Needs Specification – <Concept / IFC / WAC>

<STS Area> WASTEWATER SYSTEM

Sewage Pumping Station SP<Asset No.>

<Location, Suburb>

<Council >

You can change this image by entering the header area, right-clicking on the image and selecting Change Picture. It can then be scaled accordingly to fit the space. This text will not print or be visible when saving as a PDF.

Guidance Notes:

For guidance notes, please select the show / hide function (Ctrl + shift + \*).

Please note that the instructional guidance notes throughout this template will not be printed.

#Instructional Key:

Black text (normal text): refrain from editing.

# Blue (guidance notes - hidden): Instructional text #

Green text (normal text): Suggested SWC wording based on a simple wet well submersible SPS, to be edited to be relevant for the SPS facility, project or contract type.

Red text (normal text): < Input specific information relating to the facility or project >

*Red italic: # Examples # cut and pasted from an example Needs Specification, to be edited or replaced with text relevant for the facility or project* #

#Use of Template:

This template is to be used for sewage pumping stations only. This template has primarily been written for wet well type SPSs, the wording can be modified for a dry well SPS. When issuing the final document, save the document as a pdf; the guidance notes written throughout this template will not be visible when saved as a pdf.#

The template is general in nature and not specific to a particular contract type, and therefore various sections (specifically regarding scope, investigations and specifications) need to be reviewed and amended with respect to other contract documentation to avoid duplication or ambiguity.

# Needs Specification Purpose:

A separate Needs Specification Guide and Q&As is provided which expands on the summary below in further detail and presents ‘process flow’ for Needs Specification development.

The first version of the Needs Specification should be published before the concept design is commenced (prior to OABC). During the concept design and investigations during the concept phase, the Needs Specification will be updated based on the additional information available and re-issued. Typically, the following attachments are provided:

* Location Plan
* Network catchment diagram
* Site plan
* General arrangement plan and section
* Rising main alignment (with long section if available)
* System curves and duty point
* Flow / EP calculation

The Needs Specification should identify the unique or specific aspects of the subject facility, rather than ‘standard’ requirements which are addressed in technical specifications, codes and standards

The Needs Specification is not intended to be a ‘catch-all’ specification and should refrain from duplicating specific specification clauses, copying or paraphrasing from Technical Specification, Standards or Contract Clauses. The Needs Specification should be read in conjunction with the full suite of technical specifications and standards

The Needs Specification is not a Concept Design Report, and the focus is on the specific function and objective of the facility, rather than how the specific function and arrangement of the facility was adopted or the background story of the facility's development.

Any approved and specific deviations to the Codes and Specifications to be applied to the facility should be highlighted within this document and attached to the Needs Specification.

If it is required to apply a higher specification than a Sydney Water specification requirement then this higher standard should be provided within the Needs Specification.

Subsequent versions of the Needs Specification are typically published as WAC for future reference by Sydney Water for use during operations or planning#

Revision Details

#This section details all individual changes made to a revision of the document including the author and verifier of the original document or revisions #

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| Revision No. | Description of Revision | Author | Verifier |
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| Signature |  |
| Date |  |

Abbreviations

#Delete abbreviations which are not required or add and amend below accordingly#

|  |  |
| --- | --- |
| ABS | Acrylonitrile Butadiene Styrene |
| ACA | Australian Communications Authority |
| ADWF | Average Dry Weather Flow |
| AEP | Annual Exceedance Probability (flood level) |
| AHD | Australian Height Datum |
| AMG | Australian Map Grid |
| AS | Australian Standard |
| AS/NZS | Australian New Zealand Standard |
| ATWL | Above Top Water Level |
| BEP | Best Efficiency Point |
| BS | British Standard |
| CEMP | Construction Environmental Management Plan |
| d | Internal Diameter |
| D | Outside Diameter |
| DI | Ductile Iron |
| DICAL | Ductile Iron Calcium Aluminate (cement) Lined |
| DICL | Ductile Iron Cement Lined |
| DIFB | Ductile Iron Fusion Bonded |
| DIN | Deutsches Institut für Normung (German Institute for Standardization) |
| DN | Nominal Diameter |
| DOL | Direct On Line |
| EIA | Environmental Impact Assessment |
| EIS | Environmental Impact Statement |
| EN | European Standard |
| EP | Equivalent Population |
| EPA | Environmental Protection Authority |
| EPL | Environmental Protection License |
| EMP | Environmental Management Plan |
| ERS | Emergency Relief Structure |
| ESS | Emergency Storage Structure |
| f | Friction Coefficient |
| FAT | Factory Acceptance Test |
| FMECA | Failure Mode, Effects and Criticality Analysis |
| FRP | Fibre Reinforced Plastic |
| FSL | Finished Surface Level |
| GDA | Geocentric Datum of Australia |
| GPO | General Purpose Outlet |
| GRP | Glass Reinforced Plastic |
| H | Total Mean Head for Pumping Station |
| Hf | Friction Head Loss in Pumping Station Pipework and Fittings |
| Hp | Friction Head Loss in Pressure Main |
| Hs | Mean Static Head |
| HIDRA | Hazard Identification & Risk Assessment |
| HGL | Hydraulic Grade Line |
| H2S | Hydrogen Sulphide |
| HV | High Voltage |
| IEC | International Electrotechnical Commission |
| IFC | Issued for Construction |
| IICATS | Integrated Instrumentation Control and Telemetry System |
| IMH | Inlet Maintenance Hole |
| IP | Ingress Protection |
| I/O | Input / Output |
| ITP | Inspection and Test Plan |
| kf | Sum of the head loss coefficients for a pumping station’s suction and delivery pipework, fittings and valves |
| LP | length of pressure main |
| LV | Low Voltage |
| MAOP | Maximum Allowable Operating Pressure |
| MCPR | Maximum Cyclic Pressure Range |
| NATA | National Association of Testing Authorities |
| NPSHa | Net Positive Suction Head Available |
| NPSHr | Net Positive Suction Head Required |
| OH&S | Occupational Health and Safety |
| O&M | Operations and Maintenance |
| PDWF | Peak Dry Weather Flow |
| PE | Polyethylene |
| P&ID | Process and Instrumentation Diagram |
| PIPA | Plastics Industry Pipe Association of Australia Limited |
| PLC | Programmable Logic Controller |
| PN | Nominal Pressure Class |
| PSAT | Pre-Site Acceptance Test |
| PVC | Polyvinylchloride |
| PVC–M | Polyvinylchloride Modified |
| PVC–O | Polyvinylchloride Oriented |
| PVC–U | Polyvinylchloride Unplasticised |
| Qp | Pumping Rate |
| RCD | Residual Current Devices |
| REF | Review of Environmental Factors |
| RL | Reduced Level |
| RPZD | Reduced Pressure Zone Device |
| RTD | Resistance Thermistor Device |
| RTU | Remote Telemetry Unit |
| SAT | Site Acceptance Tests |
| SCA | Switchgear and Control Assembly |
| SCADA | Supervisory Control and Automated Data Acquisition |
| SPS | Sewage Pumping Station |
| SWL | Safe Working Load |
| TRT | Telstra Remote Product Telemetry |
| VS | Wet-Well Storage Volume |
| VSD | Variable Speed Drive |
| WAC | Work As Constructed |
| WSAA | Water Services Association of Australia |
| WCL | Wier Crest Level (emergency relief) |

