

Queensland Urban Utilities  
Rosewood Sewage Treatment Plant

Contract No. I112-025

# **QUEENSLAND URBAN UTILITIES**

## **Rosewood Sewage Treatment Plant**

### **Stage 2a**

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## **A084 OPERATIONS & MAINTENANCE MANUAL**



**CONTRACT No. I112-025**

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### Revisions

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B	Second Draft	25/01/13	Daniel Hassed
1.0	Finalised Manual	25/03/13	Daniel Hassed



<b>Q-Pulse Id</b>	<b>Manual Section</b>	<b>Link</b>
TMS308	Operation and Maintenance Manual - Part 1: Sections 1.1 - 4.1	<a href="#">TMS308</a>
TMS309	Operation and Maintenance Manual - Part 2: Section 4.2	<a href="#">TMS309</a>
TMS310	Operation and Maintenance Manual - Part 3: Sections 5.1 - 6.2	<a href="#">TMS310</a>
VM175	Manufacturers Manuals - Part 4: 6.3.1 Grundfos Sodium Hypochlorite Dosing System	<a href="#">VM175</a>
VM176	Manufacturers Manuals - Part 4: 6.3.2 Grundfos Polymer Dosing System	<a href="#">VM176</a>
VM177	Manufacturers Manuals - Part 4: 6.3.3 CST Wastewater Screen Extractor	<a href="#">VM177</a>
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### 1.3 DESCRIPTION OF EQUIPMENT & PROCESS

Abergeldie Complex Infrastructure has completed an optimization of the Rosewood Waste Water Treatment Plant as outlined in the functional specification provided by Sinclair Knight Merz (SKM) with input/recommendations provided by QUU plant operators and ACPL Construction and Process personnel.

The treatment plant at Rosewood is comprised of several main areas:-

INLET WORKS

FLOW SPLITTER

SEQUENCING BATCH REACTOR (SBR)

RETURN ACTIVATED SLUDGE (RAS) PUMP STATION

CHLORINE CONTACT TANK (CCT)

WASTE ACTIVATED SLUDGE (WAS) PUMP STATION

SLUDGE THICKENER

CHLORINE STORAGE AND DOSING AREA

POLYELECTROLYTE STORAGE AND DOSING AREA

Each area is a unique system in the plant that reacts to the systems joined to it by the process; together they work as a whole to make the treatment plant at Rosewood function correctly.

#### 1.3.1 INLET WORKS

The function of the inlet works is to condition the feed material for further processing. In this case the inlet works is designed to remove stringy materials and large solids that would cause process issues if allowed to pass through the inlet unimpeded.

The inlet works consists of two (2) channels, a manual inlet channel that contains a manual screen that needs to be cleaned each morning and afternoon and a channel that houses an automatic screen that will extract the solids and convey them to a bin as required. A set of stop boards allows each of the channels to be separated from the inlet flow for maintenance purposes.

During normal operation the flow is steered using one (1) stop board only through the automatic screen. If the automatic screen suffers any failure the level in the inlet channel will rise and overflow into the bypass channel where the manual screen will intercept any unwanted material before the flow enters the flow splitter.

Any screenings extracted from the manual channel go into the stainless steel tray and will drain into the inlet channel until the solids are somewhat dry. They are then to be disposed of in the wheelie bin provided, the tray cleaned and returned to the inlet channel.

The automatic screen will require regular maintenance and is installed on a pivot to allow the end of the screen to be raised out of the channel to be worked on at a comfortable height.

#### 1.3.2 FLOW SPLITTER

The purpose of the flow splitter is to limit the flow into the plant to 30litres/sec. If at any time the flow into the Rosewood WWTP exceeds this value the control valve located beneath the flow splitter will begin to close and restrict the flow into the plant until the inlet flow falls to 30litres/sec once again.

When the flow into the treatment plant is restricted by the control valve the level in the flow splitter tank will rise until the second overflow weir level is reached. At this point the flow into the plant enters the overflow chamber and is directed to a manhole that is joined to both Lagoon 2 and the plant bypass line. A valve installed either side of the manhole allows operators to select the final destination for the overflow (either Lagoon 2 or Plant Bypass).

One of these valves **MUST BE OPEN** at all times **DO NOT** leave them both closed.

### 1.3.3 SBR – SEQUENCING BATCH REACTOR

The SBR exists to accept waste water from the township of Rosewood and produce “good quality” water and sludge as by-products.

The SBR has two main vessels, the Demand Aeration Tank or the DAT and the Intermittent Aeration Tank or the IAT. The SBR also has three modes of operation; the react phase that can change in length with flow into the plant, the settling phase which is set to 1 hour and the decanting phase which runs until the lower decant level is reached. The DAT is where a majority of the treatment occurs as it will always have (barring some major process upset) water containing a higher concentration of nutrients than the IAT. As the “bugs” in the water eat the nutrients and clean the water they consume oxygen and multiply. The oxygen is supplied to the bugs using the two floating aerators and these are controlled by the plant PLC.

The aerators have three 3 modes of operation:-

Normal – Both Aerators Run

De-Nitrification – Aerators run on a timer

DO Control – Aerators maintain a DO level in the Tanks

Plant operators may choose between these aeration styles as required. The DAT also contains a mixer that is available for use in the De-Nitrification and DO control modes.

A pipe connects the DAT and IAT and as water enters the DAT from the township it overflows into the IAT through this line, into a still zone behind a baffle installed against the side of the IAT. The IAT vessel also contains two aerators and one mixer, these operate in the same manner as those contained within the DAT. The difference between the DAT and the IAT is that the IAT also houses the Decanter Mechanism and the intake for the RAS pump station.

The decanter mechanism in the IAT is responsible for releasing the treated effluent to the lagoon system located next to the plant. The effluent once released from the IAT flows to a “T” intersection in the pipework that is connected to both Lagoon 1 and Lagoon 2. Valves installed either side of this “T” steer the treated effluent to either lagoon. **DO NOT** close both of these valves, one must remain open at all times.

### 1.3.4 RETURN ACTIVATED SLUDGE (RAS) PUMP STATION

As the water in the DAT overflows into the IAT it carries the “bugs” responsible for the treatment with it. These “bugs” collect in the IAT and must be returned to the DAT where they can do the most good. They are returned to the DAT by the RAS pumps which draw the thickened sludge from the floor of the IAT during the react phase of SBR operation. The relatively high level of bugs in the IAT ensures that the remaining nutrients in the water are eaten quickly leaving clean water when the settling phase begins.

### 1.3.5 CHLORINE CONTACT TANK

A new chlorine contact tank has been constructed as part of the optimisation for the Rosewood WWTP. The contact tank is fed by a submersible pump station located next to lagoon 1. The pump station has an intake structure in Lagoon 1 approximately 8m from the Effluent Discharge Point. The effluent pumps run slowly delivering the treated effluent to the chlorine contact tank at a constant rate. A flow meter in the delivery line ensures that the chlorine is dosed into the chlorine contact tank at the right level (flow paced). As the effluent enters the contact tank it is immediately mixed with the chlorine solution and will spend at least 1 hour within the tank before it is discharged into the chlorinated Sump.

The chlorinated sump acts as a water reservoir for the service water pumps and the recycled water pumps. The service water pumps will use the water in the chlorinated sump to water the site each evening and the recycled water pumps will send water across to the golf course constantly. If there is any water remaining it will be discharged to the creek that runs beside the Rosewood Waste Water Treatment Plant.

### 1.3.6 WASTE ACTIVATED SLUDGE (WAS) PUMP STATION

As the SBR operates and the bugs contained within it grow and multiply there will come a time when the MLSS (mixed liquor suspended solids) is at a level where some of the bugs must be taken out of the process to maintain the solids at the correct level. For this plant at the moment we are saying that the correct MLSS level is 4000ppm.

To waste solids the WAS pumps must be enabled and switched to automatic dewatering. When this occurs the operator may choose to nominate a time period where sludge wasting will occur in the SCADA. When the react phase of treatment commences the WAS pumps will activate for the nominated period and pump sludge out of the process.

Using the WAS pumps gives the plant operator control of the plant bug population and allows them to ensure that it does not get too high.

### 1.3.7 SLUDGE THICKENER

The sludge thicker requires both the WAS pumps and the Polyelectrolyte system to run. It is designed to separate the sludge carried in the WAS (Waste Activated Sludge) stream from the majority of the water and return the water to the process. Sludge will be kept in the concrete tank located beside the sludge thickener.

The sludge thickener works by mixing the polyelectrolyte with the WAS stream, this causes the sludge to form tight clumps leaving the clean water between them. The clumps/water mixture is passed through a trommel screen that separates the clumps from the liquid, clumps travel down a chute into the concrete tank and the water flows into the flow splitter.

### 1.3.8 CHLORINE STORAGE AND DOSING AREA

Chlorine dosing and storage area contains the chlorine fill station, the chlorine storage tank and the chlorine dosing pumps.

The fill station provides a place to connect the chlorine truck hose and power to drive the delivery pump. The system is designed to ensure that the tank is not overfilled.

The storage tank will hold 1000 litres of chlorine and should last the plant approximately 30 days under normal operating conditions.

Chlorine dosing pumps are given their speed signals from the PLC and dose to maintain a chlorine level according to the flow reported by the effluent flowmeter. Current flow rate is reported on an LCD display located on top of the pump body.

### **1.3.9 POLYELECTROLYTE STORAGE AND DOSING AREA**

The polyelectrolyte storage and dosing facility contains dosing pumps and a powdered polymer batching unit. The batching unit is designed to maintain a reservoir of prepared polymer so that the dosing pumps may start at any time and have polymer available. Operators must ensure that the polymer batching plant has a full powder hopper but the batching plant will continuously batch polymer as required.

The dosing pumps start automatically with the WAS pump and run at the last speed set by the operator, water carries the polymer along the dosing line to the sludge thickener. The transport water serves two functions, firstly it ensures that changes to polymer dose reach the equipment quickly and secondly the polymer mixes with the water during transport diluting it and making it more effective when it is dosed into the sludge line (by allowing to mix quickly).

## **1.4 OPERATIONAL MODES**

For details on Operational Modes, please refer to Section 1.3 Description of Equipment and Process.



**VOLUME 2. PROPRIETARY EQUIPMENT MANUALS, MAINTENANCE  
SERVICE, DATA SHEETS****2.1 PROPRIETARY EQUIPMENT MANUALS****2.1.1 POLYMER DOSING SKID (GRUNDFOS)**

All equipment and associated process manuals can be found in Appendix C.  
Manufacturer Contact Info - 07 5540 6700

**2.1.2 SODIUM HYPOCHLORITE DOSING SKID (GRUNDFOS)**

All equipment and associated process manuals can be found in Appendix C.  
Manufacturer Contact Info - 07 5540 6700

**2.1.3 SCREEN EXTRACTOR (CST WASTEWATER SOLUTIONS)**

All equipment and associated process manuals can be found in Appendix C.  
Manufacturer Contact Info – 02 9417 3611

**2.1.4 LD300 LINEAR DECANTER (PROWATER)**

All equipment and associated process manuals can be found in Appendix C.

**2.1.5 MECHANICAL EQUIPMENT*****2.1.5.1 Amarex KRT Submersible Pump***

Manufacturer Contact Info - 1300 073 887

***2.1.5.2 DW VOX Submersible Pump***

Manufacturer Contact Info - 1300 073 887

***2.1.5.3 Sewatec Volute Casing Pump***

Manufacturer Contact Info - 1300 073 887

***2.1.5.4 CST Rotary Drum Thickener***

Manufacturer Contact Info - 02 9417 3511

***2.1.5.5 Liquitek AquaDDM Mixer***

Manufacturer Contact Info - 02 9912 8475

***2.1.5.6 Liquitek Aqua-Jet Aerator***

Manufacturer Contact Info - 02 9912 8475

***2.1.5.7 Tyco Class 16 FL-FL Gate Valve w/Handwheel***

Manufacturer Contact Info - 07 5589 4400

***2.1.5.8 Dobbie Dico Reflux Valve***

Manufacturer Contact Info - 07 5589 4400

***2.1.5.9 Tyco Ball-Centric Valve***

Manufacturer Contact Info - 07 5589 4400

***2.1.5.10 Rotork IQT Actuator***

Manufacturer Contact Info - 07 5589 4400

**2.1.5.11 Grundfos AQC-D2 Measuring Cell**

Manufacturer Contact Info - 07 5540 6700

**2.1.5.12 Davey Sump Pump**

Manufacturer Contact Info – 1300 367 866

**2.1.5.13 Amarex KRT Dry Installation Pump**

Manufacturer Contact Info - 1300 073 887

**2.1.5.14 Series 009 RPZ Assembly**

Manufacturer Contact Info – (978) 688-1811

**2.1.5.15 Enware Emergency Shower**

Manufacturer Contact Info – 1300 369 273

**2.1.5.16 Davey SS Vertical Multistage Pump**

Manufacturer Contact Info – 1300 367 866

**2.1.6 ELECTRICAL EQUIPMENT****2.1.6.1 ABB Electromagnetic Flowmeter**

Michael Freeman – 02 9753 7965

**2.1.6.2 Vegason 61 Level Transmitter**

Manufacturer Contact Info - 02 9542 6662

**2.1.6.3 Vegason 62 Level Transmitter**

Manufacturer Contact Info - 02 9542 6662

**2.1.6.4 COS16D Dissolved O<sub>2</sub> Sensor**

Manufacturer Contact Info - 02 8877 7000

**2.1.6.5 FTS20 Level Switch**

Manufacturer Contact Info - 02 8877 7000

**2.1.6.6 Proline Promag 50 Electromagnetic Flowmeter**

Manufacturer Contact Info - 02 8877 7000

**2.1.6.7 Turbimax CUS51D Turbidity Sensor**

Manufacturer Contact Info - 02 8877 7000

**2.1.6.8 Liquiline CM442 Multichannel Controller**

Manufacturer Contact Info - 02 8877 7000

**2.1.6.9 Orbisint CPS12D ORP Sensor**

Manufacturer Contact Info - 02 8877 7000

**2.1.6.10 Grundfos Conex DIA-1 Controller**

Manufacturer Contact Info - 07 5540 6700

**2.1.6.11 Chloromax CCS142D Chlorine Analyser**

Manufacturer Contact Info - 03 8846 4600



**2.1.6.12 Danfoss VLT Aquadrive FC200**

Manufacturer Contact Info - 07 3292 3600

**2.1.6.13 Danfoss VLT Aqua Drive 8000**

Manufacturer Contact Info - 07 3292 3600

**2.1.6.14 Danfoss VLT Aqua Drive MC 500**

Manufacturer Contact Info - 07 3292 3600

**2.2 OPERATIONAL PROCEDURES****2.2.1 INLET WORKS**

The inlet works requires a small amount of maintenance stop board positions have been provided at the end of each inlet channel to allow either to be isolated from the inlet flow for maintenance activities. When the manual channel is in use the manual inlet screen requires cleaning first thing in the morning and last stop at night to keep it clean. A small tray that sits inside the channel will hold any screenings collected from the manual screen. The base of the tray has several holes in it to allow the contents to drain before the tray is emptied into the wheelie bin provided.

The automatic screen will activate for an adjustable time period when the high level is reached in the inlet channel. This timer is a mechanical timer switch with a delay dial and will be located inside the inlet screen control panel. If for any reason the level has not fallen to below the high level when the timer expires, the screen will continue to run for another set time period. When the automatic screen is in operation the manual screen channel should be blanked off at the beginning but not at the end as it needs to act as a backup screen in the event of automatic screen failure.

The automatic screen empties into a wheelie bin through a disposable plastic chute that can be replaced as necessary as it is a consumable component. The screen itself can be raised out of the inlet channel so that it can be worked on at a comfortable height as it is mounted on a pivot.

The inlet works should be inspected on a daily basis to identify and rectify any issues that may arise. Routine maintenance tasks should be carried out as specified in the routine maintenance section of the manual. Please ensure that routine maintenance is conducted in conjunction with the manufacturers specifications located in Appendix A of this document.

**2.2.2 FLOW SPLITTER**

The flow splitter should require very little maintenance but there are places where rag and silt may accumulate so the flow splitter should be inspected daily. During the daily inspection it would be advisable to use the screen rake to check the depth of the central chamber in the flow splitter to check for silt and stone build-up. A sucker truck can deal with this accumulation of silt and stone on a regular basis.

Please also check the instrumentation on the flow splitter to ensure that no stringy material has fouled the level sensors. If this is the case this material needs to be cleaned off immediately to make sure that the functionality of the flow splitter is not impaired.

If the overflow chamber is used during periods of high flow, the level sensor will send an alarm to the PLC. Ensure that the plant is prepared for an unexpected rain event by making sure that the overflow line has one valve open to send the water to either the plant bypass or Lagoon 2. Do not leave these valves closed or the flow splitter will overflow.

There are also routine maintenance activities required in this area, check the section titled routine maintenance to see when it is necessary. Please ensure that the instructions in the manufacturers' maintenance manual are followed when attempting any repair or service activity to equipment in this area.

### 2.2.3 SEQUENCING BATCH REACTOR (SBR)

The sequencing batch reactor is the heart of the process at Rosewood, this is where the work is done to clean the water to a level where it can be released to the environment. Similarly this is the area that will impact the process the most and do the most damage if it is not properly maintained.

Beginning the SBR treatment cycle is the React Phase

React Phase duration is adjustable through the SCADA located in the office (or by remote access) but it is recommended that it be 1 hour for high flows which are above 2.4 times the average dry weather flow (ADWF) or approximately 24lps and 2 hours for flows below the 24lps mark. The flow into the plant will rarely exceed 30lps as this is set in the flow splitter as the maximum possible inflow. If the plant experiences flow above 30lps it should be during a storm event where most of the inflow is caused by infiltration into the sewer system.

There should be no reason that you will ever need to change the treatment cycle length but if it is something that is necessary it can be changed by clicking in the box on the SCADA screen and typing in the new duration in minutes.

During the react phase the objective is to get oxygen to the bugs living in the plant so that they can eat the nutrients out of the water. There are a number of control strategies available to you as an operator for delivering the oxygen using the equipment you have available. The options are listed in the SCADA screen (SBR) and they are:-

**NORMAL OPERATION** – During normal operation both of the aerators in the DAT and the IAT will run at the speed that is set on the respective VSD drive for each aerator. The aerators do not take breaks they simply run for the entire cycle with no changes in duty. This might be a strategy chosen during high flow conditions (not storms) where the plant oxygen take-up is at a maximum.

**DE-NITRIFICATION** – The de-nitrification control is the control strategy where the operator has total control of how the aerators in the plant run. There is a series of on/off timers on the right hand side of the SBR page that show when the aerators will run and when they will rest. On this table the current position of each aerator in the timer cycle is shown as a blue highlighted box. In addition to the aerator control the mixers will operate regularly during the reaction phase (the aerators shut down during the mixing portion of the program). This is a program that could be run during low flow periods where high DO levels are experienced in the plant during normal operation. The de-nitrifying program run under these conditions will keep the plant healthy.

**DO CONTROL** – Arguably the better of the three control strategies as it combines the benefits of the normal and de-nitrifying strategies listed above. Of course this depends on what levels the DO is set to be controlled to. During DO control both aerators will run if DO Levels are below the LOW set point (recommended starting level is 1.5ppm). The two aerators will drive the DO up to the HIGH set point (recommend setting this to 2.5ppm) and at this DO level the DUTY aerator will continue to operate while the ASSIST aerator will stand down. If the DO level falls after the ASSIST aerator is shut down this aerator will start once the LOW set point is reached again to bring the DO

level back up to H. If the DO level continues to rise when the ASSIST Aerator is shut down the DUTY aerator will also shut down when the HH DO level is reached (set this to 3ppm to start), this aerator will re-start at L.

If the aerators are shut down by the program, the mixer will start to ensure that the DO level remains relatively even throughout the DAT or IAT. Using this strategy will allow the operators to ensure that brief anoxic (<1ppm DO) and anaerobic (0ppm DO) periods are experienced by the plant as these encourage de-nitrification and keep the water quality at an acceptable level.

The position of the DO probes in the tank is fairly close to the surface of the water, the reading that the instrument returns to the PLC will be slightly high relative to other positions in the tank as the water that the probe is immersed in is freshly discharged by the aerators and flows across the top layer of the DAT/IAT.

The equipment in the IAT and DAT will require daily visual inspections to assess whether cleaning should occur. Any rag or fibre that enters the plant can get trapped on the aerator causing them to "rag up". An indication of this may be poor aerator performance and increased motor load. If the aerators or mixers require cleaning and maintenance use the cables provided to pull the equipment to the side of the tank where it may be worked on more easily. Ensure that any maintenance activities are carried out with instruction from the suppliers operation and maintenance manual taken into consideration, please refer to the section entitled Routine Maintenance for the regular maintenance activities required in this area. Appendix A contains the manufacturers maintenance manual.

The next step in the SBR treatment cycle is the Settle Phase

The settle phase is set to one hour for both the DAT and IAT. During settle phase all equipment in both SBR zones is de-activated to allow the sludge to settle in the tanks, this allows the product water to be as clean as possible.

Settle phase is also important as it allows the plant to undergo a period of anoxic/anaerobic condition that gets rid of process by-products that could otherwise accumulate to toxic levels. It is important to check the DO level during settle phase regularly to ensure that the period of nil oxygen is occurring on a regular basis.

The final step in the SBR treatment cycle is the Decant Phase

During the decant phase the decanter actuator opens the base of the decanter and allows the water in the IAT to drain to the lagoon system. The valve on the outside of the IAT nearest the lagoons is used to control the flow of water from the IAT. This has been set to regulate the flow of water from the IAT so that a typical decant cycle will take approximately 15 minutes. On occasion the sludge in the IAT might not settle very quickly or the sludge level may be too high. At these times it could be advantageous to restrict the flow through the decanter even further to reduce the amount of solids leaving the plant in the treated effluent stream. Of course at higher flows through the plant the valve may need to be opened to reduce the decant time.

The decanter body floats on top of the water and is connected to the discharge pipework by a telescopic line connected to the underside of the decanter "saucer section". As the decant cycle progresses the level in the IAT falls and the decanter body will follow the water level down and only discharge water from the top 100mm – 200mm of the IAT. This cycle continues until the "decant to" level is reached, then the decanter will be driven closed and the react phase will begin.

There are a number of fail-safes in this area that support the operation of the decanter to reduce the risk of failure.

L level switch – the decanter is set to drain the IAT until the water level reaches 2100mm, the L level switch will be set at 2000mm to re-initiate the

closing of the decanter. Since the mixers in the IAT will cause the L level float to actuate due to the extreme turbulence, this switch has a delay. Once the delay period has passed the decanter will be told to close immediately and an alarm message will be sent to the operations mobile.

**H Level Switch** – The high level switch is a conductive probe type and if it is continuously on for a set time period the SBR will be given the signal to settle and decant.

**HH level switch** – There has been an overflow installed into the SBR IAT to direct any excess level to either the emergency storage lagoon or Lagoon 2. For this overflow to be used the signal must already have been given by the H level switch to enter the settle and decant cycles. For this reason the HH level switch will trigger another request to the decanter to open and send a message to the operations mobile to inform them that something is seriously wrong. The HH level is set to 50mm below the overflow weir level.

As the water leaves the IAT via the decanter it enters drainage pipework that is connected to both Lagoon 2 and Lagoon 1. There are valves installed to allow the water to be steered either way, one of these must be open at all times or the plant will overflow.

#### **2.2.4 RETURN ACTIVATED SLUDGE (RAS) PUMP STATION**

The RAS pump station consists of two pumps that operate in Duty/Standby. Duty for the pumps changes with each start to ensure that they are used regularly and do not have the opportunity to lose prime when the sewage generates gas in the line. The RAS pumps are set at a fixed speed through the PLC but get their reference speed from the SCADA. If the need to change the speed arises the new speed can be entered through the SCADA screen.

RAS pumps operate only during the React phase of the SBR program to return the activated sludge back to the DAT. There is a flow switch installed on each RAS pump that will stop the pump if it has not actuated in a set time period after the pump has been given a start command. If one of the RAS pumps fails to start it will be faulted and an alarm raised, the standby pump will start to take over the duty. The RAS pump station should be inspected daily, preferably when the pumps are running so that any ragging or clogging issues can be quickly rectified.

Apart from the daily check there are routine maintenance activities to be carried out at regular intervals on the pumps, please refer to the sections Routine Maintenance and Appendix A for instructions concerning the maintenance requirements.

#### **2.2.5 CHLORINE CONTACT TANK (CCT)**

Water collected in Lagoon 1 (the effluent balancing lagoon) needs to be sterilised before it is released to the environment. A new chlorine contact tank has been built for this purpose. The effluent pump station and inlet structure are located in Lagoon 1. The pump station pumps water through a magflo meter to the chlorine contact tank. The magflo paces chlorine into the Chlorine Contact Tank (CCT) based on a rate specified by the operator on the SCADA screen. The rate at which water is pumped to the CCT is set by the operator and based on level in the Pump well. Under the H level the flow is on the Low set point (currently approximately 4lps) and above the H level the flow is on the High set point (currently approximately 8lps). Please note that the actual flow rate is not entered in SCADA but a reference speed for the two final effluent pumps.

The flow pacing of the chlorine dosing pumps means that they will dose at the same concentration regardless of the effluent flow. This value may be changed in the SCADA on the CCT screen in the lower left hand corner, you will see 3 figures.

Adjust the top figure up or down as required to increase or decrease the proportion of chlorine dosed into the effluent to maintain the chlorine residual at the desired level. Flow pacing also means that operators may alter the flow rates to suit plant conditions without having to worry about setting up the chlorine dosing all over again.

To actually change the effluent pump speed the plant operator must alter the speed reference in the SCADA. If for any reason the level in the pump well reaches L level then the pumps will turn off and wait for the level to rise again before re-activating.

Upon entering the CCT effluent is contained within a small tank that is well agitated by a small submersible pump. The chlorine solution enters this chamber with the final effluent and both are well mixed before overflowing a weir into the CCT channel. Water must remain in the CCT for at least an hour to ensure that harmful pathogens are destroyed before release to the environment. At the end of the CCT channel there is another weir and on the other side the chlorinated effluent sump.

In an effort to utilise all of the water that the plant produces the recycled water pumps are set to constantly pump water to the golf course and maintain a level in the chlorinated effluent sump that is below the overflow weir. In addition the site water pumps will start each afternoon to water the site gardens from this water supply.

In the event that the golf course cannot take any more water they will call the plant and the recycled water pumps will be switched off. In all cases but this one the pumps will operate duty standby and pump water to the golf course constantly (duty rotation occurs every 24hrs). Operators may select one of the pumps to fill the recycled water tanks if necessary.

Regular maintenance of these pumps will ensure that they run correctly for many years, please ensure that maintenance activities in this area are carried out in accordance with the manufacturers specifications (please see section entitled Routine Maintenance and Appendix A).

## **2.2.6 WASTE ACTIVATED SLUDGE (WAS) PUMP STATION AND SLUDGE THICKENER**

The waste activated sludge (WAS) pumps allow the operator to control the MLSS concentration within the plant by drawing the sludge off the plant and storing it in the large concrete vessel next to the sludge thickener.

Once the MLSS within the SBR builds up to 4000 sludge wasting can begin. The WAS pumps will run for an operator set length of time at the beginning of each react phase as the RAS pump station needs to be operational and the tanks mixed before the sludge wasting will be effective.

To waste sludge the operator needs to set a time in the WAS pump duration box in SCADA. Initially I would recommend that it be set to 10 minutes and this should be changed no more than weekly to increase or decrease the amount of sludge that is wasted from the plant. Although setting the WAS pumps to less than 10 minutes will not be advisable as the wasting/thickening process needs to stabilise.

WAS pumps will run duty standby and rotate duty with each start. In addition the sludge thickening equipment can be run in MANUAL or AUTO thickening mode. Sludge thickening equipment consists of the WAS pumps, Sludge Thickener and the Polymer dosing system.

### **AUTO thickening mode**

In the AUTO thickening Mode the diversion valves located beside the WAS storage tank should be in position to divert the WAS into the sludge thickener feed tank. Failure to have the valves in the correct position will result in a message coming up on screen telling you to go and fix the position. Once the valves are in the correct

position AUTO mode may be selected. When the command to start the WAS pumps is delivered by the PLC it will now initiate a sequence of events.

Delay timer on WAS pump start

Start trommel drive

Start Spray Bar (activate water solenoid)

Start Mixing tank Drive

Start Duty Polymer Transfer Pump

Timer expires and WAS pump starts

This sequence prepares the system to receive WAS and then delivers the WAS to the system, if any of the equipment is not in a healthy state the WAS thickening sequence will not start and an alarm will be raised to warn the operator that something has gone wrong.

The adjustable components of the WAS thickening system from an operators perspective will be the WAS pump speed and the Polymer dosing pump speed. As a starting point I recommend adjusting the WAS pump speed until a consistent 4.0lps enters the WAS thickener and then leave this constant while the polymer dose rate is adjusted to achieve adequate flocculation. To adjust the polymer dosing pump speed go into SCADA and select the dosing pumps, you will find the speed reference field in the drive information. The addition rate of polymer can only be adjusted in this way but once it is set up there will be very little need to adjust these settings.

Check the flocculation is good by looking into the top of the flocculation tank connected to the front of the sludge thickener. I would recommend getting a strong torch for this as the tank is very dark, when the flocculation is good you should see clear water with large chunks of sludge floating about in it. If the water is dirty and cloudy add some more polymer, if it is clear with lots of small pieces of sludge try adding a bit less. No real harm can come from playing with the system if you underdose polymer then all of your sludge goes back to the DAT and if it is overdosed you will collect all of the sludge and floc a small portion of the DAT. The flocculation should be checked at least weekly so that small adjustments can be made if necessary.

Once the STOP signal is given to the WAS pumps another sequence of events takes place to correctly shut the sludge thickener down.

STOP WAS pumps

STOP Polymer Dosing Pumps

Start Timer 60 sec

STOP Mixer

Timer Expires

STOP Trommel Drive

STOP Water Spray

MANUAL thickening mode

In manual thickening mode the plant operator needs to wait until the react cycle begins in the SBR then they need to turn the equipment to manual and start it in the same sequence as is mentioned above for the Automatic Start.

When the operator has run the sludge thickening system for the appropriate amount of time the shutdown sequence outlined above should be followed to shut the sludge thickening plant down. Please note that since the dosing pumps receive their speed

reference from the PLC they will run in the same speed when run manually as in automatic, if you need to change the manual speed it needs to be done through the SCADA.

There are some basic maintenance activities required in this area, please do daily checks to ensure that equipment is not fouled and follow manufactures instructions when performing scheduled maintenance (see Appendix C and the section entitles Routine Maintenance).

### 2.2.7 CHLORINE STORAGE AND DOSING AREA

Chlorine storage and dosing is comprised of three separate areas:-

Unloading Area – when chlorine is required the truck will connect here and plug into the regulated power supply provided by this control. An LCD display on the panel shows the level of the tank and the power supply to the chlorine delivery pump will cut out when the tank is full. The system is also fitted with alarms should the tank overfill but as all chlorine truck drivers are such nice and attentive people this very rarely happens.

Storage Area – The storage area is essentially the bund that the storage tank is mounted inside and the storage tank itself. The tank is fitted with overflows and drains as required and will hold enough chlorine to run the plant during normal operation for approximately 30 days.

Dosing Area – The dosing area is everything inside the dosing cabinet and this includes all the pumps pipes and instrumentation. From an operators perspective what needs to be done in this area is as follows:-

Daily Check for leaks and problems

Check pump status – both lights should be green if one is not find out why

Check dilution water flow as it should be approximately 1000lph

If dilution water is not running check that the pumps are also not running and that there is no flow through the effluent pump station.

Visually verify the tank level is reading correctly.

Hose out any chlorine spills and ensure that the area is clean and tidy.

In addition to the daily checks there will be routine maintenance activities required in this area, please make sure that the correct spares are kept in stock for the grundfoss dosing pumps as the seals and non-return valves will need to be replaced annually. Ensure that the dosing pump maintenance as well as any other tasks called up in the Routine Maintenance Section are carried out by adequately trained personnel. Chlorine is not the most dangerous chemical but once you have been splashed in the face or eye you WILL soon learn to respect it. For your own safety and for the safety of others please make sure that the cabinet doors on the chlorine system are kept closed at all times.

### 2.2.8 POLYELECTROLYTE STORAGE AND DOSING AREA

Firstly as a general note on the use of powdered polymer –

DO wear a dust mask when handling it

DO NOT leave any half bags open to the atmosphere (they will become unusable in a matter of hours on a humid day)

DO NOT leave any powder on the floor in the bund as it will become incredibly slippery with the smallest amount of water

USE LOTS of water to hose any spills away immediately, don't let them dry on the floor.

Polymer storage areas can be very dangerous please keep this area clean and store the polymer properly, in a sealed bag in a dry place NOT in the bund preferably.

The polymer system has 2 major equipment items the first is the polymer batching system and the second is the polymer dosing system.

The batching system will be set up before plant operators need to touch it, however by following some simple steps in the manual it can be re-calibrated for any powdered polymer. The calibration procedure is as follows:-

Ensure that the polymer hopper is empty and clean, no residual polymer.

Fill the hopper with the new polymer

Run polymer manually through the powder feeder to ensure that it is full and flowing freely

Run polymer through the hopper for a set time period and collect/weigh the resultant pile

This figure should be converted to the units on screen and entered in as the new dry powdered polymer feed flow rate normally in kg/min (look at you screen and see what it needs to be!!).

I do not expect that the polymer will change frequently on site at Rosewood but if this does happen the re-calibration needs to be carried out each time.

The next parameter that needs to be entered is the solution strength; the starting point when setting the polymer system up will be 3500ppm. There are a couple of things to remember when setting up the strength of your solution and that is:-

The stronger the solution the less you need to dose

The stronger the solution the thicker and more viscous it will become (making it more difficult to mix into solution and making it take longer to be effective in the process).

Well how do I know when to make the solution stronger or weaker?

This may seem like a difficult question but it is not too difficult to work out, set up your sludge thickening system and observe where the pump speed ends up when you have it working correctly. If your final pump speed is high say in the top 10% you need to increase the strength of your polymer solution and similarly if the polymer pumps are running very slowly you need to decrease the strength of the polymer solution (so that you need more volume!). The only pain here is that you need to get through a batch of "transitional" polymer solution; I would recommend using it in the process as cleaning it out of your bund is something that you will only ever want to do once.

The polymer batching system is relatively simple to take care of as a plant operator. Make sure that it has a full load of polymer at all times and check the system daily for polymer spillage and blockages, this is very important around the wetting head as this needs to be kept very clean.

There is an operation and maintenance manual in Appendix A for the polymer batching system please refer to this when carrying out any maintenance activities.

The polymer dosing system draws prepared polymer from the batching system storage vessel, as the pumps dose polymer into the system the batching system vessel level will fall until it reaches the L set point and the batching system will prepare another batch. The batching system is designed to provide an uninterrupted



supply of polymer to the dosing system. This ensures that when polymer is required it is available.

The dosing pumps receive a speed set point from the SCADA, the speed is raised and lowered from the control room. On the skid there is also a solenoid that will activate dilution water when the polymer skid begins to dose, ensure that the dilution water is set to half scale or below with the valve provided.

The dilution water and polymer solution pre mix in the polymer dosing line before they enter the WAS line that ultimately feeds into the flocculation tank. It is expected that there will be some flocculation occurring in the line before the solution reaches the tank, check this with your torch as it is a better indication of what is happening than the mixture within the tank.

As mentioned previously the ideal situation is one where the flocculated sludge is suspended in clear water, if you have this happening you know that the polymer dose is right.

## 2.3 FAULT PROTECTION & RECTIFICATION

### 2.3.1 INLET WORKS

Inlet Screen Constantly Running – If the inlet screen is constantly on you need to: -

- Check the activation level and make sure that it is not set too low

- Ensure that the screen has not become blinded by rag or other foreign objects, give it a clean with the hose.

- Check that the spray bars are not blocked, they should run when the screen runs.

- Check the brushes, if they need adjusting they tend to clean the screen poorly

Channel Overflows

- Check the flows into the plant and decide whether they were higher than normal

- Check the brushes, if they need adjusting they tend to clean the screen poorly

- Check the brushes, if they are worn and need replacing they tend to clean the screen poorly

- Check that the screen is turned on and has power

- Check the positioning of the stop boards

### 2.3.2 FLOW SPLITTER

Constantly overflowing backwards into the bypass line

- Check the flow into the plant and see whether it is above 30lps as excess flow is meant to go into bypass

- Check the position of the actuator, is it closed, manually drive it open

- Check the signal from the DAT flow-meter, is it reporting correctly. Manually operate the actuated valve if this is not the case.

**Flow splitter is overflowing**

Check the valves at the manhole that directs flow into bypass or Lagoon 2, make sure one of them is open, visually inspect the discharge point (either lagoon 2 or chlorinated effluent sump) to check whether there is flow. If one line is blocked use the other.

Check flow into the plant through the DAT flow-meter, is it correct at 30lps or do you need to manually open the control valve.

**There are big brown chunks coming through the inlet when I waste Sludge**

Check your trommel screen and make sure that it is not torn, try not adding so much polymer solution

**2.3.3 SEQUENCING BATCH REACTOR (SBR)****Oxygen Level Too Low**

Check the Aerator speed they might need to be running faster in this tank

Check the Operating Program for the Aerators, you may need to go to DO control or Normal Operation

Check that both Aerators are available and have power

**Oxygen Level too High**

Check the Aerator speed they may need to be running slower in this tank

Check which mode the aerators are running in, they may need to be running in DO control or De-Nitrification Mode

Check that the Aerators are responding to PLC Commands

Check that aerators have not been put into manual operation

**Level Too Low**

Check the level sensor in the IAT, make sure that it is functional.

Manually open and close the decanter to make sure that it is working correctly.

Try slowing down the decant cycle by closing the discharge valve slightly.

Make sure that the level set points are correct

**Level Too High**

Check that the decanter is functional and available

Check flow into the plant and make sure that it is at the correct level and not above

Check the level probe is working

**Poor Quality Final Effluent**

Try slowing down the decant cycle if this is due to Suspended Solids

Try checking that the plant is reaching DO levels of zero regularly if this is due to excess BOD

Check that MLSS is at or near 4000ppm

Ensure that adequate aeration is provided during the react phase

**MLSS Too Low**

Stop wasting as much sludge run the WAS pumps for less time

Check that the DO levels are maintained during react phase

MLSS Too High

Waste more sludge, increase the WAS duration timer

Check that adequate flocculation is occurring in the Flocculation tank (if it is poor most of the WAS will return to the DAT through the trommel screen).

#### **2.3.4 RETURN ACTIVATED SLUDGE (RAS) PUMP STATION**

RAS pump is not pumping

Check that power is available

Remove priming bung and check for an air lock

Isolate pump and remove access hatch to check for ragging in the impeller

Check that impeller is installed correctly and key is still in shaft

Ensure that inlet/outlet valves have not been closed

Check inlet line for blockages

#### **2.3.5 CHLORINE CONTACT TANK (CCT)**

Chlorine level too low

Increase your dose rate slightly and check again in 4hrs

Check that dosing pumps are functional and operating in AUTO mode

Ensure that the dilution water is switching on

Make sure that you have chlorine in the chlorine storage tank

Check that the chlorine pumps have prime(they should fault if they do not)

Chlorine level too high

Reduce the dose rate slightly and check again in 4 hrs

#### **2.3.6 WASTE ACTIVATED SLUDGE (WAS) PUMP STATION AND SLUDGE THICKENER**

Water coming up through the flow splitter is chocolate brown during sludge wasting

Your polymer level is a little low speed it up and check again

Check the WAS flow and make sure it is 4.0lps

Water coming up through the flow splitter is all chunky and Flocced

Your Polymer Dose rate is too high, turn it down and check again

Check the WAS flow and make sure it is 4.0lps

The Sludge thickener will not go into AUTO mode

Check the diversion valve positions

The sludge thickener will not start

Check that the WAS pumps are available

Check that service water is available

Check that the Mixer is available

- Check that the trammel screen is available
- Check that the polymer Dosing Pumps are available
- Check that you have polymer
- Make sure that it is receiving a start request either through the SCADA (AUTO) or manually

### 2.3.7 CHLORINE STORAGE AND DOSING AREA

The Fill Station will not give the truck power

- Check that the tank is not already full
- Check that the level instrument is reporting the correct level (if not you can try drying it off and putting it back in).
- Check that the panel is not isolated
- Ensure that the switch on the front of the panel is in the ON position
- Check that the emergency stop has not accidentally been pushed in.

The bund is filling up with water

- Pull the leaves out of the drain in the corner it is blocked
- Try hosing them out from the other end if unsuccessful

The chlorine pumps are not dosing

- Check that there is flow into the CCT they will not dose if not required
- Check that the chlorine storage tank level is not too low
- Ensure that the pumps are enabled in SCADA
- Make sure that the local isolators are in the on position and the pumps are plugged in.

The chlorine pump lost prime now it has a red light showing

- The easiest way to re-prime the pump is to get the tank filled then hold in the black button and force the pump to run until chlorine flows through it again. If this fails adjust the position of the discharge valves to give you discharge to the bunded area then try again and the chlorine should almost flow through the pump without it running. Once you have flow return the valves to where they were and clean the spilled chlorine away.

One of the chlorine pumps is broken/leaking

- Isolate the leak with the valves in the skid and switch the pump off

### 2.3.8 POLYELECTROLYTE STORAGE AND DOSING AREA

The polymer batching system is at low level

- Fill the powder hopper and see whether that starts it up
- Check the HMI and find out whether the system is set to operate automatically (find the person that is playing with it and tell them to stop). Alarms will register here as well and give you information as to why the system has stopped
- Check that power is available
- Check that water is available
- Check that the level in the tank is actually below the fill level

Check that the emergency stop has not been bumped

Turn it off for 10 sec then back on

The polymer dosing pump is running at full speed but I cannot get the sludge thickener to produce any thickened sludge.

Check that you have dilution water switched on

Take a sample from the tank and ensure that it contains polymer (it will be thick and slippery)

Access the HMI and make the next batch stronger

Switch the system into manual and run both dosing pumps to get enough polymer to produce sludge. Keep going until the new (stronger) polymer batch starts processing, check again with the stronger batch on the next React phase in the SBR.

Check the flow splitter to see whether you are underdosing (chocolate brown water) or overdosing (flocculated feed to the SBR). Too much polymer can sometimes be just as bad as too little (pin flocs – google it for more information).

I set up the system but now its not working

The Process can produce different sludge with different characteristics when it is experiences upsets. It is up to you as a plant operator to react to these changes and ensure that everything does work, experiment with the sludge thickener and you will be an expert in the operation very quickly.

## **2.4 START-UP & SHUT-DOWN PROCEDURES**

For details on Start-Up & Shut-Down Procedures, please refer to Section 1.3 Description of Equipment and Process.

## **2.5 ISOLATION & RESTORATION PROCEDURES**

For details on Isolation & Restoration Procedures, please refer to Section 1.3 Description of Equipment and Process.

## **2.6 MAINTENANCE SCHEDULE**

For detailed maintenance instructions, please refer to the relevant manufacturer's manuals, located in Appendix C.





## Operations - Asset-Equipment List Table Template

Asset Maintenance Requirements							
Asset ID	Asset Component	Maintenance Method	Warranty End Date	On Maint/ Off Maint	Maintenance Frequency	Condition Parameters	Brief Maintenance Description
Tag no. from P&ID	The maintained component within the asset	Run to Fail Periodic Hours Run Condition	Warranty end date provided by the principal contractor or the Original Equipment Manufacturer	On maintenance - performed by contractor until plant acceptance handover Off maintenance - performed by QUTU (or delegate) after plant acceptance handover	i.e. number of days / months / years etc (for periodic based maintenance) or number of hours run (hours run based maintenance)	For "Condition" based maintenance, the condition indicator that determines when maintenance is required	
RWSTP-HV-0210-080 - HAND VALVE 200mm							
RWSTP-HV-0210-030 - HAND VALVE 200mm							
RWSTP-FE-0210-010 - MAGNETIC FLOWMETER							
RWSTP-HV-0210-012 - HAND VALVE 250mm							
RWSTP-HV-0210-011 - HAND VALVE 250mm							
RWSTP-SB-0210-010 - STOP BOARD 1							
RWSTP-SCN-0210-010 - MANUAL SCREEN							
RWSTP-SB-0210-020 - STOP BOARD 2							
RWSTP-SB-0210-030 - STOP BOARD 3							
RWSTP-LSH-0210-020 - LEVEL SWITCH HIGH							
RWSTP-SCY-0210-010 - SCREEN EXTRACTOR	Garbage Bin	Cleaning			Every day		Cut off plastic sock and tie off Replace full bin with empty one Pull down and re-tie sock
	Entire structure of the machine including supports and rotation spiral	Inspection			100 hours		Direction of rotation of the spiral, structure stability and perfect covers locking
	Anti-wear plates	Inspection			100 hours		Clamping bolts
	Safety measures - identifying	Inspection			100 hours		Presence and integrity
	Screen and brushes	Inspection			100 hours		Perfect filtration and correct tightening of the brushes
	Flexible hose	Inspection			100 hours		Check fixing
	Drainage outlets	Inspection					Check for absence of clogging materials
	Washing system (nozzles and	Inspection			40 hours		Working efficiency of cleaning water delivery system
	Seals and anti-wear plates	Inspection			1 month		wear condition
	Screen	Cleaning			1 month		Cleaning
	Entire structure of the machine and anti-wear plates	Inspection			1 year		check the tightening of the nuts and bolts and wear condition
	Motor	replace seals and coating			2 years		replace seals and coating
	Cleaning Brushes	Replacement				Faulty, highly clogged, worn or damaged	Isolate machine Move machine away from it's work position Unscrew the screws Replace Brushes
	Screen Basket	Replacement				Faulty, highly clogged, worn or damaged	Isolate machine Move machine away from it's work position Unscrew the bolts Put new basket on





## Operations - Asset-Equipment List Table Template

						Faulty, highly clogged, worn or damaged	Isolate machine Move machine away from it's work position Unscrew the screws Replace flaps
	Lateral Flaps	Replacement					
	Wearing bars	Replacement				Damaged	Deassemble upper cone Replace wearing bars Reassemble
RWSTP-SB-0210-040 - STOP BOARD 4							
RWSTP-PU-1150-010 - KWIKFLO PUMP STATION	QUU Supplied						
RWSTP-NRV-0210-001 - NON-RETURN VALVE 32mm							
RWSTP-LS-0210-030 - LEVEL SWITCH (HIGH)							
RWSTP-HV-0210-001 - HAND VALVE 32mm							
RWSTP-HV-0210-002 - HAND VALVE 32mm							
RWSTP-LS-0210-010 - LEVEL SWITCH (FOR HIGH HIGH)							
RWSTP-LS-0210-020 - LEVEL SWITCH (FOR HIGH)							
RWSTP-HV-0210-070 - HAND VALVE							
RWSTP-HV-0210-040 - HAND VALVE							
RWSTP-VCE-0210-010 - ACTUATED VALVE	U9VL lithium manganese dioxide battery	Replacement			5 years		Replace actuator battery. The main power feed to the actuator should be left on while this is done
RWSTP-HV-0210-050 - HAND VALVE							
RWSTP-HV-0210-060 - HAND VALVE							
RWSTP-FIT-0510-010 - MAGNETIC FLOWMETER							
RWSTP-HV-0510-030 - HAND VALVE							
RWSTP-TK-0510-010 - SBR ZONE 1 (DEMAND AERATION TANK)							
RWSTP-MX-0510-010 - MIXER AquaDDM Direct Drive Mixer-Blender	LiquiTek AquaDDM Mixer	Lubrication			5 years		Relubrication of motor with chevron black pearl EP 2
	LiquiTek AquaDDM Mixer	De-ragging			1 week		Using hoooked pole, scrape away rag from aerotrs
	LiquiTek AquaDDM Mixer	Check and maintain			1 week		Check mooring lines are secure, remove rag from lines
RWSTP-VSD-0510-010 - VARIABLE SPEED DRIVE 1 VLT Aqua Drive 8000	Variable Speed Drive	Variable Speed Drive				Aerator motor is not reaching full power or is functioning incorrectly	Consult troubleshooting guide to determine whether it may be an issue with the VSD
RWSTP-AER-0510-010 - AERATOR 1 Aqua Jet Surface Mechanical Aerator	AquaJet Aerator	Lubrication			5 years		Relubrication of motor with chevron black pearl EP 2
	AquaJet Aerator	De-ragging			1 week		Using hoooked pole, scrape away rag from aerotrs
	Mooring Lines	Check and maintain			1 week		Check mooring lines are secure, remove rag from lines
RWSTP-VSD-0510-011 - VARIABLE SPEED DRIVE 2 VLT Aqua Drive 8000	Variable Speed Drive	Variable Speed Drive				Aerator motor is not reaching full power or is functioning incorrectly	Consult troubleshooting guide to determine whether it may be an issue with the VSD
RWSTP-AER-0510-011 - AERATOR 2 Aqua Jet Surface Mechanical Aerator	AquaJet Aerator	Lubrication			5 years		Relubrication of motor with chevron black pearl EP 2
	AquaJet Aerator	De-ragging			1 week		Using hoooked pole, scrape away rag from aerotrs
	Mooring Lines	Check and maintain			1 week		Check mooring lines are secure, remove rag from lines
RWSTP-AIT-0510-010 - DISSOLVED OXYGEN SENSOR Endress and Hauser Oxymax COS61D Dissolved oxygen sensor	Sealing Ring	Replacement			When visibly damaged		Replace Sealing Ring
	Florescent Cap (Sensor Cap)	Replacement			2 years		Removal of old florescent cap and installation of new cap





## Operations - Asset-Equipment List Table Template

	Membrane	Cleaning			If sensor is faulting If membrane is clogged		Removal of membrane from housing. Clean and dry membrane Return to housing
RWSTP-TK-0510-020 - SBR ZONE 2 (INTERMITTENT AERATION TANK)							
RWSTP-MX-0510-020 - MIXER AquaDDM Direct Drive Mixer-Blender	LiquiTek AquaDDM Mixer	Lubrication			5 years		Relubrication of motor with chevron black pearl EP 2
	LiquiTek AquaDDM Mixer	De-ragging			1 week		Using hooked pole, scrape away rag from aerotrs
	LiquiTek AquaDDM Mixer	Check and maintain			1 week		Check mooring lines are secure, remove rag from lines
RWSTP-VSD-0510-020 - VARIABLE SPEED DRIVE 3 VLT Aqua Drive 8000	Variable Speed Drive	Variable Speed Drive				Aerator motor is not reaching full power or is functioning incorrectly	Consult troubleshooting guide to determine whether it may be an issue with the VSD
RWSTP-AER-0510-020 - AERATOR 3 Aqua Jet Surface Mechanical Aerator	AquaJet Aerator	Lubrication			5 years		Relubrication of motor with chevron black pearl EP 2
	AquaJet Aerator	De-ragging			1 week		Using hooked pole, scrape away rag from aerotrs
	Mooring Lines	Check and maintain			1 week		Check mooring lines are secure, remove rag from lines
RWSTP-VSD-0510-021 - VARIABLE SPEED DRIVE 4 VLT Aqua Drive 8000	Variable Speed Drive	Variable Speed Drive				Aerator motor is not reaching full power or is functioning incorrectly	Consult troubleshooting guide to determine whether it may be an issue with the VSD
RWSTP-AER-0510-021 - AERATOR 4 Aqua Jet Surface Mechanical Aerator	AquaJet Aerator	Lubrication			5 years		Relubrication of motor with chevron black pearl EP 2
	AquaJet Aerator	De-ragging			1 week		Using hooked pole, scrape away rag from aerotrs
	Mooring Lines	Check and maintain			1 week		Check mooring lines are secure, remove rag from lines
RWSTP-AIT-0510-010 - DISSOLVED OXYGEN SENSOR Endress and Hauser Oxymax COS61D Dissolved oxygen sensor	Sealing Ring	Replacement			When visibly damaged		Replace Sealing Ring
	Florescent Cap (Sensor Cap)	Replacement			2 years		Removal of old florescent cap and installation of new cap
	Membrane	Cleaning			If sensor is faulting If membrane is clogged		Removal of membrane from housing. Clean and dry membrane Return to housing
RWSTP-LIT-0510-020 - LEVEL INDICATING TRANSMITTER							
RWSTP-LS-0510-020 - LEVEL SWITCH (HIGH HIGH)							
RWSTP-LS-0510-030 - LEVEL SWITCH (HIGH)							
RWSTP-DEC-0510-025 - DECANTER							
RWSTP-HV-0510-020 - HAND VALVE							
RWSTP-HV-0510-050 - HAND VALVE							
RWSTP-HV-0510-060 - HAND VALVE							
RWSTP-HV-0540-020 - HAND VALVE							
RWSTP-FS-0540-010 - FLOW SWITCH (PROXIMITY SWITCH)	Efactor100						
RWSTP-NRV-0540-020 - NON-RETURN VALVE							
RWSTP-VSD-0540-020 - VARIABLE SPEED DRIVE							
RWSTP-PU-0540-020 - RAS PUMP 1 Amarex KRT Submersable Pump KRTF 150-315/66UKG-D IE3	Insulation Resistance	Insulation Resistance Test			1 year		Measure the insulation resistance of the motor winding during annual maintenance work
	Power Cables	Checking power cables			1 year		Inspect cables and replace when necessary during annual maintenance
	Sensors	Check the Sensors			3 years		Measure the resistance between terminals





## Operations - Asset-Equipment List Table Template

	Lubrication	Change the lubricant			3 years		Ensure correct lubricant is supplied Check quantity of lubricant Open reservoir, drain and replace
	Entire Pump	General Overhaul			5 years		Dismantling and replacing parts General servicing
	Entire Pump	De-gassing of pumps				On each operator visit, or if the pumps have lost prime	Place bucket underneath copper tube on pump Crack the ball valve until effluent begins draining Close the ball valve
RWSTP-HV-0540-022 - HAND VALVE							
RWSTP-HV-0540-021 - HAND VALVE							
RWSTP-FS-0540-012 - FLOW SWITCH (PROXIMITY SWITCH)	Efector100						
RWSTP-NRV-0540-021 - NON-RETURN VALVE							
RWSTP-VSD-0540-021 - VARIABLE SPEED DRIVE							
RWSTP-PU-0540-021 - RAS PUMP 2 Amarex KRT Submersable Pump KRTF 150-315/66UKG-D IE3	Insulation Resistance	Insulation Resistance Test			1 year		Measure the insulation resistance of the motor winding during annual maintenance work
	Power Cables	Checking power cables			1 year		Inspect cables and replace when necessary during annual maintenance
	Sensors	Check the Sensors			3 years		Measure the resistance between terminals
	Lubrication	Change the lubricant			3 years		Ensure correct lubricant is supplied Check quantity of lubricant Open reservoir, drain and replace
	Entire Pump	General Overhaul			5 years		Dismantling and replacing parts General servicing
	Entire Pump	De-gassing of pumps				On each operator visit, or if the pumps have lost prime	Place bucket underneath copper tube on pump Crack the ball valve until effluent begins draining Close the ball valve
RWSTP-HV-0540-023 - HAND VALVE							
RWSTP-HV-0530-012 - HAND VALVE							
RWSTP-VSD-0530-010 - VARIABLE SPEED DRIVE							
RWSTP-PU-0530-010 - WAS PUMP 1 Sewatec Dry-installed Volute Casing Pump	Entire Pump	Inspection				If the pump appears to be clogged	Open inspection hole Inspect the pump Close Inspection hole
	Lubrication	Change the lubricant			3 years		Ensure correct lubricant is supplied Check quantity of lubricant Open reservoir, drain and replace
RWSTP-FS-0530-010 - FLOW SWITCH (PROXIMITY SWITCH)							
RWSTP-NRV-0530-010 - NON-RETURN VALVE							
RWSTP-HV-0530-010 - HAND VALVE							
RWSTP-HV-0530-013 - HAND VALVE							
RWSTP-VSD-0530-011 - VARIABLE SPEED DRIVE							
RWSTP-PU-0530-011 - WAS PUMP 2 Sewatec Dry-installed Volute Casing Pump	Entire Pump	Inspection				If the pump appears to be clogged	Open inspection hole Inspect the pump Close Inspection hole
	Lubrication	Change the lubricant			3 years		Ensure correct lubricant is supplied Check quantity of lubricant Open reservoir, drain and replace
RWSTP-FS-0530-011 - FLOW SWITCH (PROXIMITY SWITCH)							





## Operations - Asset-Equipment List Table Template

RWSTP-NRV-0530-011 - NON-RETURN VALVE						
RWSTP-HV-0530-011 - HAND VALVE						
RWSTP-HV-0710-001 - HAND VALVE						
RWSTP-HV-0710-002 - HAND VALVE						
RWSTP-TK-0710-020 - EFFLUENT PUMP STATION						
RWSTP-LIT-0710-010 - LEVEL INDICATOR TRANSMITTER						
RWSTP-LS-0710-010 - LEVEL SWITCH (HIGH)						
RWSTP-LS-0710-020 - LEVEL SWITCH (LOW)						
RWSTP-VSD-0710-010 - VARIABLE SPEED DRIVE						
RWSTP-PU-0710-010 - EFFLUENT PUMP 1 KRT Amarex Submersible Sump Pump KRTK 150-315/46UG-S	Insulation Resistance	Insulation Resistance Test			1 year	Measure the insulation resistance of the motor winding during annual maintenance work
	Power Cables	Checking power cables			1 year	Inspect cables and replace when necessary during annual maintenance
	Lifting chain/rope	Inspect the lifting chain/rope			1 year	Inspect chain/rope for any damage and replace as required
	Sensors	Check the Sensors			3 years	Measure the resistance between terminals
	Mechanical Seal	Check for mechanical seal			3 years	Remove plug and drain leakage
	Lubrication	Change the lubricant			3 years	Ensure correct lubricant is supplied Check quantity of lubricant Open reservoir, drain and replace
	Bearings	Lubrication of bearings			3 years	Check grease quality Check grease quantity Lubricate bearings
	Entire Pump	General Overhaul			5 years	Dismantling and replacing parts General servicing
RWSTP-NRV-0710-010 - NON-RETURN VALVE						
RWSTP-HV-0710-010 - HAND VALVE						
RWSTP-VSD-0710-011 - VARIABLE SPEED DRIVE						
RWSTP-PU-0710-011 - EFFLUENT PUMP 2 KRT Amarex Submersible Sump Pump KRTK 150-315/46UG-S	Insulation Resistance	Insulation Resistance Test			1 year	Measure the insulation resistance of the motor winding during annual maintenance work
	Power Cables	Checking power cables			1 year	Inspect cables and replace when necessary during annual maintenance
	Lifting chain/rope	Inspect the lifting chain/rope			1 year	Inspect chain/rope for any damage and replace as required
	Sensors	Check the Sensors			3 years	Measure the resistance between terminals
	Mechanical Seal	Check for mechanical seal			3 years	Remove plug and drain leakage
	Lubrication	Change the lubricant			3 years	Ensure correct lubricant is supplied Check quantity of lubricant Open reservoir, drain and replace
	Bearings	Lubrication of bearings			3 years	Check grease quality Check grease quantity Lubricate bearings
	Entire Pump	General Overhaul			5 years	Dismantling and replacing parts General servicing
RWSTP-NRV-0710-011 - NON-RETURN VALVE						
RWSTP-HV-0710-011 - HAND VALVE						
RWSTP-FIT-0710-010 - MAGNETIC FLOWMETER						
RWSTP-HV-0710-020 - HAND VALVE						





## Operations - Asset-Equipment List Table Template

RWSTP-HV-0710-021 - HAND VALVE							
RWSTP-TK-0710-030 - CHLORINE CONTACT TANK							
RWSTP-PU-0710-030 - SUBMERSABLE MIXING PUMP DW VOX 75 Submersable Free Standing 0.55kW 415V	Mechanical Seals	Replacement				Pump not operating as intended	Remove and replace
	Grommets	Replacement				Pump not operating as intended	Remove and replace
	Bearings	Replacement				Pump not operating as intended	Remove and replace
	Capacitors	Replacement				Pump not operating as intended	Remove and replace
RWSTP-HV-0710-022 - HAND VALVE							
RWSTP-AIT-0710-010 - OXYDATION REDUCTION POTENTIAL SENSOR Orbisint CPS12D ORP Sensor	ORP Sensor	Cleaning				Faulty readings No readings	Clean the sensor with distilled water, re-calibrate
RWSTP-HV-0710-023 - HAND VALVE							
RWSTP-HV-0710-024 - HAND VALVE							
RWSTP-HV-0710-031 - HAND VALVE							
RWSTP-NRV-0710-050 - NON-RETURN VALVE							
RWSTP-ZO-0710-010 - SOLENOID VALVE							
RWSTP-HV-0710-030 - HAND VALVE							
RWSTP-HV-0710-032 - HAND VALVE							
RWSTP-TK-0710-040 - CHLORINATED EFFLUENT SUMP							
RWSTP-NRV-0710-040 - NON-RETURN VALVE							
RWSTP-NRV-0710-0XX - NON-RETURN VALVE							
RWSTP-NRV-0710-0XX - NON-RETURN VALVE							
RWSTP-HV-0710-060 - HAND VALVE							
RWSTP-PU-0710-040 - ANALYSER FEED PUMP							
RWSTP-AIT-0710-020 - RESIDUAL CHLORINE ANALYSER Chloromax CCS142D	Sensor Membrane	Cleaning				If membrane is visibly soiled	Remove sensor from flow assembly Clean Membrane gently with 0.5% Hydrochloric acid in water solution Replace membrane
	Electrolyte	Re-filling				Membrane or electrodes damaged, air bubbles Measuring errors up to total failure of the measuring point	Remove sensor from flow assembly Dispose of existing electrolyte in sensor Pour electrolyte into chamber Tap to remove air bubbles Reassemble Sensor
	Silver chloride Layer	Sensor Regeneration				If the silver chloride layer has changed color to brown	Send sensor to manufacturer for regeneration
	Sensor	Reconditioning				Sensor has been >3 months in chlorine free media	Sensor must be reconditioned as it has deactivated
RWSTP-FS-0710-010 - FLOW SWITCH							
RWSTP-LIT-0710-011 - LEVEL SENSOR							
RWSTP-AIT-0710-030 - TURBIDITY ANALYSER Turbimax CUS51D Turbidity Sensor	Sensor	Cleaning				Sensor is fouled by lime deposits	Immerse the sensor in 1-5 % hydrochloric acid (for a few minutes). Rinse thoroughly with water
	Sensor	Cleaning				Dirt particles are found in the optical window	Use a cloth to clean the optical windows Rinse thoroughly with water
RWSTP-PU-0710-050 - SERVICE WATER PUMP 1	Not installed by ACPL						
RWSTP-HV-0710-042 - HAND VALVE							





## Operations - Asset-Equipment List Table Template

RWSTP-HV-0710-040 - HAND VALVE							
RWSTP-NRV-0710-020 - NON-RETURN VALVE							
RWSTP-HV-0710-041 - HAND VALVE							
RWSTP-PU-0710-060 - SERVICE WATER PUMP 2	Not installed by ACPL						
RWSTP-HV-0710-043 - HAND VALVE							
RWSTP-HV-0710-045 - HAND VALVE							
RWSTP-NRV-0710-030 - NON-RETURN VALVE							
RWSTP-HV-0710-044 - HAND VALVE							
RWSTP-PS-0710-010 - PRESSURE SWITCH							
RWSTP-PIT-0710-050 - PRESSURE INDICATING TRANSMITTER							
RWSTP-TK-0710-010 - EFFLUENT HOLDING TANK 1							
RWSTP-LS-0710-010 - LIMIT SWITCH (LOW LIMIT)							
RWSTP-LS-0710-051 - LIMIT SWITCH (HIGH LIMIT)							
RWSTP-HV-0710-050 - HAND VALVE							
RWSTP-HV-0710-051 - HAND VALVE							
RWSTP-TK-0710-060 - EFFLUENT HOLDING TANK 2							
RWSTP-LS-0710-060 - LIMIT SWITCH (LOW LIMIT)							
RWSTP-LS-0710-061 - LIMIT SWITCH (HIGH LIMIT)							
RWSTP-VCE-0710-010 - ACTUATED VALVE							
RWSTP-VSD-2000-010 - VARIABLE SPEED DRIVE							
RWSTP-PU-2000-010 - RECYCLED WATER PUMP 1 Vm65-43/B Davey Pump	Fan Exhaust	Cleaning				If fan exhaust appears blocked or dirty	Clean with a moist rag
RWSTP-HV-2000-015 - HAND VALVE							
RWSTP-HV-2000-010 - HAND VALVE							
RWSTP-NRV-2000-010 - NON-RETURN VALVE							
RWSTP-HV-2000-011 - HAND VALVE							
RWSTP-HV-2000-017 - HAND VALVE							
RWSTP-VSD-2000-020 - VARIABLE SPEED DRIVE							
RWSTP-PU-2000-020 - RECYCLED WATER PUMP 2 Vm65-43/B Davey Pump	Fan Exhaust	Cleaning				If fan exhaust appears blocked or dirty	Clean with a moist rag
RWSTP-HV-2000-016 - HAND VALVE							
RWSTP-HV-2000-012 - HAND VALVE							
RWSTP-NRV-2000-011 - NON-RETURN VALVE							
RWSTP-HV-2000-013 - HAND VALVE							
RWSTP-HV-2000-018 - HAND VALVE							
RWSTP-HV-2000-019 - HAND VALVE							
RWSTP-FIT-2000-010 - MAGNETIC FLOWMETER							
RWSTP-HV-2000-032 - HAND VALVE							
RWSTP-HV-2000-033 - HAND VALVE							
<b>RWSTP-0420-WAS THICKENING AND STORAGE</b>							
RWSTP-HV-0420-022 - HAND VALVE 40mm							
RWSTP-TK-0420-020 - FLOC TANK	Covered within RDT Manual						
RWSTP-MX-0420-010 - MIXER	Covered within RDT Manual						
RWSTP-RDT-0420-010 - ROTARY DRUM THICKENER							open the ball valve connecting the nozzles pipe drain point to the lower tank, turn the handwheel connected to the internal brush: in this way the spray nozzles will self-clean and the dirty water will flow out through the drain outlet.
	Spray Nozzles	Cleaning			1 day		
	Drum Supports	Greasing			10 days		Check and greasing of the drum supports, grease if necessary





