLARDS TO SUIT AT MAX 1.5m SPACING.
  - ALL ACCESSES TO SITES MUST BE SUITABLE FOR A MINIMUM 8.8 METRE SERVICE VEHICLE. FOR SITES WITH CHEMICAL DOSING GWW REQUIRE THE SITE TO BE DESIGNED FOR A 12.5 METRE SERVICE VEHICLE.
  - THE SITE LAYOUT DRAWING MUST SHOW THE MINIMUM SERVICE VEHICLE.
  - VEHICLE TRACKING INCLUDING APPLICABLE TURNING CIRCLES BOTH WITHIN AND EXTERNAL TO THE SITE.
  - ACCESS ROAD TO THE SITE TO BE ACCESSIBLE 24/7 IN ALL WEATHER, DESIGNED FOR THE MAXIMUM NOMINATED SERVICE VEHICLE.
  - THE DESIGNER IS TO ENSURE VEHICLES ARE NOT REQUIRED TO REVERSE ONTO A CLASSIFIED ROAD. THE DESIGNER IS TO CONFIRM THE NOMINATED VEHICLE CAN SAFELY ENTER/EXIT THE SITE, MEETING THE ROADING AUTHORITY REQUIREMENTS.
  - DESIGN OF SITE ACCESS AND INTERNAL AREA IS TO ENSURE AS FAR AS IS PRACTICABLE THE FINISHED WORKS WILL NOT INTRODUCE TRIP HAZARDS.
  - THE ACCESS ROAD WHERE ADJACENT TO VALVE CHAMBER AND WET WELL IS TO HAVE ALL SURFACE GRADES NOT TO EXCEED 1% MAX.
  - ACCESS ROAD AND SITE IMPERMEABLE AREAS TO BE GRADED TO ENSURE NO SURFACE WATER PONDING. SURFACE WATER FLOW PATHWAYS TO BE CONSIDERED BY THE DESIGNER TO REDUCE MAINTENANCE (E.G. DUE TO SILT BUILDUP ACROSS CRITICAL AREAS).
  - ALL ROAD SPOT LEVELS, DIMENSIONS, CROSS SECTION ETC. ARE TO BE SHOWN ON THE SITE DRAWINGS.
  - SPECIFICATIONS FOR EARTHWORKS, DRAINAGE, FENCING, KERBS, GUTTERS, ACCESS ROAD, CONDUITS, SERVICES, CONCRETE HARDSTAND AND ANY OTHER ASSOCIATED/PERIPHERAL COMPONENTS ARE TO BE SHOWN ON THE DRAWINGS.
  - TEMPORARY ACCESS TRACKS MUST BE SUITABLE FOR THE HEAVIEST VEHICLE NOMINATED BY GWW, NOMINALLY A CRANE UNLESS OTHERWISE AGREED WITH GWW.
  - A PERMANENT SEALED ACCESS ROAD TO SUIT THE MAXIMUM SERVICE VEHICLE IS REQUIRED, DESIGNED TO ROAD AUTHORITY STANDARDS, FOR ALL PERMANENT SPS SITES.
  - FOR TEMPORARY SPS SITES, A CRUSHED ROCK ROAD TO SUIT ALL NOMINATED SERVICE VEHICLES IS REQUIRED.
  - TRAFFICABLE AREAS TO BE CONCRETE, THIS INCLUDES VEHICLE, WALKING AND PERSONNEL AREAS. NON TRAFFICABLE AREAS TO BE 20mm GRAVEL/CRUSHED ROCK NOT LESS THAN 200mm THICK UNLESS OTHERWISE AGREED WITH GWW.
  - ANY AREAS SUSCEPTIBLE TO POTENTIAL DISCHARGE OF HAZARDOUS MATERIALS OR FLUIDS (INCLUDING DELIVERIES) TO BE BUNDED UNLESS OTHERWISE REMOVED FOLLOWING A HAZOP REVIEW, WITH MEANS TO MANAGE HAZARDOUS DISCHARGES, E.G. TO THE WET WELL, IF APPLICABLE IN HAZOP.
- VALVE CHAMBER/PIPEWORK:**
- A MIN DN32 HOSE REEL WITH DN25 TAP BELOW IS TO BE INSTALLED CLOSE TO/MOUNTED ALONGSIDE ELECTRICAL CANOPY POST. REFER SPS SUPPLEMENT SECTION 13.1.2.
  - A MIN DN32 CONNECTION IS TO BE PROVIDED FROM THE RPZD TO THE WET WELL WASHER AND ESV (REFER DRAWING 6586260-SPS-C-002). REFER TO THE GWW METERING AND BACKFLOW DESIGN AND INSTALLATION GUIDELINES.
  - BYPASS FITTINGS MUST HAVE A DIAMETER EQUIVALENT TO THE RISING MAIN DIAMETER, WITH A BAUER TYPE B FEMALE COUPLING CONNECTION OR APPROVED EQUIVALENT. IF FEASIBLE THE BYPASS IS TO BE PROVIDED FROM THE INLET MAINTENANCE HOLE TO THE RISING MAIN, OTHERWISE BYPASS IS TO BE PROVIDED FROM THE WET WELL TO THE RISING MAIN.
  - BYPASS PIPEWORK CONNECTIONS TO BE LOCATED ABOVE GROUND TO AVOID CONFINED SPACE ENTRY.
  - REFER TO SECTION 10.4.1 OF THE GWW SPS SUPPLEMENT FOR ADDITIONAL BYPASS REQUIREMENTS.
  - DESIGNER TO DETERMINE SIZE AND SUITABILITY OF INTEGRATED VS EXTERNAL VALVE CHAMBER IN CONSULTATION WITH GWW.
  - IF AN EXTERNAL VALVE CHAMBER IS PROVIDED FLEXIBLE JOINTS ARE TO BE USED. EXTERNAL VALVE CHAMBERS ARE TO BE NO MORE THAN 10m FROM THE NEAREST WET WELL.
  - VALVE CHAMBER INTERNAL DEPTH TO BE 1.2 METRES UNLESS OTHERWISE AGREED WITH GWW.
  - ALL SERVICE TRENCHES TO BE BACKFILLED WITH CRUSHED ROCK AS A MINIMUM, SUBJECT TO ACTUAL SITE CONDITIONS.
- SAFETY/SECURITY**
- ALL ABOVE-GROUND PIPEWORK MUST BE INSTALLED INSIDE A VANDAL-PROOF, LOCKABLE STEEL ENCLOSURE TO PREVENT DAMAGE OR UNAUTHORISED ACCESS.
  - FENCING MUST BE PROVIDED AROUND ALL SITES AS PER THE GWW BASELINE SECURITY STANDARDS.

**LEGEND:**  
 AEP: ANNUAL EXCEEDANCE PROBABILITY OF RAINFALL EVENT  
 B: BOLLARD (NOTE: NOT ALL SHOWN FOR SIMPLICITY)  
 ERS: EMERGENCY RELIEF STRUCTURE  
 ESS: EMERGENCY STORAGE STRUCTURE  
 IMH: INLET MAINTENANCE HOLE  
 RB: REMOVEABLE BOLLARD (NOTE: NOT ALL SHOWN FOR SIMPLICITY)  
 WHS: WORK HEALTH AND SAFETY

SPS MINIMUM REQUIREMENTS	
CONNECTION TO RISING MAIN	
FLOWMETER	
VALVE CHAMBER	
WET WELL	
BYPASS ARRANGEMENT	
INLET MAINTENANCE HOLE	
CONTROL CABINET	
RPZD AND WATER SUPPLY	
ERS	
5m WIDE ACCESS ROAD	
AREA FOR TEMPORARY GENERATOR/PUMP LAYDOWN AND OPERATION	

REV	DESCRIPTION	DATE	APPROVED
P3	RE-ISSUED FOR USE	07/03/2024	IH
P2	ISSUED FOR USE	14/02/2024	IH
P1	ISSUED FOR REVIEW	21/12/2023	IH

DESIGNED: MS	GWW PROJECT NO. SO381
DATE: 14.02.24	
DRAWN: MS	MELWAY REF:
DATE: 14.02.24	
CHECKED: PA	AUTHORISED: IH
DATE: 14.02.24	DATE: 14.02.24

