BRISBANE CITY COUNCIL

Sewage Pump Station SP140

Cullen Ave West

Contract : **BW 70103-037**

Job Number : **WT400089**

ELECTRICAL INSTALLATION

OPERATIONS and MAINTENANCE MANUAL

VOLUME 2

INSTALLATION BY:

SJ Electric (Qld) Pty Ltd
19 Elliot Street
Albion Qld 4010

Telephone: 07 3256 1522 Fax: 07 3256 1533

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4. INSPECTION & TEST RESULTS

SSM089

FIXED SPEED SEWAGE PUMP STATION

SWITCHBOARD CHANGEOVER COMMISSIONING PLAN

Site ID and Name	**SP140 Cullen Ave West**
Commissioning Date	24/6/10

In Attendance

Name	Role During Commissioning	Company
John Clayton	**Commissioning Manager**	**QUU Projects**
PETER CRUST	PROJECT MANAGER	**SJ Electric**
		SJ Electric
		SJ Electric

1 INTRODUCTION

This document is the standard testing procedure for a switchboard change over at a sewage pumping station. The procedure ensures that for a two pump sewage pump station, at least one pump will be operational at all times. The basic cut-over procedure is as follows:

1. Install temporary pumping system (pump controller and generator).
2. Disconnect sewage Pump #2 from existing switchboard and connect to temporary pumping system.

PUMP #1 IS NOW RUNNING THE STATION FROM EXISTING SWITCHBOARD

3. Fully commission Pump #2 on the temporary pumping system.

PUMP #2 IS NOW RUNNING THE STATION FROM TEMPORARY PUMPING SYSTEM

4. Disconnect Pump #1, consumer mains, on site generator and all field instrumentation from the existing switchboard.
5. Install new switchboard and connect to consumer mains.
6. Connect Pump #1 to the new switchboard and test in "emergency pumping" mode (via the "Emergency Start" switch).

PUMP #2 IS STILL RUNNING THE STATION FROM THE TEMPORARY PUMPING SYSTEM AND PUMP #1 CAN BE RUN UNDER "EMERGENCY PUMPING" MODE FROM NEW SWITCHBOARD.

7. Connect all field instrumentation.
8. Fully commission Pump #1 on the new switchboard to operate in "Local" and "Remote" modes.

PUMP #1 IS NOW RUNNING THE STATION FROM NEW SWITCHBOARD

9. Connect Pump #2 to the new switchboard and fully commission on the new switchboard to operate in all modes.
10. Complete the Site Acceptance Test (SAT) including all pump, RTU and SCADA testing.

NOTE: This testing procedure will only be acceptable on sites that do NOT need two pumps to run during the cut over procedure.

(Confirm the current running conditions of the existing switchboard before commencing).

For sites that require two pumps to run simultaneously under dry weather conditions during the proposed cut over period, a site-specific cut over procedure must be developed to incorporate adequate flow control measures (ie tankers or temporary pumps).

2 PRE - CHANGE OVER WORKS CHECKLIST

The following checklist is to be completed and signed by the electrical contractor.

2.1 SWITCHBOARD FACTORY ACCEPTANCE TEST

Contractor Task	Completed
FAT has been completed as per BW FAT Document and all defects that were identified have been rectified.	18/6/10

2.2 CONCRETE SLAB EXTENSION

Contractor Task	Result
Confirm the concrete slab extension is complete including all necessary conduits.	OK ☑ NA ☐

2.3 SUPPLY AUTHORITY

Contractor Task	Outcome
The relevant supply authority has been organised to install the metering into the New Switchboard. NA	Company _____ Booked for / / @ _____(time) Ref # _____

2.4 NEW RADIO ANTENNA MAST LOCATION

Contractor Task	Result
Check the location of the antenna mast and ensure that the new position will not be directly below electrical transmission lines.	Location OK ☑ Antenna dir. _____ o

2.5 DISCHARGE MAINS PRESSURE TRANSDUCER

Contractor Task	Completed
Install delivery pressure transducer on the discharge rising main. Transducer is calibrated to the specified range (as per spec). Calibration sheet to be supplied with AS BUILT drawings. 0kPA to 500 kPA	Installed OK ☐ Range 0(m) to 50 (m)

2.6 TEMPORARY GENERATOR SIZE

Contractor Task	Completed
Note the kW of each pump.	Pump #1 4.6 kW Pump #2 4.6 kW
Determine the type of generator and size of pump starter required. Confirm generator starting battery is in good condition, (have a contingency plan) ✓	Genset Size 20. kVA Date Booked / / Delivery Date / / Delivery Time 6.00 Am.

Electrical Contactor's Supervisor

Name:...Peter Crust Date: 24/6/10

Signature: .....

QUU Commissioning Manager

Name:...John Clayton Date: 24/6/10

Signature: J Clayton

3 CHANGE OVER WORKS

The following sequence of works that must be carried out in order. One pump must be operational at all times. After each phase has been completed, the commissioning manager will record the results and instruct the commissioning team to commence work on the next phase.

3.1 STEP 1 - INSTALL TEMPORARY PUMPING SYSTEM

3.1.1 Register with Control Room

Contractor Task	Outcome
Call the Brisbane Water Control Room Operator (CRO) and inform him that you are on site. Record the CRO's Name and Officer Code and record the time of the call. Advise CRO that you are performing a switchboard changeover and that you will initially be taking one pump off line. Give the operator a contact name and number and ask that he contact you if any level alarm is activated on site.	Name: Brett. CRO: _____ Time: 0630

3.1.2 Existing Switchboard Parameters

Contractor Task		Outcome
Ensure that the station is fully functional (pump can run)		OK ☐
Record the direction of the installed antenna for later reference.		Antenna dir. _____ °
Record the kWhr meter serial numbers.		#436306
Record 3 phase motor currents. Note rate of wet well pump down time.	Pump #1 Pump #2	U.___ V.___W.___ U.___ V.___W.___
Record pump rotation **Mains** Supply C'wise (RWB) Anti C'wise ☑ ☐	Pump #1 Pump #2	C'wise (RWB) Anti C'wise ☐ ☑ ☐ ☑

3.1.3 Prepare and Install Temporary Pump Controller and Generator

Contractor Task	Outcome
Position generator in an appropriate location. Locate away from the work site to reduce noise.	OK ☑
Position fire extinguisher and oil spill bund as per risk analysis.	OK ☑
Connect the temporary pump controller to the generator and test connection (ie point to point to confirm correct connection)	OK ☑
Install Multitrode level sensors and set the Start and Stop levels to be equivalent to the current Start and Stop levels of the existing switchboard parameters.	OK ☑
Install the backup audible and visual alarm system (powered by separate battery). Test electrodes back to temporary pump controller to confirm operation.	OK ☑
Ensure that the generator fuel will be sufficient to enable the generator to run loaded for 12 hours. (This may require extra fuel – arrange if required).	OK ☑
Start the generator and measure the 3 phase volts and record the phase rotation.	C'wise (RWB) ☑ Anti C'wise ☐

Electrical Contactor's Supervisor

Name: Peter Crust Date: 24/6/10.

Signature: .....

BW Commissioning Manager

Name: **John Clayton**..... Date: 24/6/10

Signature: J. Clayton.....

3.2 STEP 2 - CONNECT PUMP #2 TO TEMPORARY PUMPING SYSTEM

Contractor Task	Outcome
On the existing switchboard, Isolate sewage pump (Pump #2) as per BW Isolation Tag and Lock Out procedure. (Unplug from Decontactor).	OK ☑
Disconnect Pump #2 from the existing switchboard and remove the power and control cables from the switchboard.	OK ☑
Connect Pump #2 power and control cables to the **temporary pump controller**.	OK ☑
Electrically test Pump #2 to temporary pump controller connections.	OK ☑
Switch the existing switchboard to "Local" and stop Pump #1.	OK ☑
Manual Test of Temporary Pumping System: (Confirm Pump Direction) Manually start the submersible pump and closely monitor wet well level to confirm that the level is dropping. When confirmed, stop pump.	OK ☑
Auto Test of Temporary Pumping System: (Confirm Pump Cycle) Allow the temporary pumping system to complete one full start and stop cycle automatically to confirm complete system is functioning correctly. NOT DONE **This is a HOLD point. Do not proceed until the temporary pump is confirmed to be controlling the wet well level.** NO LEVEL.	OK ☐ TIME:

3.3 STEP 3 - DISCONNECT EXISTING SWITCHBOARD AND REMOVE

3.3.1 Contact Control Room

3.3.2 Disconnect Pump #1 and Remove Existing Switchboard

Contractor Task	Outcome
On the existing switchboard, Isolate sewage pump (Pump #1) as per BW Isolation Tag and Lock Out procedure. (Unplug from Decontactor).	OK ☑
Disconnect Pump #1 from the existing switchboard and remove the power and control cables from the switchboard and place near the temporary system so as to enable a quick changeover for Pump #2 if required.	OK ☑
Isolate main incomer at the switchboard. Ensure all secondary sources of power (ie on site Generator) are also isolated. Confirm there is no load.	OK ☑
Remove primary 3-phase fuses from power pole. Lock fuses in lockout box as per BW Isolation and Lock Out procedure. Fuse Size ~~100~~ 160 amps	OK ☐
Disconnect mains cable from the switchboard.	OK ☑
Disconnect all other control and communication cables and remove	OK ☑
Remove the existing switchboard away from job site.	OK ☐

Electrical Contactor's Supervisor

Name: Peter Crust Date: 24/6/10

Signature: .....

BW Commissioning Manager

Name: **John Clayton**..... Date: 29/6/10

Signature: J. Clayton

3.4 STEP 4 - INSTALL NEW SWITCHBOARD

3.4.1 Install new switchboard (For Sites with Option F Only)

Contractor Task	Outcome
Install and connect the required (new or existing) mains and earth as per the contract. Install mains cable within the switchboard in steelflex conduit	New ☑ Existing ☐
Record the cable insulation resistance of the 3 phases	A 200 Megohm B 200 Megohm. C 200 Megohm
Record earth resistance	_____ ohms
Point to point phase continuity	**R to L1** OK☑ **W to L2** OK☑ **B to L3** OK☑

3.4.2 Install Supply Authority Metering

Task	Outcome
Install the direct connected kWhr Meter or Energex to connect CT metered metering as per 2.3	OK ☑

3.4.3 Energise New Switchboard

Contractor Task	Outcome
Retrieve mains 3-phase pole fuses from lock out box as per BW Isolation and Lock Out procedure.	OK ☑
Ensure new switchboard main incomer is turned "Off".	OK ☑
Install the 3-phase pole fuses. Check MEN connection.	OK ☑ OK ☑
Turn on mains switch	OK ☑
Check 3 phase voltages	AB 430 V BC 430 V CA 430 V
Check phase rotation and ensure it is the same as determined earlier.	OK ☑
Confirm that a corrosion inhibitors has been positioned in the switchboard	OK ☑

Electrical Contactor's Supervisor

Name: Peter Crust Date: 24/6/10.

Signature: .....

BW Commissioning Manager

Name:...**John Clayton**..... Date: 24/6/10

Signature: J. Clayton

3.5 STEP 5 - CONNECT PUMP #1 TO NEW SWITCHBOARD

Contractor Task	Outcome
At the beginning of this procedure, Pump #2 is operating under the control of the temporary switchboard running from the Generator.	OK ☑
Isolate submersible Pump #1 and Pump #2 at the **new switchboard**, as per BW Isolation and Lock Out procedure.	OK ☑
Via the MERACHAL plug in sockets provided on the switchboard reconnect the power and control cables for Pump #1 only (the pump that is **not** connected to the generator set) If VFD connection is direct connect.	OK ☑
Before beginning the next step ensure that the well level is between 'Start' and 'Stop' level and Pump #2 is not running. **Isolate Pump #2 to prevent it from running during the next test**	OK ☑
De-isolate this now connected Pump #1. Check the rotation by starting the pump via the local "Emergency Start" switch. Monitor pump / wet level operating parameters.	OK ☑
Check the 3 phase motor current and compare with original readings. **PUMP #1 Can now be run in an emergency under the control of the new switchboard.** **When checking is complete - Isolate Pump #1**	A 6.2 Amps B 6.2 Amps C 6.2 Amps
De-isolate Pump #2 so that the station is again under the control of the temporary switchboard.	OK ☑

3.6 STEP 6 - CONNECT FIELD INSTRUMENTATION TO NEW SWITCHBOARD

3.6.1 Field Devices

Contractor Task	Outcome
Install and connect the hydrostatic level probe to the transmitter **Do not tighten shroud cable compression gland**	OK ☐ 0 to 3 Mtrs
Connect the delivery pressure probe to the transmitter	OK ☐ 0 to 50 Mtrs
Install and connect the Multitrode LR3 wet well high level relay Probe	OK ☐ at ___ Mtrs
Install and connect the Multitrode SIR surcharge imminent level relay Probe	OK ☐ at ___ Mtrs
Connect the moisture in oil sensor for each pump (sites with option A only)	OK ☐ N/A ☑
Connect the moisture in stator for each pump (sites with option B1 only)	OK ☐ N/A ☐
Connect the motor bearing temperature for each pump (sites with option B2 only)	OK ☐ N/A ☑
Connect the reflux valve micro switch for each pump (sites with option C only)	OK ☐ N/A ☐
Connect the upstream manhole surcharge imminent probe (sites with option D only)	OK ☐ N/A ☑
Connect the Multitrode LR2 sump pump start/ stop probes (sites with option E only)	OK ☐ N/A ☑
Connect the Multitrode LR4 Dry well high/trip probes (sites with option E only) High = 50mm off the floor, Drip 200mm below the first flood exposed equipment	OK ☐ N/A ☑
Connect the sump pump (sites with option E only)	OK ☐ N/A ☑
Connect the generator IO cables (sites with option F only)	OK ☐ N/A ☑
Connect the thermistors for each pump (sites with option I only)	OK ☑ N/A ☐

Electrical Contactor's Supervisor

Name: Peter Crust Date: 24/6/10

Signature: .....

BW Commissioning Manager

Name: **John Clayton** Date: 24/6/10

Signature: .....

3.6.2 Install Generator Mains (For Sites with Permanent Generators)

Contractor Task	Outcome
Record insulation resistance of the 3-phases	A _____ Megohm B 200 Megohm. C _____ Megohm
Record earth resistance	2 ohms
Point to point phase continuity	R to L1 OK☑ W to L2 OK☑ B to L3 OK☑

3.6.3 Radio Antenna Installation

BW Programmer Task	Outcome
Install new mast with Antenna, orientate antenna to the position determined in section 3.1.2 connect coaxial cable plugs.	OK ☑

3.6.4 Telemetry and SCADA Communications Checks

BW Programmer Task	Outcome
Brisbane Water programmer must complete the following procedures ***From the SSM086 Standard Fixed Speed Sewage Pumping Station (S.A.T.)*** ***Section 1: Setup and Pre-Commissioning Checks***	OK ☐

3.7 STEP 7 - COMMISSIONING PUMP #1

BW Programmer & Contractor Task	Outcome
Before doing the next step ensure that the well level is between 'Start' and 'Stop' level and Pump #2 is not running. **Isolate Pump #2 to prevent it from running during the next test.**	OK ☐
At this stage the Brisbane Water Programmer must complete the following procedures ***From the SSM086 Standard Fixed Speed Sewage Pumping Station (S.A.T.)*** ***Section2 : On Site Commissioning Procedure (Pump #1 Only)***	OK ☐
Once Pump #1 has been commissioned, leave the new switchboard in control of the site operating under "Remote" control.	OK ☐

No wet well Level to Test Fully

Electrical Contactor's Supervisor

Name: Peter Crust Date: 24/6/10

Signature: .....

BW Commissioning Manager

Name: John Clayton Date: .....

Signature: J. Clayton

3.8 STEP 8 - CONNECT PUMP #2 AND COMMISSION

3.8.1 Connect Pump #2 to New Switchboard

Contractor Task	Outcome
At the beginning of this procedure, Pump #1 is operating under the control of the new switchboard running from the supply authority.	OK ☐
Shut down the generator and disconnect Pump #2 from the temporary switchboard	OK ☐
Ensure Pump #2 circuit breaker at the new switchboard is still isolated and locked out as per BW Isolation and Lock Out procedure.	OK ☐
Via the MERACHAL plug in sockets provided on the switchboard, connect the power and control cables for Pump #2.	OK ☐
De-isolate this now connected submersible pump. Check the rotation of this submersible pump by bumping the pump On / Off via the local "Emergency Start" switch.	OK ☐
Check the 3-phase motor current and compare with original results. **PUMP #2 Can now be run in an emergency under the control of the new switchboard.**	A _____ Amps B _____ Amps C _____ Amps

3.8.2 Commissioning of Pump #2

BW Programmer & Contractor Task	Outcome
Before beginning the next step ensure that the well level is between "Start and Stop" level and Pump #1 is not running. (Station under the control of the new board) **Isolate Pump #1 to prevent it from running during the next test.**	OK ☐
Brisbane Water Programmer must complete the following procedures ***From the SSM086 Standard Fixed Speed Sewage Pumping Station (S.A.T.)*** ***Section2: On Site Commissioning Procedure – (Pump #2 Only)***	OK ☐
Once Pump #2 has been commissioned, de-isolate Pump #1 and leave that new switchboard in control of the site operating under remote control with both pumps able to run	OK ☐

Electrical Contactor's Supervisor

Name: Peter Crust Date: 24/6/10

Signature: ....

BW Commissioning Manager

Name:...**John Clayton**..... Date: ....

Signature: ....

3.9 STEP 9 - COMPLETE TESTING

3.9.1 Site Acceptance Testing (S.A.T) – Remaining Tests

BW Programmer & Contractor Task	Outcome
Once pump 2 has been commissioned Complete any **remaining procedures in Section 2** ***from the SSM086 Standard Fixed Speed Sewage Pumping Station (S.A.T.)***	OK ☐
Check operation of SIR for 20 sec. with probe to prove probe operation and operation of 2 pumps	OK ☐
Check operation LR3 with probe to prove RTU and probe	OK ☐
Seal conduits with denso and grout under switchboard.	OK ☐
Check Energex Phase Fail Input.	OK ☐
Confirm automatic control of pumps.	OK ☐
Check Parameter 203 of Soft Starter is a positive value	OK ☐
Confirm correct operation of all door locks	OK ☐
Confirm Operation & Maintenance Manual left on site.	OK ☐

3.9.2 SCADA Testing

BW Programmer & Contractor Task	Outcome
The Brisbane Water Programmer must complete the following procedures with the assistance from the Commissioning Engineer and SCADA Commissioning Engineer in the Control Room. ***From the SSM086 Standard Fixed Speed Sewage Pumping Station (S.A.T.)*** ***Section3 : SCADA Commissioning Procedure***	OK ☐

3.9.3 Preliminary Work Completion by Electrical Contractors

Contractor Task	Outcome
Leave the site clean and tidy and hazard free.	OK ☐
Confirm with BW that the job is complete and their staff can leave.	OK ☐
Confirm with BW that BW staff will lock up the site on completion of the switchboard change over work.	OK ☐
Note: If there is a problem with finishing the work due to unforeseen circumstance refer to **the Risk Analysis attached**.	OK ☐

3.9.4 Register Control Room

BW Programmer & Contractor Task	Outcome
Commissioning Engineer to call the Control Room Operator (CRO) and inform him that the site works is complete and that the site is now fully in "Remote" control and that all alarms are to be acted on as per the alarm instructions. C.R.O. to confirm that the site is healthy and that there are no alarms active. Record the C.R.O.'s name and Officer Code and record the time of the call.	Name._____ CRO _____ TIME: _____

BW Commissioning Manager

Name:.....John Clayton..... Date: ....

Signature: ....

4 POST CHANGE OVER CHECKLIST

4.1 DELIVERABLES FROM RTU PROGRAMMER

BW Programmer	Date Completed
Within 7 days of the change over the following must be completed and signed off by the BW Programmer0 Complete **Section 4: Post Commissioning** ***from the SSM086 Standard Fixed Speed Sewage Pumping Station (S.A.T.)***	/ /
The BW Programmer will ensure that the Control Room Acceptance (CRA) form is signed by the Manager of the Control Room Officers. The form is to be handed to the Contracts Manager (CM).	/ /

4.2 DELIVERABLES FROM ELECTRICAL CONTRACTOR

Contractor Task	Date Completed
All documentation required under the contract is to be provided with the time specified (AS BUILT's, Electrical Certificates etc).	/ /

4.3 DELIVERABLES FROM COMMISSIONING MANAGER

Commissioning Manager	Date Completed
All documentation is handed to the Project Manager to that the new switchboard asset can be capitalised and handed over to the customer.	
Factory Acceptance Test Sheet – Completed & signed off.	OK ☐
Electrical Inspection Sheet – Completed & signed off.	OK ☐
Site Acceptance Test Sheet – Completed & signed off.	OK ☐
Commissioning Plan – Completed & signed off.	OK ☐
Control Room Acceptance Form – Completed & signed off	OK ☐
As built Drawings have been updated, drafted and taken to site along with the Site Specific Functional Specification,	/ /

4.4 SUGGESTIONS FOR IMPROVEMENT

Suggestion	Recommended By

BW Commissioning Manager

Name:.....John Clayton..... Date: ....