## Operations - Asset-Equipment List Table Template

	Speed Motor Variator	Greasing			20 days		Check and lubrication of the speed motor variator ed top up if necessary
RWSTP-BND-0420-010 - BUND							
RWSTP-ZS-0420-010 - POSITION SWITCH (PLOUGH SWITCH)							
RWSTP-HV-0420-022 - HAND VALVE 25mm							
RWSTP-HV-0420-023 - HAND VALVE 25mm							
RWSTP-HV-0420-024 - HAND VALVE 25mm							
RWSTP-HV-0420-030 - HAND VALVE 80mm							
RWSTP-HV-0420-031 - HAND VALVE 80mm							
RWSTP-HV-0420-032 - HAND VALVE 15mm							
RWSTP-HV-0420-033 - HAND VALVE 80mm							
RWSTP-SN-0420-010 - SOLENOID VALVE 80mm (VALVE OPEN CONTROL)							
RWSTP-PG-0420-010 - PRESSURE GAGUE (PORTABLE)							
RWSTP-FS-0420-030 - FLOW SWITCH (LOW)							
RWSTP-PS-0420-0XX - PRESSURE SWITCH (LOW)							
RWSTP-ZX-0420-0XX - POSITION SWITCH (ALARM)							
RWSTP-ZX-0420-0XX - POSITION SWITCH (ALARM)							
RWSTP-FE-0420-010 - FLOW SENSING ELEMENT							
RWSTP-FIT-0420-010 - FLOW INDICATOR TRANSMITTER (CONTROL)							
RWSTP-HV-0420-010 - HAND VALVE 150mm							
RWSTP-HV-0420-011 - HAND VALVE 150mm							
RWSTP-HV-0420-012 - HAND VALVE 150mm							
RWSTP-TK-0420-010 - TWAS STORAGE TANK							
RWSTP-LIT-0420-010 - LEVEL INDICATING TRANSMITTER (CONTROLLED)							
RWSTP-HV-0420-021 - HAND VALVE 80mm							
RWSTP-HV-0420-020 - HAND VALVE 80mm							
RWSTP-NRV-0420-020 - NON-RETURN VALVE 80mm							
RWSTP-FS-0420-020 - FLOW SWITCH (LOW)							
RWSTP-PU-0420-010 - WAS THICKENER FEED PUMP							
RWSTP-VSD-0420-010 - VARIABLE SPEED DRIVE (W/ SPEED INDICATOR CONTROLLER)							
<b>RWSTP-460 - POLYMER DOSAGE SKID</b>	All lines Valves All equipment	Inspection			1 day		Visual inspect all lines for leaks and faults Check for crystallising chlorine that will buildup
	Mounting	Inspection			1 month		Check for vibration and security of mounting
RWSTP-HV-0460-040 - HAND VALVE 63mm							
RWSTP-FS-0460-010 - FLOW SWITCH (LOW)							
RWSTP-SN-0460-010 - SOLENOID VALVE 32mm (OPEN VALVE CONTROL)							
RWSTP-RPZ-0460-010 - REDUCED PRESSURE ZONE 32mm							
RWSTP-HV-0460-001 - HAND VALVE 32mm							
RWSTP-EJC-0460-010 - POLY UNIT 1 EJECTOR							
RWSTP-HTR-0460-010 - POLY UNIT 1 HEATER PAD							
RWSTP-FDR-0460-010 - POLY UNIT 1 SCREW FEEDER							
RWSTP-SS-0460-010 - SPEED SWITCH							
RWSTP-HPR-0460-010 - POLY UNIT 1 HOPPER							
RWSTP-LS-0460-010 - LIMIT SWITCH (HIGH)							
RWSTP-LS-0460-011 - LIMIT SWITCH (LOW)							
RWSTP-MX-0460-011 - MIXER							
RWSTP-LS-0460-020 - LIMIT SWITCH (HIGH)							
RWSTP-LS-0460-021 - LIMIT SWITCH (LOW)							
RWSTP-TK-0460-010 - POLY UNIT 1 BATCHING TANK							





## Operations - Asset-Equipment List Table Template

RWSTP-ZSO-0460-010 - POSITION SWITCH OPEN (POSITION INDICATOR OPEN)							
RWSTP-ZSC-0460-010 - POSITION SWITCH CLOSED (POSITION INDICATOR CLOSED)							
RWSTP-VCA-0460-010 - VALVE CONTROL AIR 40mm							
RWSTP-TK0-0460-020 - POLY UNIT 1 DOSING TANK							
RWSTP-LS-0460-030 - LIMIT SWITCH (HIGH)							
RWSTP-LS-0460-031 - LIMIT SWITCH (LOW)							
RWSTP-CCL-0460-010 - CALIBRATION CYLINDER	Calibration cylinder	cleaning				when required	remove dirt and debris build-up
RWSTP-HV-0460-002 - HAND VALVE 15mm							
RWSTP-HV-0460-004 - HAND VALVE 15mm							
RWSTP-HV-0460-041 - HAND VALVE 40mm							
RWSTP-HV-0460-020 - HAND VALVE 40mm							
RWSTP-HV-0460-010 - HAND VALVE 40mm							
RWSTP-STR-0460-010 - STRAINER	strainer	cleaning			1 month		check for debris, remove build-up, clean
RWSTP-STR-0460-020 - STRAINER	strainer	cleaning			1 month		check for debris, remove build-up, clean
RWSTP-HV-0460-022 - HAND VALVE 20mm							
RWSTP-HV-0460-023 - HAND VALVE 20mm							
RWSTP-HV-0460-012 - HAND VALVE 20mm							
RWSTP-HV-0460-013 - HAND VALVE 20mm							
RWSTP-HV-0460-011 - HAND VALVE 40mm							
RWSTP-HV-0460-021 - HAND VALVE 40mm							
RWSTP-NRV-0460-010 - NON RETURN VALVE 40mm	Non-return valve	clearing				after diaphragm breakage	remove the ball non-return valve immediately and clean it
RWSTP-NRV-0460-020 - NON RETURN VALVE 40mm	Non-return valve	clearing				after diaphragm breakage	remove the ball non-return valve immediately and clean it
RWSTP-PU-0460-020 - POLY UNIT 1 PUMP DUTY/STANDBY	Rotor and Stator	replacement				when the pump performance goes down beyond an acceptable level.	The wear rate of rotor and stator depends on many factors, such as abrasiveness of the fluid media, speed, discharge pressure etc. One or possibly both the components (i.e. rotor and stator) need replacement.
	Pump Joints	Greasing				as required	apply bearing grease to pump joints
	Pump	Calibrate pump			3 months		calibrate dosage pump
	Pump	Replace pump kit			1 year		replace pump kit - refer grundfos installation and maintenance manual section 9
	Pump	Servicing			1 year		general servicing of pump by grundfos aldor
	Diaphragm and suction valves	Cleaning			1 year		Replace diaphragm and suction valves. This is subject to variables so a longer lifespan may be expected
RWSTP-VSD-0460-020 - VARIABLE SPEED DRIVE (SPEED INDICATOR CONTROLLER)							
RWSTP-PU-0460-010 - POLY UNIT 1 PUMP DUTY/STANDBY	Rotor and Stator	replacement				when the pump performance goes down beyond an acceptable level.	The wear rate of rotor and stator depends on many factors, such as abrasiveness of the fluid media, speed, discharge pressure etc. One or possibly both the components (i.e. rotor and stator) need replacement.
	Pump Joints	Greasing				as required	apply bearing grease to pump joints





## Operations - Asset-Equipment List Table Template

	Pump	Calibrate pump			3 months		calibrate dosage pump
	Pump	Replace pump kit			1 year		replace pump kit - refer grundfos installation and maintenance manual section 9
	Pump	Servicing			1 year		general servicing of pump by grundfos aldor
	Diaphragm and suction valves	Cleaning			1 year		Replace diaphragm and suction valves. This is subject to variables so a longer lifespan may be expected
RWSTP-VSD-0460-010 - VARIABLE SPEED DRIVE (SPEED INDICATOR CONTROLLER)							
RWSTP-VPF-0460-020 - VALVE PRESSURE RELIEF 40mm							
RWSTP-VPF-0460-010 - VALVE PRESSURE RELIEF 40mm							
RWSTP-HV-0460-006 - HAND VALVE 40mm							
RWSTP-MX-0460-010 - MIXER							
RWSTP-HV-0460-003 - HAND VALVE 40mm							
RWSTP-HV-0460-030 - HAND VALVE 25mm							
RWSTP-NRV-0460-030 - NON RETURN VALVE 25mm	Non-return valve	clearing				after diaphragm breakage	remove the ball non-return valve immediately and clean it
RWSTP-SN-0460-030 - SOLENOID VALVE 25mm (OPEN VALVE CONTROL)							
RWSTP-FS-0460-030 - FLOW SWITCH (LOW)							
RWSTP-FI-0460-030 - FLOW INDICATOR							
RWSTP-HV-0460-024 - HAND VALVE 15mm							
RWSTP-PG-0460-030 - PRESSURE GAUGE (PORTABLE)							
RWSTP-HV-0460-031 - HAND VALVE 25mm							
RWSTP-LS-0460-040 - LIMIT SWITCH (HIGH)							
RWSTP-BND-0460-010 - POLYMER BUND							
RWSTP-3040 - CHLORINE DOSAGE SKID							
RWSTP-SN-3040-010 - SOLENOID VALVE 25mm (VALVE OPEN CONTROL)							
RWSTP-FS-3040-011 - FLOW SWITCH (LOW)							
RWSTP-FI-3040-011 - FLOW INDICATOR							
RWSTP-HV-3040-022 - HAND VALVE 15mm							
RWSTP-PG-3040-010 - PRESSURE GAUGE							
RWSTP-HV-3040-021 - HAND VALVE 25mm							
RWSTP-HV-3040-040 - HAND VALVE 25mm							
RWSTP-HV-3040-030 - HAND VALVE 25mm							
RWSTP-VPR-3040-010 - VALVE PRESSURE REDUCER 300kPa 25mm							
RWSTP-VPR-3040-020 - VALVE PRESSURE REDUCER 300kPa 25mm							
RWSTP-SSH-3040-001 - SAFETY SHOWER (SODIUM HYPO)	Safety Shower	Checking and clearing			1 week		activate the shower to ensure it remains operational, and to clear the lines from stagnant water
	Safety Shower	Servicing			1 year		shower requires servicing once a year to maintain AS conformance
RWSTP-HV-3040-005 - HAND VALVE 15mm							
RWSTP-HV-3040-003 - HAND VALVE 20mm							
RWSTP-HV-3040-200 - HAND VALVE 15mm							
RWSTP-HV-3040-202 - HAND VALVE 15mm							
RWSTP-HV-3040-203 - HAND VALVE 15mm							
RWSTP-HV-3040-204 - HAND VALVE 15mm							
RWSTP-STR-3040-020 - STRAINER	strainer	cleaning			1 month		check for debris, remove build-up, clean
RWSTP-VPF-3040-200 - VALVE PRESSURE RELIEF 15mm							
RWSTP-SIC-3040-020 - SPEED INDICATOR CONTROLLER							





## Operations - Asset-Equipment List Table Template

RWSTP-FI-3040-020 - FLOW INDICATOR							
RWSTP-PU-3040-020 - SODIUM HYPO DOSING PUMP 2	Pump	Calibrate pump			3 months		calibrate dosage pump ensuring correct chlorine delivery
	Pump	Replace pump kit			1 year		replace pump kit - refer grundfos installation and maintenance manual section 9
	Pump	Servicing			1 year		general servicing of pump by grundfos aldor
	Diaphragm	Cleaning				If leaking or clogged	Clean the diaphragm and valves and replace, if necessary (for stainless-steel valves: inner valve parts)
RWSTP-HV-3040-100 - HAND VALVE 15mm							
RWSTP-HV-3040-103 - HAND VALVE 15mm							
RWSTP-HV-3040-201 - HAND VALVE 15mm							
RWSTP-HV-3040-104 - HAND VALVE 15mm							
RWSTP-STR-3040-010 - STRAINER							
RWSTP-VPF-3040-100 - VALVE PRESSURE RELIEF 15mm							
RWSTP-SIC-3040-010 - SPEED INDICATOR CONTROLLER							
RWSTP-FI-3040-010 - FLOW INDICATOR							
RWSTP-PU-3040-010 - SODIUM HYPO DOSING PUMP 1							
RWSTP-NRV-3040-100 - NON RETURN VALVE 15mm	Non-return valve	clearing				after diaphragm breakage	remove the ball non-return valve immediately and clean it
RWSTP-SSH-3040-002 - SAFETY SHOWER (CHEMICAL DELIVERY)	Safety Shower	Checking and clearing			1 week		activate the shower to ensure it remains operational, and to clear the lines from stagnant water
	Safety Shower	Servicing			1 year		shower requires servicing once a year to maintain AS conformance
RWSTP-HS-3040-011 - HAND SWITCH							
RWSTP-HS-3040-012 - HAND SWITCH							
RWSTP-HS-3040-013 - HAND SWITCH							
RWSTP-LI-3040-012 - LEVEL INDICATOR							
RWSTP-LAH-3040-012 - LEVEL ALARM HIGH							
RWSTP-HV-3040-001 - HAND VALVE 50mm							
RWSTP-HV-3040-002 - HAND VALVE 50mm							
RWSTP-HV-3040-004 - HAND VALVE 15mm							
RWSTP-FS-3040-010 - FLOW SWITCH (LOW)							
RWSTP-HV-3040-020 - HAND VALVE 25mm							
RWSTP-NRV-3040-010 - NON RETURN VALVE 25mm	Non-return valve	clearing				after diaphragm breakage	remove the ball non-return valve immediately and clean it
RWSTP-VPS-3040-010 - VALVE PRESSURE SUSTAINING 25mm							
RWSTP-HV-3040-018 - HAND VALVE 15mm							
RWSTP-HV-3040-014 - HAND VALVE 15mm							
RWSTP-NRV-3040-200 - NON RETURN VALVE 15mm							
RWSTP-DMP-3040-010 - DAMPENER							
RWSTP-HV-3040-013 - HAND VALVE 15mm							
RWSTP-HV-3040-015 - HAND VALVE 15mm							
RWSTP-HV-3040-016 - HAND VALVE 15mm							
RWSTP-HV-3040-017 - HAND VALVE 15mm							
RWSTP-PG-3010-010 - PRESSURE GAUGE							
RWSTP-BND-3040-010 - SODIUM HYPOCHLORITE BUND							
RWSTP-HV-3040-006 - HAND VALVE 50mm							
RWSTP-TK-3040-010 - SODIUM HYPOCHLORITE TANK 1500L							
RWSTP-LS-3040-010 - LEVEL SENSOR (LOW LOW, LOW, HIGH, HIGH HIGH)							
RWSTP-HV-3040-010 - HAND VALVE 15mm							
RWSTP-HV-3040-011 - HAND VALVE 15mm							



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Operations - Asset-Equipment List Table Template

RWSTP-HV-3040-012 - HAND VALVE 15mm							
RWSTP-CCL-3040-010 - CALIBRATION CYLINDER	Calibration cylinder	cleaning				when required	remove dirt and debris build-up
RWSTP-HV-3040-101 - HAND VALVE 15mm							
RWSTP-HV-3040-102 - HAND VALVE 15mm							

## **2.7 LIST OF SUB-CONTRACTORS & PROPRIETARY EQUIPMENT**

Refer Section 2.1 of this Operations & Maintenance Manual.

**2.8 RECOMMENDED SPARE PARTS & SPECIAL TOOLS****Bill of Materials for Maintenance**

1. All parts required to perform the maintenance items outlined in the "Asset\_Equipment Maint Req" Sheet
2. All identified critical spares

Asset ID	Asset Component	Part Number	Part Description	Shelf Life	Critical Y/N	Quantity	Manufacturer	Supplier	Column1	Column2
								Name	Location	Contact
Tag no. from P&ID	The maintained component within the asset	Manufacturer's part number								
RWSTP-SCY-0210-010 - SCREEN EXTRACTOR	Garbage Bin		Plastic Sock		Y		CST Wastewater Solutions	CST Wastewater Solutions	Roseville	02 9417 3611
	Cleaning Brushes		Cleaning Brushes		N		CST Wastewater Solutions	CST Wastewater Solutions	Roseville	02 9417 3611
	Screen Basket		Screen Basket		N		CST Wastewater Solutions	CST Wastewater Solutions	Roseville	02 9417 3611
	Lateral Flaps		Lateral Flaps		N		CST Wastewater Solutions	CST Wastewater Solutions	Roseville	02 9417 3611
	Wearing bars		Wearing Bars		N		CST Wastewater Solutions	CST Wastewater Solutions	Roseville	02 9417 3611
RWSTP-VCE-0210-010 - ACTUATED VALVE	Actuator		Actuator Battery, U9VL lithium manganese dioxide battery		Y		Ultralife Corporation	Tyco Water	Currumbin	07 3266 2255
RWSTP-MX-0510-010 - MIXER AquaDDM Direct Drive Mixer-Blender	LiquiTek AquaDDM Mixer		Chevron Black Pearl EP2 Motor Oil		N		Aqua-Aerobics Systems	Liquitek	Seven Hills	02 9624 1722
RWSTP-AER-0510-010 - AERATOR 1 Aqua Jet Surface Mechanical Aerator	AquaJet Aerator		Chevron Black Pearl EP2 Motor Oil		N		Aqua-Aerobics Systems	Liquitek	Seven Hills	02 9624 1722
RWSTP-AER-0510-011 - AERATOR 2 Aqua Jet Surface Mechanical Aerator	AquaJet Aerator		Chevron Black Pearl EP2 Motor Oil		N		Aqua-Aerobics Systems	Liquitek	Seven Hills	02 9624 1722
RWSTP-AIT-0510-010 - DISSOLVED OXYGEN SENSOR Endress and Hauser Oxymax COS81D Dissolved oxygen sensor	Sealing Ring	51518597	Sealing Ring		N	2	Endress & Hauser	E&H	Eight Mile Plains	07 3457 0299
	Florescent Cap (Sensor Cap)	51518598	Florescent Cap (Sensor Cap)		N	1	Endress & Hauser	E&H	Eight Mile Plains	07 3457 0299
	Sensor		Sensor		N	1	Endress & Hauser	E&H	Eight Mile Plains	07 3457 0299
RWSTP-MX-0510-020 - MIXER AquaDDM Direct Drive Mixer-Blender	LiquiTek AquaDDM Mixer		Chevron Black Pearl EP2 Motor Oil		N		Aqua-Aerobics Systems	Liquitek	Seven Hills	02 9624 1722
RWSTP-AER-0510-020 - AERATOR 3 Aqua Jet Surface Mechanical Aerator	AquaJet Aerator		Chevron Black Pearl EP2 Motor Oil		N		Aqua-Aerobics Systems	Liquitek	Seven Hills	02 9624 1722
RWSTP-AER-0510-021 - AERATOR 4 Aqua Jet Surface Mechanical Aerator	AquaJet Aerator		Chevron Black Pearl EP2 Motor Oil		N		Aqua-Aerobics Systems	Liquitek	Seven Hills	02 9624 1722
RWSTP-AIT-0510-010 - DISSOLVED OXYGEN SENSOR Endress and Hauser Oxymax COS81D Dissolved oxygen sensor	Sealing Ring	51518597	Sealing Ring		N	2	Endress & Hauser	E&H	Eight Mile Plains	07 3457 0299
	Florescent Cap (Sensor Cap)	51518598	Florescent Cap (Sensor Cap)		N	1	Endress & Hauser	E&H	Eight Mile Plains	07 3457 0299
	Sensor		Sensor		N	1	Endress & Hauser	E&H	Eight Mile Plains	07 3457 0299
RWSTP-PU-0530-010 - WAS PUMP 1 Sewatec Dry-installed Volute Casing Pump	Lubrication		Chevron Black Pearl EP2 Motor Oil		N		KSB	KSB	Bundamba	1301 301 356
	Cover	163	Discharge Cover		N	2	KSB	KSB	Bundamba	1302 301 356
	Shaft	210	Shaft		N	1	KSB	KSB	Bundamba	1303 301 356
	Impeller	230	Impeller		N	1	KSB	KSB	Bundamba	1304 301 356



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	Bearing	321.01/02	Rolling Element Bearing (Set)	N	1	KSB	KSB	Bundamba	1305 301 358
	Seal	433.01/02	Mechanical Seal	N	2	KSB	KSB	Bundamba	1306 301 358
	Gland Packing		Assembly for Gland Packing including: Neck Bush, Shaft Protecting Sleeve, Lantern Ring	N	1	KSB	KSB	Bundamba	1307 301 358
	Packing Cord		Packing Cord	N	4	KSB	KSB	Bundamba	1308 301 358
	Casing	502.01	Casing Wear Ring	N	2	KSB	KSB	Bundamba	1309 301 358
	Wear Plate	135	Wear Plate	N	2	KSB	KSB	Bundamba	1310 301 358
	Sealing Elements (set)		Sealing Elements (set)	N	4	KSB	KSB	Bundamba	1311 301 358
RWSTP-PU-0530-011 - WAS PUMP 2 Sewatec Dry-installed Volute Casing Pump	Lubrication		Chevron Black Pearl EP2 Motor Oil	N		KSB	KSB	Bundamba	1312 301 358
	Cover	163	Discharge Cover	N	2	KSB	KSB	Bundamba	1313 301 358
	Shaft	210	Shaft	N	1	KSB	KSB	Bundamba	1314 301 358
	Impeller	230	Impeller	N	1	KSB	KSB	Bundamba	1315 301 358
	Bearing	321.01/02	Rolling Element Bearing (Set)	N	1	KSB	KSB	Bundamba	1316 301 358
	Seal	433.01/02	Mechanical Seal	N	2	KSB	KSB	Bundamba	1317 301 358
	Gland Packing		Assembly for Gland Packing including: Neck Bush, Shaft Protecting Sleeve, Lantern Ring	N	1	KSB	KSB	Bundamba	1318 301 358
	Packing Cord		Packing Cord	N	4	KSB	KSB	Bundamba	1319 301 358
	Casing	502.01	Casing Wear Ring	N	2	KSB	KSB	Bundamba	1320 301 358
	Wear Plate	135	Wear Plate	N	2	KSB	KSB	Bundamba	1321 301 358
	Sealing Elements (set)		Sealing Elements (set)	N	4	KSB	KSB	Bundamba	1322 301 358
RWSTP-PU-0710-010 - EFFLUENT PUMP 1 KRT Amarex Submersible Sump Pump KRTK 150-315/46UG-S	Lubrication	No.: 7174	Thin-bodied paraffin oil	N		Merck	KSB	Bundamba	1300 301 358
	Cable	834	Cable Gland	N	1	KSB	KSB	Bundamba	1301 301 358
	Impeller	230	Impeller	N	1	KSB	KSB	Bundamba	1302 301 358
	Casing	502	Casing Wear Ring	N	2	KSB	KSB	Bundamba	1303 301 358
	Motor	433.01	Mechanical Seal, Motor End	N	2	KSB	KSB	Bundamba	1304 301 358
		321.01/322	Rolling Element Bearing, Motor End	N	1	KSB	KSB	Bundamba	1305 301 358
		99-9	Sealing Elements	N	4	KSB	KSB	Bundamba	1306 301 358
	Pump	433.02	Mechanical Seal, Pump End	N	2	KSB	KSB	Bundamba	1307 301 358
		320/321.02	Rolling Element Bearing, Pump End	N	1	KSB	KSB	Bundamba	1308 301 358
	Hydraulics	99-9	Sealing Elements	N	4	KSB	KSB	Bundamba	1309 301 358
RWSTP-PU-0710-011 - EFFLUENT PUMP 2 KRT Amarex Submersible Sump Pump KRTK 150-315/46UG-S	Lubrication	No.: 7174	Thin-bodied paraffin oil	N		Merck			
	Cable	834	Cable Gland	N	1	KSB	KSB	Bundamba	1301 301 358
	Impeller	230	Impeller	N	1	KSB	KSB	Bundamba	1302 301 358
	Casing	502	Casing Wear Ring	N	2	KSB	KSB	Bundamba	1303 301 358
	Motor	433.01	Mechanical Seal, Motor End	N	2	KSB	KSB	Bundamba	1304 301 358
		321.01/322	Rolling Element Bearing, Motor End	N	1	KSB	KSB	Bundamba	1305 301 358
		99-9	Sealing Elements	N	4	KSB	KSB	Bundamba	1306 301 358
	Pump	433.02	Mechanical Seal, Pump End	N	2	KSB	KSB	Bundamba	1307 301 358
		320/321.02	Rolling Element Bearing, Pump End	N	1	KSB	KSB	Bundamba	1308 301 358
	Hydraulics	99-9	Sealing Elements	N	4	KSB	KSB	Bundamba	1309 301 358



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RWSTP-AIT-0710-020 - RESIDUAL CHLORINE ANALYSER Chloromax CCS142D	Sensor Membrane		Hydrolic Acid for cleaning sensor membrane		N		Endress & Hauser	E&H	Eight Mile Plains	07 3457 0299
	Electrolyte		Electrolyte		N		Endress & Hauser	E&H	Eight Mile Plains	07 3457 0299
RWSTP-RDT-0420-010 - ROTARY DRUM THICKENER	Grease for Drum Supports		AGIP GRMU 3 Beacon ESSO 2 bp Energrease LS 3 IP Athesia 3		Y		Ecomacchine	CST Wastewater Solutions	Roseville	02 9417 3611
	Grease for Speed Motor Variator		AGIP GRMU 3 Beacon ESSO 2 bp Energrease LS 3 IP Athesia 3		Y		Ecomacchine	CST Wastewater Solutions	Roseville	02 9417 3611
RWSTP-PU-0460-020 - POLY UNIT 2 PUMP DUTY/STANDBY	Greasing for Pump Joints		AGIP GRMU 3 Beacon ESSO 2 bp Energrease LS 3 IP Athesia 3		Y		Allidos	Grundfos	Ormeau	07 5540 6700
	Pump		Pump Kit		Y		Allidos	Grundfos	Ormeau	07 5540 6700
RWSTP-VSD-0460-020 - VARIABLE SPEED DRIVE (SPEED INDICATOR CONTROLLER)										
RWSTP-PU-0460-010 - POLY UNIT 1 PUMP DUTY/STANDBY	Greasing for Pump Joints		AGIP GRMU 3 Beacon ESSO 2 bp Energrease LS 3 IP Athesia 3		Y		Allidos	Grundfos	Ormeau	07 5540 6700
	Pump		Pump Kit		Y		Allidos	Grundfos	Ormeau	07 5540 6700
RWSTP-PU-3040-020 - SODIUM HYPO DOSING PUMP 2	Pump		Pump Kit		Y		Allidos	Grundfos	Ormeau	07 5540 6700

**2.9 LIST OF MANUFACTURER & SUPPLIER DETAILS****ABB Australia Pty Limited**

Scope - Measurement Products  
 Phone - +61 2 9753 7965  
 Fax - +61 2 9821 0950  
 Email - Michael.Mason@au.abb.com  
 Address - Bapaume Road  
 Moorebank, NSW 2170

**CST Wastewater Solutions**

Scope - Rotary Drum Thickeners  
 Phone - +61 2 9417 3511  
 Fax - +61 2 9417 0097  
 Email - peterb@cstwastewater.com  
 Address - 16/20 Barcoo Street  
 Roseville, NSW 2069

**Grundfos Pumps Pty Ltd**

Scope - Analysers, Dosing Skids  
 Phone - +61 7 5540 6700  
 Email - mwarnes@grundfos.com  
 Address - 30 Blanck Street  
 Ormeau, QLD 4208

**KSB Australia Pty Ltd**

Scope - Pumps, Controllers  
 Phone - +61 7 4774 9201  
 Fax - +61 7 4774 9208  
 Email - grant.butler@ksb.com.au  
 Address - 786 Ingham Road  
 Townsville, QLD 4818

**Liquitek Pty Ltd**

Scope - Aerators, Mixers  
 Phone - +61 2 9912 8475  
 Fax - +61 2 9624 1722  
 Email - rbhana@liquitek.com.au  
 Address - Unit 3, 4 Bonz Place  
 Seven Hills, NSW 2147

**Tyco Water Pty Ltd**

Scope - Pipes, Valves,  
 Phone - +61 7 5589 4400  
 Fax - +61 7 5534 7079  
 Email - kbartley@tycowater.com  
 Address - 63 Currumbin Creek Road  
 Currumbin, QLD 4223

**Endress & Hauser**

Scope - Level Switches, Sensors, Controllers  
 Phone - +61 1800 363 737  
 Fax - +61 7 3457 0299  
 Email - adrian.thomas@au.endress.com  
 Address - Office 2, 35 Miles Platting Road

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Eight Mile Plains, QLD 4113

Vega Australia Pty Ltd

Scope - Level Switches  
Phone - +61 2 9542 6662  
Fax - +61 2 9542 6665  
Email - info.au@vega.com  
Address - 398 The Boulevard  
Kirrawee, NSW 2232

Danfoss

Scope - VLT Drives  
Phone - +61 7 3292 3600  
Fax - +61 7 3266 4571  
Address - Unit 26/67 Depot Street  
Banyo, QLD 4014

## **VOLUME 3. DRAWINGS, DRAWING REGISTER, UNDERGROUND CABLE ROUTING DETAILS**

### **3.1 DRAWINGS REGISTER**

See attached

### **3.2 'AS-CONSTRUCTED' DRAWINGS**

See attached

### **3.3 UNDERGROUND CABLE ROUTING DETAILS**

Refer As-Constructed Drawings.



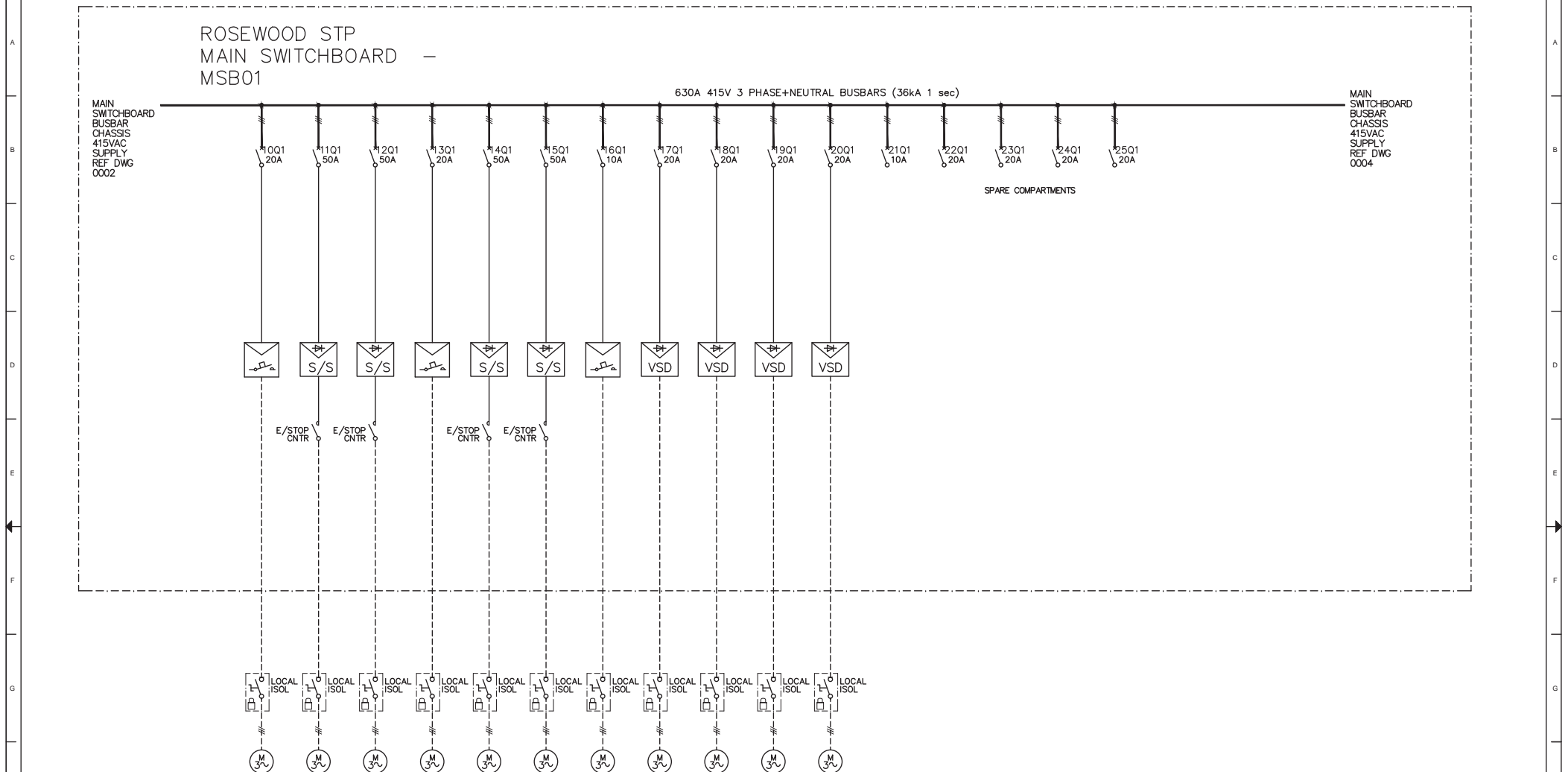
ELECTRICAL DRAWING INDEX															
DRAWING No.		TITLE													
QUU-RWSTP-2A-ELE-0000		TITLE PAGE													
QUU-RWSTP-2A-ELE-0001		ELECTRICAL DRAWING LIST													
QUU-RWSTP-2A-ELE-0002		MAIN SWITCHBOARD-MSB01 SINGLE LINE DIAGRAM SHEET 1 of 3													
QUU-RWSTP-2A-ELE-0003		MAIN SWITCHBOARD-MSB01 SINGLE LINE DIAGRAM SHEET 2 of 3													
QUU-RWSTP-2A-ELE-0004		MAIN SWITCHBOARD-MSB01 SINGLE LINE DIAGRAM SHEET 3 of 3													
QUU-RWSTP-2A-ELE-0005		EMERGENCY LIGHTING MSB-01 & MCC-01													
QUU-RWSTP-2A-ELE-0006		MOTOR CONTROL CENTRE-MCC01 SINGLE LINE DIAGRAM SHEET 1 of 2													
QUU-RWSTP-2A-ELE-0007		MOTOR CONTROL CENTRE-MCC01 SINGLE LINE DIAGRAM SHEET 2 of 2													
QUU-RWSTP-2A-ELE-0009		MAIN SWITCHBOARD-MSB01 24VDC DISTRIBUTION SINGLE LINE DIAGRAM													
QUU-RWSTP-2A-ELE-0010		MOTOR CONTROL CENTRE-MCC01 24VDC DISTRIBUTION SINGLE LINE DIAGRAM													
QUU-RWSTP-2A-ELE-0011		MAIN CONTROL ROOM-MCR01 24VDC DISTRIBUTION SINGLE LINE DIAGRAM													
QUU-RWSTP-2A-ELE-0012		MAIN SWITCHBOARD-MSB01 MAIN INCOMER & GENERATOR SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0012A		AUTOMATIC TRANSFER SWITCH (ATS) CONTROL PANEL													
QUU-RWSTP-2A-ELE-0013		WAS THICKENER FEED PUMP SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0014		FLOC TANK MIXER SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0015		ROTARY DRUM THICKENER SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0016		DEMAND AERATION TANK MIXER SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0017		DEMAND AERATION TANK AERATOR 1 SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0018		DEMAND AERATION TANK AERATOR 2 SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0019		INTERMITTENT AERATION TANK MIXER SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0020		INTERMITTENT AERATION TANK AERATOR 1 SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0021		INTERMITTENT AERATION TANK AERATOR 2 SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0022		INTERMITTENT AERATION TANK DECANTER SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0023		RAS PUMP 1 SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0024		RAS PUMP 2 SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0025		WAS PUMP 1 SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0026		WAS PUMP 2 SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0027		UNINTERRUPTIBLE POWER SUPPLY SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0028		Spare Drawing													
QUU-RWSTP-2A-ELE-0029		Spare Drawing													
QUU-RWSTP-2A-ELE-0030		Spare Drawing													
QUU-RWSTP-2A-ELE-0031		Spare Drawing													
QUU-RWSTP-2A-ELE-0032		EFFLUENT PUMP 1 SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0033		EFFLUENT PUMP 2 SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0034		CHLORINE CONTACT TANK MIXING PUMP SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0035		CHLORINE CONTACT TANK ANALYSER FEED PUMP SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0036		SERVICE WATER PUMP 1 SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0037		SERVICE WATER PUMP 2 SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0038		RECYCLED WATER PUMP 1 SCHEMATIC DIAGRAMS													
QUU-RWSTP-2A-ELE-0039		RECYCLED WATER PUMP 2 SCHEMATIC DIAGRAMS													
QUU-RWSTP-2A-ELE-0040		WATER MANAGER TRANSFER PUMP SCHEMATIC DIAGRAM													
QUU-RWSTP-2A-ELE-0041		Spare Drawing													
QUU-RWSTP-2A-ELE-0042		Spare Drawing													
QUU-RWSTP-2A-ELE-0043		Spare Drawing													
QUU-RWSTP-2A-ELE-0044		FLOW SPLITTER ACTUATED VALVE SCHEMATIC DIAGRAMS													
QUU-RWSTP-2A-ELE-0045		SOLENOID VALVES & MISC EQUIPMENT SCHEMATIC DIAGRAMS													
QUU-RWSTP-2A-ELE-0046		SODIUM HYPOCHLORITE LOADOUT PANEL SCHEMATIC DIAGRAMS													

ELECTRICAL DRAWING INDEX															
DRAWING No.		TITLE													
QUU-RWSTP-2A-ELE-0047		Spare Drawing													
QUU-RWSTP-2A-ELE-0048		Spare Drawing													
QUU-RWSTP-2A-ELE-0049		Spare Drawing													
QUU-RWSTP-2A-ELE-0050		Spare Drawing													
QUU-RWSTP-2A-ELE-0051		Spare Drawing													
QUU-RWSTP-2A-ELE-0052		PLC, SCADA & COMMUNICATIONS NETWORK DIAGRAM													
QUU-RWSTP-2A-ELE-0053		Spare Drawing													
QUU-RWSTP-2A-ELE-0054		Spare Drawing													
QUU-RWSTP-2A-ELE-0055		PLC DIGITAL INPUT MODULE No1 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0056		PLC DIGITAL INPUT MODULE No2 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0057		PLC DIGITAL INPUT MODULE No3 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0058		PLC DIGITAL INPUT MODULE No4 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0059		PLC DIGITAL INPUT MODULE No5 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0060		PLC DIGITAL INPUT MODULE No6 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0061		PLC DIGITAL INPUT MODULE No7 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0062		PLC DIGITAL INPUT MODULE No8 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0063		Spare Drawing													
QUU-RWSTP-2A-ELE-0064		Spare Drawing													
QUU-RWSTP-2A-ELE-0065		Spare Drawing													
QUU-RWSTP-2A-ELE-0066		Spare Drawing													
QUU-RWSTP-2A-ELE-0067		PLC DIGITAL OUTPUT MODULE No1 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0068		PLC DIGITAL OUTPUT MODULE No2 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0069		PLC DIGITAL OUTPUT MODULE No3 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0070		PLC DIGITAL OUTPUT MODULE No4 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0071		PLC DIGITAL OUTPUT MODULE No5 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0072		Spare Drawing													
QUU-RWSTP-2A-ELE-0073		PLC ANALOG INPUT MODULE No1 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0074		PLC ANALOG INPUT MODULE No2 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0075		PLC ANALOG INPUT MODULE No3 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0076		PLC ANALOG INPUT MODULE No4 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0077		Spare Drawing													
QUU-RWSTP-2A-ELE-0078		Spare Drawing													
QUU-RWSTP-2A-ELE-0079		PLC ANALOG OUTPUT MODULE No1 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0080		PLC ANALOG OUTPUT MODULE No2 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0081		PLC ANALOG OUTPUT MODULE No3 TERMNATION DIAGRAM													
QUU-RWSTP-2A-ELE-0082		MSB-01 CABLE SCHEDULE Sheet 1 of 2													
QUU-RWSTP-2A-ELE-0083		MSB-01 CABLE SCHEDULE Sheet 2 of 2													
QUU-RWSTP-2A-ELE-0084		MCC-01 CABLE SCHEDULE Sheet 1 of 1													
QUU-RWSTP-2A-ELE-0085		MAIN SWITCHBOARD MSB-01 GENERAL ARRANGEMENT													
QUU-RWSTP-2A-ELE-0086		MOTOR CONTROL CENTRE MCC-01 GENERAL ARRANGEMENT													
QUU-RWSTP-2A-ELE-0087		SODIUM HYPOCHLORITE LOADOUT PANEL GENERAL ARRANGEMENT													
QUU-RWSTP-2A-ELE-0088		Spare Drawing													
QUU-RWSTP-2A-ELE-0089		Spare Drawing													
QUU-RWSTP-2A-ELE-0090		Spare Drawing													
QUU-RWSTP-2A-ELE-0091		ELECTRICAL EQUIPMENT AND SERVICES GENERAL LAYOUT													
QUU-RWSTP-2A-ELE-0092		Spare Drawing													

AS CONSTRUCTED

REVISIONS			CONSULTING ENGINEER:		Engineering Certification:		QUEENSLAND UrbanUtilities		SCALES BEFORE REDUCTION:		SUN NAME DATE		QUU: ROSEWOOD STP - OPTIMISATION ELECTRICAL DRAWING INDEX	
AMENDMENT			INITIALS DATE		WSE		PO Box 2765 Brisbane QLD 4001 Telephone 132 657 Web www.urbanutilities.com.au		DO NOT SCALE, USE FIGURED DIMENSIONS ONLY		DESIGNED AW 28-10-11		Doc Status :	
C AS CONSTRUCTED			PAH 21-12-12		WATER SERVICES ENGINEERING PTY LTD						DRAWING PH 28-10-11		Size : A1	
B ISSUED FOR CONSTRUCTION			PH 20-02-12		PO Box 487 Aspley, QLD 4034						DRAFTING CHECK RJ 28-10-11		Rev: C	
A ISSUED FOR TENDER			PH 28-10-11		Phone (07) 3353 6452 Fax (07) 3353 6472						DESIGN REVIEW RJ 28-10-11		Drg : QUU-RWSTP-2A-ELEC- 0001	
					Job No						PROJECT MANAGER PH 28-10-11			
											APPROVED DATE			
											FOR QUEENSLAND URBAN UTILITIES			





TAG	MX-0510-01D	AER-0510-01A	DER-0510-01B	MX-0510-02A	AER-0510-02B	DER-0510-02C	DECE-0510-02P	PUS-0540-02Q	PUS-0540-02R	PUS-0530-01S	PUS-0530-01T
DESCRIPTION	DEMAND AERATION TANK MIXER	DEMAND AERATOR Tank No1	DEMAND AERATOR Tank No2	INTERMITTENT AERATION TANK MIXER	INTERMITTENT AERATOR Tank No1	INTERMITTENT AERATOR Tank No2	INTERMITTENT AERATION TANK DECANTER	RAS PUMP No1	RAS PUMP No2	WAS PUMP No1	WAS PUMP No2
STARTER TYPE	DOL	SOFT STARTER	SOFT STARTER	DOL	SOFT STARTER	SOFT STARTER	DOL	VSD	VSD	VSD	VSD
RATING (kW)	2.2 kW	15 kW	15 kW	2.2 kW	15 kW	15 kW	0.18 kW	4.8 kW	4.8 kW	2.2 kW	2.2 kW
FLC (A)	4.8 A	28 A	28 A	4.8 A	28 A	28 A	0.6 A	10 A	10 A	4.8 A	4.8 A
SCHEMATIC DIAG.	DWG 0016	DWG 0017	DWG 0018	DWG 0019	DWG 0020	DWG 0021	DWG 0022	DWG 0023	DWG 0024	DWG 0025	DWG 0026

REVISIONS			
	AMENDMENT	INITIALS	DATE
C	AS CONSTRUCTED	RM	19-12-1
B	ISSUED FOR CONSTRUCTION	PH	20-02-1
A	ISSUED FOR TENDER	PH	28-10-1

**CONSULTING ENGINEER:**  
**WSE**  
**WATER SERVICES ENGINEERING PTY LTD**  
PO Box 487  
Aspley, QLD 4034  
Phone (07) 3353 6452  
Fax (07) 3353 6472  
Job No

**Engineering Certification:**  
As Registered Practising Engineer for this project, I certify that the works detailed on this drawing are in accordance with current engineering practices and complies with the current Australian Standards.

SIGNED ..... DATE .....

R.P.E.Q. No. ....



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Telephone 132 657  
Web [www.urbanutilities.com.au](http://www.urbanutilities.com.au)

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SKM	NAME	DATE
DESIGNED	AM	28-10-8
DRAWN	PH	28-10-8
DRAFTING CHECK	RJ	28-10-8
DESIGN REVIEW	RJ	28-10-8
PROJECT MANAGER	PN	28-10-8
APPROVED		DATE

.....  
FOR QUEENSLAND URBAN UTILITIES

QUU: ROSEWOOD STP - OPTIMISATION  
MAIN SWITCHBOARD - MSB-01  
SINGLE LINE DIAGRAM SHEET 2 of 3

Doc Status :	Size : A1	Rev: C	Drq : QUU-RWSTP-2A-ELEC- 0003
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ROSEWOOD STP  
MAIN SWITCHBOARD — MSB-01

MAIN  
SWITCHBOARD  
BUSBAR  
CHASSIS  
415VAC  
SUPPLY  
REF DWG  
0003

630A 415V 3 PHASE+NEUTRAL BUSBARS (36kA 1 sec)

LIGHT & POWER  
DISTRIBUTION BOARD MSB01-DB01

36 POLE CHASSIS, 415VAC 3 PHASE 50Hz

240VAC UPS  
DISTRIBUTION BOARD MSB01-DB02

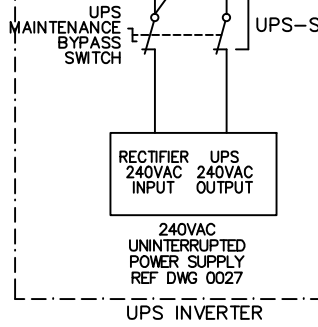
24 POLE CHASSIS, 240VAC 1 PHASE 50Hz

FED FROM MSB-01  
DWG 0002

MAIN CONTROL ROOM — MCR-01

LIGHT & POWER  
DISTRIBUTION BOARD MCR01-DB01

18 POLE CHASSIS, 415VAC 3 PHASE 50Hz



240VAC UPS  
DISTRIBUTION BOARD MCR01-DB02

18 POLE CHASSIS, 240VAC 1 PHASE 50Hz

FOR CONSTRUCTION

REVISIONS		
AMENDMENT	INITIALS	DATE
C AS CONSTRUCTED	RM	19-12-12
B ISSUED FOR CONSTRUCTION	PH	20-02-12
A ISSUED FOR TENDER	PH	28-10-11

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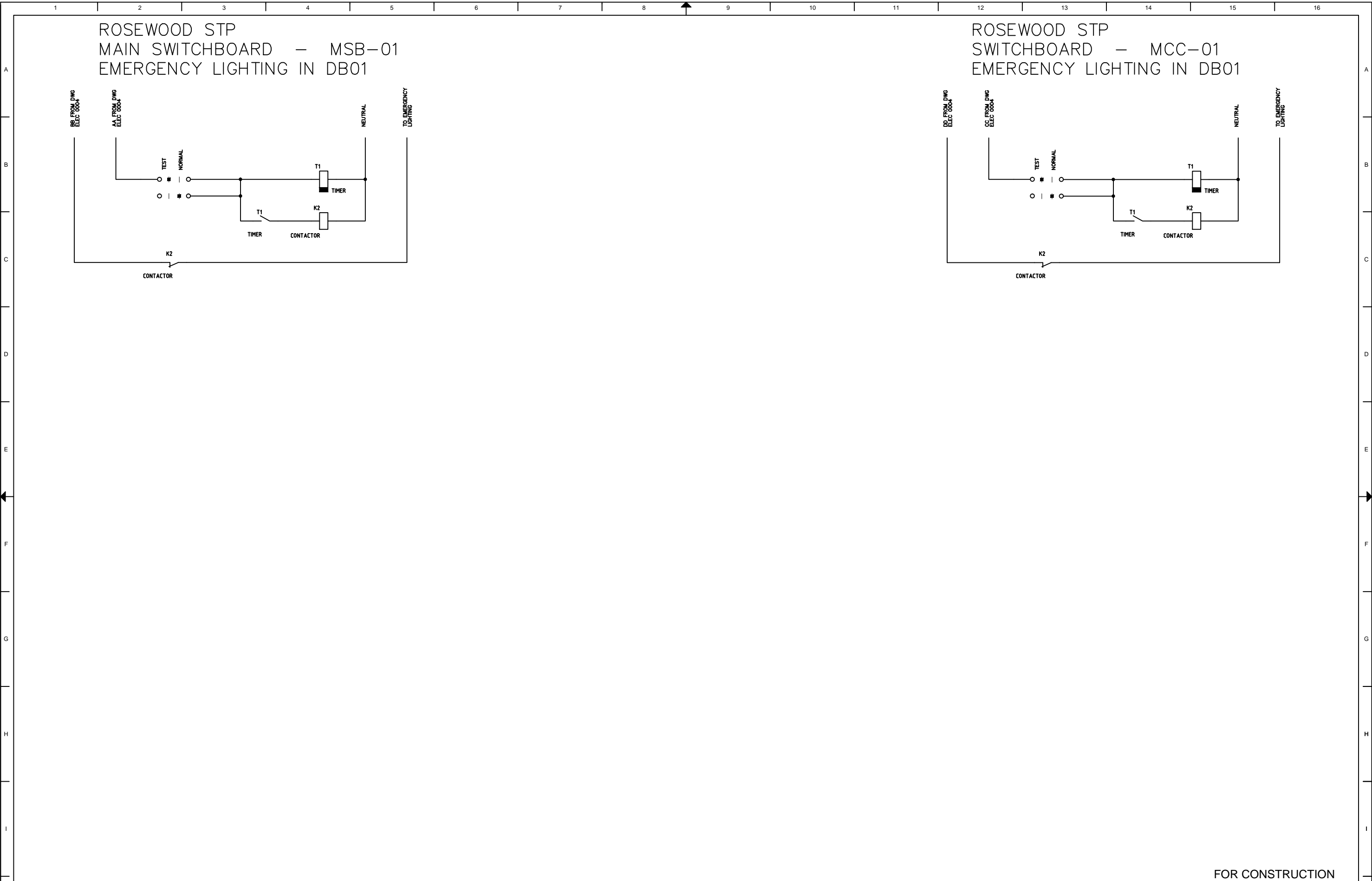
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SKM	NAME	DATE
DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PN	28-10-11
APPROVED		DATE

FOR QUEENSLAND URBAN UTILITIES

QUU: ROSEWOOD STP - OPTIMISATION  
MAIN SWITCHBOARD - MSB-01  
SINGLE LINE DIAGRAM SHEET 3 of 3  
Doc Status : Size : A1 Rev: C Drg : QUU-RWSTP-2A-ELEC- 0004



REVISIONS		
AMENDMENT	INITIALS	DATE
C AS CONSTRUCTED	PH	19-12-12
B ISSUED FOR CONSTRUCTION	PH	20-02-12
A ISSUED FOR TENDER	PH	28-10-11

CONSULTING ENGINEER:  
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WATER SERVICES ENGINEERING PTY LTD  
PO Box 487  
Aspley, QLD 4034  
Phone (07) 3353 6452  
Fax (07) 3353 6472  
Job No

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SKM	NAME	DATE
DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PN	28-10-11
APPROVED		DATE

FOR QUEENSLAND URBAN UTILITIES

Doc Status :

Size : A1

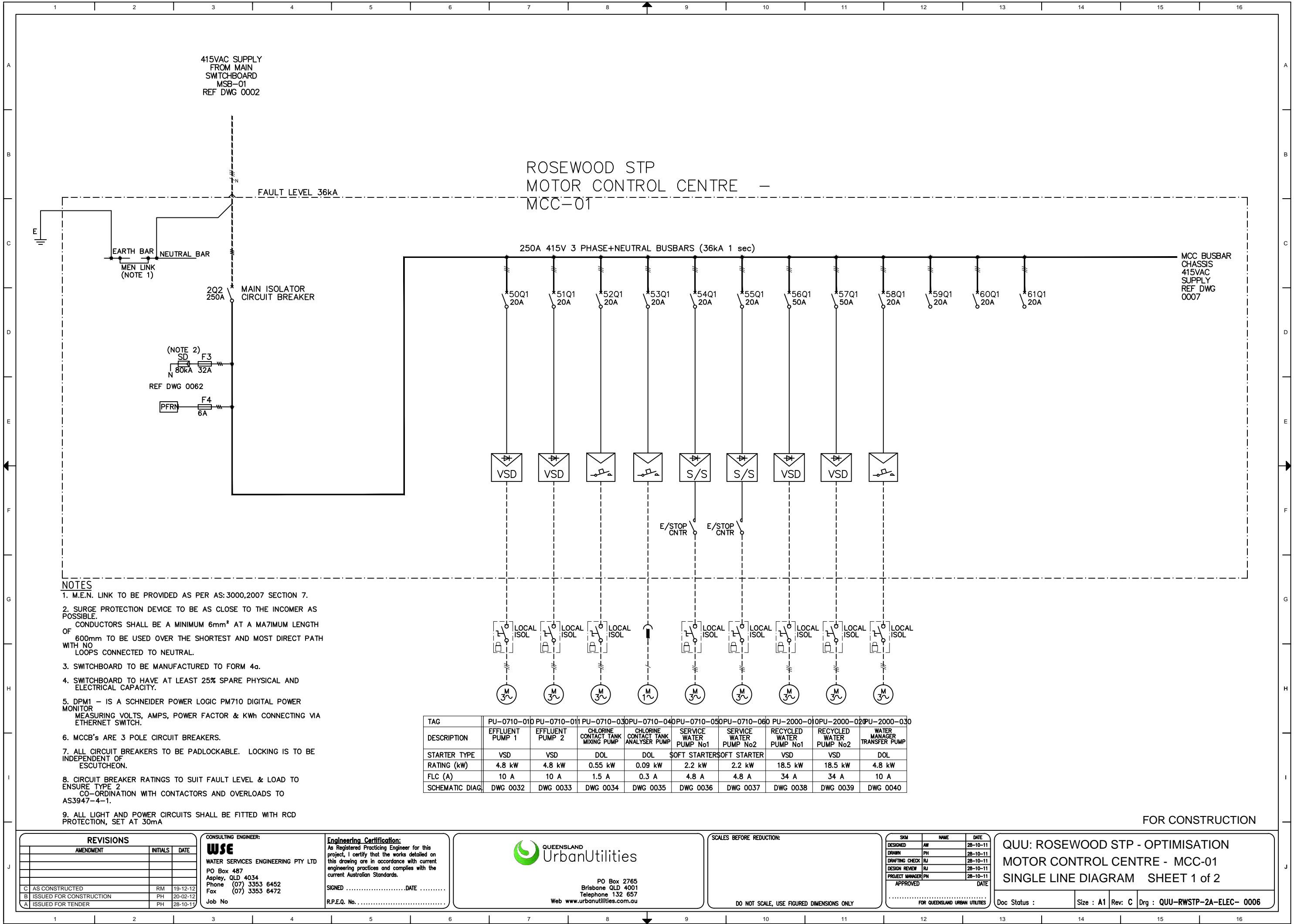
Rev: C

Drg : QUU-RWSTP-2A-ELEC- 0005

FOR CONSTRUCTION

QUU: ROSEWOOD STP - OPTIMISATION  
EMERGENCY LIGHTING MSB01 & MCC01





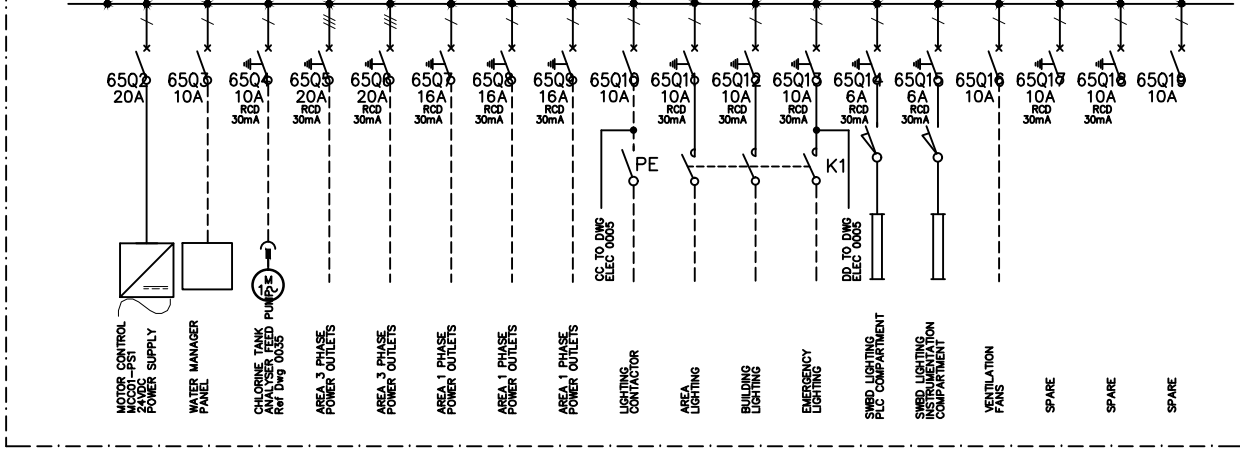
ROSEWOOD STP  
MOTOR CONTROL CENTRE -  
MCC-01

MCC BUSBAR  
CHASSIS  
415VAC  
SUPPLY  
REF DWG  
0006

250A 415V 3 PHASE+NEUTRAL BUSBARS (36kA 1 sec)

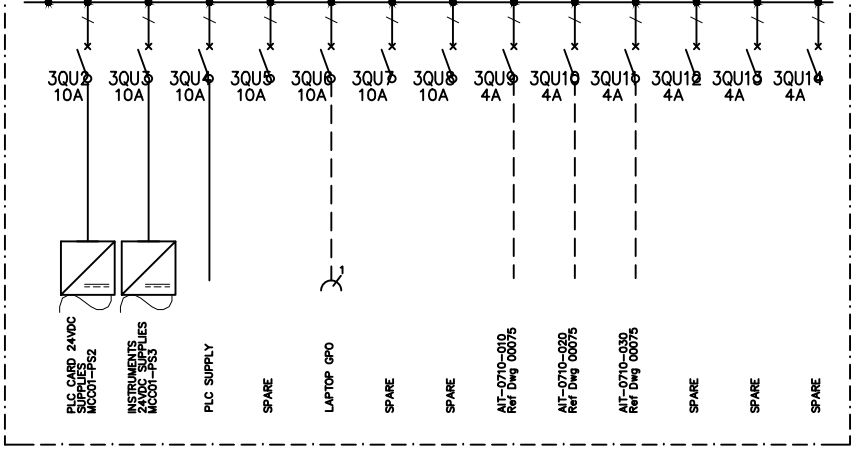
LIGHT & POWER  
DISTRIBUTION BOARD  
MCCB01-DB01

36 POLE CHASSIS, 415VAC 3 PHASE 50Hz



240VAC UPS  
DISTRIBUTION BOARD  
MCC01-DB02

24 POLE CHASSIS, 240VAC 1 PHASE 50Hz



FROM CONTROL  
ROOM 240VAC UPS  
DISTRIBUTION  
BOARD  
MCC01-DB02  
3QU3  
REFER DWG 0004

FOR CONSTRUCTION

REVISIONS		
AMENDMENT	INITIALS	DATE
C AS CONSTRUCTED	RM	19-12-12
B ISSUED FOR CONSTRUCTION	PH	20-02-12
A ISSUED FOR TENDER	PH	28-10-11

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WATER SERVICES ENGINEERING PTY LTD  
PO Box 487  
Aspley, QLD 4034  
Phone (07) 3353 6452  
Fax (07) 3353 6472  
Job No

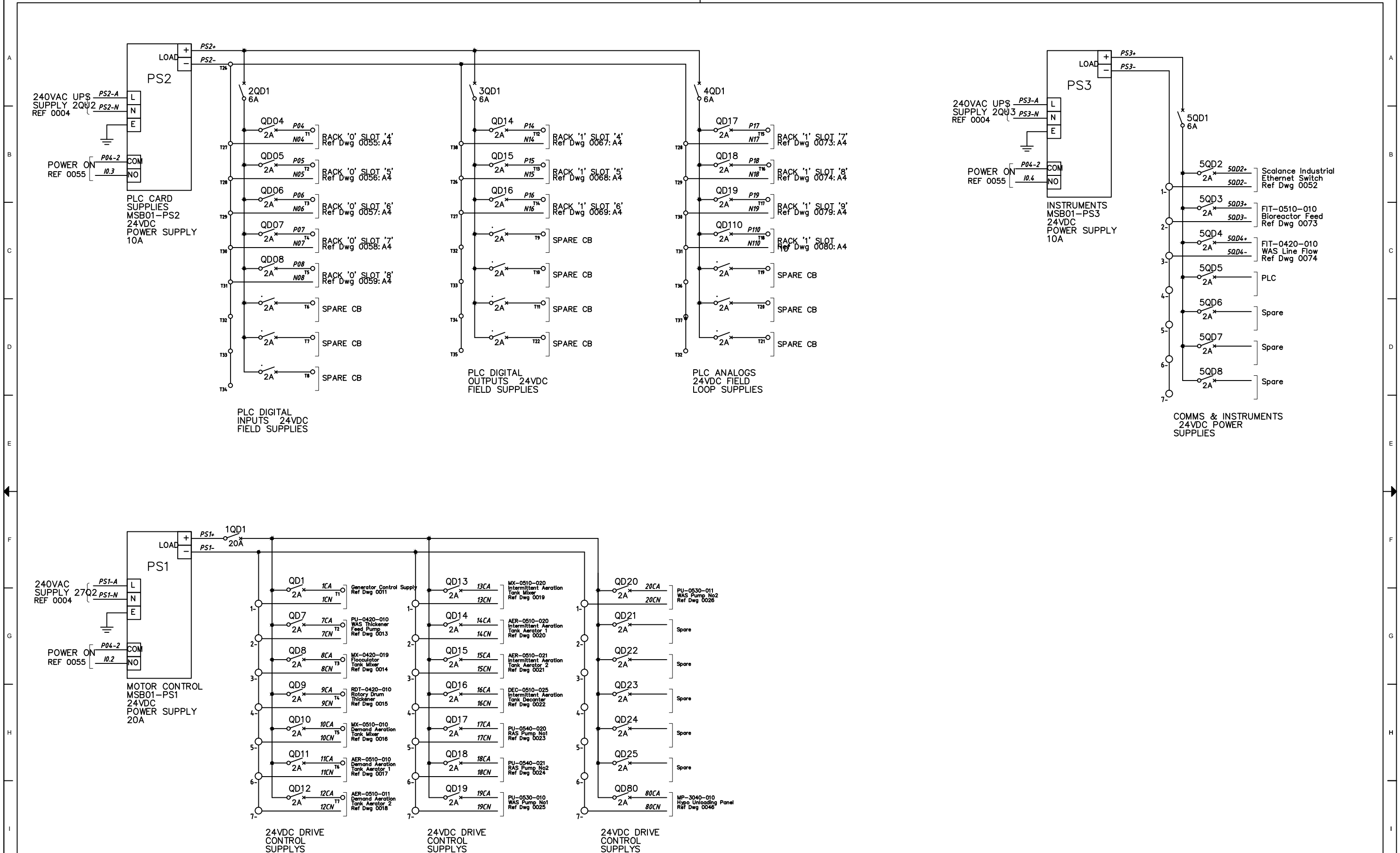
Engineering Certification:  
As Registered Practising Engineer for this project, I certify that the works detailed on this drawing are in accordance with current engineering practices and complies with the current Australian Standards.  
SIGNED .....DATE .....  
R.P.E.Q. No. ....