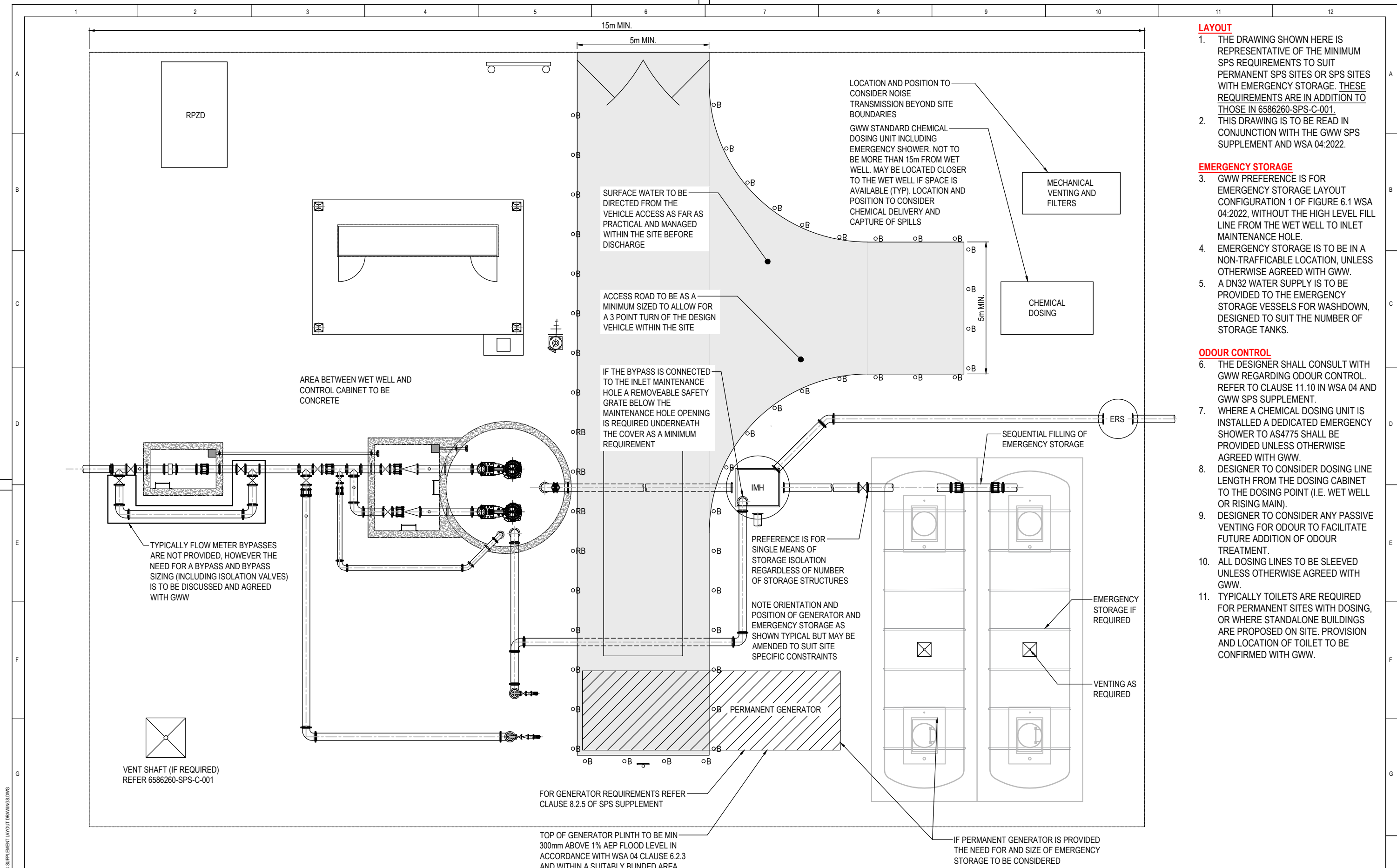


GWW REGION  
 TYPICAL SPS SITE LAYOUT  
 MINIMUM SPS REQUIREMENTS  
 GWW SPS SUPPLEMENT

DISCIPLINE: -	SCALE: NTS	A1
FACILITY NUMBER: -		
6586260-SPS-C-001		P3
DRAWING NUMBER:		REV:

CAD FILE NAME: P:\6586260-1\WP\00-CADDERS SUPPLEMENT LAYOUT DRAWINGS.DWG





- LAYOUT**
1. THE DRAWING SHOWN HERE IS REPRESENTATIVE OF THE MINIMUM SPS REQUIREMENTS TO SUIT PERMANENT SPS SITES OR SPS SITES WITH EMERGENCY STORAGE. THESE REQUIREMENTS ARE IN ADDITION TO THOSE IN 6586260-SPS-C-001.
  2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE GWW SPS SUPPLEMENT AND WSA 04:2022.

- EMERGENCY STORAGE**
3. GWW PREFERENCE IS FOR EMERGENCY STORAGE LAYOUT CONFIGURATION 1 OF FIGURE 6.1 WSA 04:2022, WITHOUT THE HIGH LEVEL FILL LINE FROM THE WET WELL TO INLET MAINTENANCE HOLE.
  4. EMERGENCY STORAGE IS TO BE IN A NON-TRAFFICABLE LOCATION, UNLESS OTHERWISE AGREED WITH GWW.
  5. A DN32 WATER SUPPLY IS TO BE PROVIDED TO THE EMERGENCY STORAGE VESSELS FOR WASHDOWN, DESIGNED TO SUIT THE NUMBER OF STORAGE TANKS.

- ODOUR CONTROL**
6. THE DESIGNER SHALL CONSULT WITH GWW REGARDING ODOUR CONTROL. REFER TO CLAUSE 11.10 IN WSA 04 AND GWW SPS SUPPLEMENT.
  7. WHERE A CHEMICAL DOSING UNIT IS INSTALLED A DEDICATED EMERGENCY SHOWER TO AS4775 SHALL BE PROVIDED UNLESS OTHERWISE AGREED WITH GWW.
  8. DESIGNER TO CONSIDER DOSING LINE LENGTH FROM THE DOSING CABINET TO THE DOSING POINT (I.E. WET WELL OR RISING MAIN).
  9. DESIGNER TO CONSIDER ANY PASSIVE VENTING FOR ODOUR TO FACILITATE FUTURE ADDITION OF ODOUR TREATMENT.
  10. ALL DOSING LINES TO BE SLEEVED UNLESS OTHERWISE AGREED WITH GWW.
  11. TYPICALLY TOILETS ARE REQUIRED FOR PERMANENT SITES WITH DOSING, OR WHERE STANDALONE BUILDINGS ARE PROPOSED ON SITE. PROVISION AND LOCATION OF TOILET TO BE CONFIRMED WITH GWW.

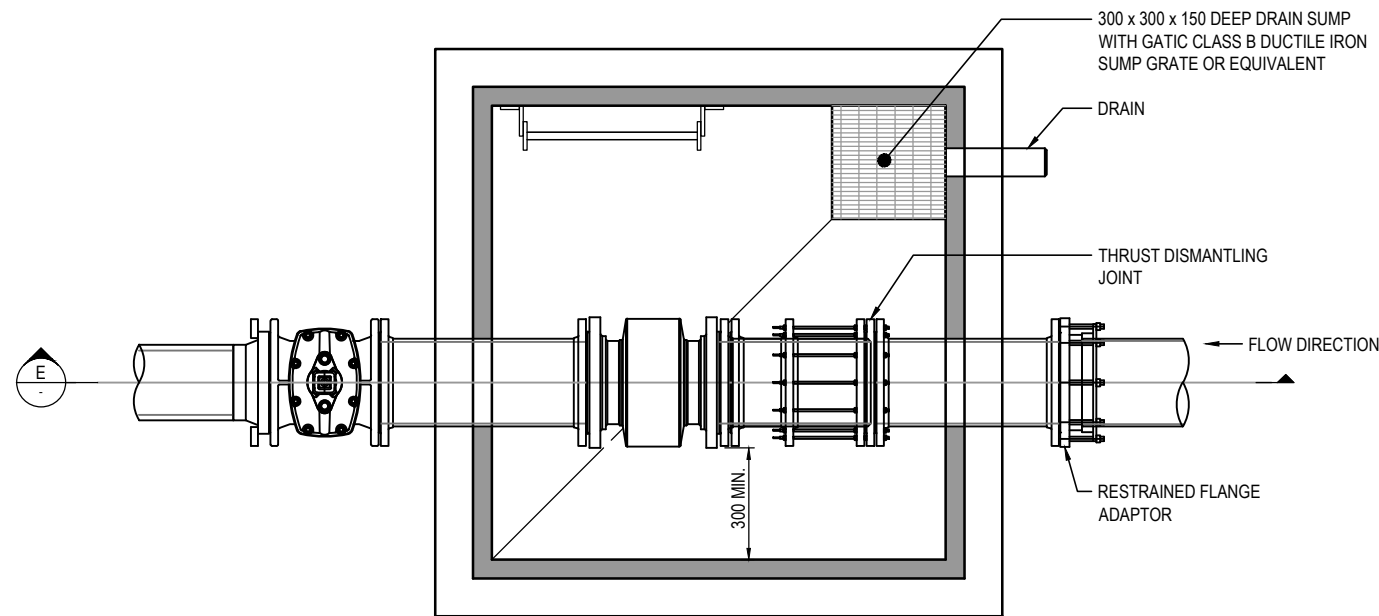
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DATE: 14.02.24	
DRAWN: MS	MELWAY REF: -
DATE: 14.02.24	
CHECKED: PA	AUTHORISED: IH
DATE: 14.02.24	DATE: 14.02.24

REV	DESCRIPTION	DATE	APPROVED
P3	RE-ISSUED FOR USE	07/03/2024	IH
P2	ISSUED FOR USE	14/02/2024	IH
P1	ISSUED FOR REVIEW	21/12/2023	IH