Signature: ....

ELECTRIC

T"ST BEFORE YOU TOUCH

№ 16179

TEST SHEET

CUSTOMER NAME: Brisbane Water **SWITCHBOARD ID:** SP140 **DATE:** 24/6/10

CUSTOMERS ADDRESS: Cullen Ave West **JOB No.:** WT4000089

C/B NO.	CABLE SIZE	C/B SIZE	N NO.	CIRCUIT DESCRIPTION	VISUAL INSPECTION	CORRECT CIRCUIT CONNECTION	EARTH CONT.	A - E MΩ	N - E MΩ	A - E VOLTS	A - N VOLTS	ø - ø VOLTS	RCD TEST mA	RCD TEST mS	Fault loop Impendance measurement
–	25mm²	Fuse 100A	–	Mains (Pole to Board)	✓	✓	0.05	2MΩ		253	253	438	–	–	
	"	"	–	" "	✓	✓		5MΩ		254	253	439	–	–	
	"	"	–	" "	✓	✓		9MΩ		252	253		–	–	

TEST EQUIPMENT: Kyoritsu Insulation Tester

SERIAL NO: 512 3060

TEST DUE DATE: 12/10/2010

NAME: Martin Coogan

LIC NO: 112 573

SIGNATURE:

S L 61 ISSUE 2

SJ Electric Pty Ltd

Ref: SJQF 502
Date: 19 July 2007

Inspection and Test Check List

Project: Brisbane Water SP140		
Contractor / Order No.		SJ Electric Job No. BT430022
ITC No. 003	Date: 17/6/10	**Corresponding ITP No. 001**

General Data

Built By: Brendan Stringer, Thomas Chan	Test Equipment: Megger / Multimeter
Location: Workshop	Type: Kyoritsu / Fluke
Drg rev No.	Serial No. 5149622 / 10620027

Check List (Tick ( ) acceptable items only, note deviations under "REMARKS") (If not applicable mark as N/A)

Switch Board and Control Panels Construction Check List

Item	Activity Description	Hold Points	Checked	By (Initial)
	Busbar		( )	RB
1	Correct size busbar to rated current load to meet AS 2067		(✓)	
2	Appearance is good i.e. Straight & level		(✓)	
3	Correct phase identification		(✓)	
4	Correct hole sizes for joins and terminations		(✓)	
5	All clearances have been meet		(✓)	
6	Correct busbar support material has been used		(✓)	
7	Busbar supports are at the correct distances apart		(✓)	
8	Correct tensioning & blue spotted at all joins & terminations		(✓)	
9	Correct hole format in joining cubicle		(✓)	
10	Sufficient clearances for terminating cable		(✓)	
11	Heat shrink attached to flags for terminations		(✓)	
12	All joins are dressed flat & polished		(✓)	
13	Busbar is insulated at supports		(✓)	
	Cabling			RB
15	Correct size for demand of circuit		(✓)	
16	Correct phase colouring		(✓)	
17	Correct termination & insulated		(✓)	
18	Correct numbering		(✓)	
19	Correctly formed and neat		(✓)	
20	Correctly supported		(✓)	
21	All cable entry holes are insulated		(✓)	
22	Check cable tray is mounted correctly & all sharp surfaces are removed		(✓)	
23	All cable ties are neatly trimmed		(✓)	
24	All cable clear from busbar's		(✓)	
25	Check all analog inputs and outputs are shielded		(✓)	
26	All shielded cables have been earthed		(✓)	

Remarks/Remedial Action Required Hold Points:

Remedial Actions Completed ☐ **Signature:** ..... **Date:**

Checked By: Brendan Stringer	
Signature: BStringer	**Approved By: Renee Wardrop**
Electrical Licence No. 114766	**Signature:** RWardrop **Date: 17/6/10**

All the above signatories certify that the Electrical switchboard work listed has been checked and tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the Electricity Act, AS3000 2007 and AS3008.1.1 1998

SJ Electric Pty Ltd

Ref: SJQF 502

Date: 19 July 2007

Inspection and Test Check List

Switch Board and Control Panels Construction Check List (SJQF 502)				
Item	**Activity Description**	**Hold Points**	**Checked**	**By (Initial)**
	Switchgear			
1	Check all main switches & circuit breakers are the correct			
	• current rating		✓	
	• ka rating.		✓	
	• trip settings		✓	
	• correct to cabling		✓	
	• to labels.		✓	
	• shunt trips		✓	
	• inter locks		✓	
2	Check the fixings		✓	
3	Check the number of poles		✓	
4	Check correct operation		✓	
5	Correct mechanism		✓	
	Control Switches			
6	Check correct number of positions		✓	
7	Check correct size		✓	
8	Check correct to labels		✓	
9	Check mountings		✓	
	Contactors			
10	Check for correct model no		✓	
11	Check for correct current rating to control		✓	
12	Correct auxiliary contacts		✓	
13	Correct phasing		✓	
14	Correct coil size		✓	
15	Check that it is accessible		✓	
16	Check it has correct overloads		✓	
17	Correct labelling		✓	
	Relays and Timers			
18	Check correct rated voltage		✓	
19	Correct contacts		✓	
20	Correct variances		✓	
21	Dip switches in required position		✓	
22	Timers set to correct settings		✓	
23	Correct operation		✓	
24	Correct auxiliaries		✓	
	Transformers and Power Supplies			
25	Check for correct voltage ratings		✓	
26	Check for correct current ratings		✓	
27	Check cabling is correct (no crossed voltage)		✓	
28	Check the secondary has been earthed when applicable		✓	
29	Check correct labelling		✓	
30	Check mountings		✓	
31	Check for clearance around for heat extraction		✓	

Remarks/Remedial Action Required:

Remedial Actions Completed ☐ **Signature:** ..... **Date:**

Checked By: Brendan Stringer		
Signature:	**Approved By: Renee Wardrop**	
Electrical Licence No. 114766	**Signature:**	**Date: 17/6/10**

All the above signatories certify that the Electrical switchboard work listed has been checked and tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the Electricity Act 2002, AS3000 2007 and AS3008.1 1998

SJ Electric Pty Ltd

Ref: SJQF 502
Date: 19 July 2007

Inspection and Test Check List

Switch Board and Control Panels Construction Check List (SJQF 502)				
Item	**Activity Description**	**Hold Points**	**Checked**	**By (Initial)**
	Fuses			
1	Check that the cartridge is correct size		✓	
2	Correct mountings		✓	
3	Correct labelling		✓	
4	Check that line side conductors are SDI and < 500mm		✓	
5	Current Transformers		-	
6	Correct ratio & size		-	
7	Correct direction of feed		-	
8	Correct earthing		-	
9	Correct cabling		-	
	Voltage / Current Monitoring Equipment			
10	Correct voltage / current range on meter to the installation		-	
11	Correct to ratio on Cts		-	
12	Voltmeter terminations are insulated		-	
13	Check that all meters are preset to zero		✓	
14	Correct indication labels applied		✓	
	Indication Equipment			
15	Correct colour		-	
16	Correct voltage size with matching lamp attached		-	
17	Correct operation eg. Push to test		-	
18	Correct labelling		-	
	Terminal Blocks			
19	Correct size to cable		✓	
20	Correct colour coding		✓	
21	Correct numbering		✓	
22	Correctly mounted with lock ends		✓	
23	Correct labels		✓	
	Neutral Links			
24	Check that they are accessible		✓	
25	Correct labelling		✓	
26	Correct numbers stamped to match circuit identification		✓	
27	Correct cabling to circuit identification		✓	
28	Check that all neutral links & bar are insulated from the switchboard frame		✓	
	Earthing			
29	Check that all main earth bar is correct size		✓	
30	Check that the main earth is continuous		✓	
31	Correctly labelled		✓	
32	Continuous for CT wiring		-	
33	Check that all doors with equipment mount are electrically earth		✓	
34	Check all frames are earthed		✓	

Remarks/Remedial Action Required:

Remedial Actions Completed ☐ **Signature:** ..... **Date:**

Checked By: Brendan Stringer		
Signature:	**Approved By: Renee Wardrop**	
Electrical Licence No. 114766	**Signature:**	**Date: 17/6/10**

All the above signatories certify that the Electrical switchboard work listed has been checked and tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the Electricity Act 2002, AS3000 2007 and AS3008.1 1998

SJ Electric Pty Ltd

Ref: SJQF 502
Date: 19 July 2007

Inspection and Test Check List

Switch Board and Control Panels Construction Check List (SJQF 502)				
Item	**Activity Description**	**Hold Points**	**Result**	**By (Initial)**
	Earthing Resistance & Continuity Test (Note all readings should be < .5 ohms)			
1	Make sure the MEN connection is removed	✓		
2	Attach lead to main earth connection point than test with other lead between	✓		
3	The frame of each section		< .1Ω	
4	The doors		< .1Ω	
5	All mounting bolts to all equipment		< .1Ω	
6	All brackets		< .1Ω	
7	All earth links		< .1Ω	
8	All bolts & threads for the mounting of escutcheon		< .1Ω	
9	All gland plates		< .1Ω	
10	All cable trays		< .1Ω	
11	All earth connection		< .1Ω	
12	Earth secondary of transformers and power supplies where applicable		< .1Ω	
13	Earth surge diverters		< .1Ω	
14	Current transformers			
	Insulation Test	**Hold Points**	**Test Result**	**By (Initial)**
1	Make sure all control fuses and earths are removed from all electronic equipment before this test is carried out		(✓)	
2	Set insulation tester (meggar) to 500 volts before proceeding		(✓)	
3	Test between: • Red - White		>100MΩ	
	• Red - Blue		>100MΩ	
	• Red - Earth		>100MΩ	
	• Red - Neutral		>100MΩ	
	• White - Blue		>100MΩ	
	• White - Earth		>100MΩ	
	• White - Neutral		>100MΩ	
	• Blue - Earth		>100MΩ	
	• Blue - Neutral		>100MΩ	
4	If all readings are clear the insulation tester is to be set at 1000 volts then proceed with the following		(✓)	
5	Test between: • Red - White		>100MΩ	
	• Red - Blue		>100MΩ	
	• White - Blue		>100MΩ	

Remarks/Remedial Action Required:

Remedial Actions Completed ☐ **Signature:** ..... Date:

Checked By: Brendan Stringer	
Signature:	**Approved By: Renee Wardrop**
Electrical Licence No. 114766	**Signature:** **Date: 17/6/10**

All the above signatories certify that the Electrical switchboard work listed has been checked and tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the Electricity Act 2002, AS3000 2007 and AS3008.1 1998

SJ Electric Pty Ltd

Ref: SJQF 502
Date: 19 July 2007

Inspection and Test Check List

Switch Board and Control Panels Construction Check List (SJQF 502)				
Item	**Activity Description**	**Hold Points**	**Checked**	**By (Initial)**
	2.5 KV Test This test is used to prove all busbar construction			
1	Make sure all control fuses and earths are removed from all electronic equipment before this test is carried out		(.)	
2	All the following tests must be set at a 1 minute time period, result should be 0 Amps		( )	
		Hold Points	**Test Result**	**By (Initial)**
3	Test between: • Red - White			
	• Red - Blue			
	• Red - Earth			
	• Red - Neutral			
	• White - Blue			
	• White - Earth			
	• White - Neutral			
	• Blue -Earth			
	• Blue - Neutral			
	Supply Authority section			
1	Check supply authority main isolator lockable in the on position		(✓)	
2	Check all doors before the Ct's. Or meters are lockable		(✓)	
3	Check where the neutral link is located for the site connection if metres are remotely mounted		(✓)	
4	Check where the earth link is located for the site connection if meters are remotely mounted		(✓)	
5	Check double insulated cable for POT fuses are less than 800 mm		(✓)	
6	Check double insulated cable are taken on line side of Ct.s		(✓)	
7	Check metre wiring is in building wire and correct size		(✓)	
8	Check if Ct meter wiring is in steel conduit when closer than 100mm to other conductors		(✓)	
9	Check there is no equipment connected before on the line side of meters or Ct.s (i.e., surge diverters)		(✓)	
10	Check list may vary if switch board is going interstate. Alter where applicable		(✓)	

Remarks/Remedial Action Required:

Remedial Actions Completed ☐ **Signature:** ..... Date:

Checked By: Brendan Stringer		
Signature:	**Approved By: Renee Wardrop**	
Electrical Licence No. 114766	**Signature:**	**Date: 17/6/10**

All the above signatories certify that the Electrical switchboard work listed has been checked and tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the Electricity Act 2002, AS3000 2007 and AS3008.1 1998

SJ Electric Pty Ltd

Ref: SJQF 502
Date: 19 July 2007

Inspection and Test Check List

Switch Board and Control Panels Construction Check List (SJQF 502)				
Item	**Activity Description**	**Hold Points**	**Checked**	**By (Initial)**
	Functional Test			
Prior to connection of supply all inspection and test check lists must be completed		**Hold Points**	**Checked**	**By (Initial)**
1	Point to point test on all cables as per schematic and single line drgs. (Leave spot for drawing. No's and Rev No's		(✓)	
2	Check all Cts are not open circuit		✓	
Connect supply (personal protection equipment must be used)		**Hold Points**	**Test Result**	**By (Initial)**
3	Check polarity of connection • Red - White	415✓	(✓)	
	• Red - Blue	415✓	(✓)	
	• Red - Earth	240✓	(✓)	
	• Red - Neutral	240✓	(✓)	
	• White - Blue	415✓	(✓)	
	• White - Earth	240✓	(✓)	
	• White - Neutral	240✓	(✓)	
	• Blue -Earth	240✓	(✓)	
	• Blue - Neutral	240✓	✓	
		Hold Points	**Checked**	**By (Initial)**
4	Correct voltage / current range on meter to the installation		(✓)	
5	Check functional operation of switchboard following specific construction issue drawings (leave spot for drawing No's and Rev No's		(✓)	
6	Check operation of all RCD's < .03s		(✓)	
	Pre delivery check list		( )	
1	Check all punch list items are complete		(✓)	
2	Check if Compliance label is mounted and correct		(✓)	
3	Check if heat shrinks is supplied when necessary		(✓)	
4	Check all load bolts are supplied		(✓)	
5	Check if m.e.n is mounted after testing		(✓)	
6	All drawings have been as built red lined and supplied and signed for to drafting office		(✓)	
	Received by drafting Office (Sign)		(✓)	
7	Photos have been taken of every section and given to manager		(✓)	
8	Test reports have been photo copied and placed in the client folder and SJ Electric folder		(✓)	
9	As built drawings received back from drafting office , verify Rev No.		(✓)	
	Received by Work shop (Sign)		(✓)	
10	Manuals placed in client folder		(✓)	
11	Switch Board wrapped with delivery details supplied		(✓)	
12	As built drawings placed in client folder. (Latest revision ( )	Copy of red lined marked Drawing ( )		

Remarks/Remedial Action Required:

Remedial Actions Completed ☐ **Signature:** ..... **Date:**

Checked By: Brendan Stringer		
Signature:	**Approved By: Renee Wardrop**	
Electrical Licence No. 114766	**Signature:**	**Date: 17/6/10**

All the above signatories certify that the Electrical switchboard work listed has been checked and tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the Electricity Act 2002, AS3000 2007 and AS3008.1 1998

SJ Electric (Qld) Pty. Ltd.

FACTORY ACCEPTANCE TEST SHEET 1:

Project: Pump Station SP 140
Client: QLD Urban Utilities
Job No. BT 430022
Equipment: SP 140 Switchboard
Section: Incomer
Drawing: 486/5/7 - 0130 Sheet 1

	Process Operation	Reference/ Acceptance Criteria	Passed	
1.	Ensure Insulation test as per QA3CH-15 have been completed	SJ QA3CH-15 AS 3000 Insulation resistance greater than 1 megohm ph to earth Hi pot test 2.5 kv ph-eth for 1 minute	✓	17/6/10
2.	Ensure Checks 1 to 11 as per QA3CH-020 have been completed	SJ QA3CH-020 Point to Point check of schematics. Visual Check of wiring.	✓	17/6/10
3.	Check Manual Transfer Switch is functioning by confirming power to the line and then load sides of the switches when energized and de-energized.	Drawing 486/5/7 - 0180	✓	17/6/10
4.	Check operation of Energex Power On phase failure relay PFRE and correct signal is being received by RTU	Drawing 486/5/7 - 0130 Remove one phase from relay sensing circuit to simulate loss of power.	✓	17/6/10
5.	Check operation of Station Power On phase failure relay PFRS and correct signal is being received by RTU	Drawing 486/5/7 - 0180 Remove one phase from relay sensing circuit to simulate loss of power.	✓	17/6/10

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Tests Completed By	Witnessed By	Accepted By
Brendan Stringer	Renee Wardrop	
Date 17/6/10	Date 17/6/10	Date
Comments:		
Instruments Used:		

SJ Electric (Qld) Pty. Ltd.

FACTORY ACCEPTANCE TEST SHEET 2:

Project: Pump Station SP_____
Client: QLD Urban Utilities
Job No. _____
Equipment: SP____ Switchboard
Section: DB
Drawing: _____ Sheet 1

	Process Operation	Reference/ Acceptance Criteria	Passed	Date
1.	Ensure Insulation test as per QA3CH-15 have been completed	SJ QA3CH-15 AS 3000 Insulation resistance greater than 1 megohm ph to earth Hi pot test 2.5 kv ph-eth for 1 minute	✓	17/6/10
2.	Ensure Checks 1 to 11 as per QA3CH-020 have been completed	SJ QA3CH-020 Point to Point check of schematics. Visual Check of wiring.	✓	17/6/10
3.	Check voltage is available on line side of circuit breaker Q9	Drawing 446/5/7 - 0140 415 vac ph to ph. 240 vac ph to n 240 vac ph to e	✓	17/6/10
4.	Ensure all distribution circuit breakers are "OFF" and operate circuit breaker Q9 and confirm voltage is available to distribution chassis.	Drawing 446/5/7 - 0140 415 vac ph to ph. 240 vac ph to n 240 vac ph to e	✓	17/6/10
5.	Ensure Station Mains Power Failure Relay Circuit Breaker Q10 is "OFF" and close circuit breaker for PFRS Relay supply.	Drawing 446/5/7 - 0140	✓	17/6/10
6.	Confirm voltage is available to line side of Station Mains Power Failure Relay Circuit Breaker. Close circuit breaker and confirm voltage is available to Line side of PFRS Relay.	Drawing 446/5/7 - 0140 415 vac ph to ph. 240 vac ph to n 240 vac ph to e	✓	17/6/10
7.	Repeat Step 6 above for circuit breaker Q11, Q12, Q13, Q14, Q16, Q17, Q19, Q20 and Q21	Drawing 446/5/7 - 0140 415 vac ph to ph (Where applicable). 240 vac ph to n 240 vac ph to e	✓	17/6/10

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8.	Check operation of the following RCD's and note tripping times: • Q11 15ms • Q12 27ms • Q13 26ms • Q19 24ms • Q21	Drawing 496/5/7-0140 Tripping Time:	17/6/10

Tests Completed By	Witnessed By	Accepted By
Brendan Springer	Renee Wardrop	
Date 17/6/10	Date 17/6/10	Date
Comments:		
Instruments Used:		

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FACTORY ACCEPTANCE TEST SHEET 3:

Project: Pump Station SP_____
Client: QLD Urban Utilities
Job No. _____
Equipment: SP____ Switchboard
Section: RTU Connection
Drawing: _____ Sheets 1 & 6

	Process Operation	Reference/ Acceptance Criteria	Passed	Date
1.	Ensure Insulation test as per QA3CH-15 have been completed	SJ QA3CH-15 AS 3000 Insulation resistance greater than 1 megohm ph to earth Hi pot test 2.5 kv ph-eth for 1 minute	✓	17/6/10
2.	Ensure Checks 1 to 11 as per QA3CH-020 have been completed	SJ QA3CH-020 Point to Point check of schematics. Visual Check of wiring.	✓	17/6/10
3.	Ensure Laptop GPO, circuit breaker Q13 is "OFF" and operate RTU circuit breaker Q30 on DB Chassis and ensure: RTU Power Supplies are operating correctly.	Drawing 486/5/7-0194 Sheet 1 240 vac ph to n on power supply input. 24 vdc on power supply output	✓	17/6/10
4.	Close Laptop GPO Circuit Breaker and: Check GPO polarity. Check GPO switch is functioning. Check operation of RCD device.	Drawing 486/5/7-0194 Sheet 1	✓	17/6/10
7.	Confirm operation of door switches.	Drawing 486/5/7-0194 Sheet 1 & 6	✓	17/6/10

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Tests Completed By	Witnessed By	Accepted By
Brendan Stringer	Renee Wardrop	
Date 17/6/10	Date 17/6/10	Date
Comments:		
Instruments Used:		

S. Electric (Qld) Pty. Ltd.

FACTORY ACCEPTANCE TEST SHEET 4:

Project: Pump Station SP_____
Client: QLD Urban Utilities
Job No. _____
Equipment: SP____ Switchboard
Section: Pump 1
Drawing: _____ Sheet 2

	Process Operation	Reference/ Acceptance Criteria	Passed	Date
1.	Ensure Insulation test as per QA3CH-15 have been completed	SJ QA3CH-15 AS 3000 Insulation resistance greater than 1 megohm ph to earth Hi pot test 2.5 kv ph-eth for 1 minute	✓	
2.	Ensure Checks 1 to 11 as per QA3CH-020 have been completed	SJ QA3CH-020 Point to Point check of schematics. Visual Check of wiring.	✓	
3.	Check voltage is available on line side of motor circuit breaker Q4.	415 vac ph to ph	✓	
4.	Ensure control circuit breaker Q4-1 is "OFF" and emergency stop is operated, close circuit breaker Q4 and confirm voltage is available on line side of circuit breaker Q4.	415 vac ph to ph	✓	
5.	Check voltage is available on line side of control circuit breaker Q4-1, close circuit breaker and ensure: • 1K2 Control Supply Relay is operating correctly.	240 vac ph to n	✓	
6.	Release emergency stop and confirm operation of isolating contactor 1K1 and confirm voltage is available to VSD.	415 vac ph to ph	✓	

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7.	Confirm operation of Pump 1 Digital Inputs.	Drawing _____ Sheet 2	✓	
8.	Confirm Operation of Pump 1 Digital Outputs	Drawing _____ Sheet 2	✓	
9.	Confirm Operation of Pump 1 Analog I/O	Drawing _____ Sheet 2		
10.	Confirm Operation of cubicle fan by manually operating the thermostat 1FC	Drawing _____ Sheet 2		

Tests Completed By	**Witnessed By**	**Accepted By**
Brendan Strong	Renee Wardrop	
Date 17/6/10	**Date** 17/6/10	**Date**
Comments:		
Instruments Used:		

SJ Electric (Qld) Pty. Ltd.