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DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PN	28-10-11
APPROVED	DATE	
AS CONSTRUCTED	FOR QUEENSLAND URBAN UTILITIES	

QUU: ROSEWOOD STP - OPTIMISATION  
MOTOR CONTROL CENTRE - MCC-01  
SINGLE LINE DIAGRAM SHEET 2 of 2  
Doc Status : Size : A1 Rev: C Drg : QUU-RWSTP-2A-ELEC- 0007



FOR CONSTRUCTION

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	AMENDMENT	INITIALS	DATE
C	AS CONSTRUCTED	RM	19-12-12
B	ISSUED FOR CONSTRUCTION	PH	20-02-12
A	ISSUED FOR TENDER	PH	28-10-11

**CONSULTING ENGINEER:**  
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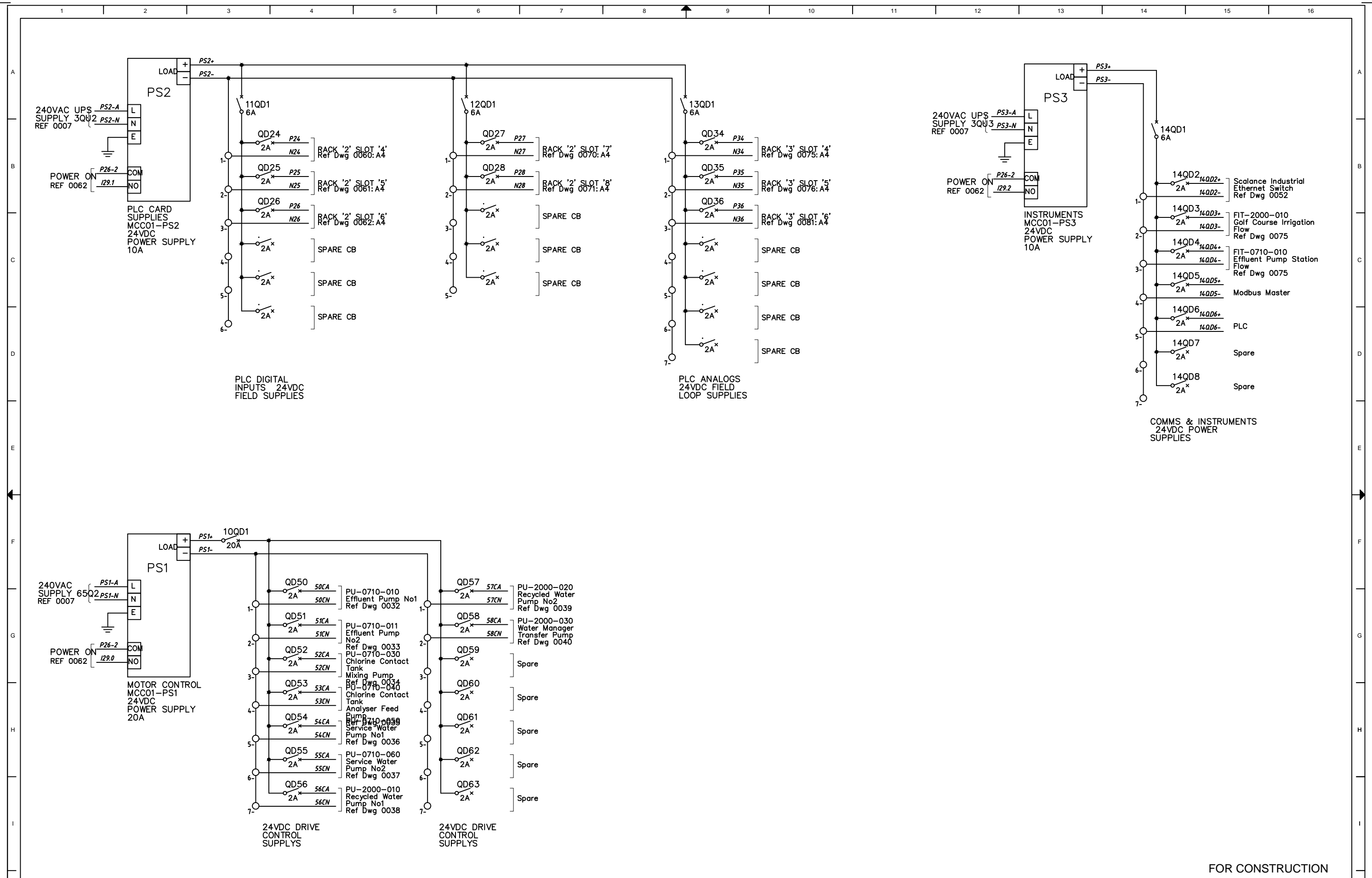
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SKM	NAME	DATE
DESIGNED	AW	28-10-1
DRAWN	PH	28-10-1
DRAFTING CHECK	RJ	28-10-1
DESIGN REVIEW	RJ	28-10-1
PROJECT MANAGER	PN	28-10-1
APPROVED		DATE
.....		
FOR QUEENSLAND URBAN UTILITIES		

QUU: ROSEWOOD STP - OPTIMISATION MAIN SWITCHBOARD - MSB01 24VDC DISTRIBUTION SINGLE LINE DIAGRAM			
Doc Status :	Size : A1	Rev: C	Drg : QUU-RWSTP-2A-ELEC- 0009





REVISIONS		
AMENDMENT	INITIALS	DATE
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CONSULTING ENGINEER:

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Fax (07) 3353 6472

Job No

Engineering Certification:

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SKM	NAME	DATE
DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PN	28-10-11
APPROVED		

FOR QUEENSLAND URBAN UTILITIES

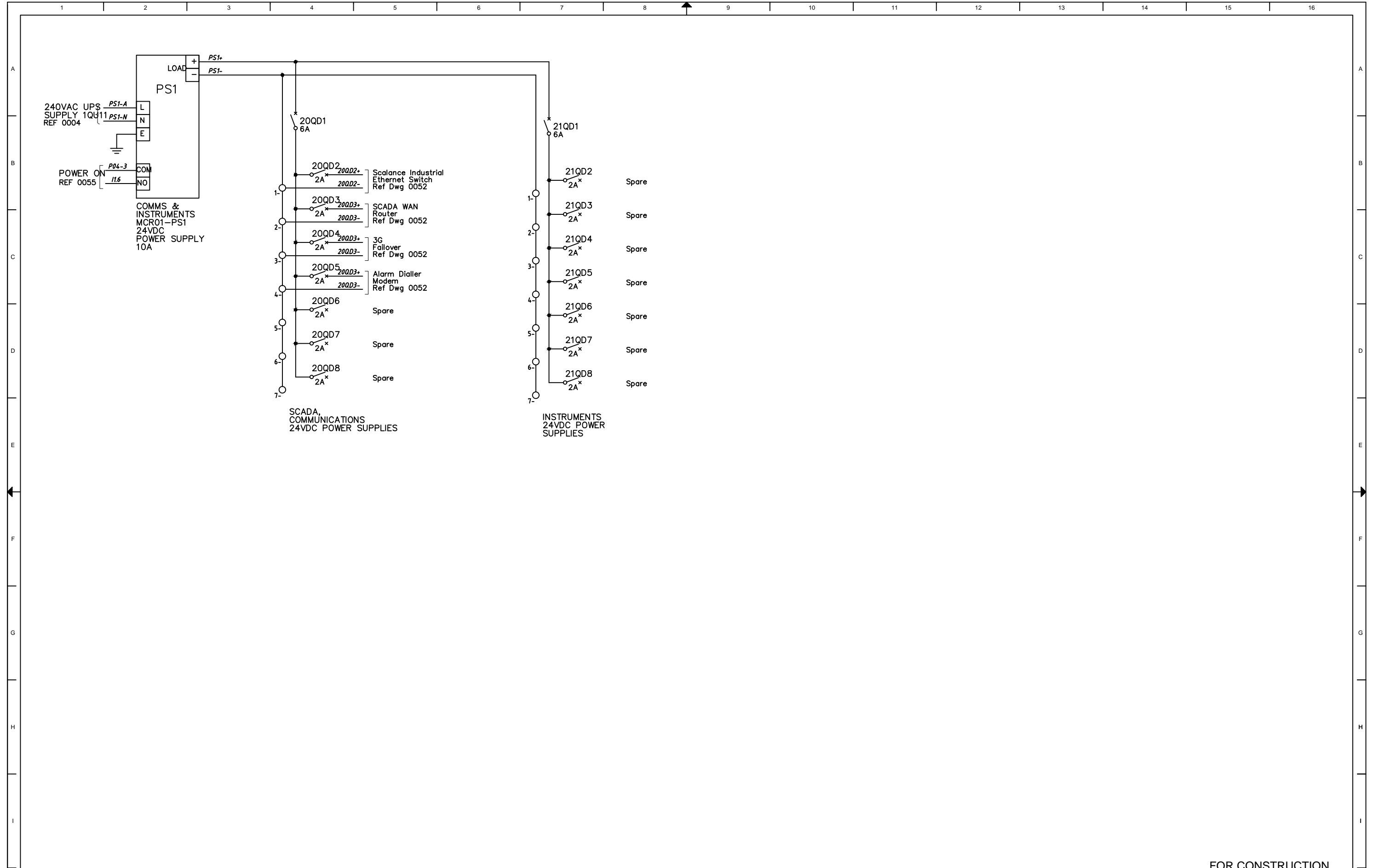
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FOR CONSTRUCTION

QUU: ROSEWOOD STP - OPTIMISATION

MOTOR CONTROL CENTRE - MCC-01

24VDC DISTRIBUTION SINGLE LINE DIAGRAM



REVISIONS			
AMENDMENT	INITIALS	DATE	
C AS CONSTRUCTED	RM	19-12-12	
B ISSUED FOR CONSTRUCTION	PH	20-02-12	
A ISSUED FOR TENDER	PH	28-10-11	

CONSULTING ENGINEER:  
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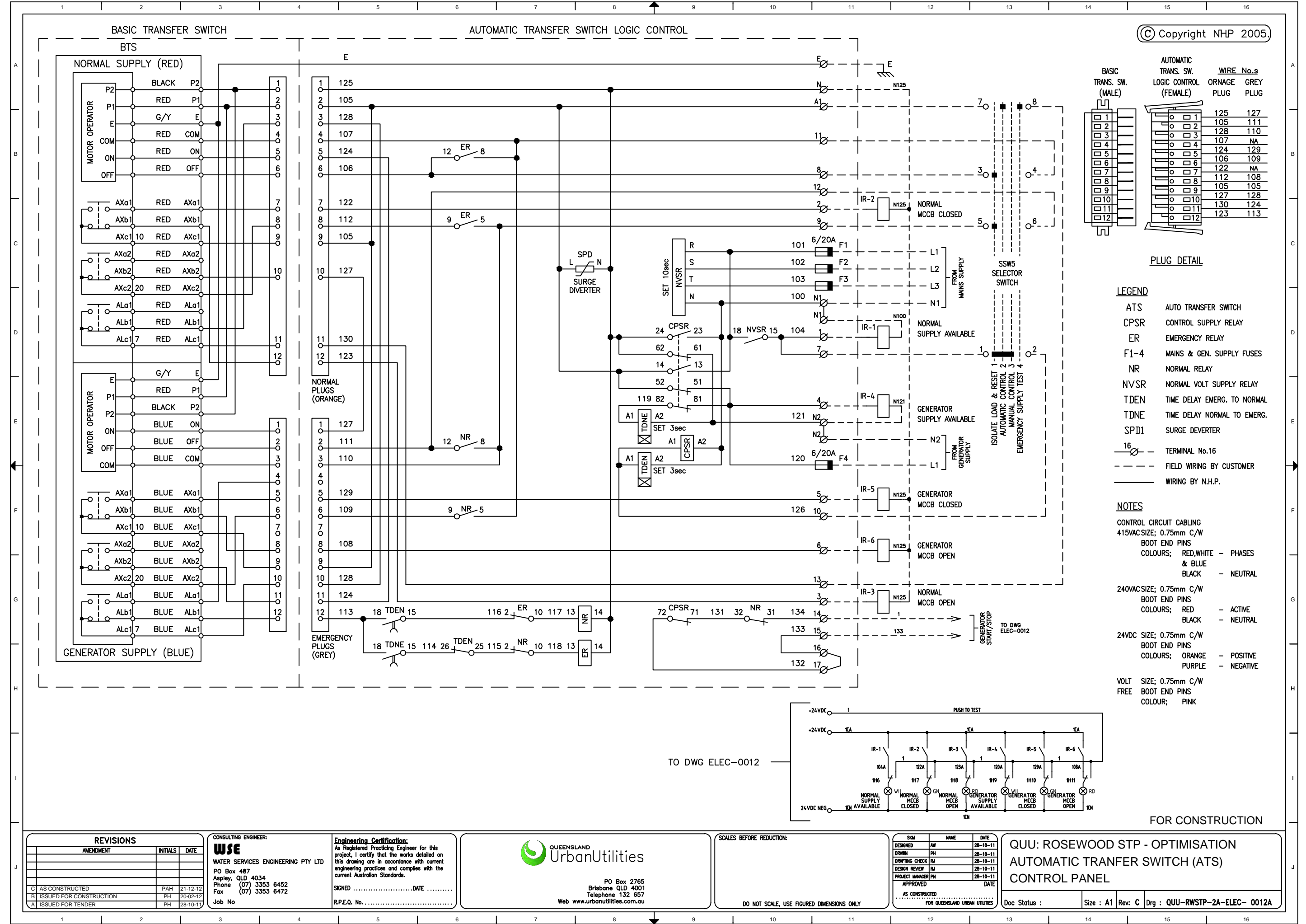
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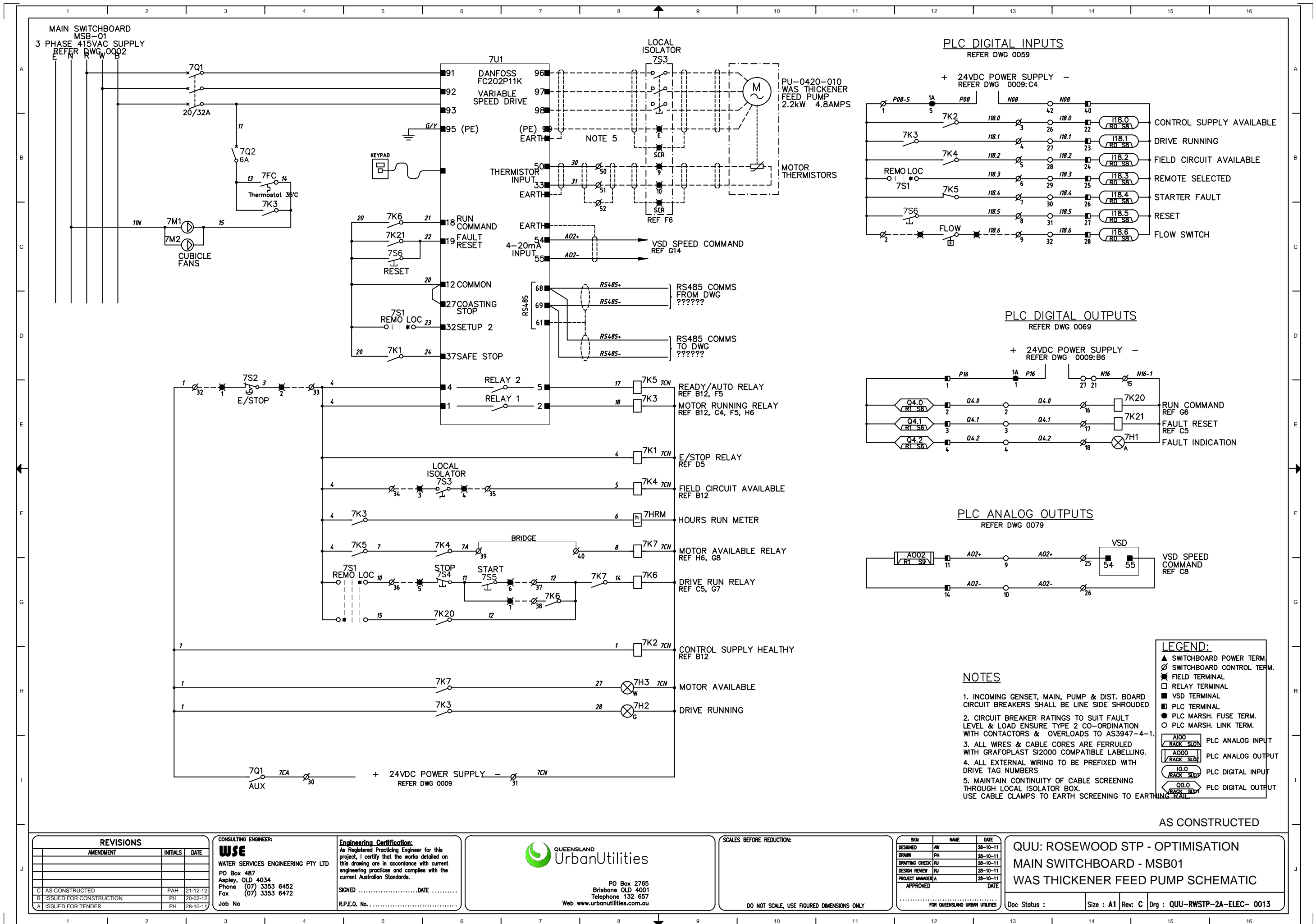
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DRAWN	PH	28-10-11
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PROJECT MANAGER	PN	28-10-11
APPROVED	DATE	

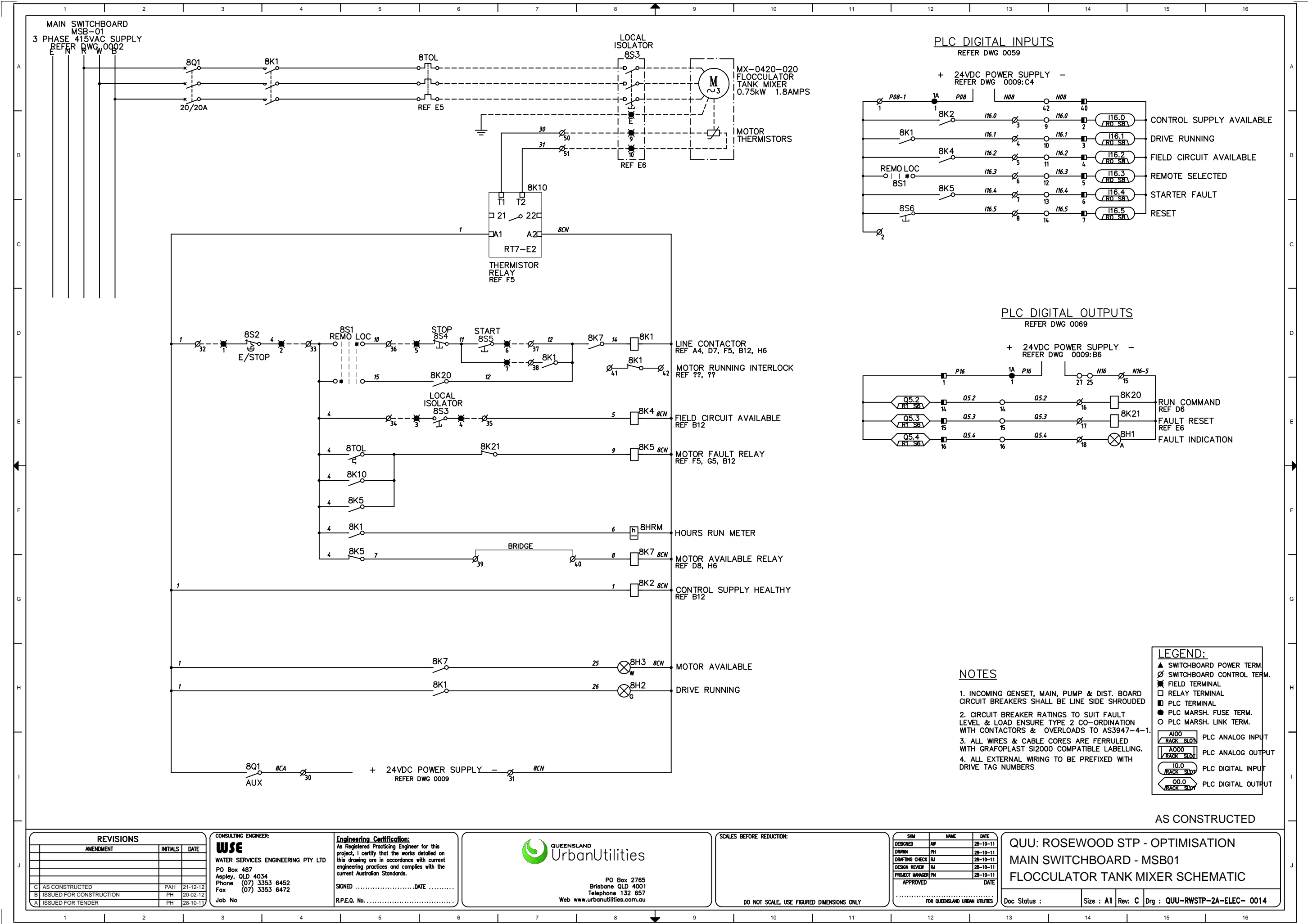
FOR CONSTRUCTION

QUU: ROSEWOOD STP - OPTIMISATION  
MAIN CONTROL ROOM- MCR-01  
24VDC DISTRIBUTION SINGLE LINE DIAGRAM

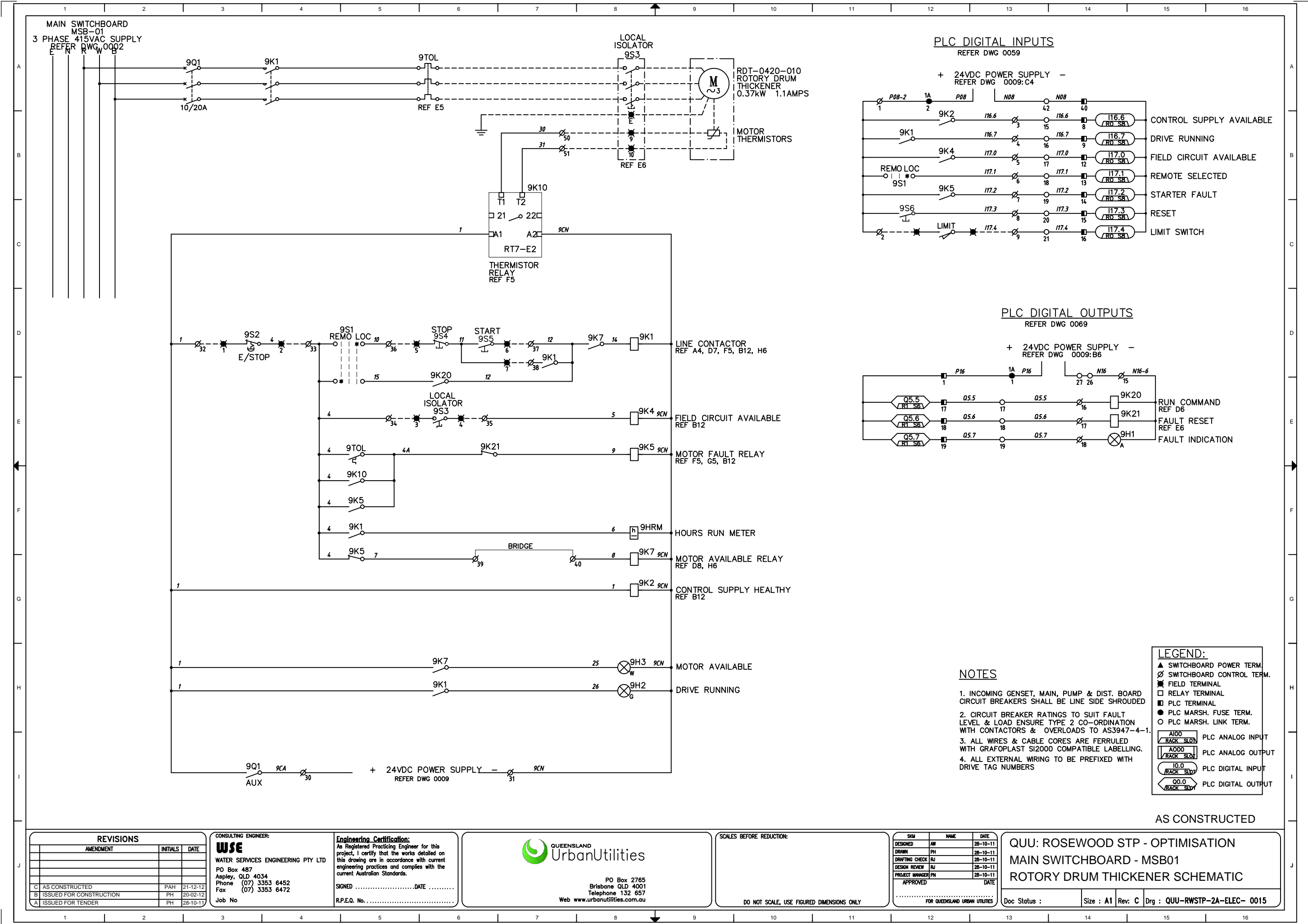
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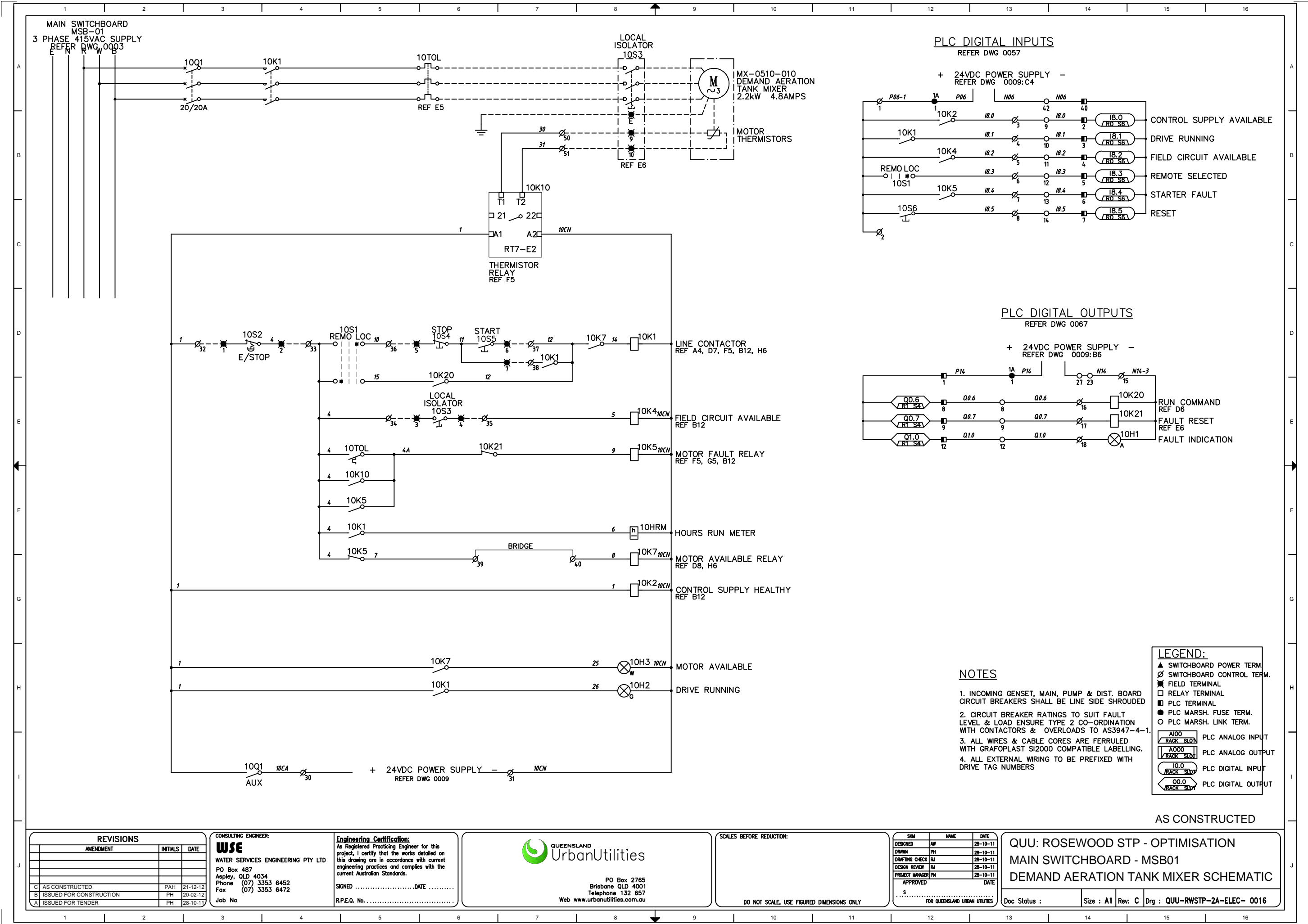