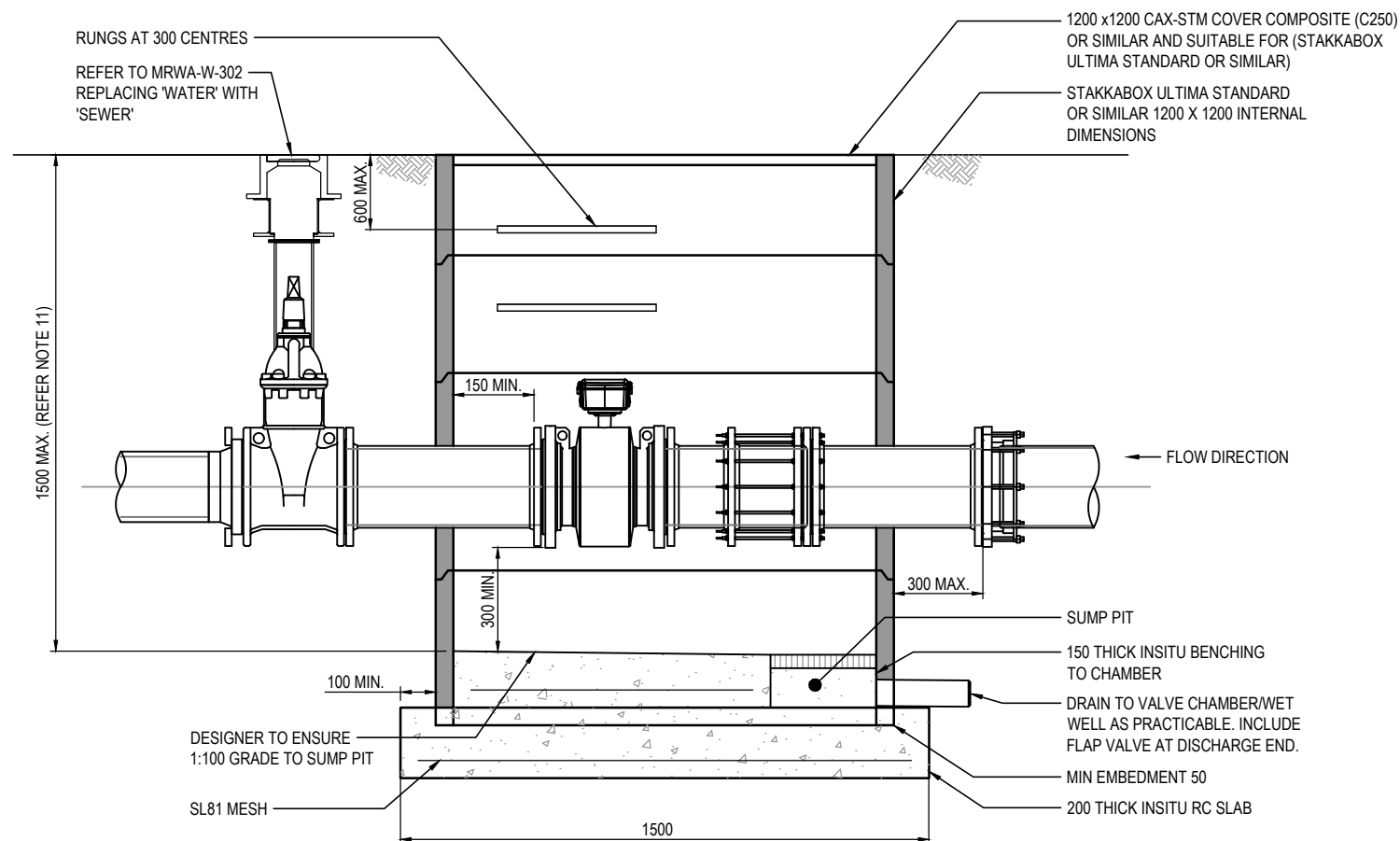
GWW REGION  
**TYPICAL SPS SITE LAYOUT**  
**PERMANENT SPS REQUIREMENTS**  
**GWW SPS SUPPLEMENT**

DISCIPLINE: -	SCALE: NTS	A1
FACILITY NUMBER: -		P3
6586260-SPS-C-002		
DRAWING NUMBER:		REV:



PLAN TYPE E

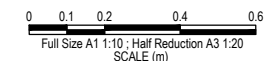
NOTE: PIPE TO BE FULLY RESTRAINED WITH NO TRANSFER OF FORCE TO CHAMBER.  
IN-LINE THRUST RESTRAINT IN ACCORDANCE WITH MRWA-W-205A FIG H WHERE REQUIRED



SECTION TYPE E

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. ARRANGEMENT FOR INTELLIGENT NETWORK MAGFLOW METER.
3. ALL PENETRATIONS THROUGH CHAMBER TO BE SEALED WITH A SUITABLE WATERSTOP. (e.g. WEEP FLANGE, HYDROTITE OR SIMILAR).
4. CHAMBER COVER PANELS AND REMOVABLE SUPPORT BEAM (IF REQUIRED) NOT SHOWN FOR CLARITY.
5. CHAMBER CONSTRUCTED FROM PRECAST GRP OR INSITU CONCRETE WHERE DIAMETER IS LESS THAN OR EQUAL TO DN375. PIPE DIAMETER GREATER THAN DN375 CHAMBER TO BE INSITU CONCRETE.
6. CONCRETE SURROUND TO BE PROVIDED TO CAST IRON FRAME OF LID.
7. WHERE FOUNDATION BEARING PRESSURE IS LESS THAN 50kPa, EXCAVATE AND REPLACE UNSATISFACTORY MATERIAL IN ACCORDANCE WITH MRWA SPECIFICATION 04.03.
8. FLANGE SPIGOT MIN 400 LENGTH TO FACILITATE TAPPING BAND WITH DN50 OFFTAKE.
9. ALL REINFORCEMENT TO HAVE MINIMUM COVER 75.
10. THESE DRAWINGS ARE ONLY SUITABLE FOR AN INTERNAL DEPTH OF CHAMBER NOT EXCEEDING 1500. GWW APPROVAL IS REQUIRED TO EXCEED 1500 INTERNAL DEPTH OF CHAMBER BASED ON SITE CONDITIONS.
11. ALL FLANGES TO BE GREATER OF EITHER PN16 OR THE PN RATING OF THE SEWER RISING MAIN.
12. DRAIN TO WET WELL TO CONNECT TO WET WELL MIN 200 ABOVE SPILL LEVEL.
13. TYPICALLY FLOW METER BYPASSES ARE NOT PROVIDED, HOWEVER THE NEED FOR A BYPASS AND BYPASS SIZING IS TO BE DISCUSSED AND AGREED WITH GWW.



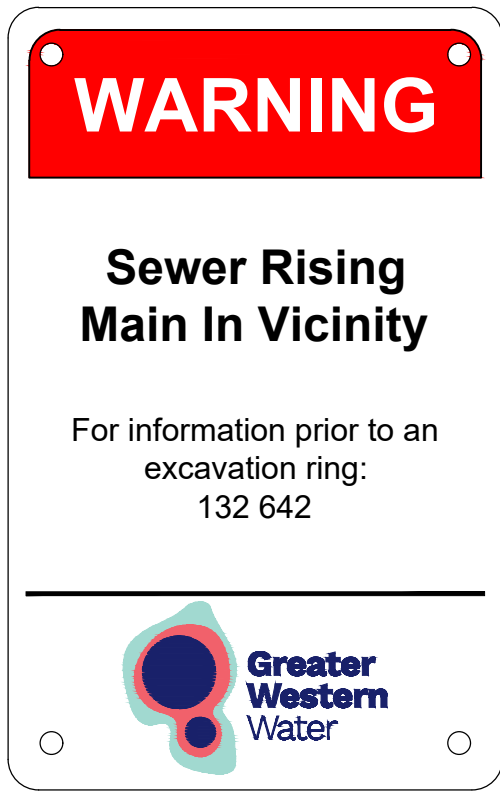
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P3	RE-ISSUED FOR USE	07/03/2024	IH	DRAWN: HB DATE: 14.02.24	MELWAY REF:
P2	ISSUED FOR USE	14/02/2024	IH	CHECKED: PA DATE: 14.02.24	AUTHORISED: IH DATE: 14.02.24
P1	ISSUED FOR REVIEW	21/12/2023	IH		
REV	DESCRIPTION	DATE	APPROVED		

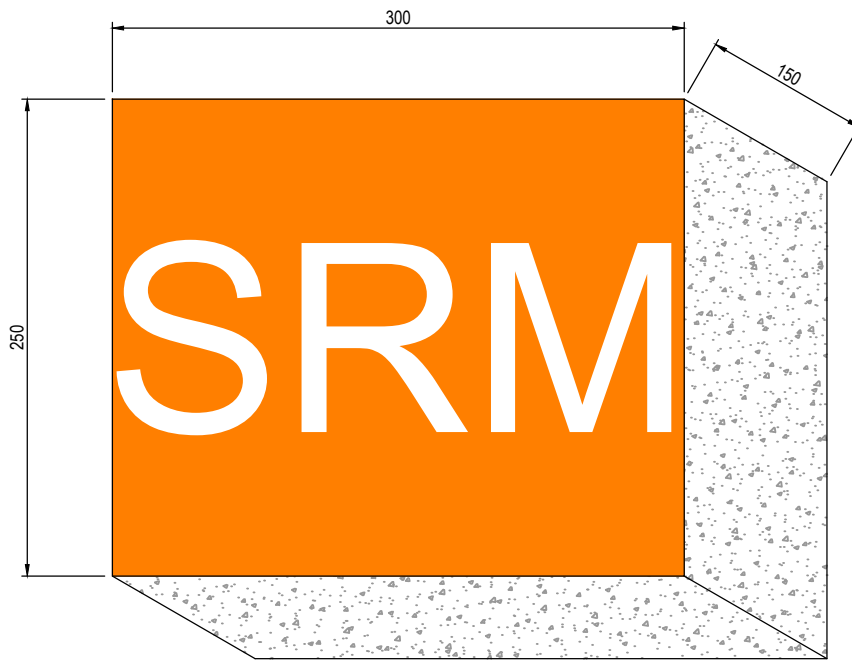


GWW REGION  
STANDARD CHAMBER  
FOR MAGFLOW METER (NON-TRAFFICABLE)  
GWW SPS SUPPLEMENT

DISCIPLINE: CIVIL		
FACILITY NUMBER:	SCALE: 1:10 A1 1:20 A3	A1
6586260-SPS-C-003		P3
DRAWING NUMBER:		REV:

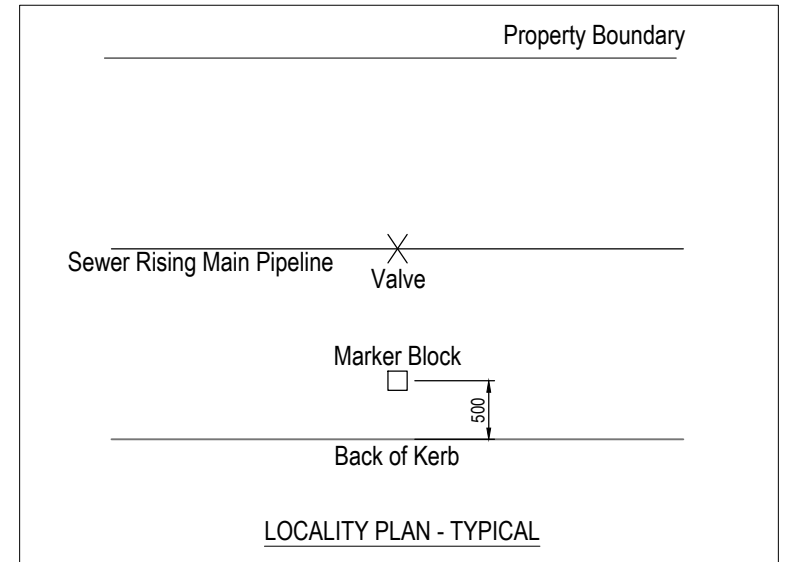


GWW WARNING SIGN - TYPICAL

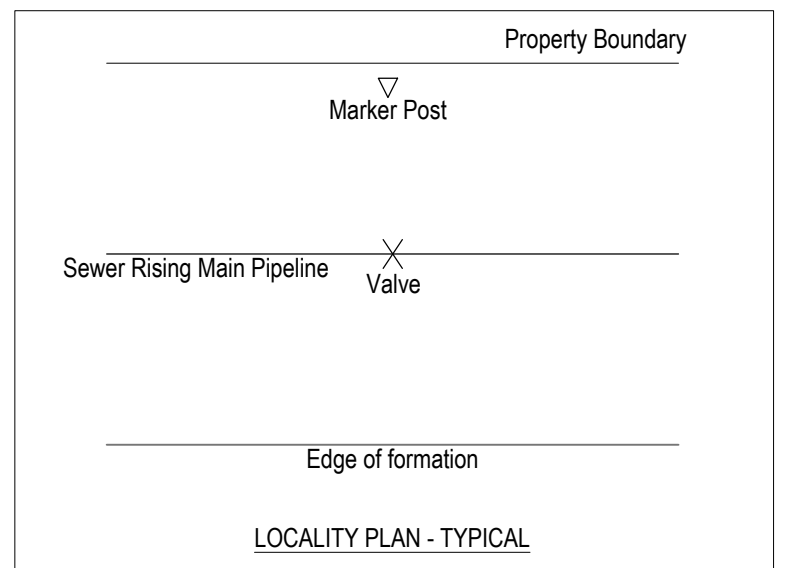


NOTE: LETTERING 150 HIGH WITH 15 DEEP ETCHING

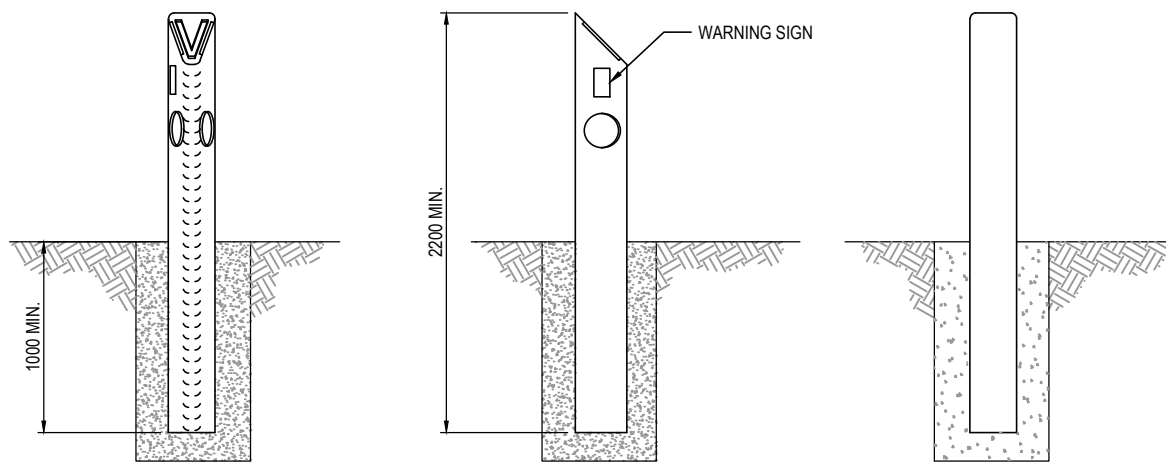
MARKER BLOCK - TYPICAL



LOCALITY PLAN - TYPICAL



LOCALITY PLAN - TYPICAL




MARKER POST - TYPICAL

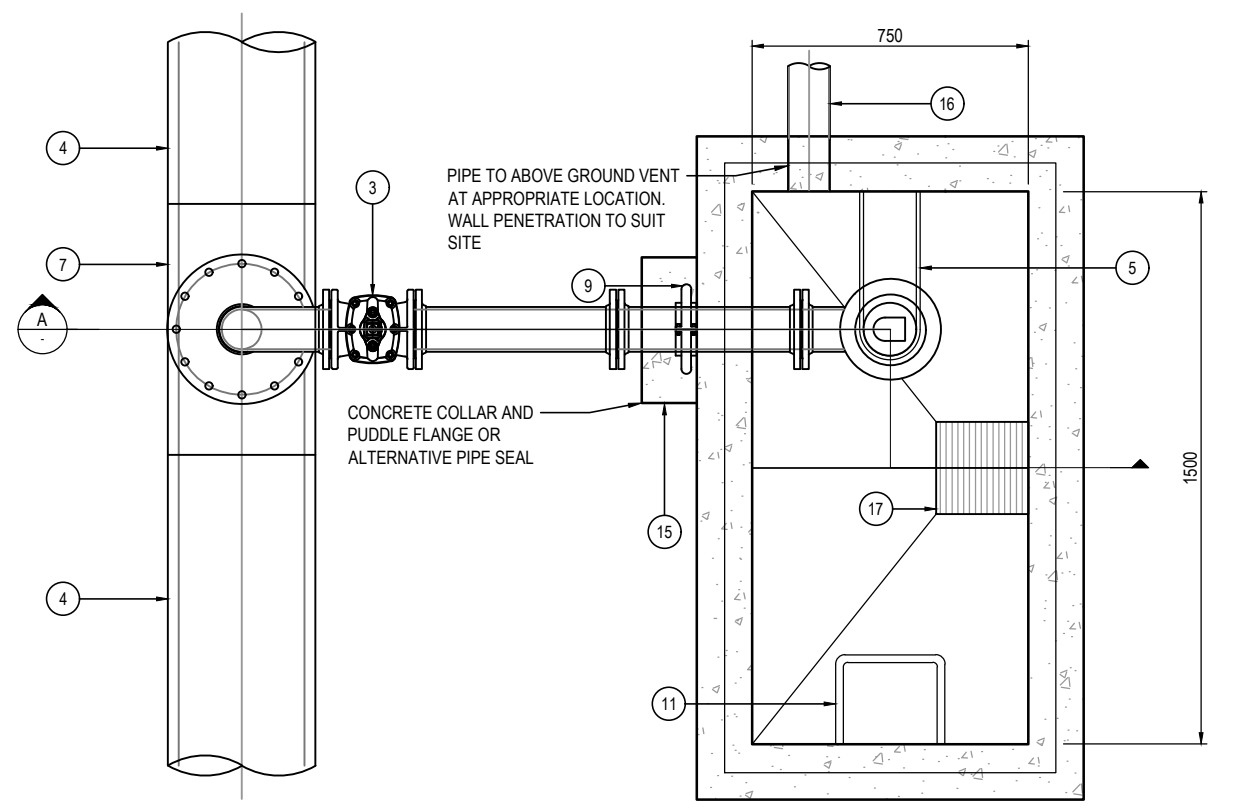
**NOTES:**

- ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
- MARKER POSTS OR BLOCKS ARE TO BE LOCATED AT ALL FITTING LOCATIONS, INCLUDING:
  - A. VALVES
  - B. FLUSHING POINTS; AND
  - C. AIR VALVES
- MARKER BLOCKS ARE TO BE USED FOR FITTINGS ADJACENT TO SEALED ROADWAYS.
- MARKER POSTS ARE TO BE USED FOR FITTINGS ADJACENT TO UNSEALED ROADWAYS.
- WARNING SIGNS ARE TO BE ATTACHED TO ALL POSTS USING SELF TAPPING STAINLESS STEEL SCREWS.
- WARNING SIGNS TO BE PROVIDED BY THE RELEVANT WATER AUTHORITY.
- TOP OF MARKER POST IS TO BE CUT OFF SQUARE IF NOT BEING USED AS A VALVE INDICATOR POST.
- MARKER POSTS TO BE MADE OF RECYCLED PLASTIC, COLOURED GREEN.
- MARKER BLOCKS ARE TO BE MANUFACTURED IN CONCRETE, WITH THE TOP COLOURED ORANGE AND CREAM COLOURED WRITING.