Table of contents

A. GENERAL DESCRIPTION 12

B. PURPOSE AND FUNCTION 13

C. SPECIFICATIONS, STANDARDS AND RELEVANT FILES 14

D. LOCATION 15

E. LAND ACQUISITION 16

F. SUBMISSION TO LOCAL COUNCIL 17

G. DESCRIPTION 18

H. SUBMISSION TO SUBSIDENCE ADVISORY NSW 23

I. PRESSURE MAIN AND RECEIVING ASSET 24

J. PUMP STATION CAPACITY 26

K. CRITICAL DIMENSIONS AND PARAMETERS 28

L. PUMP AND PIPEWORK ARRANGEMENT 30

M. WET WELL 32

N. VENTILATION, ODOUR AND SEPTICITY CONTROL 33

O. VALVE CHAMBER 35

P. INLET MAINTENANCE HOLE & EMERGENCY RELIEF SYSTEM 36

Q. EMERGENCY STORAGE 37

R. TELEMETRY 38

S. ELECTRICAL AND CONTROL 39

T. ACCESS TO STATION, SIGNAGE & PERIMETER FENCE 42

U. WATER SUPPLY 43

V. ENVIRONMENTAL IMPACT 44

W. LANDSCAPING 45

X. INVESTIGATIONS 46

Y. ALTERNATIVE CONCEPTS 47

Z. DRAWINGS 48

Figures

**No table of figures entries found.**

Tables

**No table of figures entries found.**

# GENERAL DESCRIPTION

#‘General Description’ provides an introduction to the facility, the high level scope (new pump station, pump station upgrade) and arrangement of the facility within the network.#

<Asset No.> will be <constructed> <upgraded> <improved> as part of the <insert development location here> and will ultimately service ## residential / commercial / industrial lots by gravity.

#If the station receives pumped flows from another location, include the following:

<Asset No.> will also receive pumped flow of ## L/s from <upstream Asset Number>.

Otherwise, delete#.

The pumping station catchment is shown on the attached Figure no. <ASSET NO.>/C.

#If station is a wet well type add this note, otherwise modify for dry well type #

*The pumping station shall consist of an inground wet well, utilising* ## <variable/single> *speed submersible pumping units* (<## duty + one standby>), *valve chamber and inlet maintenance hole (IMH). An above ground* <building / kiosk> *shall be constructed to house electrical equipment.*

#If the pumping station requires an emergency storage include the following:

The station will require underground emergency storage of ##kL <within wet well> <within separate storage structure> to meet the current standards and NSW EPA dry and wet weather sewage treatment system licence requirements.

Otherwise delete#

#Outline if includes chemical dosing, odour control, generator or other significant ancillary items

The station will require <chemical dosing unit> <odour control unit> <permanent generator>

Otherwise delete#

Sewage is to be discharged via a <single/dual> <insert diameter and material> pressure main into <insert details of receiving system here >.

Overflow from the station shall discharge into <insert name of watercourse / stormwater channel> and eventually into the Class “X” waters of the <insert name of water body>.

#Include specific staging strategy if any, for example, provision for staging via future extension of manifold or sizing of wet well for additional pumps in the future. Otherwise delete.#

# Detail any additional information including where the pumping station fits into the sewer network, where the pumping station receives flow from, where the pressure main connects to the existing system and where the sewage ultimately ends up #

# PURPOSE AND FUNCTION

#‘Purpose and Function’ should explain the reason for a new or upgraded facility and specific objectives and drivers for the new asset or upgrade. A good starting point for the objective is the business case, but will likely need to expand on the description of objectives in the Needs Specification

This section also explains the purpose of the Needs Specification. #

The purpose (objective) of the <new pump station> <pump station upgrade> is to <increase capacity to service new development area / service growth> <address licence compliance or other environmental driver / safety improvement>

#add brief but concise statement that defines specific purpose and objective#

This Needs Specification sets out Sydney Water’s requirements for the design, construction and commissioning of <new> <upgraded> sewage pumping station, its pressure main and other associated infrastructure and ancillary works (such as chemical dosing unit, odour control unit, power supplies, water supply etc.). The Needs specification provides but is not limited to:

* Defining critical parameters, basis of design and acceptance criteria
* Identifies needs and requirements
* Any future requirements or provisions for future requirements,
* Identify acquisition, environmental and external stakeholder / customer interfaces and requirements
* Specific or unique features and requirements, scope, constraints or special considerations such as land contamination or geotechnical considerations where relevant

The sewage pump station shall be designed to meet the NSW EPA sewage treatment system license (STS) requirements of:

* No dry weather overflows from the station;
* No offensive odour emissions from the station; and
* Limiting the frequency of wet weather overflow events (no more than ## events in 10 years) from the sewerage system.

#Insert additional and specific drivers and objectives#

# SPECIFICATIONS, STANDARDS

#The Needs Specification intends to identify the unique aspects of a facility, and shouldn’t duplicate or paraphrase the Specifications or Standards.

Relevant specifications, procedures and policies are found within the Sydney Water Management Specification or other individual specifications as applicable are typically referenced within the contract scope (ECC scope for NEC4) hence individual specifications need not be listed separately within the Needs Specification where NEC4 contract (for example) is adopted.

Subject to the type of contract being used and upon confirming with Sydney Water Contracts, if Specifications are not addressed by the main contract documents, then the below could be expanded with specific applicable Technical Specifications and current version.#

The facility shall meet the design requirements set out herein, and:

* Sydney Water Specifications (including WSAA Codes and Sydney Water Supplements)
* Sydney Water edition of the WSAA Sewage Pumping Station Code of Australia WSA 04 and Sewage Code of Australia WSA 02.
* NSW EPA sewage treatment system license
* EPA’s policy Technical framework - assessment and management of odour from stationary sources in NSW.

# RELEVANT FILES

#‘Relevant Files’ historically listed the hardcopy file reference, e.g. “S0639 PS.02” rather than filename of electronic documents or attachments to the Needs Specification, but electronic files can also be referenced. Reference information already referenced or attached to the main contract or ECC scope (for NEC4) need not be duplicated in this section of the Needs Specification so consideration should be given to what reference files will be of use during operations and asset planning in future.

