



Operation & Maintenance Manuals Volume 5

Fernvale Clarifier Upgrade



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Reports - Design Report



100% Design Report

Fernvale Water Recycling Plant Interim Upgrade Project

QUU Contract No. BW.70146-WD17

Tenix Contract No. 300744

14th of December 2012

Record Amendment Sheet

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Distribution List

Name	Emails	Position	Organisation
Dave Matheson	Dave.matheson@tenix.com	Design Project Manager & Engineering Manager	Tenix
Raymond Jio	Raymond.jio@tenix.com	Senior Design Engineer	Tenix
Yingjie Wu	Yingjie.wu@tenix.com	Mechanical Engineer	Tenix
Peter Flood	Peter.flood@tenix.com	Project Manager	Tenix
Allison Genau	Allison.genau@urbanutilities.com.au	Contract Manager	QUU
Will Campbell	Will.campbell@urbanutilities.com.au	Senior Project Manager	QUU
Ted Aston	Ted.aston@urbanutilities.com.au	Principal Process Engineer	QUU
Mike Oakey	Mike.oakey@urbanutilities.com.au	Service Delivery Leader	QUU
Peter Mostert	Peter.mostert@urbanutilities.com.au	Senior Electrical Engineer	QUU
Jamie Doherty	Jamie.doherty@urbanutilities.com.au	Civil Engineer	QUU

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1. DEFINITIONS, ACRONYMS AND ABBREVIATIONS

1.1 Definitions

The following definitions shall be used in the interpretation of this document:

- May expresses permissive guidance.
- Should express a non-binding preference.
- Shall express a characteristic which is to be present in the item which is the subject of the specification, i.e. "shall" express a binding requirement.
- Will may be used to express a declaration of intent on the part of a party, usually the sponsoring or contracting organisation. "Will" does not express a binding requirement. "Will" may also be used in cases where the simple future tense is required, for example, "Details of the hardware platform will be supplied upon request." Any statement which employs the term "will", if used in Section 3, should be present as a note so as to be clearly distinguishable from requirements.

The Australia Macquarie Dictionary shall be used in the interpretation of terms used in Section 3.

"REQUIREMENTS" which are not otherwise defined above.

1.2 Acronyms

The acronyms used in this document shall be interpreted as follows:

- AS means Activated Sludge
- AE – TK means Aeration Tanks
- CL– TK means Clarifier
- CCT means Chlorine Contact Tank
- DWG means drawings
- DN means Nominal Diameter
- DE means Disinfected Effluent
- DO means Dissolved Oxygen Analyser
- DOL means Direct On Line / Fixed speed
- FE means Filtered Effluent
- FIT means Flow Indicating Transmitter / Magnetic Flow-meter
- FRP means Fibre Reinforced Plastic
- GRP means Glass Reinforced Plastic
- GA means General Arrangement
- HMI means Human Machine Interface
- LCP means Local Control Panel
- LS means Level Switch
- MDPE means Medium Density Poly-Ethylene
- MLSS means Mixed Liquor Suspended Solids
- N/A means Not Applicable
- PLC means Programmable Logic Controller

- U-PVC means Un-plasticised Polyvinyl Chloride plastic
- TBA means To Be Assigned Later
- TBC means To Be Confirmed
- TK means Storage/holding Tank
- RS means Raw Sewage
- RAS means Recycled Activated Sludge
- RCD means Residual Current Device
- SC means Scum
- SC - TK means Scum Holding Tank
- SS1 means 316 Stainless Steel
- VSD means Variable Speed Drive
- WAS means Waste Activated Sludge
- WRP means Water Recycling Plant
- ZS means Limit/ Proximity Switch

2. OVERVIEW

2.1 Purpose

This project is intended to provide the Principal, Queensland Urban Utilities (QUU), with a reliable and economical Aeration & Clarification facility at Fernvale WRP, with capacity to meet future demand with no reduction in capacity due to equipment breakdown.

This basis of design is for the replacement and upgrade of the Aeration & Clarification facility to increase system reliability, capacity and performance. Basis of design is elaborated in detailed in Concept Process Design Report as attached in Appendix 2 of Section 4.

2.2 Introduction

The existing Fernvale Water Reclamation Plant (WRP) Aeration & Clarification facility consists of the existing Aeration Tanks & Clarifier and ancillaries, existing RAS and WAS pumping system, pipe-works and ancillaries.

This specification describes the requirement for the conversion of the existing Clarifier chambers into two new Aeration Tanks (AE-TK-02 & AE-TK-03), installation of a New Rectangular Clarifier system (CL-TK-01) complete with scrapper mechanism, a New Rectangular Chlorine Contact Tank (CT-TK-01), a new Cylindrical Scum Holding tank (SC-TK-01), 2 new RAS pumps, each with capacity 4.0 L/s plus a new magnetic flow-meter to be installed on the Filtered Effluent pipeline from the Clarifier overflow to the inlet of the new Chlorine Contact Tank, relocation of 2 existing RAS and WAS pumps to the New Clarifier facility.

The above paragraph is followed by an outline of the methodology used to gather the requirements and a design criteria overview (Section 3). The design criteria are followed by assumptions that have been made and constraints that apply on this project. The list of input data is outlined in Section 4. The P&ID drawings are listed in Section 4 (Appendix 1), The Concept Process Design Report is listed in Section 4 (Appendix 2), Equipment & Motor Lists, Instruments List, Manual Valves Lists are listed in Section 5 (Appendix 3), Equipment Packages (the New Clarifier, the new Chlorine Contact Tank, the new Scum Holding Tank, the new RAS pumps, etc.) are listed in Section 6 (Appendices 4 to 7), the Site Layout is listed in Section 7 (Appendix 8), the Detailed Layout & Piping Plans are listed in Section 8 (Appendix 9).

2.3 Methodology

The basis of design for this project was obtained through two primary methods:

- Stakeholder meetings – Conducted with key personal involved during the tender period and throughout the approval processes.
- Tender research – Conducted by researching tender documents, offers and previous submissions.

3. DESIGN CRITERIA

The equipment for the upgrade of Fernvale WRP Aeration & Clarification facility is designed based on the criteria below.

3.1 New Clarifier

A New Clarifier shall be installed next to the existing Aeration & Clarification facility in Fernvale WRP.