FACTORY ACCEPTANCE TEST SHEET 5:

Project: Pump Station SP_____
Client: QLD Urban Utilities
Job No. _____
Equipment: SP____ Switchboard
Section: Pump 2
Drawing: _____ Sheet 3

	Process Operation	Reference/ Acceptance Criteria	Passed	Date
1.	Ensure Insulation test as per QA3CH-15 have been completed	SJ QA3CH-15 AS 3000 Insulation resistance greater than 1 megohm ph to earth Hi pot test 2.5 kv ph-eth for 1 minute.	✓	17/6/10
2.	Ensure Checks 1 to 11 as per QA3CH-020 have been completed	SJ QA3CH-020 Point to Point check of schematics. Visual Check of wiring.	✓	17/6/10
3.	Check voltage is available on line side of motor circuit breaker Q5.	415 vac ph to ph	✓	17/6/10
4.	Ensure control circuit breaker Q5-1 is "OFF" and emergency stop is operated, close circuit breaker Q5 and confirm voltage is available on line side of circuit breaker Q5.	415 vac ph to ph	✓	17/6/10
5.	Check voltage is available on line side of control circuit breaker Q5-1, close circuit breaker and ensure: • 2K2 Control Supply Relay is operating correctly.	240 vac ph to n	✓	17/6/10
6.	Release emergency stop and confirm operation of isolating contactor 2K1 and confirm voltage is available to VSD.	415 vac ph to ph	✓	17/6/10

SJ Electric (Qld) Pty. Ltd.

7.	Confirm operation of Pump 1 Digital Inputs.	Drawing _____ Sheet 3	✓	17/6/10
8.	Confirm Operation of Pump 1 Digital Outputs	Drawing _____ Sheet 3	✓	17/6/10
9.	Confirm Operation of Pump 1 Analog I/O	Drawing _____ Sheet 3		
10.	Confirm Operation of cubicle fan by manually operating the thermostat 2FC	Drawing _____ Sheet 3	NA	17/6/10

Tests Completed By	**Witnessed By**	**Accepted By**
Brendan Stimpson	Renee Wardrop	
Date 17/6/10	**Date** 17/6/10	**Date**
Comments:		
Instruments Used:		

Sewage Pump Station SP140

Cullen Ave West

Electrical Drawing List 2

Factory Test

Sheet No.	Drawing No.	Title
00	486/5/7-0181-000	Site Cover Sheet
01	486/5/7-0181-001	Power Distribution Schematic Diagram
02	486/5/7-0181-002	Pump 01 Schematic Diagram
03	486/5/7-0181-003	Pump 02 Schematic Diagram
04	486/5/7-0181-004	[RESERVED] Sump Pump
05	486/5/7-0181-005	[RESERVED] Generator Control
06	486/5/7-0181-006	Common Controls Schematic Diagram
07	486/5/7-0181-007	Common RTU I/O Schematic Diagram
08	486/5/7-0181-008	RTU Power Distribution Schematic Diagram
09	486/5/7-0181-009	RTU Digital Inputs Termination Diagram
10	486/5/7-0181-010	RTU Digital Inputs Termination Diagram
11	486/5/7-0181-011	RTU Digital Outputs Termination Diagram
12	486/5/7-0181-012	RTU Analogs & Miscellaneous Termination Diagram
13	486/5/7-0181-013	Common Controls Termination Diagram
14	486/5/7-0181-014	Equipment List
15	486/5/7-0181-015	Cable Schedule
16	486/5/7-0181-016	Switchboard Label Schedule
17	486/5/7-0181-017	Switchboard Construction Details
18	486/5/7-0181-018	Switchboard Construction Details
19	486/5/7-0181-019	Level Probes and Pressure Transmitter Installation Details
20	486/5/7-0181-020	[RESERVED] Cathodic Protection Unit
21	486/5/7-0181-021	[RESERVED] Field Disconnection Box
22	486/5/7-0181-022	Switchboard General Arrangement Elevations – Double Sided
23	486/5/7-0181-023	Switchboard General Arrangement Sections – Double Sided
24	486/5/7-0181-024	Switchboard Slab & Conduit Details
25	486/5/7-0181-025	Switchboard Slab & Conduit Details
26	486/5/7-0181-026	Switchboard Slab & Conduit Details
27	486/5/7-0181-027	Switchboard Slab & Conduit Details

SJ Electric 7623
Brendan Stringer 114766
17/6/10

Test Copy

QUEENSLAND Urban Utilities
ABN 72 002 765 795

SP140 CULLEN AVE WEST SEWAGE PUMPING STATION

SITE COVER SHEET

ELECTRICAL DRAWINGS INDEX

DWG N°.	TITLE	SHEET	REVISIONS
486/5/7-0181-000	SITE COVER SHEET	00	0 A
486/5/7-0181-001	POWER DISTRIBUTION SCHEMATIC DIAGRAM	01	0 A
486/5/7-0181-002	PUMP 01 SCHEMATIC DIAGRAM	02	0 A
486/5/7-0181-003	PUMP 02 SCHEMATIC DIAGRAM	03	0 A
486/5/7-0181-004	*RESERVED (SUMP PUMP)*	04	
486/5/7-0181-005	*RESERVED (GENERATOR CONTROL)*	05	
486/5/7-0181-006	COMMON CONTROLS SCHEMATIC DIAGRAM	06	0 A
486/5/7-0181-007	COMMON RTU I/O SCHEMATIC DIAGRAM	07	0 A
486/5/7-0181-008	RTU POWER DISTRIBUTION SCHEMATIC DIAGRAM	08	0 A
486/5/7-0181-009	RTU DIGITAL INPUTS TERMINATION DIAGRAM	09	0 A
486/5/7-0181-010	RTU DIGITAL INPUTS TERMINATION DIAGRAM	10	0 A
486/5/7-0181-011	RTU DIGITAL OUTPUTS TERMINATION DIAGRAM	11	0 A
486/5/7-0181-012	RTU ANALOGS & MISCELLANEOUS TERMINATION DIAGRAM	12	0 A
486/5/7-0181-013	*RESERVED (COMMON CONTROLS TERMINATION DIAGRAM)*	13	
486/5/7-0181-014	EQUIPMENT LIST	14	0 A
486/5/7-0181-015	CABLE SCHEDULE	15	0 A
486/5/7-0181-016	SWITCHBOARD LABEL SCHEDULE	16	0 A
486/5/7-0181-017	SWITCHBOARD CONSTRUCTION DETAILS	17	0 A
486/5/7-0181-018	SWITCHBOARD CONSTRUCTION DETAILS	18	0 A
486/5/7-0181-019	LEVEL PROBES AND PRESSURE TRANSMITTER INSTALLATION DETAILS	19	0 A
486/5/7-0181-020	*RESERVED (CATHODIC PROTECTION UNIT)*	20	
486/5/7-0181-021	*RESERVED (FIELD DISCONNECTION BOX)*	21	
486/5/7-0181-022	SWITCHBOARD GENERAL ARRANGEMENT ELEVATIONS - DOUBLE SIDED	22	0 A
486/5/7-0181-023	SWITCHBOARD GENERAL ARRANGEMENT SECTIONS - DOUBLE SIDED	23	0 A
486/5/7-0181-024	*RESERVED (GENERATOR EXTERNAL CONNECTION BOX)*	24	
486/5/7-0181-025	SLAB & CONDUIT DETAILS - SHEET 1 of 3	25	0 A
486/5/7-0181-026	SLAB & CONDUIT DETAILS - SHEET 2 of 3	26	0 A
486/5/7-0181-027	SLAB & CONDUIT DETAILS - SHEET 3 of 3	27	0 A

STANDARD VARIABLES

DESCRIPTION	VALUES
CT METERING ISOLATOR	*NOT APPLICABLE*
NORMAL SUPPLY MAIN SWITCH	125A S250PE/125
GENERATOR SUPPLY MAIN SWITCH	125A S250PE/125
PUMP1 CIRCUIT BREAKER	20A S125GJ/20
PUMP2 CIRCUIT BREAKER	20A S125GJ/20
DRY WELL SUMP PUMP CIRCUIT BREAKER	*NOT APPLICABLE*
PUMP SOFT STARTER SIZE	MSF-017 + Max 7.5kW
PUMP RATING	4.6kW 10.5A
PUMP LINE CONTACTOR	CA7-9
PUMP BYPASS CONTACTOR	CA7-9
SUMP PUMP RATING	*NOT APPLICABLE*
SUMP PUMP CONTACTOR & TOL	*NOT APPLICABLE*
PUMP SOCKET OUTLET + INCLINE SLEEVE	DS1 3114013972 + 51BA058
PUMP INLET PLUG + HANDLE	DS1 3118013972 + 311A013
WET WELL LEVEL TRANSMITTER	FMX21.AA.2.Z.1H.G.D.11.A.P0PS 3m
EMERGENCY STORAGE WELL LEVEL TRANSMITTER	*NOT APPLICABLE*
DELIVERY PRESSURE TRANSMITTER	BR74XXGG1FHA2X 50m
WET WELL ULTRASONIC LEVEL SENSOR	*NOT APPLICABLE*
FLOWMETER RANGE	*NOT APPLICABLE*
RADIO	DR900-06A02-D0
EMERGENCY PUMPING TIME	096sec
No of SINGLE POINT PROBES	2
INCOMING MAINS SUPPLY CABLE	16mm^2
MAIN EARTHING CABLE	6mm^2
INCOMING GENERATOR SUPPLY CABLE	*NOT APPLICABLE*
SOFT STARTER 3 PHASE SUPPLY	4mm^2

STANDARD DESIGN OPTIONS

OPTION	DESCRIPTION	FITTED
A	*INDIVIDUAL PUMP MOISTURE IN OIL (MIO) SENSOR AND FAULT RELAY*	NO
B	*INDIVIDUAL PUMP MOTOR AUX PROTECTION SENSORS AND FAULT RELAYS*	NO
C	*INDIVIDUAL PUMP REFLUX VALVE MICROSWITCH*	NO
D	*STATION MANHOLE SURCHARGE IMMINENT*	NO
E	*STATION DRY WELL SUMP PUMP AND LEVEL INDICATION SENSORS AND RELAYS*	NO
F	*STATION PERMANENT GENERATOR - ATS AND CONTROL CONNECTIONS*	NO
G	*STATION EMERGENCY STORAGE LEVEL SENSOR*	NO
H	*STATION DELIVERY FLOWMETER*	NO
I	BACKUP COMMUNICATION - GSM	YES
J	PUMP CONNECTION (Via De-contactors)	YES
K	*CATHODIC PROTECTION*	NO
L	MOTOR THERMISTORS (Via De-contactors)	YES
M	*ODOUR CONTROL*	NO
N	*CURRENT TRANSFORMER (CT) METERING*	NO
O	*PUMPS ELECTRICAL INTERLOCK*	NO
P	*WET WELL WASHER*	NO
Q	*AUX PIT SUMP PUMP AND LEVEL PROBE*	NO
R	TELEMETRY RADIO	YES
S	*WET WELL ULTRASONIC LEVEL SENSOR*	NO
T	DOUBLE SIDED SWITCHBOARD PLINTH EXTENSION FITTED	YES
U	DELIVERY PRESSURE TRANSMITTER	YES
V	*CHEMICAL DOSING*	NO

Sheet 00

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
10		ISSUED FOR CONSTRUCTION	P.H.	A.W.
0	04.10	ISSUED FOR TENDER	P.H.	A.W.

DRAFTED P.HAGUE
DRAFTING CHECK A.WITTHOFT
CAD FILE 57-0181set_A
B.C.C. FILE No.

Original Signed by G.ANDERSON 09-04-10
DESIGN R.P.E.Q. No. DATE
Original signed by A.WITTHOFT 8895 09-04-10
DESIGN CHECK R.P.E.Q. No. DATE

Original Signed by K.VAHEESAN 13-04-10
PRINCIPAL DESIGN MANAGER DATE
Original Signed by P.SHERRIFF 12-04-10
CLIENT DELEGATE DATE

QUEENSLAND Urban Utilities
A DIVISION OF THE BRISBANE CITY COUNCIL

SITE
SP140
CULLEN AVE WEST
SEWAGE PUMP STATION

TITLE
SITE COVER SHEET

SHEET No. 0
Queensland Urban Utilities DRAWING No. 486/5/7-0181-000
AMEND. A

STD TEMPLATE SP-JP-SS Ver1.0

Q:\1194 WATER SUPPLY\200 Drafting\6248 Plans\Electrical\2. SEWERAGENETWORKS\SP140 Cullen Ave West\Reliability Improvement\For Construction\57-0181set_A.dwg Last Saved by 078549 on Friday, 30 April 2010 9:32:58 AM

ENERGEX SUPPLY 3 PHASE 415VAC
FEED FROM P/POLE No38186
16mm² (NOTE 4, 5)

N R W B

ACTIVE LINKS

SUPPLY AUTHORITY DIRECT METERING

Electrical contractor to note energex supply pole or pillar number .....

GENERATOR CONNECTION SOCKET (In Switchboard) (NOTE 6)

R W B N E

BOLTED CONNECTIONS (SHROUDED)

SR1,2,3 620 F1 621 622 80kA 63A

SWITCHBOARD RATING 125A
MAX DEMAND 46A

E MEN LINK

ENERGEX MAINS POWER FAILURE RELAY REF 07:A2

Q7 601 602 603 PFRE 6A

Q2 NORMAL SUPPLY MAIN SWITCH 125A Ir=0.4 (50A) Charact= 6 (NOTE 1, 2)

Q3 GEN SUPPLY MAIN SWITCH 125A Ir=0.4 (50A) Charact= 6

MANUAL TRANSFER SWITCH

GEN/N

Q9 50A SUB-DISTRIBUTION BOARD CB Ir=0.72 (36A) (NOTE 1, 2) Ii = 6 (300A)

Q10 630 631 632 SR4d 6A STATION MAINS POWER FAILURE RELAY REF 07:B2

Q11 640 641 642 N-011 10A 3 PHASE 10 AMP OUTLET

Q12 643 N2 N-012 16A 15A GPO

Q13 644 N3 N-013 10A LAPTOP GPO - TWIN

Q14 6A SPARE

Q15 10A SPARE

Q16 650 N6 N-016 6A SLCR REF 06:E15

651A FLUORO IN RTU CUBICLE
651B FLUORO IN COMMON CUBICLE
651C FLUORO IN PUMP CONTROL CUBICLE
651D FLUORO IN BOLTED CONNECTION CUBICLE
651E FLUORO IN DISTRIBUTION CUBICLE
651F FLUORO IN MAIN SWITCH CUBICLE

Q17 660 10A N7 SURGE FILTER SRF N7A

Q30 661 662 4A SN1 RTU POWER SUPPLY REF 08:B2

Q31 661 663 4A SN2 SURGE FILTER ALARM RELAY REF 06:F11

Q32 661 664 4A SN3 SPARE

Q33 661 665 4A SN4 SPARE

PROTECTED NEUTRAL

Q18 670 N8 6A EMERGENCY PUMP CONTROL POWER SUPPLY & SURCHARGE IMMINENT RELAY REF 06:A4

Q19 680 N9 N-019 10A (NOTE 6) GENERATOR ANCILLARY SUPPLY 10A SOCKET

Q20 6A SPARE

Q21 6A SPARE

E N L1 L2 L3

CONT'D ON SHEET 02

NOTES

1. INCOMING GENSET, MAIN, PUMP & DIST. BOARD CIRCUIT BREAKERS SHALL BE LINE SIDE SHROUDED.
2. CIRCUIT BREAKER RATINGS TO SUIT FAULT LEVEL & LOAD. ENSURE MIN TYPE 1 CO-ORDINATION WITH CONTACTORS & OVERLOADS TO IEC 947-4-1.
3. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
4. ADD POINT OF SUPPLY
5. ADD ACTUAL FAULT LEVEL
6. CABLING TO GENERATOR CONNECTION SOCKET AND AUXILIARY SUPPLY SOCKET TO BE DOUBLE INSULATED. CABLING TO BE FULLY SEALED TO OTHER COMPARTMENTS

Tested by Brendan Shingar 11476 01/9/10

No	DATE	AMENDMENT	DRN.	APD.
0	04.10	ISSUED FOR TENDER	P.H.	A.W.
1	.10	ISSUED FOR CONSTRUCTION	P.H.	A.W.

DRAFTED P.HAGUE
DRAFTING CHECK A.WITTHOFT
CAD FILE 07-0181set_A
B.C.C. FILE No.