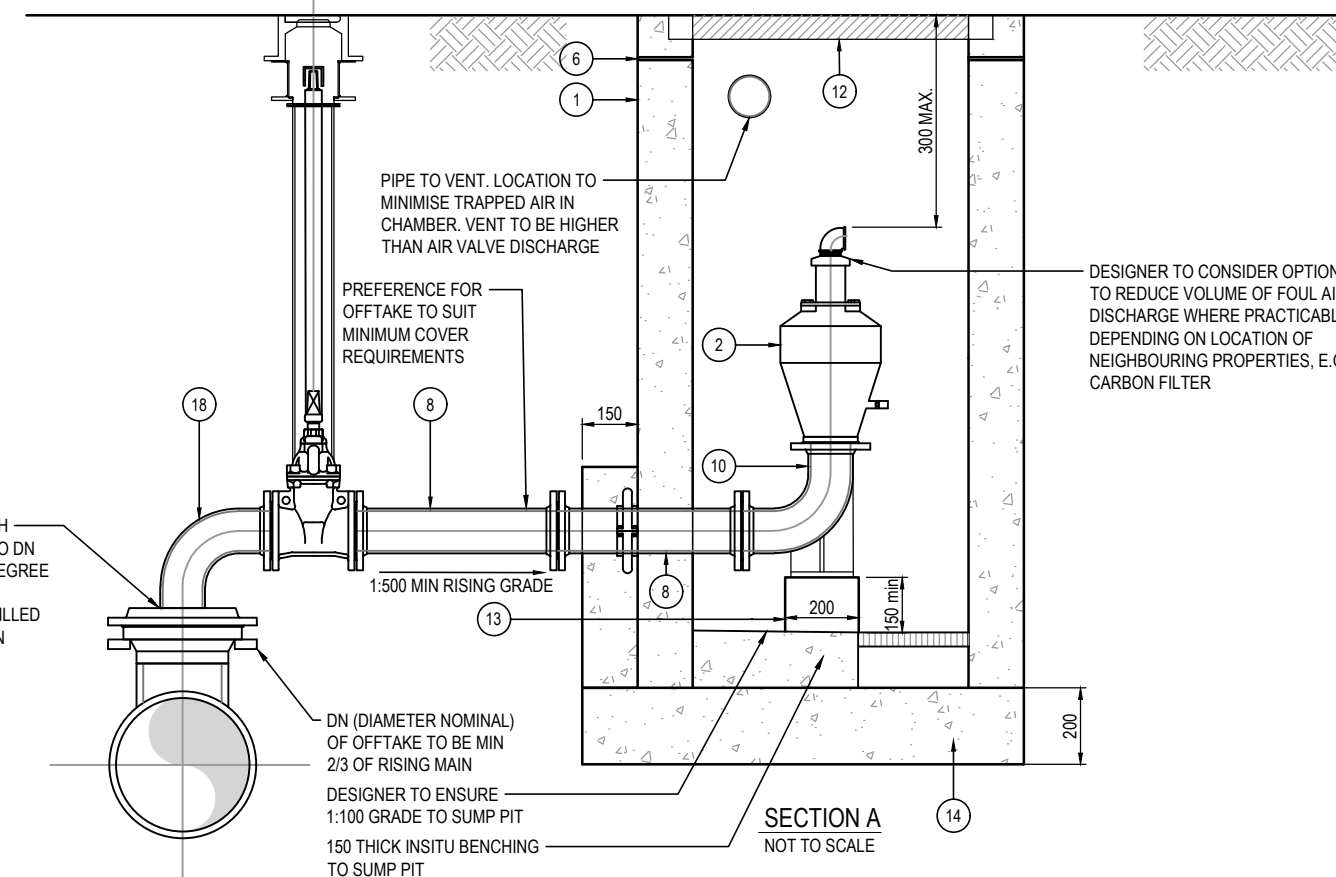
CAD FILE NAME: P:\6586260\1-WP\0-CADDERS SUPPLEMENT DRAWINGS.DWG

				DESIGNED: MS DATE: 14.02.24	GWW PROJECT NO. SO381		GWW REGION <b>MARKER POSTS AND MARKER BLOCKS</b> GWW SPS SUPPLEMENT		DISCIPLINE: CIVIL		
				DRAWN: HB DATE: 14.02.24	MELWAY REF:				FACILITY NUMBER: -	SCALE: NTS	A1
				CHECKED: PA DATE: 14.02.24	AUTHORISED: IH DATE: 14.02.24				6586260-SPS-C-004		P3
REV	DESCRIPTION	DATE	APPROVED	DATE: 14.02.24	DATE: 14.02.24				DRAWING NUMBER:		REV:





TYPICAL OFFSET AIR VALVE AND PIT DETAIL  
NOT TO SCALE



SECTION A  
NOT TO SCALE

**NOTES:**

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. MINIMUM PRESSURE RATING FOR ALL PIPEWORK AND FITTINGS TO BE THE GREATER OF PN16 OR THE PN RATING OF THE SEWER RISING MAIN.
3. ALL DI PIPEWORK AND FITTINGS SHALL BE EPOXY COATED OR AN APPROVED EQUIVALENT.
4. AIR VALVES ARE NOT TO BE LOCATED IN TRAFFICABLE AREAS.
5. ALL BACKING RINGS, NUTS, BOLTS AND WASHERS TO BE A MINIMUM GRADE 316 STAINLESS STEEL. COAT THE THREADED SECTIONS OF ALL STAINLESS STEEL BOLTS WITH AN ANTI-SEIZE LUBRICANT.
6. GASKET MATERIAL TO COMPLY WITH AS/NZS 4087 AND IN ACCORDANCE WITH WSA 109.
7. LOCATE GROUND VENT ADJACENT TO PROPERTY BOUNDARY.
8. PLACE SCREENING BUSHES AROUND GROUND VENT WHERE APPROPRIATE.
9. CONTRACTOR TO INSTALL EDUCT VENT IN ACCORDANCE WITH WSA DRAWING SEW-1408 (WHERE REQUIRED).
10. FUSION JOINTING OF PE FLANGE ADAPTER TO REDUCER SHALL BE MADE BY BUTT WELDING ONLY.
11. ALL CONCRETE TO BE SULPHATE RESISTANT AND/OR ALL INTERNAL SURFACES TO BE EPOXY COATED.
12. PROVIDE APPROVED LIFTING POINTS TO TOP OF SLAB IF PRECAST
13. THESE DRAWINGS ARE ONLY SUITABLE FOR AN INTERNAL DEPTH OF CHAMBER NOT EXCEEDING 1500.
14. THE DESIGNER IS TO UNDERTAKE A SAFETY IN DESIGN REVIEW AND MANAGE RISKS ACCORDINGLY.
15. WHERE REASONABLY PRACTICABLE, THE DESIGNER IS TO AVOID PLACEMENT OF AIR VALVES ADJACENT TO EXISTING PROPERTIES. ODOUR RELEASE WILL NEED TO CONSIDER MITIGATION SUCH AS FILTERS TO ELIMINATE THE RISK OF COMPLAINTS.

TYPICAL FITTING SCHEDULE

ITEM No.	ITEM DESCRIPTION
1	GREATER WESTERN WATER APPROVED RECTANGULAR PIT
2	AIR VALVE COMPLIANT WITH WSA PS-275 AIR VALVES FOR PRESSURE APPLICATIONS - SEWERAGE
3	VALVE AS PER WSA PS-278 GATE VALVES, RESILIENT SEATED, WITH INTEGRAL POLYETHYLENE (PS) ENDS FOR PRESSURE APPLICATIONS - WATER SUPPLY AND SEWERAGE
4	SEWER RISING MAIN
5	STAINLESS STEEL BRACING
6	10 THICK BITUMISED STRIP
7	PE TEE
8	DIEL/PE PIPE (LENGTH TO SUIT). SUITABILITY OF PIPE MATERIAL TO BE NOMINATED BY THE DESIGNER, DEPENDING ON DIFFERENTIAL SETTLEMENT RISK AND PIPE TOLERANCE
9	PUDDLE FLANGE
10	FLANGED DIEL DUCKFOOT BEND
11	STEP IRONS, REFER GWW APPROVED PRODUCTS CATALOGUE
12	750x750 TWO PART SQUARE MANHOLE COVER WSA PS-290 DUCTILE IRON ACCESS COVERS AND FRAMES FOR WATER SUPPLY AND SEWERAGE TO WSA 132
13	CONCRETE PIPE SUPPORT
14	CONCRETE BASE
15	CONCRETE COLLAR CONNECTED VIA REBAR WITH HYDROPHILIC STRIP
16	DN100 PVC TO VENT (LENGTH AND LOCATION TO BE DETERMINED ON SITE)
17	SUMP PIT AT APPROPRIATE LOCATION
18	DIEL FLANGED 90 DEGREE BEND

NOTE:  
ALL PIPE AND FITTINGS MUST BE APPROVED FOR USE. REFER TO THE MRWA WEB PORTAL.  
DETAILS ARE SHOWN FROM A DN100 SEWER.