- The New Clarifier CL-TK-01 (located on ground floor next the existing Aeration & Clarification facility) shall be fed from the existing Aeration Tank (AE-TK-01) and two new Aeration Tanks (AE-TK-02 & AE-TK-03) which were converted from the 2 chambers of the existing Clarifier / Settler.
- The New Clarifier shall have a scrapper mechanism driven by a single DOL motor.
- The New Clarifier RAS requirement will be provided by a common ring main of 4 RAS pumps (consisting of 2 x 4.0 L/s new RAS pumps and 2 x 2.0 L/s relocated RAS pumps) located on ground floor next to New Clarifier facility.
- The New Clarifier WAS requirement shall be provided by a common ring main of 2 WAS pumps (consisting of 2 x 2.0 L/s relocated WAS pumps) located on ground floor next to New Clarifier facility.
- The New Clarifier shall have local control panel installed at elevated walkway level (above the flood level) at the New Clarifier facility.
- The New Clarifier shall be fitted with
 - Variable speed drive (VSD);
 - Mechanical shear pin for the gear box of the scrapper mechanism.
- Please refer to the attached Appendix 4: New Clarifier technical specifications & data-sheets for more detailed information.

The New Clarifier	QUU Requirements	Design Technical Specification
Number & Type of the New Clarifier	1 new Clarifier	1 new Rectangular Clarifier
Total Clarifier Tank Volume (not effective volume)	Tenix to design & advice	270 m3
Clarifier surface area	Tenix to design & advice	80 m2
Maximum operating configuration	Duty, 24 hours/day, 7 days/week	Duty, 24 hours/day, 7 days/week
Material of Construction	Tenix to design & advice	<p>Materials should be as specified herein. Where a material is not specified it should be selected by the Supplier and should be resistant to the conditions to which it is exposed.</p> <ul style="list-style-type: none"> • Tank: Mild Steel • Tank Support: Mild Steel • Feed well: Mild Steel • Feed & outlet nozzles: Mild Steel • Flight & Weir strip: Plastic • Grating & stair thread: Mild Steel • Effluent launder: 316 Stainless steel • Sludge Scraper Assembly: Chain & shaft: 316 Stainless steel • Scum Canoe: 316L Stainless Steel <p>The Mild steel is AS 3679.1 Gr.300. All Mild steel structures shall be painted according to painting specification as described in Tenix New Clarifier technical specification.</p>
The New Clarifier Local Control Panel	Supplier to advise	Supplier to advise
The New Clarifier Scraper Motor (1 Unit only)		
Supply Voltage & Frequency	415V / 3phases / 50 Hz	415V / 3phases / 50 Hz / 4 poles
Motor Rating (kW) and type	Supplier to advise	SEW Euro-drive DRS 71-S4, 0.37 kW per electric motor

Motor Speed	Supplier to advise	1460 rpm
Motor method of starting	VSD	VSD & motor provided by Vendor
Enclosure	Stainless steel IP56	Stainless steel IP56
Corrosion protection	Conformal coating to all electrical items	Conformal coating to all electrical items
Accessories		
Safety System	Supplier to advise	Mechanical Shear pin installed on the gear box of the Scraper motor

3.2 RAS Pumps

A total of four (4) RAS Pumps shall be installed at the new Clarifier facility in Fernvale WRP.

- 2x 4.0 L/s new RAS pumps (RAS-PU-01 and RAS-PU-02) and 2 x 2.0 L/s relocated RAS pumps (RAS-PU-03 and RAS-PU-04) will be installed on ground floor next to New Clarifier facility.
- 4x RAS Pumps Supply Header shall be connected to the New Clarifier.
- Each RAS Pump shall be supplied with Recycled Activated Sludge from the New Clarifier.

Description	QUU Requirements	Design Technical Specification
Service	RAS	RAS
Fluid	Recycled Activated Sludge	Recycled Activated Sludge
Configuration	4 pumps	2 new RAS pumps, each with capacity 4.0 L/s. 2 relocated existing RAS pumps, each with capacity 2.0 L/s.
Flow rate for new pump	Tenix to advise	4.0 L/s
Total dynamic head	Tenix to advise	Maximum Pump head 10 m
Generated Head	Tenix to advise	1 Bar (10 m)
Pump operation	Manual with timer	Manual with timer
Installation	Tenix to advise	Dry
Base Frame	Supplier to advise	Hot dipped galvanised mild steel or Stainless steel
Pump type	Helical Rotor pump complete with a DOL motor	Helical Rotor pumps complete with a DOL motor
Model	Supplier to advise	MONO or equivalent
Pump Manufacture	Stainless Steel wetted parts	Stainless Steel wetted parts
Suction & delivery pipe work manifolds	Supplier to advise	Suction 80 x 65 mm discharge 65 x 80 mm
Isolation Valves	2 off pump suction	2 off pump suction
Isolation Valves	2 off pump discharge	2 off pump discharge
Drain Valves	Tenix to advise	2 off (1 at pumps inlet header & 1 at pumps outlet header)
Pressure Relief Valves	1 off each pump discharge	1 off each pump discharge
Pressure Indicator	1 off each pump discharge	1 off each pump discharge
Limit/Proximity Switches	1 off each pump discharge	1 off each pump discharge

Electrical	Supplier to advise	3.0 kW, 415/3/50, IP56, DOL motor
Motor method of starting	Fixed speed (DOL)	DOL provided by Pumps Vendor
Corrosion protection	Conformal coating	Conformal coating

3.3 New Chlorine Contact Tank

One new rectangular Chlorine Contact Tank (CT-TK-01) shall be installed at the new Clarifier facility in Fernvale WRP.

- The new Chlorine Contact Tank inlet pipe shall be connected to the New Clarifier Overflow / Filtered Effluent pipeline.
- The new Chlorine Contact Tank discharge pipe shall be connected to the existing Treated Effluent Discharge pipe to the Brisbane River.
- The new Chlorine Contact Tank shall be connected to a DN 50 mm drain valve.

Description	QUU Requirements	Design Technical Specification
Type	Tenix to design & advice	Rectangular tank
Capacity	Tenix to design & advice	16.2 kL (total tank volume)
CCT Effective Volume	Tenix to design & advice	12.6 kL (at 0.4 m freeboard) or 11.7 kL (at 0.5 m freeboard)
Dimension	Tenix to design & advice	6 m length x 1.8 m width x 1.5 m height
Mounting	Tenix to design & advice	At ground level
Materials of construction	Tenix to design & advice	316 Stainless steel
Accessories & Tank details	DN 150 inlet connection from the new Clarifier Overflow / Filtered Effluent U-PVC pipeline; DN 150 outlet connection to the Treated Effluent Discharge pipe to the Brisbane river; DN 25 drain valve and pipe connection.	