Original Signed by G.ANDERSON
DESIGN R.P.E.Q. No. 8595 DATE 09-04-10
Original signed by A.WITTHOFT
DESIGN CHECK R.P.E.Q. No. DATE
Original Signed by K.VANHEERAN
PRINCIPAL DESIGN MANAGER DATE 13-04-10
Original Signed by P.SHERROFF
CLIENT DELEGATE DATE 12-04-10

Queensland Urban Utilities
A DIVISION OF THE BRISBANE CITY COUNCIL

SITE
SP140
CULLEN AVE WEST
SEWAGE PUMP STATION

TITLE
POWER DISTRIBUTION
SCHEMATIC DIAGRAM

FOR CONSTRUCTION

Sheet 01

SHEET No. 1
Queensland Urban Utilities DRAWING No.
486/5/7-0181-000
AMEND. A

tested On the 17/6/10 by Brendon Stringer 114766

CONT'D FROM SHEET 01

E N R W B

Q4 20A Ir=0.63 (12.5A) Im= 6 (120A) Note 1

1K1

Q4-1 6A

EMOTRON MSF-017 + MODBUS Max 7.5kW SOFT STARTER 1U1

L1 L2 L3 T1 T2 T3 PE

P1 P2

DE-CONTACTORS

M 3 SUBMERSIBLE PUMP No1 4.6kW 10.5AMPS

MOTOR THERMISTORS

1K4 12 RUN

1K21 13 COMMON 11 RESET

69 70 75 76 77 Rd Bl Br

1S3 E/STOP

FAULT OPERATE FULL VOLT

1K3 STARTER FAULT RELAY REF 02:C12

1K1 LINE CONTACTOR REF 02:B3, E5

1K2 BY-PASS CONTACTOR REF 02:A6, C13

RS485 1 2 3 4 Set terminating switch to 'OFF'

FROM GRAPHIC DISPLAY REF 08:I11 RS485A+ RS485A- Cable 17 RS485B+ RS485B- Cable 18 TO SOFT STARTER 2 REF 03:E6

1K1 1K20 EMG1 REF 06:C6 OFF ON 1S5 EM.START

HRM1 HOURS RUN METER

1K4 RUN RELAY REF 02:B4

1K5 CONTROL CCT 'POWER ON' RELAY REF 02:B12

CONT'D ON SHEET 03

RTU DIGITAL INPUTS

+ 24VDC POWER SUPPLY - REFER SHEET 08:C7

DI00	1K5	P1-01	DI-00	CONTROL POWER
DI01	1S1	P1-02	DI-01	START PUSHBUTTON
DI02	1S2	P1-03	DI-02	STOP PUSHBUTTON
DI03	1S3	P1-04	DI-03	E/STOP PUSHBUTTON
DI04	1S4	P1-05	DI-04	RESET PUSHBUTTON
DI05	1K2	P1-06	DI-05	RUNNING
DI06	1K3	P1-07	DI-06	STARTER FAULT
DI07		P1-08	DI-07	SPARE
DI08		P1-09	DI-08	SPARE
DI09		P1-10	DI-09	SPARE

SHEET 07 CONT'D ON

SHEET 07 CONT'D ON

RTU DIGITAL OUTPUTS

+ 24VDC POWER SUPPLY - REFER SHEET 08:C7

DO-00	0 NO	P4-02	1K20	RUN COMMAND REF 02:E5
DO-01	1 NO	P4-03	1K21	FAULT RESET REF 02:C5
DO-02	2 NO	P4-04	1K22	EMERGENCY MODE INTERRUPT REF 06: C4
DO-03	3 NO	P4-05		SPARE

CONT'D ON SHEET 07

CONT'D ON SHEET 07

LEGEND:

- SWITCHBOARD POWER TERMINAL
- SWITCHBOARD CONTROL TERMINAL
- SWITCHBOARD GENERATOR TERM.
- FIELD TERMINAL
- PLC TERMINAL
- RTU TERMINAL
- SS TERMINAL
- PLC/RTU MARSH. FUSE TERMINAL
- PLC/RTU MARSH. LINK TERMINAL
- TO RTU — DISCONNECT PLUG
- DI1-02 RTU DIGITAL INPUT
- DO1-02 RTU DIGITAL OUTPUT
- AI1-02 RTU ANALOGUE INPUT
- AO1-02 RTU ANALOGUE OUTPUT

NOTES

1. INCOMING GENSET, MAIN, PUMP & DIST. BOARD CIRCUIT BREAKERS SHALL BE LINE SIDE SHROUDED.
2. CIRCUIT BREAKER RATINGS TO SUIT FAULT LEVEL & LOAD ENSURE MIN TYPE 1 CO-ORDINATION WITH CONTACTORS & OVERLOADS TO IEC 947-4-1.
3. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
4. FAULT LEVEL OF 20kA AT 415V FOR 0.2sec.

Sheet 02

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
P	10.10	ISSUED FOR CONSTRUCTION	P.H.	A.W.
O	04.10	ISSUED FOR TENDER	P.H.	A.W.

DRAFTED P.HAGUE; DRAFTING CHECK A.WITTHOFT; CAD FILE 57-0181set_A; B.C.C. FILE No.

Original Signed by G.ANDERSON 09-04-10 DESIGN R.P.E.Q. No. DATE

Original signed by A.WITTHOFT 8895 09-04-10 DESIGN CHECK R.P.E.Q. No. DATE

Original Signed by K.VAHEESAN 13-04-10 PRINCIPAL DESIGN MANAGER DATE

Original Signed by P.SHERRIFF 12-04-10 CLIENT DELEGATE DATE

QUEENSLAND UrbanUtilities A DIVISION OF THE BRISBANE CITY COUNCIL

SITE SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE PUMP No1 SCHEMATIC DIAGRAM

SHEET No. 2

Queensland Urban Utilities DRAWING No. 486/5/7-0181-000 AMEND. A

STB TEMPLATE SP-3P-SS Ver1.2

G:\1194 WATER SUPPQ2B9 Drafting\6248 Plans\Electrical\2. SEWERAGE\NETWORKS\SP140 Cullen Ave West\Reliability Improvement\For Construction\57-0181set_A.dwg Last Saved by 078548 on Friday, 30 April 2010 9:32:58 AM

Tested On the 17/6/10 by Brendan Stringer 114766

CONT'D FROM SHEET 02

E N R W B

Q5 20A
Ir=0.63 (12.5A) Im= 6 (120A) Note 1
Q5-1 6A
2K1
2K2
2K4
2K21
2K5
2S3 E/STOP
2S5 EM.START
REF 06:D6
OFF ON

EMOTRON MSF-017 + MODBUS
Max 7.5kW
SOFT STARTER 2U1
L1 L2 L3 T1 T2 T3 PE
12 RUN
13 COMMON
11 RESET
RS485 1 2 3 4
FROM SOFT STARTER 1 REF 02:E6
RS485B+ RS485B- Cable 18
Set terminating switch to 'ON'

DE-CONTACTORS
P1 P2
SUBMERSIBLE PUMP No2 4.6kW 10.5AMPS
MOTOR THERMISTORS
69 70 75 76 77
Rd Bl Br

200 210 211 212 230 231 201 200N 207 208 209 203 204 205

FAULT
OPERATE
FULL VOLT
STARTER FAULT RELAY REF 03:C12
LINE CONTACTOR REF 03:B3, E5
BY-PASS CONTACTOR REF 03:A6, C13

HRM2
HOURS RUN METER
RUN RELAY REF 03:B4

CONTROL CCT 'POWER ON' RELAY REF 03:B12

200N

RTU DIGITAL INPUTS

+ 24VDC POWER SUPPLY - REFER SHEET 08:C7

2A DI2+24V J6+ J6- DI2-COM P2-19 CM

36	37	38	39	DI-16 CONTROL POWER
40	41	42	43	DI-17 START PUSHBUTTON
44	45	46	47	DI-18 STOP PUSHBUTTON
48	49	50	51	DI-19 E/STOP PUSHBUTTON
52	53	54	55	DI-20 RESET PUSHBUTTON
56	57	58		DI-21 RUNNING
				DI-22 STARTER FAULT
				DI-23 SPARE
				DI-24 SPARE
				DI-25 SPARE

2K5 2S1 2S2 2S3 2S4 2K2 2K3

CONT'D ON SHEET 07

RTU DIGITAL OUTPUTS

+ 24VDC POWER SUPPLY - REFER SHEET 08:C7

CM DO2+24V P4-11 DO2+24V 2A 123 J6+ J6- 124 DO2-COM

DO-08	8 NO	P4-12	125	2K20	126 RUN COMMAND REF 03:E5
DO-09	9 NO	P4-13	127	2K21	128 FAULT RESET REF 03:C5
DO-10	10 NO	P4-14	129	2K22	130 EMERGENCY MODE INTERRUPT REF 06:D4
DO-11	11 NO	P4-15	131		132 SPARE

CONT'D ON SHEET 07

LEGEND:

- SWITCHBOARD POWER TERMINAL
- SWITCHBOARD CONTROL TERMINAL
- SWITCHBOARD GENERATOR TERM.
- FIELD TERMINAL
- PLC TERMINAL
- RTU TERMINAL
- SS TERMINAL
- PLC/RTU MARSH. FUSE TERMINAL
- PLC/RTU MARSH. LINK TERMINAL
- TO RTU — DISCONNECT PLUG
- DI1-02 RTU DIGITAL INPUT
- DO1-02 RTU DIGITAL OUTPUT
- AI1-02 RTU ANALOGUE INPUT
- AO1-02 RTU ANALOGUE OUTPUT

NOTES

1. INCOMING GENSET, MAIN, PUMP & DIST. BOARD CIRCUIT BREAKERS SHALL BE LINE SIDE SHROUDED.
2. CIRCUIT BREAKER RATINGS TO SUIT FAULT LEVEL & LOAD ENSURE MIN TYPE 1 CO-ORDINATION WITH CONTACTORS & OVERLOADS TO IEC 947-4-1.
3. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
4. FAULT LEVEL OF 20kA AT 415V FOR 0.2sec.

Sheet 03

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
1	.10	ISSUED FOR CONSTRUCTION	P.H.	A.W.
0	04.10	ISSUED FOR TENDER	P.H.	A.W.

DRAFTED P.HAGUE
DRAFTING CHECK A.WITTHOFT
CAD FILE 57-0181set_A
B.C.C. FILE No.

Original Signed by G.ANDERSON 09-04-10 DESIGN R.P.E.Q. No. DATE
Original signed by A.WITTHOFT 8895 09-04-10 DESIGN CHECK R.P.E.Q. No. DATE
Original Signed by K.VAHEESAN 13-04-10 PRINCIPAL DESIGN MANAGER DATE
Original Signed by P.SHERRIFF 12-04-10 CLIENT DELEGATE DATE

Queensland Urban Utilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE PUMP No2 SCHEMATIC DIAGRAM

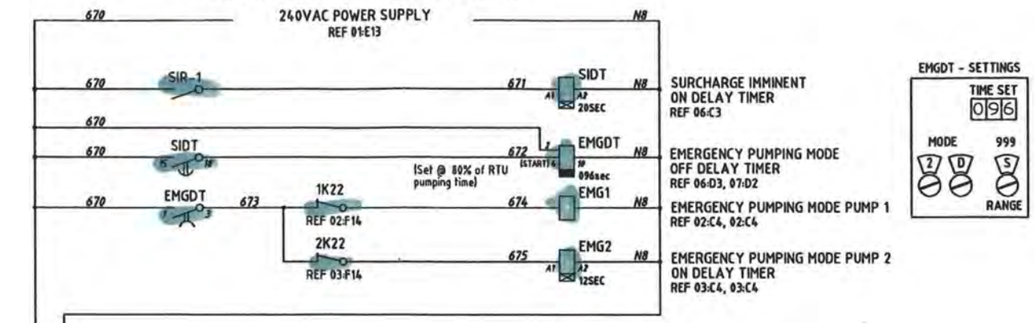
SHEET No. 3
Queensland Urban Utilities DRAWING No. 486/5/7-0181-000
AMEND. A

Q:\194 WATER SUPPLY\SS Drafting\6248 Plans\Electrical\2. SEWERAGE\NETWORKS\SP140 Cullen Ave West\Reliability Improvement\For Construction\57-0181set_A.dwg Last Saved by 078548 on Friday, 30 April 2010 9:32:58 AM

tested on the 17/6/10 by Brendan Stringer 114766

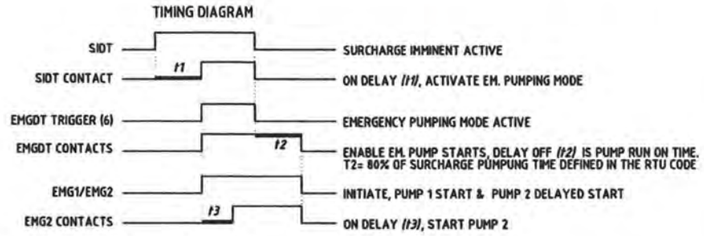
COMMON CONTROL SECTION

EMERGENCY PUMPING MODE (240VAC)



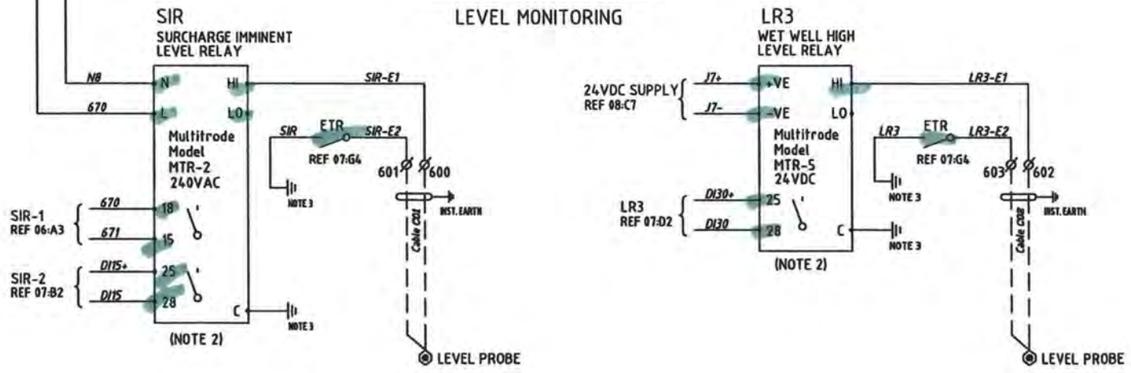
EMGDT - SETTINGS
TIME SET 096
MODE 999
RANGE

TIMING DIAGRAM



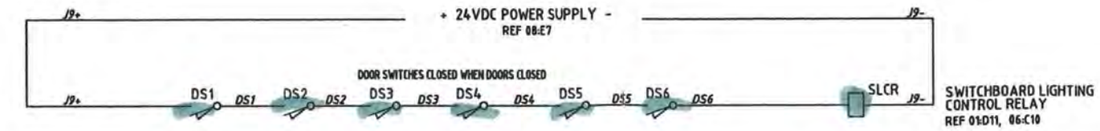
COMMON CONTROL SECTION

LEVEL MONITORING

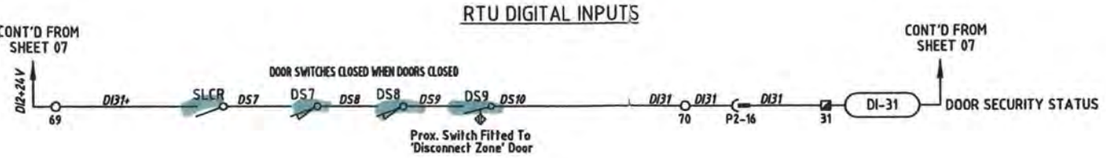


COMMON CONTROL SECTION

SWITCHBOARD INTERNAL LIGHTING

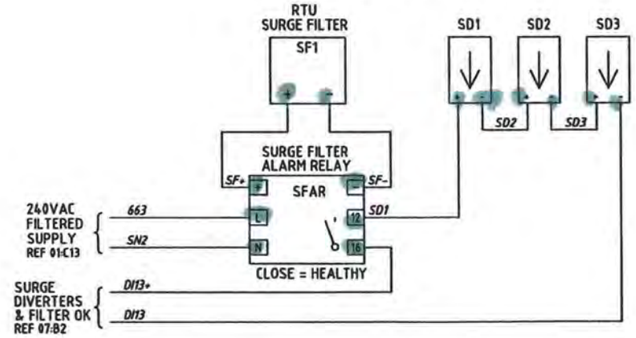


RTU DIGITAL INPUTS



ATS SECTION

SURGE DIVERTERS



LEGEND:

- ▲ SWITCHBOARD POWER TERMINAL
- ⌀ SWITCHBOARD CONTROL TERMINAL
- □ SWITCHBOARD GENERATOR TERM.
- ⊠ FIELD TERMINAL
- ◧ PLC TERMINAL
- ◪ RTU TERMINAL
- ■ SS TERMINAL
- ● PLC/RTU MARSH. FUSE TERMINAL
- ○ PLC/RTU MARSH. LINK TERMINAL
- TO RTU → DISCONNECT PLUG
- DI1-02 RTU DIGITAL INPUT
- DO1-02 RTU DIGITAL OUTPUT
- AI1-02 RTU ANALOGUE INPUT
- AO1-02 RTU ANALOGUE OUTPUT

NOTES

1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
2. SET DIPSWITCH TO 'DISCHARGE' MODE.
3. RUN SEPARATE DEDICATED EARTH CONDUCTOR TO EARTH BAR.

Sheet 06

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
	...10	ISSUED FOR CONSTRUCTION	P.H.	A.W.
O	04.10	ISSUED FOR TENDER	P.H.	A.W.

DRAFTED	P.HAGUE	Original Signed by G.ANDERSON 09-04-10	Original Signed by K.VAHEESAN 13-04-10
DRAFTING CHECK	A.WITTHOFT	DESIGN R.P.E.Q. No. DATE	PRINCIPAL DESIGN MANAGER DATE
CAD FILE	57-0181set_A	Original signed by A.WITTHOFT 8895 09-04-10	Original Signed by P.SHERRIFF 12-04-10
B.C.C. FILE No.		DESIGN CHECK R.P.E.Q. No. DATE	CLIENT DELEGATE DATE

QUEENSLAND UrbanUtilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE: SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE: COMMON CONTROLS SCHEMATIC DIAGRAM

SHEET No. 6

Queensland Urban Utilities DRAWING No. 486/5/7-0181-000

AMEND. A

STD TEMPLATE SP-3P-35 Ver1.02

Q:\194 WATER SUPP\288 Dra/Eng\6248 Plans\Electrical\2. SEWERAGENETWORKS\SP140 Cullen Ave West\Reliability Improvement\For Construction\57-0181set_A.dwg Last Saved by 078549 on Friday, 30 April 2010 9:32:56 AM

RTU DIGITAL INPUTS

CONT'D FROM SHEET 02

CONT'D FROM SHEET 02

DI1-24V	PFRE	DI-10	SPARE	
	PFRS	DI-11	ENERGEX MAINS POWER	REF 01:F4
	SFAR	DI-12	STATION MAINS POWER	REF 01:D7
	SD1,2&3	DI-13	SURGE DIVERTERS OK	REF 06:F11
	LOC REM S10	DI-14	STATION LOCAL/REMOTE SWITCH	
	SIR-2	DI-15	SURCHARGE IMMINENT	REF 06:G2

CONT'D FROM SHEET 03

CONT'D FROM SHEET 03

DI2-24V		DI-26	SPARE	
	BOK	DI-27	RTU BATTERY OK	REF 08:C4
	RTU	DI-28	RTU CONTROL POWER	REF 08:C4
	EMGDT	DI-29	EMERGENCY PUMPING MODE	REF 06:C6
	LR3	DI-30	WET WELL HIGH LEVEL	REF 06:F6

CONT'D ON SHEET 06

CONT'D ON SHEET 06

+ 24VDC POWER SUPPLY - REFER SHEET 08:C7

DI3-24V	Q2 REF 01:H6	DI-32	NORMAL SUPPLY CB CLOSED
		DI-33	DI33 TO DI41 SPARES RESERVED FOR GENERATOR CONTROL
		DI-41	
		DI-42	SPARE - RESERVED FOR VALVE PIT HIGH LEVEL
		DI-43	SPARE RESERVED FOR CP
		DI-44	DI44 TO DI47 SPARES RESERVED FOR DRY WELL SUMP PUMP
		DI-47	

RTU DIGITAL OUTPUTS

CONT'D FROM SHEET 02

CONT'D FROM SHEET 02

DO1-24V	DO-04 4 NO	ETR	DO1-COM	ELECTRODE TEST RELAY REF 06:F4, 06:F8
	DO-05 5 NO			SPARE RESERVED FOR WELL WASHER
	DO-06 6 NO			SPARE - RESERVED FOR DRY WELL ALARM STROBE
	DO-07 7 NO			SPARE - RESERVED FOR ODOUR CONTROL UNIT

CONT'D FROM SHEET 03

CONT'D FROM SHEET 03

DO2-24V	DO-12 12 NO	DO2-COM	SPARE - RESERVED FOR GEN. CONTROL
	DO-13 13 NO		SPARE RESERVED FOR CP
	DO-14 14 NO		SPARE RESERVED FOR CP
	DO-15 15 NO		SPARE

RTU ANALOG INPUTS

24VDC SUPPLY REF 08:C7

ANALOG LEVEL METER — TERMINAL HOUSING — FMX21 TRANSMITTER

AI1-24V	AI00	500mA	AI00 PS-01	PRIMARY WET WELL LEVEL
AI1-COM			AI00 PS-02	
AI1-24V	ADJ. UNIT — TRANSMITTER			
	AI01	500mA	AI01 PS-03	DELIVERY PRESSURE
AI1-COM			AI01 PS-04	
AI1+24V	AI02	500mA	AI02 PS-05	RESERVED FOR EMERGENCY STORAGE LEVEL
			AI02 PS-06	
AI1+24V	AI03	500mA	AI03 PS-07	SPARE
			AI03 PS-08	
AI1+24V	AI04	500mA	AI04 PS-09	RESERVED FOR GENERATOR FUEL LEVEL
			AI04 PS-10	
AI1+24V	AI05	500mA	AI05 PS-11	RESERVED FOR SECONARY WET WELL LEVEL
			AI05 PS-12	
	AI06	500mA	AI06 PS-13	RESERVED FOR RECTIFIER CURRENT
			AI06 PS-14	
	AI07	500mA	AI07 PS-15	RESERVED FOR DELIVERY FLOWMETER
			AI07 PS-16	

RTU ANALOG OUTPUTS

RESERVED FOR CHEMICAL DOSING PUMP SPEED REFERENCE — AO-03 — AO3+ PS-07 — AO3- PS-08 — 500mA

Tested on the 17/6/10 by Brendan Stringer 114766

NOTES

1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.