Below can be deleted and the section ‘Not Used’ if not applicable#

**Relevant files:**

|  |  |
| --- | --- |
| File Number | Description |
| <xxxxx> | <xxxxx> |
| <xxxxx> | <xxxxx> |

# LOCATION

<Asset No.> shall be located within Lot ## in DP######, off <insert access road and suburb> as shown on the attached Figure no. <Asset No.>/B. The Google Maps street reference is <insert address and / or nearest cross road>, the corresponding longitudinal and latitudinal coordinates are <insert coordinates>. Access to the station shall be via council roads and a sealed driveway.

The pressure main shall discharge at <insert location>. The pressure main route shall be via <insert road(s)> as shown on Figure no. <Asset No.>/B.

#If temporary access is required, provide additional information including off what existing road, how the temporary access will be surfaced (e.g. sealed, concrete, etc) and the expected timing for permanent access. #

# LAND ACQUISITION

# If land acquisition is required, include the following. Where easements are required, confirm the roles and responsibilities:#

The site for <Asset No.> is located within Lot ## in DP###### which is currently owned by <insert owners’ details>. Ownership of the station, the land on which the pumping station is constructed, all improvements and any easements shall be vested in Sydney Water prior to commissioning.

The route of the pressure main shall be via public roads and within easements for sewage to be created over private land, public reserves, crown land etc.

Where vent lines and educt vent shafts for the pressure main are located within private property an easement will be required over these assets and coordination with Sydney Water and / or other authorities.

Where required, easements shall also be acquired for access and services such as power, water and communications.

< Input any further specific information relating to your project >

A contaminated land assessment shall be undertaken, and approval to use the site shall be obtained from Sydney Water before any design or works commence.

Otherwise delete #

*# Example: The site for SP1173 is located within Lot 7 in DP 1206952. Ownership of the SPS site, all improvements and any easements shall be vested in Sydney Water on commissioning. Land acquisition is required for the SP1173 site. Lot 7 is currently owned by a private landowner.*

*Access to the pumping station site shall be via a new concrete access road off Schofields Road Upgrade initially and ultimately could be off Fermoy Road subject to future land acquisition. The access road will be within Sydney Water acquired land.*

*The Stage 1 pressure main shall be laid in private land (Lots 5 and 6 in DP1206952) at the SPS site and then within road reserves and private land (Lot3, DP1205982, Lot 6, DP193074, Lot 129 DP1205228 and Lot 51 DP1193199). The pressure main will require easements within these lots for provision of Stage 2 pressure main as well.*

*The Overflow main from SP1173 shall be laid in private land (Lots 8 and 9 in DP1206952) to Bells Creek. This main shall require an easement within these lots. #*

# If land acquisition is not required, include the following:

The site for <Asset No.> is located within Lot ## in DP###### which is owned by Sydney Water. All works are on Sydney Water land. No land acquisition is required for the upgrade of <Asset No.>.

Otherwise delete #

*# Example: The site for SP0564 is located within Lot 1 of DP 3496936 which is owned by Sydney Water. All works are on Sydney Water land. No land acquisition is required for the upgrade of SP0564. #*

# SUBMISSION TO LOCAL COUNCIL

#The Project Manager should consult with the Sydney Water Environmental Lead to confirm any specific or unique requirements. For example, recent changes to NSW regulation regarding identified wetlands and associated Council consultation and approval required for some circumstances #

The State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State.

Most sewage reticulation systems, pipelines and pumping stations can be approved by Sydney Water without obtaining development consent from the Local Council (clause 106(3B) of the ISEPP). Sydney Water must undertake its own environmental impact assessment for the project, referred to as a Review of Environmental Factors (REF).

As part of the REF process, and under the Infrastructure SEPP, Sydney Water must consult with local Council for matters which affect the Council, such as flooding, roads, stormwater, etc (Division 1, ISEPP).

#There are some exceptions where Sydney Water can’t determine an REF and would need Council or State Government approval, for example in some environmentally sensitive areas, such as wetlands.

The Environment and Heritage team coordinates the REF and any associated approvals, as well as the consultation with Council under the ISEPP. #

# DESCRIPTION

#The ‘Description’ identifies the scope of work for the delivery of the new or upgraded facility. The scope of works will vary for each new facility or upgrade and contract type used for the delivery of the SPS. Therefore the below section is a hypothetical example only and will need to be edited.

Scope of work addressed within the Sydney Water Management Specification or contract documents need not be duplicated, for example FMECA, preparation of EMP, work method statements, delivery programme, approvals, WTP, dilapidation survey, commissioning, O&M development of WAC drawings etc #

# Consider the contract documentation (and ECC scope where NEC4 adopted) to determine specific scope, investigations and level of detail to be included within the Needs Specification. #

The work shall include but is not limited to:

#Add, amend or remove from the follow list as required

1. Preparation of detailed design drawings to Sydney Water’s requirements
2. Surge analysis and investigation including water-hammer and fatigue analysis
3. Carry out all necessary geotechnical and contamination investigations
4. Background noise monitoring and testing as required
5. Undertake detailed ground survey of the site and pressure main alignment including services search and location of existing services
6. Condition assessment of existing and interfacing assets
7. Any other investigation or assessment as required to complete the works
8. Pre-selection of equipment (including pumps)
9. Undertake clearing and excavation of the site.
10. Construct an in-ground inlet maintenance hole, reinforced concrete wet well, valve chamber, <emergency storage structure> and associated infrastructure.
11. Construct a low-level inlet pipe from the inlet maintenance hole to the wet well with a stop valve and open tee drop tube in the wet well.
12. Construct a high level pipe from the inlet maintenance hole to the wet well with a flanged end in the inlet maintenance hole.
13. Construct connecting pipework between inlet maintenance hole and emergency storage structure.
14. Construct a gas check maintenance hole connecting to the inlet maintenance hole, including discharge pipes and a gas check.
15. Supply and installation of pump guide rails, and pipe brackets and other steelwork in the wet well.
16. Supply and installation of <insert number of pumps> new submersible pumping units and discharge pipework in the wet well.
17. Supply and install pump discharge non-return and isolating valves, pipes and fittings in the valve chamber.
18. Supply and install a pressure main isolating valve to enable two valve isolation of the pumping station.
19. Supply and install a pressure main scour valve and a scour line draining back to the wet well.
20. Supply and install an emergency bypass line with an isolating valve and an above ground emergency by-pass pump connection within a concrete bund area.
21. Supply and install flushing/stirring lines from valve chamber to wet well including stop and non-return valves, actuated control valves, pipes and fittings.
22. Supply and install covers and frames for access for pumps, personnel and instruments in the wet well, <emergency storage structure,> valve chamber, inlet maintenance hole and gas check maintenance hole.
23. Supply and installation of valve chamber and inlet maintenance hole access ladders.
24. Supply and construct a pressure main with associated appurtenances, including air release valves, educt vent shafts and scours.
25. Construct a new discharge maintenance hole at <location of discharge maintenance hole> and connect the pressure main to the receiving sewer.
26. Installation of an educt vent shaft off the discharge maintenance hole.
27. Corrosion protection of all the internal concrete surfaces of the discharge maintenance hole and two downstream maintenance holes as per WSA 201
28. Construct an <above ground electrical kiosk on a concrete plinth/electrical switchroom with a toilet>.
29. Supply and install electrical equipment, incorporating:

* Main distribution board with facility to receive power supply from the electricity distributor and an emergency generator.
* Motor starters, IICATS Remote Telemetry Unit (RTU) and associated controls.
* Emergency controller PLC independent of IICATS as backup to the RTU.