3.4 New Scum Holding Tank

One new cylindrical Scum Holding Tank shall be installed at the new Clarifier facility in Fernvale WRP.

- The new Scum Holding Tank inlet pipe shall be connected to the New Clarifier Scum canoe.
- The new Scum Holding Tank discharge pipe shall be connected to both relocated existing WAS pumps.
- The new Scum Holding Tank discharge pipe shall be connected to a DN 25 mm flushing / drain valve for rodding.

- A two point Multi-trode Level -switch (LS-202) shall be installed on the new Scum Holding Tank.

Description	QUU Requirements	Design Technical Specification
Type	Rectangular storage tank or Cylindrical with domed head	Cylindrical with domed head
Capacity	2 weeks storage	2 m3 (absolute tank volume)
Mounting	At or near ground level	At or near ground level
Materials of construction	Poly or similar	MDPE or FRP
Accessories & Tank details	Inspection opening and cover (manhole) on the top of the tank; DN 100 inlet connection from the Clarifier Scum canoe; DN 80 outlet connection with a DN 80 manual ball valve to the header pipe of the two relocated existing WAS pumps; DN 25 flushing/drain connection; 2-point Multitrode Level-switch LS-202; Steel base frame	

3.5 Design Life

	QUU Technical Specification	Design Technical Specification
Civil structures	80 years	80 years
Mechanical and electrical plant/equipment	20 years	20 years
Control and instrumentation systems	10 years	10 years
Computer systems	5 years	5 years
Analytical and process Instruments.	10 years	10 years

ASSUMPTIONS AND CONSTRAINTS

3.6 New Clarifier

The following shall be made during the course of the project:

- The existing Clarifier shall be operational at all times during the construction period.

3.7 RAS Pumps

The following assumptions shall be made during the course of the project:

- As requested by QUU, the existing 2 sets of new RAS pumps (helical rotor /progressive cavity type), each with a capacity of 2.0 L/s @ 10 m head will be relocated and installed to function as standby RAS pumps for the New Clarifier.

3.8 New Chlorine Contact Tank

The following shall be made during the course of the project:

- A New Rectangular Chlorine Contact Tank (CCT) of 16.2 m³ (total tank volume) constructed from 316 Stainless steel shall be provided.
- The CCT effective volume is 12.6 kL (at 0.4 m freeboard) and 11.7 kL (at 0.5 m freeboard).
- The Chlorine Contact Time is approximately 40 minutes for the above-said CCT effective volume.

The New Rectangular Chlorine Contact Tank shall be installed nearby the new Clarifier facility.

3.9 New Scum Holding Tank

The following assumptions shall be made during the course of the project:

- A new cylindrical Scum Holding Tank of 2 m³ (absolute tank volume) constructed from MDPE with a steel base frame shall be provided.
- The Scum Holding Tank shall be installed nearby the new Clarifier facility.

3.10 Suppliers

The following suppliers or equivalent shall provide the new equipment required for new Fernvale WRP Aeration & Clarification Upgrade Project

Equipment	Company / Brand
New Clarifier	Tenix New Zealand
New Rectangular Chlorine Contact Tank	Euro-Fabrication or equivalent
New Scum Holding Tank	BVCI or Clark or equivalent
New RAS pumps	MONO or equivalent
New Magnetic Flow-meter	Endress Hauser Promag 50W or equivalent
Pipe work	Promains & Crevet
Switchboard	EDSS or equivalent

Valves	AVFI or equivalent
Pressure Relief Valves	Lesser / Pressure Systems or equivalent

4. INPUT DATA

4.1 Appendix 1 : P&ID

P&ID drawings are attached as part of this report, the following P&IDs shall be read in conjunction with this report.

- 300744-I-5000.pdf (Fernvale WRP Process Flow Diagram)
- 300744-I-5001.pdf (Fernvale WRP Hydraulic Profile)
- 300744-I-5002.pdf (Fernvale WRP P&ID Legend)
- 300744-I-5003.pdf (Fernvale WRP QUU Legend)
- 300744-I-5004.pdf (Fernvale WRP P&ID Augmentation).

4.2 Appendix 2 : Process Design Report

Fernvale WRP Process Design Report is attached as part of this report and shall be read in conjunction with this report the P&ID in Appendix 2.

- Fernvale WRP Process Design Report.pdf.

5. EQUIPMENT, INSTRUMENTS AND VALVES LISTS

The following documents are provided as Appendix and shall be read in conjunction with this report

5.1 Appendix 3 LISTS

- 300744_Fernvale WRP Equipment List.pdf
- 300744_Fernvale WRP Instruments List.pdf
- 300744_Fernvale New Manual Valves List.pdf.

6. EQUIPMENT PACKAGES

The following documents are provided as Appendix and shall be read in conjunction with this report

6.1 Appendix 4 : New Clarifier

- 300744-M-TS-5001_Fernvale Rectangular Clarifier Specification-Rev-E.pdf
- Clarifier drawings from Tenix NZ.

6.2 Appendix 5 : New Chlorine Contact Tank

- 300744_Fernvale New Chlorine Contact Tank sketched drawings-Rev-2.pdf

6.3 Appendix 6 : New Scum Holding Tank

- 300744-M-DS-5003_Fernvale New Scum Holding tank data sheet-Rev-0.pdf
- Industrial 2000lt Tank.pdf (typical drawing – not project specific).

6.4 Appendix 7 : New RAS Pumps

- MONO Helical Rotor Pump-Z15KC11RMA, Max duty 4.0 L/s @ 10 m Differential Head
- 300744-M-DS-5004_Fernvale RAS Pumps data sheets-Rev-0.pdf
- MONO-EZstrip Helical Rotor Pump Brochure.pdf

7. SITE LAYOUT

The following documents are provided as Appendix and shall be read in conjunction with this report

7.1 Appendix 8 : Site Layout

- 300744-G-DWG-0001.pdf (Cover Sheets & Drawings Index)
- 300744-P-DWG-6000.pdf (Fernvale WRP Site Layout Plan drawing).

8. DETAILED LAYOUT & PIPING PLANS

The following documents are provided as Appendix and shall be read in conjunction with this report.