LEGEND:

- ▲ SWITCHBOARD POWER TERMINAL
- ⌀ SWITCHBOARD CONTROL TERMINAL
- □ SWITCHBOARD GENERATOR TERM.
- ⊠ FIELD TERMINAL
- ◧ PLC TERMINAL
- ◪ RTU TERMINAL
- ■ SS TERMINAL
- ● PLC/RTU MARSH. FUSE TERMINAL
- ○ PLC/RTU MARSH. LINK TERMINAL
- TO RTU —⊃— DISCONNECT PLUG
- DI1-02 RTU DIGITAL INPUT
- DO1-02 RTU DIGITAL OUTPUT
- AI1-02 RTU ANALOGUE INPUT
- AO1-02 RTU ANALOGUE OUTPUT

Sheet 07

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
.10		ISSUED FOR CONSTRUCTION	P.H.	A.W.
0	04.10	ISSUED FOR TENDER	P.H.	A.W.

DRAFTED P.HAGUE — Original Signed by G.ANDERSON 09-04-10 DESIGN R.P.E.Q. No. DATE

DRAFTING CHECK A.WITTHOFT — Original signed by A.WITTHOFT 8895 09-04-10 DESIGN CHECK R.P.E.Q. No. DATE

CAD FILE S7-0181set_A — B.C.C. FILE No.

Original Signed by K.VAHEESAN 13-04-10 PRINCIPAL DESIGN MANAGER DATE

Original Signed by P.SHERRIFF 12-04-10 CLIENT DELEGATE DATE

Queensland Urban Utilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE: SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE: COMMON RTU I/O SCHEMATIC DIAGRAM

SHEET No. 7

Queensland Urban Utilities DRAWING No. 486/5/7-0181-000

AMEND. A

tested on 17/6/10 by Brendan Stringer 114766

POWERBOX
PB251-24CM-CC-T

PS1
LOAD
BATT

SHROUD
240VAC FILTERED SUPPLY
REF 01:D12
COMMON CONTROLS SECTION

BOK
BATTERY OK
REF 07:C2
0 = Fault, 1 = Healthy

RTU
POWER ON
REF 07:C2
0 = Fault, 1 = Healthy

TEMPERATURE PROBE LOCATED AT BATTERIES

RTU POWER SUPPLY
10A 24VDC

24V DC / 13.8V DC

Rx TBA
Tx TBA
SD
RADIO

PIN-OUT FOR RADIO CONNECTION

RADIO	MD3311
DB9-M-1	DB9-F-1
DB9-M-2	DB9-F-2
DB9-M-3	DB9-F-3
DB9-M-4	DB9-F-4
DB9-M-5	DB9-F-5
DB9-M-6	DB9-F-6
DB9-M-7	DB9-F-7
DB9-M-8	DB9-F-8
DB9-M-9	DB9-F-9

DISCONNECT PLUG 6
P6-20
P6-19
P6-18
RS485-
RS485+ Cable 18
TO GRAPHIC DISPLAY REF 08:H10

GSM ANTENNA
GSM MODEM
SUB MDIS
11A+ 0.8AMP 11+
20+
20-
11-
24VDC SUPPLY REF 08:F8
TERMINALS "20" MOUNTED ADJACENT TO GSM MODEM

DISCONNECT PLUG 6
P6-13
P6-14

RS485-
RS485+
NOT AVAILABLE CONFIGURED FOR RS232
NOT AVAILABLE CONFIGURED FOR RS485

REFER TO SHEET 12

PIN-OUT FOR GSM CONNECTION

MODEM	MD3311
HD15-1	DB9-F-1
HD15-2	DB9-F-2
HD15-3	DB9-F-3
HD15-4	DB9-F-4
HD15-5	DB9-F-5
HD15-6	DB9-F-6
HD15-7	DB9-F-7
HD15-8	DB9-F-8
HD15-9	DB9-F-9
HD15-10	
HD15-11	
HD15-12	
HD15-13	
HD15-14	
HD15-15	

ON/OFF SWITCH
TB1 + E3 -
POWER SUPPLY CONNECTOR
TB2 - + NC - + NC TB3
P2 P1
RS 485 PORTS
P3 P2 P1
RS 232 PORTS
*0- *1- *2- *3- *4- *5- *6- *7- E4
ANALOGUE INPUTS

EXTERNAL I/O BOARD CONNECTOR

RTU
LOGICA CMG - MD3311E 24VDC - MOTHER BOARD

DIGITAL INPUTS (MODULE No. 1)
E1 COM 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
REFER TO SHEET 09

DIGITAL OUTPUTS (MODULE No. 1)
E2 7 6 5 4 3 2 1 0 COM
REFER TO SHEET 11

REFER TO SHEET 10
32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 COM E7
DIGITAL INPUTS (MODULE No. 3)

REFER TO SHEET 12
0 1 2 3 COM E8
ANALOGUE OUTPUTS

EXTERNAL I/O BOARD CONNECTOR

RTU
LOGICA CMG - MD3311E 24VDC - EXTENSION BOARD

DIGITAL INPUTS (MODULE No. 2)
E5 COM 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16
REFER TO SHEET 10

DIGITAL OUTPUTS (MODULE No. 2)
E6 15 14 13 12 11 10 9 8 COM
REFER TO SHEET 11

J10+
J10-
GRAPHIC DISPLAY
REDLION G306A000
RJ45
1 8 E

FROM RTU REF 08:A13
RS485+
RS485- Cable 18
RS485A+
RS485A- Cable 17
TO SOFT STARTER 1 REF 02:E5

PORT 1
CONFIGURED FOR LAPTOP CONNECTION
LOGICA CMG - MD3311E 24VDC ETHERNET BOARD
PORT 2

5AMP
J3+ 3+
J3- 3-
J4+ 4+
J4- 4-
J4A+
J4A-

J5+ 5+
J5- 5-

J6+ 6+ RTU 24VDC CARD SUPPLY REF 02:A13
J6- 6-

J7+ 7+ WET WELL HIGH LEVEL RELAY LR3 REF 06:F7
J7- 7-

8+ SPARE RESERVED FOR DRY WELL LEVEL RELAY LR2
8-

J9+ 9+ COMMON CONTROLS REF 05:H10, 06:B12
J9- 9-

J10+ 10+
J10- 10-

J11+ 11+ MODEM REF 08:B15
J11- 11-

13+ SPARE RESERVED FOR FLOWMETER
13-

14+ SPARE RESERVED FOR VALVE PIT HIGH LEVEL
14-

15+ SPARE RESERVED FOR ULTRASONIC WET WELL LEVEL
15-

16+ SPARE RESERVED FOR WELL WASHER
16-

17+ SPARE RESERVED FOR STATION MANHOLE SURCHARGE IMMINENT
17-

18+ SPARE
18-

RTU
TB2 P2 + -
GRAPHIC DISPLAY
RJ45 1 8
SOFT STARTER 1
SOFT STARTER 2
RS485 1 2 3 4
Do Not Earth
TERMINALS
PLUG 6
18 19 20
RS485- Bk
RS485+ W
Cable 18
RS485A-
RS485A+
Cable 17
RS485B- Bk
RS485B+ W
Cable 18
Set terminating switch to 'OFF'
Set terminating switch to 'ON'
Use 120ohm Impedence Twisted Pair Cable
MODBUS CONNECTIONS

LEGEND:
- SWITCHBOARD POWER TERMINAL
- SWITCHBOARD CONTROL TERMINAL
- SWITCHBOARD GENERATOR TERM.
- FIELD TERMINAL
- PLC TERMINAL
- RTU TERMINAL
- SS TERMINAL
- PLC/RTU MARSH. FUSE TERMINAL
- PLC/RTU MARSH. LINK TERMINAL
- TO RTU — DISCONNECT PLUG
- DI1-02 RTU DIGITAL INPUT
- DO1-02 RTU DIGITAL OUTPUT
- AI1-02 RTU ANALOGUE INPUT
- AO1-02 RTU ANALOGUE OUTPUT

NOTES
1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
2. ALL FUSES ARE 500mA EXCEPT WHERE NOTED OTHERWISE.

Sheet 08
FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
P	04.10	ISSUED FOR CONSTRUCTION	P.H.	A.W.
O	04.10	ISSUED FOR TENDER	P.H.	A.W.

DRAFTED	P.HAGUE	Original Signed by G.ANDERSON	09-04-10
DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No. DATE
CAD FILE	57-0181set_A	Original signed by A.WITTHOFT	8895 09-04-10
B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No. DATE

Original Signed by K.VAHEESAN	13-04-10
PRINCIPAL DESIGN MANAGER	DATE
Original Signed by P.SHERRIFF	12-04-10
CLIENT DELEGATE	DATE

Queensland Urban Utilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE: SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE: RTU POWER DISTRIBUTION SCHEMATIC DIAGRAM

SHEET No. 8
Queensland Urban Utilities DRAWING No. 486/5/7-0181-000
AMEND. A

STD TEMPLATE SP-JP-26 Ver1.0

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RTU COMPARTMENT

MITS RTU
MD3311 EA

SWITCHBOARD

FIELD

RTU POWER SUPPLIES

24VDC

Tested on the 17/6/10 by Brendan Stringer 114766

REFER SHEET 08

LINK BARS

STARTER COMPARTMENT
PUMP 1
REFER SHEET 02

- DI00 — 1K5 — CONTROL POWER
- DI01 — 1S1 — START PUSHBUTTON
- DI02 — 1S2 — STOP PUSHBUTTON
- DI03 — 1S3 — E/STOP PUSHBUTTON
- DI04 — 1S4 — RESET PUSHBUTTON
- DI05 — 1K2 — PUMP RUNNING
- DI06 — 1K3 — STARTER FAULT

16 CHANNEL DIGITAL INPUT MODULE 1

DISCONNECT PLUG 1

DI1

CONT ON SHEET 10

COMMON COMPARTMENT

- DI11 — PFBE — ENERGEX MAINS POWER — REF 01:G4
- DI12 — PFBS — STATION MAINS POWER — REF 01:E9

ATS COMPARTMENT

- DI13 — SFAR — SURGE DIVERTERS OK — REF 06:F13

STARTER COMPARTMENT

- DI14 — S10 LOC REM — STATION LOCAL/REMOTE SWITCH

COMMON COMPARTMENT

- DI15 — SIR — SURCHARGE IMMINENT — REF 06:G2

LEGEND:

- C?? — CABLE IDENTIFIER
- TO RTU — DISCONNECT PLUG
- FUSE TERMINAL
- DISCONNECT LINK TERMINAL

NOTES

1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
2. ALL FUSES ARE 500mA EXCEPT WHERE NOTED OTHERWISE.

Sheet 09

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DRAFTING CHECK A.WITTHOFT
CAD FILE 57-0181set_A
B.C.C. FILE No.

Original Signed by G.ANDERSON 09-04-10 — DESIGN — R.P.E.Q.No. — DATE
Original signed by A.WITTHOFT 5895 09-04-10 — DESIGN CHECK — R.P.E.Q.No. — DATE

Original Signed by K.VAHEESAN 13-04-10 — PRINCIPAL DESIGN MANAGER — DATE
Original Signed by P.SHERRIFF 12-04-10 — CLIENT DELEGATE — DATE

QUEENSLAND Urban Utilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE: SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE: RTU DIGITAL INPUTS TERMINATION DIAGRAM

SHEET No. 9

Queensland Urban Utilities DRAWING No. 486/5/7-0181-000

AMEND. A

RTU COMPARTMENT

MITS RTU
MD3311 EA

16 CHANNEL DIGITAL INPUT MODULE 2

DISCONNECT PLUG 2

DI2

CONT ON SHEET 09

DI16	16	DI16	Plug 1	2A 36			
DI17	17	DI17	2	37			
DI18	18	DI18	3	38	DI16+	DI16	Gy
DI19	19	DI19	4	39			
DI20	20	DI20	5	40	DI17+	DI17	Gy
DI21	21	DI21	6	41			
DI22	22	DI22	7	42	DI18+	DI18	Gy
DI23	23	DI23	8	43			
DI24	24	DI24	9	44	DI19+	DI19	Gy
DI25	25	DI25	10	45			
DI26	26	DI26	11	46	DI20+	DI20	Gy
DI27	27	DI27	12	47			
DI28	28	DI28	13	48	DI21+	DI21	Gy
DI29	29	DI29	14	49			
DI30	30	DI30	15	50	DI22+	DI22	Gy
DI31	31	DI31	16	51			
			17	52			
			18	53			
COM		DI2-COM V	19	54			
ES		E	20	55			
				56			
				57			
				58			
				59			
				60			
				61	DI27+	DI27	Gy
				62			
				63	DI28+	DI28	Gy
				64			
				65	DI29+	DI29	Gy
				66			
				67	DI30+	DI30	Gy
				68			
				69	DI31+	DI31	Gy
				70			

0 DI2-24V
V DI2-COM

0 DI2+ 0
V DI2- V

LINK BARS

STARTER COMPARTMENT

PUMP 2

REFER SHEET 03

DI16+ / DI16	2K5	CONTROL POWER
DI17+ / DI17	2S1	START PUSHBUTTON
DI18+ / DI18	2S2	STOP PUSHBUTTON
DI19+ / DI19	2S3	E/STOP PUSHBUTTON
DI20+ / DI20	2S4	RESET PUSHBUTTON
DI21+ / DI21	2K2	PUMP RUNNING
DI22+ / DI22	2K3	STARTER FAULT

SWITCHBOARD

FIELD

tested on the 17/6/10
by Brendan Stringer
114766

RTU COMPARTMENT

DI27+ / DI27	BOK	RTU BATTERY OK REF 08:C3
DI28+ / DI28	RTU	RTU CONTROL POWER REF 08:C3

COMMON COMPARTMENT

DI29+ / DI29	EMGDT	EMERGENCY PUMPING MODE REF 06:C6
DI30+ / DI30	LR3	WET WELL HIGH LEVEL REFER 06:G7
DI31+ / DI31	SLCR	DOOR SECURITY STATUS REF 06:C15
DS	3 Off	

DI32+ / DI32	Q2	NORMAL SUPPLY CB CLOSED

16 CHANNEL DIGITAL INPUT MODULE 3

DISCONNECT PLUG 3

DI3

DI32	32	DI32	Plug 1	2A 71			
DI33	33	DI33	2	72			
DI34	34	DI34	3	73	DI32+	DI32	
DI35	35	DI35	4	74			
DI36	36	DI36	5	75	DI33+	DI33	
DI37	37	DI37	6	76			
DI38	38	DI38	7	77	DI34+	DI34	
DI39	39	DI39	8	78			
DI40	40	DI40	9	79	DI35+	DI35	
DI41	41	DI41	10	80			
DI42	42	DI42	11	81	DI36+	DI36	
DI43	43	DI43	12	82			
DI44	44	DI44	13	83	DI37+	DI37	
DI45	45	DI45	14	84			
DI46	46	DI46	15	85	DI38+	DI38	
DI47	47	DI47	16	86			
			17	87			
			18	88			
COM		DI3-COM V	19	89			
E7		E	20	90			
				91			
				92	DI39+	DI39	
				93			
				94	DI40+	DI40	
				95			
				96	DI41+	DI41	
				97			
				98	DI42+	DI42	
				99			
				100	DI43+	DI43	
				101			
				102	DI44+	DI44	
				103			
				104	DI45+	DI45	

0 DI3+24V
V DI3-COM

0 DI3+ 0
V DI3- V

LINK BARS

CONT ON SHEET 11

NOTES

1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
2. ALL FUSES ARE 500mA EXCEPT WHERE NOTED OTHERWISE.

LEGEND:

- C?? — CABLE IDENTIFIER
- TO RTU → — DISCONNECT PLUG
- 5 — FUSE TERMINAL
- 5 — DISCONNECT LINK TERMINAL

Sheet 10

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
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DRAFTING CHECK	A.WITTHOFT		
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Original signed by A.WITTHOFT	8895	09-04-10	
DESIGN CHECK	R.P.E.Q. No.	DATE	
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PRINCIPAL DESIGN MANAGER		DATE	
Original Signed by P.SHERRIFF		12-04-10	
CLIENT DELEGATE		DATE	

QUEENSLAND Urban Utilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE: SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE: RTU DIGITAL INPUTS TERMINATION DIAGRAM

SHEET No. 10

Queensland Urban Utilities DRAWING No. 486/5/7-0181-000

AMEND. A

STD TEMPLATE SP-3P-25 Ver1.0

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Tested on
17/6/10 by Brendan Stringer
114766

RTU COMPARTMENT
MITS RTU
MD3311 EA

CONT ON SHEET 10

SWITCHBOARD

FIELD

8 CHANNEL DIGITAL OUTPUT MODULE 1

DO00 00 COM NC NO — DO00
DO01 01 COM NC NO — DO01
DO02 02 COM NC NO — DO02
DO03 03 COM NC NO — DO03
DO04 04 COM NC NO — DO04
DO05 05 COM NC NO — DO05
DO06 06 COM NC NO — DO06
DO07 07 COM NC NO — DO07
E2 — E

DO1+24V 0
Plug Block
1 2 3 4 5 6 7 8 9 10
DO1+24V 0
DO1-COM V

DISCONNECT PLUG 4

DO1
2A 105 DO1+24V 0
106 DO1-COM V
107 DO00
108 DO00-
109 DO01
110 DO01-
111 DO02
112 DO02-
113
114
115 DO04
116 DO04-
117
118
119
120
121
122

LINK BARS

Gy Gy Gy Gy

STARTER COMPARTMENT

DO00 / DO00- — 1K20 — PUMP 1 RUN COMMAND REFER 02:F14
DO01 / DO01- — 1K21 — PUMP 1 FAULT RESET REFER 02:F14
DO02 / DO02- — 1K22 — PUMP 1 EMERGENCY MODE INTERRUPT REFER 02:F14

COMMON COMPARTMENT

DO04 / DO04- — ETR — ELECTRODE TEST RELAY REFER 07:G4

8 CHANNEL DIGITAL OUTPUT MODULE 2

DO08 08 COM NC NO — DO08
DO09 09 COM NC NO — DO09
DO10 10 COM NC NO — DO10
DO11 11 COM NC NO — DO11
DO12 12 COM NC NO — DO12
DO13 13 COM NC NO — DO13
DO14 14 COM NC NO — DO14
DO15 15 COM NC NO — DO15
E6 — E

DO2+24V 0
Plug Block
11 12 13 14 15 16 17 18 19 20
DO2+24V 0
DO2-COM V

DISCONNECT PLUG 4

DO2
2A 123 DO2+24V 0
124 DO2-COM V
125 DO08
126 DO08-
127 DO09
128 DO09-
129 DO10
130 DO10-
131
132
133
134
135
136
137
138
139
140

LINK BARS

Gy Gy Gy

STARTER COMPARTMENT

DO08 / DO08- — 2K20 — PUMP 2 RUN COMMAND REFER 03:F14
DO09 / DO09- — 2K21 — PUMP 2 FAULT RESET REFER 03:F14
DO10 / DO10- — 2K22 — PUMP 2 EMERGENCY MODE INTERRUPT REFER 03:F14

CONT ON SHEET 12

LEGEND:
- C?? — CABLE IDENTIFIER
- TO RTU — DISCONNECT PLUG
- Ø — SWITCHBOARD CONTROL TERMINAL
- 5 — FUSE TERMINAL
- 5 — DISCONNECT LINK TERMINAL

NOTES
1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
2. ALL FUSES ARE 500mA EXCEPT WHERE NOTED OTHERWISE.