CAD FILE NAME: P:\6586260\1-WP\0-CADDERS\ SUPPLEMENT DRAWINGS.DWG

DESIGNED: MS	GWW PROJECT NO. SO381
DATE: 14.02.24	
DRAWN: HB	MELWAY REF:
DATE: 14.02.24	
CHECKED: PA	AUTHORISED: IH
DATE: 14.02.24	DATE: 14.02.24



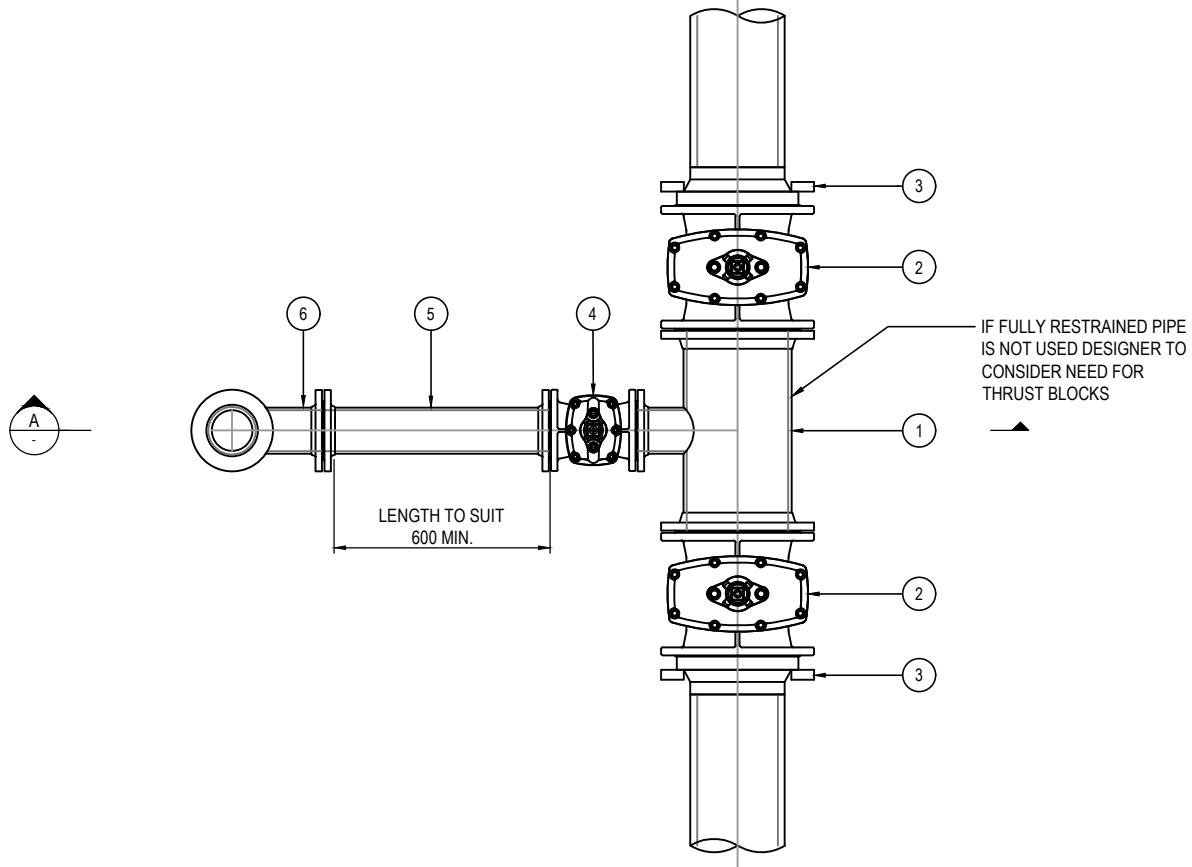
GWW REGION  
OFFSET AIR VALVE INSTALLATION  
GWW SPS SUPPLEMENT

DISCIPLINE: CIVIL	
FACILITY NUMBER:	SCALE: NTS
6586260-SPS-C-005	A1
DRAWING NUMBER:	REV:
	P3

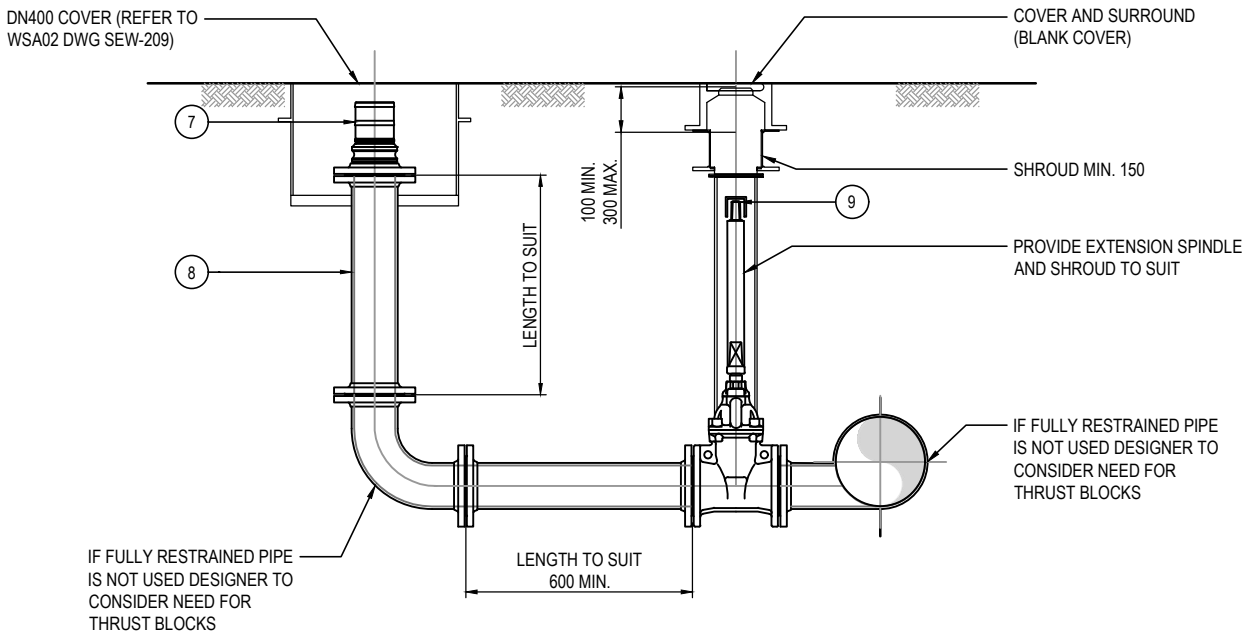
- NOTES:**
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
  2. REFER TO MRWA WEB PORTAL FOR APPROVED PIPES AND FITTINGS.
  3. MINIMUM PRESSURE FOR ALL PIPEWORK AND FITTINGS IS TO BE THE GREATER OF EITHER PN16 OR THE PN RATING OF THE SEWER MAIN.
  4. THIS DRAWING IS BASED ON MRWA PRESSURE SEWER CODE DRAWING PSS-1016-M. THE DESIGNER MUST REVIEW THE SAFETY OF THE DESIGN AND MANAGE THESE RISKS ACCORDINGLY BASED ON THE CONSIDERATIONS OF EACH PROJECT.