8.1 Appendix 9 : Detailed Layout & Piping Plans

- 300744-P-DWG-6001.pdf (Fernvale WRP Detailed Layout & Piping Plan-sheet 1 of 2)
- 300744-P-DWG-6002.pdf (Fernvale WRP Detailed Layout & Piping Plan-sheet 2 of 2)
- 300744-P-DWG-6005.pdf (Fernvale WRP Aeration Tank Piping Section drawing)
- 300744-P-DWG-6007.pdf (Fernvale WRP Aeration Tank Piping Elevation drawing)
- 300744-P-DWG-6008.pdf (Fernvale WRP Clarifier Tank Piping Sections drawing)
- 300744-P-DWG-6009.pdf (Fernvale WRP Chlorine Contact Tank Arrangement drawing).

8.2 Appendix 10 : Footing Details & Typical Sections

- 300744-S-DWG-3000.pdf (Fernvale WRP Footing Details & Typical Sections drawing).

8.3 Appendix 11 : Electrical Conduit Layout Plan

- 300744-E-DWG-8000.pdf (Fernvale WRP Electrical Conduit Layout Plan).



Fernvale Water Recycling Plant Interim Upgrade Project

Appendix 1 : P&ID



Fernvale Water Recycling Plant Interim Upgrade Project

Appendix 2 :

Concept Process Design Report



Fernvale Water Recycling Plant Interim Upgrade Project

Appendix 3 : LISTS



Fernvale Water Recycling Plant Interim Upgrade Project

Appendix 4 : New Clarifier



Fernvale Water Recycling Plant Interim Upgrade Project

Appendix 5 : New Chlorine Contact Tank



Fernvale Water Recycling Plant Interim Upgrade Project

Appendix 6 : New Scum Holding Tank



Fernvale Water Recycling Plant Interim Upgrade Project

Appendix 7 : New RAS Pumps



Fernvale Water Recycling Plant Interim Upgrade Project

Appendix 8 : Site Layout



Fernvale Water Recycling Plant Interim Upgrade Project

Appendix 9: Detailed Layout & Piping Plan



Fernvale Water Recycling Plant Interim Upgrade Project

Appendix 10: Footing Details & Typical Sections



Fernvale Water Recycling Plant Interim Upgrade Project

Appendix 11: Electrical Conduit Layout Plan

Lists and Schedules

Equipment & Motor List



TENIX AUSTRALIA PTY. LTD.
ENGINEERING AND OPERATIONS
DIVISION
FERNVALE SEWAGE TREATMENT PLANT

EQUIPMENT LISTS

Client	Queensland Urban Utilities, QLD	
Tenix Doc No.	300744-M-EL-5001	
Approved By		
Date		



FERNVALE WRP INTERIM UPGRADE EQUIPMENT AND MOTOR LIST

Item No.	P&ID Tag No.	Process Equipment Description	Process Equipment Type	Process Fluid Type	Process Output Requirement	Starter	Motor Size (kW)	Approx. Power Draw at Duty Point (kW)	Recommended Vendor	Item
1	ST048-TK_-0611-001	New Clarifier	Rectangular Tank	Activated Sludge	Volume=270m3, Surface Area=80m2 Dimension: Length= 6.0 m x Width= 1.8 m x Height = 1.5 m, Tank Volume = 16.2 m3 (kL), CCT Effective Volume= 11.7 kL (0.5 m freeboard); CCT Effective Volume= 12.6 kL (0.4 m freeboard)	DOL	0.37		Tenix New Zealand	Volume = 270m3, Surface Area = 80m2
2	ST048-TK_-0780-001	New Chlorine Contact Tank	Rectangular, open top Epoxy-painted Mild Steel tank c/w five internal vertical baffles	Filtered Effluent		N/A	0		TBC	Dimension: Length= 6.0 m x Width= 1.8 m x Height = 1.5 m, Tank Volume = 16.2 m3 (kL), CCT Effective Volume= 11.7 kL (0.5 m freeboard); CCT Effective Volume= 12.6 kL (0.4 m freeboard)
3	ST048-TK_-0611-002	New Scum Holding Tank	Vertical cylindrical, domed head MDPE tank	Scum	Volume = 2 m3 (kL)	N/A	0		BVCI or Clark	
4	ST048-PUS-0530-001	Existing WAS Pump 1 Re-use (Duty)	Helical Rotor Pump (progressive cavity)	WAS (Waste Activated Sludge)	2 L/s @ 20 m head	DOL	2.2		MONO	
5	ST048-PUS-0530-002	Existing WAS Pump 2 Re-use (Standby)	Helical Rotor Pump (progressive cavity)	WAS (Waste Activated Sludge)	2 L/s @ 20 m head	DOL	2.2		MONO	
6	ST048-PUS-0630-001	Existing RAS Pump 1 Re-use (Standby)	Helical Rotor Pump (progressive cavity)	RAS (Recycled Activated Sludge)	2 L/s @ 20 m head	DOL	2.2		MONO	
7	ST048-PUS-0630-002	Existing RAS Pump 2 Re-use (Standby)	Helical Rotor Pump (progressive cavity)	RAS (Recycled Activated Sludge)	2 L/s @ 20 m head	DOL	2.2		MONO	
8	ST048-PUS-0630-003	New RAS Pump 1 (Duty)	Helical Rotor Pump (progressive cavity)	RAS (Recycled Activated Sludge)	4 L/s @ 10m head	DOL	3		MONO or ROTO Pumps	
9	ST048-PUS-0630-004	New RAS Pump 2 (Duty)	Helical Rotor Pump (progressive cavity)	RAS (Recycled Activated Sludge)	4 L/s @ 10m head	DOL	3		MONO or ROTO Pumps	
10	ST048-DIF-0511-000	Aeration Tanks New Aeration Diffusers	Submersible	Mixed Liquor	16 new in total, 8 new for each Aeration tank, air flow through each diffuser = 5 Nm3/hr	N/A	0		Aquatec Maxcon or equivalent	16 x Aquatec / Elastox T-type diffusers, each with 0.019 kg O2/Nm3/m Oxygen transfer efficiency
11	ST048-BL_-0520-001	Plant Existing Air Blower 1 (Duty)	Positive Displacement, root-type blower	Aeration Air	144 CFM @ 7 psig, 245 m3/hr @ 15m H2O absolute	DOL	5.5		Gardner Denver (existing)	Gardner Denver, Sutorbilt 4 MVR, model GACMBRA, 3600 RPM
12	ST048-BL_-0520-002	Plant Existing Air Blower 2 (Duty)	Positive Displacement, root-type blower	Aeration Air	144 CFM @ 7 psig, 245 m3/hr @ 15m H2O absolute	DOL	5.5		Gardner Denver (existing)	Gardner Denver, Sutorbilt 4 MVR, model GACMBRA, 3600 RPM
13	ST048-BL_-0520-003	Plant Existing Air Blower 3 (Standby)	Positive Displacement, root-type blower	Aeration Air	144 CFM @ 7 psig, 245 m3/hr @ 15m H2O absolute	DOL	5.5		Gardner Denver (existing)	Gardner Denver, Sutorbilt 4 MVR, model GACMBRA, 3600 RPM
14	ST048-SCH_-0611-001	Scum Harvester Canoe	Open tube	Scum	N/A	N/A				
15	ST048-SP_-0611-001	Scraper Unit	chain + flights	Activated Sludge	N/A	N/A				
16	ST048-GMU-0611-001	Geared Motor Unit Scraper	motor + gear box	Activated Sludge	Volume=270m3, Surface Area=80m2	DOL	0.37		Tenix New Zealand	