Sheet 11

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CAD FILE	57-0181set_A	Original signed by A.WITTHOFT 8895	09-04-10
B.C.C. FILE No.		DESIGN CHECK R.P.E.Q. No.	DATE

Original Signed by K.VAHEESAN	13-04-10
PRINCIPAL DESIGN MANAGER	DATE
Original Signed by P.SHERRIFF	12-04-10
CLIENT DELEGATE	DATE

QUEENSLAND Urban Utilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE: SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE: RTU DIGITAL OUTPUTS TERMINATION DIAGRAM

SHEET No. 11
Queensland Urban Utilities DRAWING No. 486/5/7-0181-000
AMEND. A

STB TEMPLATE SP-JP-SS Ver1.0

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SWITCHBOARD

FIELD

RTU COMPARTMENT

MITS RTU
MD3311 EA

CONT ON SHEET 11

AI1

8 CHANNEL ANALOG INPUT MODULE 1

AI00	0	AI00+	AI00-
AI01	1	AI01+	AI01-
AI02	2	AI02+	AI02-
AI03	3	AI03+	AI03-
AI04	4	AI04+	AI04-
AI05	5	AI05+	AI05-
AI06	6	AI06+	AI06-
AI07	7	AI07+	AI07-
E4		E	

Plug / Block

DISCONNECT PLUG 5

2A	141	J6+ 0
	142	J6- V
	143	AI00A
	144	AI01A
	145	
	146	
	147	
	148	
	149	AI00C
	150	
	Screen	
	151	AI01B
	152	
	Screen	
	153	
	154	
	Screen	
	155	
	156	
	Screen	
	157	
	158	
	Screen	
	159	
	160	
	Screen	
	161	
	162	
	Screen	
	163	
	164	
	Screen	

NOTE 2

TO INSULATED INSTRUMENT EARTH

USE SCREENED CABLES

COMMON COMPARTMENT

ANALOG LEVEL METER

AI00A
AI00B
AI00C
AI00A

608
609
610
Screen

AI00B
AI00C

TERMINAL HOUSING

+
-
E
Breather

R
Bk

I1

PRIMARY WET WELL LEVEL TRANSMITTER

AI01A
AI01B

ADJ. UNIT - VEGADIS12

10+
11-

1
2
3

Br+
Bl-
G

INST. EARTH

Breather

I2

DELIVERY PRESSURE TRANSMITTER

Tested on 17/6/10
by Brendan Stringer 1147 66

NOTES

1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
2. ALL FUSES ARE 500mA EXCEPT WHERE NOTED OTHERWISE.

A01

8 CHANNEL ANALOG OUTPUT MODULE 1

A000	0	A000+	A000-
A001	1	A001+	A001-
A002	2	A002+	A002-
A003	3	A003+	A003-
E8		E	

Plug / Block

DISCONNECT PLUG 6

0 V	A01+24V	A01-COM
	A000+	A000-
	A001+	A001-
	A002+	A002-
	A003+	A003-

	165 2A	J6+ 0
	166	J6- V
	167	
	168	
	Screen	
	169	
	170	
	Screen	
	171	
	172	
	Screen	
	173	
	174	
	Screen	

NOTE 2

TO INSULATED INSTRUMENT EARTH

USE SCREENED CABLES

REFER SHEET 08:B7

RTU TB1 POWER SUPPLY
REF 08:B11

0 V	J5+	12	J5+	0 V
	J5-	13	J5-	

RTU TB2 COMMS PORT2
REF 08:A11

RS485+	18	RS485+	I6	PUMP 1 SOFT STARTER REF 02:E6
RS485-	19	RS485-		

DISCONNECT PLUG 6

LEGEND:

C??	CABLE IDENTIFIER
TO RTU	DISCONNECT PLUG
5	FUSE TERMINAL
5	DISCONNECT LINK TERMINAL
5	EARTH TERMINAL

Sheet 12

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QUEENSLAND Urban Utilities
A DIVISION OF THE BRISBANE CITY COUNCIL

SITE
SP140
CULLEN AVE WEST
SEWAGE PUMP STATION

TITLE
RTU ANALOGS & MISCELLANEOUS TERMINATION DIAGRAM

SHEET No. 12

Queensland Urban Utilities DRAWING No.
486/5/7-0181-000

AMEND.
A

STD TEMPLATE SP-SP-05 Ver1.2

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5J Electric 7623
Brendan Stringer 114766
17/6/10

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QUEENSLAND UrbanUtilities
ABN 72 002 765 795

SP140 CULLEN AVE WEST SEWAGE PUMPING STATION

SITE COVER SHEET

ELECTRICAL DRAWINGS INDEX

DWG N°.	TITLE	SHEET	REVISIONS
486/5/7-0181-000	SITE COVER SHEET	00	0 A
486/5/7-0181-001	POWER DISTRIBUTION SCHEMATIC DIAGRAM	01	0 A
486/5/7-0181-002	PUMP 01 SCHEMATIC DIAGRAM	02	0 A
486/5/7-0181-003	PUMP 02 SCHEMATIC DIAGRAM	03	0 A
486/5/7-0181-004	*RESERVED (SUMP PUMP)*	04	
486/5/7-0181-005	*RESERVED (GENERATOR CONTROL)*	05	
486/5/7-0181-006	COMMON CONTROLS SCHEMATIC DIAGRAM	06	0 A
486/5/7-0181-007	COMMON RTU I/O SCHEMATIC DIAGRAM	07	0 A
486/5/7-0181-008	RTU POWER DISTRIBUTION SCHEMATIC DIAGRAM	08	0 A
486/5/7-0181-009	RTU DIGITAL INPUTS TERMINATION DIAGRAM	09	0 A
486/5/7-0181-010	RTU DIGITAL INPUTS TERMINATION DIAGRAM	10	0 A
486/5/7-0181-011	RTU DIGITAL OUTPUTS TERMINATION DIAGRAM	11	0 A
486/5/7-0181-012	RTU ANALOGS & MISCELLANEOUS TERMINATION DIAGRAM	12	0 A
486/5/7-0181-013	*RESERVED (COMMON CONTROLS TERMINATION DIAGRAM)*	13	
486/5/7-0181-014	EQUIPMENT LIST	14	0 A
486/5/7-0181-015	CABLE SCHEDULE	15	0 A
486/5/7-0181-016	SWITCHBOARD LABEL SCHEDULE	16	0 A
486/5/7-0181-017	SWITCHBOARD CONSTRUCTION DETAILS	17	0 A
486/5/7-0181-018	SWITCHBOARD CONSTRUCTION DETAILS	18	0 A
486/5/7-0181-019	LEVEL PROBES AND PRESSURE TRANSMITTER INSTALLATION DETAILS	19	0 A
486/5/7-0181-020	*RESERVED (CATHODIC PROTECTION UNIT)*	20	
486/5/7-0181-021	*RESERVED (FIELD DISCONNECTION BOX)*	21	
486/5/7-0181-022	SWITCHBOARD GENERAL ARRANGEMENT ELEVATIONS - DOUBLE SIDED	22	0 A
486/5/7-0181-023	SWITCHBOARD GENERAL ARRANGEMENT SECTIONS - DOUBLE SIDED	23	0 A
486/5/7-0181-024	*RESERVED (GENERATOR EXTERNAL CONNECTION BOX)*	24	
486/5/7-0181-025	SLAB & CONDUIT DETAILS - SHEET 1 of 3	25	0 A
486/5/7-0181-026	SLAB & CONDUIT DETAILS - SHEET 2 of 3	26	0 A
486/5/7-0181-027	SLAB & CONDUIT DETAILS - SHEET 3 of 3	27	0 A

STANDARD VARIABLES

DESCRIPTION	VALUES
CT METERING ISOLATOR	*NOT APPLICABLE*
NORMAL SUPPLY MAIN SWITCH	125A S250PE/125
GENERATOR SUPPLY MAIN SWITCH	125A S250PE/125
PUMP1 CIRCUIT BREAKER	20A S125GJ/20
PUMP2 CIRCUIT BREAKER	20A S125GJ/20
DRY WELL SUMP PUMP CIRCUIT BREAKER	*NOT APPLICABLE*
PUMP SOFT STARTER SIZE	MSF-017 + Max 7.5kW
PUMP RATING	4.6kW 10.5A
PUMP LINE CONTACTOR	CA7-9
PUMP BYPASS CONTACTOR	CA7-9
SUMP PUMP RATING	*NOT APPLICABLE*
SUMP PUMP CONTACTOR & TOL	*NOT APPLICABLE*
PUMP SOCKET OUTLET + INCLINE SLEEVE	DS1 3114013972 + 51BA058
PUMP INLET PLUG + HANDLE	DS1 3118013972 + 311A013
WET WELL LEVEL TRANSMITTER	FMX21.AA.2.2.1H.G.D.11.A.POPS 3m
EMERGENCY STORAGE WELL LEVEL TRANSMITTER	*NOT APPLICABLE*
DELIVERY PRESSURE TRANSMITTER	BR74XXGG1FHA2X 50m
WET WELL ULTRASONIC LEVEL SENSOR	*NOT APPLICABLE*
FLOWMETER RANGE	*NOT APPLICABLE*
RADIO	DR900-06A02-D0
EMERGENCY PUMPING TIME	096sec
No of SINGLE POINT PROBES	2
INCOMING MAINS SUPPLY CABLE	$16mm^2$
MAIN EARTHING CABLE	$6mm^2$
INCOMING GENERATOR SUPPLY CABLE	*NOT APPLICABLE*
SOFT STARTER 3 PHASE SUPPLY	$4mm^2$

STANDARD DESIGN OPTIONS

OPTION	DESCRIPTION	FITTED
A	*INDIVIDUAL PUMP MOISTURE IN OIL (MIO) SENSOR AND FAULT RELAY*	YES NO
B	*INDIVIDUAL PUMP MOTOR AUX PROTECTION SENSORS AND FAULT RELAYS*	YES NO
C	*INDIVIDUAL PUMP REFLUX VALVE MICROSWITCH*	YES NO
D	*STATION MANHOLE SURCHARGE IMMINENT*	YES NO
E	*STATION DRY WELL SUMP PUMP AND LEVEL INDICATION SENSORS AND RELAYS*	YES NO
F	*STATION PERMANENT GENERATOR - ATS AND CONTROL CONNECTIONS*	YES NO
G	*STATION EMERGENCY STORAGE LEVEL SENSOR*	YES NO
H	*STATION DELIVERY FLOWMETER*	YES NO
I	BACKUP COMMUNICATION - GSM	YES (SELECTED)
J	PUMP CONNECTION (Via De-contactors)	YES (SELECTED)
K	*CATHODIC PROTECTION*	YES NO
L	MOTOR THERMISTORS (Via De-contactors)	YES (SELECTED)
M	*ODOUR CONTROL*	YES NO
N	*CURRENT TRANSFORMER (CT) METERING*	YES NO
O	*PUMPS ELECTRICAL INTERLOCK*	YES NO
P	*WET WELL WASHER*	YES NO
Q	*AUX PIT SUMP PUMP AND LEVEL PROBE*	YES NO
R	TELEMETRY RADIO	YES (SELECTED)
S	*WET WELL ULTRASONIC LEVEL SENSOR*	YES NO
T	DOUBLE SIDED SWITCHBOARD PLINTH EXTENSION FITTED	YES (SELECTED)
U	DELIVERY PRESSURE TRANSMITTER	YES (SELECTED)
V	*CHEMICAL DOSING*	YES NO

Sheet 00

FOR CONSTRUCTION

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0	04.10	ISSUED FOR TENDER	P.H.	A.W.

DRAFTED P.HAGUE
DRAFTING CHECK A.WITTHOFT
CAD FILE 67-018100L_A
B.C.C. FILE No.

Original Signed by G.ANDERSON 09-04-10
DESIGN R.P.E.Q. No. DATE
Original signed by A.WITTHOFT 8895 09-04-10
DESIGN CHECK R.P.E.Q. No. DATE

Original Signed by K.VAHEESAN 13-04-10
PRINCIPAL DESIGN MANAGER DATE
Original Signed by P.SHERRIFF 12-04-10
CLIENT DELEGATE DATE

QUEENSLAND UrbanUtilities
A DIVISION OF THE BRISBANE CITY COUNCIL

SITE SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE SITE COVER SHEET

SHEET No. 0
Queensland Urban Utilities DRAWING No. 486/5/7-0181-000
AMEND. A

ENERGEX SUPPLY 3 PHASE 415VAC
FEED FROM P/POLE No38186
16mm² (NOTE 4, 5)

N R W B

ACTIVE LINKS

SUPPLY AUTHORITY DIRECT METERING

SR1,2,3 — 620 — F1 — 80kA — 63A
621
622

electrical contractor to note energex supply pole or pillar number .....

GENERATOR CONNECTION SOCKET (In Switchboard) (NOTE 6)
R W B N E

BOLTED CONNECTIONS (SHROUDED)

SWITCHBOARD RATING 125A
MAX DEMAND 46A

E — MEN LINK

ENERGEX MAINS POWER FAILURE RELAY
REF 07:A2

Q7 — 601 — 602 — 603 — PFRE — 6A

Q2 NORMAL SUPPLY MAIN SWITCH
125A Ir=0.4 (50A) Charact= 6 (NOTE 1, 2)

Q3 GEN SUPPLY MAIN SWITCH
125A Ir=0.4 (50A) Charact= 6

MANUAL TRANSFER SWITCH

GEN/N

Q9 — 50A SUB-DISTRIBUTION BOARD CB Ir=0.72 (36A) Ii = 6 (300A) (NOTE 1, 2)

Q10 — 630 — 631 — 632 — PFRS — 6A — STATION MAINS POWER FAILURE RELAY REF 07:B2

Q11 — 640 — 641 — 642 — N-Q11 — 10A — 3 PHASE 10 AMP OUTLET

Q12 — 643 — N2 — N-Q12 — 16A — 15A GPO

Q13 — 644 — N3 — N-Q13 — 10A — LAPTOP GPO - TWIN

Q14 — 6A — SPARE

Q15 — 10A — SPARE

Q16 — 650 — N6 — N-Q16 — 6A — SLCR REF 06:E15

- 651A — FLUORO IN RTU CUBICLE
- 651B — FLUORO IN COMMON CUBICLE
- 651C — FLUORO IN PUMP CONTROL CUBICLE
- 651D — FLUORO IN BOLTED CONNECTION CUBICLE
- 651E — FLUORO IN DISTRIBUTION CUBICLE
- 651F — FLUORO IN MAIN SWITCH CUBICLE

Q17 — 660 — 10A — N7 — SURGE FILTER SRF — N7A

Q30 — 661 — 662 — 4A — SN1 — RTU POWER SUPPLY REF 08:B2

Q31 — 661 — 663 — 4A — SN2 — SURGE FILTER ALARM RELAY REF 06:F11

Q32 — 661 — 664 — 4A — SN3 — SPARE

Q33 — 661 — 665 — 4A — SN4 — SPARE

PROTECTED NEUTRAL

Q18 — 670 — N8 — 6A — EMERGENCY PUMP CONTROL POWER SUPPLY & SURCHARGE IMMINENT RELAY REF 06:A4

Q19 — 680 — N9 — N-Q19 — 10A (NOTE 6) — GENERATOR ANCILLARY SUPPLY 10A SOCKET

Q20 — 6A — SPARE

Q21 — 6A — SPARE

E N L1 L2 L3

CONT'D ON SHEET 02

NOTES

1. INCOMING GENSET, MAIN, PUMP & DIST. BOARD CIRCUIT BREAKERS SHALL BE LINE SIDE SHROUDED.
2. CIRCUIT BREAKER RATINGS TO SUIT FAULT LEVEL & LOAD. ENSURE MIN TYPE 1 CO-ORDINATION WITH CONTACTORS & OVERLOADS TO IEC 947-4-1.
3. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
4. ADD POINT OF SUPPLY
5. ADD ACTUAL FAULT LEVEL
6. CABLING TO GENERATOR CONNECTION SOCKET AND AUXILIARY SUPPLY SOCKET TO BE DOUBLE INSULATED. CABLING TO BE FULLY SEALED TO OTHER COMPARTMENTS

Point to point tested by Brendan Springer on the 17/6/10 11476 [signature]

No	DATE	AMENDMENT	DRN.	APD.
A	04.10	ISSUED FOR CONSTRUCTION	P.H.	A.W.
0	04.10	ISSUED FOR TENDER	P.H.	A.W.

DRAFTED P.HAGUE
DRAFTING CHECK A.WITTHOFT
CAD FILE 57-0181sht_A
B.C.C. FILE No.

Original Signed by G.ANDERSON
DESIGN
R.P.E.Q.No. 8895 DATE 08-04-10
Original signed by A.WITTHOFT
DESIGN CHECK
R.P.E.Q.No. DATE 09-04-10

Original Signed by K.VAHEESAN
PRINCIPAL DESIGN MANAGER
DATE 13-04-10
Original Signed by P.SHERRIFF
CLIENT DELEGATE
DATE 12-04-10

Queensland Urban Utilities
A DIVISION OF THE BRISBANE CITY COUNCIL

SITE
SP140
CULLEN AVE WEST
SEWAGE PUMP STATION

TITLE
POWER DISTRIBUTION
SCHEMATIC DIAGRAM

FOR CONSTRUCTION

SHEET No. 1
Queensland Urban Utilities DRAWING No.
486/5/7-0181-000
AMEND. A

Sheet 01

CONT'D FROM SHEET 01

Point to point tested On the 17/6/10 by Brendon Stringer 1114766

E N R W B

1K2

Q4 1K1

20A

Ir=0.63 (12.5A) Im= 6 (120A) Note 1

100

Q4-1 6A

EMOTRON MSF-017 + MODBUS Max 7.5kW SOFT STARTER 1U1

L1 L2 L3 T1 T2 T3 PE

DE-CONTACTORS

P1 P2

SUBMERSIBLE PUMP No1 4.6kW 10.5AMPS

MOTOR THERMISTORS

130 131 69 70 75 76 77 Rd Bl Br

1K4 110 12 RUN

1K21 111 13 COMMON 112 11 RESET

101 1 2 100N

101 31 FAULT 33 107 1K3 STARTER FAULT RELAY REF 02:C12

101 1S3 E/STOP 103 21 OPERATE 22 108 1K1 LINE CONTACTOR REF 02:B3, E5

103 23 FULL VOLT 24 109 1K2 BY-PASS CONTACTOR REF 02:A6, C13

RS485 1 2 3 4 Set terminating switch to 'OFF'

FROM GRAPHIC DISPLAY REF 08:I11 RS485A+ RS485A- Cable I7 RS485B+ RS485B- Cable I8 TO SOFT STARTER 2 REF 03:E6

1K1 104 HRM1 HOURS RUN METER

1K20 105 1K4 RUN RELAY REF 02:B4

EMG1 REF 06:C6

OFF ON 1SS EM.START

101 1K5 CONTROL CCT 'POWER ON' RELAY REF 02:B12

100N

CONT'D ON SHEET 03

RTU DIGITAL INPUTS

+ 24VDC POWER SUPPLY - REFER SHEET 08:C7

2A DI1+24V J6+ J6- DI1-COM DI1-COM CM

DI00+	1K5	DI00	DI00	P1-01	DI00	DI-00	CONTROL POWER
DI01+	1S1	DI01	DI01	P1-02	DI01	DI-01	START PUSHBUTTON
DI02+	1S2	DI02	DI02	P1-03	DI02	DI-02	STOP PUSHBUTTON
DI03+	1S3	DI03	DI03	P1-04	DI03	DI-03	E/STOP PUSHBUTTON
DI04+	1S4	DI04	DI04	P1-05	DI04	DI-04	RESET PUSHBUTTON
DI05+	1K2	DI05	DI05	P1-06	DI05	DI-05	RUNNING
DI06+	1K3	DI06	DI06	P1-07	DI06	DI-06	STARTER FAULT
			DI07	P1-08	DI07	DI-07	SPARE
			DI08	P1-09	DI08	DI-08	SPARE
			DI09	P1-10	DI09	DI-09	SPARE
			DI09-				

SHEET 07 CONT'D ON

SHEET 07 CONT'D ON

RTU DIGITAL OUTPUTS

+ 24VDC POWER SUPPLY - REFER SHEET 08:C7

CM DO1+24V P4-01 2A 105 J6+ J6- 106 DO1-COM

DO-00	0 NO	DO00	P4-02	DO00	1K20	DO00-	RUN COMMAND REF 02:E5
DO-01	1 NO	DO01	P4-03	DO01	1K21	DO01-	FAULT RESET REF 02: C5
DO-02	2 NO	DO02	P4-04	DO02	1K22	DO02-	EMERGENCY MODE INTERRUPT REF 06: C4
DO-03	3 NO	DO03	P4-05	DO03			SPARE

CONT'D ON SHEET 07

CONT'D ON SHEET 07

LEGEND:

- SWITCHBOARD POWER TERMINAL
- SWITCHBOARD CONTROL TERMINAL
- SWITCHBOARD GENERATOR TERM.
- FIELD TERMINAL
- PLC TERMINAL
- RTU TERMINAL
- SS TERMINAL
- PLC/RTU MARSH. FUSE TERMINAL
- PLC/RTU MARSH. LINK TERMINAL
- TO RTU — DISCONNECT PLUG
- DI1-02 RTU DIGITAL INPUT
- DO1-02 RTU DIGITAL OUTPUT
- AI1-02 RTU ANALOGUE INPUT
- AO1-02 RTU ANALOGUE OUTPUT

NOTES

1. INCOMING GENSET, MAIN, PUMP & DIST. BOARD CIRCUIT BREAKERS SHALL BE LINE SIDE SHROUDED.
2. CIRCUIT BREAKER RATINGS TO SUIT FAULT LEVEL & LOAD ENSURE MIN TYPE 1 CO-ORDINATION WITH CONTACTORS & OVERLOADS TO IEC 947-4-1.
3. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
4. FAULT LEVEL OF 20kA AT 415V FOR 0.2sec.