TYPICAL FITTING SCHEDULE	
ITEM No.	ITEM DESCRIPTION
1	DIEL/PE FL-FL-FL SCOUR TEE (DN100 SCOUR OFFTAKE)
2	DIEL FL-FL SLUICE VALVE
3	FULL FACE PE STUB FLANGE WITH STEEL BACKING RING
4	MINIMUM DN100 DIEL FL-FL SLUICE VALVE
5	MINIMUM DN100 DIEL/PE FL-FL PIPE
6	MINIMUM DN100 DIEL/PE FL-FL 90° BEND
7	MINIMUM DN100 CAMLOCK OR BAUER WITH CAP TO SUIT (STANDARD FITTING). BAUER TO BE PROVIDED WITHIN THE SPS SITE, OTHERWISE CAMLOCK TO BE PROVIDED
8	MINIMUM DN100 DIEL FL-FL RISER PIPE
9	DN32 TAPERED KEY CAP

**NOTE:**  
NO DIRECT BURIED MECHANICAL COUPLINGS OR DISMANTLING JOINTS.



**SCOUR VALVE DETAIL**  
NOT TO SCALE



**SECTION A**  
NOT TO SCALE

CAD FILE NAME: P:\6586260\1-WP\0-CADDERS SUPPLEMENT DRAWINGS.DWG

				DESIGNED: MS DATE: 14.02.24	GWW PROJECT NO. SO381
P3	RE-ISSUED FOR USE	07/03/2024	IH	DRAWN: HB DATE: 14.02.24	MELWAY REF:
P2	ISSUED FOR USE	14/02/2024	IH	CHECKED: PA DATE: 14.02.24	AUTHORISED: IH DATE: 14.02.24
P1	ISSUED FOR REVIEW	21/12/2023	IH		
REV	DESCRIPTION	DATE	APPROVED		

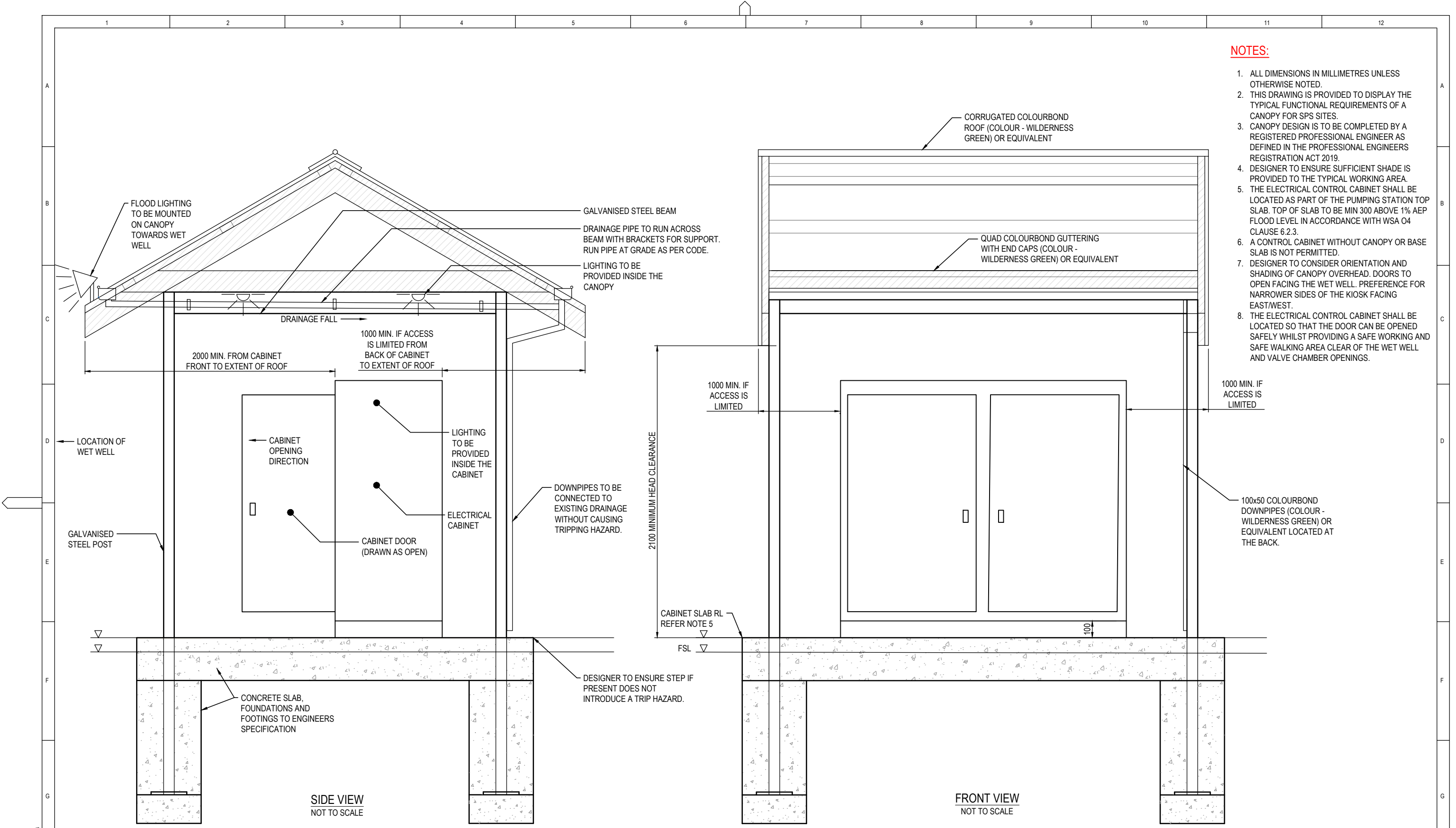


GWW REGION  
**TYPICAL SCOUR VALVE DETAIL**  
GWW SPS SUPPLEMENT

DISCIPLINE: CIVIL		
FACILITY NUMBER:	SCALE: NTS	A1
6586260-SPS-C-006		P3
DRAWING NUMBER:		REV:

**NOTES:**

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. THIS DRAWING IS PROVIDED TO DISPLAY THE TYPICAL FUNCTIONAL REQUIREMENTS OF A CANOPY FOR SPS SITES.
3. CANOPY DESIGN IS TO BE COMPLETED BY A REGISTERED PROFESSIONAL ENGINEER AS DEFINED IN THE PROFESSIONAL ENGINEERS REGISTRATION ACT 2019.
4. DESIGNER TO ENSURE SUFFICIENT SHADE IS PROVIDED TO THE TYPICAL WORKING AREA.
5. THE ELECTRICAL CONTROL CABINET SHALL BE LOCATED AS PART OF THE PUMPING STATION TOP SLAB. TOP OF SLAB TO BE MIN 300 ABOVE 1% AEP FLOOD LEVEL IN ACCORDANCE WITH WSA O4 CLAUSE 6.2.3.
6. A CONTROL CABINET WITHOUT CANOPY OR BASE SLAB IS NOT PERMITTED.
7. DESIGNER TO CONSIDER ORIENTATION AND SHADING OF CANOPY OVERHEAD. DOORS TO OPEN FACING THE WET WELL. PREFERENCE FOR NARROWER SIDES OF THE KIOSK FACING EAST/WEST.
8. THE ELECTRICAL CONTROL CABINET SHALL BE LOCATED SO THAT THE DOOR CAN BE OPENED SAFELY WHILST PROVIDING A SAFE WORKING AND SAFE WALKING AREA CLEAR OF THE WET WELL AND VALVE CHAMBER OPENINGS.



**SIDE VIEW**  
NOT TO SCALE

**FRONT VIEW**  
NOT TO SCALE

CAD FILE NAME: P:\6586260-SPS-CAD\SPS SUPPLEMENT DRAWINGS.DWG

				DESIGNED: MS	GWW PROJECT NO. SO381
				DATE: 14.02.24	
P3	RE-ISSUED FOR USE	07/03/2024	IH	DRAWN: HB	MELWAY REF:
P2	ISSUED FOR USE	14/02/2024	IH	DATE: 14.02.24	
P1	ISSUED FOR REVIEW	21/12/2023	IH	CHECKED: PA	AUTHORISED: IH
REV	DESCRIPTION	DATE	APPROVED	DATE: 14.02.24	DATE: 14.02.24