Total Power (kW)	31.7
Max Demand (kVA)	44.0

Equipment List

Project Name Fernvale WRP Interim Plant Upgrade
Project Status 30% Design

Engineering Manager Dave Matheson
Technical Design Manager Zane Gibson
Infrastructure Project Manager Peter Flood
Senior Design Engineer Raymond Jio
Head Draftsperson Ralph Seeto

Tenix Job Number 300744
E&O Job Number 300744

Break Down Details

5000 Process Flow Diagram
5002 P&ID Legend
5003 P&ID QUU Legend
5004 P&ID WRP

Date	Details	Rev	Prepared by	Checked & approved by
9/08/2012	Issued for Tender	A	RJ	ZG
21/08/2012	Updated to reflect changes made at Design Kick-Off meeting on 21.08.2012	B	RJ	ZG
5/10/2012	Updated to rectangular Chlorine Contact Tank detail	C	RJ	HS
29/10/2012	Updated Chlorine Contact Tank dimension	D	RJ	HS
12/12/2012	Updated to reflect request made by QUU to include Existing Air Blowers at 80% Design Review meeting on 11.12.2012	E	RJ	DM
30/05/2012	Update QUU tag number	F	JML	ML
18/07/2013	As Constructed	G	JML	ML

Lists and Schedules (cntd.) Instruments List

P&ID Number	Area Number	Tag Number	Tag Drawing Number	Description	Function/ Type	Supplier Range	Setpoint Range	New(N)/ Existing (E)	Supplier	Make	Model Number	Part Number	Location	Process Connection	Sensor/Transmitter Mounting Details	Switch Type	Power Supply	Signal Output	Cable	Instrument Load (VA)	Supplied By	Installed By	Location of I/O Rack
486/5/5-0172-009	0611	LS-201		Clarifier Level Switch (High & Low)	Conductive Level Switch (electrode type level detection)	TBA	TBA	N	Multitrode	Multitrode	Multitrode probe, 2 points	TBA	Refer to Tag number in P&ID drawing	Special Hook bracket supplied by vendor	Multitrode relay to be fixed in the junction box near Clarifier	Free voltage contact	24VDC	Digital	4C+E Control cable	TBA	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0611	LS-202		Scum Holding Tank Level Switch (High & Low)	Conductive Level Switch (electrode type level detection)	TBA	TBA	N	Multitrode	Multitrode	Multitrode probe, 2 points	TBA	Refer to Tag number in P&ID drawing	Special Hook bracket supplied by vendor	Multitrode relay to be fixed in the junction box near Tank	Free voltage contact	24VDC	Digital	4C+E Control cable	TBA	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0780	FIT-201		Clarifier Filtered Effluent Flow-meter	Magnetic Flow-meter	TBA	0 - 20 L/s	N	E&H	Promag 50W	TBA	TBA	Refer to Tag number in P&ID drawing	DN 150 mm Flanged	Sensor flanged connection,transmitter wall mounted	N/A	24VDC	4-20mA + HART	2 wires for signal and 2C+E for power	TBA	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0630	ZS-201		Limit Switch for RAS pump No.1 - RAS-PU-01 (High-High)	Limit/Proximity Switch	0-1200 kPa	TBA	N	Lesser/Pressure Systems or equivalent	Lesser/Pressure Systems or equivalent	TBA	TBA	Refer to Tag number in P&ID drawing	Threaded	Part of Pressure Relief Valve	Free voltage contact	N/A	Digital	2PR Control cable	TBA	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0630	ZS-202		Limit Switch for RAS pump No.2 - RAS-PU-02 (High-High)	Limit/Proximity Switch	0-1200 kPa	TBA	N	Lesser/Pressure Systems or equivalent	Lesser/Pressure Systems or equivalent	TBA	TBA	Refer to Tag number in P&ID drawing	Threaded	Part of Pressure Relief Valve	Free voltage contact	N/A	Digital	2PR Control cable	TBA	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0630	ZS-203		Limit Switch for RAS pump No.3 - RAS-PU-03 (High-High)	Limit/Proximity Switch	0-1200 kPa	TBA	N	Lesser/Pressure Systems or equivalent	Lesser/Pressure Systems or equivalent	TBA	TBA	Refer to Tag number in P&ID drawing	Threaded	Part of Pressure Relief Valve	Free voltage contact	N/A	Digital	2PR Control cable	TBA	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0630	ZS-204		Limit Switch for RAS pump No.4 - RAS-PU-04 (High-High)	Limit/Proximity Switch	0-1200 kPa	TBA	N	Lesser/Pressure Systems or equivalent	Lesser/Pressure Systems or equivalent	TBA	TBA	Refer to Tag number in P&ID drawing	Threaded	Part of Pressure Relief Valve	Free voltage contact	N/A	Digital	2PR Control cable	TBA	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0530	ZS-205		Limit Switch for WAS pump No.1 - WAS-PU-01 (High-High)	Limit/Proximity Switch	0-1200 kPa	TBA	N	Lesser/Pressure Systems or equivalent	Lesser/Pressure Systems or equivalent	TBA	TBA	Refer to Tag number in P&ID drawing	Threaded	Part of Pressure Relief Valve	Free voltage contact	N/A	Digital	2PR Control cable	TBA	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0530	ZS-206		Limit Switch for WAS pump No.2 - WAS-PU-02 (High-High)	Limit/Proximity Switch	0-1200 kPa	TBA	N	Lesser/Pressure Systems or equivalent	Lesser/Pressure Systems or equivalent	TBA	TBA	Refer to Tag number in P&ID drawing	Threaded	Part of Pressure Relief Valve	Free voltage contact	N/A	Digital	2PR Control cable	TBA	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0630	PI-201		Pressure Indicator for RAS pump No.1 - RAS-PU-01	Pressure Indicator	0-1000 kPa	TBA	N	WIKA or equivalent	WIKA or equivalent	TBA	TBA	Refer to Tag number in P&ID drawing	BSP Taper	Online	N/A	N/A	N/A	N/A	N/A	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0630	PI-202		Pressure Indicator for RAS pump No.2 - RAS-PU-02	Pressure Indicator	0-1000 kPa	TBA	N	WIKA or equivalent	WIKA or equivalent	TBA	TBA	Refer to Tag number in P&ID drawing	BSP Taper	Online	N/A	N/A	N/A	N/A	N/A	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0630	PI-203		Pressure Indicator for RAS pump No.3 - RAS-PU-03	Pressure Indicator	0-1000 kPa	TBA	N	WIKA or equivalent	WIKA or equivalent	TBA	TBA	Refer to Tag number in P&ID drawing	BSP Taper	Online	N/A	N/A	N/A	N/A	N/A	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0630	PI-204		Pressure Indicator for RAS pump No.4 - RAS-PU-04	Pressure Indicator	0-1000 kPa	TBA	N	WIKA or equivalent	WIKA or equivalent	TBA	TBA	Refer to Tag number in P&ID drawing	BSP Taper	Online	N/A	N/A	N/A	N/A	N/A	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0530	PI-205		Pressure Indicator for WAS pump No.1 - WAS-PU-01	Pressure Indicator	0-1000 kPa	TBA	N	WIKA or equivalent	WIKA or equivalent	TBA	TBA	Refer to Tag number in P&ID drawing	BSP Taper	Online	N/A	N/A	N/A	N/A	N/A	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0530	PS-206		Pressure Indicator for WAS pump No.2 - WAS-PU-02	Pressure Indicator	0-1000 kPa	TBA	N	WIKA or equivalent	WIKA or equivalent	TBA	TBA	Refer to Tag number in P&ID drawing	BSP Taper	Online	N/A	N/A	N/A	N/A	N/A	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0510	AIT-201		Dissolved Oxygen Probe for Aeration Tank No.2 (AE-TK-02)	Dissolved Oxygen Probe	TBA	TBA	N	HACH or equivalent	HACH or equivalent	TBA	TBA	Refer to Tag number in P&ID drawing	Immersion in tank	Sensor fixed to handrail,transmitter wall mounted	N/A	24VDC	4-20mA + HART	2 wires for signal and 2C+E for power	TBA	Tenix	Electrical Subcontractor	
486/5/5-0172-009	0510	AIT-101		Existing Dissolved Oxygen Probe for Aeration Tank No.1 (AE-TK-01)	Dissolved Oxygen Probe	TBA	TBA	E	TBA	TBA	TBA	TBA	Refer to Tag number in P&ID drawing	Immersion in tank	Sensor fixed to handrail,transmitter wall mounted	N/A	24VDC	4-20mA + HART	2 wires for signal and 2C+E for power	TBA	Existing instrument	Existing instrument	