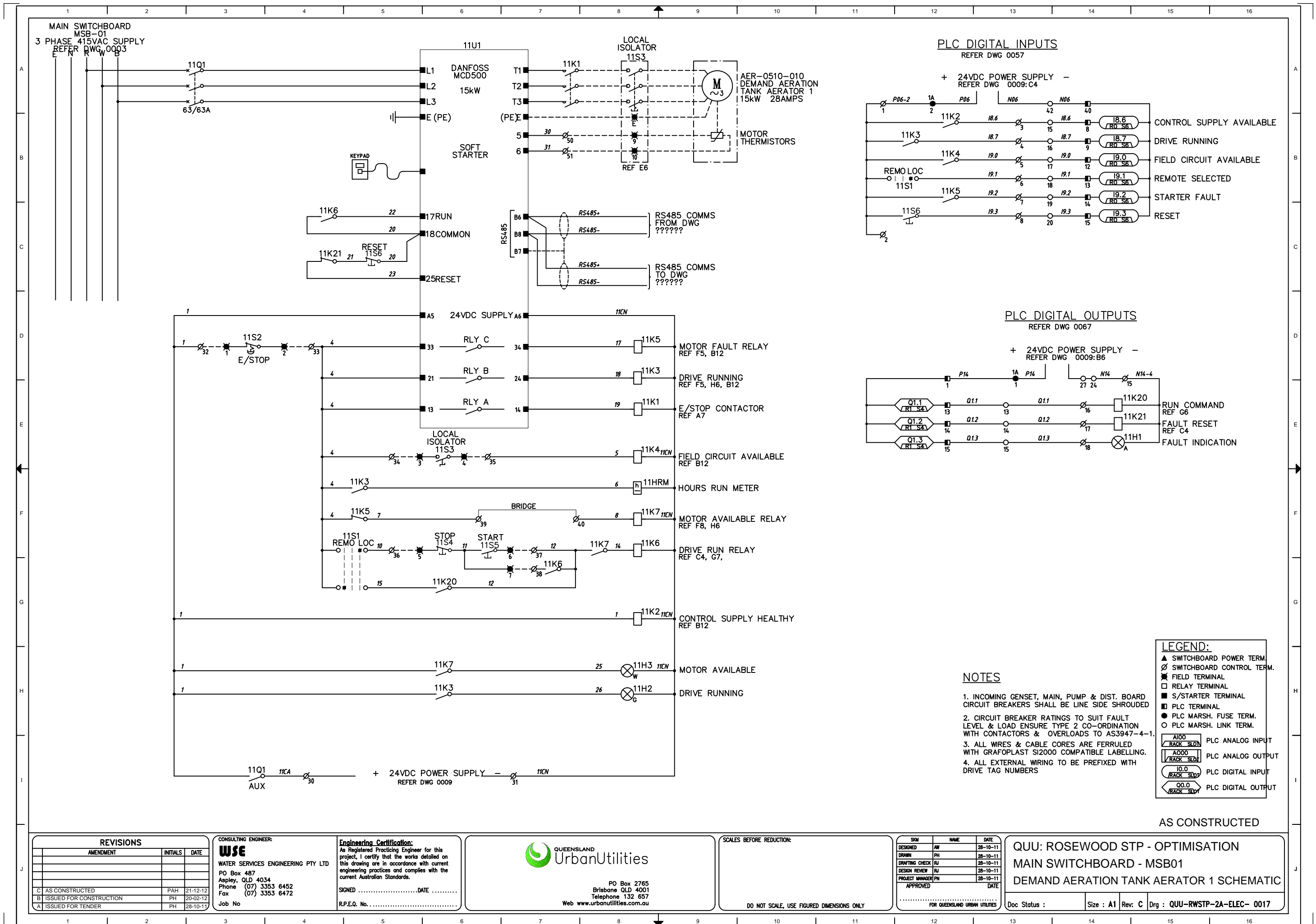


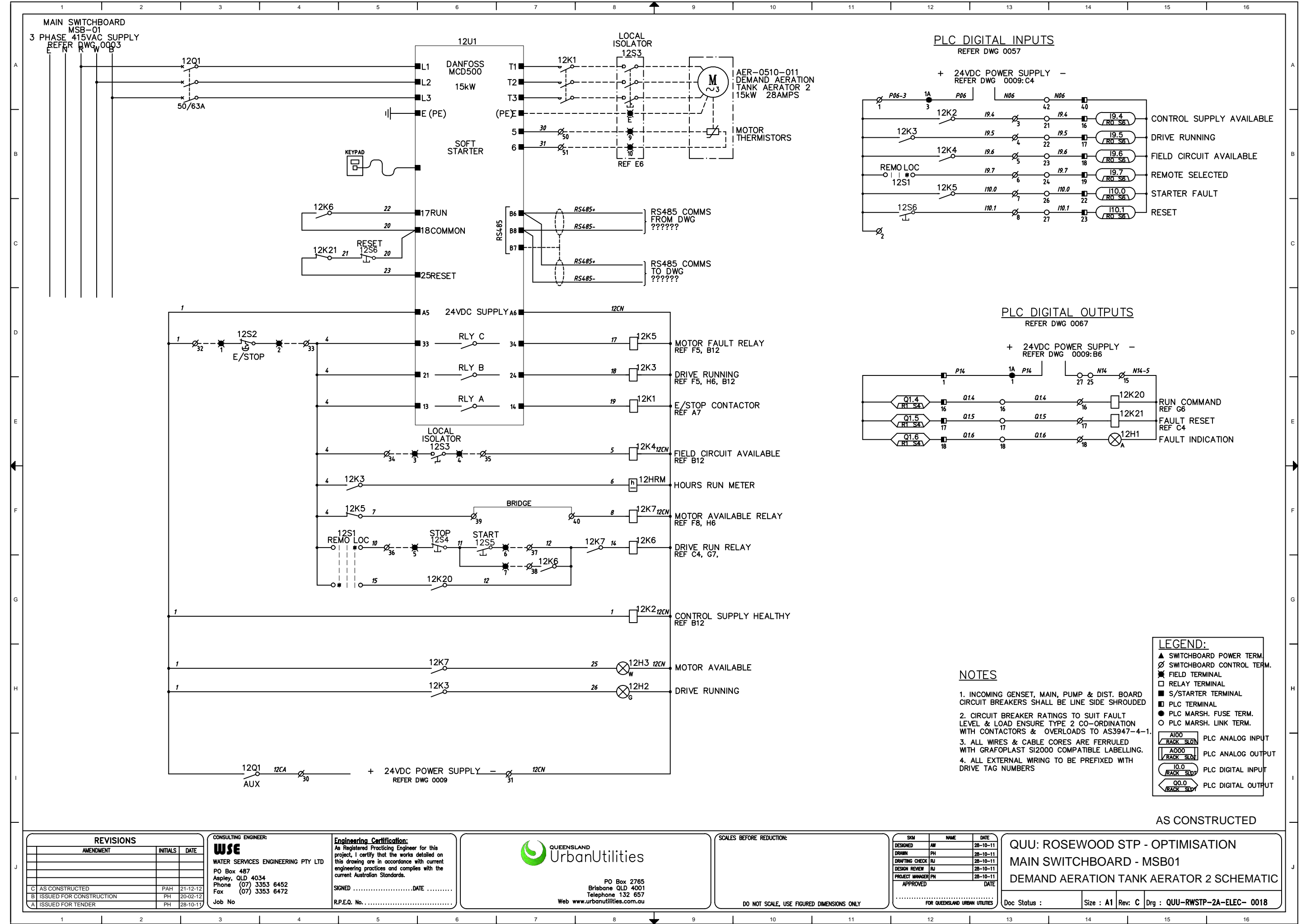




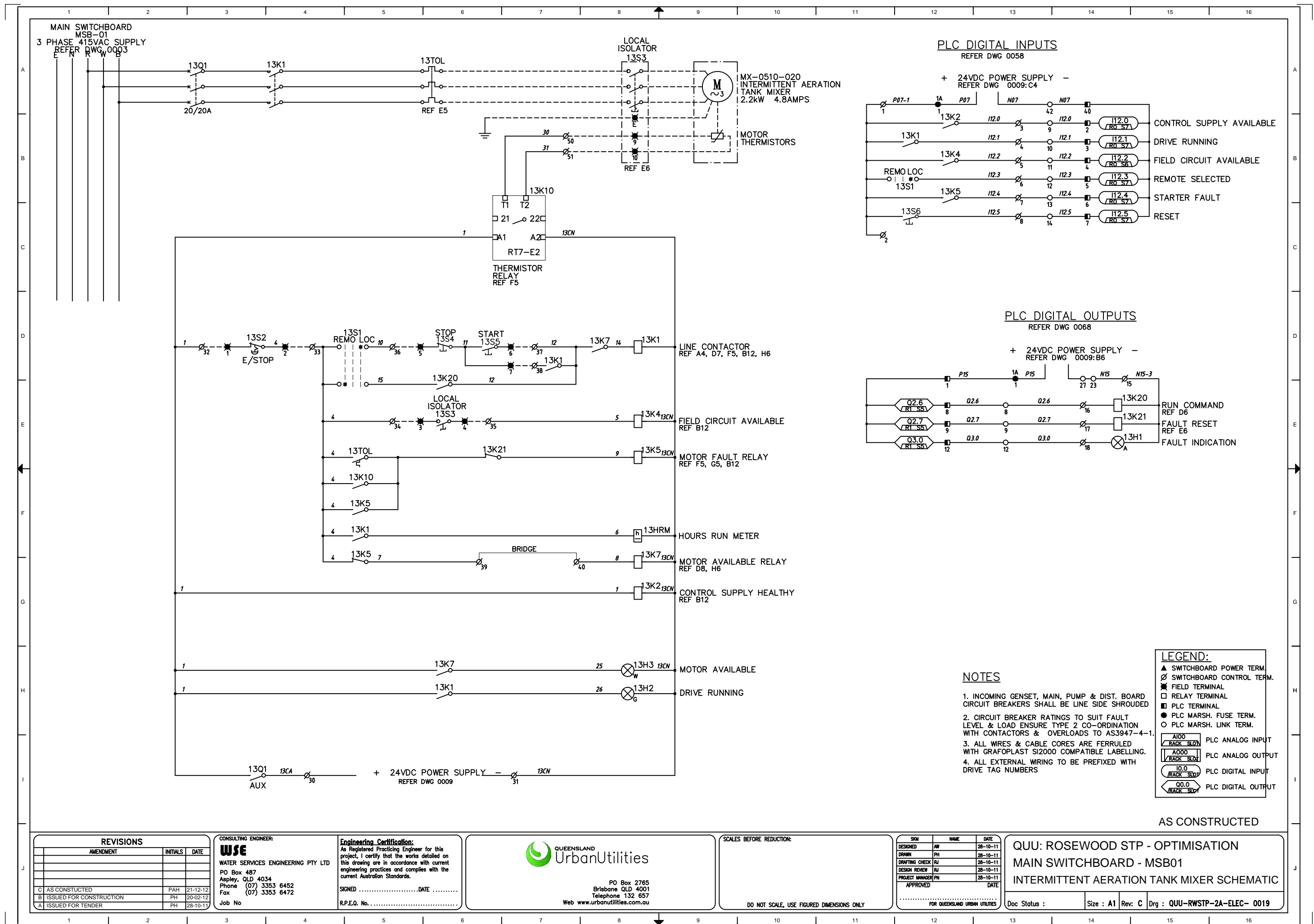


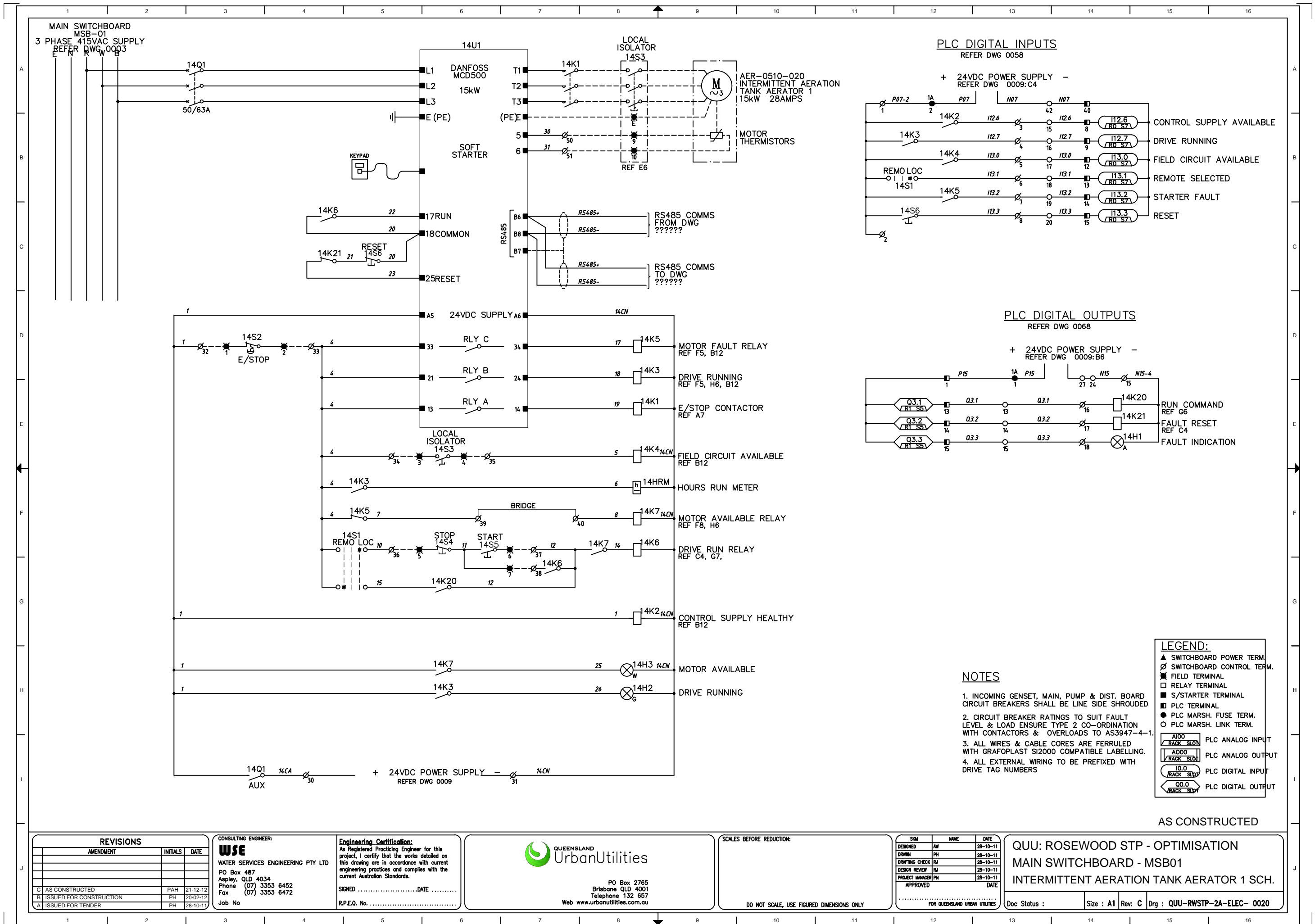


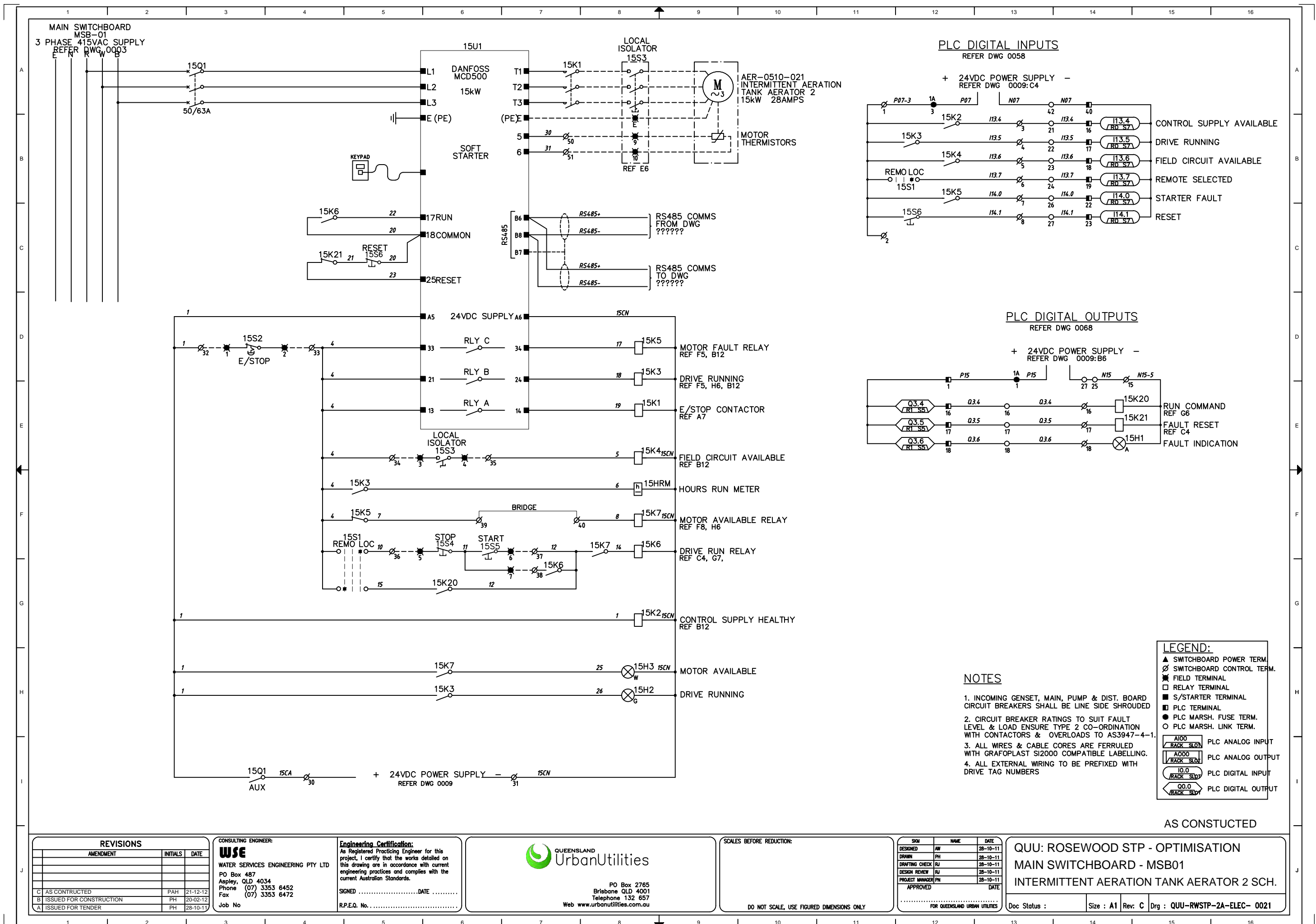




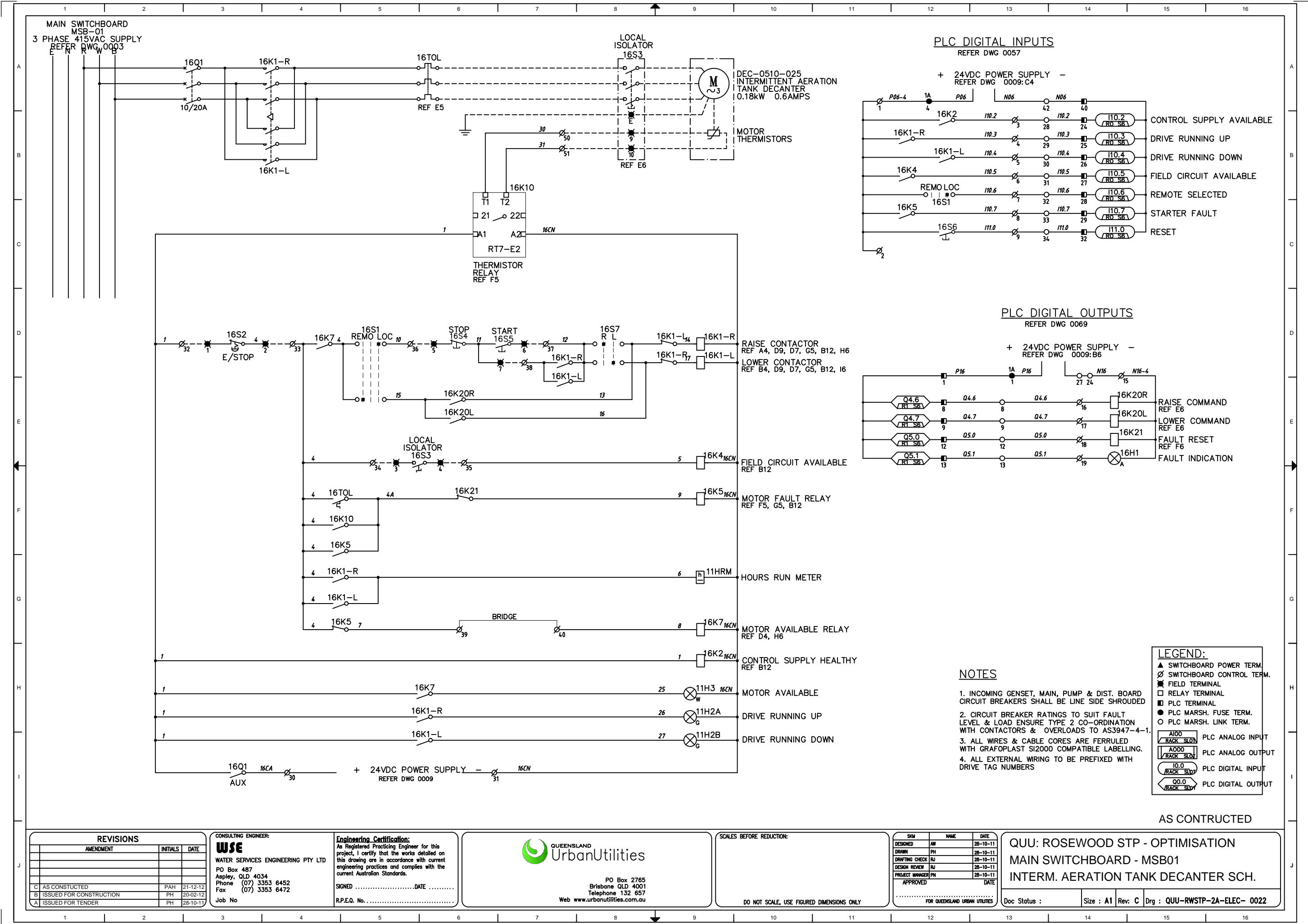


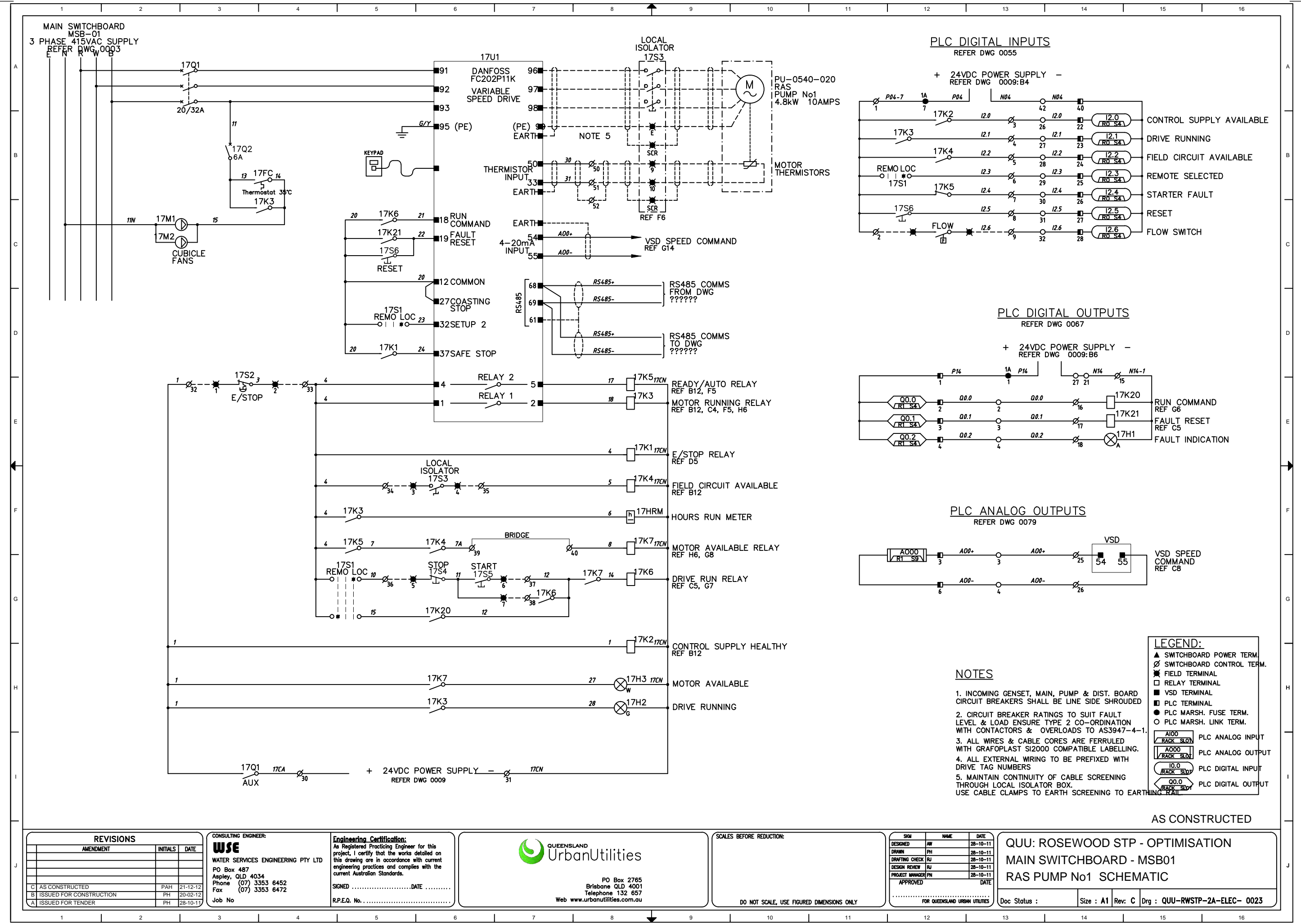


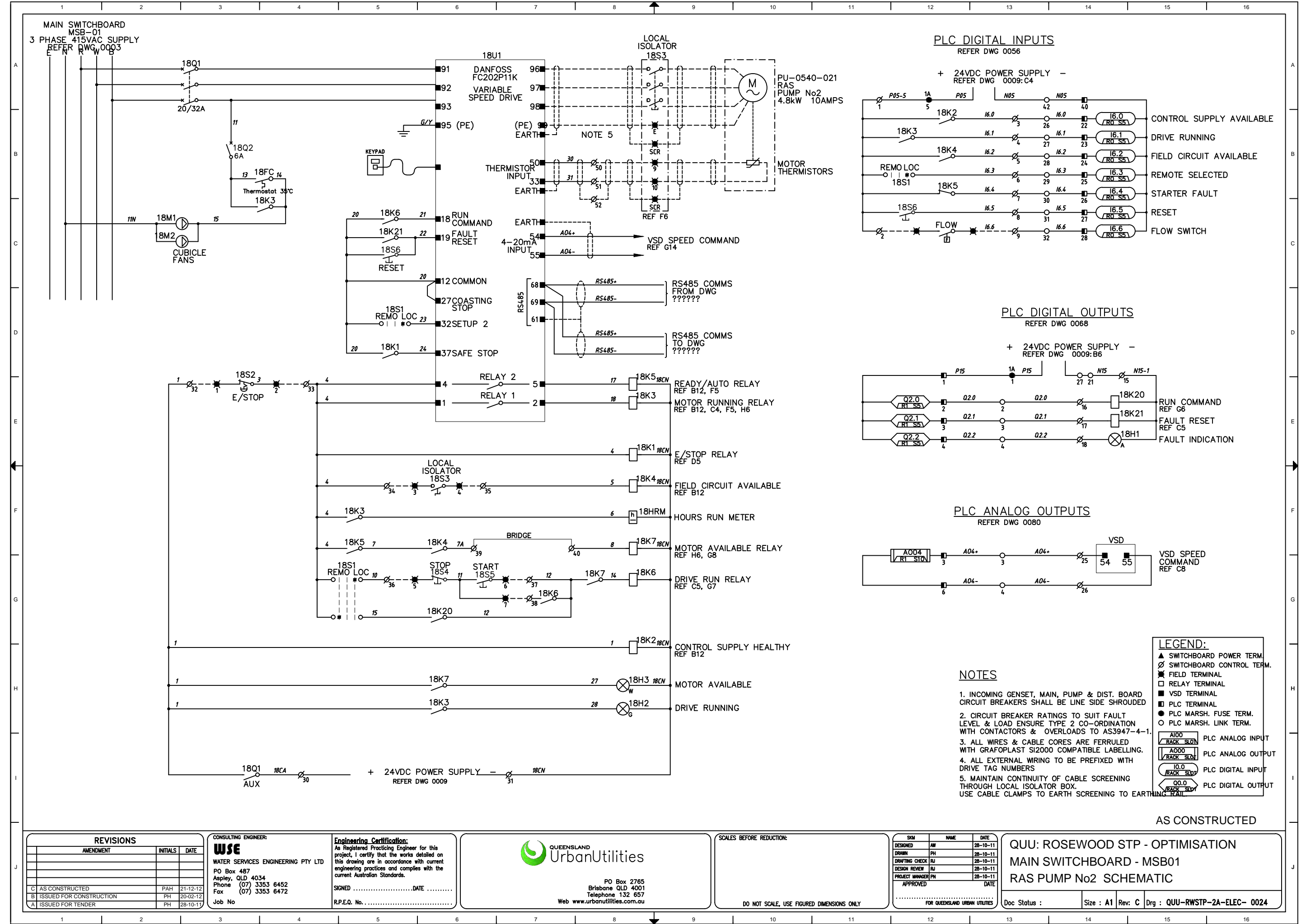




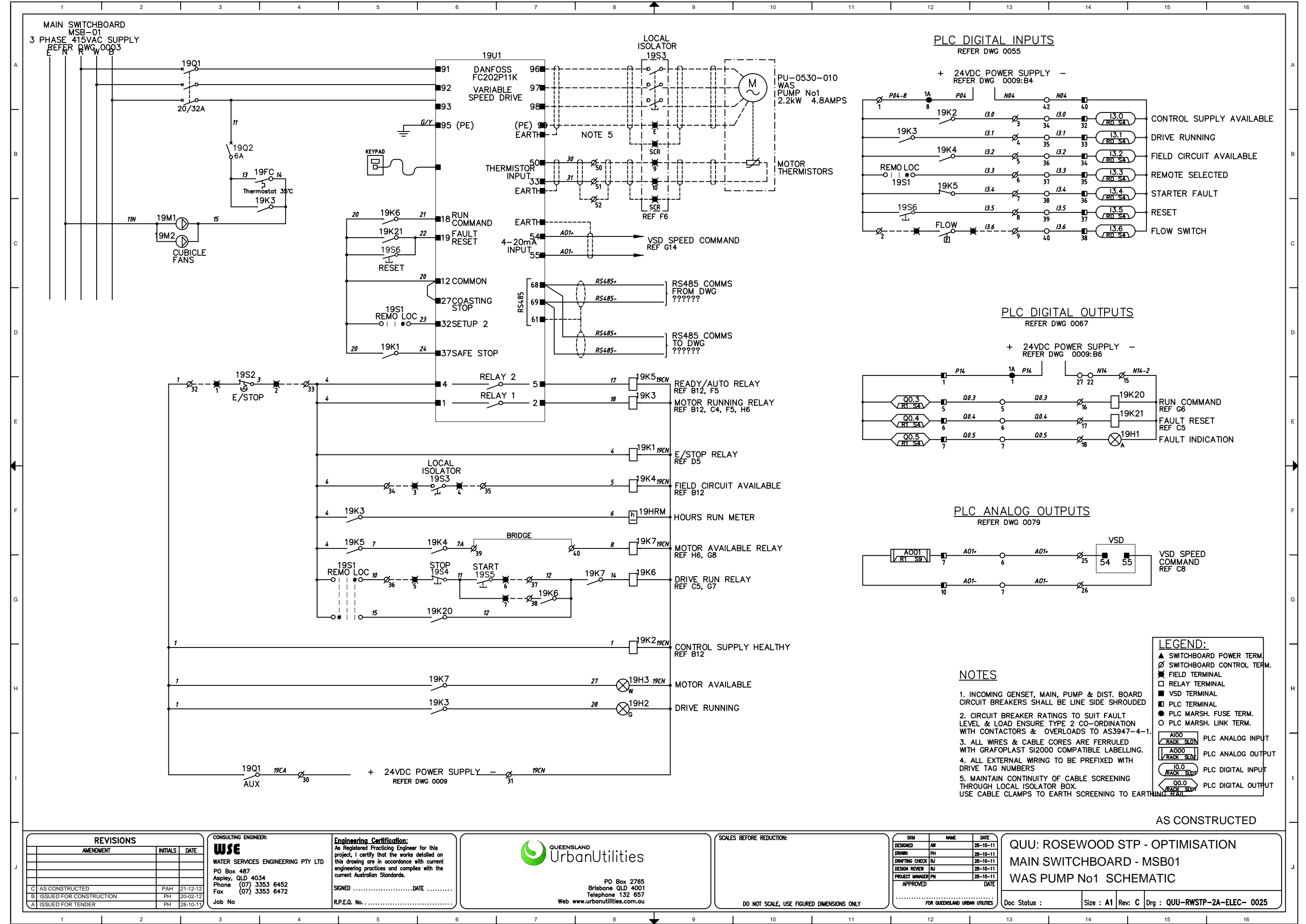


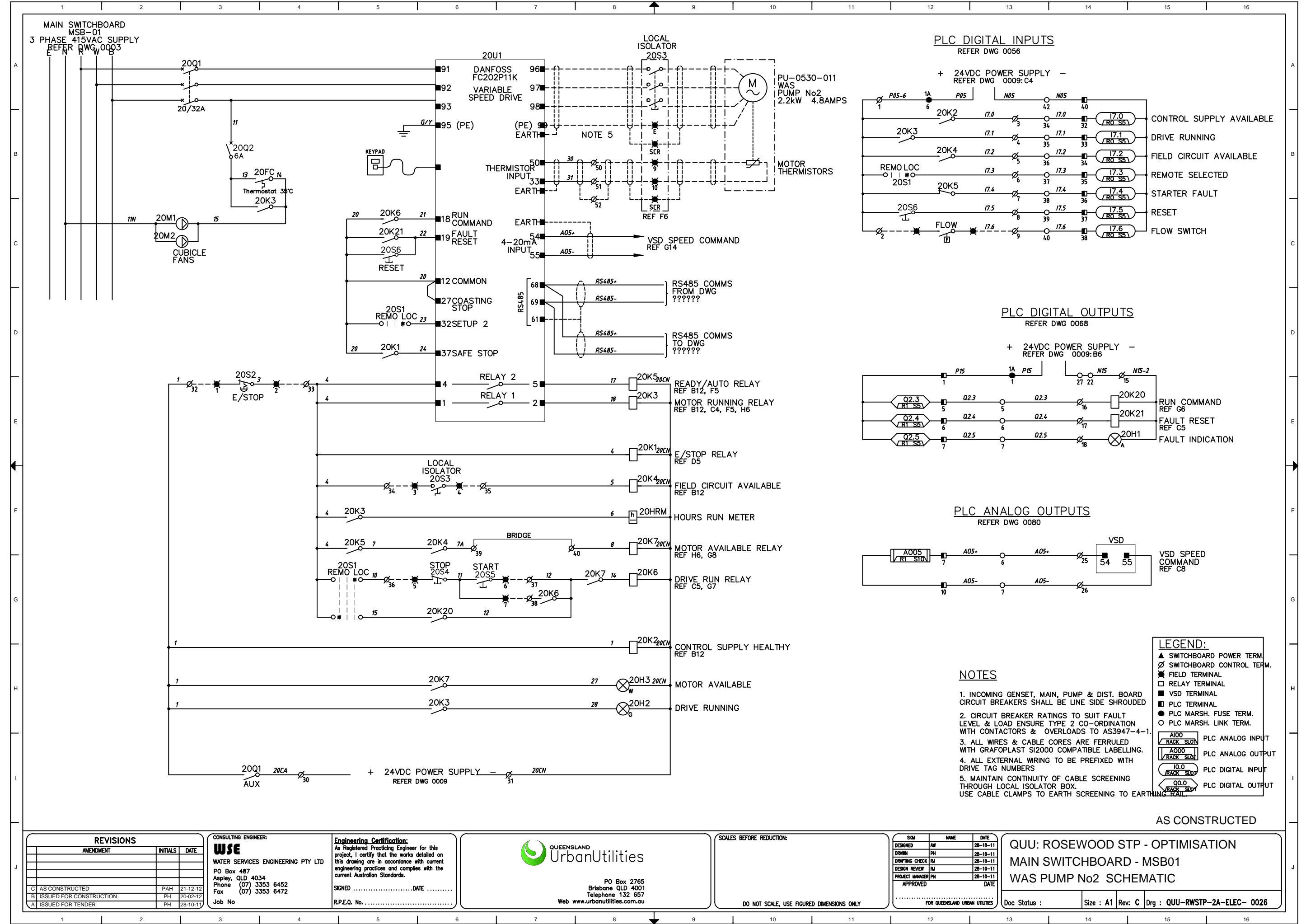


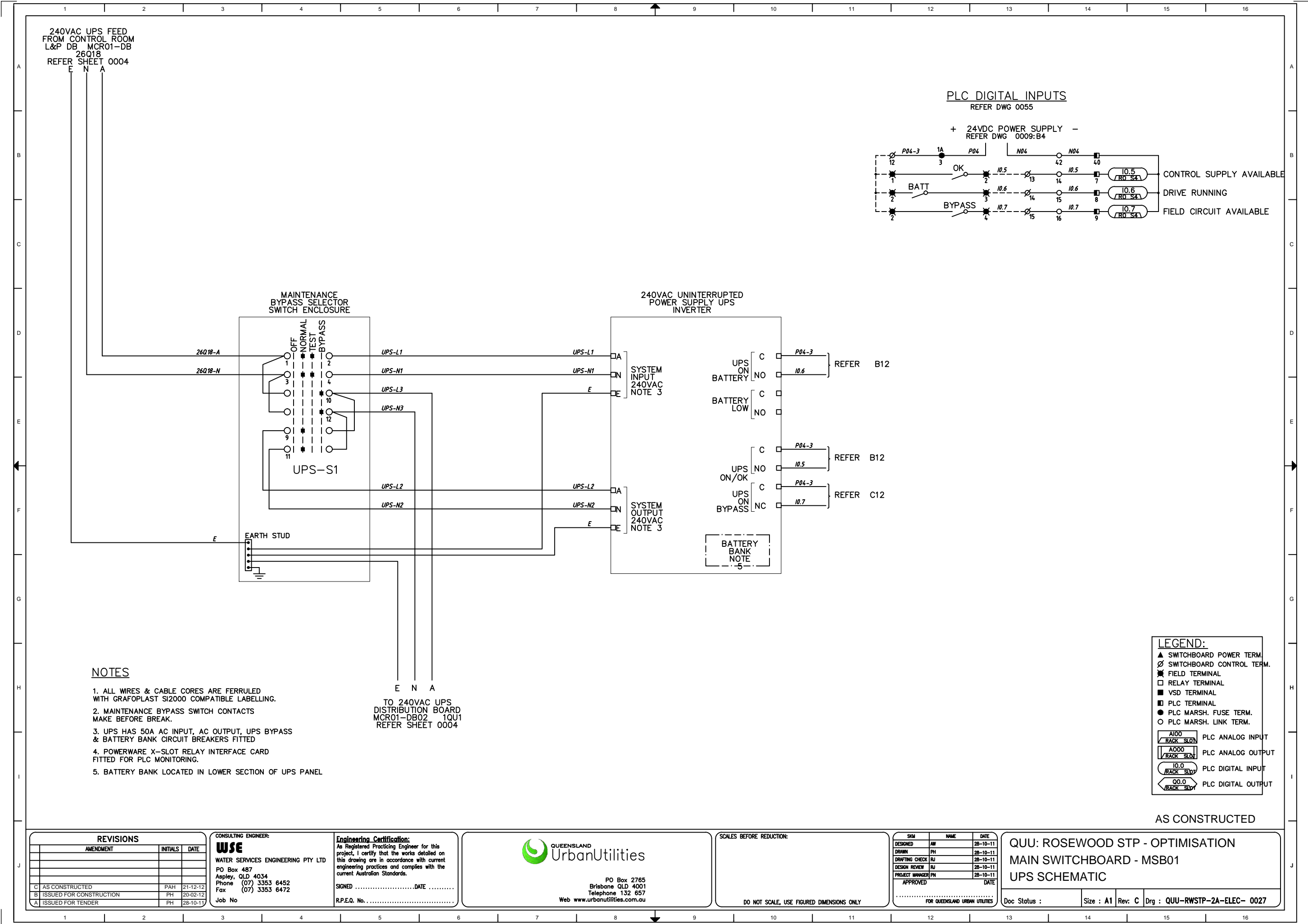


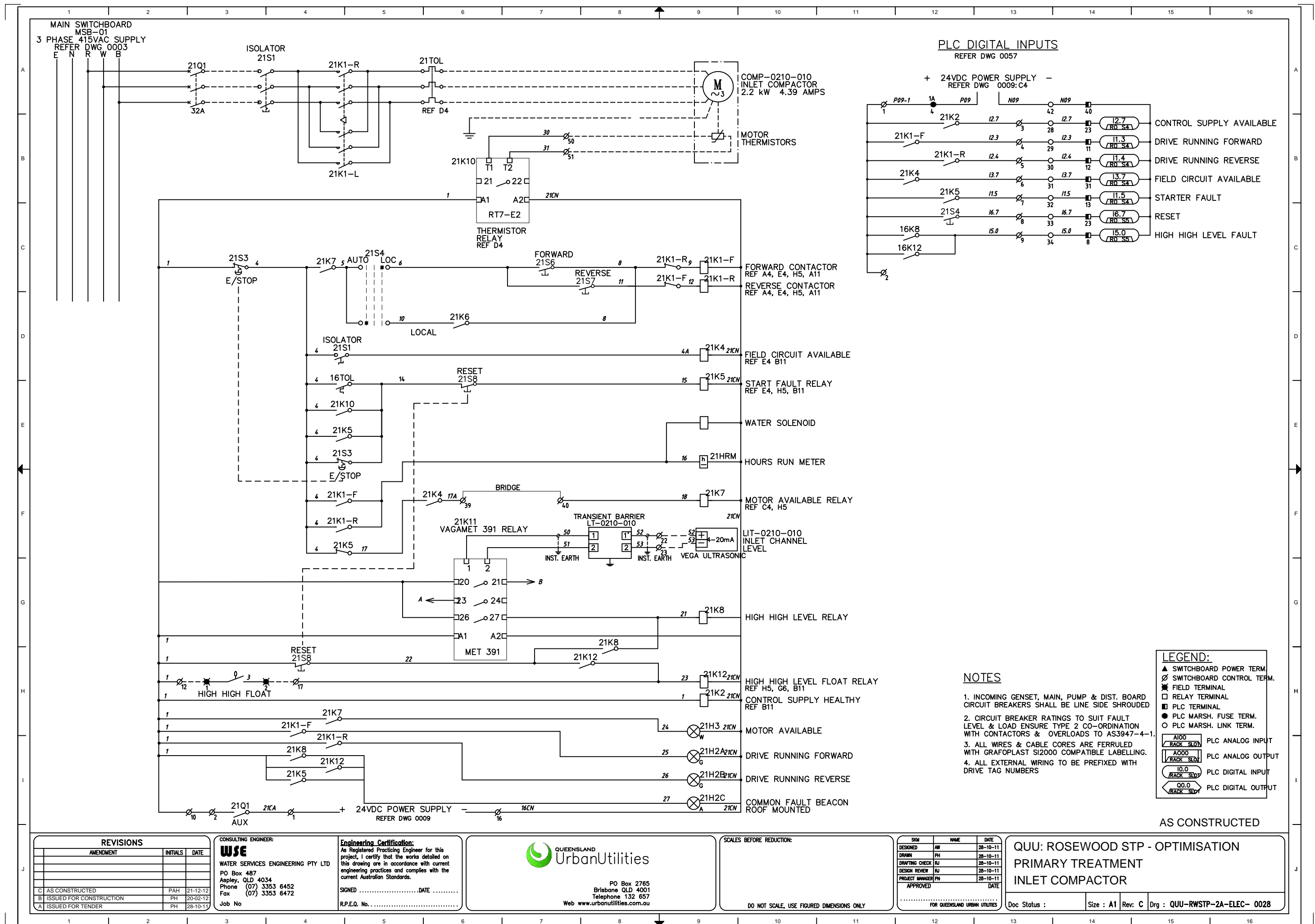




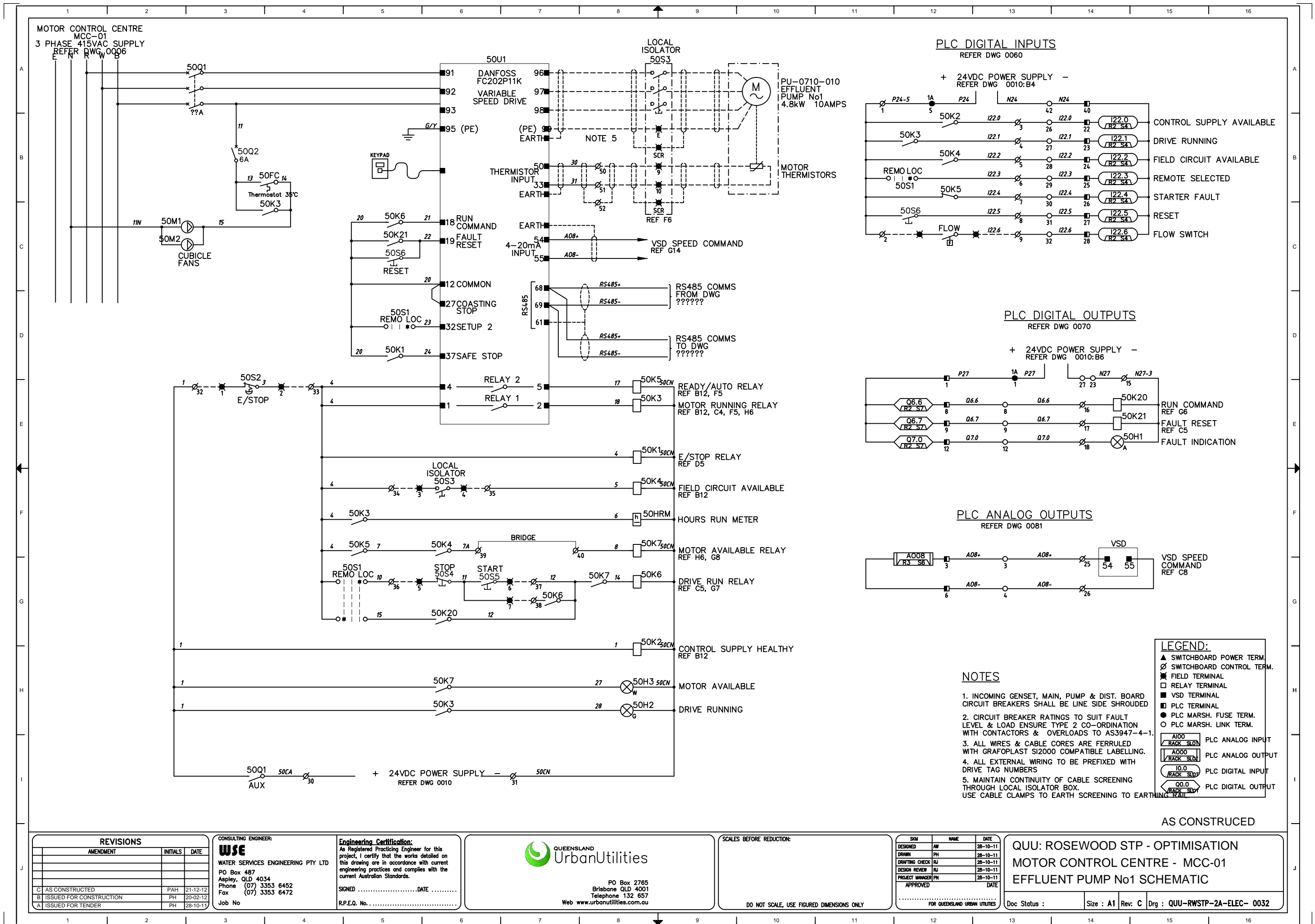


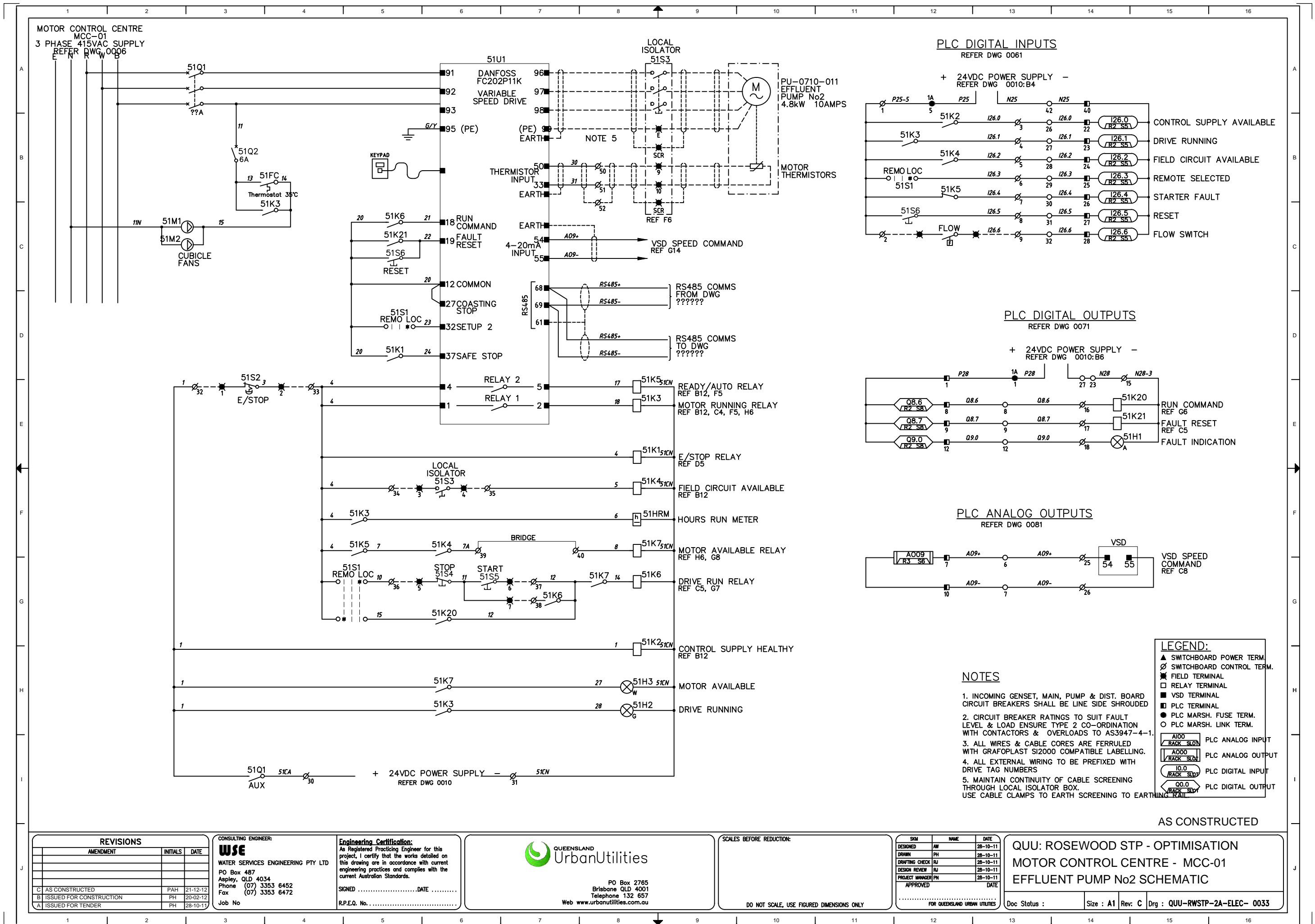


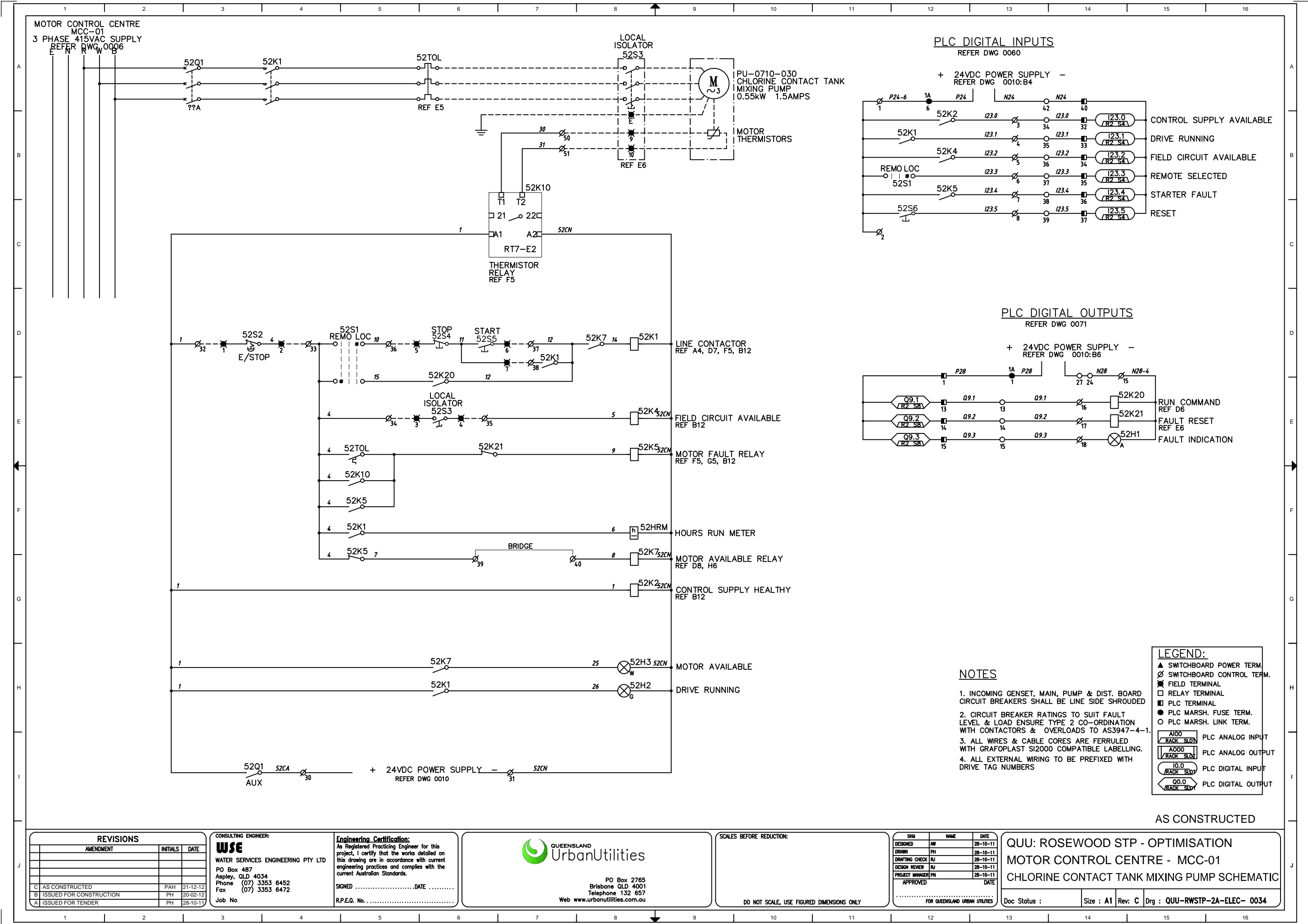


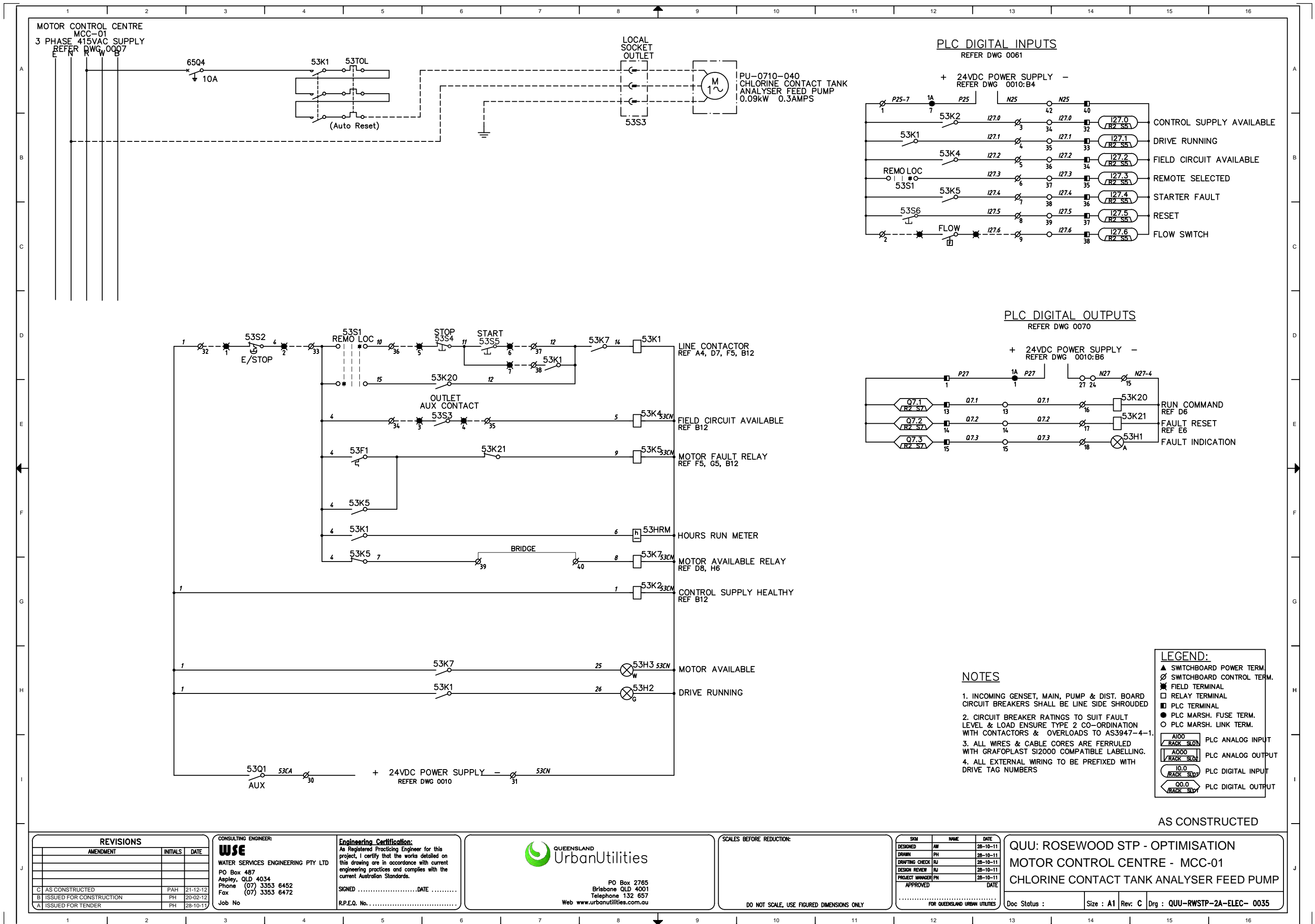




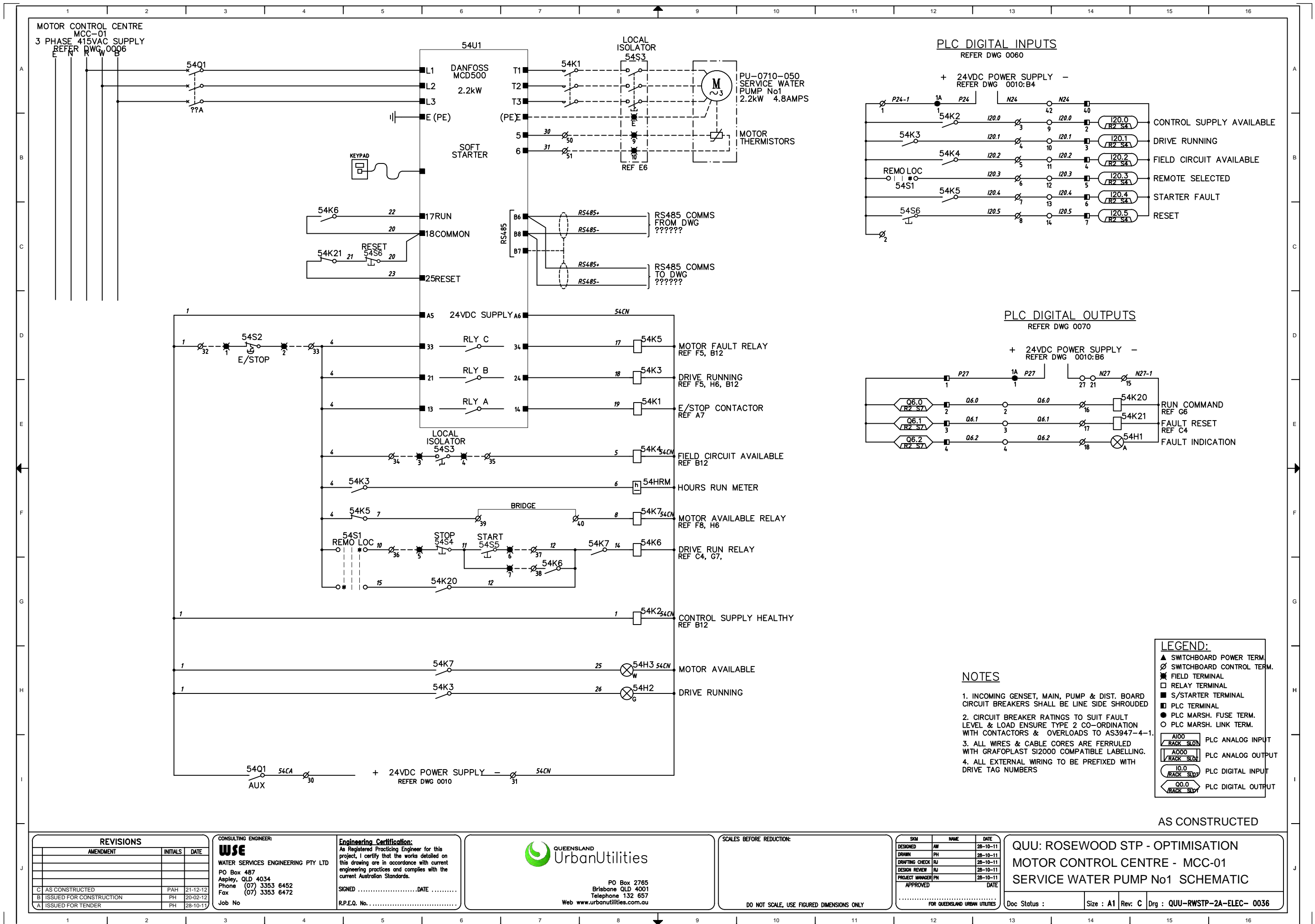


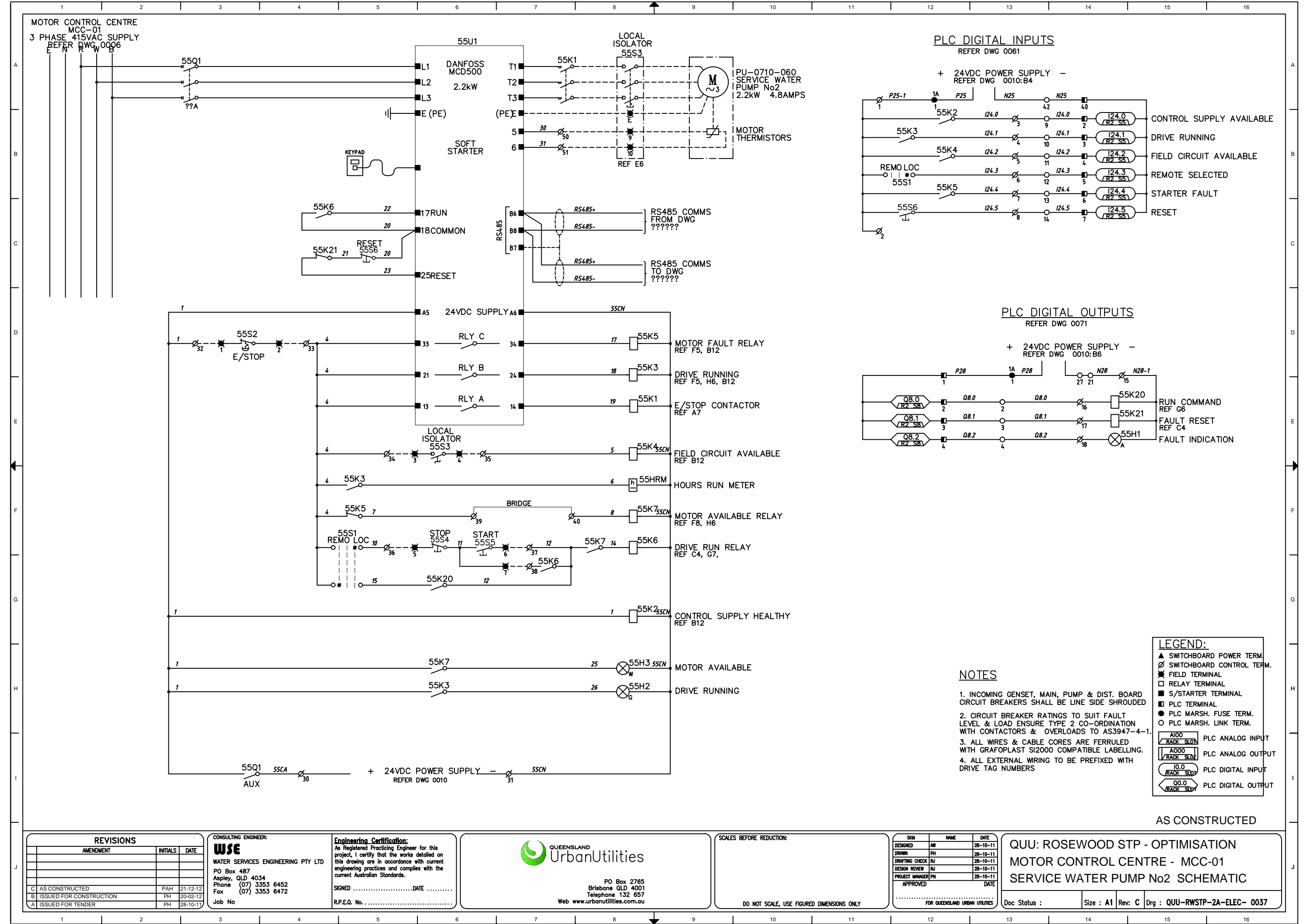


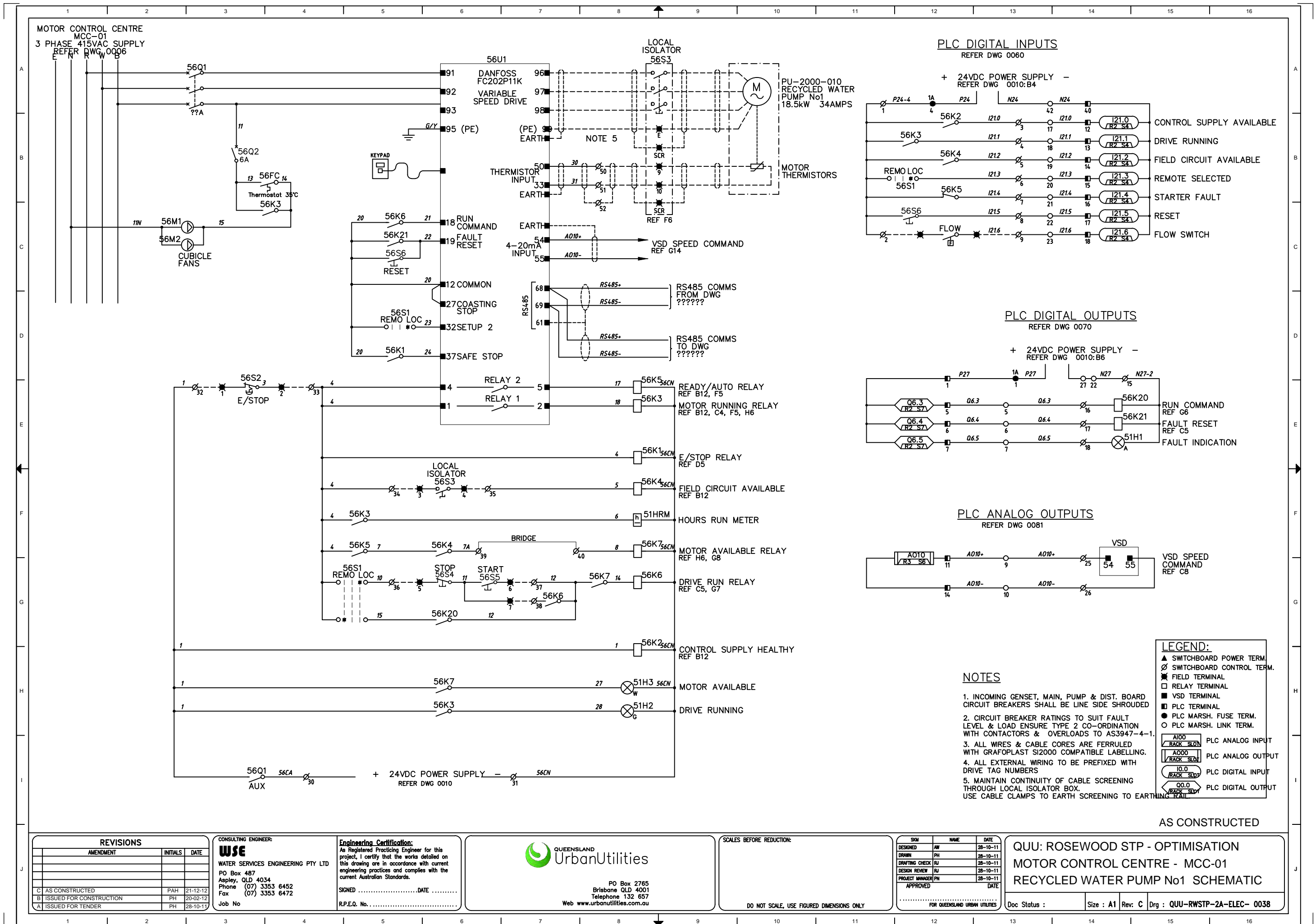


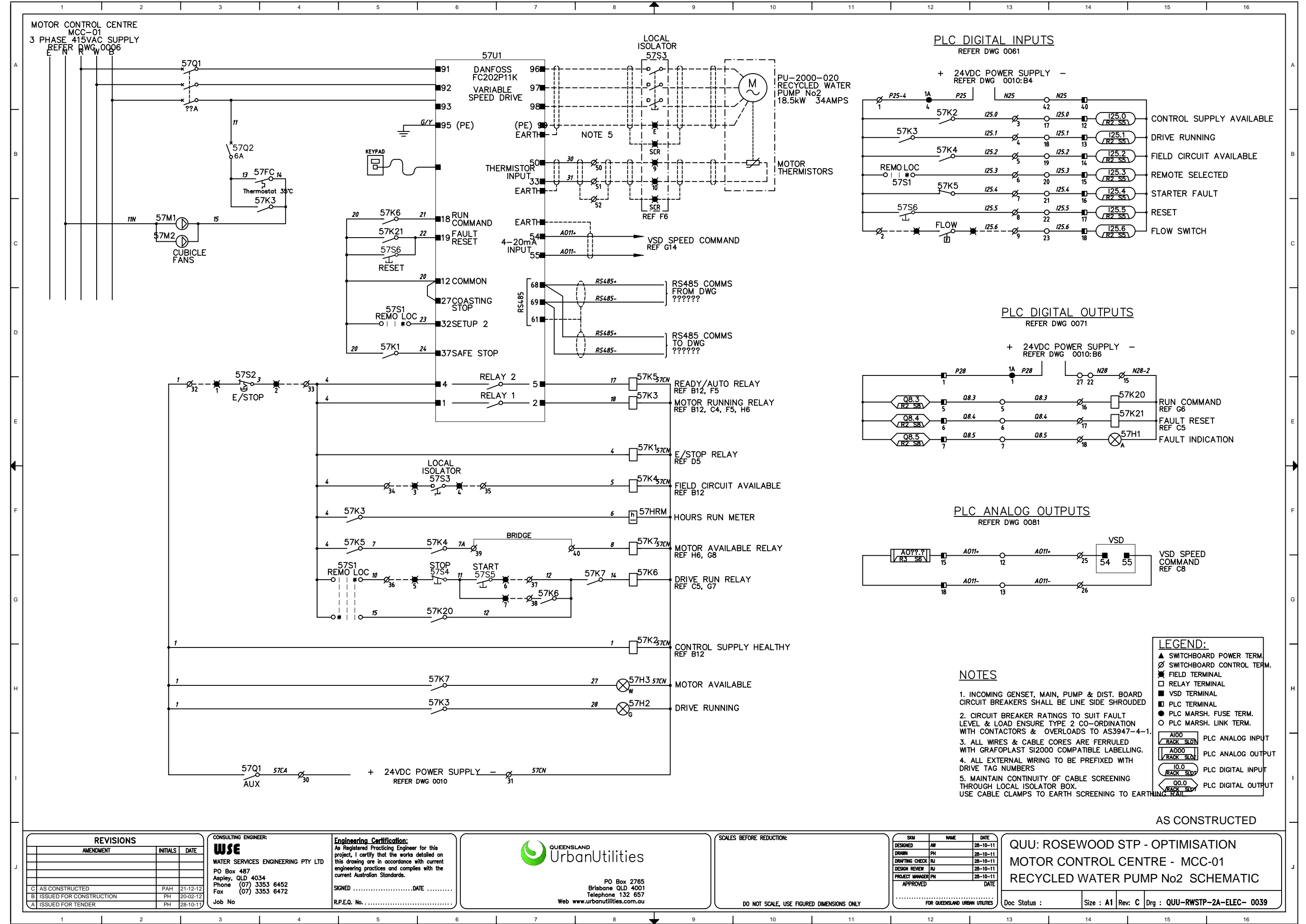












REVISIONS		
AMENDMENT	INITIALS	DATE
C	AS CONSTRUCTED	PAH 21-12-12
B	ISSUED FOR CONSTRUCTION	PH 20-02-12
A	ISSUED FOR TENDER	PH 28-10-11

CONSULTING ENGINEER:  
**WSE**  
WATER SERVICES ENGINEERING PTY LTD  
PO Box 487  
Aspley, QLD 4034  
Phone (07) 3353 6452  
Fax (07) 3353 6472  
Job No

Engineering Certification:  
As Registered Practising Engineer for this project, I certify that the works detailed on this drawing are in accordance with current engineering practices and complies with the current Australian Standards.  
SIGNED .....DATE .....  
R.P.E.Q. No. ....



PO Box 2765  
Brisbane QLD 4001  
Telephone 132 657  
Web [www.urbanutilities.com.au](http://www.urbanutilities.com.au)

SCALES BEFORE REDUCTION:  
  
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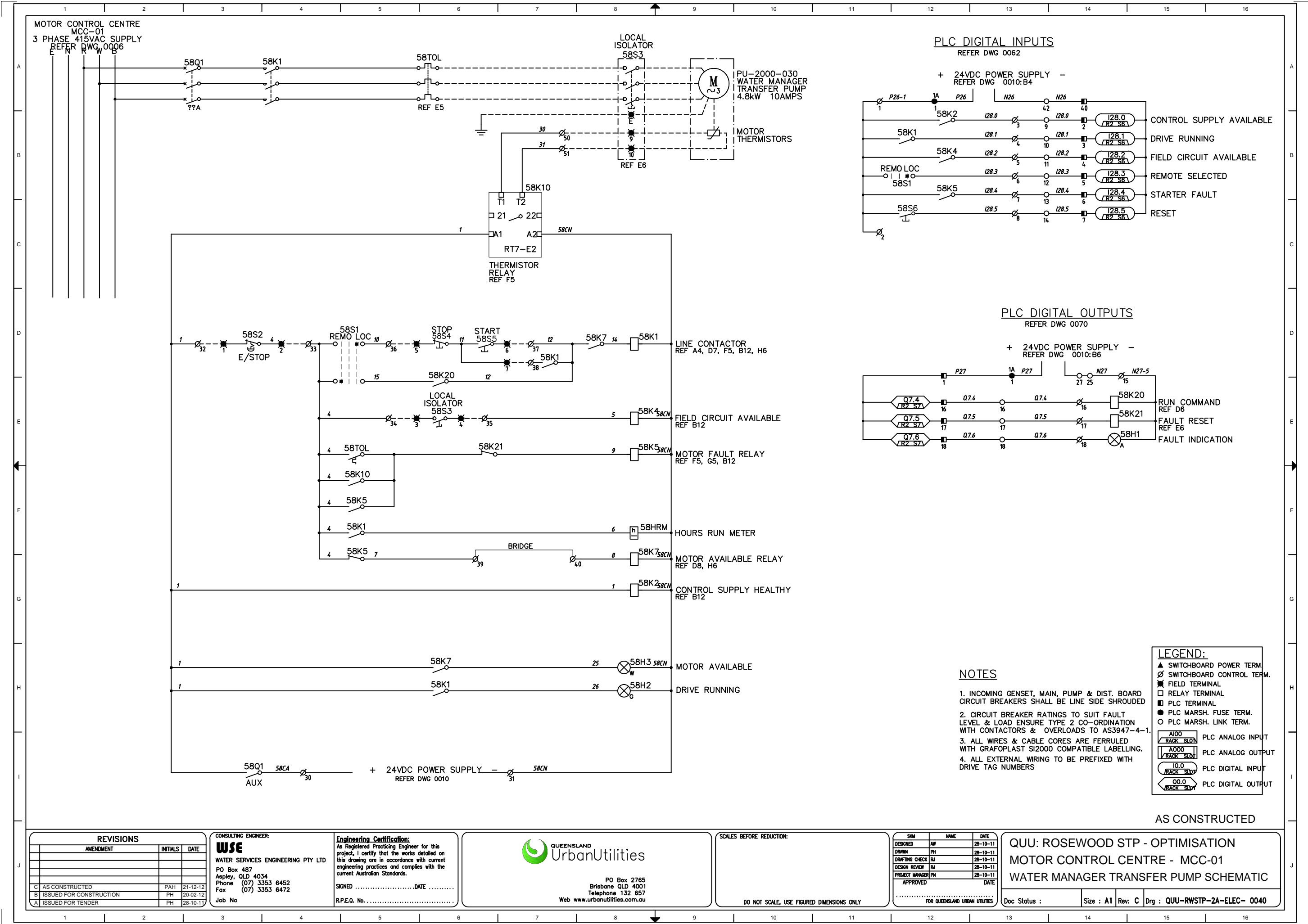
SYM	NAME	DATE
DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PH	28-10-11
APPROVED		DATE

FOR QUEENSLAND URBAN UTILITIES

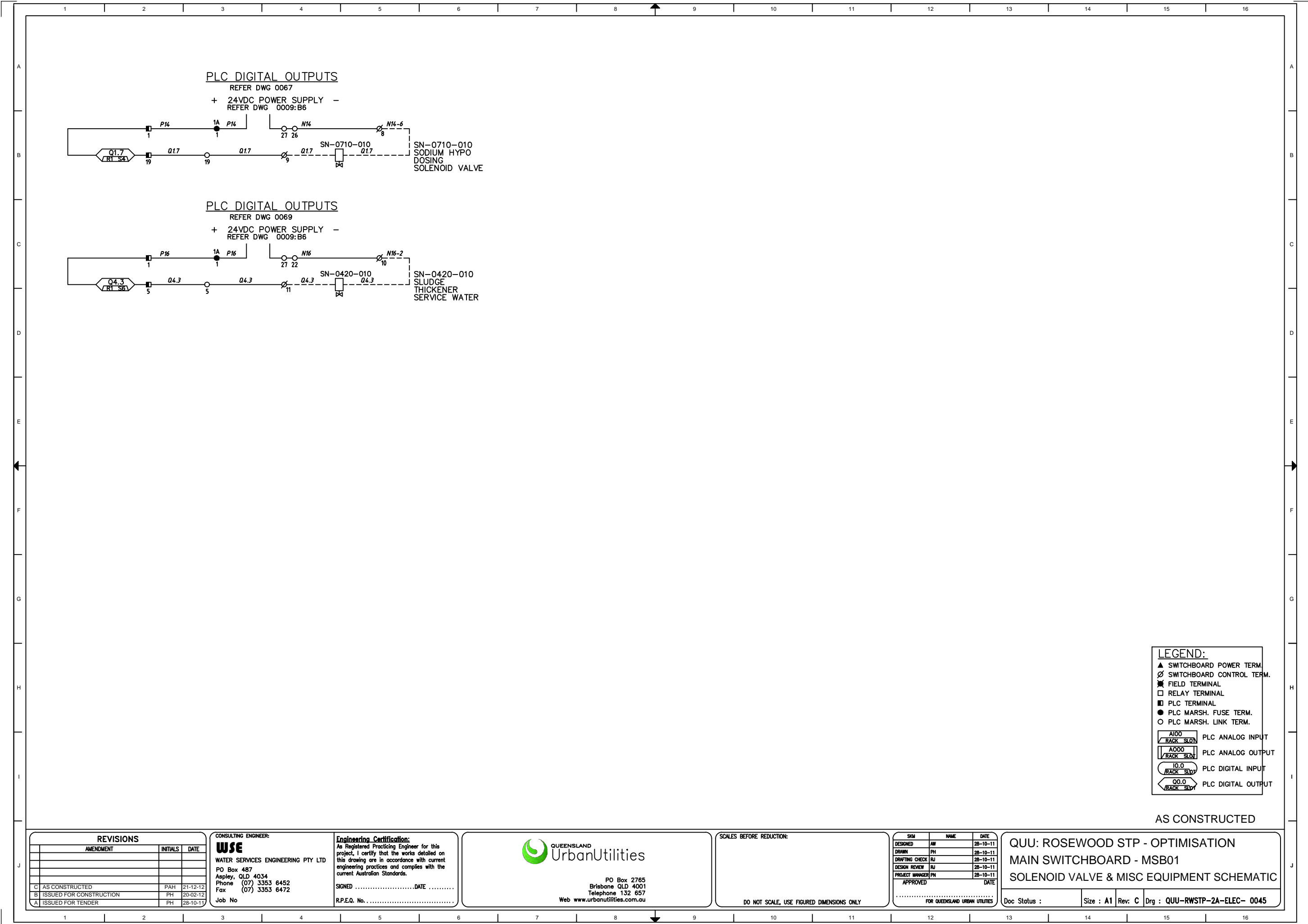
QUU: ROSEWOOD STP - OPTIMISATION  
MOTOR CONTROL CENTRE - MCC-01  
RECYCLED WATER PUMP No2 SCHEMATIC

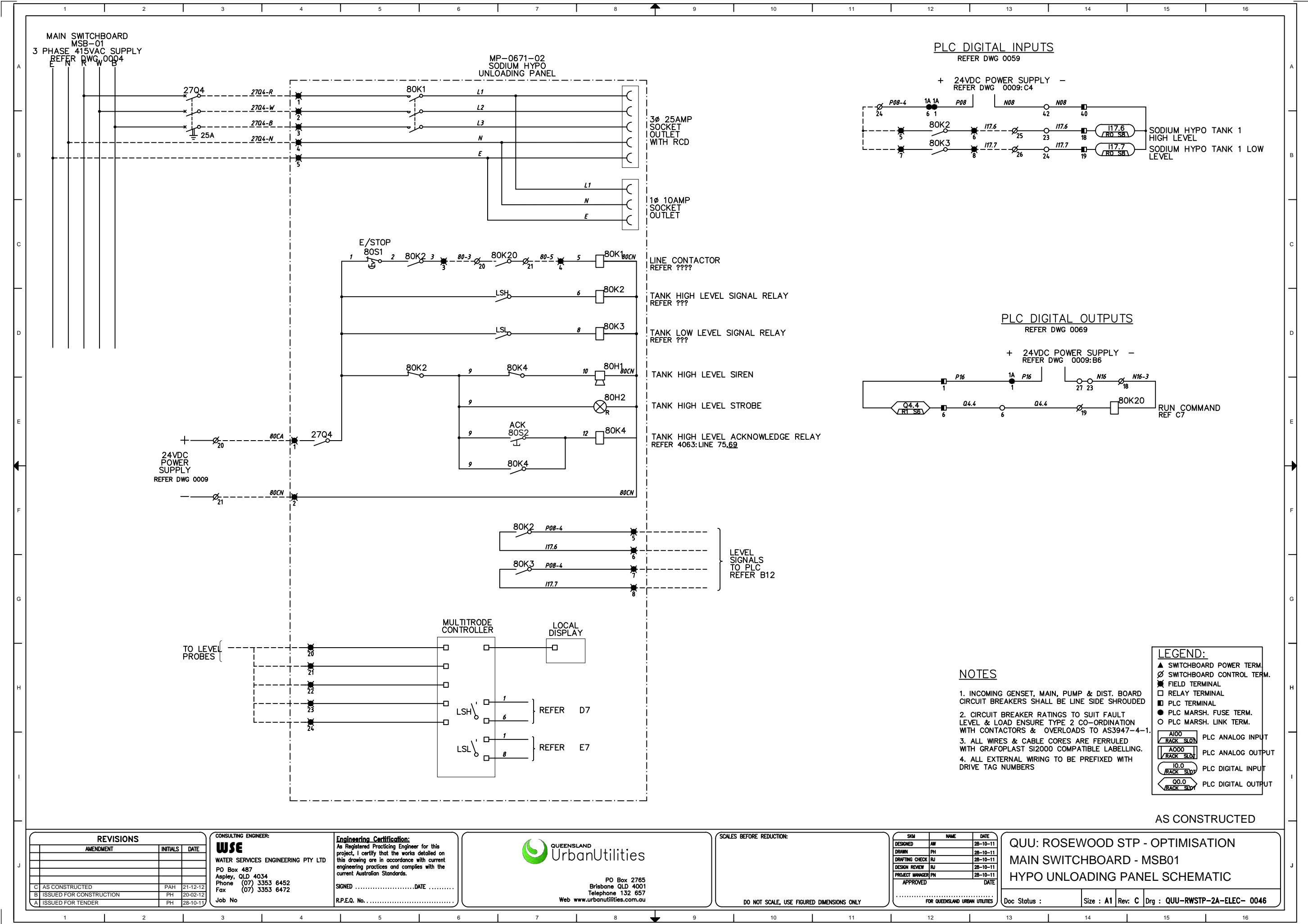
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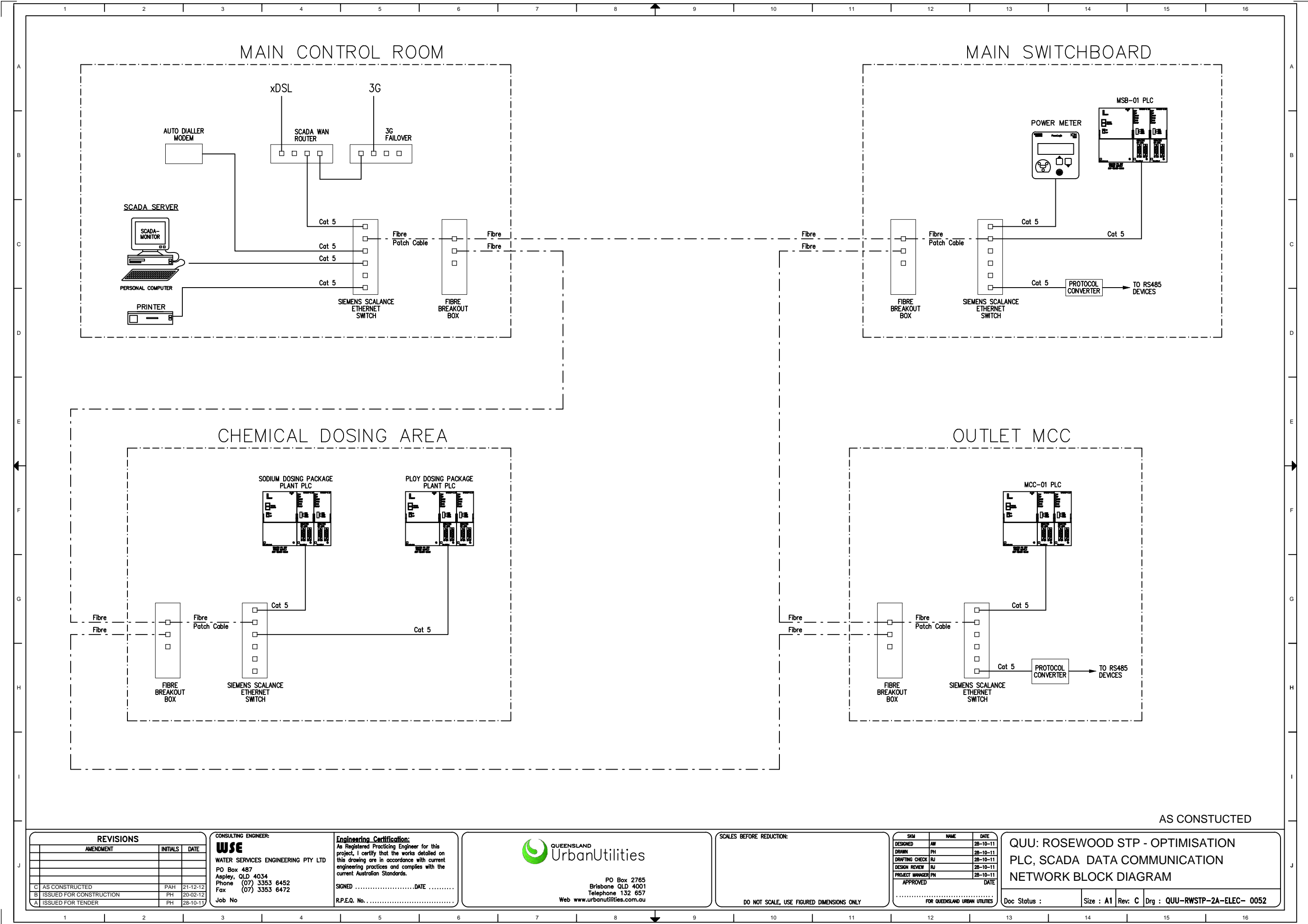












AS CONSTRUCTED

REVISIONS		
AMENDMENT	INITIALS	DATE
C AS CONSTRUCTED	PAH	21-12-12
B ISSUED FOR CONSTRUCTION	PH	20-02-12
A ISSUED FOR TENDER	PH	28-10-11

CONSULTING ENGINEER:  
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R.P.E.Q. No. ....

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Telephone 132 657  
Web www.urbanutilities.com.au

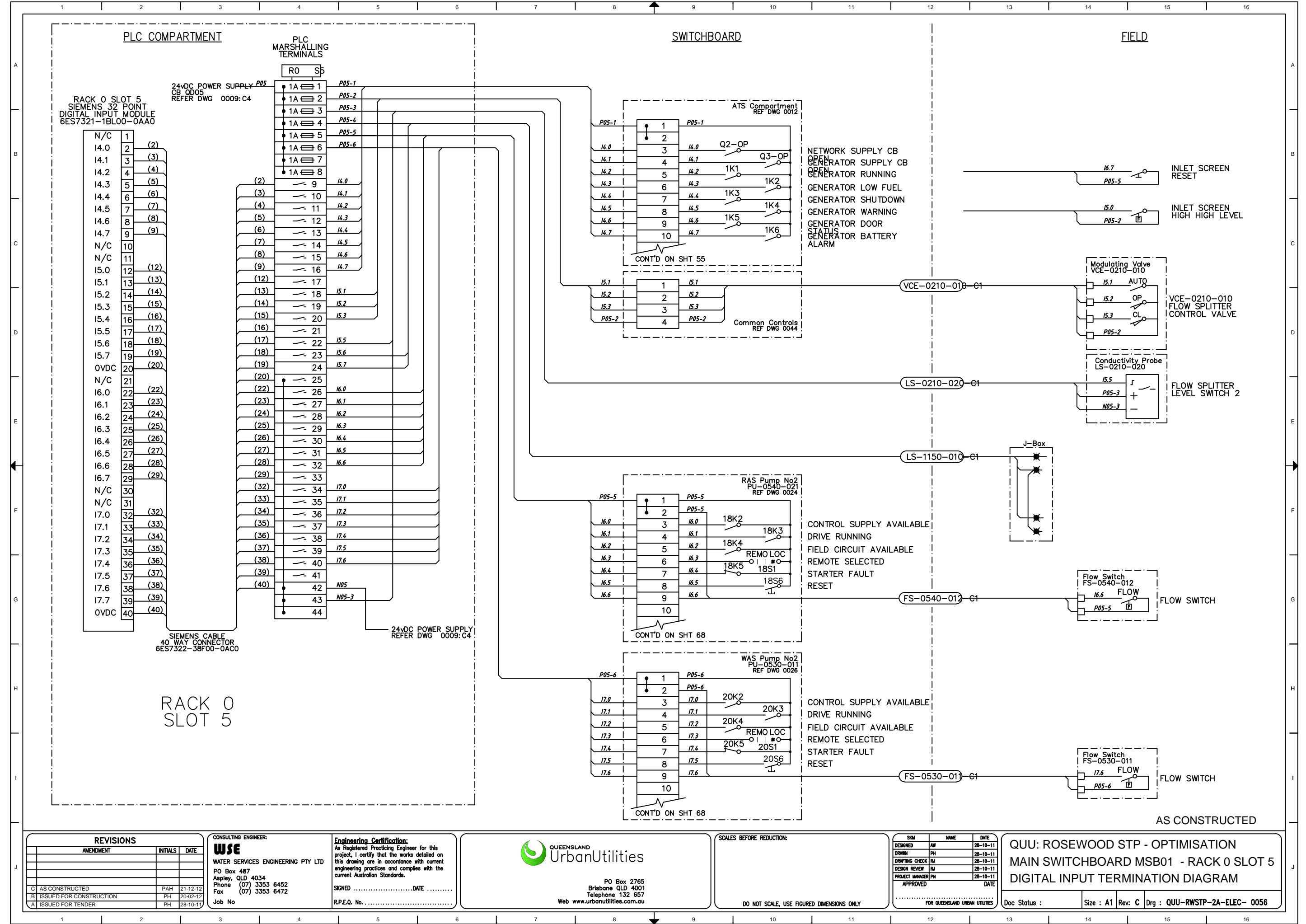
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DO NOT SCALE, USE FIGURED DIMENSIONS ONLY

SYM	NAME	DATE
DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PH	28-10-11
APPROVED		DATE
FOR QUEENSLAND URBAN UTILITIES		

QUU: ROSEWOOD STP - OPTIMISATION  
PLC, SCADA DATA COMMUNICATION  
NETWORK BLOCK DIAGRAM

Doc Status : Size : A1 Rev: C Drg : QUU-RWSTP-2A-ELEC- 0052





REVISIONS		
AMENDMENT	INITIALS	DATE
C	AS CONSTRUCTED	PAH 21-12-12
B	ISSUED FOR CONSTRUCTION	PH 20-02-12
A	ISSUED FOR TENDER	PH 28-10-11

CONSULTING ENGINEER:  
**WSE**  
WATER SERVICES ENGINEERING PTY LTD  
PO Box 487  
Aspley, QLD 4034  
Phone (07) 3353 6452  
Fax (07) 3353 6472  
Job No

Engineering Certification:  
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SIGNED .....DATE .....  
R.P.E.Q. No. ....

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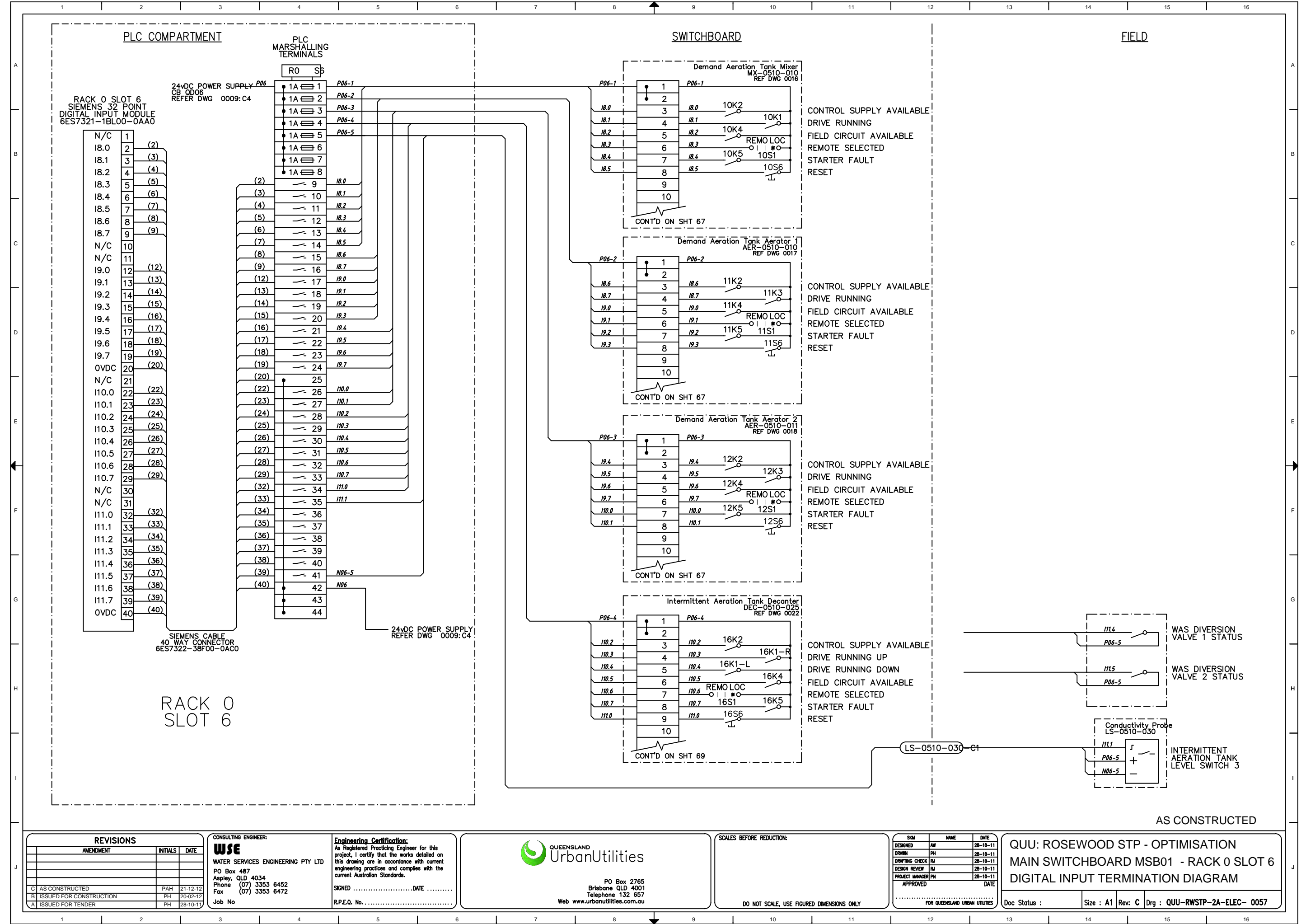
DO NOT SCALE, USE FIGURED DIMENSIONS ONLY

SYM	NAME	DATE
DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PH	28-10-11
APPROVED		DATE

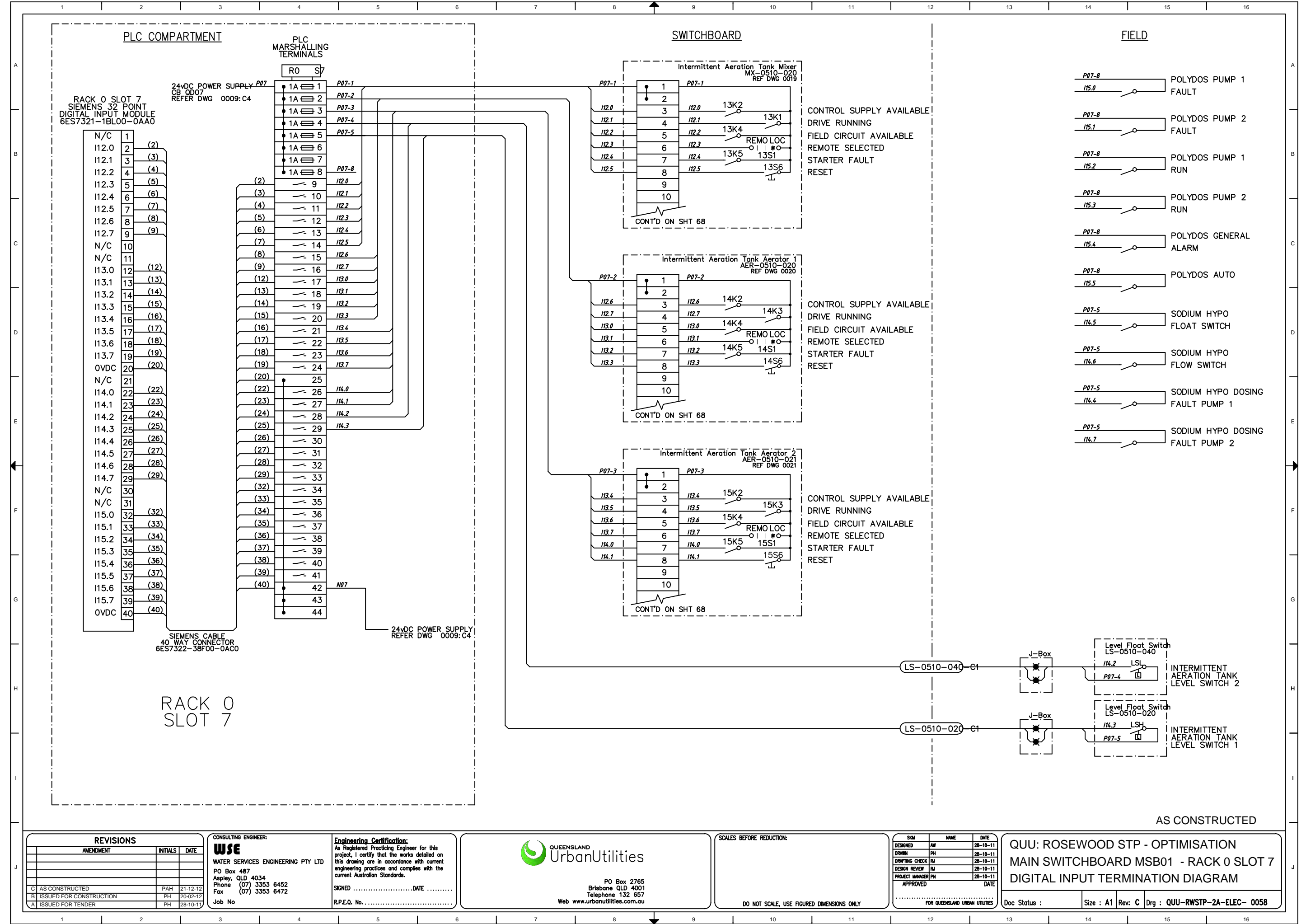
FOR QUEENSLAND URBAN UTILITIES

QUU: ROSEWOOD STP - OPTIMISATION  
MAIN SWITCHBOARD MSB01 - RACK 0 SLOT 5  
DIGITAL INPUT TERMINATION DIAGRAM

Doc Status : Size : A1 Rev: C Drg : QUU-RWSTP-2A-ELEC- 0056







REVISIONS		
AMENDMENT	INITIALS	DATE
C	AS CONSTRUCTED	PAH 21-12-12
B	ISSUED FOR CONSTRUCTION	PH 20-02-12
A	ISSUED FOR TENDER	PH 28-10-11

CONSULTING ENGINEER:  
**WSE**  
WATER SERVICES ENGINEERING PTY LTD  
PO Box 487  
Aspley, QLD 4034  
Phone (07) 3353 6452  
Fax (07) 3353 6472  
Job No

Engineering Certification:  
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SIGNED .....DATE .....  
R.P.E.Q. No. ....