1. Arrange provision of communications with Sydney Water's Operational Technology Services (OTS) team.
2. Arrange with local electricity distributor for the supply of a power supply to the pumping station.
3. Supply and install power, control, instrumentation and communications cables, pits and conduits.
4. Supply and install electrical turrets adjacent to the wet well, <ESS> and IMH to facilitate installation of pumps and instruments;
5. Supply and install a radar level sensor in the wet well.
6. Supply and install a hydrostatic level sensor in the inlet maintenance hole.
7. Construction of <roads><retaining walls>

#Where the emergency storage is not part of the wet well, include:

1. <Supply and install a hydrostatic level sensor in the emergency storage structure.>

Otherwise, delete#

1. Supply and install <two/three> buoyancy level switches (one in the wet well, one in the inlet maintenance hole <and one in the emergency storage>). All buoyancy switches shall be supported from hooks
2. Supply and install a DN100 water service and installation of an DN80 spring type hydrant and a 25mm ball cock at the wet well.
3. Supply and install a DN50 reduced pressure zone (RPZ) backflow prevention valve on the water service.
4. Supply and install external lighting for approach and emergency work at night or under low light conditions.
5. Install induct vents in the wet well <and emergency storage structure, if provided>.
6. Install an educt vent shaft and high-level vent lines from the wet well, IMH <and emergency storage structure> to the vent shaft.

#Where a CDU is required, include :

1. Provide a chemical dosing unit (CDU) for septicity control of sewage in the pressure main as per Sydney Water CDU Standard Specification ACP0002.
2. Provide a suitably bunded, truck unloading area adjacent to the CDU with a drain from the bund to the inlet maintenance hole.
3. Supply and install two DN25 reduced pressure zone (RPZ) backflow prevention valves on the water service to the CDU.

Otherwise, delete#

1. Provide an all-weather sealed access road, minimum 4 metres wide, with kerb and gutter or concrete strip with associated road drainage to the public road suitable for a fully loaded semi-trailer tanker.
2. Splay the entry off the public road to provide safer entry/egress for vehicles that is suitable for a 19m semi-trailer to turn without wheel leaving sealed road.
3. Provide a minimum 8m wide level hard stand area next to the wet well and valve chamber and a truck turning area within the pumping station site.
4. Provide adequate stormwater drainage system at the site and access road to minimise erosion, stormwater/flooding impact on the site and damage to the access road.
5. Supply and install an easily accessible emergency generator connection panel on the outside of the <switch-room building or kiosk>, sized to operate the duty pump/s plus station controls and auxiliaries. Provide a suitable hard stand area next to the kiosk for an emergency generator.
6. Provide a security fence along the perimeter of the pumping station site. Provide a lockable gate for vehicle entry into the site and "No Parking" signs. Where the site is remote from the public road, provide a boom gate at the public road and a means of preventing unauthorised vehicular access to the access road; that is acceptable to Sydney Water.
7. Provide bollards, barriers and wheel stops where required to prevent vehicles accessing top of IMH, the wet well, valve chamber <and emergency storage structure>, rolling down embankments or damaging above ground structures.
8. Develop and provide the configuration documentation at the equipment (maintainable unit) level.
9. Provide pumping station signage and the street signage in accordance with Sydney Water Customer Delivery Facility Safety Signage Specification (SDIMS0026).
10. Install anchoring points in the concrete around the wet well, IMH <and ESS> openings for anchoring of fall arrester, harness and tripod. Anchor points shall be positioned on the hinge side of the access hatch. Exact number of and location of the anchor points to be nominated by Sydney Water.
11. Site restoration and landscaping, including filling to raise and level up the site.
12. Land and easement acquisition on behalf of Sydney Water. Documents for lodgement with Lands Title Office to be fully prepared and a copy submitted to Sydney Water by end of commissioning. Documents shall be lodged with LTO before Sydney Water takes over asset and site.

#Historically many Needs Specifications in the past have listed scope related to commissioning, MAXIMO, handover and completion documentation, similar to the example text below. However subject to the contract model and arrangement of contract documentation this can be deleted from the Needs Specification. These items are addressed within the Sydney Water Management Specification and Commissioning Specification - Transitioning Assets into Operation Specification.

*#Example*

1. *Provide expert personnel to commission the pumping station and associated infrastructure.*
2. *Prepare Pre-FAT, FAT, Pre-SAT and SAT Inspection and Test Plans and Commissioning Plans.*
3. *Prepare Work As Executed drawings and Operating and Maintenance Manuals.*
4. *Document in MAXIMO the configuration of each process and equipment (Maintainable Unit) detailing the attributes and specification of the maintainable unit. MAXIMO data to be entered directly into Sydney Water's MAXIMO data base as per Sydney Water's Assets Creation for New Assets Procedure (MEPR0064).*
5. *Labelling*
6. *Operational completion, practical completion and handover documentation #*

# SUBMISSION TO SUBSIDENCE ADVISORY NSW

#Only include this section if the pumping station is within a mine subsidence area, otherwise delete below. Where not used edit the heading above as ‘Submission to Subsidence Advisory NSW – NOT USED’ to maintain consistency with heading references for the rest of the Needs Specification#

The pumping station, pressure main and carriers are located within the <insert mine subsidence area here> Mine Subsidence Area and shall therefore be designed in accordance with the requirements of Subsidence Advisory NSW.

The detailed designs shall be submitted to Subsidence Advisory NSW for review and approval of measures aimed at mitigating potential impacts of mine subsidence. The submission shall be accompanied by documentation highlighting and explaining the mitigation measure adopted to protect all the assets within the influence zone of the mine subsidence district.

# PRESSURE MAIN AND RECEIVING ASSET

#‘Pressure Main and Receiving Asset’ and other sections below describe the basic requirements, e.g. pressure main from A-B location, or more detailed alignment (e.g. From A-B via C, with relevant street names and attached plan) subject to the detail and understanding addressed during the options and concept phase. Otherwise this detail will be progressed and updated during the IFC and WAC update of the needs spec. The below section to be edited based on best available knowledge at the time of authoring the Needs Specification.#

**General**

<Asset No.> shall pump via a pressure main as defined within this Needs Specification

At the proposed pumping rate of ## L/s, both the self-cleansing and sulphide control velocities will be achieved through the pressure main.