Instrument List

Project Name Fernvale WRP Interim Plant Upgrade
Project Status 30% Design

Engineering Manager Dave Matheson
Design Manager Zane Gibson
Project Manager Peter Flood
Design Engineer Raymond Jio
Lead Draftsperson Ralph Seeto

Job Number 300744
Job Number 300744

Down Details

5000 Process Flow Diagram
5002 P&ID Legend
5003 P&ID QUU Legend
5004 P&ID WRP

Date	Details	Rev	Prepared by	Checked & Approved by
9/08/2012	Issued for Tender	A	RJ	ZG
21/08/2012	Updated to reflect changes made at Design Kick-Off meeting on 21.08.2012	B	RJ	ZG
12/09/2012	Updated to reflect changes made at Design Kick-Off meeting on 21.08.2012	C	RJ	HS
15/11/2012	Issued for 80% design	D	RJ	DM
12/12/2012	Updated to reflect changes made at 80% Design Review meeting on 12.12.2012	E	RJ	DM

Lists and Schedules

(cntd.)

Valves List



TENIX AUSTRALIA PTY. LTD.
ENGINEERING AND OPERATIONS
DIVISION
FERNVALE SEWAGE TREATMENT PLANT

VALVES LIST

Client	Queensland Urban Utilities, QLD	
Tenix Doc No.	300744-M-VL-5001	
Approved By		
Date		



300744_Fernvale WRP Interim Upgrade - New Manual Valves Schedule

Tenix supply		
Vendor package		
To be Assigned /Confirmed Later		

Note: Specifications of all valves stated below to be supplied by Tenix and vendors (as vendors'package) are subjected to changes pending to vendors' confirmation / valves availability.