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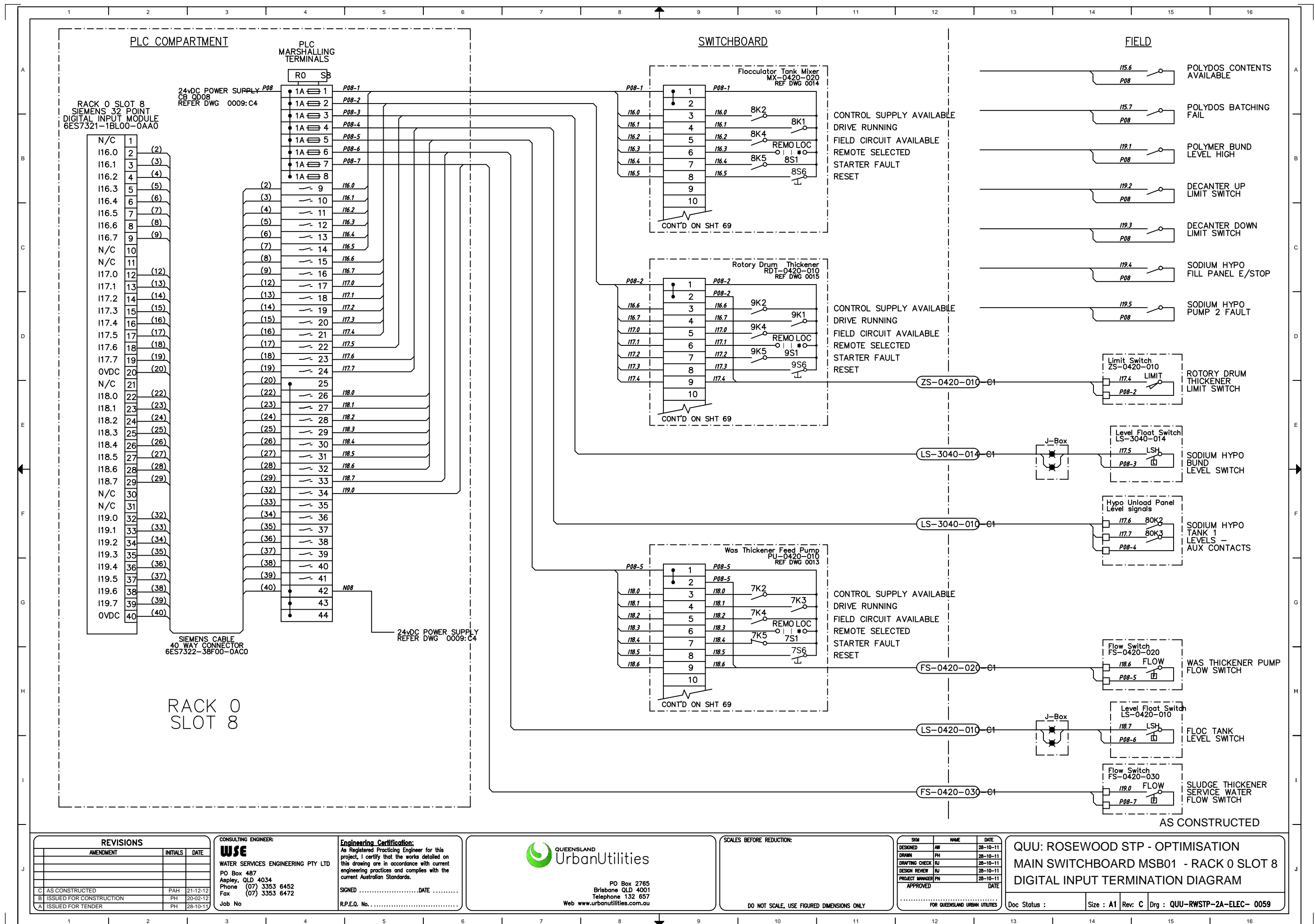
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SYM	NAME	DATE
DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PH	28-10-11
APPROVED		DATE

FOR QUEENSLAND URBAN UTILITIES

QUU: ROSEWOOD STP - OPTIMISATION  
MAIN SWITCHBOARD MSB01 - RACK 0 SLOT 7  
DIGITAL INPUT TERMINATION DIAGRAM

Doc Status : Size : A1 Rev: C Drg : QUU-RWSTP-2A-ELEC- 0058



REVISIONS		
AMENDMENT	INITIALS	DATE
C	AS CONSTRUCTED	PAH 21-12-12
B	ISSUED FOR CONSTRUCTION	PH 20-02-12
A	ISSUED FOR TENDER	PH 28-10-11

CONSULTING ENGINEER:  
**WSE**  
WATER SERVICES ENGINEERING PTY LTD  
PO Box 487  
Aspley, QLD 4034  
Phone (07) 3353 6452  
Fax (07) 3353 6472  
Job No

Engineering Certification:  
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SIGNED .....DATE .....  
R.P.E.Q. No. ....

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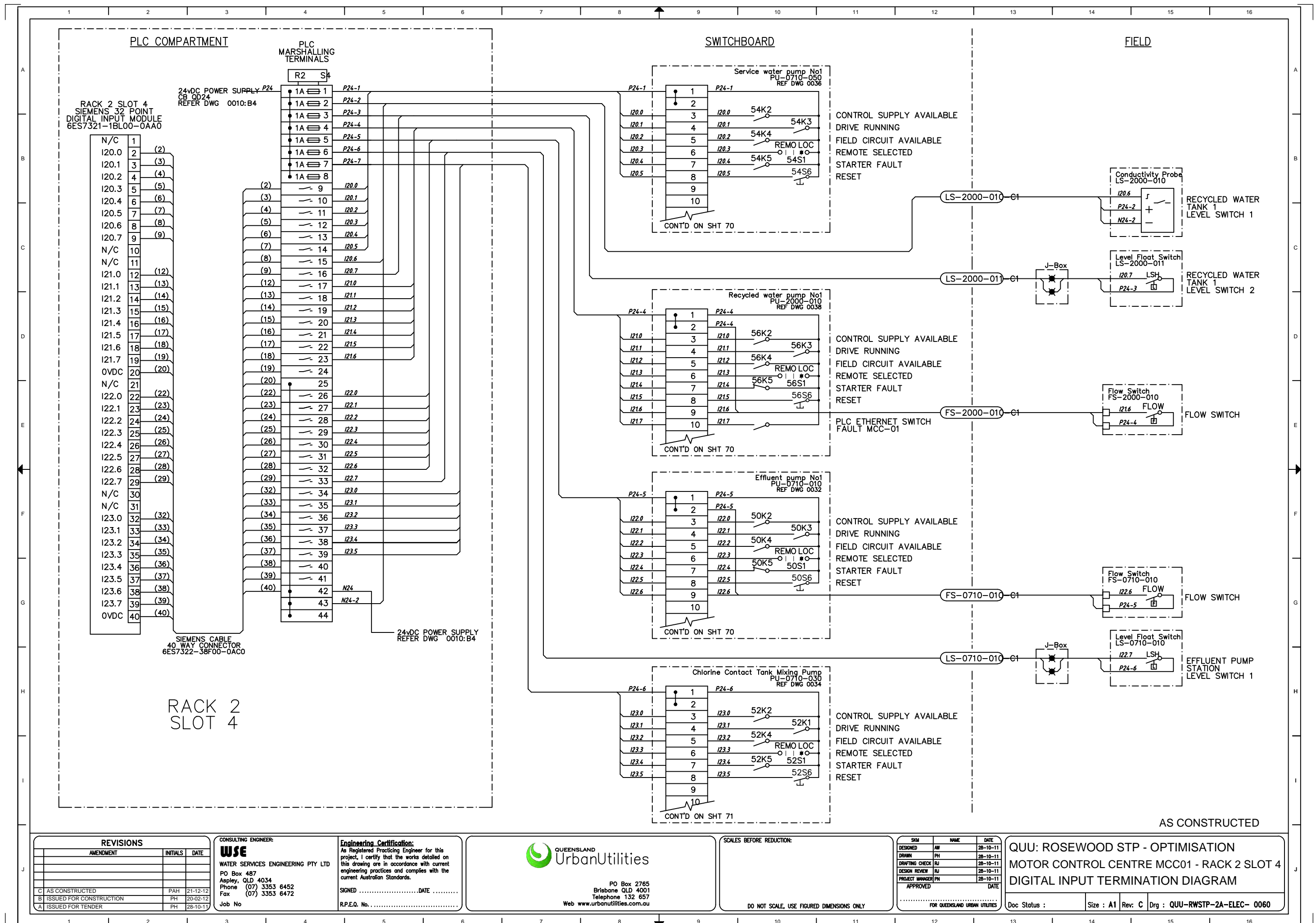
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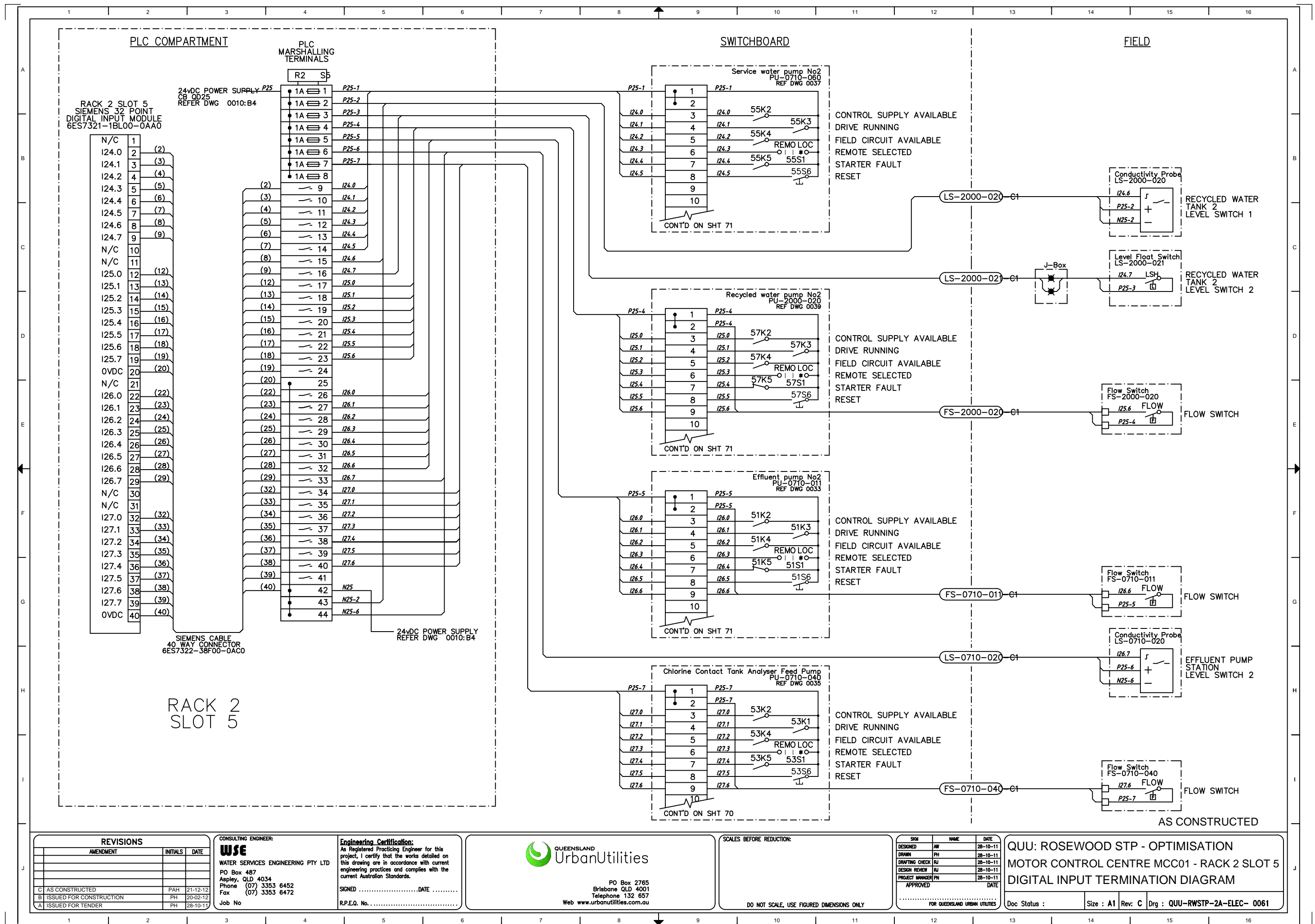
DO NOT SCALE, USE FIGURED DIMENSIONS ONLY

SIM	NAME	DATE
DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PH	28-10-11
APPROVED		DATE

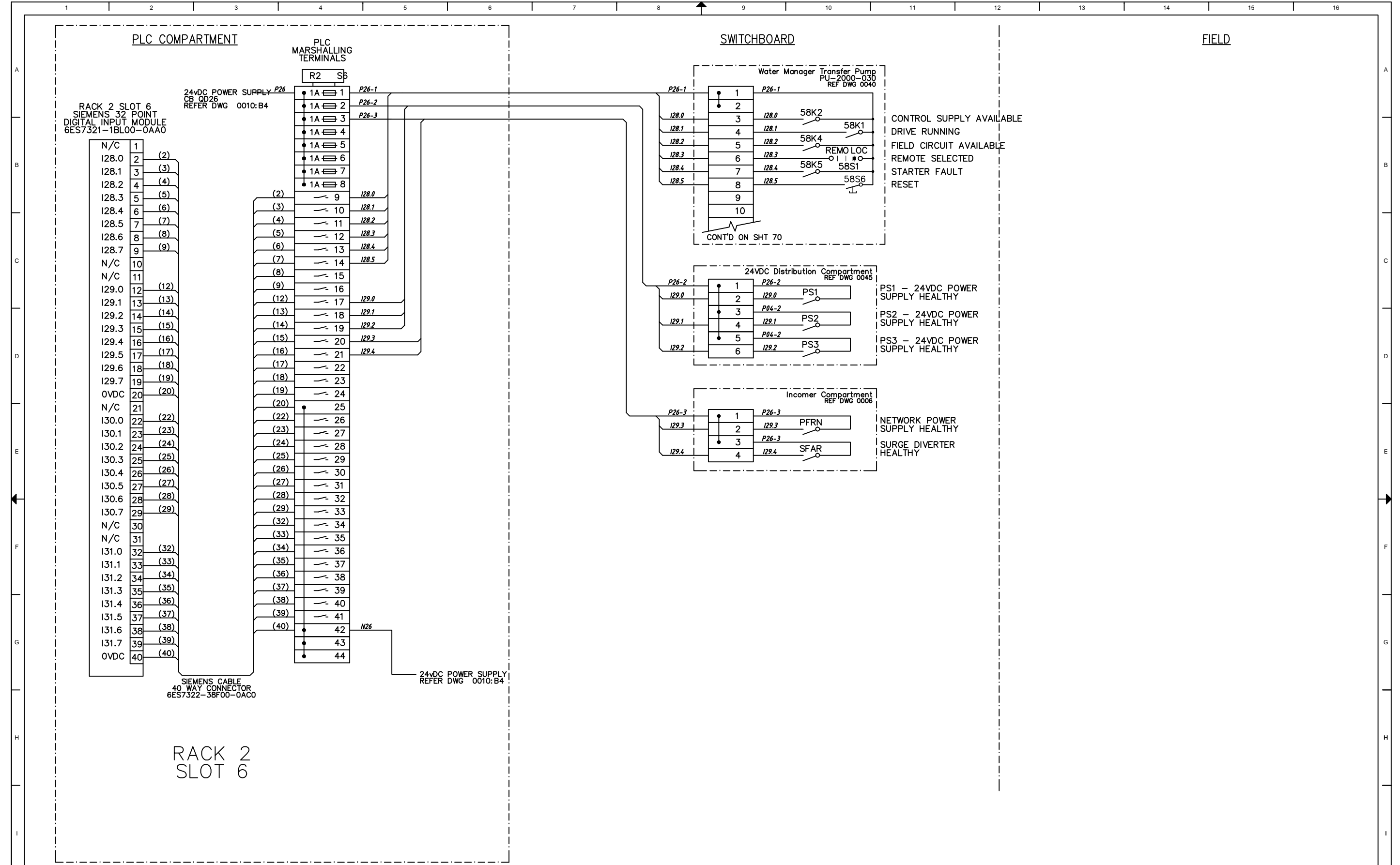
QUU: ROSEWOOD STP - OPTIMISATION  
MAIN SWITCHBOARD MSB01 - RACK 0 SLOT 8  
DIGITAL INPUT TERMINATION DIAGRAM

Doc Status : Size : A1 Rev: C Drg : QUU-RWSTP-2A-ELEC- 0059









REVISIONS		
AMENDMENT	INITIALS	DATE
C	AS CONSTRUCTED	PAH 21-12-12
B	ISSUED FOR CONSTRUCTION	PH 20-02-12
A	ISSUED FOR TENDER	PH 28-10-11

**CONSULTING ENGINEER:**  
**WSE**  
WATER SERVICES ENGINEERING PTY LTD  
PO Box 487  
Aspley, QLD 4034  
Phone (07) 3353 6452  
Fax (07) 3353 6472  
Job No

**Engineering Certification:**  
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SIGNED .....DATE .....  
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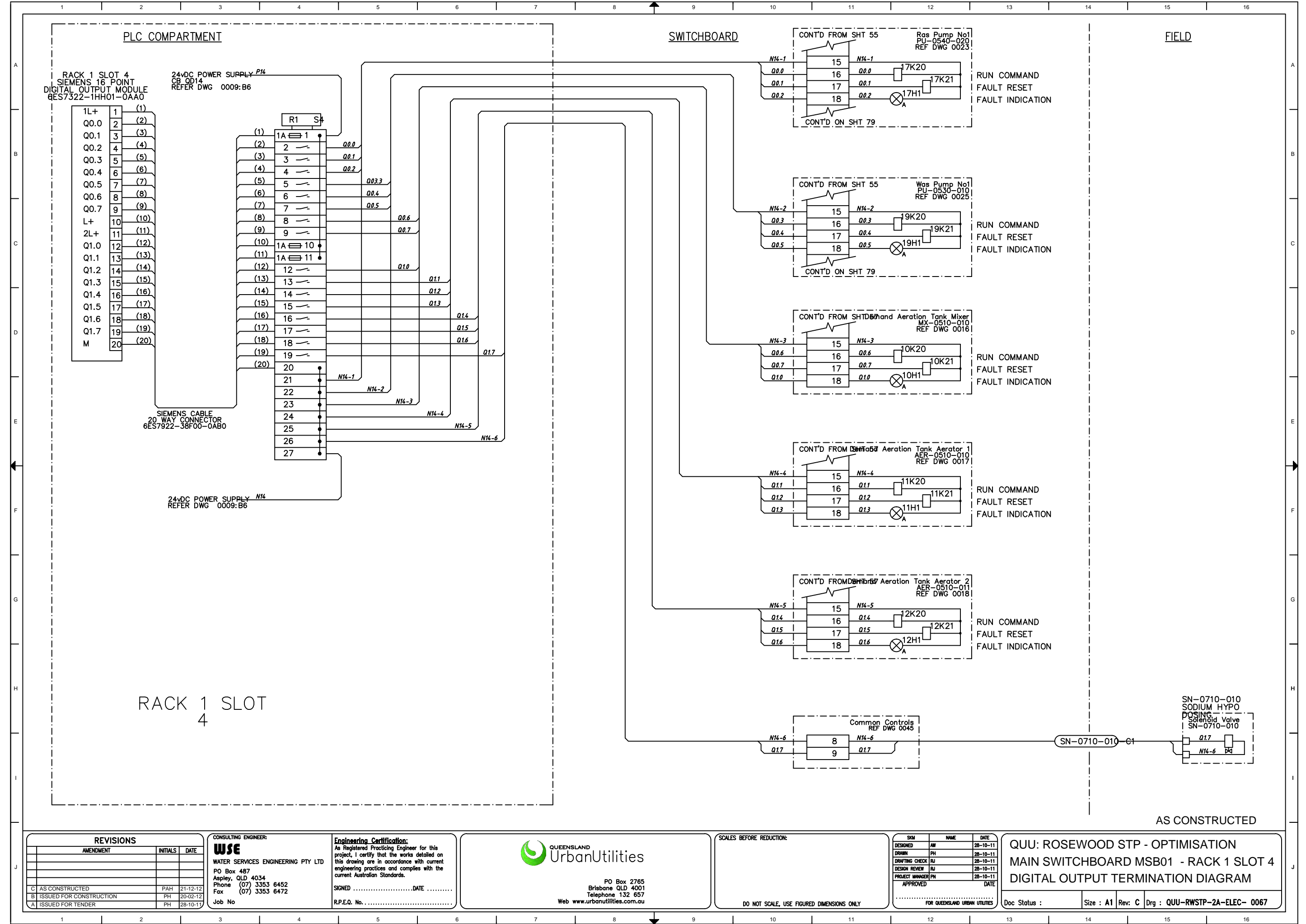
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SYM	NAME	DATE
DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PH	28-10-11
APPROVED		DATE

FOR QUEENSLAND URBAN UTILITIES

QUU: ROSEWOOD STP - OPTIMISATION  
MOTOR CONTROL CENTRE MCC01 - RACK 2 SLOT 6  
DIGITAL INPUT TERMINATION DIAGRAM

Doc Status : Size : A1 Rev: C Drg : QUU-RWSTP-2A-ELEC- 0062



REVISIONS		
AMENDMENT	INITIALS	DATE
C	AS CONSTRUCTED	PAH 21-12-12
B	ISSUED FOR CONSTRUCTION	PH 20-02-12
A	ISSUED FOR TENDER	PH 28-10-11

CONSULTING ENGINEER:  
**WSE**  
WATER SERVICES ENGINEERING PTY LTD  
PO Box 487  
Aspley, QLD 4034  
Phone (07) 3353 6452  
Fax (07) 3353 6472  
Job No

Engineering Certification:  
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SIGNED ..... DATE .....  
R.P.E.Q. No. ....

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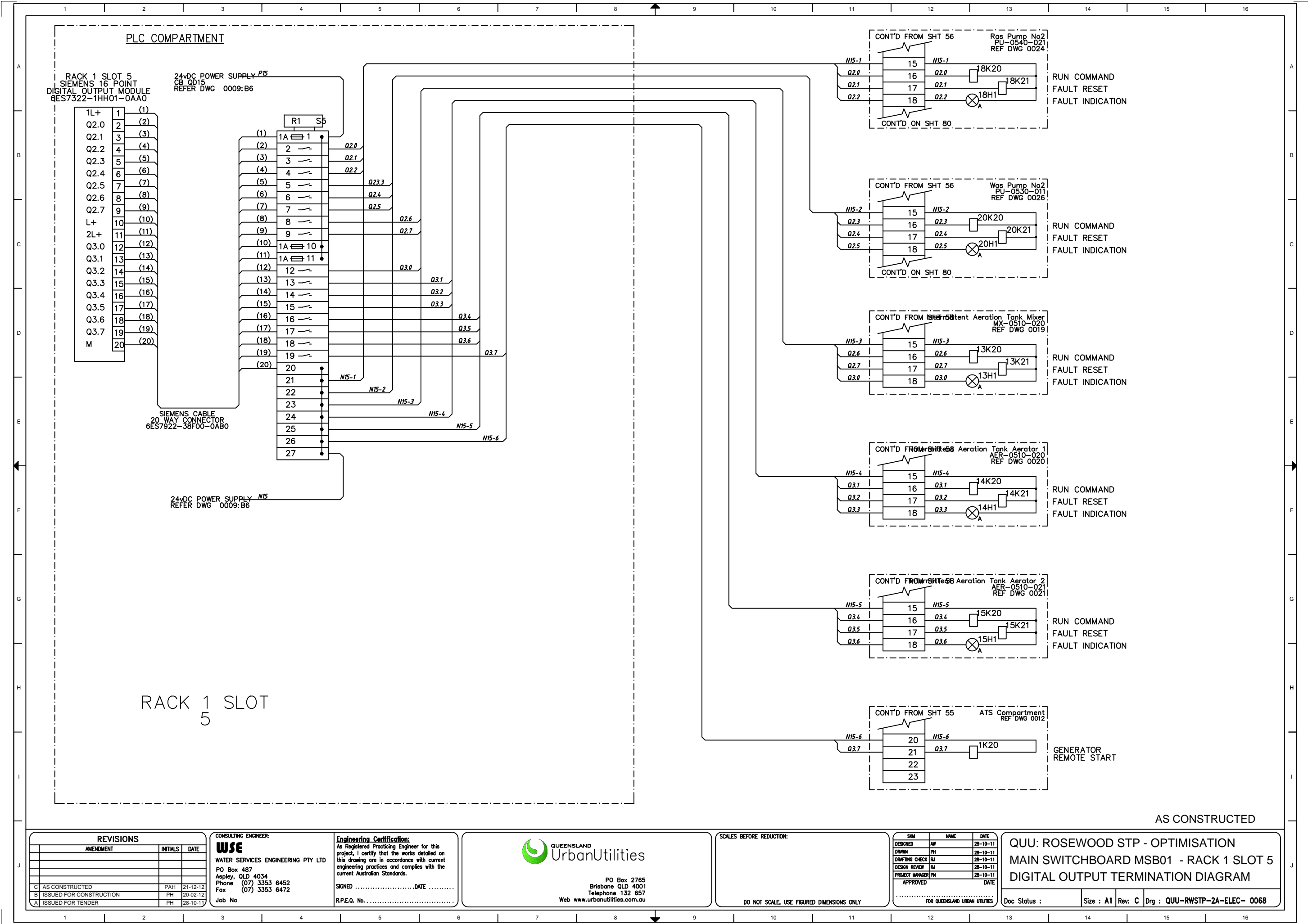
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DO NOT SCALE, USE FIGURED DIMENSIONS ONLY

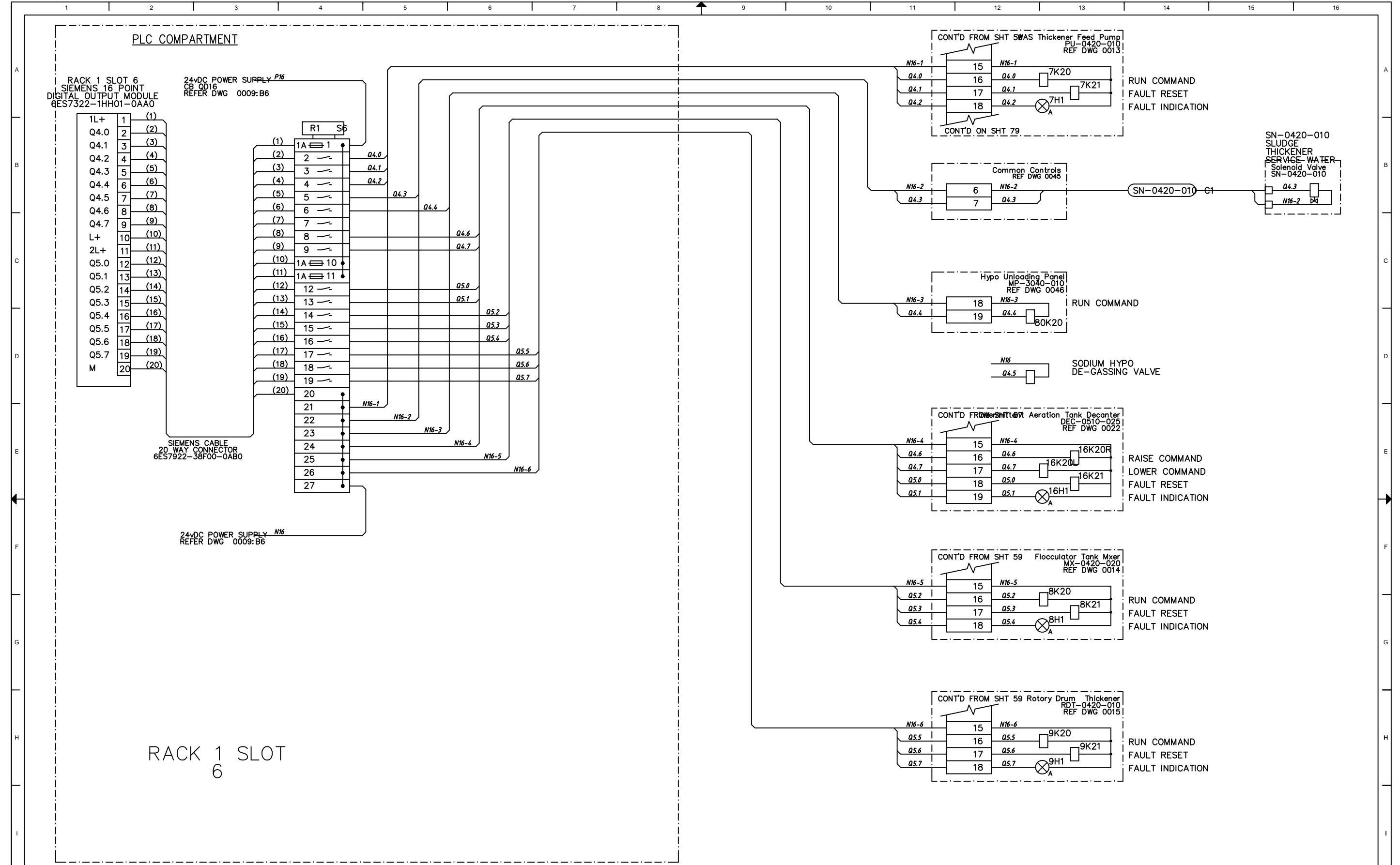
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DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PH	28-10-11
APPROVED		DATE

FOR QUEENSLAND URBAN UTILITIES

QUU: ROSEWOOD STP - OPTIMISATION  
MAIN SWITCHBOARD MSB01 - RACK 1 SLOT 4  
DIGITAL OUTPUT TERMINATION DIAGRAM

Doc Status : Size : A1 Rev: C Drg : QUU-RWSTP-2A-ELEC- 0067





RACK 1 SLOT  
6

AS CONSTRUCTED

REVISIONS		
AMENDMENT	INITIALS	DATE
C	AS CONSTRUCTED	PAH 21-12-12
B	ISSUED FOR CONSTRUCTION	PH 20-02-12
A	ISSUED FOR TENDER	PH 28-10-11

CONSULTING ENGINEER:  
**WSE**  
WATER SERVICES ENGINEERING PTY LTD  
PO Box 487  
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Phone (07) 3353 6452  
Fax (07) 3353 6472  
Job No

Engineering Certification:  
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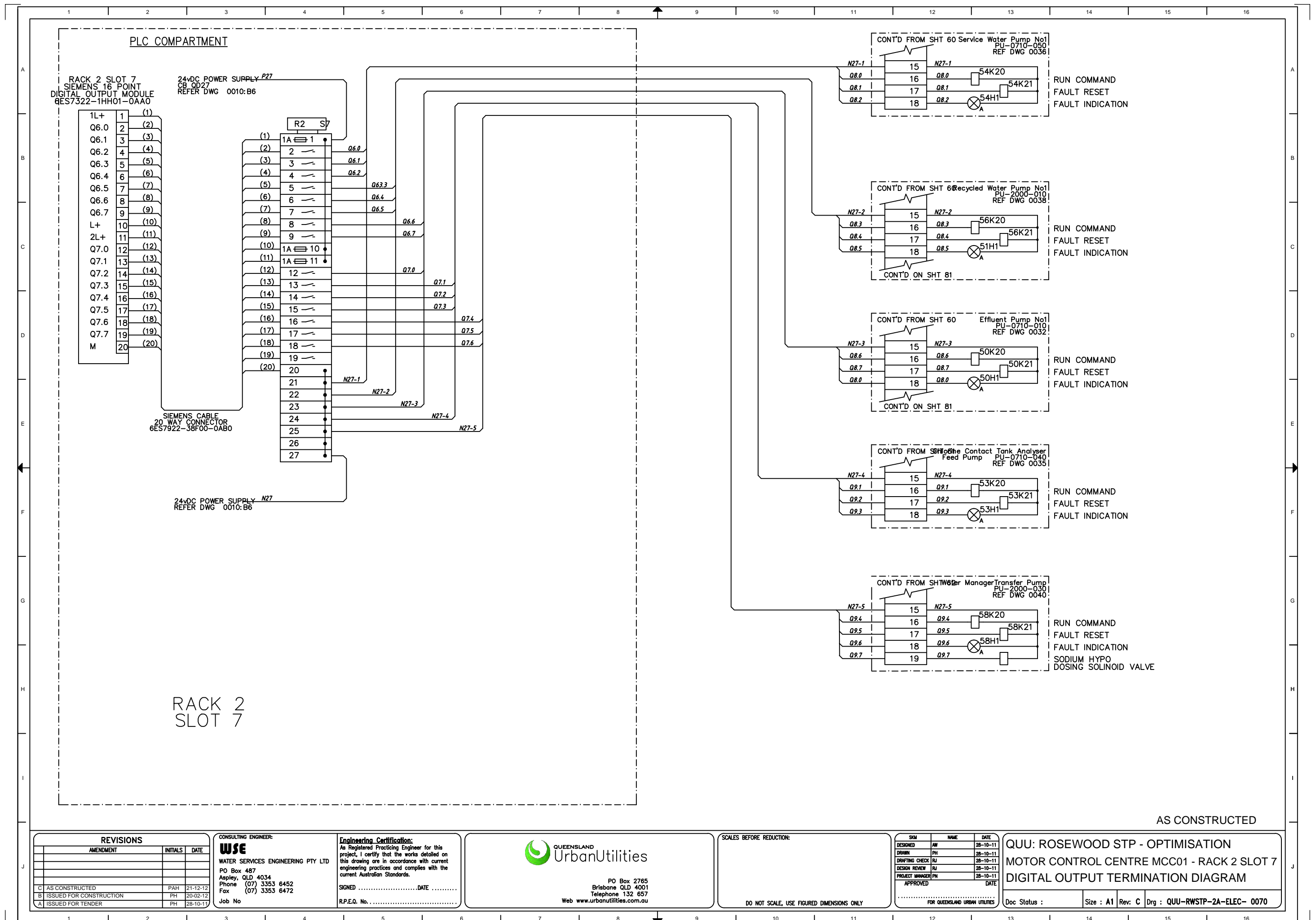
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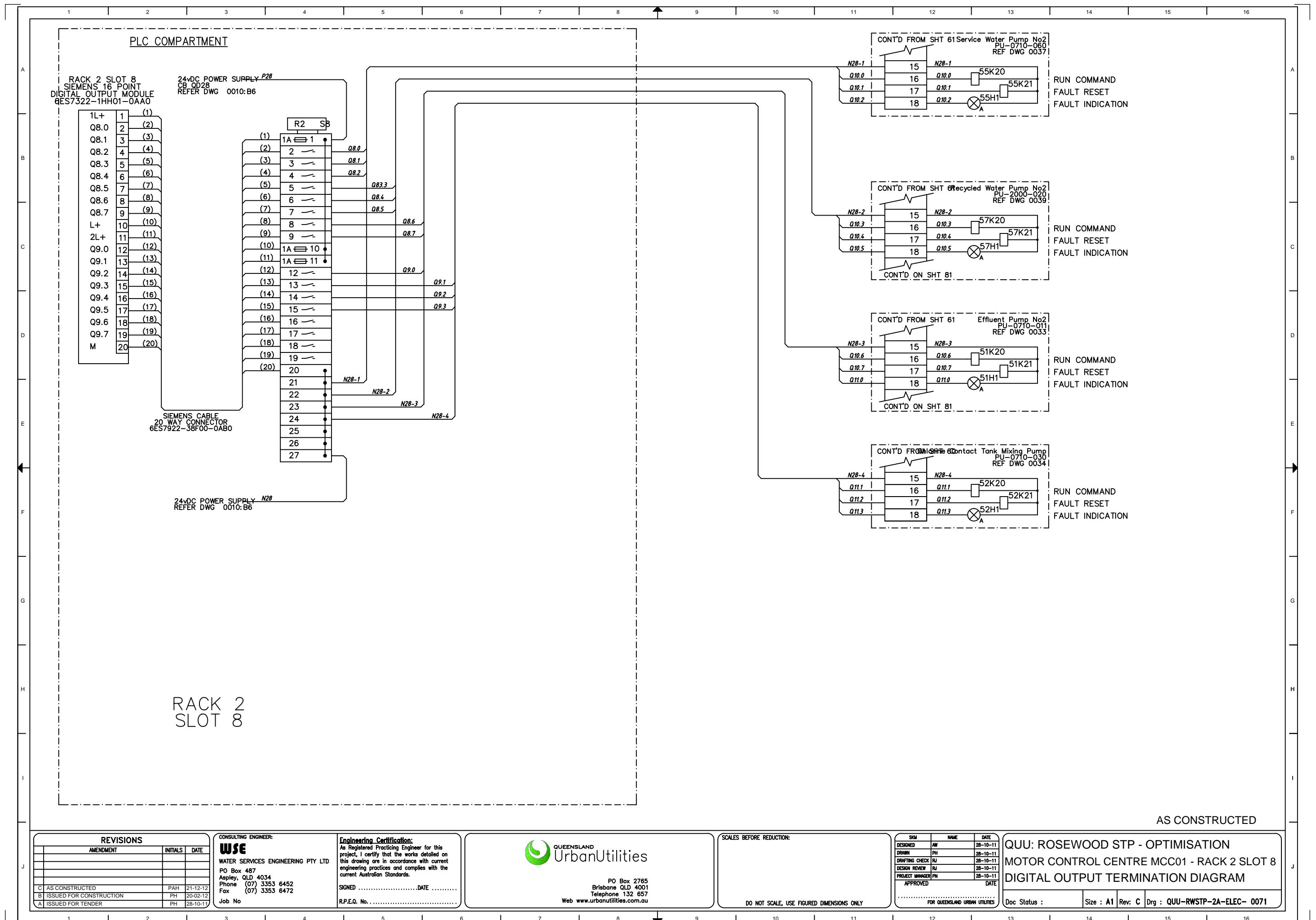
DO NOT SCALE, USE FIGURED DIMENSIONS ONLY

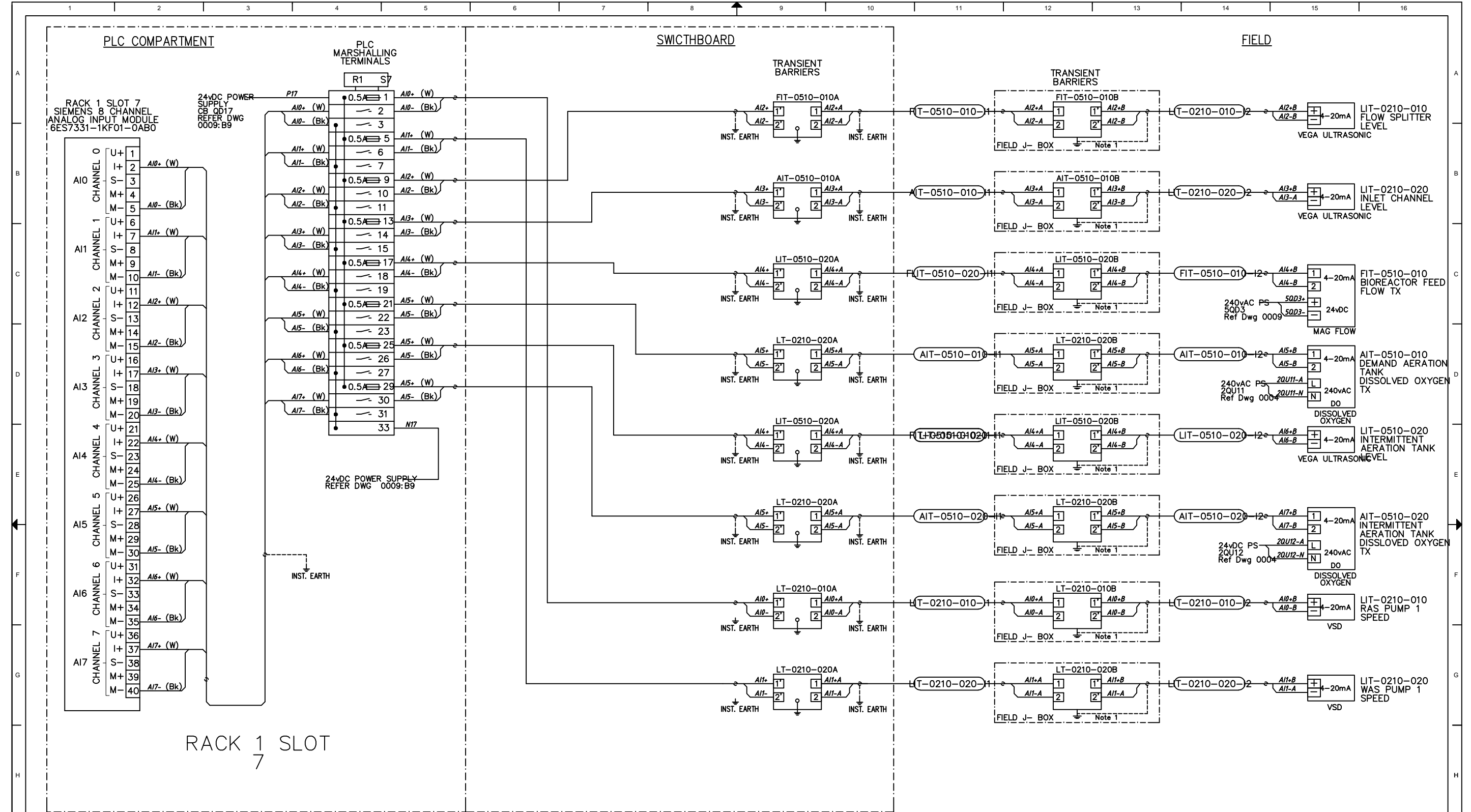
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DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PH	28-10-11
APPROVED		DATE

QUU: ROSEWOOD STP - OPTIMISATION  
MAIN SWITCHBOARD MSB01 - RACK 1 SLOT 6  
DIGITAL OUTPUT TERMINATION DIAGRAM  
Doc Status : Size : A1 Rev: C Drg : QUU-RWSTP-2A-ELEC- 0069









NOTES

1. PROVIDE LOCAL EARTH FOR CONNECTION FOR FIELD MOUNTED TRANSIENT BARRIERS

AS CONSTRUCTED

REVISIONS		
AMENDMENT	INITIALS	DATE
C	AS CONSTRUCTED	PAH 21-12-12
B	ISSUED FOR CONSTRUCTION	PH 20-02-12
A	ISSUED FOR TENDER	PH 28-10-11

CONSULTING ENGINEER:  
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WATER SERVICES ENGINEERING PTY LTD  
PO Box 487  
Aspley, QLD 4034  
Phone (07) 3353 6452  
Fax (07) 3353 6472  
Job No

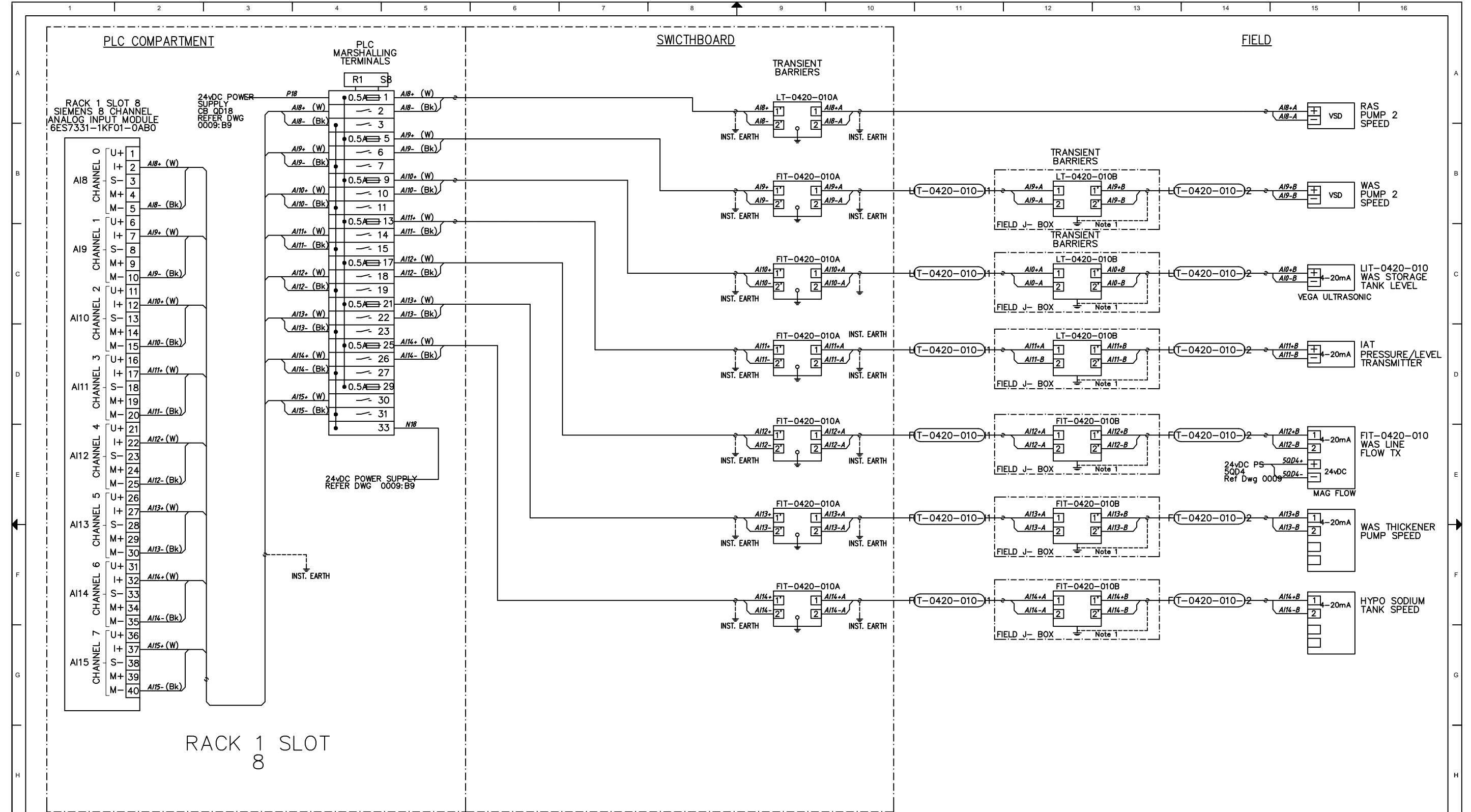
Engineering Certification:  
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SIGNED .....DATE .....  
R.P.E.Q. No. ....

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SYM	NAME	DATE
DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PH	28-10-11
APPROVED		DATE

QUU: ROSEWOOD STP - OPTIMISATION  
MAIN SWITCHBOARD MSB01 - RACK 1 SLOT 7  
ANALOG INPUT TERMINATION DIAGRAM  
Doc Status : Size : A1 Rev: C Drg : QUU-RWSTP-2A-ELEC- 0073



NOTES

1. PROVIDE LOCAL EARTH FOR CONNECTION FOR FIELD MOUNTED TRANSIENT BARRIERS

FOR CONSTRUCTION

REVISIONS		
AMENDMENT	INITIALS	DATE
C	AS CONSTRUCTED	PAH 21-12-12
B	ISSUED FOR CONSTRUCTION	PH 20-02-12
A	ISSUED FOR TENDER	PH 28-10-11

CONSULTING ENGINEER:  
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PO Box 487  
Aspley, QLD 4034  
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Fax (07) 3353 6472  
Job No

Engineering Certification:  
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SIGNED .....DATE .....  
R.P.E.Q. No. ....

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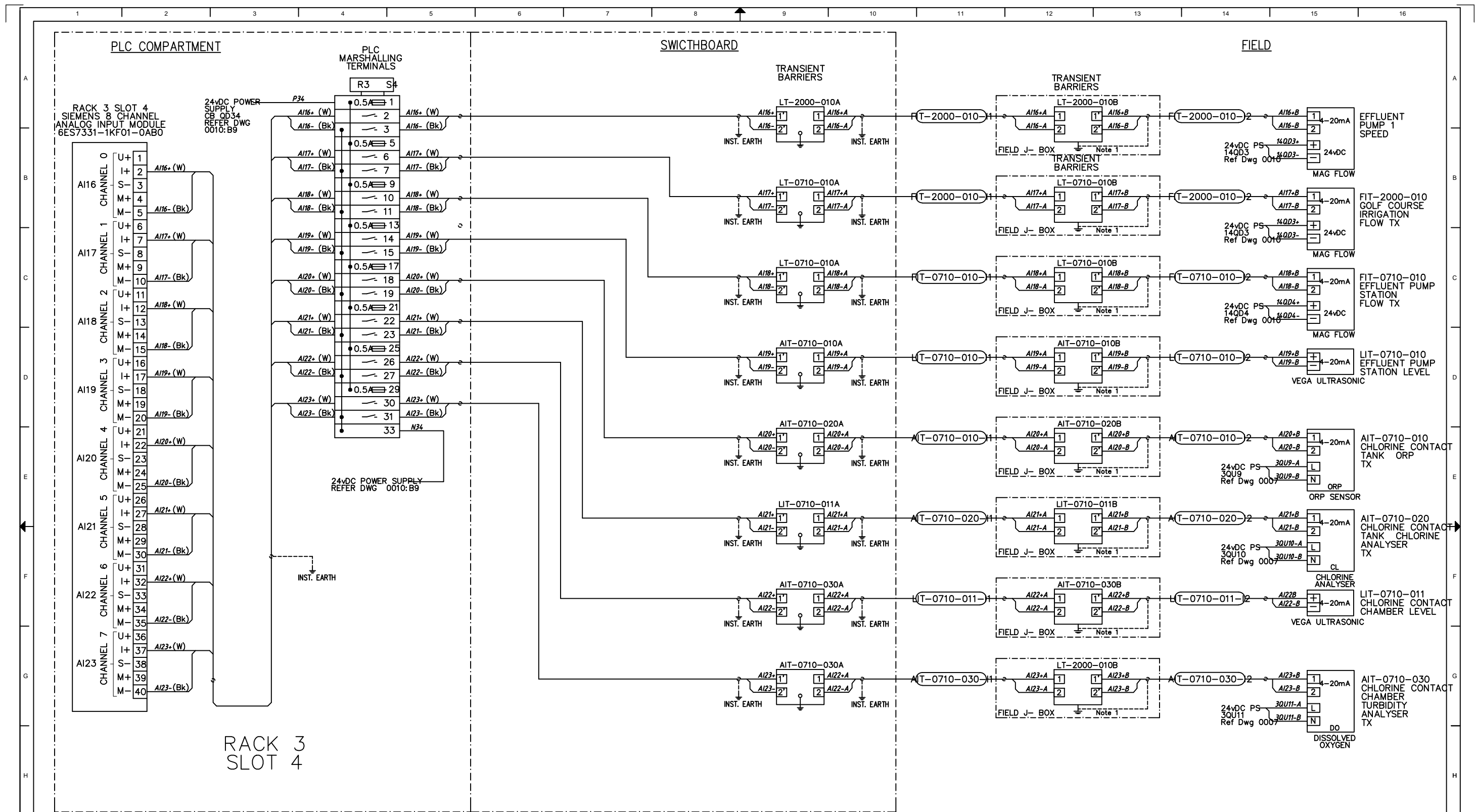
SCALES BEFORE REDUCTION:  
DO NOT SCALE, USE FIGURED DIMENSIONS ONLY

SYM	NAME	DATE
DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PH	28-10-11
APPROVED		DATE

QUU: ROSEWOOD STP - OPTIMISATION  
MAIN SWITCHBOARD MSB01 - RACK 1 SLOT 8  
ANALOG INPUT TERMINATION DIAGRAM

Doc Status : Size : A1 Rev: C Drg : QUU-RWSTP-2A-ELEC- 0074





# NOTES

1. PROVIDE LOCAL EARTH FOR CONNECTION FOR FIELD MOUNTED TRANSIENT BARRIERS

FOR CONSTRUCTION

REVISIONS		
AMENDMENT	INITIALS	DATE
C	AS CONSTRUCTED	PAH 21-12-12
B	ISSUED FOR CONSTRUCTION	PH 20-02-12
A	ISSUED FOR TENDER	PH 28-10-11

CONSULTING ENGINEER:  
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 WATER SERVICES ENGINEERING PTY LTD  
 PO Box 487  
 Aspley, QLD 4034  
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 Fax (07) 3353 6472  
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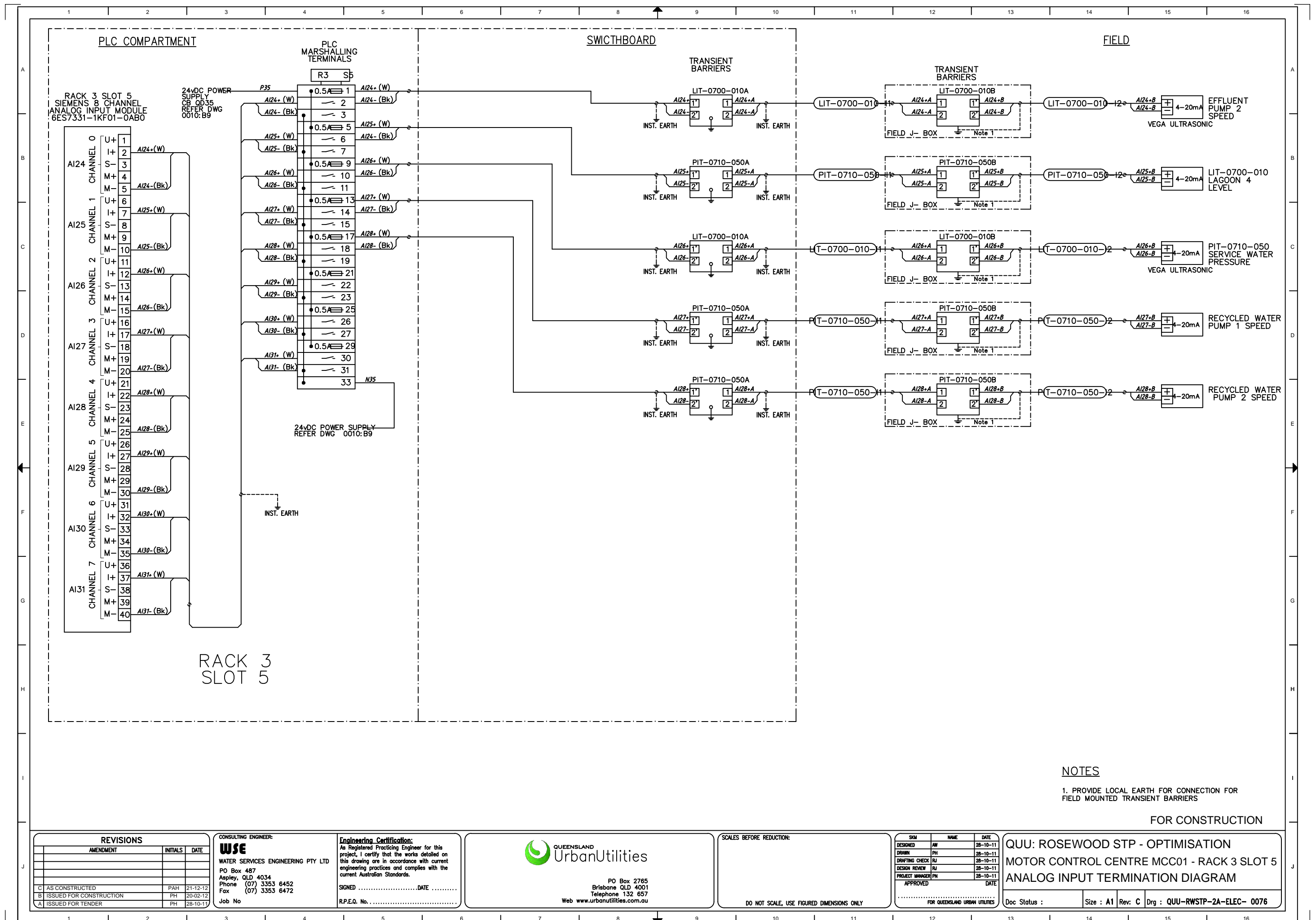
QUEENSLAND  
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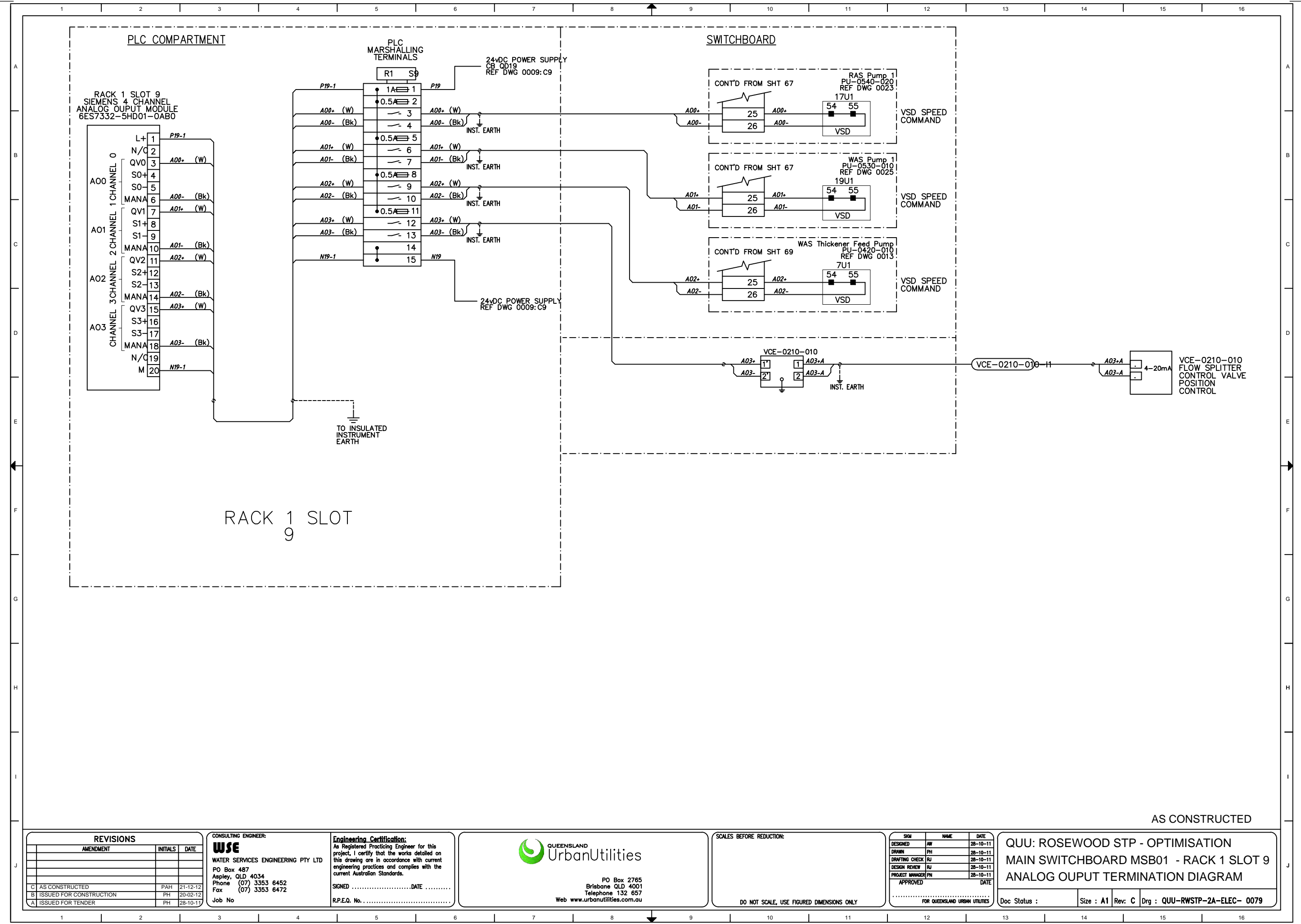
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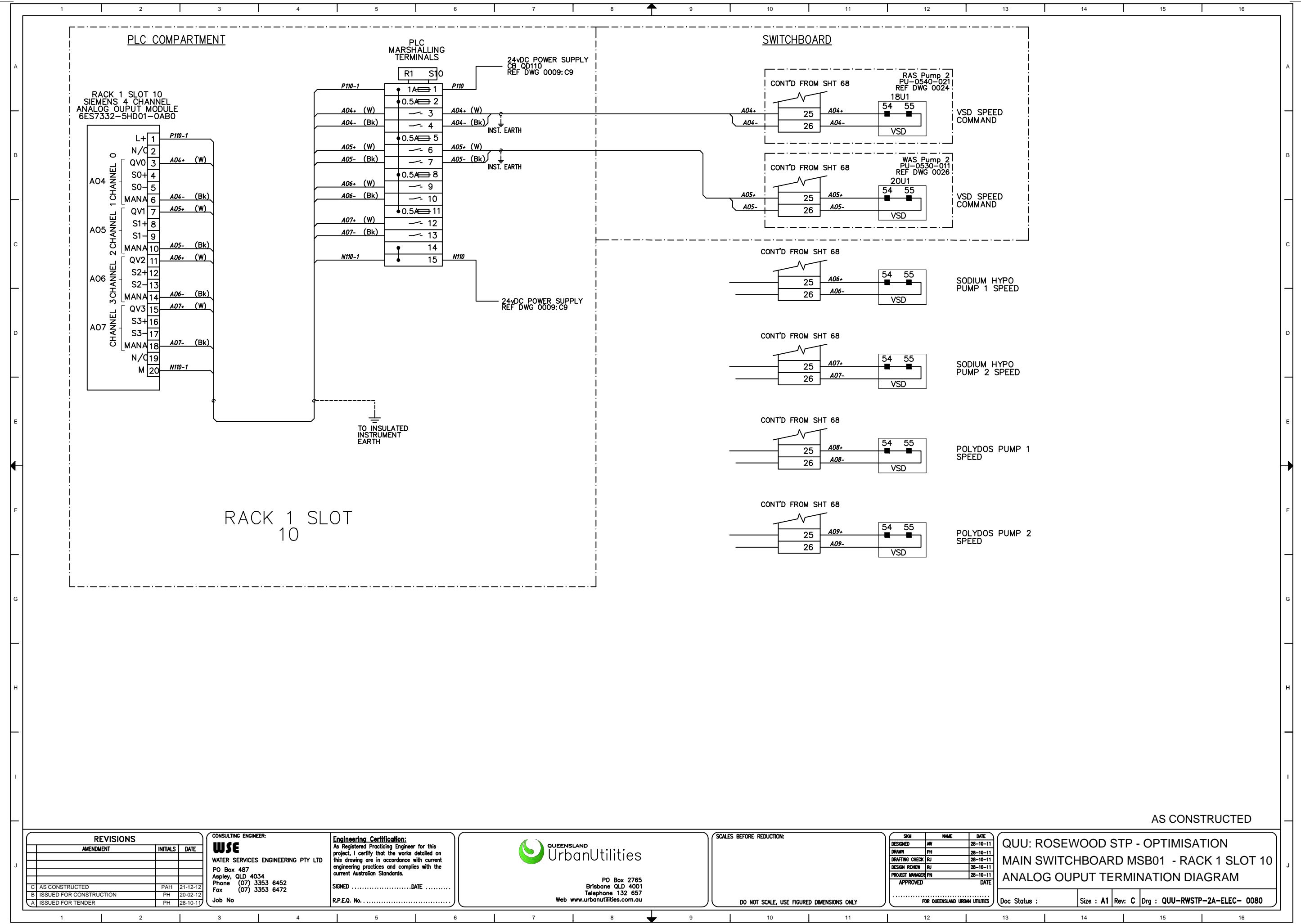
DO NOT SCALE, USE FIGURED DIMENSIONS ONLY

SYM	NAME	DATE
DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PH	28-10-11
APPROVED		DATE