Scours are to be located at low points.

**Alignment**

The route of the main shall follow public roads and SWC’s easements, as shown on the attached Figure no. <Asset No.>/17D. The main shall discharge into a <new> <discharge maintenance hole / ## m long, insert diameter and material here receiving sewer> to be constructed <at/along> <insert location of receiving asset here>.

The receiving system has enough capacity to receive the additional pumped flow from <Asset No.>

**Ventilation and Odour**

Air release / anti vacuum valves are to be constructed at pressure main high points <or as required to manage surge>.

#If septicity control is required, include, below edited or updated as relevant for the specific requirements:

<Chemical dosing unit> will be required at <the pumping station site> <or other location>.

Otherwise delete#

#If required, include:

**Gravity Section**

Where a gravity main is required to connect the pressure main to the receiving sewer the gravity main shall be larger in diameter than the pressure main.

Otherwise delete #

**Water Hammer Analysis**

A water hammer analysis shall be undertaken as part of pressure main design. As a minimum, water hammer analysis shall consider the following scenarios:

1. Controlled pump start (utilising a linear ramp up timing of 10 s)
2. Controlled pump stop (utilising a linear ramp down timings of 10, 15 and 20 s)
3. Uncontrolled single and all duty (where more than one duty installed) pumps shutdown (pump trip) with the following wet well levels:
   1. Wet well at the duty cut out level (maximum static lift scenario)
   2. Wet well at the overflow level (minimum static lift scenario)
4. Consideration and modelling of valve closing times including reflux valve slamming or actuated valves where applicable

All scenarios shall be tested with single and multiple (where more than one provided) pressure mains and air-release valves active (functional) and inactive (non-functional / isolated).

Should excessive pressure conditions be identified, appropriate water hammer attenuating measures shall be provided to protect the piping system.”

# PUMP STATION CAPACITY

<Asset No.> will serve a catchment of <mostly commercial / Industrial / residential> zoned land within the <insert development location here> drained by gravity to the pumping station.

#If the station receives pumped flows from another location, include the following:

<Asset No.> will also receive pumped flow flows of ## L/s from <upstream Asset Number>.

Otherwise, delete#.

The initial and projected future and ultimate EP loadings and corresponding design flows for <Asset No.> catchment are based on <3 EP per lot (residential dwellings)>, <45 to 150 EP/Net ha (commercial and industrial) and 150 L/EP/day>.

#Where the pumping station design flow has been determined by hydraulic modelling, insert the following:

The pumping station design capacity has been determined in conjunction with the system storage by <insert name of relevant hydraulic model here> as ### L/s.

Otherwise, delete.#

The projected loadings and design flows as well as the staging requirements for pumping infrastructure are summarised in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Initial  (YYYY) | Ultimate  (YYYY) |
| 1. | Lots served | #### | #### |
| 2. | Equivalent Population |  |  |
|  | Residential | ### EP | ### EP |
|  | Commercial | ### EP | ### EP |
|  | Industrial | ### EP | ### EP |
|  | Special Use (Schools, etc…) | ### EP | ### EP |
|  | TOTAL | ### EP | ### EP |
| 3. | Estimated Average Dry Weather Flow (Qa) | ##.## L/s | ##.## L/s |
| 4. | Estimated Peak Dry Weather Flow (Qp) | ##.## L/s | ##.## L/s |
| 5. | Dilution Factor | # | # |
| 6. | Pumped Flow from <Asset No.> (L) | ##.## L/s | ##.## L/s |
| 7. | Design Wet Weather Flow (Qw) | ##.## L/s | ##.## L/s |
| 8. | Adopted SPS Design Capacity | ##.## L/s | ##.## L/s |

# CRITICAL DIMENSIONS AND PARAMETERS

All Reduced Levels are in metres and refer to the Australian Height Datum. The levels are preliminary only and shall be confirmed prior to detailed design.#The below table including operating levels is based on a simple single duty fixed speed pump. Operating levels and the various set point for pump speed or number of pumps operating will be different for variable speed pumps or multiple pump arrangements (duty / assist etc.)#

| No | Description | Data |
| --- | --- | --- |
| 1. | Current ground level at station | RL ##.## |
| 2. | 1% AEP flood level | RL ##.## |
| 3. | Proposed finished ground level at pumping station | RL ##.## |
| 4. | Level of wet well concrete roof slab | RL ##.## |
| 5. | Invert level of pressure main at: |  |
|  | a) Highest point | RL ##.## |
|  | b) Discharge | RL ##.## |
| 6. | Size and type of pressure main: | DN###, PN## PE100 (ID=##mm) |
| 7. | Length of pressure main to: |  |
|  | a) Highest point | ##.## m |
|  | b) Discharge | ##.## m |
| 8. | Velocity in pressure main at design flow rate of ### L/s | ##.## m/s |
| 9. | Size and type of station fittings | DN###, PN## DICL or DIFB (ID=##MM) |
| 10. | Velocity in station fittings at design flow rate of ### L/s | ##.## m/s |
| 11. | Pressure mains pipe wall roughness | #.# mm |
| 12. | Pressure mains Darcy-Weisbach Co-efficient (f) | #.##### |
| 13. | Invert level of inlet maintenance hole | RL ##.## |
| 14. | #The operating levels will be different where variable speed control or multiple pumps (duty / assist etc.)  Operating levels (based on ###m2 wet well area within operating range): |  |
|  | a) Above Top Water Level (ATWL) alarm | RL ##.## |
|  | b) Emergency cut-in level | RL ##.## |
|  | c) Duty cut-in level | RL ##.## |
|  | d) Mean water level (MWL) | RL ##.## |
|  | e) Duty cut-out level | RL ##.## |
|  | f) Emergency cut-out level | RL ##.## |
|  | g) Suction safety level | RL ##.## |
| 15. | Wet well invert level | RL ##.## |
| 16. | Overflow weir crest level | RL ##.## |
| 17. | Gross pumping head at design capacity of ### L/s: |  |
|  | a) Mean Static Head | ##.## m |
|  | b) Friction losses | ##.## m |
|  | c) Fitting losses | ##.## m |
|  | d) Mean Gross Head | ##.## m |

Pumping station’s system curves are shown on Figure no. <Asset No.>/A.

# PUMP AND PIPEWORK ARRANGEMENT

#It may be tempting to copy and paste or paraphrase from the technical specifications or other sources to emphasis important or commonly overlooked items, however the below sections should address the specific facility requirements and configuration only.

Replace the example text below with the specific information relevant for the facility and project#

**Pumping Units**

Two submersible pumps (1 duty + 1 standby) are required to be installed in the wet well, complete with all necessary pipes and fittings, supporting ‘duck-foot’bends, guide rails, lifting chains and power and control cables.