Sheet 02

FOR CONSTRUCTION

A	04.10	ISSUED FOR CONSTRUCTION	P.H.	A.W.	DRAFTED	P.HAGUE	Original Signed by G.ANDERSON 09-04-10	Original Signed by K.VAHEESAN 13-04-10	QUEENSLAND Urban Utilities A DIVISION OF THE BRISBANE CITY COUNCIL	SITE SP140 CULLEN AVE WEST SEWAGE PUMP STATION	TITLE PUMP No1 SCHEMATIC DIAGRAM	SHEET No. 2	
O	04.10	ISSUED FOR TENDER	P.H.	A.W.	DRAFTING CHECK	A.WITTHOFT	DESIGN R.P.E.Q.No. DATE	PRINCIPAL DESIGN MANAGER DATE				Queensland Urban Utilities DRAWING No.	AMEND.
No	DATE	AMENDMENT	DRN.	APD.	CAD FILE	57-0181set_A	Original signed by A.WITTHOFT 8895 09-04-10	Original Signed by P.SHERRIFF 12-04-10				486/5/7-0181-000	A
					B.C.C. FILE No.		DESIGN CHECK R.P.E.Q.No. DATE	CLIENT DELEGATE DATE					

STB TEMPLATE SP-JP-55 Ver1.0

Q:\104 WATER SUPPLY\268 Drafting\6249 Plans\Electrical\2. SEWERAGE\NETWORKS\SP140 Cullen Ave West\Reliability Improvement\For Construction\57-0181set_A.dwg Last Saved by 078548 on Friday, 30 Apr 2010 9:32:56 AM

CONT'D FROM SHEET 02

Point to point tested On the 17/6/10 by Brendan Stringer 114766

E N R W B

Q5 20A Ir=0.63 (12.5A) Im= 6 (120A) Note 1

2K1

Q5-1 6A

EMOTRON MSF-017 + MODBUS Max 7.5kW SOFT STARTER 2U1

L1 L2 L3 T1 T2 T3 PE 69 70 75 76 77

DE-CONTACTORS

SUBMERSIBLE PUMP No2 4.6kW 10.5AMPS

MOTOR THERMISTORS

2K4 12 RUN

2K21 11 RESET

13 COMMON

FAULT 31 33

OPERATE 21 22

FULL VOLT 23 24

2S3 E/STOP

STARTER FAULT RELAY REF 03:C12

LINE CONTACTOR REF 03:B3, E5

BY-PASS CONTACTOR REF 03:A6, C13

RS485 1 2 3 4

FROM SOFT STARTER 1 REF 02:E6 RS485+ RS485- Cable 18

Set terminating switch to 'ON'

2K1 2K20 EM62 REF 06:D6 OFF ON 2S5 EM.START

HRM2

HOURS RUN METER

2K4

RUN RELAY REF 03:B4

2K5

CONTROL CCT 'POWER ON' RELAY REF 03:B12

200W

RTU DIGITAL INPUTS

+ 24VDC POWER SUPPLY - REFER SHEET 08:C7

DI-16	CONTROL POWER	P2-01	16	39
DI-17	START PUSHBUTTON	P2-02	17	41
DI-18	STOP PUSHBUTTON	P2-03	18	43
DI-19	E/STOP PUSHBUTTON	P2-04	19	45
DI-20	RESET PUSHBUTTON	P2-05	20	47
DI-21	RUNNING	P2-06	21	49
DI-22	STARTER FAULT	P2-07	22	51
DI-23	SPARE	P2-08	23	53
DI-24	SPARE	P2-09	24	55
DI-25	SPARE	P2-10	25	57

CONT'D ON SHEET 07

CONT'D ON SHEET 07

RTU DIGITAL OUTPUTS

+ 24VDC POWER SUPPLY - REFER SHEET 08:C7

DO-08	RUN COMMAND REF 03:E5	2K20	126	125
DO-09	FAULT RESET REF 03:C5	2K21	128	127
DO-10	EMERGENCY MODE INTERRUPT REF 06:D4	2K22	130	129
DO-11	SPARE		132	131

CONT'D ON SHEET 07

CONT'D ON SHEET 07

LEGEND:

- SWITCHBOARD POWER TERMINAL
- SWITCHBOARD CONTROL TERMINAL
- SWITCHBOARD GENERATOR TERM.
- FIELD TERMINAL
- PLC TERMINAL
- RTU TERMINAL
- SS TERMINAL
- PLC/RTU MARSH. FUSE TERMINAL
- PLC/RTU MARSH. LINK TERMINAL
- TO RTU — DISCONNECT PLUG
- DI1-02 RTU DIGITAL INPUT
- DO1-02 RTU DIGITAL OUTPUT
- AI1-02 RTU ANALOGUE INPUT
- AO1-02 RTU ANALOGUE OUTPUT

NOTES

1. INCOMING GENSET, MAIN, PUMP & DIST. BOARD CIRCUIT BREAKERS SHALL BE LINE SIDE SHROUDED.
2. CIRCUIT BREAKER RATINGS TO SUIT FAULT LEVEL & LOAD ENSURE MIN TYPE 1 CO-ORDINATION WITH CONTACTORS & OVERLOADS TO IEC 947-4-1.
3. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
4. FAULT LEVEL OF 20kA AT 415V FOR 0.2sec.

Sheet 03

FOR CONSTRUCTION

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0	04.10	ISSUED FOR TENDER	P.H.	A.W.

DRAFTED	P.HAGUE		
DRAFTING CHECK	A.WITTHOFT		
CAD FILE	57-0181sst_A		
B.C.C. FILE No.			

Original Signed by G.ANDERSON 09-04-10 DESIGN R.P.E.Q. No. DATE

Original signed by A.WITTHOFT 8895 09-04-10 DESIGN CHECK R.P.E.Q. No. DATE

Original Signed by K.VAHEESAN 13-04-10 PRINCIPAL DESIGN MANAGER DATE

Original Signed by P.SHERRIFF 12-04-10 CLIENT DELEGATE DATE

Queensland Urban Utilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE: SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE: PUMP No2 SCHEMATIC DIAGRAM

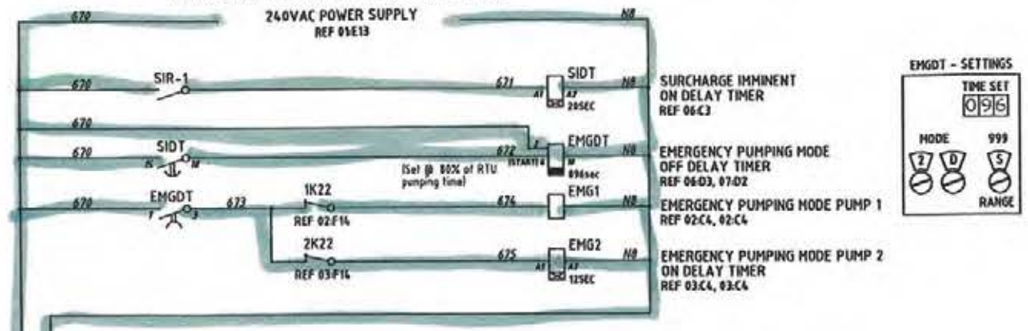
SHEET No. 3

Queensland Urban Utilities DRAWING No. 486/5/7-0181-000 AMEND. A

Point to point tested on the 17/6/10 by Brendan Stanyer 114766

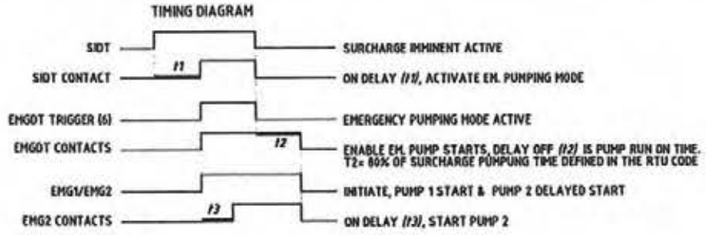
COMMON CONTROL SECTION

EMERGENCY PUMPING MODE (240VAC)



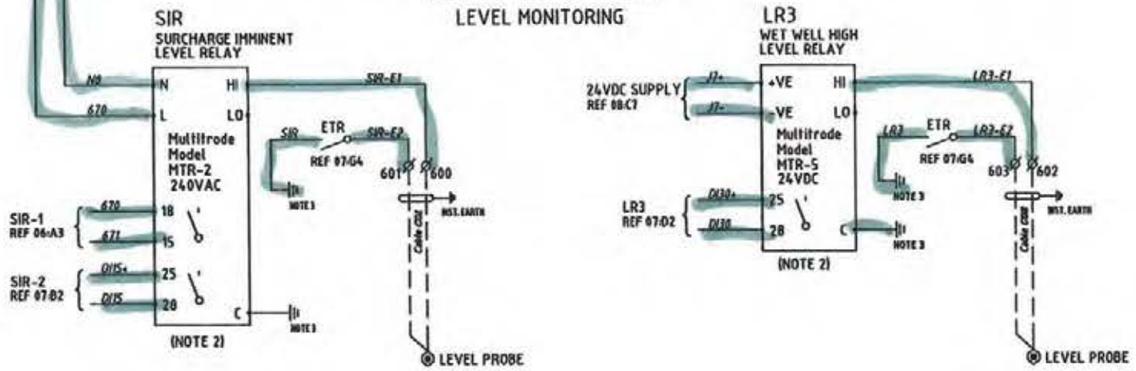
EMGDT - SETTINGS

TIMING DIAGRAM



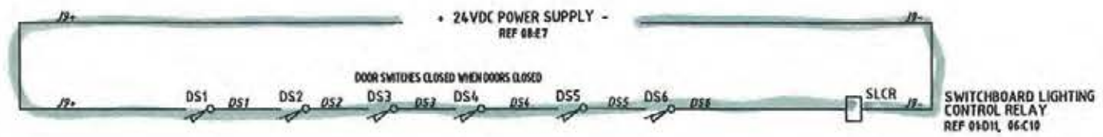
COMMON CONTROL SECTION

LEVEL MONITORING

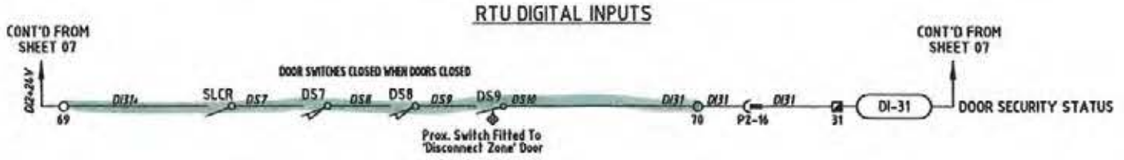


COMMON CONTROL SECTION

SWITCHBOARD INTERNAL LIGHTING

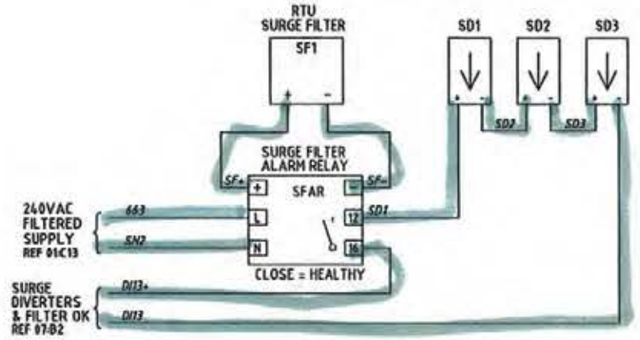


RTU DIGITAL INPUTS



ATS SECTION

SURGE DIVERTERS



LEGEND:

- ▲ SWITCHBOARD POWER TERMINAL
- ⌀ SWITCHBOARD CONTROL TERMINAL
- □ SWITCHBOARD GENERATOR TERM.
- ⊠ FIELD TERMINAL
- ▮ PLC TERMINAL
- ◪ RTU TERMINAL
- ■ SS TERMINAL
- ● PLC/RTU MARSH. FUSE TERMINAL
- ○ PLC/RTU MARSH. LINK TERMINAL
- TO RTU → DISCONNECT PLUG
- DI1-02 RTU DIGITAL INPUT
- DO1-02 RTU DIGITAL OUTPUT
- AI1-02 RTU ANALOGUE INPUT
- AO1-02 RTU ANALOGUE OUTPUT

NOTES

1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
2. SET DIPSWITCH TO 'DISCHARGE' MODE.
3. RUN SEPARATE DEDICATED EARTH CONDUCTOR TO EARTH BAR.

Sheet 06

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
A	04.10	ISSUED FOR CONSTRUCTION	P.H.	A.W.
0	04.10	ISSUED FOR TENDER	P.H.	A.W.

DRAFTED P.HAGUE
DRAFTING CHECK A.WITTHOFT
CAD FILE 57-0181set_A
B.C.C. FILE No.

Original Signed by G.ANDERSON 09-04-10
DESIGN R.P.E.Q. No. DATE
Original signed by A.WITTHOFT 8895 09-04-10
DESIGN CHECK R.P.E.Q. No. DATE

Original Signed by K.VAHEESAN 13-04-10
PRINCIPAL DESIGN MANAGER DATE
Original Signed by P.SHERRIFF 12-04-10
CLIENT DELEGATE DATE

Queensland Urban Utilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE: SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE: COMMON CONTROLS SCHEMATIC DIAGRAM

SHEET No. 6
Queensland Urban Utilities DRAWING No. 486/5/7-0181-000
AMEND. A

RTU DIGITAL INPUTS

CONT'D FROM SHEET 02

DI1+24V	24		DI10	25	P1-11	10	DI-10 SPARE
	26	PFRE	DI11	27	P1-12	11	DI-11 ENERGEX MAINS POWER REF 01:F4
	28	PFRS	DI12	29	P1-13	12	DI-12 STATION MAINS POWER REF 01:D7
	30	SFAR SD1 SD1,2&3	DI13	31	P1-14	13	DI-13 SURGE DIVERTERS OK REF 06:F11
	32	LOC REM S10	DI14	33	P1-15	14	DI-14 STATION LOCAL/REMOTE SWITCH
	34	SIR-2	DI15	35	P1-16	15	DI-15 SURCHARGE IMMINENT REF 06:G2

CONT'D FROM SHEET 03

DI2+24V	59		DI26	60	P2-11	26	DI-26 SPARE
	61	BOK	DI27	62	P2-12	27	DI-27 RTU BATTERY OK REF 08:C4
	63	RTU	DI28	64	P2-13	28	DI-28 RTU CONTROL POWER REF 08:C4
	65	EMGDT	DI29	66	P2-14	29	DI-29 EMERGENCY PUMPING MODE REF 06:C6
	67	LR3	DI30	68	P2-15	30	DI-30 WET WELL HIGH LEVEL REF 06:F6

CONT'D ON SHEET 06

+ 24VDC POWER SUPPLY - REFER SHEET 08:C7

DI3+24V	2A 71	J6+ J6-	DI3-COM	72	P3-19	CM	
	73	Q2 REF 01:H6	DI32	74	P3-01	32	DI-32 NORMAL SUPPLY CB CLOSED
	75		DI33	76	P3-02	33	DI-33 DI33 TO DI41 SPARES RESERVED FOR GENERATOR CONTROL
	91		DI41	92	P3-10	41	DI-41
	93		DI42	94	P3-11	42	DI-42 SPARE - RESERVED FOR VALVE PIT HIGH LEVEL
	95		DI43	96	P3-12	43	DI-43 SPARE RESERVED FOR CP
	97		DI44	98	P3-13	44	DI-44 DI44 TO DI47 SPARES RESERVED FOR DRY WELL SUMP PUMP
	103		DI47	104	P3-16	47	DI-47

CONT'D FROM SHEET 03

CONT'D ON SHEET 06

RTU DIGITAL OUTPUTS

CONT'D FROM SHEET 02

DO1+24V	DO-04	4 NO	DO04	P4-06	115	ETR DO04	116 DO1-COM ELECTRODE TEST RELAY REF 06:F4, 06:F8
	DO-05	5 NO	DO05	P4-07	117		118 SPARE RESERVED FOR WELL WASHER
	DO-06	6 NO	DO06	P4-08	119		120 SPARE - RESERVED FOR DRY WELL ALARM STROBE
	DO-07	7 NO	DO07	P4-09	121		122 SPARE - RESERVED FOR ODOUR CONTROL UNIT

CONT'D FROM SHEET 03

DO2+24V	DO-12	12 NO	DO12	P4-16	133		134 DO2-COM SPARE - RESERVED FOR GEN. CONTROL
	DO-13	13 NO	DO13	P4-17	135		136 SPARE RESERVED FOR CP
	DO-14	14 NO	DO14	P4-18	137		138 SPARE RESERVED FOR CP
	DO-15	15 NO	DO15	P4-19	139		140 SPARE

CONT'D FROM SHEET 03

RTU ANALOG INPUTS

24VDC SUPPLY REF 08:C7 — J6- 142, J6+ 2A 141

AI1+24V	143	ANALOG LEVEL METER	AI00A 610	AI00B 608	TERMINAL HOUSING	FMX21 TRANSMITTER AI00C 609	500mA 149 AI00+ P5-01 AI00+ 0+ A100 PRIMARY WET WELL LEVEL
AI1-COM	150						AI00- P5-02 AI00- 0-
AI1+24V	144	ADJ. UNIT	AI01A	AI01B	TRANSMITTER		500mA 151 AI01+ P5-03 AI01+ 1+ A101 DELIVERY PRESSURE
AI1-COM	152						AI01- P5-04 AI01- 1-
AI1+24V	145						500mA 153 AI02+ P5-05 AI02+ 2+ A102 RESERVED FOR EMERGENCY STORAGE LEVEL
	154						AI02- P5-06 AI02- 2-
AI1+24V	146						500mA 155 AI03+ P5-07 AI03+ 3+ A103 SPARE
	156						AI03- P5-08 AI03- 3-
AI1+24V	147						500mA 157 AI04+ P5-09 AI04+ 4+ A104 RESERVED FOR GENERATOR FUEL LEVEL
	158						AI04- P5-10 AI04- 4-
AI1+24V	148						500mA 159 AI05+ P5-11 AI05+ 5+ A105 RESERVED FOR SECONARY WET WELL LEVEL
	160						AI05- P5-12 AI05- 5-
							500mA 161 AI06+ P5-13 AI06+ 6+ A106 RESERVED FOR RECTIFIER CURRENT
	162						AI06- P5-14 AI06- 6-
							500mA 163 AI07+ P5-15 AI07+ 7+ A107 RESERVED FOR DELIVERY FLOWMETER
	164						AI07- P5-16 AI07- 7-

Point to point tested on the 17/6/10 by Brendan Stringer 114766

RTU ANALOG OUTPUTS

RESERVED FOR CHEMICAL DOSING PUMP SPEED REFERENCE — A0-03: 3+ A003+ P6-07 A003+ 500mA 173; 3- A003- P6-08 A003- 174

NOTES

1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.

LEGEND:

- ▲ SWITCHBOARD POWER TERMINAL
- ⌀ SWITCHBOARD CONTROL TERMINAL
- □ SWITCHBOARD GENERATOR TERM.
- ⊠ FIELD TERMINAL
- ◧ PLC TERMINAL
- ◪ RTU TERMINAL
- ■ SS TERMINAL
- ● PLC/RTU MARSH. FUSE TERMINAL
- ○ PLC/RTU MARSH. LINK TERMINAL
- TO RTU —▷— DISCONNECT PLUG
- DI1-02 RTU DIGITAL INPUT
- DO1-02 RTU DIGITAL OUTPUT
- AI1-02 RTU ANALOGUE INPUT
- AO1-02 RTU ANALOGUE OUTPUT

Sheet 07

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
A	04.10	ISSUED FOR CONSTRUCTION	P.H.	A.W.
O	04.10	ISSUED FOR TENDER	P.H.	A.W.

DRAFTED P.HAGUE; DRAFTING CHECK A.WITTHOFT; CAD FILE 57-0181set_A; B.C.C. FILE No.