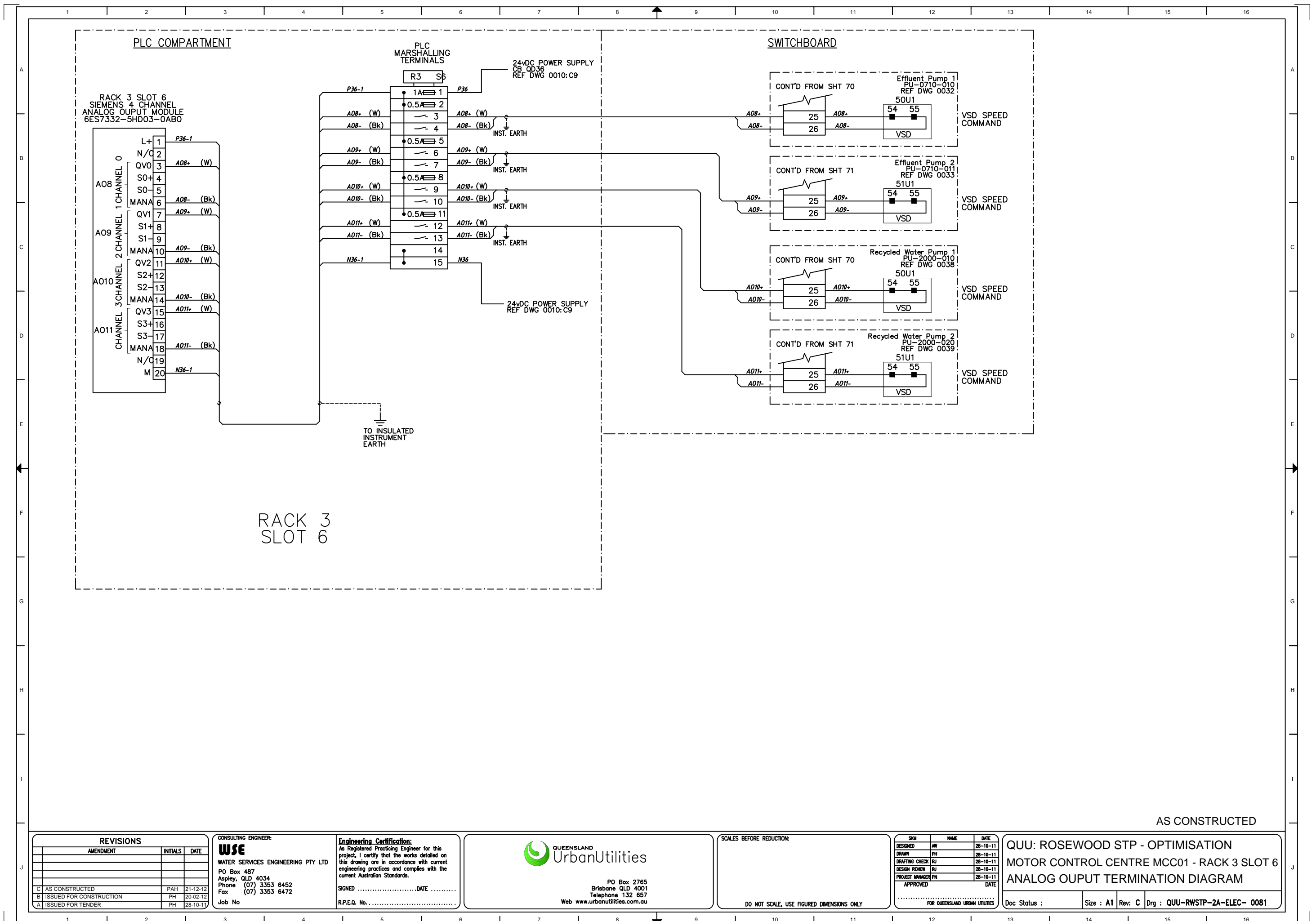
QUU: ROSEWOOD STP - OPTIMISATION  
 MOTOR CONTROL CENTRE MCC01 - RACK 3 SLOT 4  
 ANALOG INPUT TERMINATION DIAGRAM  
 Doc Status : Size : A1 Rev: C Drg : QUU-RWSTP-2A-ELEC- 0075











## NOTES

1. THE CONTRACTOR IS RESPONSIBLE IN DETERMINING THE ACTUAL CABLE LENGTHS REQUIRED ON SITE.

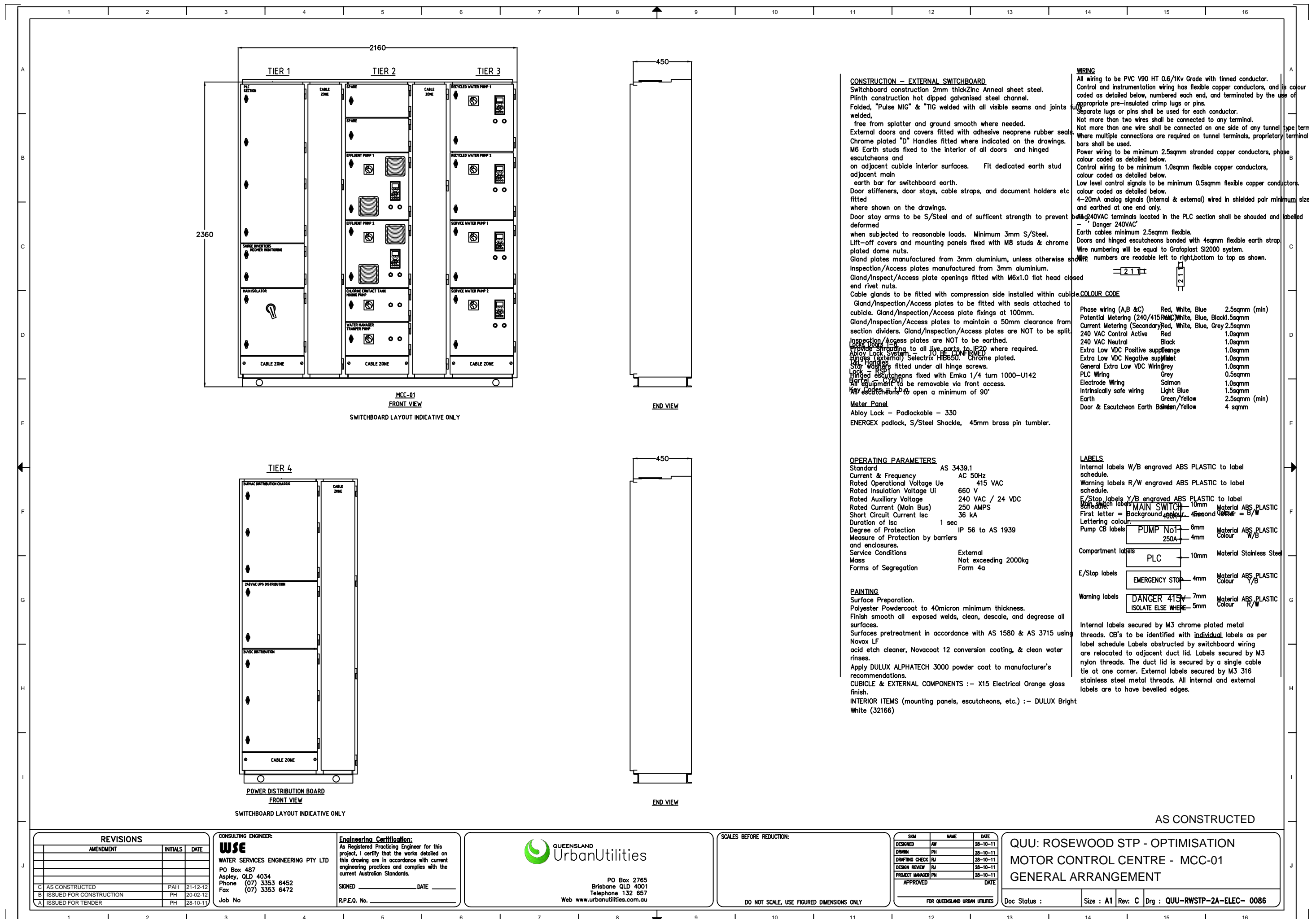
<p>QUU: ROSEWOOD STP - OPTIMISATION</p> <p>MAIN SWITCHBOARD - MSB-01</p> <p>CABLE SCHEDULE SHEET 2 of 2</p>			
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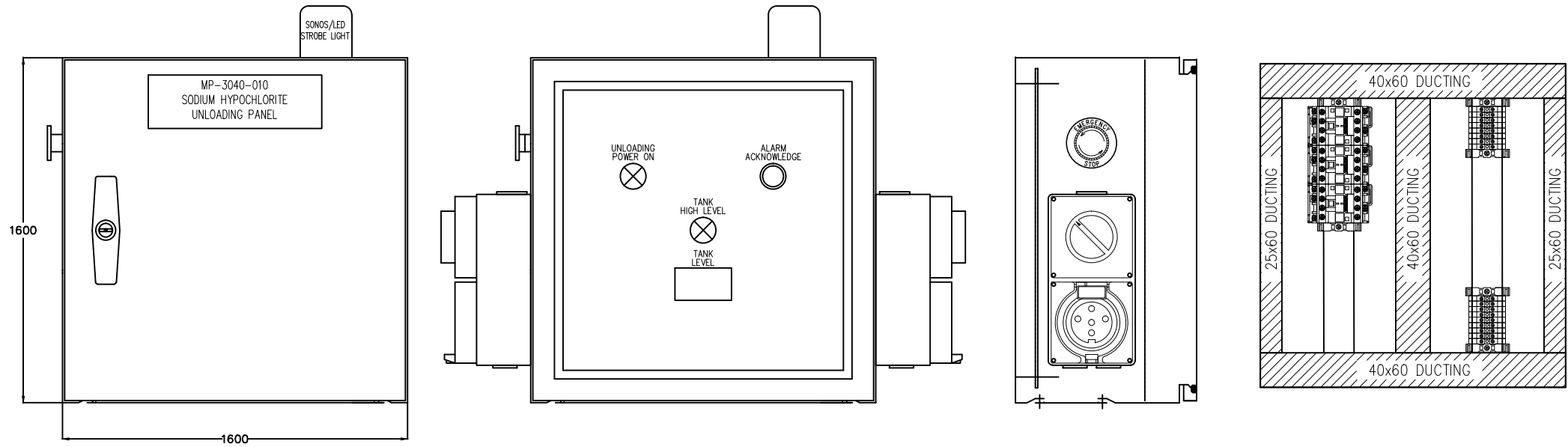


[illegible]









NOTES:  
1. MATERIAL: B&R ENCLOSURES – STAINLESS STEEL ENCLOSURE INCLUDING:  
– HINGED ESCUTCHEON KIT  
– UNIVERSAL RAIL KIT

AS CONSTRUCTED

REVISIONS		
AMENDMENT	INITIALS	DATE
C AS CONSTRUCTED	PAH	21-12-12
B ISSUED FOR CONSTRUCTION	PH	20-02-12
A ISSUED FOR TENDER	PH	28-10-11

CONSULTING ENGINEER:  
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Job No

**Engineering Certification:**  
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SIGNED \_\_\_\_\_ DATE \_\_\_\_\_  
R.P.E.Q. No. \_\_\_\_\_

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SCALES BEFORE REDUCTION:  
  
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SYM	NAME	DATE
DESIGNED	AW	28-10-11
DRAWN	PH	28-10-11
DRAFTING CHECK	RJ	28-10-11
DESIGN REVIEW	RJ	28-10-11
PROJECT MANAGER	PH	28-10-11
APPROVED		
FOR QUEENSLAND URBAN UTILITIES		

**QUU: ROSEWOOD STP - OPTIMISATION  
SODIUM HYPOCHLORITE UNLOADING PANEL  
GENERAL ARRANGEMENT**

Doc Status :	Size : A1	Rev: C	Drg : QUU-RWSTP-2A-ELEC- 0087
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HYDRAULIC PROFILE  
SCALE NTS

AS CONSTRUCTED

<b>REVISIONS</b>			
	<b>AMENDMENT</b>	<b>INITIALS</b>	<b>DATE</b>
A	AS-CONSTRUCTED	SRG	06.12.12



**ABERGELDIE**  
COMPLEX INFRASTRUCTURE



QUEENSLAND  
UrbanUtilities

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Telephone 132 657  
Web [www.urbanutilities.com.au](http://www.urbanutilities.com.au)

SCALES BEFORE REDUCTION:

AS SHOWN

DO NOT SCALE, USE FIGURED DIMENSIONS ONLY

SKM	NAME	DATE
DESIGNED	S.DOWD	01.07.11
DRAWN	NG	01.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE

.....

FOR QUEENSLAND URBAN UTILITIES

**QUU: ROSEWOOD STP – OPTIMISATION  
HYDRAULIC PROFILE (ADWF)**

Doc Status : <b>AS</b>	Size : <b>A1</b>	Rev : <b>A</b>	Drq : <b>QUU-RWSTP-2A-HYD-1000-0010</b>
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SCALES BEFORE REDUCTION:

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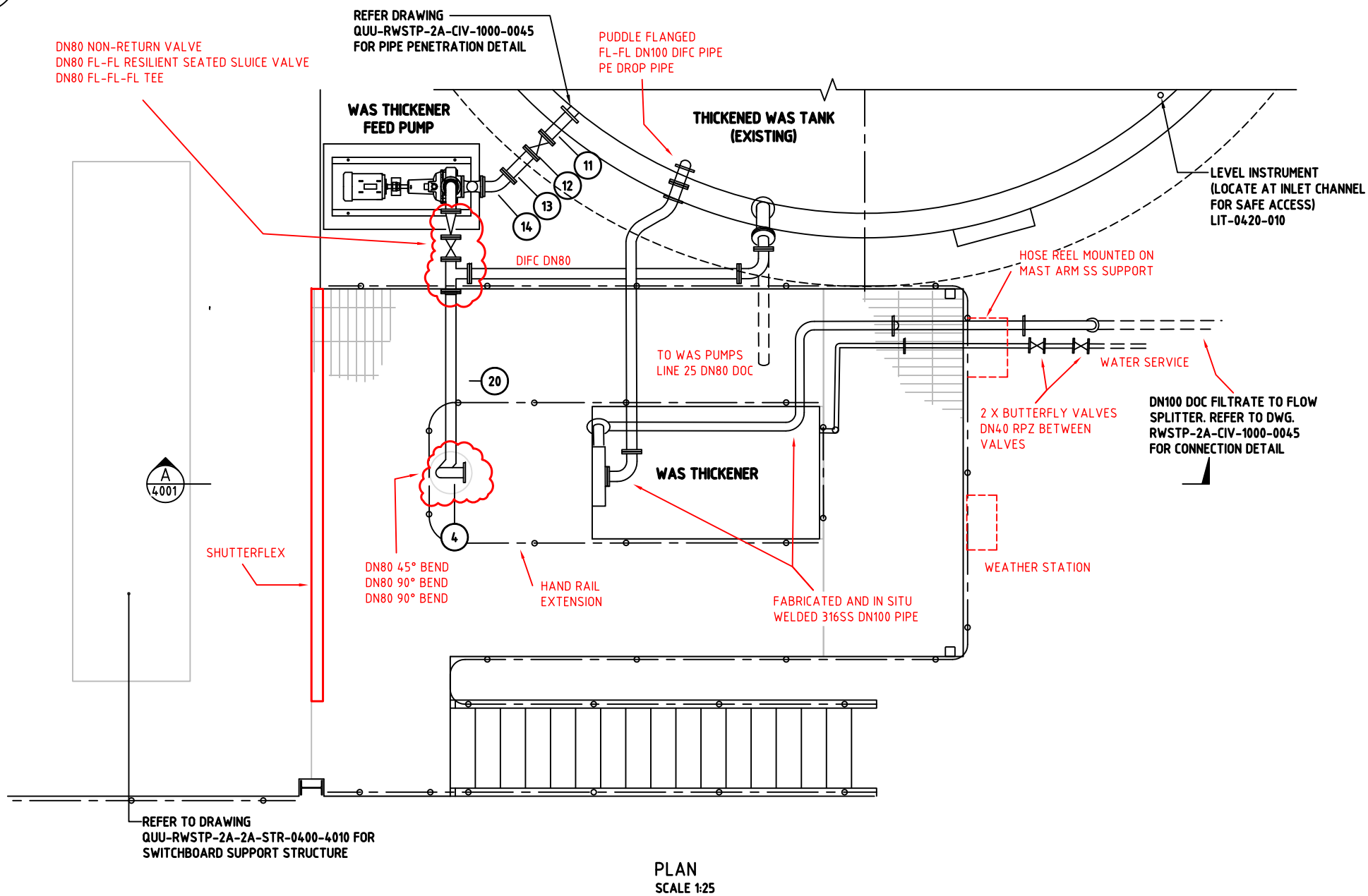
DO NOT SCALE. USE FIGURED DIMENSIONS ONLY

SKIM	NAME	DATE
DESIGNED	S.DOWD	01.07.11
DRAWN	NG	01.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE
..... FOR QUEENSLAND URBAN UTILITIES		

**QUU: ROSEWOOD STP – OPTIMISATION  
HYDRAULIC PROFILE (PWWF)**

Doc Status : <b>AS</b>	Size : <b>A1</b>	Rev : <b>A</b>	Drq : <b>QUU-RWSTP-2A-HYD-1000-0011</b>
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NOTES

1. REFER TO DWG RWSTP-2A-STR-0400-4010 FOR STRUCTURAL DETAILS.
2. STRUCTURE FOOTINGS SHALL BE ESTABLISHED ON ENGINEERED FILL. REFER TO EARTHWORKS SPECIFICATION QUU-RWSTP-2A-CIV-SPEC-0210. THE SUBGRADE SHALL BE INSPECTED AND APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF ENGINEERED FILL.

ITEM	QTY	PART No.	DESCRIPTION	LENGTH (mm)
1	2		DN80 GIBALT COUPLING	
2	1		DN80 DOC SP-SP PIPE	400
3	1		DN80 DOC FL-SP CONNECTOR	
4	6		DN80 DOC FL-FL 90° BEND	
5	1		DN80 DOC FL-FL PIPE	CHECK ON SITE PRIOR TO FAB.
6	1		DN80 DOC FL-FL PIPE	CHECK ON SITE PRIOR TO FAB.
7	1		DN100 DOC FL-FL PIPE	5350
8	1		DN100 DOC FL-FL 11.25° BEND	
9	1		DN100 DOC FL-FL 22.50° BEND	
10	1		DN100 DOC FL-FL PIPE	6000
11	1		DN80 DOC FL-SP PIPE WITH PUDDLE FLANGE	515
12	1	HV-0420-020	DN80 FL-FL RESILIENT SEATED SLUICE VALVE	
13	2		DN80 DOC FL-FL PIPE	300
14	1		DN80 DOC FL-FL 45° BEND	
15	1	FIT-0420-010	DN80 FL-FL ELECTRO -MAGNETIC FLOWMETER	
16	1		DN80 DOC FL -FL PIPE	1000
17	1		DN100 DOC FL-FL 45° BEND	
18	1		DN100 DOC FL-FL PIPE	CHECK ON SITE PRIOR TO FAB.
19	1	NRV-0420-020	DN80 NON RETURN VALVE	
20	1		DN80 DOC FL-FL PIPE	CHECK ON SITE PRIOR TO FAB.
21	1		DN80 DOC FL-FL PIPE	CHECK ON SITE PRIOR TO FAB
22	1		DN100 DOC FL-FL PIPE	CHECK ON SITE PRIOR TO FAB
23	1		DN100 DOC FL-FL 90° BEND	
24	1		DN100 DOC FL-SP CONNECTOR	
25	1		DN100 GIBALT COUPLING	
26	1		DN100 DOC FL-FL PIPE	CHECK ON SITE PRIOR TO FAB
27	1	HV-0420-021	DN80 FL-FL RESILIENT SEATED SLUICE VALVE	
28	1		DN65 x DN80 STAINLESS STEEL REDUCER	SPECIAL FABRICATION

AS CONSTRUCTED

REVISIONS

AMENDMENT	INITIALS	DATE
AS-CONSTRUCTED	SRG	28.11.12

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SCALES BEFORE REDUCTION:

0 500 1000 1500 2000 2500

1:25 AT A1

DO NOT SCALE, USE FIGURED DIMENSIONS ONLY

SKM	NAME	DATE
DESIGNED	J.FELTINGHAM	01.07.11
DRAWN	NG	01.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE

FOR QUEENSLAND URBAN UTILITIES

**QUU: ROSEWOOD STP – OPTIMISATION  
WAS THICKENED  
GENERAL ARRANGEMENT PLAN**

Doc Status : **AS** Size : A1 Rev : A Drg : **QUU-RWSTP-2A-MEC-0400-4000**

QP Id: TMS308

Active: 03/09/2013

Page 113 of 144



1. REFER TO DWG QUU-RWSTP-2A-STR-0400-4010 FOR STRUCTURAL DETAILS.
2. STRUCTURE FOOTINGS SHALL BE ESTABLISHED ON ENGINEERED FILL. REFER TO EARTHWORKS SPECIFICATION QUU-RWSTP-2A-CIV-SPEC-0210. THE SUBGRADE SHALL BE INSPECTED AND APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF ENGINEERED FILL.
3. REFER TO DWG QUU-RWSTP-2A-MEC-0400-4000 FOR PARTLIST DETAILS.

AS CONSTRUCTED



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SCALES BEFORE REDUCTION:

0 500 1000 1500 2000 2500

1:25 AT A1

DO NOT SCALE. USE FIGURED DIMENSIONS ONLY

SKM	NAME	DATE
DESIGNED	J.FELLINGHAM	01.07.1
DRAWN	NG	01.07.1
DRAFTING CHECK	LAPPELGREN	02.11.1
DESIGN REVIEW	LAPPELGREN	02.11.1
PROJECT MANAGER	S.DOWD	23.02.1
APPROVED		DATE

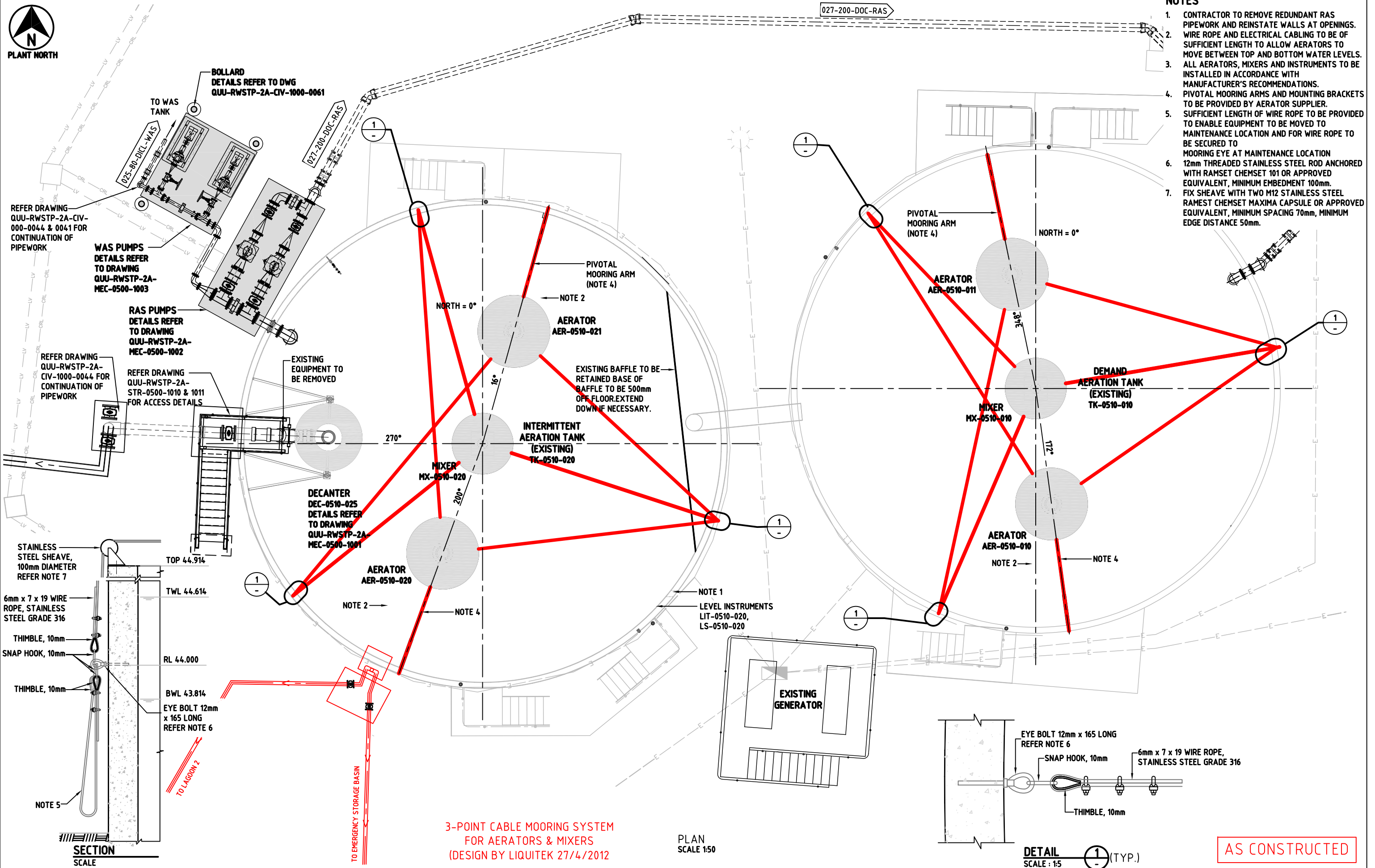
FOR QUEENSLAND URBAN UTILITIES

QUU: ROSEWOOD STP – OPTIMISATION  
WAS THICKENED  
SECTIONS

Doc Status :	AS	Size :	A1	Rev :	A	Drq :	QUU-RWSTP-2A-MEC-0400-4001
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# NOTES

1. CONTRACTOR TO REMOVE REDUNDANT RAS PIPEWORK AND REINSTATE WALLS AT OPENINGS.
2. WIRE ROPE AND ELECTRICAL CABLE TO BE OF SUFFICIENT LENGTH TO ALLOW AERATORS TO MOVE BETWEEN TOP AND BOTTOM WATER LEVELS.
3. ALL AERATORS, MIXERS AND INSTRUMENTS TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. PIVOTAL MOORING ARMS AND MOUNTING BRACKETS TO BE PROVIDED BY AERATOR SUPPLIER.
5. SUFFICIENT LENGTH OF WIRE ROPE TO BE PROVIDED TO ENABLE EQUIPMENT TO BE MOVED TO MAINTENANCE LOCATION AND FOR WIRE ROPE TO BE SECURED TO MOORING EYE AT MAINTENANCE LOCATION
6. 12mm THREADED STAINLESS STEEL ROD ANCHORED WITH RAMSET CHEMSET 101 OR APPROVED EQUIVALENT, MINIMUM EMBEDMENT 100mm.
7. FIX SHEAVE WITH TWO M12 STAINLESS STEEL RAMEST CHEMSET MAXIMA CAPSULE OR APPROVED EQUIVALENT, MINIMUM SPACING 70mm, MINIMUM EDGE DISTANCE 50mm.

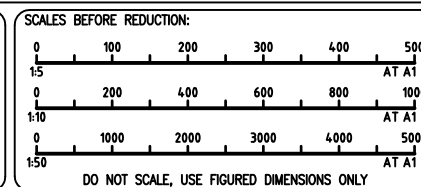
AS CONSTRUCTED

REVISIONS			
AMENDMENT	INITIALS	DATE	
B ADDITIONAL INFORMATION ADDED	SRG	25.01.13	
A AS-CONSTRUCTED	SRG	28.11.12	

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SKM	NAME	DATE
DESIGNED	J.FELTINGHAM	01.07.11
DRAWN	L.CHIN	01.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE

QUU: ROSEWOOD STP - OPTIMISATION DAT/IAT REACTORS-MIXERS,DECANTER & AERATORS GENERAL ARRANGEMENT PLAN			
Doc Status :	AS	Size : A1	Rev : B
Drg :	QUU-RWSTP-2A-MEC-0500-1000		



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SAW CUT EXISTING ASPHALT  
PAVEMENT PRIOR TO EXCAVATION  
AND REINSTATE ASPHALT  
PAVEMENT TO ADJOIN CONCRETE  
STRUCTURE POST CONSTRUCTION.

STAIR SUPPORTS  
JOINED AS COMMON  
SLAB & INCLUDES  
VALVE SUPPORT

PLAN  
SCALE 1:20

TOC 44.914

COMMON STAIR  
FOOTING & VALVE  
SUPPORT

VALVE  
SHIFTED  
100mm

REFER NOTE 4

MASS CONCRETE TO  
BASE OF TANK

NEW PVC PIPE TO  
CONNECT EXISTING

SECTION  
SCALE 1:20

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-

INTERMITTENT  
AERATION TANK  
(EXISTING)

REFER DRG  
QUU-RWSTP-2A-STR-0500-1010  
FOR STAIR DETAILS

## NOTES

1. DECANTER TO BE INSTALLED ACCORDANCE WITH SUPPLIER'S INSTRUCTIONS.
2. CONTRACTOR TO VERIFY PIPEWORK DETAILS UPON RECEIPT OF CERTIFIED DECANTER DRAWINGS AND INSPECTION OF EXISTING FACILITIES.
3. ALL PVC JOINTS TO BE SOLVENT WELDED.
4. STRUCTURE FOOTINGS SHALL BE ESTABLISHED ON MATERIAL WITH A MINIMUM ALLOWABLE BEARING PRESSURE OF 150kpa. THE SUBGRADE SHALL BE INSPECTED AND APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO FOOTING CONSTRUCTION.

AS CONSTRUCTED

7	1		DN300 PVC SOC-SP PIPE	(LENGTH TO SUIT)
6	1		DN300 PVC FULL FACED FLANGE (SITE SOLVENT WELDED TO EXISTING PVC PIPE)	
5	2		DN300 PVC 45° SOC-SOC BEND	
4	1		DN300 PVC SP-SP PIPE	(LENGTH TO SUIT)
3	1		DN300 FL-FL ROUND PORTED PLUG VALVE	
2	1		DN300 PVC FL-SP PIPE	(LENGTH TO SUIT)
1	1	DEC-0510-025	LINEARDECANTER	
ITEM	QTY	PART No.	DESCRIPTION	LENGTH (mm)

REVISIONS			
AMENDMENT	INITIALS	DATE	
B INFORMATION AMENDED	SRG	23.07.13	
A AS-CONSTRUCTED	SRG	28.11.12	



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SCALES BEFORE REDUCTION:

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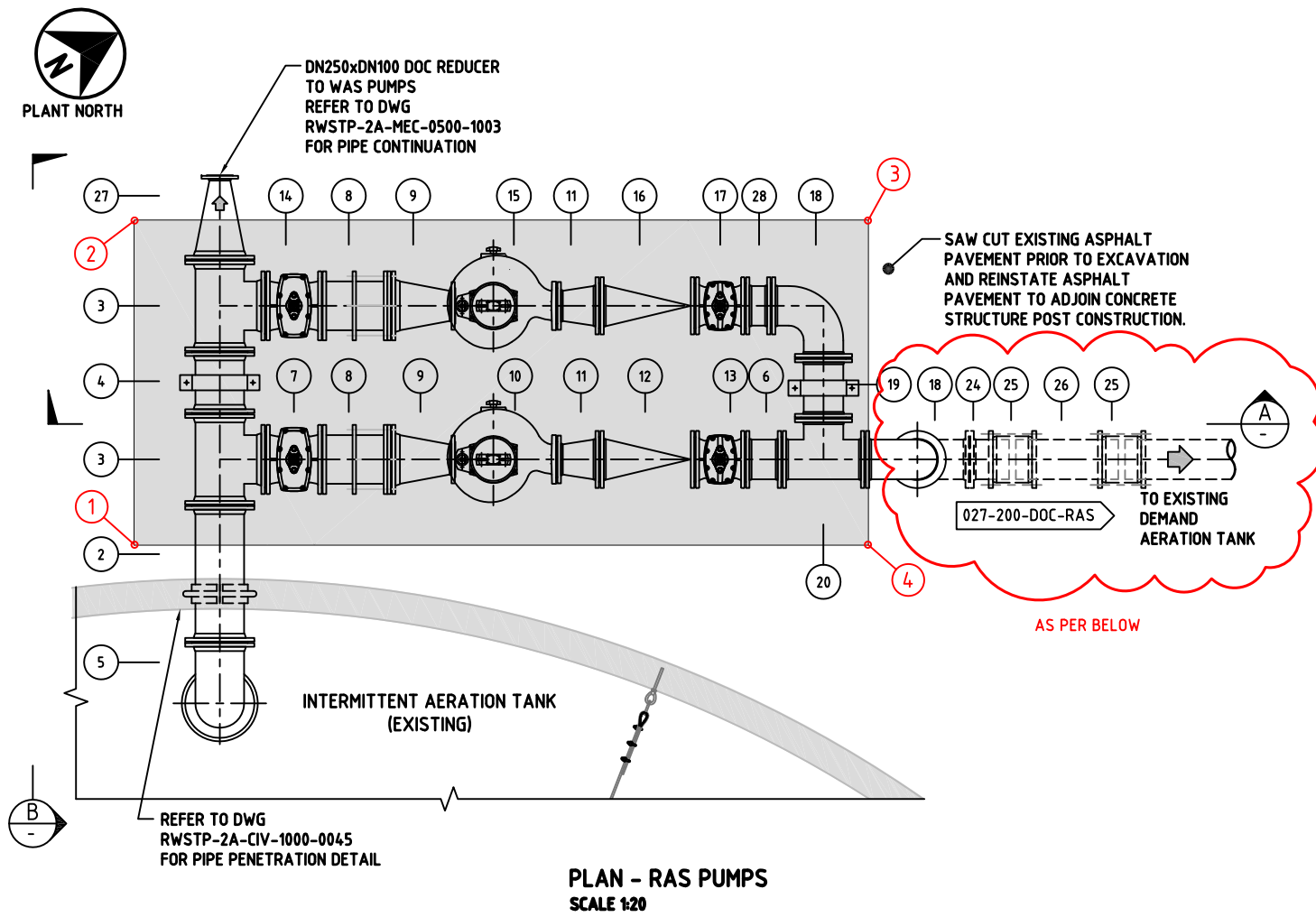
DO NOT SCALE, USE FIGURED DIMENSIONS ONLY

SKM	NAME	DATE
DESIGNED	J.F. LINGHAM	01.07.11
DRAWN	L. CHIN	01.07.11
DRAFTING CHECK	L. APPELGREN	02.11.11
DESIGN REVIEW	L. APPELGREN	02.11.11
PROJECT MANAGER	S. DOWD	23.02.12
APPROVED		DATE
FOR QUEENSLAND URBAN UTILITIES		

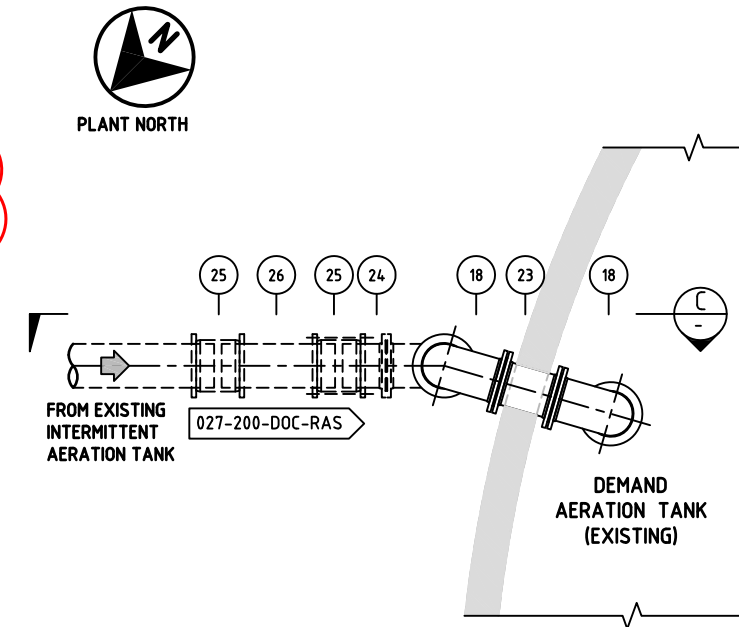
QUU: ROSEWOOD STP – OPTIMISATION  
DAT / IAT REACTORS – DECANTER  
GENERAL ARRANGEMENT PLAN AND SECTION

Doc Status : **AS** Size : **A1** Rev : **B** Drg : QUU-RWSTP-2A-MEC-0500-1001

AS CONSTRUCTED



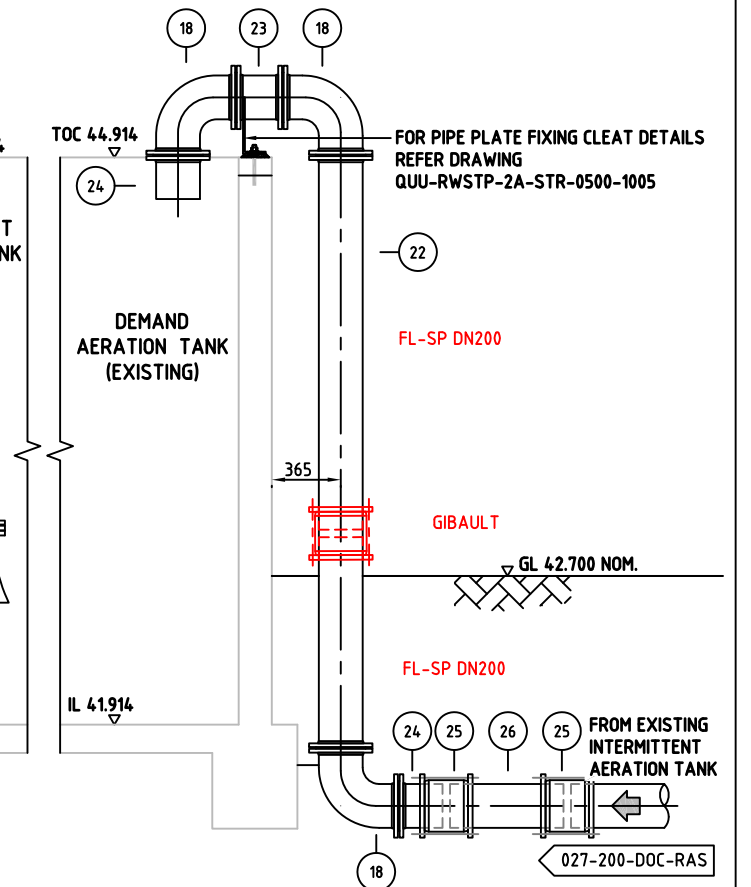
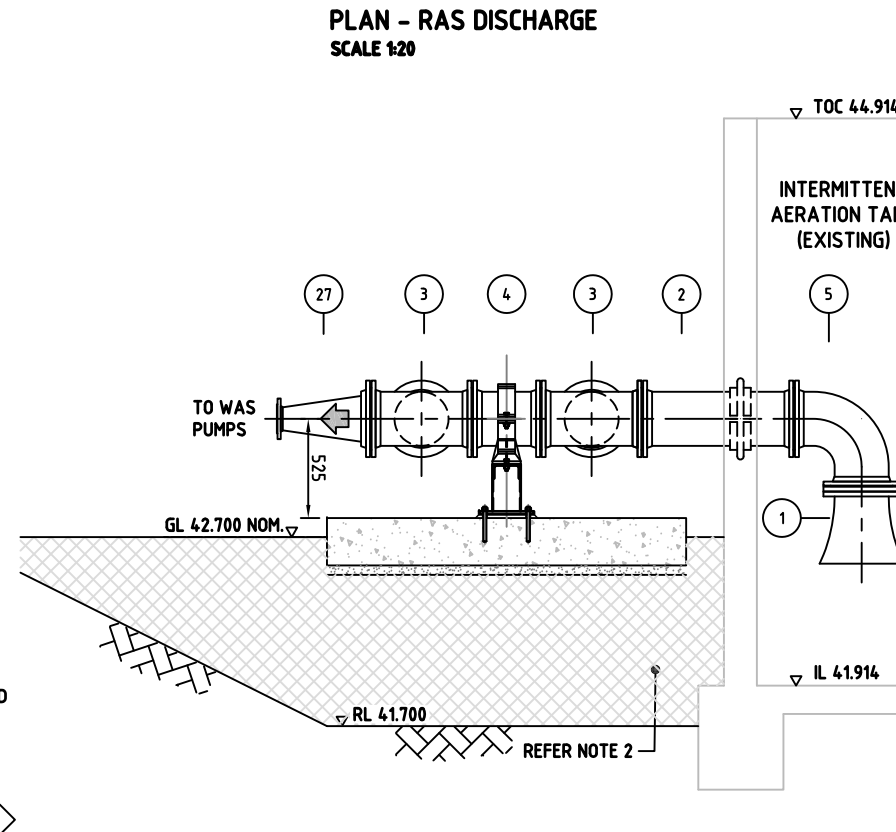
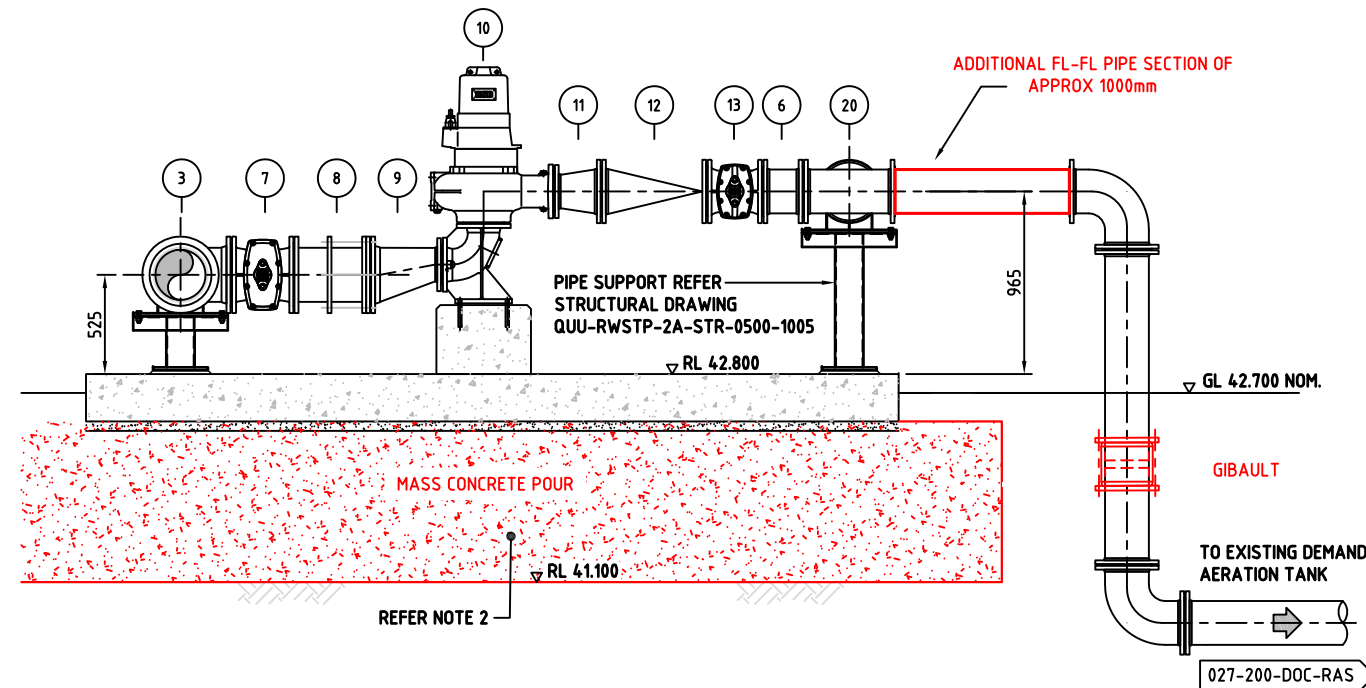
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POINT	EAST	NORTH	RL
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2	15726.419	150206.811	42.793
3	15728.515	150210.288	42.790
4	15730.100	150209.326	42.795



# NOTES

- REFER TO DWG RWSTP-2A-STR-0500-1005 FOR STRUCTURAL DETAILS.
- STRUCTURE FOOTINGS SHALL BE ESTABLISHED ON ENGINEERED FILL. REFER TO EARTHWORKS SPECIFICATION QUU-RWSTP-2A-CIV-SPEC-0210. THE SUBGRADE SHALL BE INSPECTED AND APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF ENGINEERED FILL.

ITEM	QTY	PART No.	DESCRIPTION	LENGTH (mm)
1	1		DN250 DOC FL BELLMOUTH	
2	1		DN250 DOC FL-FL PIPE C/W PUDDLE FLANGE	800
3	2		DN250 x DN250 x DN250 DOC FL-FL TEE	
4	1		DN250 DOC FL-FL PIPE	360
5	1		DN250 DOC 90° FL-FL ELBOW	
6	1		DN200 DOC FL-FL PIPE	210
7	1	HV-0540-022	DN250 FL-FL GATE VALVE	
8	2		DN250 FL-FL DISMANTLING JOINT (THRUST TYPE)	
9	2		DN250 x DN150 DOC FL-FL ECCENTRIC REDUCER	
10	1	PU-0540-020	RAS PUMP	
11	2		DN200 x DN150 DOC FL-FL CONCENTRIC REDUCER	
12	1	NRV-0540-020	DN200 FL-FL NON-RETURN VALVE	
13	1	HV-0540-020	DN200 FL-FL GATE VALVE	
14	1	HV-0540-023	DN250 FL-FL GATE VALVE	
15	1	PU-0540-021	RAS PUMP	
16	1	NRV-0540-021	DN200 FL-FL NON-RETURN VALVE	
17	1	HV-0540-021	DN200 FL-FL GATE VALVE	
18	6		DN200 DOC 90° FL-FL ELBOW	
19	1		DN200 DOC FL-FL PIPE	350
20	1		DN200 x DN200 DOC FL-FL TEE	
21	1		DN200 DOC FL-FL PIPE	1665
22	1		DN200 DOC FL-FL PIPE	3130
23	1		DN200 DOC FL-FL PIPE	245
24	3		DN200 DOC FL-SP CONNECTOR	
25	4		DN200 GIBAULT COUPLING	
26	2		DN200 DOC SP-SP PIPE	600
27	1		DN250 x DN100 DOC FL-FL CONCENTRIC REDUCER	
28	1		DN200 DOC FL-FL PIPE	150



SECTION A  
SCALE 1:20

SECTION B  
SCALE 1:20

SECTION C  
SCALE 1:20

AS CONSTRUCTED

REVISIONS		
AMENDMENT	INITIALS	DATE
B INFORMATION AMENDED	SRG	25.07.13
A AS-CONSTRUCTED	SRG	28.11.12

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SCALES BEFORE REDUCTION:	
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DO NOT SCALE, USE FIGURED DIMENSIONS ONLY	

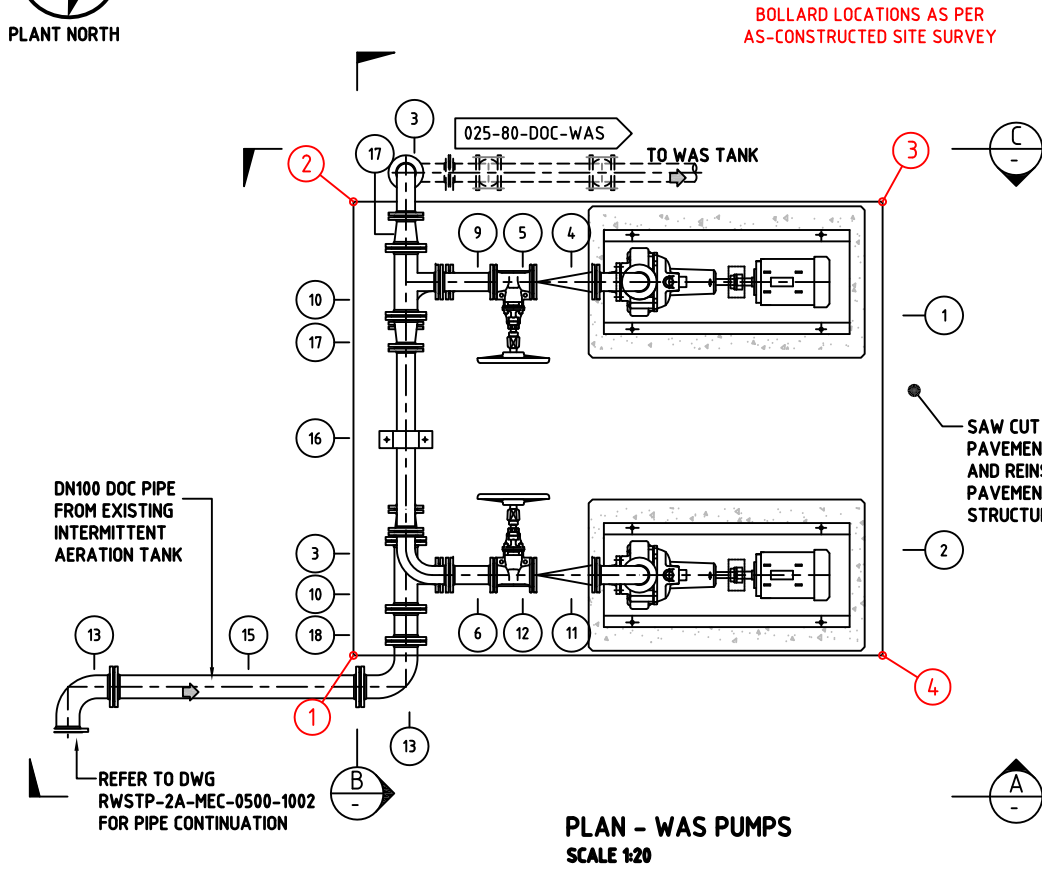
SKM	NAME	DATE
DESIGNED	J.FELTINGHAM	01.07.11
DRAWN	L.CHIN	01.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE
FOR QUEENSLAND URBAN UTILITIES		

QUU: ROSEWOOD STP - OPTIMISATION  
DAT / IAT REACTORS - RAS PUMPS  
GENERAL ARRANGEMENT PLAN AND SECTIONS

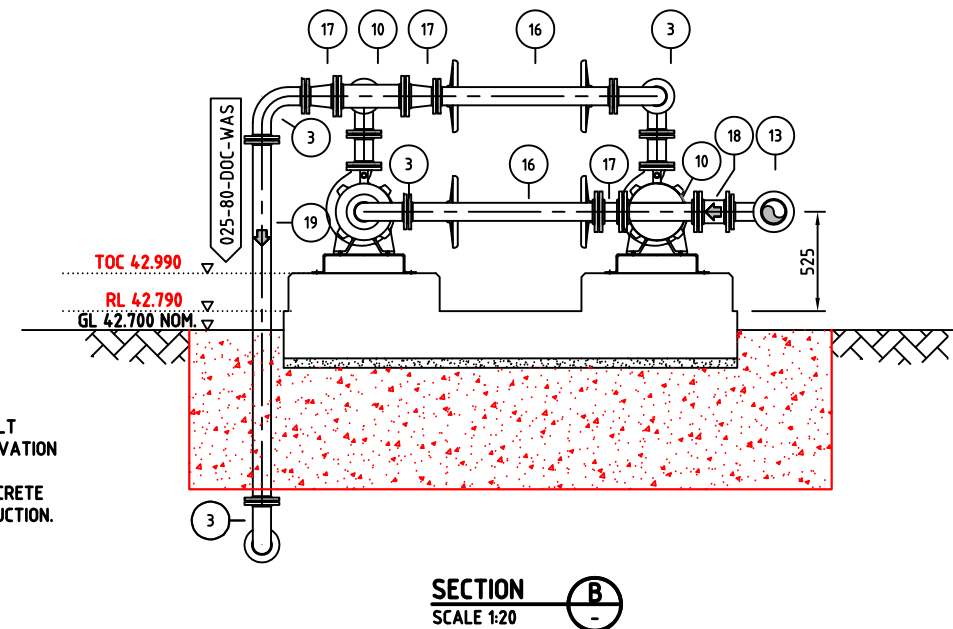
Doc Status : AS Size : A1 Rev : B Drg : QUU-RWSTP-2A-MEC-0500-1002



PLANT NORTH



PLAN - WAS PUMPS  
SCALE 1:20

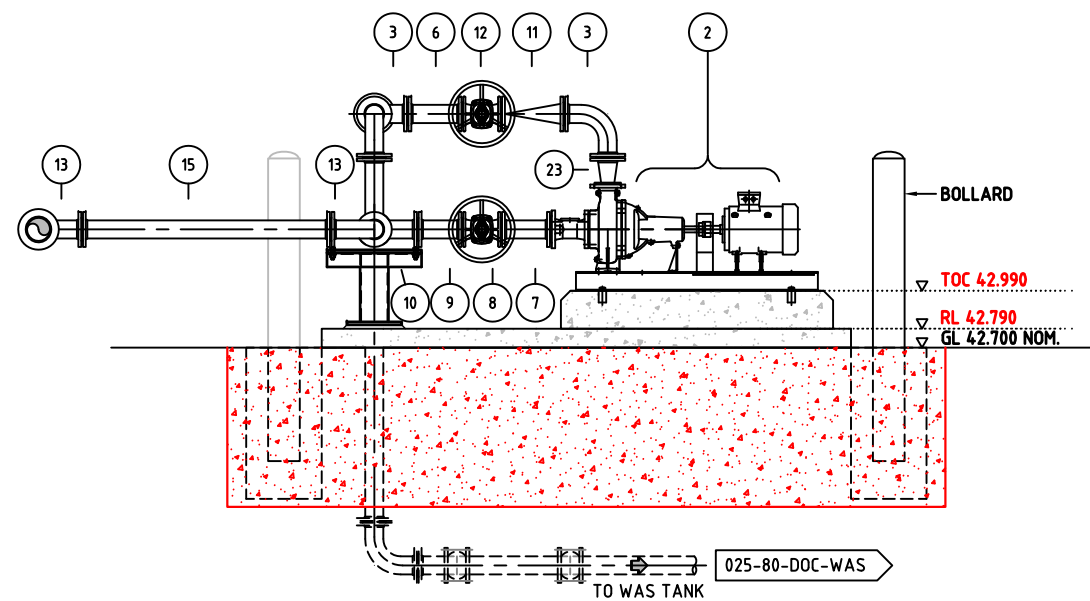


SECTION B  
SCALE 1:20

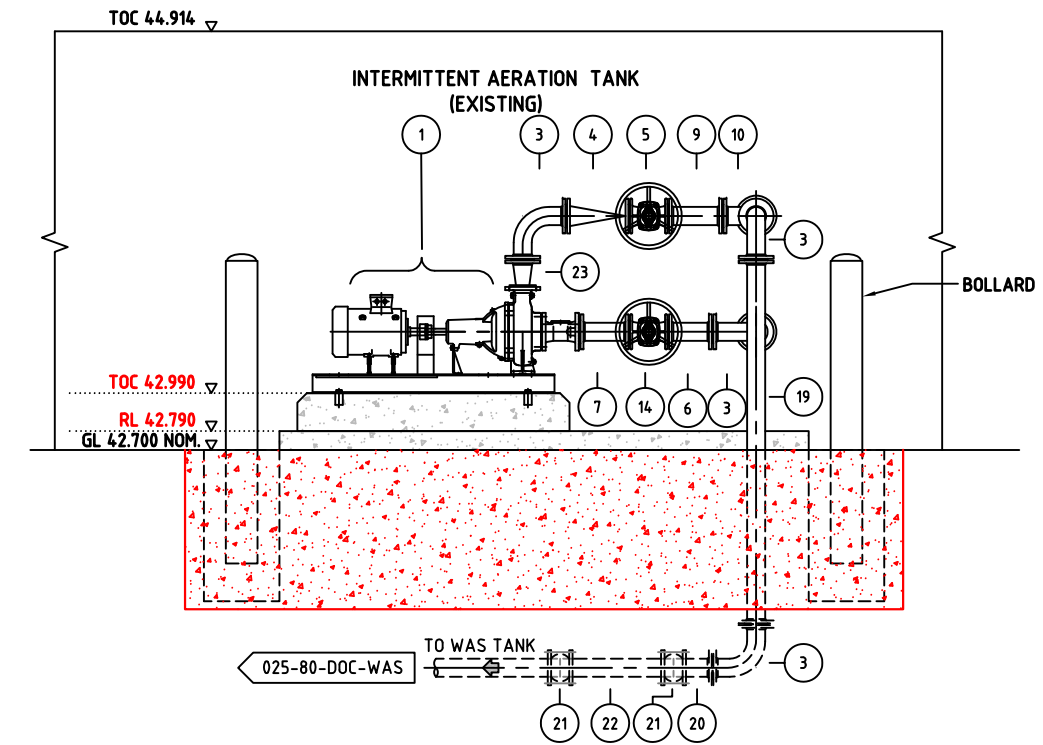
AS-CON COORDINATES			
POINT	EAST	NORTH	RL
1	15726.827	150208.666	42.792
2	15724.806	150209.888	42.791
3	15726.219	150212.248	42.786
4	15728.241	150211.028	42.785

MASS POUR SUB-GRADE FOR WAS  
& RAS PUMP SLABS.  
APPROX 1.6m DEEP & OFFSET 0.5m  
OUT FROM SLAB EDGE.

ITEM	QTY	PART No.	DESCRIPTION	LENGTH (mm)
1	1	PU-0530-010	WAS PUMP	
2	1	PU-0530-011	WAS PUMP	
3	6		DN80 D0C 90° FL-FL ELBOW	
4	1	NRV-0530-010	DN80 FL-FL NON RETURN VALVE	
5	1	HV-0530-010	DN80 FL-FL GATE VALVE	
6	2		DN80 D0C FL-FL PIPE	230
7	2		DN80 D0C FL-FL PIPE	260
8	1	HV-0530-012	DN80 FL-FL GATE VALVE	
9	2		DN80 D0C FL-FL PIPE	285
10	2		DN100 x DN100 x DN80 D0C FL-FL TEE	
11	1	NRV-0530-011	DN80 FL-FL NON RETURN VALVE	
12	1	HV-0530-011	DN80 FL-FL GATE VALVE	
13	2		DN100 D0C 90° FL-FL ELBOW	
14	1	HV-0530-013	DN80 FL-FL GATE VALVE	
15	1		DN100 D0C FL-FL PIPE	1300
16	2		DN80 D0C FL-FL PIPE	970
17	3		DN100 x DN80 D0C FL-FL CONCENTRIC REDUCER	
18	1		DN100 D0C FL-FL PIPE	165
19	1		DN80 D0C FL-FL PIPE	CHECK ON SITE PRIOR TO FAB
20	1		DN80 D0C FL-SP CONNECTOR	
21	2		DN80 GIBAULT COUPLING	
22	1		DN80 D0C SP-SP PIPE	600
23	2		DN65 x DN80 STAINLESS STEEL REDUCER	SPECIAL FABRICATION



SECTION A  
SCALE 1:20



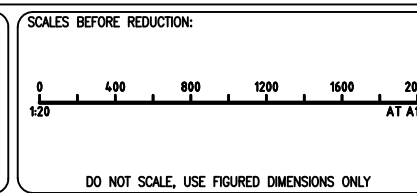
SECTION C  
SCALE 1:20

AS CONSTRUCTED

REVISIONS		
AMENDMENT	INITIALS	DATE
B ADDITIONAL INFORMATION ADDED	SRG	04.02.13
A AS-CONSTRUCTED	SRG	06.12.12



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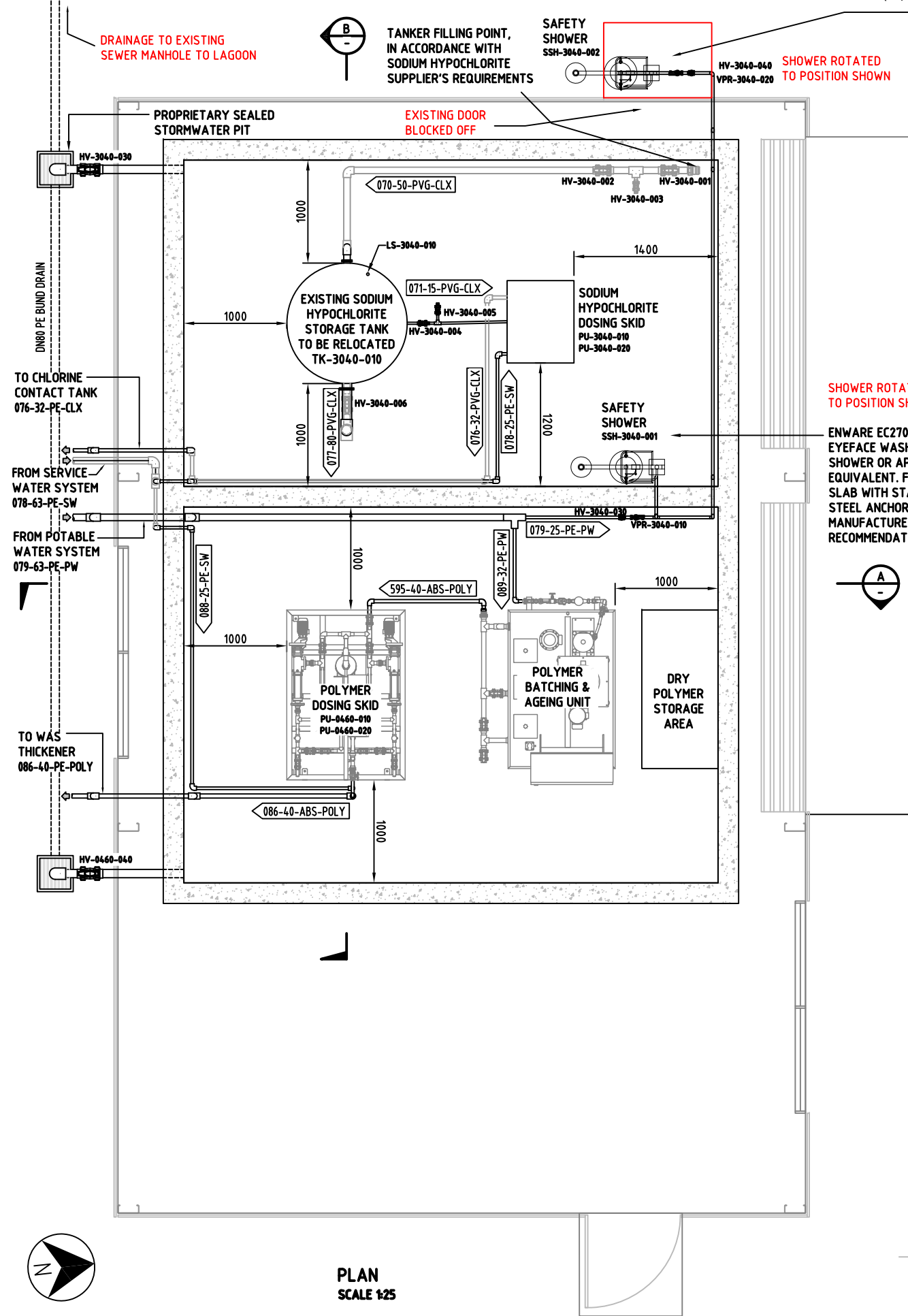
SKM	NAME	DATE
DESIGNED	J.FELTINGHAM	01.07.11
DRAWN	L.CHIN	01.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE

QUU: ROSEWOOD STP - OPTIMISATION  
DAT / IAT REACTORS - WAS PUMPS  
GENERAL ARRANGEMENT PLAN AND SECTIONS

Doc Status : AS Size : Rev : B Drg : QUU-RWSTP-2A-MEC-0500-1003



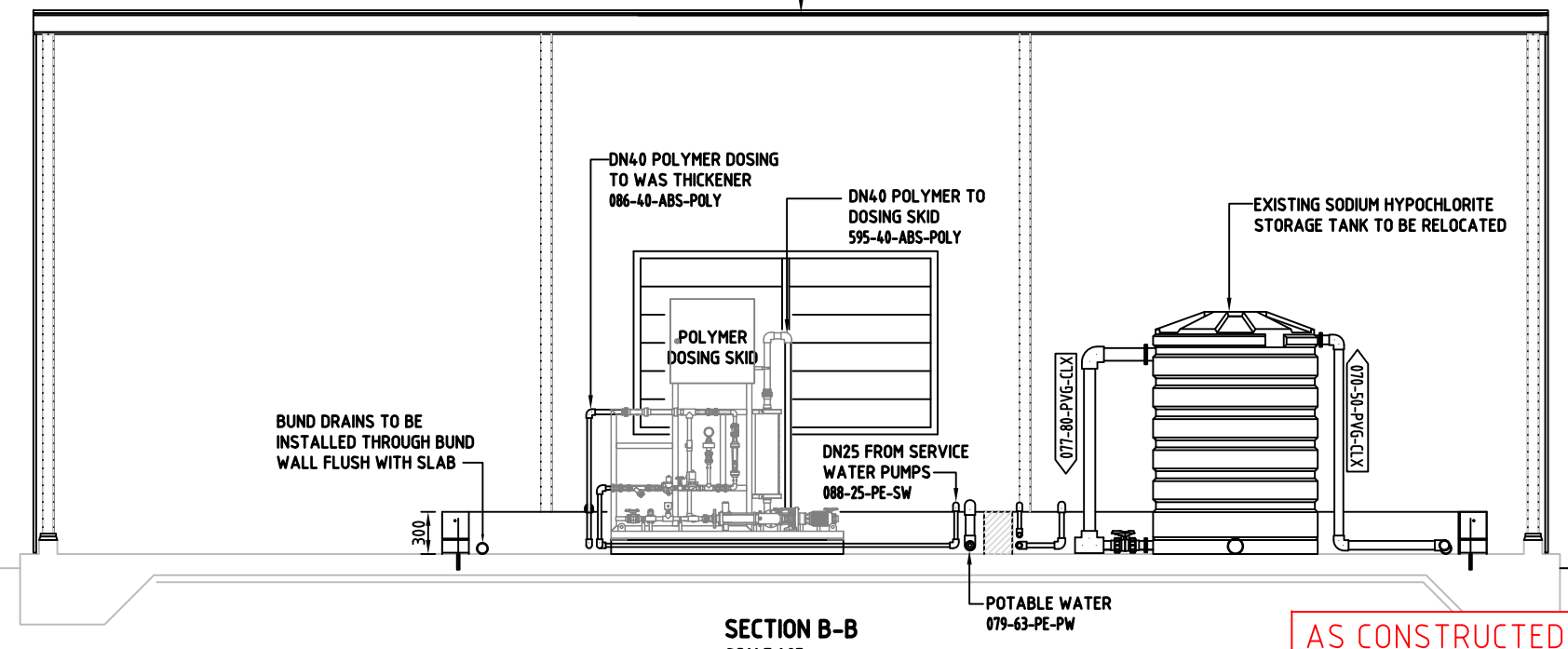
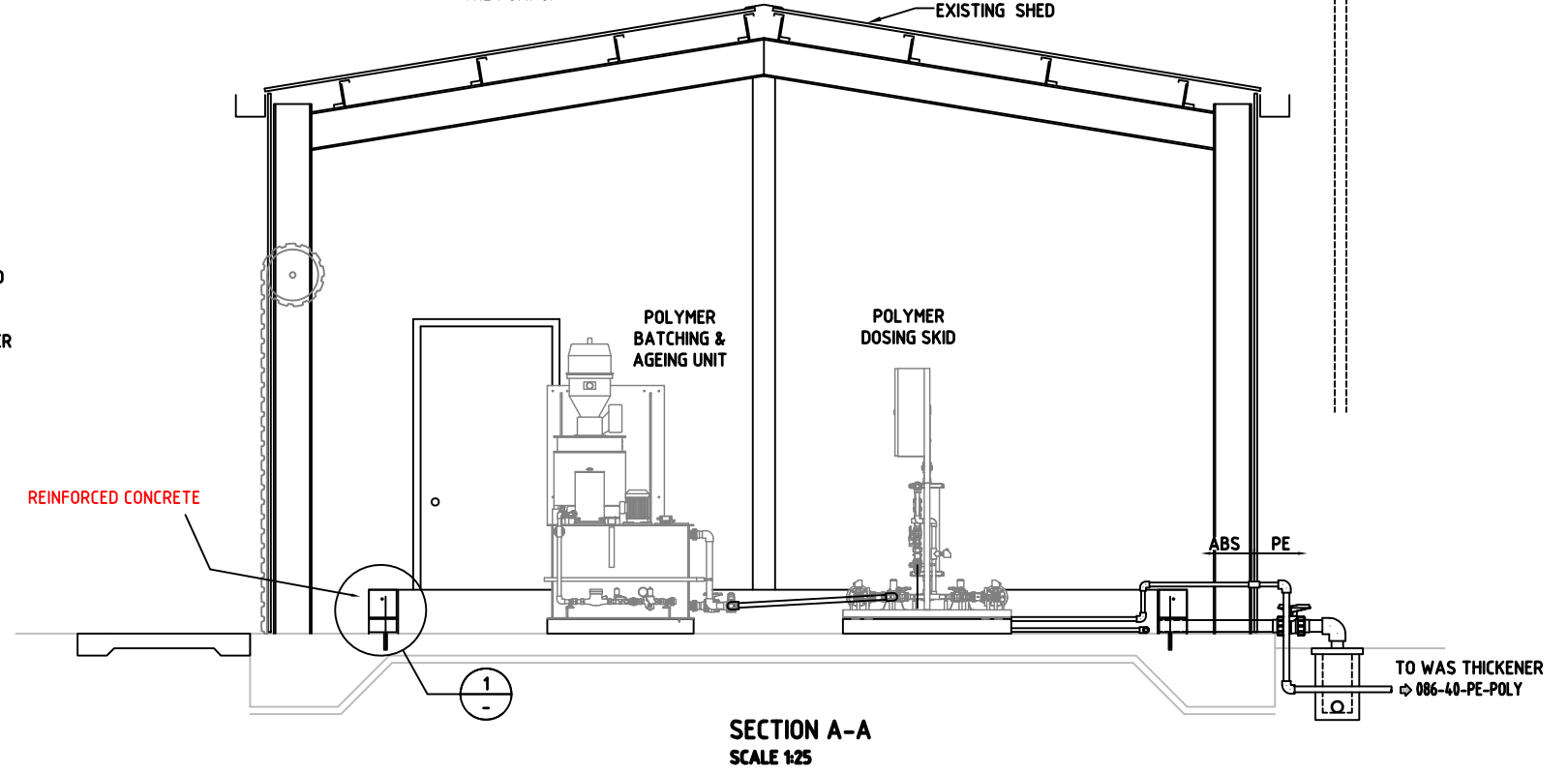
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ENWARE EC270 FOOT  
EYEWASH  
SHOWER OR APPROVED  
EQUIVALENT. FIX TO  
SLAB WITH STAINLESS  
STEEL ANCHORS AS PER  
MANUFACTURER'S  
RECOMMENDATIONS

NOTES

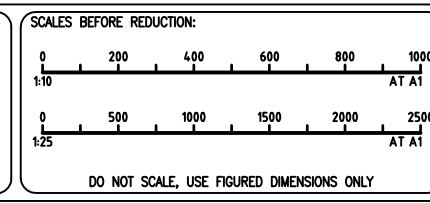
1. DIMENSIONS OF BUNDED AREA TO BE VERIFIED BY CONTRACTOR TO SUIT DIMENSIONS OF SELECTED POLYMER BATCHING AND DOSING SKIDS. CONTRACTOR TO PROVIDE MINIMUM 800mm CLEARANCE AROUND AND BETWEEN SKIDS.
2. DETAILS OF PIPEWORK IN POLYMER AND SODIUM HYPOCHLORITE AREAS TO BE VERIFIED BY CONTRACTOR TO SUIT DOSING SKIDS, EXISTING TANK AND SAFETY SHOWER. PIPEWORK TO BE IN ACCORDANCE WITH CHEMICAL REQUIREMENT, AUSTRALIAN STANDARD, AND P & IDs.
3. DETAILS OF CONNECTION TO EXISTING MANHOLE TO BE SUBMITTED TO SUPERINTENDENT FOR APPROVAL.
4. ALL EQUIPMENT AND PIPEWORK SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR MECHANICAL EQUIPMENT.
5. CONFIRM AND OBTAIN THE SUPERINTENDENT'S APPROVAL FOR THE PROPOSED LOCATION AND LEVELS OF ALL PIPING AND VALVES PRIOR TO SITE INSTALLATION.
6. REFER TO PIPING AND INSTRUMENTATION DIAGRAM QUU-RWSTP-2A-PRO-0460-5255 AND QUU-RWSTP-2A-PRO-3000-5230
7. INSTALL SIGNAGE AT THE UNLOADING CONNECTION TO CLEARLY IDENTIFY THE CHEMICAL STORED.
8. INSTALL SIGNAGE TO INDICATE SAFETY SHOWER AND EYE WASH STATIONS.
9. INSTALL EMERGENCY INFORMATION PANEL WHICH INDICATES OPERATION PPE REQUIREMENTS AND CHEMICAL DELIVERY CONTRACTORS EMERGENCY RESPONSE PHONE NUMBER.
10. ALL DOSING PUMPS MUST BE MOUNTED ABOVE TOP OF BUND WALL, ALTHOUGH AS LOW AS POSSIBLE TO MAXIMISE THE FLOODED SUCTION HEAD ON THE PUMPS.