Each pump fitted with non-clog impellers shall be capable of discharging not less than the duty specified within this Needs Specification. One of the pumps shall be fitted with a hydraulically operated auto-flush valve for automatic flushing of the wet well.

**Pump Station Pipework and Valves**

The stations valves and fittings shall be dia. xxx mm DICL. DICL or DIFB. Pump risers and discharge pipework shall be sized for ultimate capacity. Pump station stop valve and reflux valve shall be accommodated within the valve chamber. The station shall accommodate pressure main isolating and scour valves. A bypass pump connection shall be provided comprising of stop and reflux valves and a diameter xxx mm Kamlock connection

The pressure main isolation valve shall be provided downstream of the discharge valves to allow two valve isolation of the pumping station. A diameter xxx mm pressure main scour line and valve shall be provided to drain the pressure main back to the wet well.

#Where relevant / non standard (with respect to IICATS and TSOG standards), provide a process control description of the station operation including pump choke, emergency duty, pump unit operation modes and level controls. Otherwise this is addressed within the Technical Specifications including TSOG specification and can be deleted.

Add sub-headings and description as required for non-standard operation, e.g. for complex pump stations. Such as operating level triggers, emergency duty, pump unit operations modes.#

#Some facilities will have a strategy to increase capacity via future upgrades provided the provisions within the civil structures and manifolds are considered within the initial construction or upgrade. If this is the case provide the requirements and strategy for staging increases in capacity below.

Insert details regarding operational and staging strategy including any provisions required for future capacity upgrades at predicted time periods#

# WET WELL

A single ##.## m deep wet well with a diameter of ##.## m shall be constructed. The wet well capacity between cut-in and cut-out levels will be approximately #### litres.

DN### DICL or DIFB pump risers and discharge pipework shall be provided with factory fitted puddle flanges in wall penetrations towards the valve chamber.

The pump risers shall be supported off the wet well wall by stainless steel brackets. A neoprene protection strip shall be installed between the support brackets and the pump risers, fully encircling the pipe.

The puddle flanges and pipes shall resist all forces placed on the pipe and prevent movement of the pipe.

An analog level sensor and a buoyancy level switch shall be installed in the wet well under separate level sensor hatches. Preference is for a radar level sensor, with hydrostatic used only when the accuracy of a radar unit can be affected.

Level markers shall be provided to establish the Reduced Level (AHD) of the following sensing equipment:

* “Wet Well Level” in the wet well
* “ATWL” in the wet well
* “Overflow Level” in the inlet maintenance hole
* “Overflow Alarm” in the inlet maintenance hole

# VENTILATION, ODOUR AND SEPTICITY CONTROL

**Ventilation**

#Edit and update to suit the facility or project

The pumping station wet well shall be provided with a natural or forced ventilation system comprising one wet well induct vent fitted with a non-return flap and one <18-metre-high DN###> educt vent shaft.

The inlet maintenance hole, emergency storage (where provided) shall be ventilated via a vent line connected to the educt vent shaft.

Air release valves installed on the pump discharge pipes or pressure main in the valve chamber shall be vented back to the wet well.

Air release valves at pressure main high points shall be installed within chambers connected to ##m high DN### educt vent shaft/s.

An educt vent shaft shall also be provided at the pressure main discharge maintenance hole.

#Include and edit accordingly if septicity control is required.

**Septicity Control**

Chemical dosing unit shall be supplied and installed as to control the acidity in the wet well and the pressure main and keep the sulphides in solution.

|  |  |  |
| --- | --- | --- |
| No | Description | Data |
| 1. | Type | < chemical dosing unit / potable water dilution/ other > |
| 2. | Size | < dose rate / flow rate / other > |

Otherwise delete#

#Include and edit accordingly if odour control is required.

**Odour Control**

An odour control unit shall be supplied to treat foul air. The odour control unit shall be <activated carbon> <other> <yet to be determined>.#

|  |  |  |
| --- | --- | --- |
| No | Description | Data |
| 1. | Type | < activated carbon / BTF / other > |
| 2. | Size | < flow rate > |
| 3. | Foul air design | < H2S > ppm <Odour Units> |
| 4. | Treated air design | < H2S > ppm <Odour Units> |

Otherwise, delete#

# VALVE CHAMBER

#For the purpose of the template and simplicity, this section is based on a typical valve chamber as shown in the DTC as example. But should be amended to address the specific facility or project.#

A valve chamber shall be constructed to house one set of DN### non-return and gate valves for each pump. Where required the valve chamber may also house pump discharge and pressure main air release valves. Thrust type dismantling joints shall be provided next to all valves.

Tapping points shall be provided in the valve chamber pipework (one upstream of each non-return valve, one on the discharge manifold, one on the pressure main downstream of its isolating valve and one in the bypass pipe) for testing and commissioning purposes. All tapping points shall be fitted with DN15 stainless steel ¼-turn block and bleed two-part SS316 ball valves, except the tapping point on the bypass pipe which shall have only one ball valve positioned at the bottom of the pipe for proving of isolation purpose.

All non–return valves shall be fitted with extended spindle on one side with lever, counterweight and counterweight guard. The counterweights shall be installed on the opposite side of the area most likely to be accessed by the maintenance personnel, e.g. opposite to the access ladders.

The valve chamber shall have removable open grid type covers with hinged access hatches above access ladders and access through covers to the valve spindles. The covers shall be flush with the surrounding concrete. All valve spindles are to be raised to 50 mm under the cover. All valves are to be clearly labelled with the open and close direction permanently marked.

The valve chamber shall drain back to the wet well via a 100mm diameter PVC drain line fitted with a ‘P’ trap and a non-return flap valve in the wet well.

The valve chamber shall be fitted with permanent inclined ladders, with retractable hand grips. The ladders shall be positioned centrally under the access hatches.

# INLET MAINTENANCE HOLE & EMERGENCY RELIEF SYSTEM

An inlet maintenance hole shall be constructed to allow for personnel access, telemetry instruments, blank flange for high level pipe and bypass pumps.

The inlet maintenance hole shall be fitted with a hinged lightweight access cover and a hinged safety grille under the access cover.

The inlet maintenance hole shall be fitted with a stainless steel ladder.

A DN### low level (inlet) pipe shall be provided between the inlet maintenance hole and the wet well.

A DN### high-level pipe shall also be provided between the inlet maintenance hole and the wet well. A hydrostatic level sensor shall be installed in the inlet maintenance hole to monitor the incidence of overflow, mounted on the upstream side of the IMH at the obvert of the incoming sewer. A buoyancy switch shall also be provided as backup. An emergency relief system shall be provided off the inlet maintenance hole. The emergency relief system shall incorporate a gas check maintenance hole with an overflow weir point and a gas check. The emergency relief system shall enable the retention of solids, scum and trash within the sewerage system.