DWG Number	PLANT No.	Tag Label	Area No.	Tag No.	Valve Description	Size	Line Spec	Valve Type	Material Body/Blade/Seat	Connections Lugged/Wafer/Union	Manufact urer	Model Number	Supplier	Valve Code	Normally	Failure	Class Name	End Connection s	Fluid	Operation
486/5/5-0172-009	ST048	HV	0510	001	Raw Sewage Outlet Pipe Header from Aeration Tanks 1 & 2 to New Clarifier Isolation Valve	200	PVC-U	Resilient Seat Gate/Sluice Valve	Cast Iron/Cast Iron/EPDM	Flanged drilled to AS2129 Table E				V	NO		Tenix_Resilient Seat Gate/Sluice Valve	Unspecified	RS	Handwheel, Manual
486/5/5-0172-009	ST048	HV	0510	002	Aeration Tanks Outlet Pipe Flushing Valve (with Kamlok coupler)	50	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NC		Tenix_Ball Valve	Unspecified	RS	Manual
486/5/5-0172-009	ST048	HV	0630	001	RAS Pump 1 Suction Isolation Valve	50	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NC		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	002	RAS Pump 2 Suction Isolation Valve	50	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NC		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	003	RAS Pump 3 Suction Isolation Valve	80	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NO		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	004	RAS Pump 4 Suction Isolation Valve	80	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NO		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	005	RAS Pump 1 Discharge Isolation Valve	50	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NC		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	006	RAS Pump 2 Discharge Isolation Valve	50	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NC		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	007	RAS Pump 3 Discharge Isolation Valve	80	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NO		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	008	RAS Pump 4 Discharge Isolation Valve	80	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NO		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	009	New Clarifier bottom outlet to RAS Pumps Header Isolation Valve	150	PVC-U	Knife Gate Valve- Resilient Seated	Cast Iron/SS1/EPDM	Flanged drilled to AS2129 Table E				V	NO		Tenix_Knife Gate Valve	Unspecified	RAS	Handwheel, Manual
486/5/5-0172-009	ST048	HV	0630	010	RAS Suction Manifold Drain Valve (with Kamlok coupler)	25	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NC		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	011	RAS Discharge Manifold Drain Valve (with Kamlok coupler)	25	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NC		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	012	RAS Pump 1 Pressure Indicator Isolation Valve	10 (3/8")	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NO		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	013	RAS Pump 2 Pressure Indicator Isolation Valve	10 (3/8")	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NO		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	014	RAS Pump 3 Pressure Indicator Isolation Valve	10 (3/8")	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NO		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	015	RAS Pump 4 Pressure Indicator Isolation Valve	10 (3/8")	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NO		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	HV	0630	016	RAS Feed Pipe 1 to Aeration Tank TK-01 Isolation Valve	100	PVC-U	Resilient Seat Gate/Sluice Valve	Cast Iron/Cast Iron/EPDM	Flanged drilled to AS2129 Table E				V	NO		Tenix_Resilient Seat Gate/Sluice Valve	Unspecified	RAS	Handwheel, Manual
486/5/5-0172-009	ST048	HV	0630	017	RAS Feed Pipe 2 to Aeration Tank TK-01 Isolation Valve	100	PVC-U	Resilient Seat Gate/Sluice Valve	Cast Iron/Cast Iron/EPDM	Flanged drilled to AS2129 Table E				V	NO		Tenix_Resilient Seat Gate/Sluice Valve	Unspecified	RAS	Handwheel, Manual
486/5/5-0172-009	ST048	HV	0630	018	RAS Pumps Suction Manifold Vent Valve (with Kamlok coupler)	25	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NC		Tenix_Ball Valve	Unspecified	RAS	Manual
486/5/5-0172-009	ST048	VPF	0630	001	RAS Pump 1 Pressure Relief Valve	50	PVC-U	Pressure Relief Valve	Cast Iron	Flanged drilled to AS2129 Table E				PRV	NC		Tenix_Pressure Relief Valve	Unspecified	RAS	Auto
486/5/5-0172-009	ST048	VPF	0630	002	RAS Pump 2 Pressure Relief Valve	50	PVC-U	Pressure Relief Valve	Cast Iron	Flanged drilled to AS2129 Table E				PRV	NC		Tenix_Pressure Relief Valve	Unspecified	RAS	Auto
486/5/5-0172-009	ST048	VPF	0630	003	RAS Pump 3 Pressure Relief Valve	50	PVC-U	Pressure Relief Valve	Cast Iron	Flanged drilled to AS2129 Table E				PRV	NC		Tenix_Pressure Relief Valve	Unspecified	RAS	Auto
486/5/5-0172-009	ST048	VPF	0630	004	RAS Pump 4 Pressure Relief Valve	50	PVC-U	Pressure Relief Valve	Cast Iron	Flanged drilled to AS2129 Table E				PRV	NC		Tenix_Pressure Relief Valve	Unspecified	RAS	Auto
486/5/5-0172-009	ST048	HV	0530	001	New Clarifier bottom outlet to WAS Pumps Header Isolation Valve	150	PVC-U	Knife Gate Valve- Resilient Seated	Cast Iron/SS1/EPDM	Flanged drilled to AS2129 Table E				V	NO		Tenix_Knife Gate Valve	Unspecified	WAS	Handwheel, Manual
486/5/5-0172-009	ST048	HV	0530	002	WAS Pumps Suction Manifold Drain Valve (with Kamlok coupler)	25	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NC		Tenix_Ball Valve	Unspecified	WAS	Manual
486/5/5-0172-009	ST048	HV	0530	003	WAS Pump 1 Suction Isolation Valve	50	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NO		Tenix_Ball Valve	Unspecified	WAS	Manual
486/5/5-0172-009	ST048	HV	0530	004	WAS Pump 2 Suction Isolation Valve	50	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NO		Tenix_Ball Valve	Unspecified	WAS	Manual
486/5/5-0172-009	ST048	HV	0530	005	WAS Pump 1 Discharge Isolation Valve	50	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NO		Tenix_Ball Valve	Unspecified	WAS	Manual