REVISIONS		
AMENDMENT	INITIALS	DATE
B	INFORMATION AMENDED	SRG 25.01.13
A	AS-CONSTRUCTED	SRG 28.11.12



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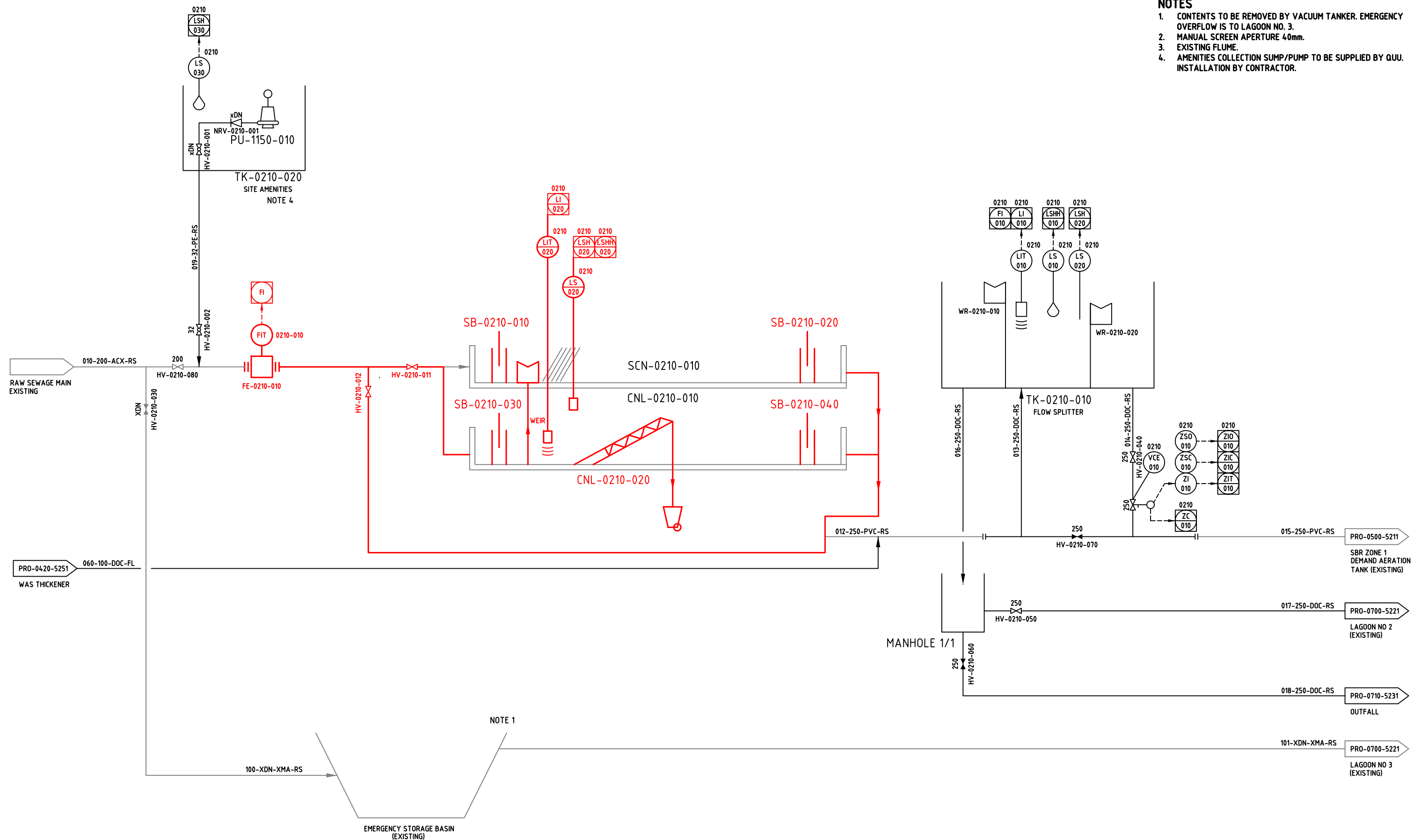
SKM	NAME	DATE
DESIGNED	J.FELTINGHAM	01.07.11
DRAWN	MEI	01.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE

QUU: ROSEWOOD STP - OPTIMISATION CHEMICAL BUILDING GENERAL ARRANGEMENT PLAN AND SECTIONS			
Doc Status :	AS	Size : A1	Rev : B
Drg :	QUU-RWSTP-2A-MEC-0700-3005		



## NOTES

1. CONTENTS TO BE REMOVED BY VACUUM TANKER. EMERGENCY OVERFLOW IS TO LAGOON NO. 3.
2. MANUAL SCREEN APERTURE 40mm.
3. EXISTING FLUME.
4. AMENITIES COLLECTION SUMP/PUMP TO BE SUPPLIED BY QUU. INSTALLATION BY CONTRACTOR.



AS CONSTRUCTED

REVISIONS			
AMENDMENT	INITIALS	DATE	
B	ADDITIONAL INFORMATION ADDED	SRG	06.02.13
A	AS-CONSTRUCTED	SRG	28.11.12



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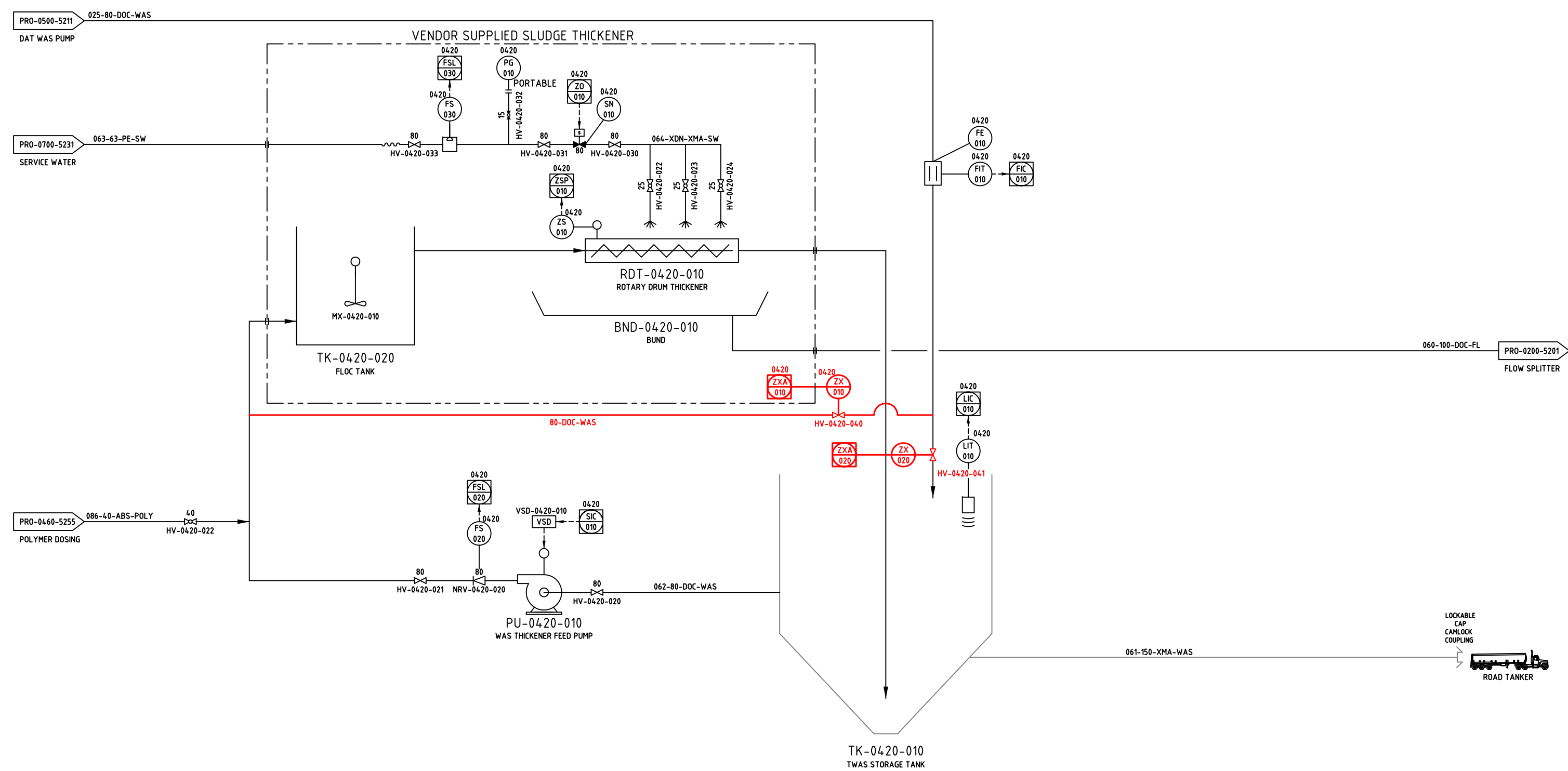
SKM	NAME	DATE
DESIGNED	J.BRAGG	06.07.11
DRAWN	L.CHIN	06.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE

FOR QUEENSLAND URBAN UTILITIES

QUU: ROSEWOOD STP – OPTIMISATION  
PROCESS AND INSTRUMENTATION DIAGRAM  
PRIMARY TREATMENT AREA

Doc Status : **AS** Size : **A1** Rev : **B** Drg : **QUU-RWSTP-2A-PRO-0200-5201**

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REVISIONS			
AMENDMENT	INITIALS	DATE	
B ADDITIONAL INFORMATION ADDED	SRG	04.02.13	
A AS-CONSTRUCTED	SRG	28.11.12	



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SKM	NAME	DATE
DESIGNED	J.BRAGG	06.07.11
DRAWN	L.CHIN	06.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE

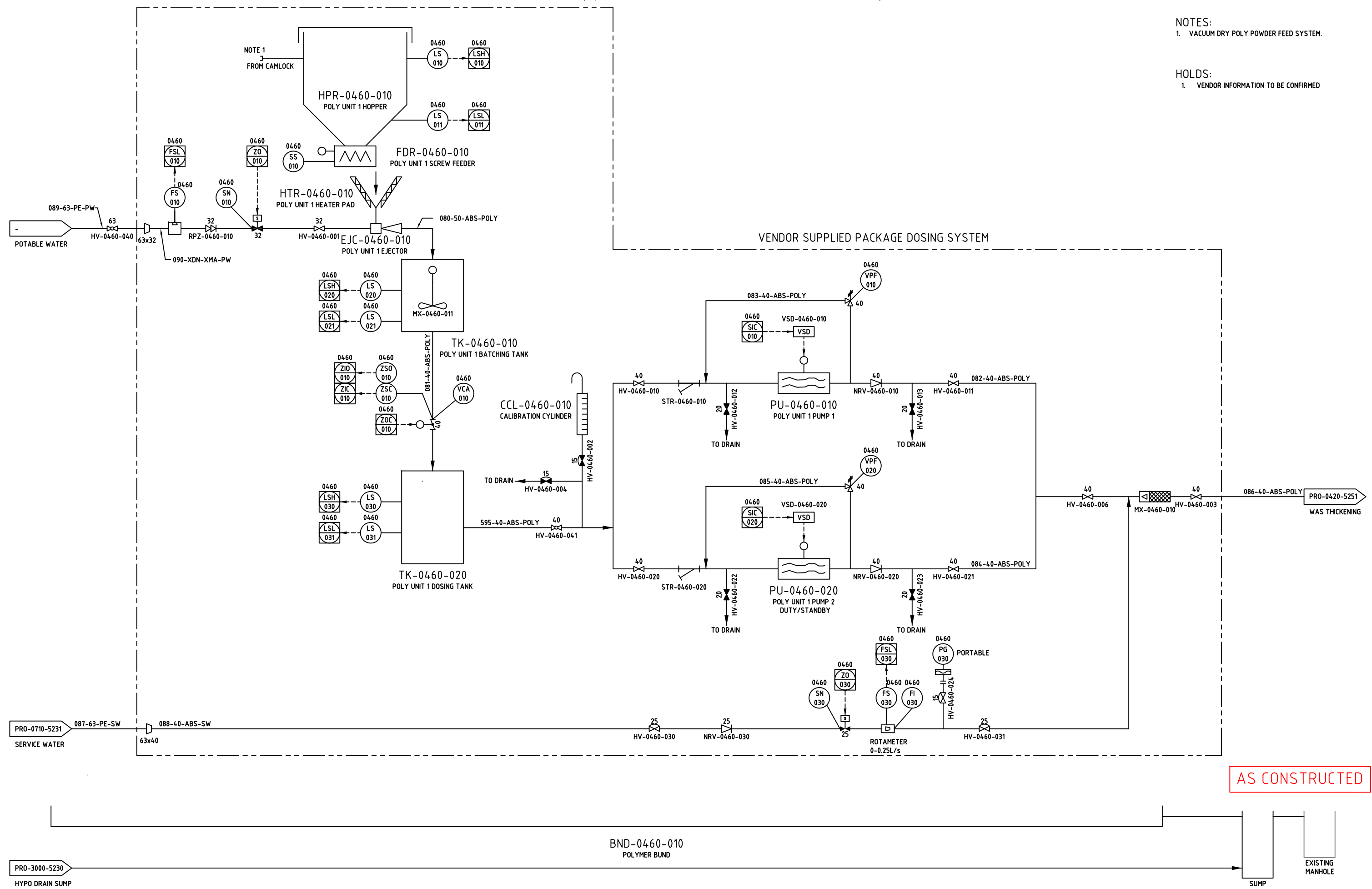
FOR QUEENSLAND URBAN UTILITIES

QUU: ROSEWOOD STP – OPTIMISATION  
PROCESS AND INSTRUMENTATION DIAGRAM  
WAS THICKENING & STORAGE

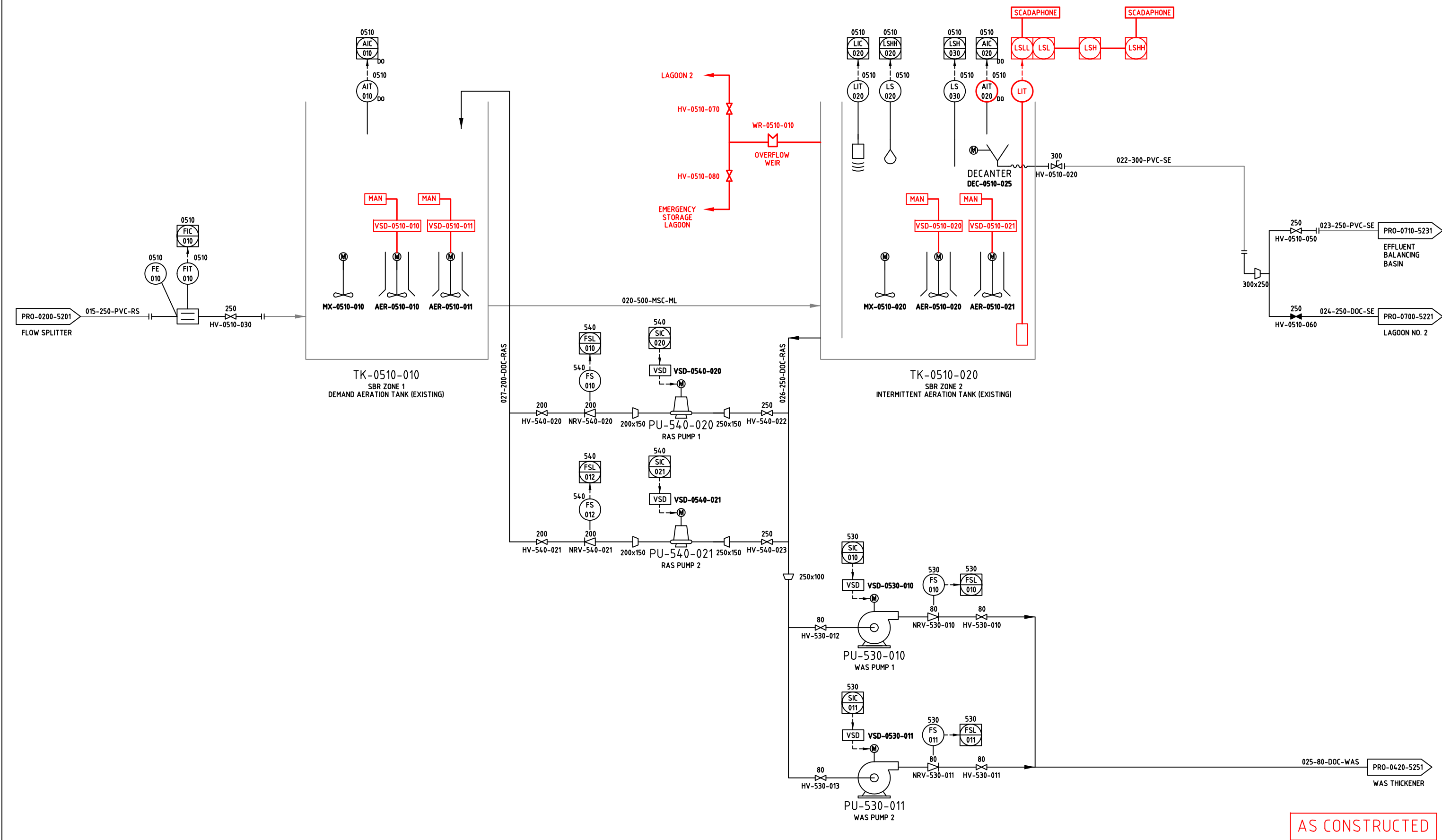
Doc Status : AS Size : A1 Rev : B Drg : QUU-RWSTP-2A-PRO-0420-5251

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- NOTES:
- VACUUM DRY POLY POWDER FEED SYSTEM.
- HOLDS:
- VENDOR INFORMATION TO BE CONFIRMED



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CONSTRUCTED



REVISIONS			
AMENDMENT	INITIALS	DATE	
B	ADDITIONAL INFORMATION ADDED	SRG	04.02.13
A	AS-CONSTRUCTED	SRG	28.11.12



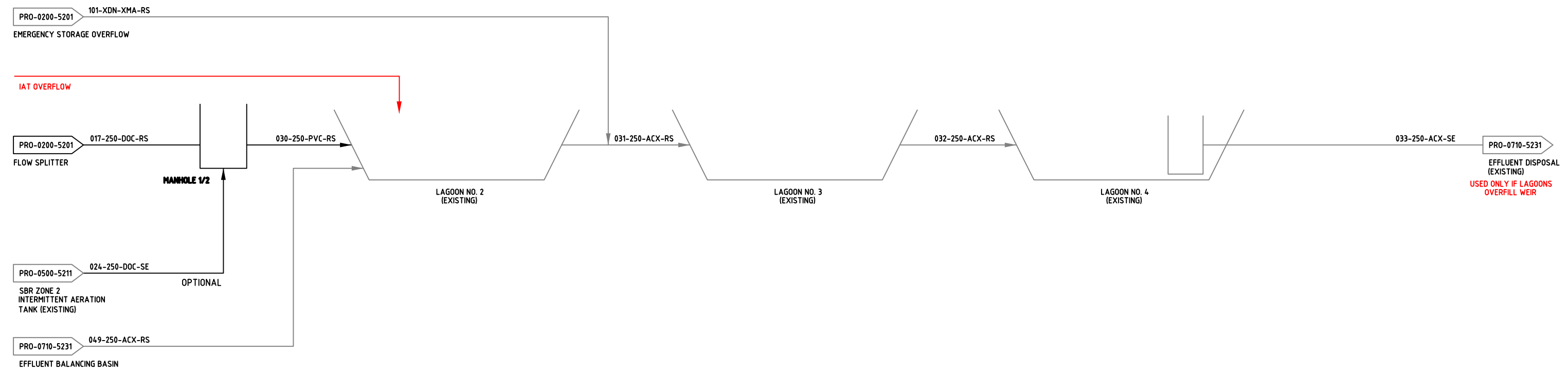
SCALES BEFORE REDUCTION:

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SYM	NAME	DATE
DESIGNED	LBAGG	06.07.11
DRAWN	LCHIN	06.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	SDOWD	23.02.12
APPROVED		DATE

QUU: ROSEWOOD STP – OPTIMISATION PROCESS AND INSTRUMENTATION DIAGRAM BIOREACTOR			
Doc Status :	AS	Size : A1	Rev : B
Drg : QUU-RWSTP-2A-PRO-0500-5211			





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REVISIONS			
	AMENDMENT	INITIALS	DATE
A	AS-CONSTRUCTED	SRG	28.11.12



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SCALES BEFORE REDUCTION:

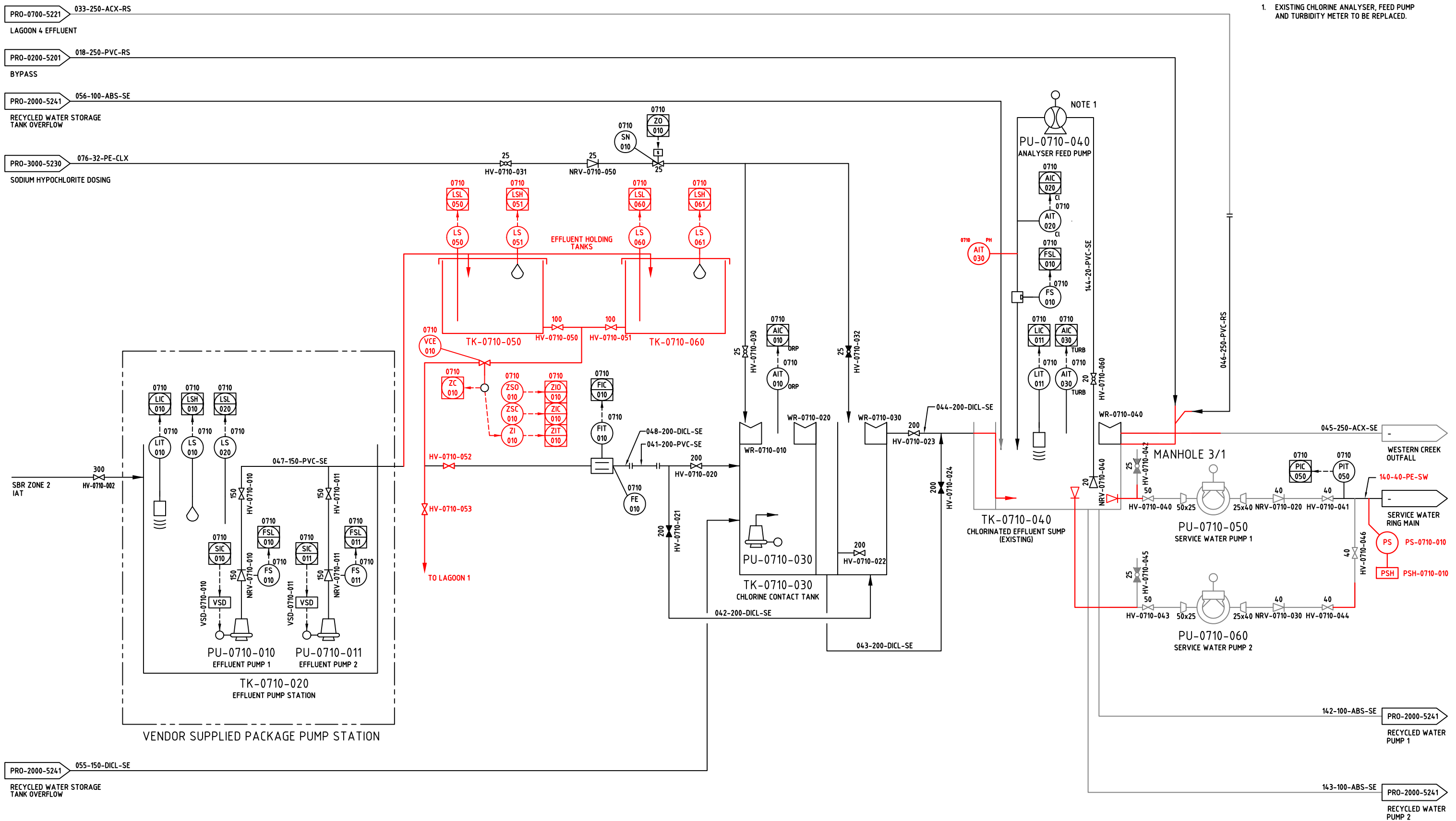
DO NOT SCALE, USE FIGURED DIMENSIONS ONLY

SKM	NAME	DATE
DESIGNED	J.BRAGG	06.07.11
DRAWN	L.CHIN	06.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE
FOR QUEENSLAND URBAN UTILITIES		

QUU: ROSEWOOD STP – OPTIMISATION  
PROCESS AND INSTRUMENTATION DIAGRAM  
BYPASS LAGOONS

Doc Status : **AS** Size : **A1** Rev : **A** Drg : **QUU-RWSTP-2A-PRO-0700-5221**

NOTE:  
1. EXISTING CHLORINE ANALYSER, FEED PUMP AND TURBIDITY METER TO BE REPLACED.



AS CONSTRUCTED

REVISIONS			
AMENDMENT	INITIALS	DATE	
B ADDITIONAL INFORMATION ADDED	SRG	04.02.13	
A AS-CONSTRUCTED	SRG	28.11.12	



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SCALES BEFORE REDUCTION:

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SKM	NAME	DATE
DESIGNED	LEBRAGG	06.07.11
DRAWN	LOHN	06.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE

QUU: ROSEWOOD STP – OPTIMISATION  
PROCESS AND INSTRUMENTATION DIAGRAM  
CHLORINE CONTACT TANK & EFFLUENT DISPOSAL

Doc Status : AS Size : A1 Rev : B Drg : QUU-RWSTP-2A-PRO-0710-5231



LINE CONTINUATION SYMBOL		VALVE SYMBOLS		PIPING SYMBOLS		BLOWERS & COOLERS SYMBOLS		GENERAL SYMBOLS		GENERAL SYMBOLS			
<div><div>AREA NUMBER P&amp;ID NUMBER</div><div>PRO-XXXX-XXXX</div><div>PRODUCTION FLUID FROM WELL</div><div>SOURCE OR DESTINATION</div></div>		<div><div></div>PENSTOCK</div> <div><div></div>PENSTOCK (WEIR)</div> <div><div></div>STOPBOARD</div>		<div><div></div>SKM XXX SUPPLY SCOPE DELIMITATION</div> <div><div></div>LINE No. CHANGE</div> <div><div></div>DRAIN COLLECTION</div> <div><div></div>PLUG</div> <div><div></div>SPECIALITY ITEM</div> <div><div></div>DIRECTION OF FALL</div> <div><div></div>TIE-IN POINT</div> <div><div></div>SPECIFICATION BREAK</div> <div><div></div>HOSE CONNECTION</div> <div><div></div>FLUSHING POINT</div> <div><div></div>PIPE CAP (SCREWED)</div> <div><div></div>PIPE CAP (BUTT WELD)</div> <div><div></div>CAMLOCK COUPLING - FEMALE</div> <div><div></div>CAMLOCK COUPLING - MALE</div> <div><div></div>ACOUSTIC SILENCER</div> <div><div></div>BLIND FLANGE</div> <div><div></div>DIFFUSER</div> <div><div></div>CONCENTRIC REDUCER</div> <div><div></div>ECCENTRIC REDUCER</div> <div><div></div>FLANGE</div> <div><div></div>UNION</div> <div><div></div>FLANGED (REMOVABLE) SPOOL</div> <div><div></div>THERMOWELL</div> <div><div></div>MAGNETIC FLOW METER</div> <div><div></div>PADDLE FLOW METER</div> <div><div></div>ORIFICE PLATE</div> <div><div></div>DIAPHRAGM SEAL</div> <div><div></div>Y STRAINER</div> <div><div></div>FLEXIBLE JOINT/HOSE</div> <div><div></div>DAMPENER</div>		<div><div></div>COMPRESSOR</div> <div><div></div>FAN</div> <div><div></div>POSITIVE DISPLACEMENT BLOWER</div> <div><div></div>CENTRIFUGAL BLOWER</div> <div><div></div>AIR COOLER</div> <div><div></div>OIL COOLER</div>		<div><div></div>UV SYSTEM</div> <div><div></div>SCREENINGS PRESS</div> <div><div></div>RUPTURE DISK</div> <div><div></div>ROTAMETER</div> <div><div></div>STATIC MIXER</div> <div><div></div>TANK VENT</div> <div><div></div>CALIBRATION CYLINDER</div> <div><div></div>PULSATION DAMPENER</div> <div><div></div>PROPELLER MIXER</div> <div><div></div>PADDLE MIXER</div> <div><div></div>AERATED MIXER</div> <div><div></div>VISUAL INDICATOR</div> <div><div></div>AUDIBLE ALARM</div> <div><div></div>VORTEX BREAKER</div> <div><div></div>FLUME</div> <div><div></div>SPRAY</div> <div><div></div>EYEWASH &amp; SAFETY SHOWER</div> <div><div></div>SLUICE</div> <div><div></div>HOSE REEL</div> <div><div></div>RPZD BACKFLOW PREVENTER</div> <div><div></div>CONVEYOR</div> <div><div></div>SCREW CONVEYOR</div> <div><div></div>BELT CONVEYOR</div> <div><div></div>PRIMARY SCREEN</div> <div><div></div>STEP SCREEN</div> <div><div></div>MANUAL BAR SCREEN</div> <div><div></div>SECONDARY SCREEN</div> <div><div></div>MACERATOR/MUNCHER</div>		<div><div></div>SPECTACLE BLIND NORMALLY CLOSED</div> <div><div></div>SPECTACLE BLIND NORMALLY OPEN</div> <div><div></div>EJECTOR</div> <div><div></div>WEIR</div> <div><div></div>VARIABLE SPEED DRIVE</div> <div><div></div>SOFT STARTER</div> <div><div></div>AUTO SAMPLER</div> <div><div></div>REVERSE STARTER</div> <div><div></div>HEATER</div> <div><div></div>SILENCER</div> <div><div></div>SEAL POT</div> <div><div></div>SCRUBBER</div> <div><div></div>GENERIC EXCHANGER</div> <div><div></div>BELT FILTER PRESS</div> <div><div></div>BIN</div> <div><div></div>CHUTE</div> <div><div></div>GRAVITY DRAINAGE DECK</div> <div><div></div>FLAME ARRESTOR</div> <div><div></div>AIR DRYER/DEHUMIDIFIER</div> <div><div></div>FLOW STREAM INDICATOR</div> <div><div></div>EXISTING EQUIPMENT FADED OUT</div> <div><div></div>LOCAL CONTROL PANEL</div> <div><div></div>FUEL/WATER SEPARATOR</div> <div><div></div>HYDRAULIC ACCUMULATOR</div> <div><div></div>INLET CONNECTION</div> <div><div></div>DRAWING REVISION CLOUD</div> <div><div></div>DECANTER</div>			
LINE SYMBOLS		ACTUATOR SYMBOLS		PUMP SYMBOLS		PUMP SYMBOLS		PUMP SYMBOLS		PUMP SYMBOLS			
<div><div></div>PROCESS PIPING</div> <div><div></div>FUTURE PROCESS PIPING</div> <div><div></div>EXISTING PROCESS PIPING</div> <div><div></div>MINOR PIPING</div> <div><div></div>HEAT TRACED LINE</div> <div><div></div>ELECTRICAL SIGNAL (NOTE 1)</div> <div><div></div>PNEUMATIC SIGNAL / INSTRUMENT AIR SUPPLY</div> <div><div></div>MECHANICAL LINK</div> <div><div></div>VENDOR PACKAGE BOUNDARY LIMIT</div> <div><div></div>CHANNEL OUTLINE</div> <div><div></div>INSULATION</div> <div><div></div>SECONDARY CONTAINED PIPE</div> <div><div>NOTES</div><div>1. ELECTRICAL SIGNALS SHOW DISCRETE CONNECTION BETWEEN FIELD DEVICE AND CONTROL SYSTEM OR BETWEEN MULTIPLE FIELD DEVICES.</div></div>		<div><div></div>FLOAT</div> <div><div></div>DIAPHRAGM</div> <div><div></div>DIAPHRAGM WITH POSITIONER</div> <div><div></div>PNEUMATIC CYLINDER</div> <div><div></div>SOLENOID</div> <div><div></div>HYDRAULIC</div> <div><div></div>ELECTROHYDRAULIC</div> <div><div></div>ELECTRIC MOTOR</div> <div><div></div>HAND JACK OR HAND WHEEL</div> <div><div></div>SPRING</div> <div><div></div>PRESSURE-REDUCING REGULATOR, SELF CONTAINED - REGULATING</div> <div><div></div>BACK PRESSURE REGULATOR, SELF CONTAINED - SUSTAINING</div>		<div><div></div>CENTRIFUGAL PUMP</div> <div><div></div>POSITIVE DISPLACEMENT / ROTARY LOBE PUMP</div> <div><div></div>PROGRESSIVE CAVITY PUMP</div> <div><div></div>INLINE CENTRIFUGAL PUMP</div> <div><div></div>SUBMERSIBLE PUMP</div> <div><div></div>DOSING PUMP</div> <div><div></div>REMOTE VSD DOSING PUMP</div> <div><div></div>DIAPHRAM PUMP</div> <div><div></div>MULTISTAGE PUMP</div> <div><div></div>SPLIT CASE PUMP</div> <div><div></div>PROPELLER PUMP</div>		<div><div></div>CONDENSATE POT</div> <div><div></div>FILTER</div> <div><div></div>IN LINE CONDENSATE FILTER WITH AUTOMATIC DRAIN</div> <div><div></div>BASKET STRAINER</div> <div><div></div>AIR EDUCTOR</div>		<div><div></div>CONDENSATE POT</div> <div><div></div>FILTER</div> <div><div></div>IN LINE CONDENSATE FILTER WITH AUTOMATIC DRAIN</div> <div><div></div>BASKET STRAINER</div> <div><div></div>AIR EDUCTOR</div>		<div><div></div>CONDENSATE POT</div> <div><div></div>FILTER</div> <div><div></div>IN LINE CONDENSATE FILTER WITH AUTOMATIC DRAIN</div> <div><div></div>BASKET STRAINER</div> <div><div></div>AIR EDUCTOR</div>		<div><div></div>CONDENSATE POT</div> <div><div></div>FILTER</div> <div><div></div>IN LINE CONDENSATE FILTER WITH AUTOMATIC DRAIN</div> <div><div></div>BASKET STRAINER</div> <div><div></div>AIR EDUCTOR</div>	
VALVE SYMBOLS		SWITCHING SYMBOLS		AIR SYMBOLS		AIR SYMBOLS		AIR SYMBOLS		AIR SYMBOLS			
<div><div></div>GATE/GENERIC VALVE (NORMALLY OPEN)</div> <div><div></div>GATE/GENERIC VALVE (NORMALLY CLOSED)</div> <div><div></div>THROUGH-CONDUIT GATE</div> <div><div></div>KNIPEGATE VALVE (NORMALLY OPEN)</div> <div><div></div>KNIPEGATE VALVE (NORMALLY CLOSED)</div> <div><div></div>GLOBE (NORMALLY OPEN)</div> <div><div></div>GLOBE (NORMALLY CLOSED)</div> <div><div></div>BALL (NORMALLY OPEN)</div> <div><div></div>BALL (NORMALLY CLOSED)</div> <div><div></div>BUTTERFLY (NORMALLY CLOSED)</div> <div><div></div>BUTTERFLY (NORMALLY OPEN)</div> <div><div></div>DIAPHRAGM VALVE (NORMALLY OPEN)</div> <div><div></div>DIAPHRAGM VALVE (NORMALLY CLOSED)</div> <div><div></div>PLUG VALVE (NORMALLY OPEN)</div> <div><div></div>PLUG VALVE (NORMALLY CLOSED)</div> <div><div></div>AIR RELIEF VALVE</div> <div><div></div>NON-RETURN</div> <div><div></div>ROTARY</div> <div><div></div>NEEDLE (NORMALLY OPEN)</div> <div><div></div>NEEDLE (NORMALLY CLOSED)</div> <div><div></div>3 WAY</div> <div><div></div>ANGLE</div> <div><div></div>PRESSURE RELIEF OR SAFETY VALVES</div> <div><div></div>LOAD VALVE</div> <div><div></div>TELESCOPIC VALVE</div> <div><div></div>FOOT VALVE</div> <div><div></div>REDUCED PRESSURE ZONE DEVICE</div>		<div><div></div>FLOAT SWITCH</div> <div><div></div>THERMAL FLOW SWITCH</div> <div><div></div>ANNUBAR FLOW ELEMENT</div> <div><div></div>PADDLE FLOW SWITCH</div> <div><div></div>PROBE LEVEL SWITCH</div> <div><div></div>PROBE MULTI LEVEL SWITCH/TRANSMITTER</div> <div><div></div>ULTRASONIC LEVEL SWITCH/TRANSMITTER</div> <div><div></div>HYDROSTATIC LEVEL SWITCH/TRANSMITTER</div> <div><div></div>RADAR LEVEL TRANSMITTER</div> <div><div></div>GUIDED RADAR LEVEL TRANSMITTER</div> <div><div></div>LEVEL SWITCH ELECTRODE</div>		<div><div></div>CONDENSATE POT</div> <div><div></div>FILTER</div> <div><div></div>IN LINE CONDENSATE FILTER WITH AUTOMATIC DRAIN</div> <div><div></div>BASKET STRAINER</div> <div><div></div>AIR EDUCTOR</div>		<div><div></div>CONDENSATE POT</div> <div><div></div>FILTER</div> <div><div></div>IN LINE CONDENSATE FILTER WITH AUTOMATIC DRAIN</div> <div><div></div>BASKET STRAINER</div> <div><div></div>AIR EDUCTOR</div>		<div><div></div>CONDENSATE POT</div> <div><div></div>FILTER</div> <div><div></div>IN LINE CONDENSATE FILTER WITH AUTOMATIC DRAIN</div> <div><div></div>BASKET STRAINER</div> <div><div></div>AIR EDUCTOR</div>		<div><div></div>CONDENSATE POT</div> <div><div></div>FILTER</div> <div><div></div>IN LINE CONDENSATE FILTER WITH AUTOMATIC DRAIN</div> <div><div></div>BASKET STRAINER</div> <div><div></div>AIR EDUCTOR</div>			



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AREA CODES		EQUIPMENT CODES		INSTRUMENT & FUNCTION SYMBOLS		PIPE NUMBERING		TYPICAL INSTALLATIONS							
<p><u>AREA 0100 – SEWAGE DELIVERY</u></p> <p>0110 SEWAGE PUMPS</p> <p>0190 PROCESS CONTROL</p> <p><u>AREA 0200 – PRE-TREATMENT</u></p> <p>0210 SCREENS</p> <p>0220 SCREENINGS WASHING</p> <p>0230 GRIT REMOVAL</p> <p>0240 GRIT CLASSIFICATION</p> <p>0250 FLOW SPLITTER</p> <p>0260 FINE SCREENS</p> <p>0290 PROCESS CONTROL</p> <p><u>AREA 0300 – CLARIFICATION</u></p> <p>0310 TANKS</p> <p>0320 SCUM PUMPING</p> <p>0330 WAS PUMPING</p> <p>0340 RAS PUMPING</p> <p>0350 SUPERNATANT</p> <p><u>AREA 0400 – SLUDGE TREATMENT</u></p> <p>0410 RAW SLUDGE THICKENING</p> <p>0420 WAS THICKENING/DEWATERING</p> <p>0430 HYDROLYSIS</p> <p>0440 DIGESTION TANKS</p> <p>0450 DIGESTED SLUDGE DEWATERING</p> <p>0460 POLY SYSTEM</p> <p>0470 SIDE STREAM TREATMENT</p> <p>0480 DIGESTION AERATION</p> <p>0490 PROCESS CONTROL</p> <p><u>AREA 0500 – BIOLOGICAL TREATMENT</u></p> <p>0510 TANKS</p> <p>0520 AERATION BLOWERS</p> <p>0530 WAS PUMPING</p> <p>0540 MLSS RECYCLE PUMPS/MBR FEED PUMPS</p> <p>0560 SCUM PUMPING</p> <p>0590 PROCESS CONTROL</p> <p><u>AREA 0600 – MEMBRANES/FILTRATION</u></p> <p>0610 TANKS</p> <p>0620 SCUM PUMPING</p> <p>0630 RAS SYSTEM</p> <p>0640 MEMBRANE AERATION BLOWERS</p> <p>0650 MEMBRANE PERMEATE SYSTEM</p> <p>0660 WAS PUMPING</p> <p>0670 BACK PULSE PS</p> <p>0680 VACUUM PS</p> <p>0690 DRAIN PS</p> <p><u>AREA 0700 – DISINFECTION AND OUTFALL</u></p> <p>0710 CHLORINE</p> <p>0720 UV</p> <p>0730 OZONE</p> <p>0740 AWT/P OFFTAKE</p> <p>0780 OUTFALL</p> <p>0790 PROCESS CONTROL</p> <p><u>AREA 0800 ODOUR MANAGEMENT</u></p> <p><u>AREA 0900 – ENERGY RECOVERY</u></p> <p><u>AREA 1000 – SITE SERVICES</u></p> <p>1010 TREATMENT COMPRESSED AIR</p> <p>1020 POTABLE WATER</p> <p>1030 SERVICE WATER</p> <p>1040 ELECTRICAL POWER DISTRIBUTION</p> <p>1050 EMERGENCY POWER GENERATION</p> <p>1060 FIRE WATER</p> <p>1090 PROCESS CONTROL</p> <p><u>AREA 1100 – GENERAL</u></p> <p>1110 ROADS</p> <p>1120 TELECOMMUNICATIONS</p> <p>1130 BUILDINGS</p> <p>1140 STORMWATER</p> <p>1150 SEWERAGE</p> <p>1160 SECURITY</p> <p>1170 GROUNDS AND LIGHTING</p> <p>1180 SAFETY AND LIFTING</p> <p>1190 PROCESS CONTROL</p> <p><u>AREA 2000 – WATER RECLAMATION</u></p> <p>2080 TANKER FACILITY</p> <p>2090 PROCESS CONTROL</p> <p><u>AREA 3000 – CHEMICAL DOSING</u></p> <p>3010 ALUMINIUM SULPHATE</p> <p>3020 CAUSTIC SODA</p> <p>3030 SUPPLEMENTRY CARBON</p> <p>3040 SODIUM HYPOCHLORITE</p> <p>3050 CITRIC ACID</p>		<p>AS AUTO SMAPLER</p> <p>ATU AIR TREATMENT UNIT</p> <p>BFP BELT FILTER PRESS</p> <p>BGU BAGGING UNIT</p> <p>BL BLOWER</p> <p>BLR BLOWER ROOM</p> <p>BN STORAGE BIN</p> <p>BND BUND</p> <p>BOI BOILER</p> <p>BRN BURNER</p> <p>CCL CALIBRATION CYLINDER</p> <p>CDR CARD READER</p> <p>CF CENTRIFUGE</p> <p>CLF CLASSIFIER</p> <p>CHU ACTUATED CHUTE</p> <p>CLM CLAM GATE</p> <p>CLR CLARIFIER</p> <p>CNL CHANNEL/OUTFALL</p> <p>CP COMPRESSOR</p> <p>CRN CRANE</p> <p>CTW COOLING TOWER</p> <p>CV CONVEYOR</p> <p>CY CYCLONE</p> <p>DE DIESEL ENGINE</p> <p>DEC DECANTER</p> <p>DIF DIFFUSER</p> <p>DMA DAMPENER AIR</p> <p>DMI DAMPENER AIR INLET</p> <p>DMP DAMPENER</p> <p>DPS DIAPHRAGM SEAL</p> <p>DVT DAVIT</p> <p>EJC EJECTOR</p> <p>EXH EXHAUST STACK</p> <p>FAN FAN</p> <p>FDR FEEDER</p> <p>FLM FLAME ARRESTOR</p> <p>FLT FILTER</p> <p>FTB FLOW TUBE/ROTAMETER</p> <p>GDD GRAVITY DRAINAGE DECK</p> <p>GEN GENERATOR SET</p> <p>GNT GANTRY</p> <p>GT GRIT TRAP</p> <p>HA HYDRAULIC ACCUMULATOR</p> <p>HEX HEAT EXCHANGER</p> <p>HOI HOIST</p> <p>HPR HOPPER</p> <p>HR HOSE REEL</p> <p>HTR HEATING COIL</p> <p>HV HAND VALVE</p> <p>HYD HYDRAULIC SYSTEM</p> <p>IPS INSTRUMENT POWER SUPPLY</p> <p>ISU INSULATION</p> <p>MNC MACERATOR</p> <p>MNH MANHOLE</p> <p>MTR MOTOR</p> <p>MW MOTORISED WEIR</p> <p>MX MIXER</p> <p>NRV NON RETURN VALVE</p> <p>PEC PORTABLE EVAPORATIVE COOLER</p> <p>PT PENSTOCK</p> <p>PTF PLATFORM AND HANDRAIL</p> <p>PU PUMP</p> <p>PV PRESSURE VESSEL</p> <p>RCT REACTOR</p> <p>REV REVERSING MOTOR</p> <p>RG RADIOACTIVE GAUGE</p> <p>SB STOP BOARD</p> <p>SBR BAND SCREEN</p> <p>SCB SCRUBBER</p> <p>SCH SCUM HARVERSTOR</p> <p>SCN MANUAL SCREEN</p> <p>SCY SCREW CONVEYOR</p> <p>SDR DRUM SCREEN</p> <p>SEP SEPARATOR</p> <p>SFT SOFTENER – WATER</p> <p>SIL SILENCER</p> <p>SG SLIDE GATE</p> <p>SLU SLUICE</p> <p>SLW SLEW DRIVE</p> <p>SN SOLENOID VALVE</p> <p>SP SCRAPER BRIDGE</p> <p>SPT SPIROTAINER</p> <p>SSH SAFETY SHOWER</p> <p>SSR STEP SCREEN</p> <p>SST SOFT STARTER</p> <p>STR STRAINER</p> <p>TK TANK</p> <p>TKP PRESSURISED TANK</p> <p>UV UV DISINFECTION</p> <p>VAR RP2D BACK FLOW PREVENTER</p> <p>VCA VALVE CONTROL – AIR</p> <p>VCE VALVE CONTROL – ELECTRIC</p> <p>VPF VALVE PRESSURE RELIEF</p> <p>VPR VALVE PRESSURE REDUCTION</p> <p>VPS VALVE PRESSURE SUSTAINING</p> <p>VSD VARIABLE SPEED DRIVE</p> <p>WMU WATER MANAGEMENT UNIT – TANKER OUTLOADING</p> <p>WSK WASHPACTOR</p> <p>WPR WASH PRESS</p> <p>WR WEIR</p>		<div><div><div></div></div><div>DISCRETE FIELD MOUNTED INSTRUMENT/DEVICE</div></div> <div><div><div></div></div><div>REMOTE PANEL MOUNTED DISCRETE INSTRUMENT/DEVICE WITH INDICATION/CONTROL</div></div> <div><div><div></div></div><div>MAIN PLANT PLC INPUT OR OUTPUT WITH ASSOCIATED FUNCTIONALITY, OPERATOR ACCESSIBLE</div></div> <div><div><div></div></div><div>VENDOR PACKAGE PLC INPUT OR OUTPUT</div></div> <div><div><div></div></div><div>GENERAL INTERLOCK</div></div>		<p>WWW-XXXX-YYYY-ZZZZ</p> <p>PIPE CONTENTS</p> <p>PIPE MATERIAL</p> <p>NOMINAL PIPESIZE (mm)</p> <p>UNIQUE PIPE NUMBER</p> <p>e.g. 114–150-UPVC-DR = No. 114, 150mm UNPLASTICISED PVC, DRAINAGE ALL DIMENSIONS NOMINAL BORE EXCEPT MILD STEEL PIPE AND PE</p>		<p>PIPE MATERIAL CODES</p> <p>ABS ACRYLONITRILE BUTADIENE STYRENE</p> <p>ACX ASBESTOS CEMENT</p> <p>CCE CONCRETE CHANNEL EXPOXY LINED</p> <p>CCX CONCRETE CHANNEL</p> <p>CIC CAST IRON CEMENT LINED</p> <p>CIE DUCTILE IRON EXPOXY LINED</p> <p>CIX CAST IRON</p> <p>CU COPPER</p> <p>DICL DUCTILE IRON CEMENT LINED</p> <p>DIFC EPOXY COATED &amp; EPOXY LINE DICL</p> <p>DOC DUCTILE IRON CALCIUM ALUMINATE CEMENT LINED</p> <p>FRC FIBRE REINFORCED CONCRETE</p> <p>FRP FIBREGLASS REINFORCED PLASTIC</p> <p>GMS GALVANISED MILD STEEL</p> <p>MSC MILD STEEL CEMENT LINED</p> <p>MSK MILD STEEL FUSION BONDED POLYETHYLENE COATED</p> <p>MSP MILD STEEL FUSION BONDED POLYETYLENE COATED AND LINED</p> <p>PE POLYETHYLENE</p> <p>PP POLYPROPYLENE</p> <p>PVC POLYVINYL CHLORIDE</p> <p>PVG PVC SCHEDULE 80</p> <p>RCP REINFORCED CONCRETE</p> <p>SS STAINLESS STEEL 316 L</p> <p>SSW STAINLESS STEEL 316 L SPIRAL – WELD</p> <p>SSX STAINLESS STEEL 316 L SCHEDULE 10</p> <p>UPVC RIGID UNPLASTICISED POLYVINYL CHLORIDE</p> <p>VCX VITRIFIED CLAY</p> <p>XMA UNKNOWN MATERIAL</p>		<p>PIPE SERVICE CODES</p> <p>ALM ALUMINIUM SUPHATE</p> <p>BRF BIOSCRUBBER RETICULATION FLUID</p> <p>CAU CAUSTIC SODA</p> <p>CIT CITRIC ACID</p> <p>CLX SODIUM HYPOCHLORITE</p> <p>DR DRAINAGE</p> <p>DL DIESEL</p> <p>DWAS DIGESTED WASTE ACTIVATED SLUDGE</p> <p>EF EFFLUENT WATER</p> <p>FA FOUL AIR</p> <p>FW FIRE WATER</p> <p>FL FILTRATE/CENTRATE</p> <p>GT GRIT SLURRY</p> <p>IA INSTRUMENT AIR</p> <p>ML MIXED LIQUOR</p> <p>MET METHANOL DOSING</p> <p>NUT NUTRIENT</p> <p>PM PERMEATE</p> <p>POLY POLYELECTROLYTE</p> <p>PRA PROCESS AIR</p> <p>PW POTABLE WATER</p> <p>RAS RETURN ACTIVATED SLUDGE</p> <p>RS RAW OR PRELIMINARY TREATED SEWAGE</p> <p>SC SCUM</p> <p>SCRS SCREENINGS</p> <p>SE SECONDARY EFFLEUNT</p> <p>SNT SUPERNATANT</p> <p>SUP SUPPLEMENTRY CARBON</p> <p>SW SERVICE WATER</p> <p>TWAS THICKENED WASTE ACTIVATED SLUDGE</p> <p>WAS WASTE ACTIVATED SLUDGE</p>		<p>PIPE SIZES</p> <p>XDN UNKNOWN PIPE DIAMETER</p>		<p>PLANT NUMBERING</p> <p>THE PROPOSED PLANT NUMBER IS A SEMI-INTELLIGENT NUMBER WHICH ALLOWS FOR READY IDENTIFICATION OF ASSET OWNER, SITE, PROCESS AND ASSET TYPE, FOLLOWED BY AN INCREMENTAL NUMBER ie</p> <div><div>PLANT NUMBER</div><div>RWSTP-FIT-0200-001</div><div>SITE ID NUMBERASSET TAG NUMBER</div></div> <p>NB: ONLY LAST 10 CHARACTERS TO BE SHOWN ON P&amp;ID SITE ID TO BE SHOWN AT THE BOTTOM OF EACH P&amp;ID</p> <div><div>RWSTP – SITE (ROSEWOOD SEWAGE TREATMENT PLANT) – 5 Characters</div><div>FIT – ASSET GROUP (FLOW METER) – 3 Characters</div><div>0200- PROCESS AREA (PRE-TREATMENT) – 4 Characters</div><div>001 – INCREMENTAL NUMBER – 3 Characters</div></div>	
EQUIPMENT NUMBERING		EQUIPMENT CODES													
<p>XXX-YYYY-ZZZ</p> <p>SEQUENTIAL NUMBER</p> <p>AREA</p> <p>EQUIPMENT TYPE</p> <p>e.g. MX-1000-001 = MIXER No.1, GENERAL AREA</p>															
EQUIPMENT CODES															
<p>ACT ACTUTATOR</p> <p>AD AIR DRYER</p> <p>AER AERATOR</p> <p>ARV AIR RELIEF VALVE</p>															
</															

REVISIONS		
AMENDMENT	INITIALS	DATE

A AS-CONSTRUCTED SRC 28.11.12



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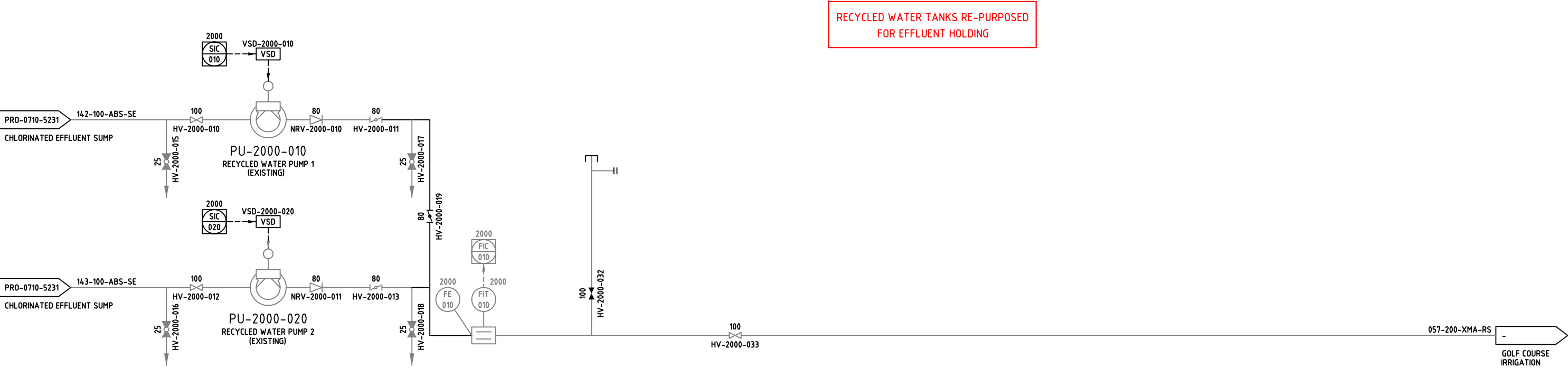
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SKM	NAME	DATE
DESIGNED	J.BRAGG	06.07.11
DRAWN	L.CHIN	06.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE
FOR QUEENSLAND URBAN UTILITIES		

QUU: ROSEWOOD STP – OPTIMISATION  
PROCESS AND INSTRUMENTATION DIAGRAM  
LEGEND SHEET 2

Doc Status : AS Size : A1 Rev : A Drg : QUU–RWSTP–2A–PRO–1100–5112



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REVISIONS			
	AMENDMENT	INITIALS	DATE
B	INFORMATION AMENDED	SRG	04.02.13
A	AS-CONSTRUCTED	SRG	28.11.12



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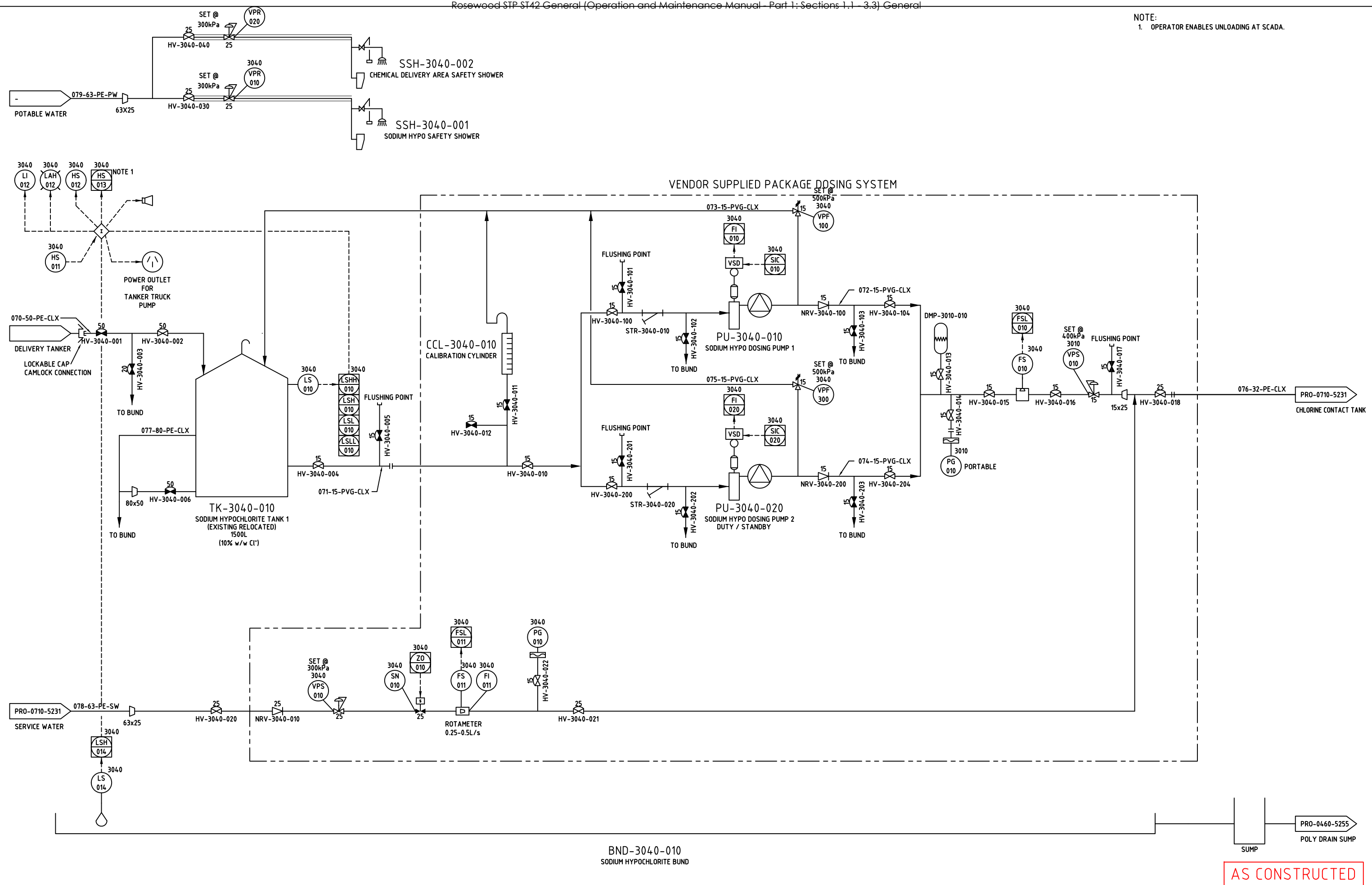
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DESIGNED	J.BRAGG	06.07.11
DRAWN	L.CHIN	06.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE

QUU: ROSEWOOD STP – OPTIMISATION  
PROCESS AND INSTRUMENTATION DIAGRAM  
RECYCLED WATER STORAGE & REUSE

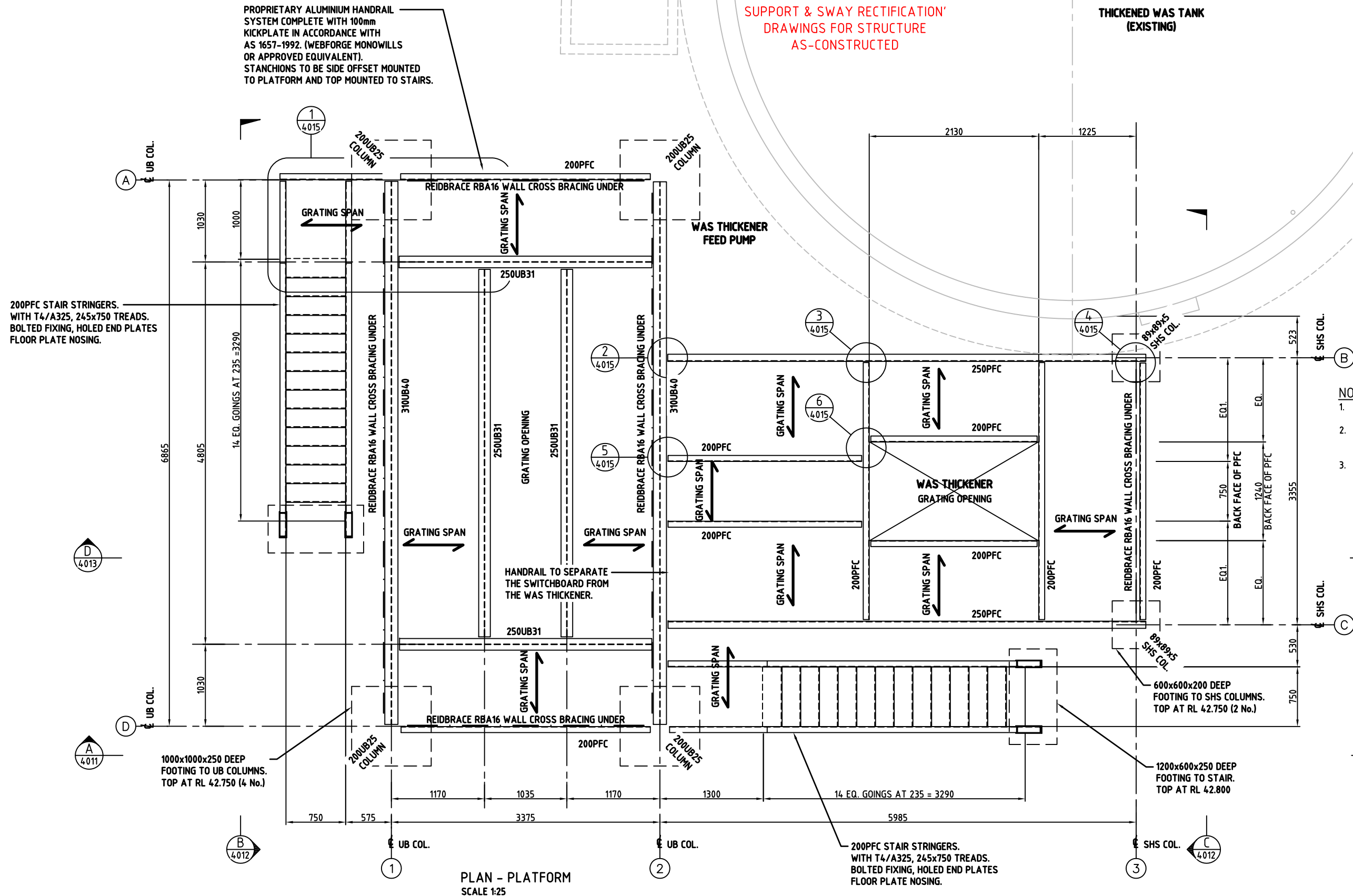
Doc Status : AS Size : A1 Rev : B Drg : QUU-RWSTP-2A-PRO-2000-5241

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NOTE:  
1. OPERATOR ENABLES UNLOADING AT SCADA.