The overflow weir crest level shall be set at the level provided within this Needs Specification. A DN### overflow pipe shall be provided from the gas check maintenance hole to discharge into the <insert name of watercourse / stormwater channel> and eventually into the Class “X” waters of the <insert name of water body>.

#Where 1% AEP is above WCL

To prevent water from entering into the wet well through the overflow, a suitable ‘Tideflex’ valve shall be fitted to the overflow discharge pipe.

Otherwise delete#

#Consider the specific site conditions and requirements subject to location of the overflow discharge. For example, include requirements for energy dissipation from ERS and avoid overflow discharge impacting public access area’s, paths etc.

A suitable energy dissipation structure shall be provided between the overflow and the waterway.

# EMERGENCY STORAGE

The pumping station shall be designed to meet the NSW EPA sewage treatment system license requirements of no dry weather overflows. Its wet well, in conjunction with associated gravity catchment and any additional storage structure, shall provide adequate emergency storage to contain all flows arriving to the station during the ultimate peak dry weather flow period over the total response time required to implement the station’s contingency plan.

Sydney Water’s adopted response time to implement the contingency strategy is 4 hours under normal access conditions, <which applies for this pumping station> or <it has been determined due to xxxx that x hours storage capacity is required for this station>.The calculated emergency storage required is ###.## kilolitres. The emergency storage shall be accommodated between the Above Top Water Level (ATWL) and the overflow weir crest level.

Approximately ###kL of storage will be available in the wet well. The storage available in the reticulation system upstream of the station will be ###kL.

The remaining sewage shall be contained in an Emergency Storage Structure of ###kL capacity.

For this SPS, configuration <1, 2, 3 or 4> of WSA04 has been chosen as the most appropriate and cost-effective option.

A hydrostatic level sensor (to monitor level) and buoyancy switch as back up, shall be installed in the emergency storage structure to monitor its operation.

# TELEMETRY

The pumping station shall be connected via an IICATS RTU to SWC’s Systems Operations Centre (SOC) for remote control and monitoring.

All telemetry and electrical designs are to be reviewed for compliance by Sydney Water’s IICATS group.

**Supply**

Provision of telemetry communications to Sydney Water facilities shall be provided over Telstra maintained and controlled infrastructure using the Telstra’s “Telstra Remote Product Telemetry” (TRT).

Provision of Telstra services, the RTU and Emergency PLC control logic, and modem is arranged through Sydney Water OTS. The contractor is to be responsible for managing and taking delivery of free issued equipment and services.

TRT is supplied by Telstra and contains the necessary functionality required for the operation of the Sydney Water telemetry network. To facilitate its maintenance of that service on behalf of Sydney Water, Telstra will only connect TRT across a Telstra owned and maintained cable.

.

# ELECTRICAL AND CONTROL

#The choice between a kiosk or superstructure is determined by the size and type of the electrical equipment and the potential for heat generation#

#Where soft starters ≤125kW, or variable speed drives ≤22kW, are used in the electrical control panel and the heat generation and dissipation is satisfactory, the panel will typically be in the form of an outdoor kiosk mounted on a plinth as per the IICATS specification.#

#When soft starters >125kW or variable speed drives >22kW are used or the heat generation and dissipation in a kiosk is not satisfactory the electrical and control equipment, including the main distribution board, drives, IICATS equipment and emergency PLC shall be accommodated within an electrical control-room building to be constructed near the wet well#

#Delete or amend the section below for the specific facility or project#

**Outdoor SCA**

The outdoor SCA shall be mounted on a concrete plinth with Compriband or equivalent waterproof gasket between the concrete and the SCA.

The outdoor SCA shall house the following electrical equipment and ancillaries, including:

* Main distribution board with facility to receive power supply from the electricity distributor and an emergency generator.
* A facility to accept power from an emergency generator.
* Local electricity distributor energy metering shall be in a separate panel on the outdoor SCA, accessible from the outside
* Separate motor starter units for each pump.
* IICATS Remote Telemetry Unit (RTU) and associated controls.
* Emergency duty PLC independent of IICATS as back up to the RTU.
* Weather shields;
* A storage pocket for the O&M manual plus the WAC drawings;
* A 400V three-phase 30 amp standard five-pin outlet suitable for a screwed-on plug for a portable pump; and
* A twin 230-volt General Purpose Outlet (GPO).

The electrical kiosk shall be provided with a shade structure for protection against solar heat and elements and confort of workers during inclement weather.

**Switchroom**

An indoor SCA shall be housed in a switch-room building. The switchroom floor shall be a minimum of 300 mm above the 1 in 100-year flood level.

#note that the electrical specification does not specify a level – only specifies it needs to be above the flood level)

Supply and installation of indoor SCA shall house the following electrical equipment and ancillaries, including:

* Main distribution board with facility to receive power supply from the electricity distributor and an emergency generator.
* Separate ,motor starter units for each pump.
* A storage pocket for the O&M manual plus the WAC drawings;
* A twin 230-volt General Purpose Outlet (GPO).
* If natural ventilation is insufficient for cooling of the electrical cabinets (where VSDs proposed), provide forced air ventilation to draw air into the cabinets from inside the building at floor level and vent into ceiling cavity. Fans are to be easily removable for maintenance or replacement.IICATS Remote Telemetry Unit (RTU) and associated controls.
* Emergency duty PLC independent of IICATS as back up to the RTU.

Local electricity distributor power metering shall be mounted external to the building. The generator connection panel shall be mounted external to the building.

Space shall be allowed for future expansion of the SCA.

**Field power connections**

Turrets shall be located adjacent to the wet well (one for each pump unit and one for controls and instrumentation), the emergency storage structure and the inlet maintenance hole.

Electrical conduits shall be installed between the SCA and each of these turrets.

**Mobile Generator Connection**

To minimise overflows during power failure, an emergency electrical connection with phase direction indicator for a mobile generator shall be provided at the station. The generator connection shall be located on the <electrical building / outdoor SCA> to facilitate ease of access by a mobile generator.

The generator shall be rated to supply the station auxiliaries and controls plus start and run <required number> pump/s to meet ultimate PDWF.

The generator panel shall be lockable with the generator cables connected.

**Field Power Outlets**

A by-pass pump power supply outlet shall be provided in a turret adjacent to the inlet maintenance hole. The power supply outlet is to be suitably sized and rated for the by-pass pump to provide the duty flow.

#Where a CDU is required, or provision for a future CDU is required, include the following or amend as relevant:

**Chemical Dosing Unit**

A power supply conduit shall be run from the switchboard to the location of the chemical dosing control panel. This panel will be installed in a separate room as part of the chemical dosing installation.

A separate communications conduit shall also be run from the switchboard RTU panel to the future CDU control panel location.

Otherwise, delete#

**Bypass Pump Electrical Connection**

A by-pass pump electrical connection shall be provided.