486/5/5-0172-009	ST048	HV	0530	006	WAS Pump 2 Discharge Isolation Valve	50	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NO		Tenix_Ball Valve	Unspecified	WAS	Manual
486/5/5-0172-009	ST048	HV	0530	007	WAS Pump 1 Pressure Indicator Isolation Valve	10 (3/8")	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NO		Tenix_Ball Valve	Unspecified	WAS	Manual
486/5/5-0172-009	ST048	HV	0530	008	WAS Pump 2 Pressure Indicator Isolation Valve	10 (3/8")	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NO		Tenix_Ball Valve	Unspecified	WAS	Manual
486/5/5-0172-009	ST048	HV	0530	009	WAS Pumps Discharge Manifold Flushing Valve (with Kamlok coupler)	25	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NC		Tenix_Ball Valve	Unspecified	WAS	Manual
486/5/5-0172-009	ST048	HV	0530	010	WAS Pumps Suction Manifold Vent Valve (with Kamlok coupler)	25	PVC-U	Ball Valve	SS1/SS1	Socket Cement Union				V	NC		Tenix_Ball Valve	Unspecified	WAS	Manual
486/5/5-0172-009	ST048	VPF	0530	001	WAS Pump 1 Pressure Relief Valve	50	PVC-U	Pressure Relief Valve	Cast Iron	Flanged drilled to AS2129 Table E				PRV	NC		Tenix_Pressure Relief Valve	Unspecified	WAS	Auto
486/5/5-0172-009	ST048	VPF	0530	002	WAS Pump 2 Pressure Relief Valve	50	PVC-U	Pressure Relief Valve	Cast Iron	Flanged drilled to AS2129 Table E				PRV	NC		Tenix_Pressure Relief Valve	Unspecified	WAS	Auto
486/5/5-0172-009	ST048	HV	0611	001	New Scum Holding Tank Outlet Isolation Valve	80	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NO		Tenix_Ball Valve	Unspecified	SC	Manual
486/5/5-0172-009	ST048	HV	0611	002	New Scum Holding Tank Outlet Drain Valve	25	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NC		Tenix_Ball Valve	Unspecified	SC	Manual
486/5/5-0172-009	ST048	HV	0611	003	New Scum Holding Tank to WAS Pump 1 Inlet Isolation Valve	50	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NO		Tenix_Ball Valve	Unspecified	SC	Manual
486/5/5-0172-009	ST048	HV	0611	004	New Scum Holding Tank to WAS Pump 2 Inlet Isolation Valve	50	PVC-U	Ball Valve	PVC-U/PVC-U/PVDF or PTFE	Socket Cement Union				V	NO		Tenix_Ball Valve	Unspecified	SC	Manual
486/5/5-0172-009	ST048	HV	0780	001	New Clarifier overflow to New Chlorine Contact Tank Isolation Valve	150	PVC-U	Resilient Seat Gate/Sluice Valve	Cast Iron/Cast Iron/EPDM or Nitrile	Flanged drilled to AS2129 Table E				V	NO		Tenix_Resilient Seat Gate/Sluice Valve	Unspecified	FE	Handwheel, Manual
486/5/5-0172-009	ST048	HV	0780	002	Filtered Effluent Flowmeter Isolation Valve	150	PVC-U	Resilient Seat Gate/Sluice Valve	Cast Iron/Cast Iron/EPDM or Nitrile	Flanged drilled to AS2129 Table E				V	NO		Tenix_Resilient Seat Gate/Sluice Valve	Unspecified	FE	Handwheel, Manual
486/5/5-0172-009	ST048	HV	0780	003	New Chlorine Contact Tank Drain Valve	50	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NO		Tenix_Ball Valve	Unspecified	FE	Manual
486/5/5-0172-009	ST048	HV	0780	004	New Chlorine Contact Tank Drain Valve	50	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NO		Tenix_Ball Valve	Unspecified	FE	Manual
486/5/5-0172-009	ST048	HV	0780	005	New Chlorine Contact Tank Drain Valve	50	PVC-U	Ball Valve	SS1/SS1	Threaded- BSP				V	NO		Tenix_Ball Valve	Unspecified	FE	Manual
486/5/5-0172-009	ST048	HV	0780	006	New Chlorine Contact Tank Drain Valve	50	PVC-U	Ball Valve	SS1/SS2	Threaded- BSP				V	NO		Tenix_Ball Valve	Unspecified	FE	Manual
486/5/5-0172-009	ST048	HV	0710	056	Sodium Hypochlorite Dosing Isolation Valve	16	HDPE	Ball Valve	PVC-C/PVC-C/PVDF or PTFE	Socket Cement Union				V	NO		Tenix_Ball Valve	Unspecified	CLX	Manual
486/5/5-0172-009	ST048	HV	0520	002	Aeration Tank AE-TK-02 Aeration Header Isolation Valve	100	MS	Butterfly Valve	Cast Iron/Cast Iron/EPDM	Lugged drilled to AS2129 Table E				V	NO		Tenix_Butterfly Valve	Unspecified	PRA	Manual
486/5/5-0172-009	ST048	HV	0520	003	Aeration Tank AE-TK-03 Aeration Header Isolation Valve	100	MS	Butterfly Valve	Cast Iron/Cast Iron/EPDM	Lugged drilled to AS2129 Table E				V	NO		Tenix_Butterfly Valve	Unspecified	PRA	Manual
486/5/5-0172-009	ST048	HV	0520	004	Aeration Tank AE-TK-02 Aeration pipe 1 Isolation Valve	50	MS	Butterfly Valve	Cast Iron/Cast Iron/EPDM	Lugged drilled to AS2129 Table E				V	NO		Tenix_Butterfly Valve	Unspecified	PRA	Manual
486/5/5-0172-009	ST048	HV	0520	005	Aeration Tank AE-TK-02 Aeration pipe 2 Isolation Valve	50	MS	Butterfly Valve	Cast Iron/Cast Iron/EPDM	Lugged drilled to AS2129 Table E				V	NO		Tenix_Butterfly Valve	Unspecified	PRA	Manual
486/5/5-0172-009	ST048	HV	0520	006	Aeration Tank AE-TK-03 Aeration pipe 1 Isolation Valve	50	MS	Butterfly Valve	Cast Iron/Cast Iron/EPDM	Lugged drilled to AS2129 Table E				V	NO		Tenix_Butterfly Valve	Unspecified	PRA	Manual
486/5/5-0172-009	ST048	HV	0520	007	Aeration Tank AE-TK-03 Aeration pipe 2 Isolation Valve	50	MS	Butterfly Valve	Cast Iron/Cast Iron/EPDM	Lugged drilled to AS2129 Table E				V	NO		Tenix_Butterfly Valve	Unspecified	PRA	Manual

New Manual Valves List

Project Name Fernvale WRP Interim Plant Upgrade
Project Status 30% Design

Engineering Manager Dave Matheson
Technical Design Manager Zane Gibson
Infrastructure Project Manager Peter Flood
Senior Design Engineer Raymond Jio
Head Draftsperson Ralph Seeto

Tenix Job Number 300744
E&O Job Number 300744

Break Down Details

5000 Process Flow Diagram
5002 P&ID Legend
5003 P&ID QUU Legend
5004 P&ID WRP

Date	Details	Rev	Prepared by	Checked & Approved by
9/08/2012	Issued for Tender	A	RJ	ZG
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16/11/2012	Issued for 80% Design Review	C	RJ	DM
29/11/2012	Issued for 80% Design Submission	D	RJ	DM
12/12/2012	Update to reflect changes made at 80% Design Review meeting with QUU on 11.12.2012	E	RJ	DM
20/12/2012	Update to reflect changes made at 100% Design Review meeting with QUU on 20.12.2012	F	RJ	DM