Original Signed by G.ANDERSON 09-04-10 DESIGN R.P.E.Q.No. DATE
Original signed by A.WITTHOFT 8895 09-04-10 DESIGN CHECK R.P.E.Q.No. DATE
Original Signed by K.VAHEESAN 13-04-10 PRINCIPAL DESIGN MANAGER DATE
Original Signed by P.SHERRIFF 12-04-10 CLIENT DELEGATE DATE

Queensland Urban Utilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE: SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE: COMMON RTU I/O SCHEMATIC DIAGRAM

SHEET No. 7

Queensland Urban Utilities DRAWING No. 486/5/7-0181-000 AMEND. A

STD TEMPLATE SP-JF-SS Ver1.2

D:\184 WATER SUPPS\288 Dra\Eng\6248 Plans\Electrical\2. SEWERAGE\NETWORKS\SP140 Cullen Ave West\Reliability Improvement\For Construction\57-0181set_A.dwg Last Saved by 078548 on Friday, 30 April 2010 9:32:58 AM

Point to point tested on 17/6/10 by Brendan Stringer 114766

POWERBOX PB251-24CM-CC-T

PS1

RTU POWER SUPPLY 10A 24VDC

240VAC FILTERED SUPPLY REF 01:D12

SHROUD

COMMON CONTROLS SECTION

BATTERY OK REF 07:C2 0 = Fault, 1 = Healthy

POWER ON REF 07:C2 0 = Fault, 1 = Healthy

TEMPERATURE PROBE LOCATED AT BATTERIES

24V DC / 13.8V DC

RADIO

Rx TBA
Tx TBA

PIN-OUT FOR RADIO CONNECTION

DISCONNECT PLUG 6

TO GRAPHIC DISPLAY REF 08:I10

GSM ANTENNA

GSM MODEM

24VDC SUPPLY REF 08:F8

TERMINALS "20" MOUNTED ADJACENT TO GSM MODEM

PIN-OUT FOR GSM CONNECTION

RTU

LOGICA CMG - MD3311E 24VDC - MOTHER BOARD

ON/OFF SWITCH

POWER SUPPLY CONNECTOR

RS 485 PORTS

RS 232 PORTS

NOT AVAILABLE CONFIGURED FOR RS232

NOT AVAILABLE CONFIGURED FOR RS485

REFER TO SHEET 12

ANALOGUE INPUTS

EXTERNAL I/O BOARD CONNECTOR

DIGITAL INPUTS (MODULE No. 1)

E1 COM 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

REFER TO SHEET 09

DIGITAL OUTPUTS (MODULE No. 1)

E2 7 6 5 4 3 2 1 0 COM

REFER TO SHEET 11

RTU

LOGICA CMG - MD3311E 24VDC - EXTENSION BOARD

REFER TO SHEET 10

DIGITAL INPUTS (MODULE No. 3)

32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 COM E7

REFER TO SHEET 12

ANALOGUE OUTPUTS

0 1 2 3 COM E8

DIGITAL INPUTS (MODULE No. 2)

E5 COM 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16

REFER TO SHEET 10

DIGITAL OUTPUTS (MODULE No. 2)

E6 15 14 13 12 11 10 9 8 COM

REFER TO SHEET 11

GRAPHIC DISPLAY REDLION G306A000

FROM RTU REF 08:A13 — RS485+ / RS485- Cable 18 — TO SOFT STARTER 1 REF 02:E5 — RS485A+ / RS485A- Cable 17

LOGICA CMG - MD3311E 24VDC ETHERNET BOARD

PORT 1 — CONFIGURED FOR LAPTOP CONNECTION

PORT 2

RTU — RTU 24VDC CARD SUPPLY REF 02:A13

WET WELL HIGH LEVEL RELAY LR3 REF 06:F7

SPARE RESERVED FOR DRY WELL LEVEL RELAY LR2

COMMON CONTROLS REF 05:H10, 06:B12

MODEM REF 08:B15

SPARE RESERVED FOR FLOWMETER

SPARE RESERVED FOR VALVE PIT HIGH LEVEL

SPARE RESERVED FOR ULTRASONIC WET WELL LEVEL

SPARE RESERVED FOR WELL WASHER

SPARE RESERVED FOR STATION MANHOLE SURCHARGE IMMINENT

SPARE

RTU — GRAPHIC DISPLAY — SOFT STARTER 1 — SOFT STARTER 2

Do Not Earth

PLUG 6

Set terminating switch to 'OFF'

Set terminating switch to 'ON'

RS485- Bk / RS485+ W Cable 18

RS485A- / RS485A+ Cable 17

RS485B- Bk / RS485B+ W Cable 18

Use 120ohm Impedence Twisted Pair Cable

MODBUS CONNECTIONS

LEGEND:

- SWITCHBOARD POWER TERMINAL
- SWITCHBOARD CONTROL TERMINAL
- SWITCHBOARD GENERATOR TERM.
- FIELD TERMINAL
- PLC TERMINAL
- RTU TERMINAL
- SS TERMINAL
- PLC/RTU MARSH. FUSE TERMINAL
- PLC/RTU MARSH. LINK TERMINAL
- TO RTU — DISCONNECT PLUG
- DI1-02 — RTU DIGITAL INPUT
- DO1-02 — RTU DIGITAL OUTPUT
- AI1-02 — RTU ANALOGUE INPUT
- AO1-02 — RTU ANALOGUE OUTPUT

NOTES

1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
2. ALL FUSES ARE 500mA EXCEPT WHERE NOTED OTHERWISE.

Sheet 08

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
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DRAFTED	P.HAGUE	Original Signed by G.ANDERSON 09-04-10	Original Signed by K.VAHEESAN 13-04-10
DRAFTING CHECK	A.WITTHOFT	DESIGN R.P.E.Q. No. DATE	PRINCIPAL DESIGN MANAGER DATE
CAD FILE	57-0181set_A	Original signed by A.WITTHOFT 8595 09-04-10	Original Signed by P.SHERRIFF 12-04-10
B.C.C. FILE No.		DESIGN CHECK R.P.E.Q. No. DATE	CLIENT DELEGATE DATE

Queensland Urban Utilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE: SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE: RTU POWER DISTRIBUTION SCHEMATIC DIAGRAM

SHEET No. 8

Queensland Urban Utilities DRAWING No. 486/5/7-0181-000 AMEND. A

STB TEMPLATE SP-JS Ver1.0

G:\184 WATER SUPPQ268 Dnl\Engl\6248 Plans\Electrics\2. SEWERAGENETWORKS\SP140 Cullen Ave WetRailability ImprovemonFor Construction\57-0181set_A.dwg Last Saved by 078549 on Friday, 30 Apr 2010 9:32:58 AM

Point to point tested on the 17/6/10 by Brendan Stringer 114766

RTU COMPARTMENT

MITS RTU
MD3311 EA

RTU POWER SUPPLIES

24VDC

REFER SHEET 08

REFER SHEET 08

LINK BARS

16 CHANNEL DIGITAL INPUT MODULE 1

DISCONNECT PLUG 1

DI11

LINK BARS

CONT ON SHEET 10

SWITCHBOARD

FIELD

STARTER COMPARTMENT

PUMP 1

REFER SHEET 02

CONTROL POWER

START PUSHBUTTON

STOP PUSHBUTTON

E/STOP PUSHBUTTON

RESET PUSHBUTTON

PUMP RUNNING

STARTER FAULT

COMMON COMPARTMENT

ENERGEX MAINS POWER
REF 01:G4

STATION MAINS POWER
REF 01:E9

ATS COMPARTMENT

SURGE DIVERTERS OK
REF 06:F13

STARTER COMPARTMENT

STATION LOCAL/REMOTE SWITCH

COMMON COMPARTMENT

SURCHARGE IMMINENT
REF 06:G2

LEGEND:

C?? CABLE IDENTIFIER

TO RTU DISCONNECT PLUG

FUSE TERMINAL

DISCONNECT LINK TERMINAL

NOTES

1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
2. ALL FUSES ARE 500mA EXCEPT WHERE NOTED OTHERWISE.

Sheet 09

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B.C.C. FILE No.		DESIGN CHECK R.P.E.Q.No. DATE	CLIENT DELEGATE DATE

Queensland Urban Utilities
A DIVISION OF THE BRISBANE CITY COUNCIL

SITE
SP140
CULLEN AVE WEST
SEWAGE PUMP STATION

TITLE
RTU DIGITAL INPUTS
TERMINATION DIAGRAM

SHEET No. 9

Queensland Urban Utilities DRAWING No.
486/5/7-0181-000

AMEND. A

STD TEMPLATE SP-JP-SS Ver1.2

G:\194 WATER SUPPORT\Drafting\Eagle Farm\Electrical\2. SEWERAGENETWORKS\SP140 Cullen Ave West\Retrofit\By Improvement\For Construction\57-0181set_A.dwg Last Saved by 078549 on Friday, 30 April 2010 9:32:58 AM

RTU COMPARTMENT

MITS RTU
MD3311 EA

CONT ON SHEET 09

16 CHANNEL DIGITAL INPUT MODULE 2

DISCONNECT PLUG 2

DI2

DI16	16	DI16	Plug 1	DI2 2A	36	AK+	0
DI17	17	DI17	2		37	AK-	V
DI18	18	DI18	3		38	DI16+	DI16 Gy
DI19	19	DI19	4		39	DI16	
DI20	20	DI20	5		40	DI17+	DI17 Gy
DI21	21	DI21	6		41	DI17	
DI22	22	DI22	7		42	DI18+	DI18 Gy
DI23	23	DI23	8		43	DI18	
DI24	24	DI24	9		44	DI19+	DI19 Gy
DI25	25	DI25	10		45	DI19	
DI26	26	DI26	11		46	DI20+	DI20 Gy
DI27	27	DI27	12		47	DI20	
DI28	28	DI28	13		48	DI21+	DI21 Gy
DI29	29	DI29	14		49	DI21	
DI30	30	DI30	15		50	DI22+	DI22 Gy
DI31	31	DI31	16		51	DI22	
			17		52		
			18		53		
COM		DI2-COM V	19		54		
ES		E	20		55		
					56		
					57		
					58		
					59		
					60		
					61	DI27+	DI27 Gy
					62	DI27	
					63	DI28+	DI28 Gy
					64	DI28	
					65	DI29+	DI29 Gy
					66	DI29	
					67	DI30+	DI30 Gy
					68	DI30	
					69	DI31+	DI31 Gy
					70	DI31	

0 V DI2-24V
V DI2-COM

LINK BARS

STARTER COMPARTMENT

PUMP 2
REFER SHEET 03

DI16+ / DI16	2K5	CONTROL POWER
DI17+ / DI17	2S1	START PUSHBUTTON
DI18+ / DI18	2S2	STOP PUSHBUTTON
DI19+ / DI19	2S3	E/STOP PUSHBUTTON
DI20+ / DI20	2S4	RESET PUSHBUTTON
DI21+ / DI21	2K2	PUMP RUNNING
DI22+ / DI22	2K3	STARTER FAULT

SWITCHBOARD

Point to point tested on the 17/6/10 by Brendan Stringer 114766

FIELD

RTU COMPARTMENT

DI27+ / DI27	BOK	RTU BATTERY OK REF 08:C3
DI28+ / DI28	RTU	RTU CONTROL POWER REF 08:C3

COMMON COMPARTMENT

DI29+ / DI29	EMGDT	EMERGENCY PUMPING MODE REF 06:C6
DI30+ / DI30	LR3	WET WELL HIGH LEVEL REFER 06:G7
DI31+ / DI31	SLCR	DOOR SECURITY STATUS REF 06:C15
DS 3 Off		

DI32+ / DI32 — Q2 — NORMAL SUPPLY CB CLOSED

16 CHANNEL DIGITAL INPUT MODULE 3

DISCONNECT PLUG 3

DI3

DI32	32	DI32	Plug 1	DI3 2A	71	AK+	0
DI33	33	DI33	2		72	AK-	V
DI34	34	DI34	3		73	DI32+	DI32
DI35	35	DI35	4		74	DI32	
DI36	36	DI36	5		75		
DI37	37	DI37	6		76		
DI38	38	DI38	7		77		
DI39	39	DI39	8		78		
DI40	40	DI40	9		79		
DI41	41	DI41	10		80		
DI42	42	DI42	11		81		
DI43	43	DI43	12		82		
DI44	44	DI44	13		83		
DI45	45	DI45	14		84		
DI46	46	DI46	15		85		
DI47	47	DI47	16		86		
			17		87		
			18		88		
COM		DI3-COM V	19		89		
E7		E	20		90		
					91		
					92		
					93		
					94		
					95		
					96		
					97		
					98		
					99		
					100		
					101		
					102		
					103		
					104		

0 V DI3+24V
V DI3-COM

LINK BARS

CONT ON SHEET 11

NOTES

1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
2. ALL FUSES ARE 500mA EXCEPT WHERE NOTED OTHERWISE.

LEGEND:

- C?? — CABLE IDENTIFIER
- TO RTU —▷— DISCONNECT PLUG
- FUSE TERMINAL
- DISCONNECT LINK TERMINAL

Sheet 10

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
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QUEENSLAND UrbanUtilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE: SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE: RTU DIGITAL INPUTS TERMINATION DIAGRAM

SHEET No. 10

Queensland Urban Utilities DRAWING No. 486/5/7-0181-000 AMEND. A

STD TEMPLATE SP-2P-05 Ver1.2

G:\194 WATER SUPP\266 Drafting\6248 Panel\Electrical\2. SEWERAGENETWORKS\SP140 Cullen Ave WetReliability Improvement\For Construction\57-0181set_A.dwg Last Saved by 078548 on Friday, 30 April 2010 9:32:58 AM

Point to point tested on the 17/6/10 by Brendan Stringer 114766

RTU COMPARTMENT

MITS RTU
MD3311 EA

CONT ON SHEET 10

SWITCHBOARD

FIELD

8 CHANNEL DIGITAL OUTPUT MODULE 1

DO0 00 DO0 · DO1 01 DO1 · DO2 02 DO2 · DO3 03 DO3 · DO4 04 DO4 · DO5 05 DO5 · DO6 06 DO6 · DO7 07 DO7 (COM, NC, NO) · F2 E

DO1+24V 0 · DO1-COM V

DISCONNECT PLUG 4 (Plug / Block 1–10)

DO1 (2A): 105 M+ 0 · 106 M- V · 107 DO0 · 108 DO0- · 109 DO1 · 110 DO1- · 111 DO2 · 112 DO2- · 113 · 114 · 115 DO4 · 116 DO4- · 117 · 118 · 119 · 120 · 121 · 122 — LINK BARS

Gy · Gy · Gy · Gy

STARTER COMPARTMENT

DO0 / DO0- — 1K20 — PUMP 1 RUN COMMAND — REFER 02:F14

DO1 / DO1- — 1K21 — PUMP 1 FAULT RESET — REFER 02:F14

DO2 / DO2- — 1K22 — PUMP 1 EMERGENCY MODE INTERRUPT — REFER 02:F14

COMMON COMPARTMENT

DO4 / DO4- — ETR — ELECTRODE TEST RELAY — REFER 07:G4

8 CHANNEL DIGITAL OUTPUT MODULE 2

DO8 08 DO8 · DO9 09 DO9 · DO10 10 DO10 · DO11 11 DO11 · DO12 12 DO12 · DO13 13 DO13 · DO14 14 DO14 · DO15 15 DO15 (COM, NC, NO) · E6 E

DO2+24V 0

DISCONNECT PLUG 4 (Plug / Block 11–20)

DO2 (2A): 123 M+ 0 · 124 M- V · 125 DO8 · 126 DO8- · 127 DO9 · 128 DO9- · 129 DO10 · 130 DO10- · 131 · 132 · 133 · 134 · 135 · 136 · 137 · 138 · 139 · 140 — LINK BARS

Gy · Gy · Gy

STARTER COMPARTMENT

DO8 / DO8- — 2K20 — PUMP 2 RUN COMMAND — REFER 03:F14

DO9 / DO9- — 2K21 — PUMP 2 FAULT RESET — REFER 03:F14

DO10 / DO10- — 2K22 — PUMP 2 EMERGENCY MODE INTERRUPT — REFER 03:F14

CONT ON SHEET 12

LEGEND:

- C?? — CABLE IDENTIFIER
- TO RTU — DISCONNECT PLUG
- Ø — SWITCHBOARD CONTROL TERMINAL
- 5 — FUSE TERMINAL
- 5 — DISCONNECT LINK TERMINAL

NOTES

1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
2. ALL FUSES ARE 500mA EXCEPT WHERE NOTED OTHERWISE.

Sheet 11

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Queensland Urban Utilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE: SP140 CULLEN AVE WEST SEWAGE PUMP STATION

TITLE: RTU DIGITAL OUTPUTS TERMINATION DIAGRAM

SHEET No. 11

Queensland Urban Utilities DRAWING No. 486/5/7-0181-000 AMEND. A

STD TEMPLATE SP-3P-35 Ver1.0

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SWITCHBOARD

FIELD

RTU COMPARTMENT

MITS RTU
MD3311 EA

8 CHANNEL ANALOG INPUT MODULE 1

A100 0 A101 1 A102 2 A103 3 A104 4 A105 5 A106 6 A107 7

Plug Block

DISCONNECT PLUG 5

CONT ON SHEET 11

AI1

USE SCREENED CABLES

TO INSULATED INSTRUMENT EARTH

NOTE 2

COMMON COMPARTMENT

ANALOG LEVEL METER

TERMINAL HOUSING

Breather

ADJ. UNIT - VEGADIS12

RST. EARTH

Breather

I1 PRIMARY WET WELL LEVEL TRANSMITTER

I2 DELIVERY PRESSURE TRANSMITTER

Point to point tested on 17/6/10
by Brendan Stringer 114766

NOTES

1. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST SI2000 COMPATIBLE LABELLING.
2. ALL FUSES ARE 500mA EXCEPT WHERE NOTED OTHERWISE.

8 CHANNEL ANALOG OUTPUT MODULE 1

A00 0 A01 1 A02 2 A03 3

DISCONNECT PLUG 6

A01

USE SCREENED CABLES

TO INSULATED INSTRUMENT EARTH

NOTE 2

RTU TB1 POWER SUPPLY REF 08:B11

RTU TB2 COMMS PORT2 REF 08:A11

REFER SHEET 08:B7

DISCONNECT PLUG 6

16 PUMP 1 SOFT STARTER REF 02:E6

LEGEND:

- C?? CABLE IDENTIFIER
- TO RTU DISCONNECT PLUG
- 5 FUSE TERMINAL
- 5 DISCONNECT LINK TERMINAL
- 5 EARTH TERMINAL

Sheet 12

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
A	04.10	ISSUED FOR CONSTRUCTION	P.H.	A.W.
0	04.10	ISSUED FOR TENDER	P.H.	A.W.

DRAFTED P.HAGUE
DRAFTING CHECK A.WITTHOFT
CAD FILE 57-0181sht_A
B.C.C. FILE No.

Original Signed by G.ANDERSON 09-04-10
DESIGN R.P.E.Q. No. DATE
Original signed by A.WITTHOFT 8895 09-04-10
DESIGN CHECK R.P.E.Q. No. DATE

Original Signed by K.VAHEESAN 13-04-10
PRINCIPAL DESIGN MANAGER DATE
Original Signed by P.SHERRIFF 12-04-10
CLIENT DELEGATE DATE

QUEENSLAND UrbanUtilities
A DIVISION OF THE BRISBANE CITY COUNCIL

SITE
SP140
CULLEN AVE WEST
SEWAGE PUMP STATION

TITLE
RTU ANALOGS & MISCELLANEOUS TERMINATION DIAGRAM

SHEET No. 12
Queensland Urban Utilities DRAWING No. 486/5/7-0181-000
AMEND. A

STD TEMPLATE SA-2P-A3 Ver1.0

03194 WATER SUPP288 Drafting\0248 Plant\Electrical\2. SEWERAGENETWORKS\SP140 Cullen Ave West\Rehab\By Improvement\For Construction\57-0181sht_A.dwg Last Saved by 078549 on Friday, 30 April 2010 9:32:58 AM

SJ ELECTRIC PTY LTD
Queensland

Ref: Test Certificate P140.doc

TEST CERTIFICATE

SJ Electric (Qld) Pty. Ltd.
19 Elliot Street.
Albion Qld. 4010
R.E.C. 7623

Attention: Wendy Wong

Level 2 TC Beirne Centre, 315 Brunswick Street Mall, Fortitude Valley Q 4006

Work performed for Brisbane Water at SP140 Cullen Ave West Eagle Farm under contract BW: 70103-037 (SJ Electric Job Number WT400089)

Installation Tested / Equipment Tested

- New Sewage pump station switchboard
- New main earth
- Earth bonding to main earth link and all switchboard components.

All supporting test sheets attached.

Test Date
24/06/10

For the electrical installation, this certificate certifies that the electrical installation to the extent it is affected by the electrical work has been tested to ensure it is electrically safe and is in accordance with the requirements of the wiring rules and the electrical safety regulation 2002. C.J. Holmes (endorsee to electrical contracting license 7623)

For the electrical equipment, this certificate certifies that the electrical equipment, to the extent it is affected by the electrical work, is electrically safe. C.J. Holmes (endorsee to electrical contracting license 7623)

Signed.