**Electricity Supply**

A low voltage 400V 50Hz electrical supply shall be obtained from the <insert relevant local electricity distributor here>. The power supply shall be connected from a point of connection outside of the station site, to the point of attachment located at the SCA.

A low voltage 400V 50Hz electrical supply shall be obtained from the relevant local electricity distributor. The power supply shall be connected from a point of connection outside of the station site, to the point of attachment located at the <SCA / Kiosk>.

**External Lighting**

External lighting shall be provided to illuminate the wet well, the valve chamber, above ground emergency bypass pump connection and IMH, so that maintenance can be carried out at night and under low light conditions.

# ACCESS TO STATION, SIGNAGE & PERIMETER FENCE

**Access**

# provide specific details where requirements in addition to the specification or to address specific details or preferences#

Temporary construction access to the pumping station site will be via <xxxxxx>.

Permanent access to the station shall be via an all-weather sealed access road, with kerb and gutter plus surface and subsurface drainage systems (as required) to the nearest public road.

The concrete section of the driveway, vehicle hard stand and turning areas shall be colored with <black oxide and given a coarse transverse scored texture on all graded sections to assist with vehicle grip>.

A level <Xm wide x Xm> long hard stand area shall be provided adjacent to the wet well and valve chamber for placement of crane outriggers.

A vehicle turning and parking area capable of taking a <maximum length semi-trailer (20kL) with 8 tonne axle loads shall be provided within the SPS site>.

Bollards shall be placed, where required, to protect the wet well, valve chamber, emergency storage structure and above ground structures from vehicles.

Adequate drainage system within the pumping station site shall be provided to minimise erosion, protect the access road, station and surrounds, and prevent rainwater ingress through the access covers.

**Signage**

# provide specific details where requirements in addition to the specification or to address specific details or preferences#

Pumping station signage shall be provided at the access road together with no parking signs.

#DTC drawings also address signage which maybe applicable for the facility or project#

Security signage shall be provided and installed as advised by Sydney Water. Station identification labels indicating Sydney Water ownership, station number and emergency telephone numbers shall also be provided and attached to the station perimeter fence. Sydney Water ownership, station number and emergency telephone numbers shall also be provided and attached to the station perimeter fence.

**Perimeter Fence**

A perimeter fence (Intruder Resistant Perimeter Barrier) with lockable gate meeting shall be provided alongside the SPS site boundaries.

# WATER SUPPLY

The pumping station will be provided with a permanent DN100 water service terminating with one DN80 spring hydrant and one DN25 vandal proof tap near the wet well. The main shall be installed as per WSA03.

A DN50 reduced pressure zone device (RPZD), line strainer and resilient seated isolating valves shall be installed on the water service within a lockable vandal proof enclosure to prevent water supply contamination. <This shall service the wet well and emergency storage structure.>

#Where a CDU is required:

The CDU shall be provided with two separate water services (one for safety shower and the other for chemicals dilution), each comprising of a reduced pressure zone device (RPZD) line strainer and resilient seated isolating valves within a lockable vandal proof enclosure in accordance

Otherwise, delete#

#Where an emergency storage is being provided, include the following:

The emergency storage structure shall be provided with two DN80 spring hydrants and one DN25 vandal proof tap near the emergency storage structure.

Otherwise, delete#

The minimum desirable supply condition is a static water pressure of 25 m head. A static water pressure of <xx m> is currently available at the station.

# ENVIRONMENTAL IMPACT

All care shall be taken to minimise impact to the environment during the construction and operation of this pumping station.

A Review of Environmental Factors (REF), approved by Sydney Water (usually the Manager, Environment and Heritage) identifies the construction and operation environmental impacts and mitigation measures associated with the pump station.

The representative from the Environment and Heritage team will coordinate the REF and provide guidance on minimizing environmental impacts, complying with environmental regulations and obtaining additional approvals associated with the REF.

To mitigate overflow of the pumping station, the following preventative measures will be provided:

* 100% standby pumping capacity
* Connection to the IICATS system for remote monitoring and control at the Systems Operation Centre (SOC)
* Greater than 4 hours storage at ultimate maximum dry weather flow above normal operating levels
* Overflow monitoring located in the inlet maintenance hole
* Facility to accept electricity supply from a mobile emergency generator
* A bypass pump connection
* Provision of a hardwire emergency cut-in control circuit and PLC as a back-up to the normal control circuit and IICATS RTU
* Site environmental management during construction, maintenance and operation

# LANDSCAPING

# The REF should provide guidance on minimum requirements regarding landscaping, although there may be other requirements or preferences from asset owners or stakeholders

Landscaping shall be of a low maintenance type. Native species shall be planted to reduce the visual impact of all above ground structures (vent shaft and electrical structures). When planting trees, species which cause root invasion shall not be planted and proximity to structures should be considered.

# INVESTIGATIONS

# Consider the contract documentation (and ECC scope where NEC4 adopted) to determine specific investigations and level of details to be included within the Needs Specification. #

All investigations required to design and construct the station shall be carried out including but not limited to:

* Noise monitoring and testing as or if required to demonstrate compliance with the REF and EPA guidelines. Being of a submersible in-ground type, the noise levels from this pumping station are expected to be low, however they will need to comply with the requirements of the REF, EPA guidelines and Sydney Water requirements. Noise levels of equipment and the pump station will need to be confirmed during commissioning.
* Geotechnical investigations for the pumping station site and route of the new pressure main or other significant assets
* Ground-water level investigation and monitoring
* Ground water contamination sampling and testing
* Soil contamination sampling, testing and classification
* Search and investigate for any existing asbestos or hazardous building material registers
* Services search and identification
* Condition and compliance assessment of any existing and interfacing assets or equipment

# Provide further details below of any previous investigations or known conditions. Consult with Sydney Water Property Services group or others#

# ALTERNATIVE CONCEPTS

#Depending on the contract type adopted, ‘alternative concepts’ may be addressed elsewhere in the contract and may not be required in the Needs Specificaiton. #

During the design stage it might be considered that the concept of the project contained in this Needs Specification could be beneficially amended. Approval of the Sydney Water Project Manager and the Sydney Water Wastewater Operations Area Manager shall be obtained before any alternative concepts are adopted.

# DRAWINGS

The following drawings and figures form part of this Needs Specification:

# Amend the below table as required and with consideration to the contract type and the content of the main contract documents (and ECC scope where NEC4 has been adopted). #

**Drawings and attachments**

|  |  |
| --- | --- |
| Document Number | Description |
| <Asset Number>/A | System Curves |
| <Asset Number>/B | Location Plan |
| <Asset Number>/C | Pressure Main and Area Served and / or Catchment Plan |
| <Asset Number>/D | EP / Flow schedule calculation |
| <Asset Number>/17 | SPXXXX Conceptual Layout (Sheet 1 of 2 - Plan) |
| <Asset Number>/17A | SPXXXX Conceptual Layout (Sheet 1 of 2 – Elevations / Sections) |