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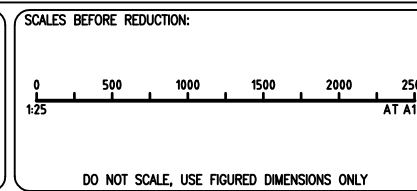


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AMENDMENT	INITIALS	DATE



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SKM	NAME	DATE
DESIGNED	J.MASON	17.10.11
DRAWN	D.NOBLE	19.10.11
DRAFTING CHECK	J.MASON	02.11.11
DESIGN REVIEW	C.SINGH	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE
FOR QUEENSLAND URBAN UTILITIES		

**QUU: ROSEWOOD STP - OPTIMISATION  
WAS THICKENER AND SWITCHBOARD  
STRUCTURAL PLAN**

Doc Status : **AS** Size : **A1** Rev : **A** Drg : **QUU-RWSTP-2A-STR-0400-4010**




**ABERGELDIE**  
 COMPLEX INFRASTRUCTURE

SKM	NAME	DATE
DESIGNED	J.MASON	17.10.11
DRAWN	D.NOBLE	19.10.11
DRAFTING CHECK	J.MASON	02.11.11
DESIGN REVIEW	C.SINGH	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE
..... FOR QUEENSLAND URBAN UTILITIES		

**QUU: ROSEWOOD STP – OPTIMISATION  
WAS THICKENER AND SWITCHBOARD  
ELEVATIONS SHEET 1**


**ABERGELDIE**  
 COMPLEX INFRASTRUCTURE

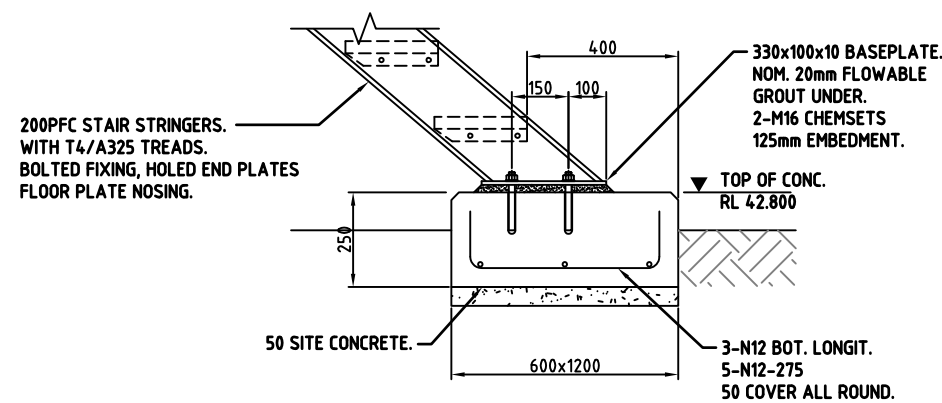
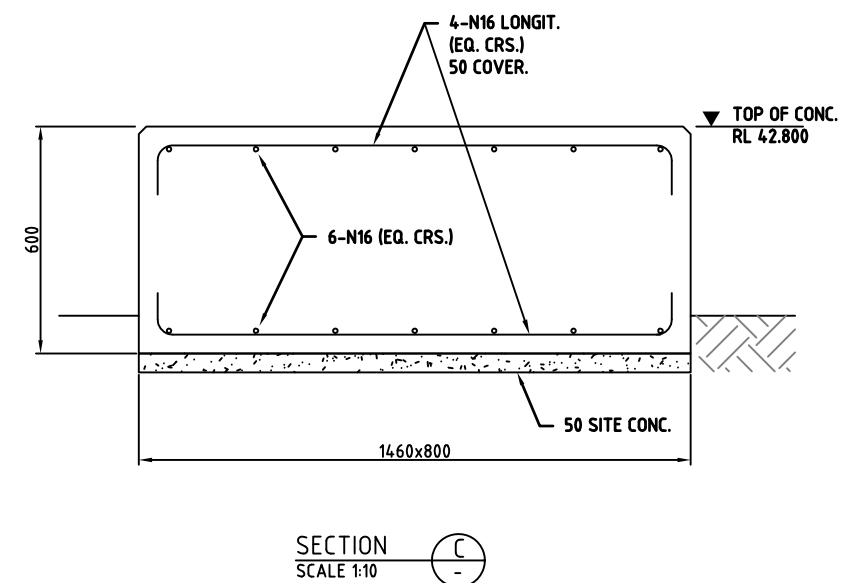
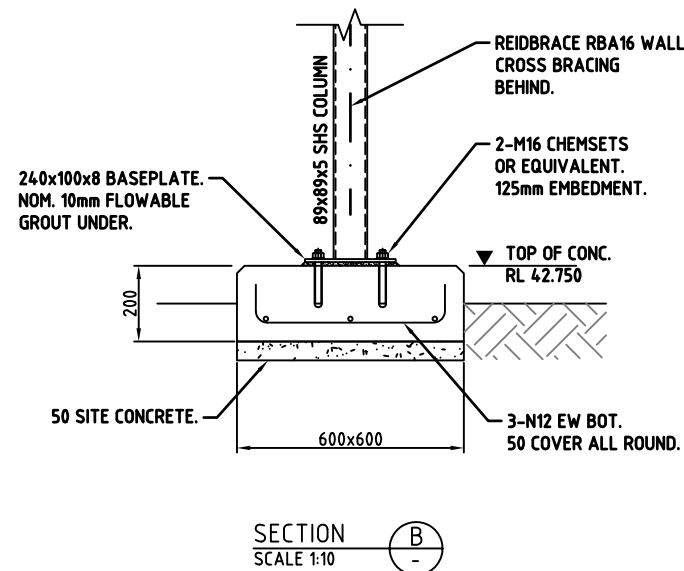
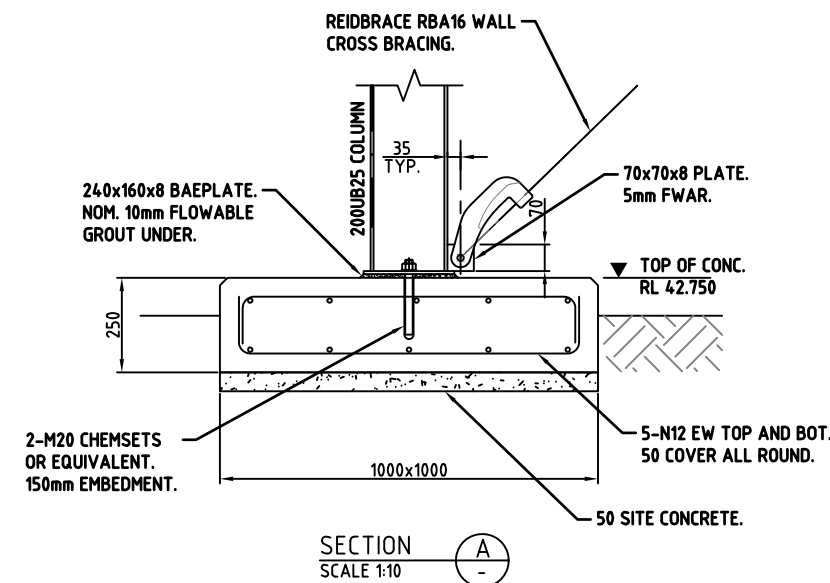
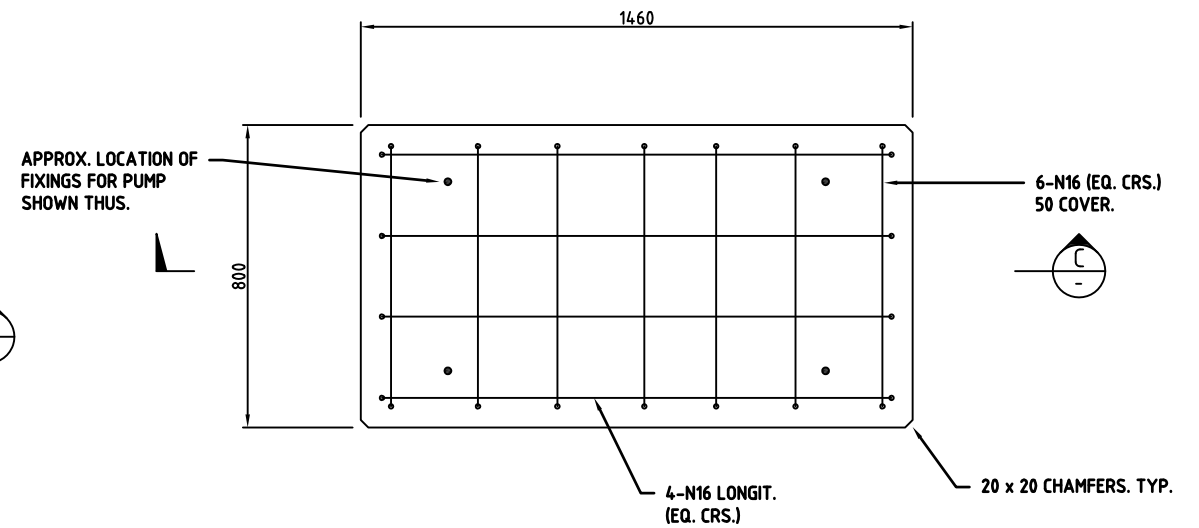
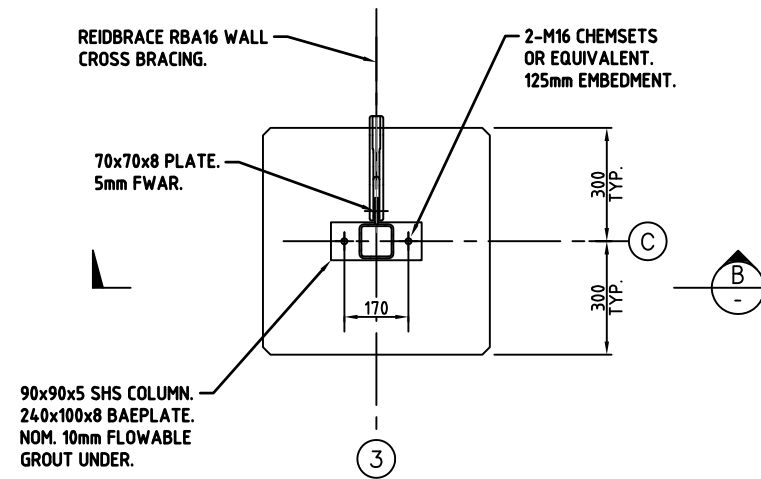
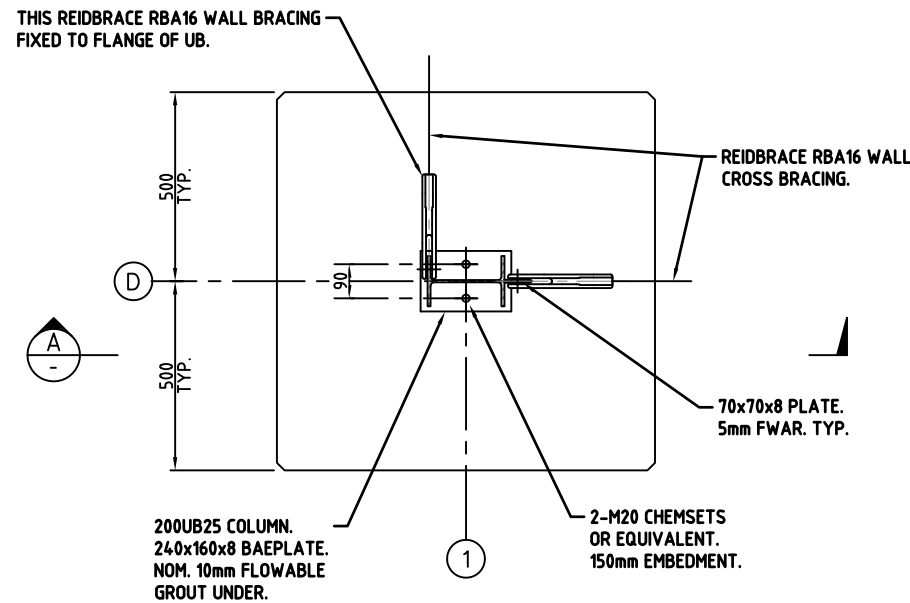
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**QUU: ROSEWOOD STP – OPTIMISATION  
WAS THICKENER AND SWITCHBOARD  
ELEVATIONS SHEET 2**

Doc Status :	AS	Size :	A1	Rev :	B	Drg :	QUU-RWSTP-2A-STR-0400-4012
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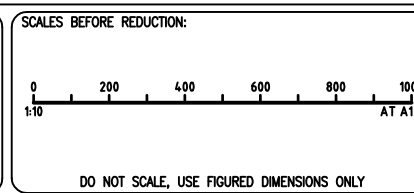
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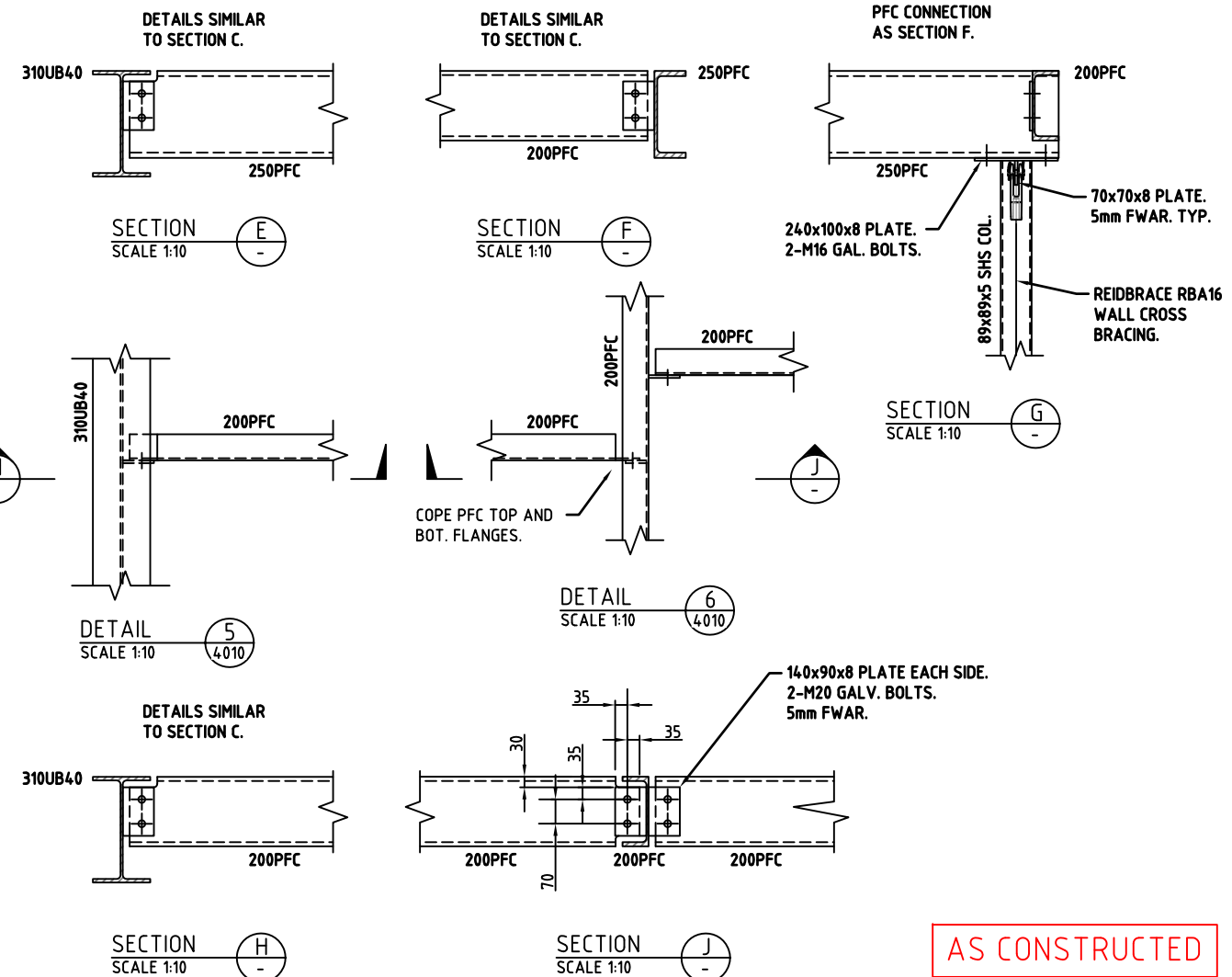
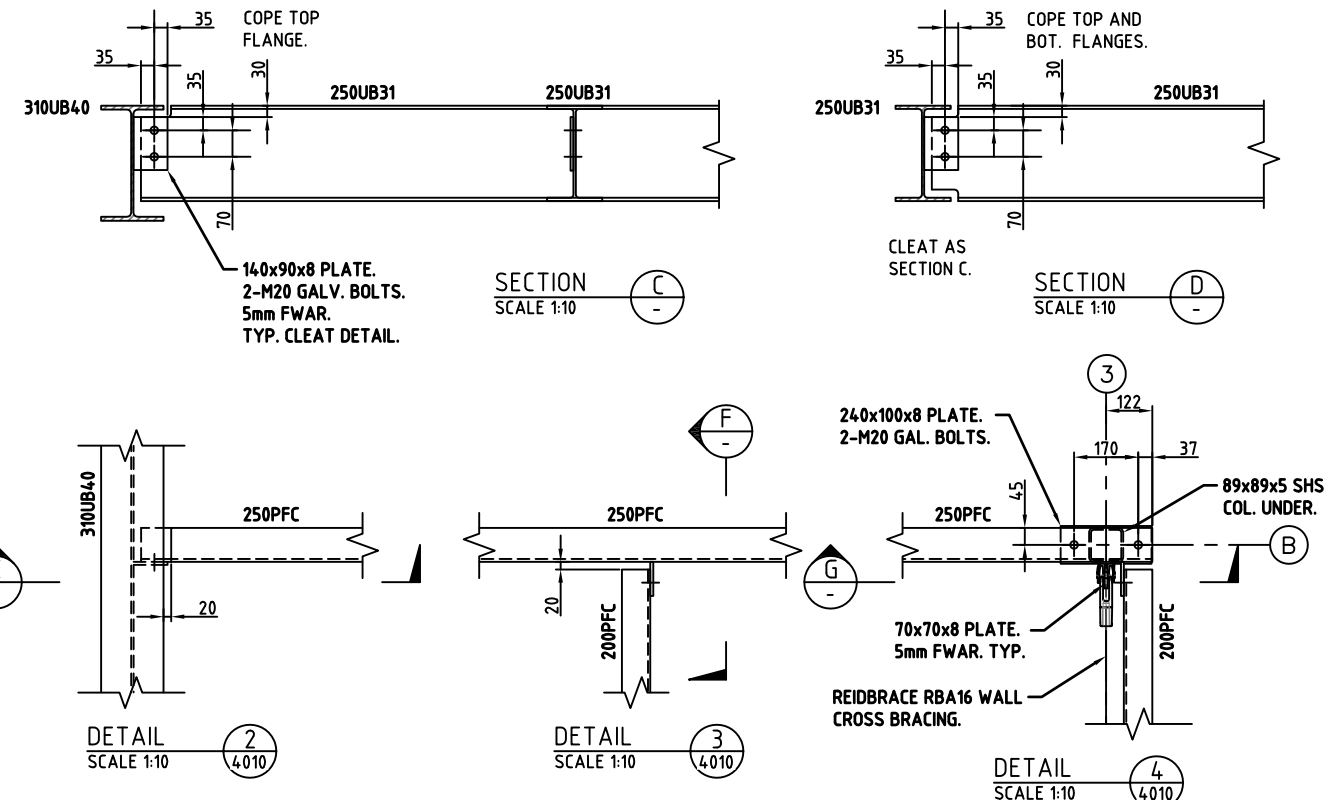
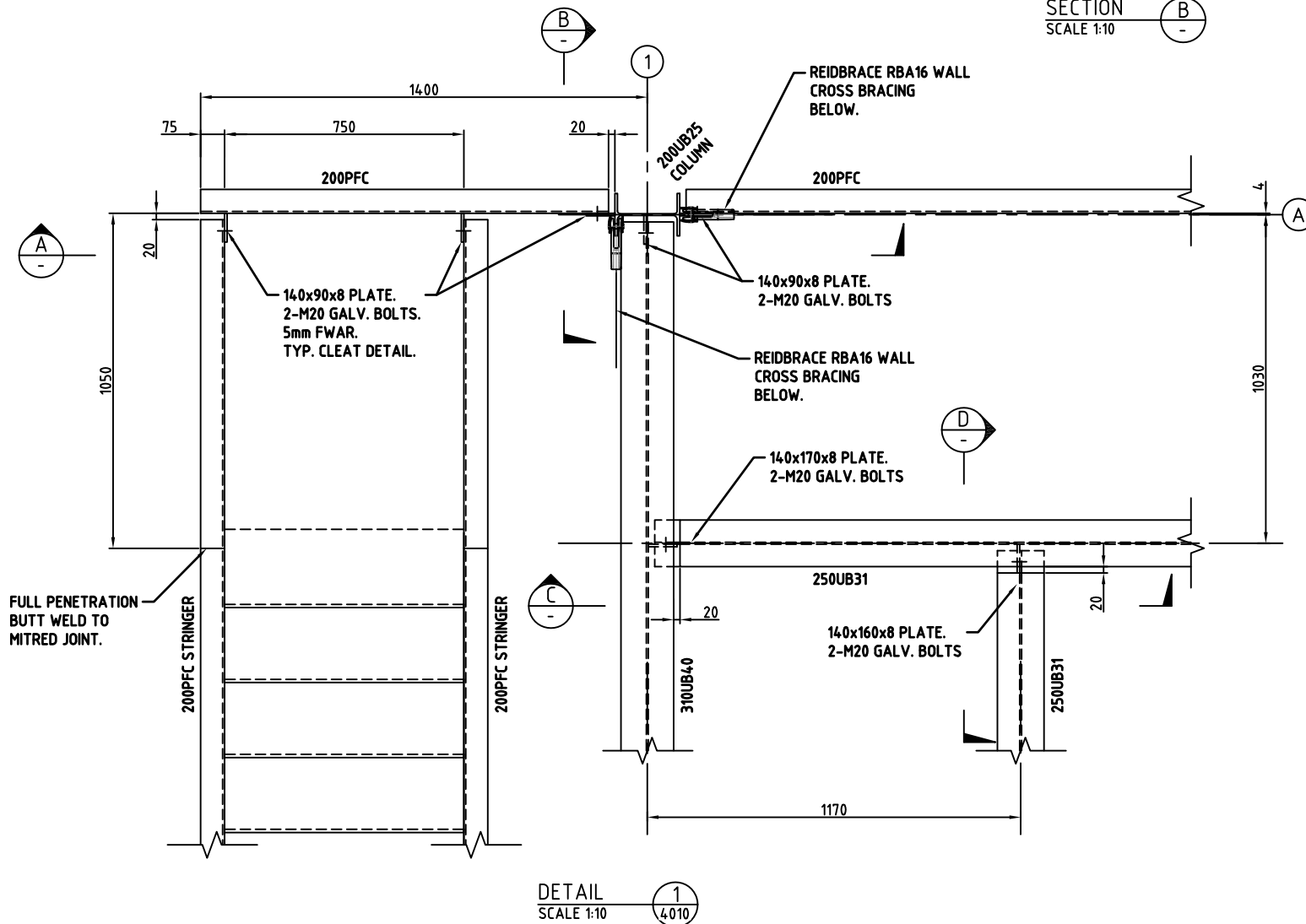
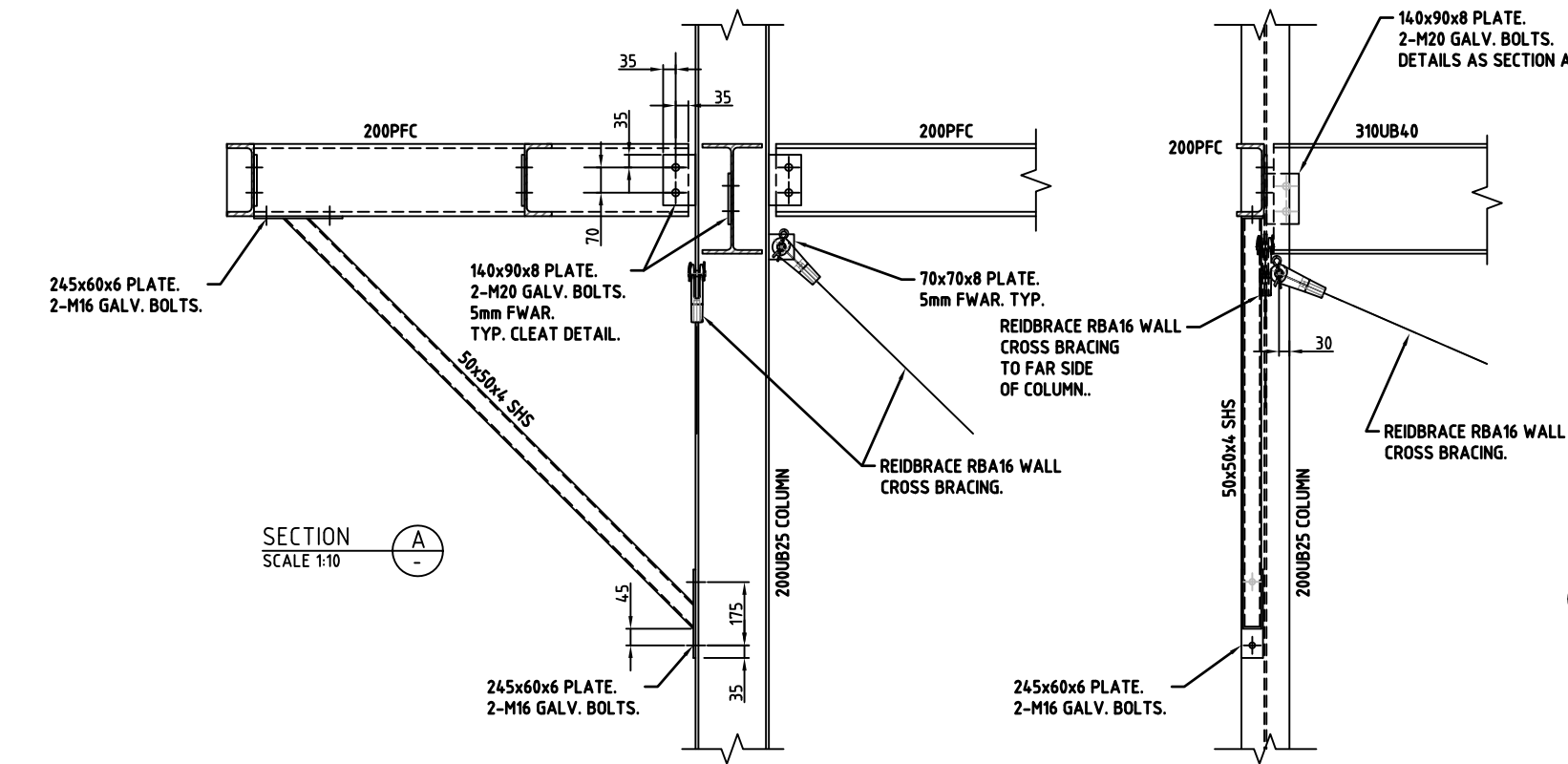
SKM	NAME	DATE
DESIGNED	J.MASON	17.10.11
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DRAFTING CHECK	J.MASON	02.11.11
DESIGN REVIEW	C.SINGH	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE
FOR QUEENSLAND URBAN UTILITIES		

**QUU: ROSEWOOD STP - OPTIMISATION  
WAS THICKENER AND SWITCHBOARD  
STRUCTURAL DETAILS SHEET 1**

Doc Status : **AS** Size : A1 Rev : A Drg : **QUU-RWSTP-2A-STR-0400-4014**



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400	600
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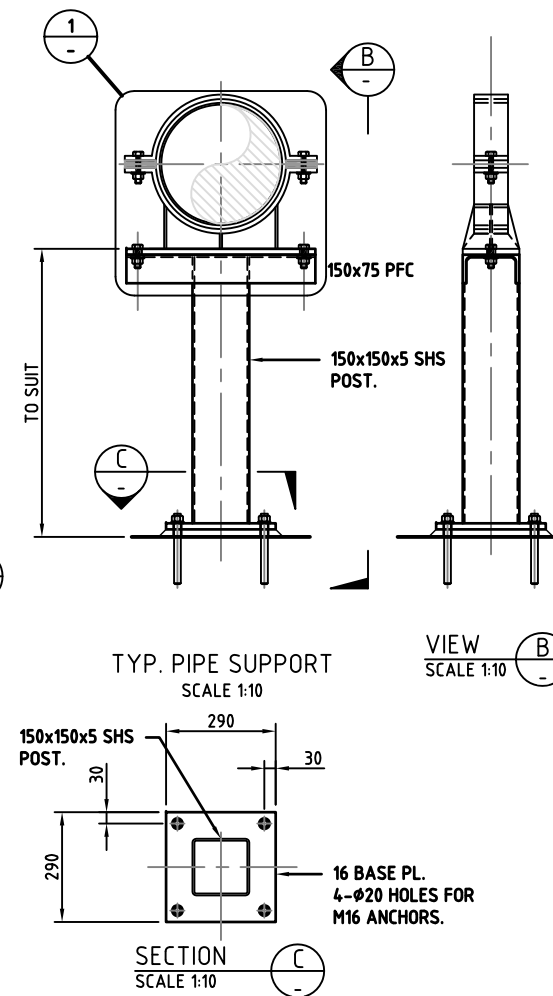
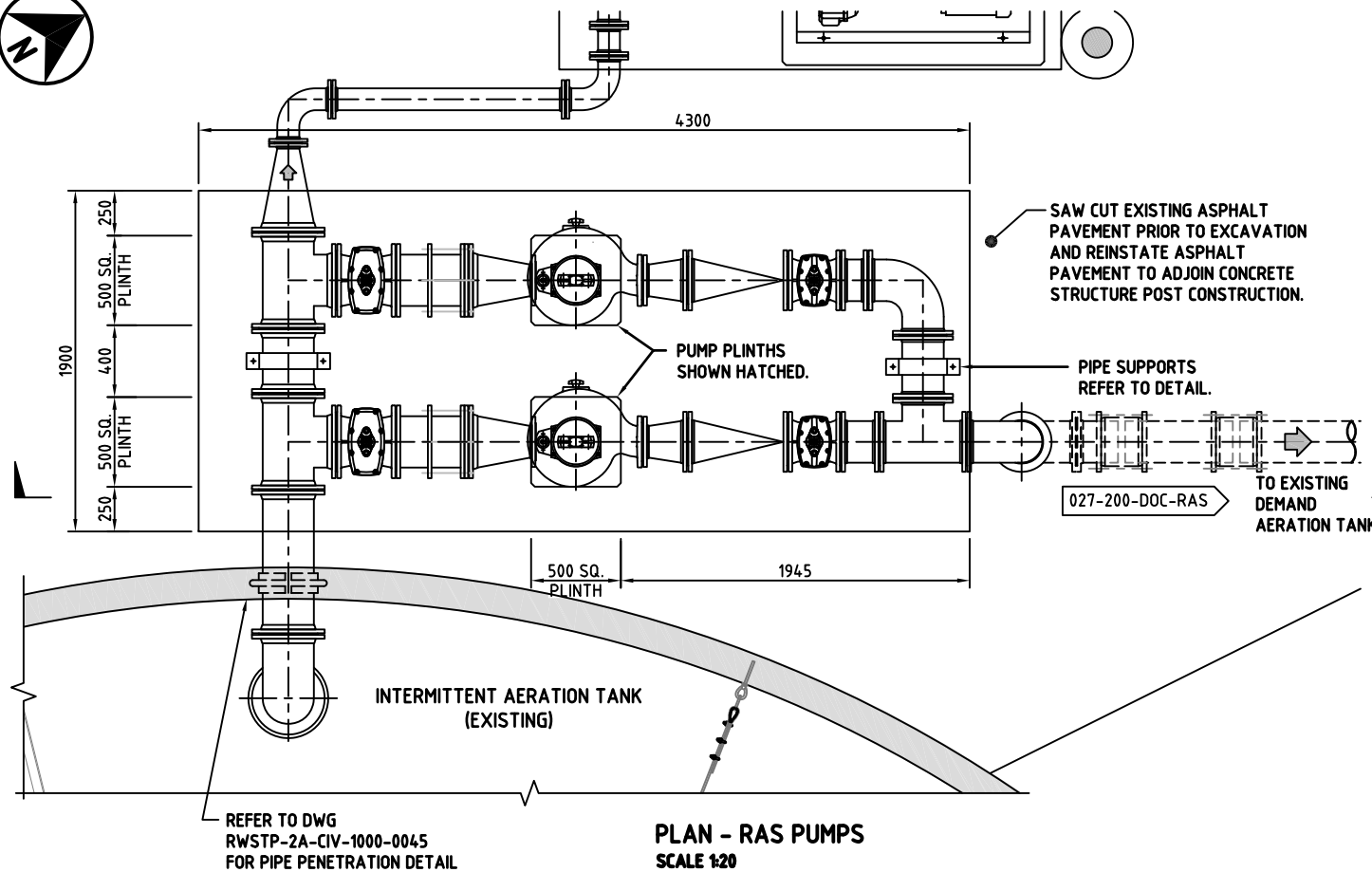
SKM	NAME	DATE
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DRAFTING CHECK	J.MASON	02.11.11
DESIGN REVIEW	C.SINGH	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		
FOR QUEENSLAND URBAN UTILITIES		

**QUU: ROSEWOOD STP - OPTIMISATION  
WAS THICKENER AND SWITCHBOARD  
STRUCTURAL DETAILS SHEET 2**

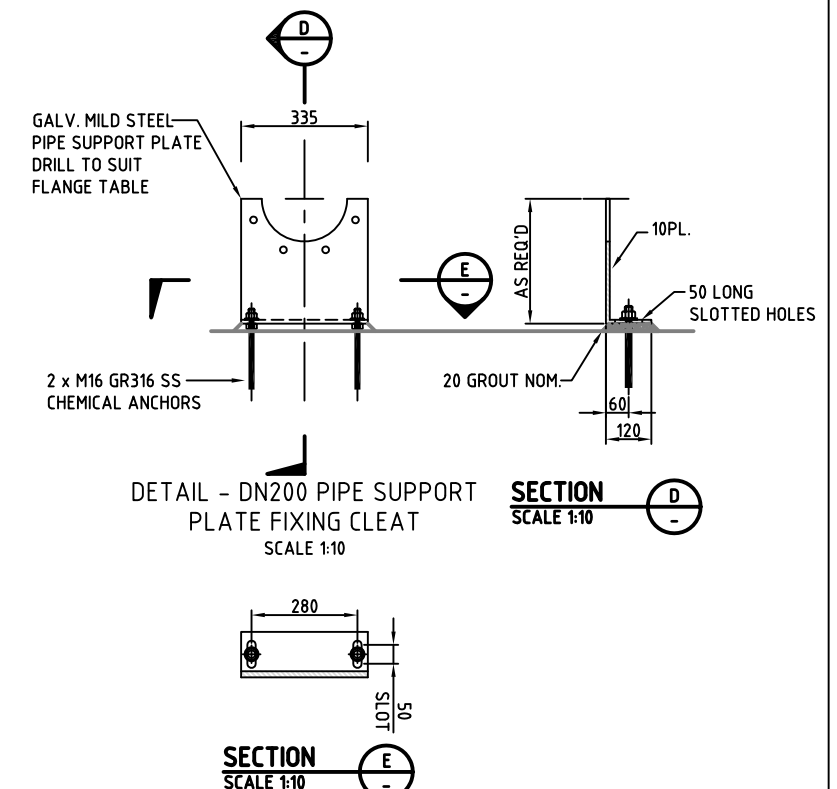
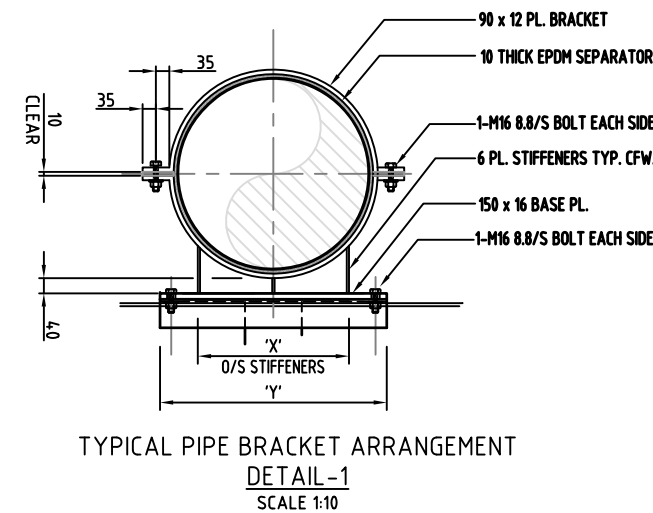
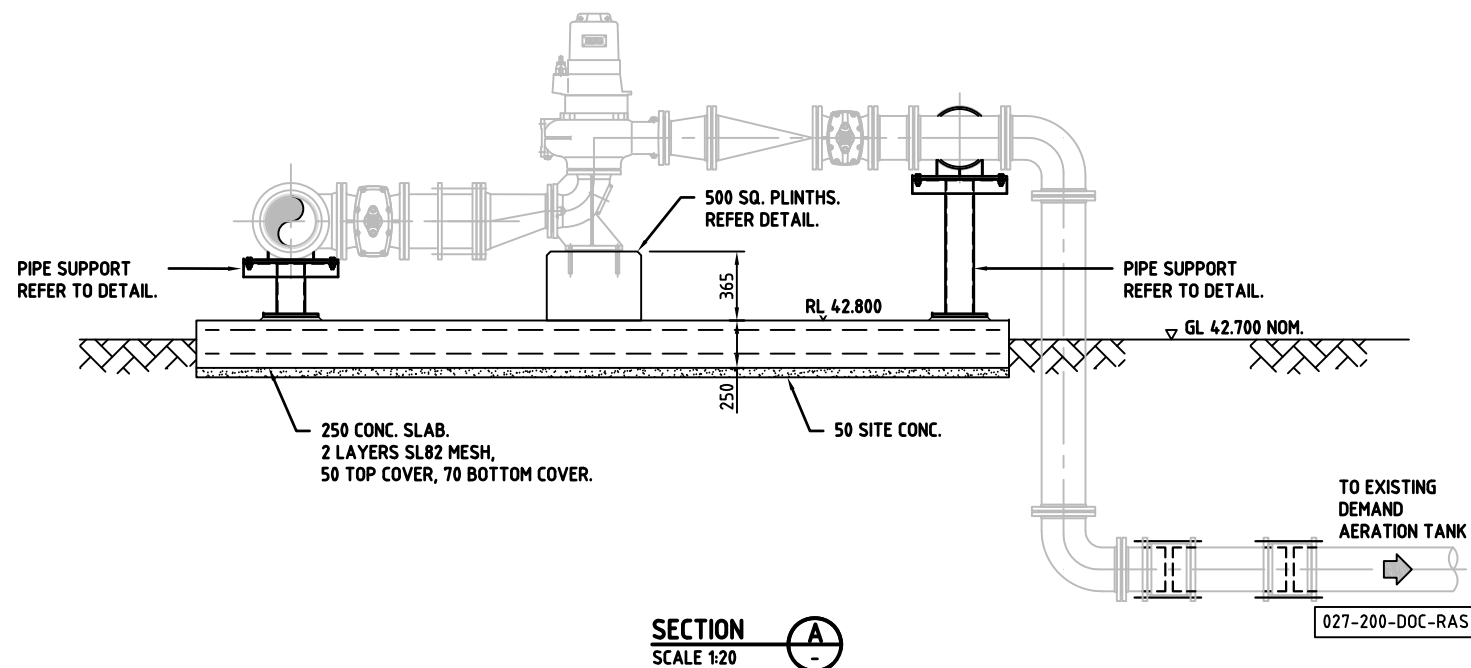
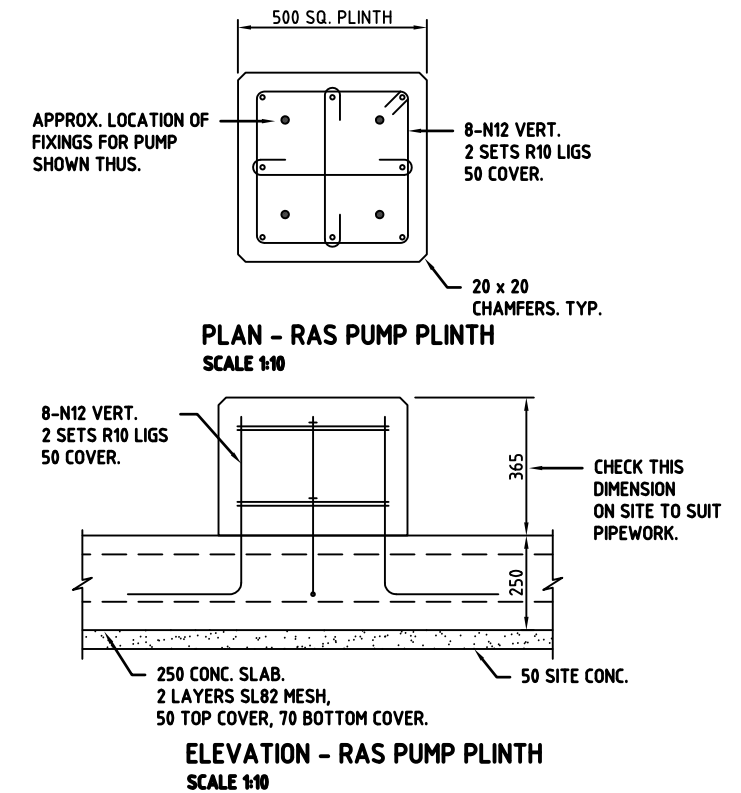
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WAS FOUNDATION  
REFER DWG./1006



- NOTES**
- REFER TO DRAWING QUU-RWSTP-2A-MEC-0500-1002 FOR GENERAL ARRANGEMENT AND ENGINEERED FILL REQUIREMENTS.
  - REFER TO ELECTRICAL DRAWINGS FOR CONDUITS, LOCAL CONTROL PANELS ETC.



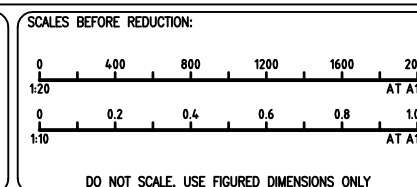
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REVISIONS		
AMENDMENT	INITIALS	DATE

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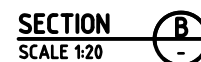
PO Box 2765  
Brisbane QLD 4001  
Telephone 132 657  
Web www.urbanutilities.com.au



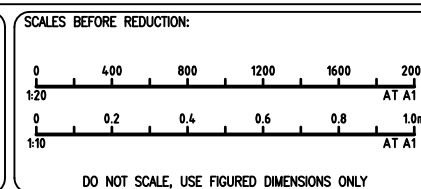
SKM	NAME	DATE
DESIGNED	J. MASON	01.07.11
DRAWN	D. NOBLE	01.07.11
DRAFTING CHECK	J. MASON	02.11.11
DESIGN REVIEW	C. SINGH	02.11.11
PROJECT MANAGER	S. DOWD	23.02.12
APPROVED		

QUU: ROSEWOOD STP - OPTIMISATION  
DAT / IAT REACTORS - RAS PUMPS  
STRUCTURAL DETAILS

Doc Status : **AS** Size : **A1** Rev : **A** Drg : **QUU-RWSTP-2A-STR-0500-1005**



REVISIONS			
	AMENDMENT	INITIALS	DATE
A	AS-CONSTRUCTED	SRG	28.11.12

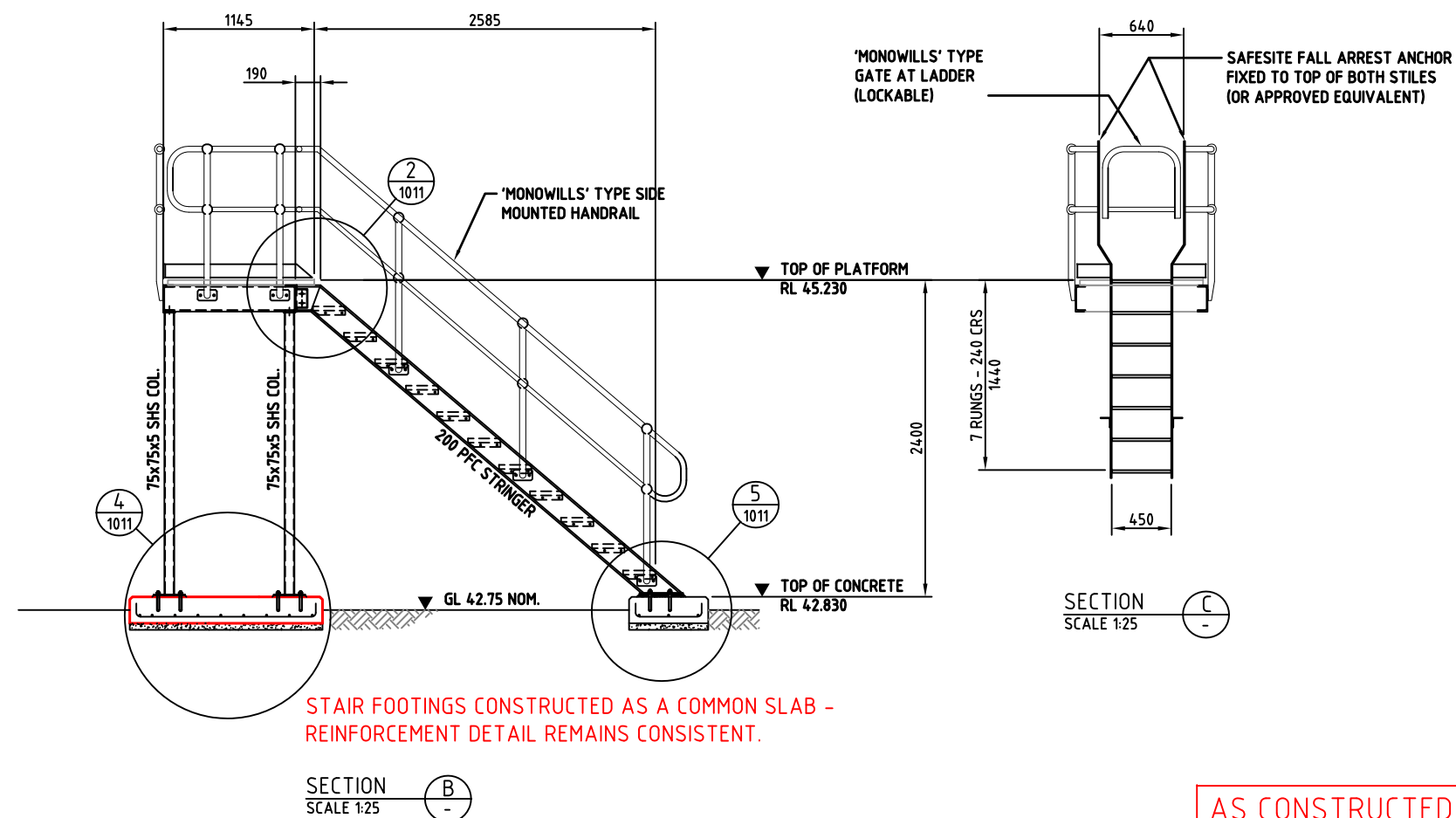
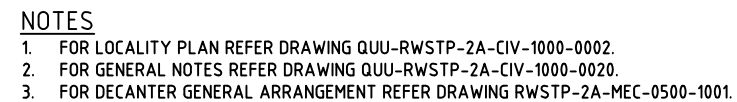


SKM	NAME	DATE
DESIGNED	J. MASON	01.07.11
DRAWN	D.NOBLE	01.07.11
DRAFTING CHECK	J. MASON	02.11.11
DESIGN REVIEW	C.SINGH	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE

.....

FOR QUEENSLAND URBAN UTILITIES

Doc Status : <b>AS</b>	Size : <b>A1</b>	Rev : <b>A</b>	Drq : <b>QUU-RWSTP-2A-STR-0500-1006</b>
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REVISIONS		
	AMENDMENT	INITIALS      DATE
<b>B</b>	<b>ADDITIONAL INFORMATION ADDED</b>	<b>SRG      25.01.13</b>
<b>A</b>	<b>AS-CONSTRUCTED</b>	<b>SRG      28.11.12</b>



DO NOT SCALE, USE FIGURED DIMENSIONS ONLY

SKM	NAME	DATE
DESIGNED	J. MASON	10.11.11
DRAWN	D. CONNOR	10.11.11
DRAFTING CHECK	J. MASON	10.11.11
DESIGN REVIEW	C.SINGH	10.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE

FOR QUEENSLAND URBAN UTILITIES

**QUU: ROSEWOOD STP - OPTIMISATION  
DECANTER ACCESS  
STRUCTURAL PLAN AND SECTIONS**

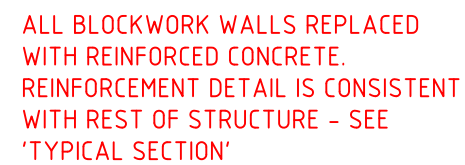
Doc Status : <b>AS</b>	Size : <b>A1</b>	Rev : <b>B</b>	Drg : <b>QUU-RWSTP-2A-STR-0500-1010</b>
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Doc Status :	AS	Size :	A1	Rev :	B	Dwg :	QUU-RWSTP-2A-STR-0500-1011
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1. FOR CHLORINE CONTACT TANK PLAN REFER DWG. RWSTP-2A-CIV-0700-3000.
2. FOR SITE PLAN REFER DRG. RWSTP-2A-CIV-1000-0002.
3. FOR GENERAL NOTES REFER DWG. RWSTP-2A-CIV-1000-0020 AND 0021.
4. ALL CONCRETE TO BE S40.
5. INTERNAL WALLS AND FLOOR ARE TO BE COATED WITH AN ELASTOMERIC SOLVENTLESS POLYURETHANE COATING - POLIBRID 705-E OR APPROVED EQUIVALENT. PREPARE SURFACE AND APPLY COATING IN ACCORDANCE WITH THEN MANUFACTURERS RECOMMENDATIONS.



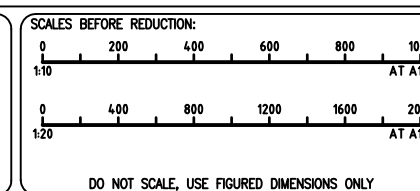
AS CONSTRUCTED



**ABERGELDIE**  
COMPLEX INFRASTRUCTURE



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Brisbane QLD 4001  
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SKM	NAME	DATE
DESIGNED	S.DOWD	01.07.11
DRAWN	MEI / NG	01.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	J.MASON	02.11.11
PROJECT MANAGER	S.DOWD	23.02.11
APPROVED		DATE

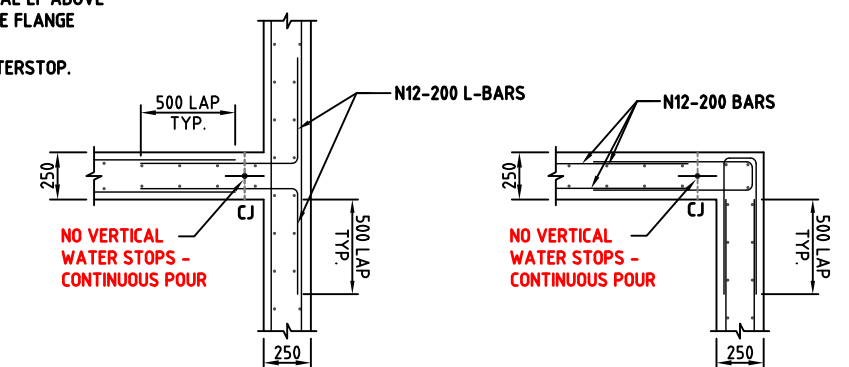
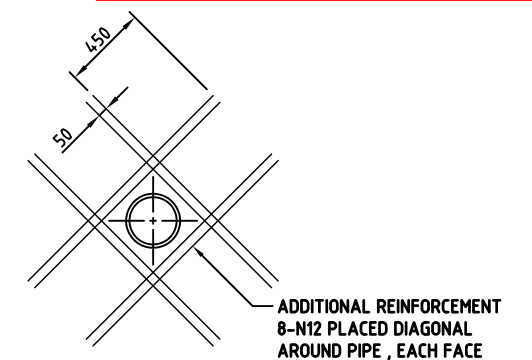
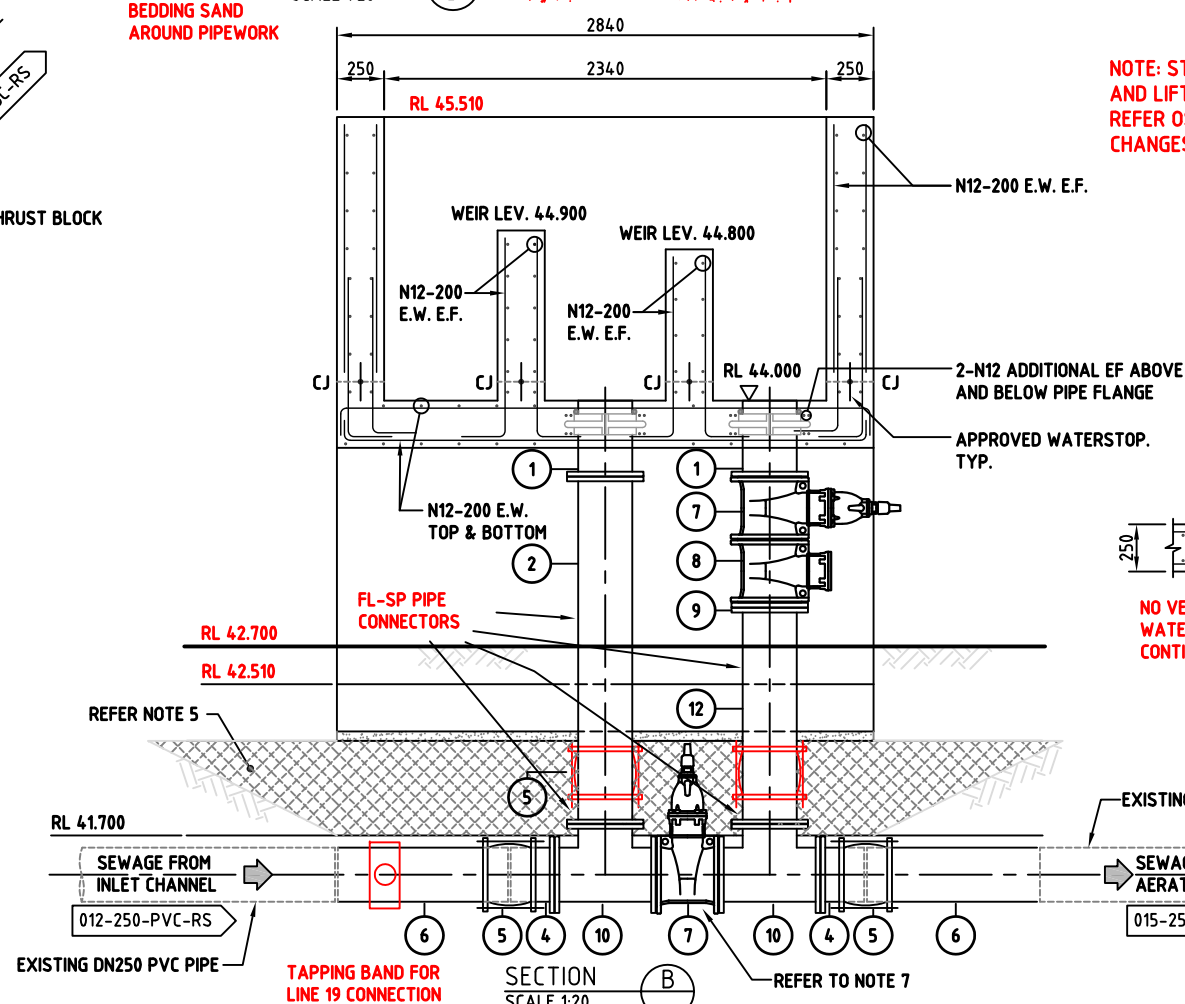
FOR QUEENSLAND URBAN UTILITIES

QUU: ROSEWOOD STP – OPTIMISATION  
CHLORINE CONTACT TANK  
REINFORCEMENT

Doc Status :	<b>AS</b>	Size :	<b>A1</b>	Rev :	<b>B</b>	Drq :	<b>QUU-RWSTP-2A-STR-0700-3003</b>
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ITEM	QTY	PART No.	DESCRIPTION	LENGTH (mm)
1	3		DN250 DOC FL-SP PIPE WITH PUDDLE FLANGE 125 FROM SP END	400
<del>2</del>	<del>2</del>		<del>DN250 DOC FL-FL PIPE</del>	CHECK ON SITE PRIOR TO FAB.
3	2		DN250 DOC FL-FL 90° BEND	
4	3		DN250 DOC FL-SP CONNECTOR	
5	5		DN250 GIBAULT COUPLING	
6	3		DN250 PVC SP-SP PIPE (RE-USE EXISTING/REMOVE PIPE)	600
7	2		DN250 FL-FL RESILIENT SEATED SLUICE VALVE	
8	1	VCE-0210-010	DN250 FL-FL ROUND PORTED PLUG VALVE	
<del>9</del>	<del>1</del>		<del>DN250 DISMANTLING JOINT NON THRUST TYPE</del>	
10	2		DN250 DOC FL-FL-FL TEE	
11	1		DN250 DOC SOC-SOC 45° BEND	
<del>12</del>	<del>1</del>		<del>DN250 DOC FL-SP PIPE</del>	CHECK ON SITE



### TYPICAL WALL CORNER DETAILS

SCALE 1:20

AS CONSTRUCTED

1. FOR LOCALITY PLAN REFER DWG. RWSTP-2A-CIV-1000-0002.
2. FOR GENERAL NOTES AND LEGEND REFER DWG. RWSTP-2A-CIV-1000-0020.
3. CONCRETE TO BE GRADE S40.
4. COVER TO REINFORCEMENT TO BE 50mm.
5. STRUCTURE FOOTINGS SHALL BE ESTABLISHED ON ENGINEERED FILL. REFER TO EARTHWORKS SPECIFICATION QUU-RWSTP-2A-CIV-SPEC-0210. THE SUBGRADE SHALL BE INSPECTED AND APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF ENGINEERED FILL.
6. INTERNAL WALL AND FLOOR ARE TO BE COATED WITH AN ELASTOMERIC SOLVENTLESS POLYURETHANE COATING - POLIBRID 705-E OR APPROVED EQUIVALENT. PREPARE SURFACE AND APPLY COATING IN ACCORDANCE WITH THEN MANUFACTURERS RECOMMENDATIONS.
7. ROTATE VALVE THROUGH ONE BOLT HOLE OFF VERTICAL FOR EASE OF OPERATIONAL ACCESS AND COMMISSIONING.

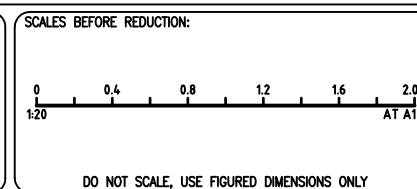
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SP1	15760.287	150221.806
SP2	15759.909	150218.931
SP3	15757.431	150219.263
SP4	15757.809	150222.138

POINT	EAST	NORTH
SP1	15760.287	150221.806
SP2	15759.909	150218.931
SP3	15757.431	150219.263
SP4	15757.809	150222.138

REVISIONS			
	AMENDMENT	INITIALS	DATE
B	ADDITIONAL INFORMATION ADDED	SRG	28.01.13
A	AS-CONSTRUCTED	SRG	28.11.12



Active: 03/09/2013



SKM	NAME	DATE
DESIGNED	S.DOWD	01.07.11
DRAWN	MEI / NG	01.07.11
DRAFTING CHECK	LAPPELGREN	02.11.11
DESIGN REVIEW	LAPPELGREN	02.11.11
PROJECT MANAGER	S.DOWD	23.02.12
APPROVED		DATE

FOR QUEENSLAND URBAN UTILITIES

Doc Status :	AS	Size :	A1	Rev :	B	Drq :	QUU-RWSTP-2A-STR-1000-0050
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- | ITEM | QTY | PART No.     | DESCRIPTION   | LENGTH |
|------|-----|--------------|---|--------|
| 1    | 2   |              | DN250 GIBALT COUPLING                                   |        |
| 2    | 1   |              | DN250 DOC FL-SP PIPE WITH PUDDLE FLANGE 350 FROM FLANGE | 1000   |
| 3    | 1   |              | DN250 DOC FL-SP PIPE WITH PUDDLE FLANGE 600 FROM FLANGE | 1250   |
| 4    | 1   | FIT-0510-010 | DN250 FL-FL ELECTRO-MAGNETIC FLOWMETER                  |        |
| 5    | 1   |              | DN250 THRUST TYPE DISMANTLING JOINT                     |        |
| 6    | 1   | HV-0510-030  | DN250 SOC-SOC SLUICE VALVE                              |        |
| 7    | 1   |              | CAST IRON VALVE BOX WITH CONCRETE SURROUND              |        |
| 8    | 1   |              | DN250 DOC SP-SP PIPE                                    | 900    |

AS-CON COORDINATES		
POINT	EAST	NORTH
SP1	15759.296	150216.317
SP2	15759.013	150214.232
SP3	15756.972	150214.483
SP4	15757.205	150216.539



AS CONSTRUCTED

Doc Status :	AS	Size :	A1	Rev :	B	Drq :	QUU-RWSTP-2A-STR-1000-0055
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