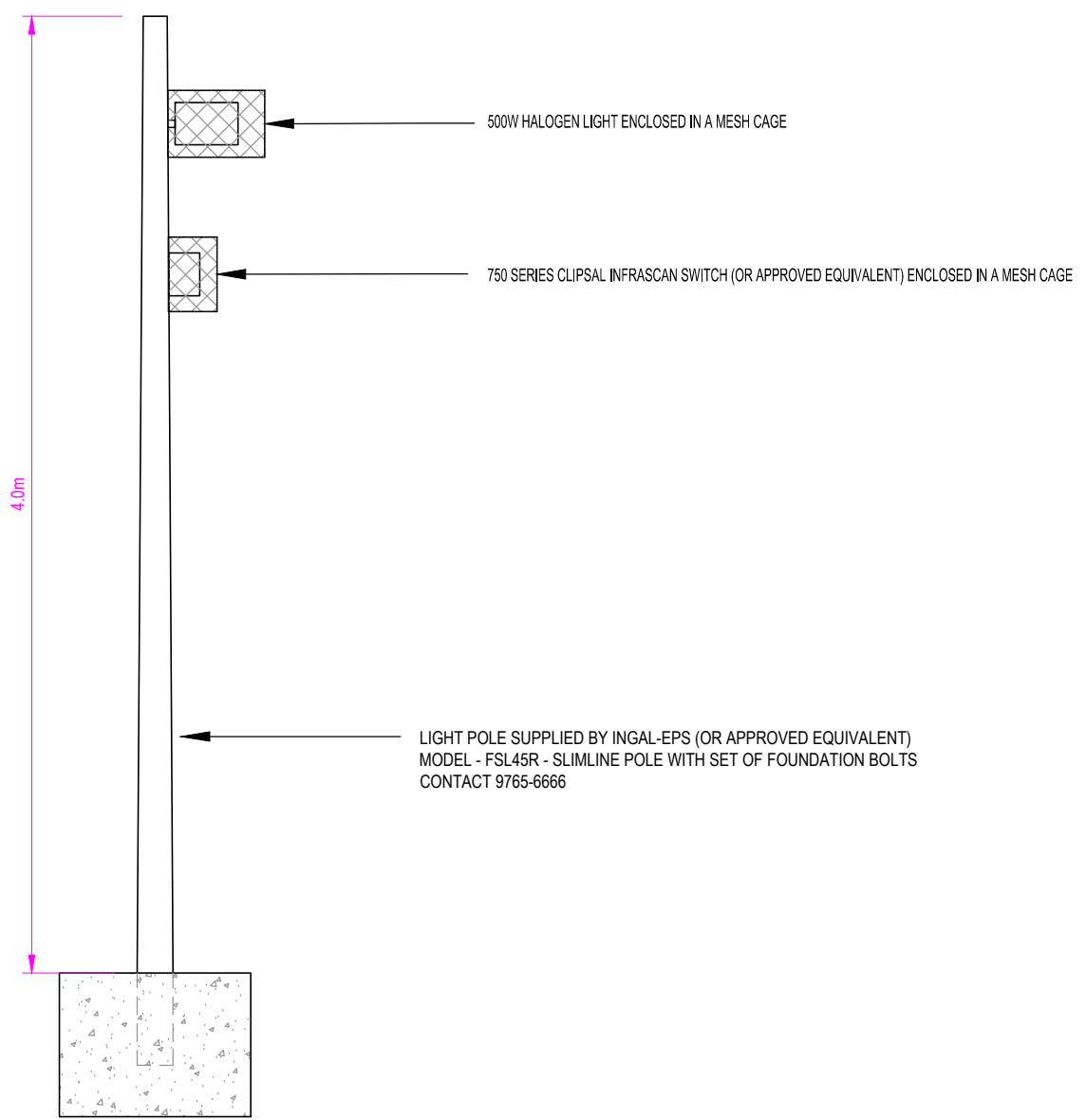


GWW REGION  
**TYPICAL CANOPY DETAILS**  
GWW SPS SUPPLEMENT

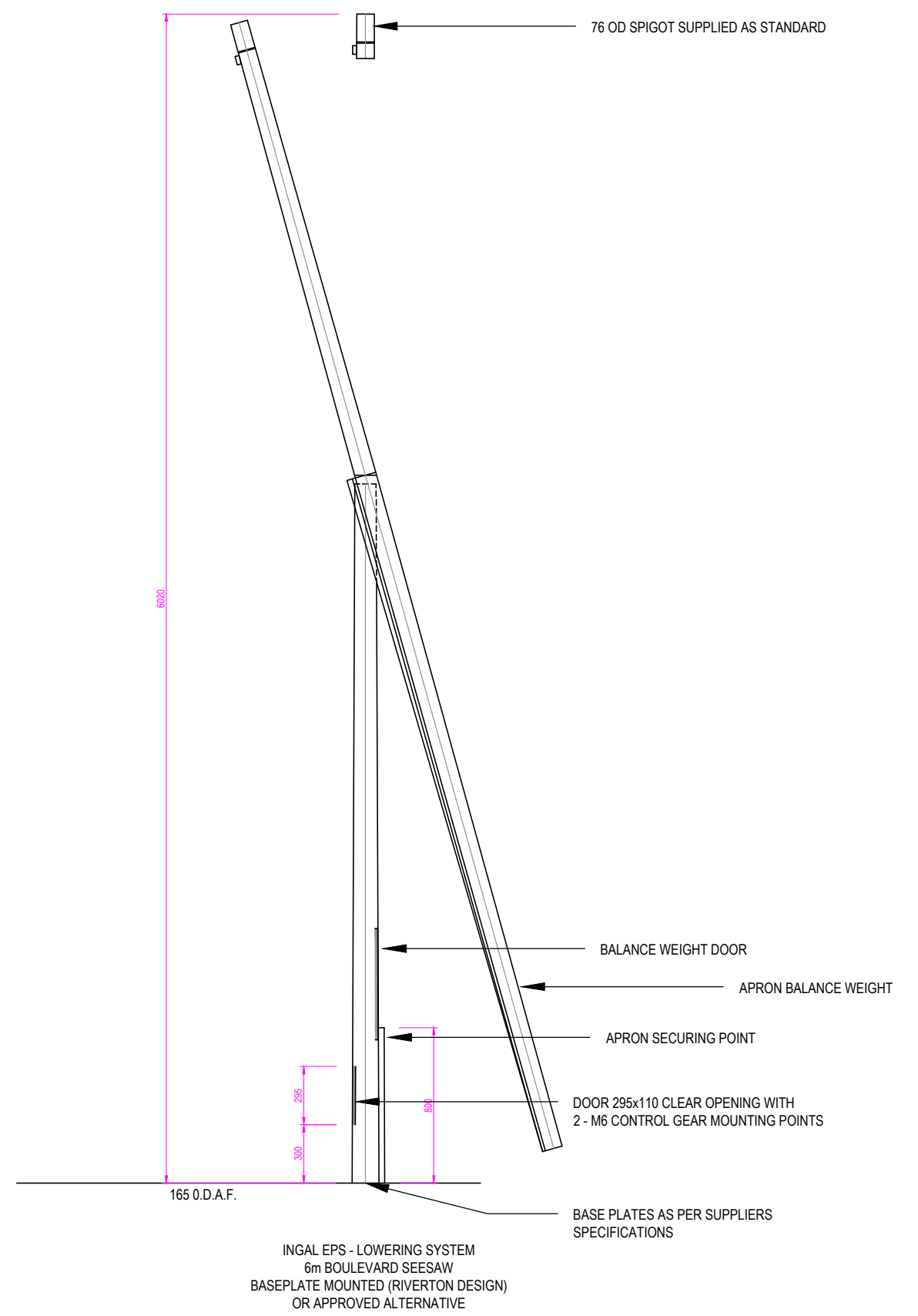
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6586260-SPS-C-007		P3
DRAWING NUMBER:		REV:

CAD FILE NAME: C:\USER\STOLENT1\GREATER WESTERN WATERIS - STANDARDS - CAD\STANDARD DRAWINGS\GWW SPS\SPS-TYP-012-R1.DWG

**LIGHT POLE - SLIMLINE**  
NOT TO SCALE



**LIGHT POLE - PIVOT TYPE**  
NOT TO SCALE



DESIGNED: R. Samarawickrama DATE:	GWW PROJ. NO.
DRAWN: D. TOLENTINO DATE:	MELWAY REF:
CHECKED:	AUTHORISED:
DATE:	DATE:

**DISCLAIMER:**  
THIS DRAWING SHALL ONLY BE USED FOR GUIDANCE PURPOSES ONLY.  
CITY WEST WATER IS NOT RESPONSIBLE FOR THE RESULT OF ANY  
ACTIONS TAKEN ON THE BASIS OF INFORMATION WITHIN THIS DRAWING,  
NOR ANY ERRORS OR OMISSIONS.



GWW STANDARD DRAWING  
SEWERAGE PUMPING STATION  
TYPICAL DRAWING  
LIGHT POLE DETAIL

DISCIPLINE: CIVIL		
FACILITY NUMBER: -	SCALE: NTS	A3
SPS-TYP-012		1
DRAWING NUMBER:		REV:

## **GWW ADDENDUM 3 – ELECTRICAL, INSTRUMENTATION AND CONTROLS SPARE PARTS**

Make and model of the following spares must be as per GWW requirements.

The GWW Electrical, Instrumentation and Controls preferred equipment list (PEL) is a live document, access to the link below is only available to internal GWW staff. For external users, a copy of the latest version of the preferred equipment list can be obtained by contacting your Greater Western Water project manager or email [standards@gww.com.au](mailto:standards@gww.com.au).

[GWW Electrical, Instrumentation and Controls-Parts Equipment List.xlsx](#)

<b>Quantity</b>	<b>Requirements</b>
1	Soft starter or VSD
1	Pump controller
1	Complete RTU with back plane, power supply and I/O cards (RTU/PLC)
1	Radio unit
1	GSM modem
2	Hydrostatic level sensor
1	Loop isolator
1	LCD indicator for level signal
1	Power supply/battery charger
2	Indicator lamps with globes
1	Submersible pump identical to units installed for each well.
1	Autodialler 700 series – Include power pack 15 V & Surge Arrestor
1	HMI
2	Floats – Hi/Low floats
1	Failsafe float
1	Air valves specific to that type of RM
2	Spare Terminals for 12v fused supplies from 12v battery system.

## DOCUMENT INFORMATION

The following documented information generated by this procedure will be in accordance with GWW records and documentation processes.

Document / Record	Location	Security / retention requirements
IGD1007583	Watershed/The Current	Permissions and security are maintained through SharePoint permissions and application settings

## REVIEW PROCESS

The document will be reviewed as required. Revisions are signed off (endorsed) by the Team Leader Infrastructure Quality.

**Approved by: Nick Rhoden, Team Leader, Infrastructure Quality (V01.1)**

## VERSION TABLE

Version Number	Document Owner's Position Title	Purpose/Change	Date
V01	Tarek Kabbani – Lead Engineer	Supplementary Manual to the WSAA Sewage Pumping Station Code of Australia (WSA 04-2022:3.1)	07/03/2024
V01.1	Tarek Kabbani – Lead Engineer	Supplementary Manual to the WSAA Sewage Pumping Station Code of Australia (WSA 04-2022:3.1)	16/05/2024