



QUEENSLAND URBAN UTILITIES

SP011 Caswell Street

Sewage Pump Station

Contract : BW 70103-06/07
Order 87
Job Number : 43400697

ELECTRICAL INSTALLATION

OPERATIONS and MAINTENANCE MANUAL

VOLUME 1/2

INSTALLATION BY:

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

Telephone: 07 3256 1522 Fax: 07 3256 1533

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1. General

1.1 General Workplace Health and Safety

- The Workplace Health and Safety Act (2011) sets out the laws about Workplace Health and Safety for all workplaces, workplace activities and specified high risk plant. The Electrical Safety Act (2002) sets out the laws covering electrical safety. Nothing in this document is designed, in any way, to undermine the authority of the Acts.
- All reasonable care must always be taken to ensure the plant is without risk to the health and safety of personnel operating and maintaining plant and equipment.
- Employers have an obligation to ensure the workplace health and safety of all personnel at work.
- It is employer responsibility to ensure that all persons entering or working on the premises use appropriate personal protective equipment.
- Personal protective equipment includes gloves, safety glasses, hard hats, ear protection, safe foot ware and, where necessary, specialist protective clothing for hazardous areas.
- Any item of equipment should always be isolated before maintenance or repairs commence to ensure that inadvertent operation of the item does not result in risk to the health and safety of any person.
- Where the item is isolated, any total or partial shutdown should not allow a hazardous situation to be created.
- Where the item cannot be isolated, another person should be stationed at the controls of the item and an effective means of direct communication should exist between the persons carrying out the maintenance and the person at the controls.

General Operating Principles

- All persons working the premises must be qualified Electrical Engineers or electrical trades persons capable of performing the required tasks competently. All personnel must also be familiar with plant and equipment.
- Adequate information, instruction, training and supervision must be provided to enable personnel to perform work without risk to health and safety.
- Work in an orderly way.
- Plan work in advance to avoid hazardous situations.
- Warn others of any hazards.
- Make inquiries before starting work, particularly on any unfamiliar installation or equipment.
- Before any work begins ensure that any instructions received or given are fully understood.
- Concentrate on the task on hand.
- Do not distract others or allow yourself to be distracted by foolish actions.
- Work from a safe and convenient position that provides a maximum working space that you do not have to over reach, you cannot slip, trip or stumble and so endanger yourself and others.
- Keep the working area tidy and free of unwanted materials and equipment.
- Use insulated tools where possible.
- Inspect tools and equipment regularly and ensure that any necessary maintenance is carried out.
- Keep yourself in good health.
- Do not work if ill or over tired, to the extent that your concentration, movement or alertness is affected. Illness or fatigue can endanger yourself and others.

1.2 Project Overview

Contract BW70103-06/07 Order 87 was for the manufacture and testing of one (1) new pump station switchboard for SP011 Caswell Street, East Brisbane.

Equipment provided by SJ Electric ensures safe and efficient operation of the pump station. Equipment supplied and installed by SJ Electric includes: -

- Switchboards
- Disconnect Boxes
- New lighting
- Field Wiring
- Instrumentation

The switchboard incorporates the latest technology in motor control, power monitoring, and instrumentation. It is important engineers, technicians and operators are familiar with the equipment installed before attempting any adjustments, modifications or maintenance.

The following Sections of this manual contain a comprehensive description of all equipment supplied, by SJ Electric. It is recommended that this manual be referred to before carrying out any work on any equipment.

1.3 Plant Maintenance

To ensure proper operation of the plant the following should be observed: -

- The plant should be kept clean and tidy at all times. Not only is this of aesthetic value, it extends equipment life.
- Check that all plant and equipment is operating correctly. Correctly operating equipment promotes overall plant efficiency.
- All items and areas of equipment should be hosed down and cleaned regularly.

WARNING

- **Avoid directly hosing any drive motor or electrical item.**

- All maintenance, service, modifications and significant deviations from Normal operating conditions should be recorded in the Plant Service Log
- After a month of operation, check the tension of all bolts associated with the plant and thereafter periodically. Bolted connections on painted surfaces can loosen due to thinning of the paint underneath the bolt head-bearing surface. Motor mounting bolts and other bolted connections subjected to vibration should be periodically checked for loosening.

WARNING

- **Before starting work on any item ensure that the power supply is isolated, tagged off, and the item cannot be started.**

- The importance of preventative maintenance cannot be over-emphasized. Regular maintenance and suitable care of the equipment will ensure a long and reliable service life of the equipment.
- Many stoppages can be avoided by following the recommended maintenance procedures. Do not wait until you hear the grinding of equipment that has broken down. If you see any item wearing down, replace it, before it causes damage to other associated items.

Preventive Maintenance

Maintenance procedures recommended to extend switchboard life are outlined as follows: -

- Switchboard exterior should be regularly wiped down with a solvent base cleaner such as "Spray & Wipe". This will ensure longevity of the powder-coated surface.
- Accessible areas like distribution boards and motor starter panels should be cleaned with a vacuum cleaner to remove dust and foreign matter.
- PLC panels should be maintained as dust free as possible. Dusting with a dry rag is recommended - taking care not to allow dust inside the I/O modules or processor.
- When removing or installing PLC modules care should be taken to ensure that power is turned off to the rack before modules are removed or installed.
- Connections and efficient operation of circuit breakers, contactors and isolators should be checked every 12 months - especially where connected to busbars.
- Busbar connections should be checked every 12 months.
- Globes for indicator lights should be checked on a weekly basis with any faulty lamps replaced.
- Cubicle Fans Filter should be inspected and cleaned frequently.

1.4 Electrical Control System

General Description

The switchboards are manufactured from 3mm aluminium and are suitable for location outdoors; the switchboards have been designed by Brisbane Water and contain several separate sections including:

- Incoming Section.
- Metering.
- Motor Starter Section.
- Distribution Section.
- RTU Section.

1.5 Control and Monitoring System.

The control and monitoring of the system is performed by the Queensland Urban Utilities telemetry system and was not included in this contract.

2. Manufacturer's Technical Data

The electronic version of the manual has been split into a number of files due to the large file size of the complete manual; vendor manuals have been registered as separate files in Q-Pulse, some other files are included as attachments with the record in Q-Pulse. This will substantially reduce load times on remote sites. All files can be accessed by clicking on the links within this (the main) document.

Section	Manual	Link
2.1	Terasaki S400/S125	VM85
2.2	Weidmuller Power Supply	VM86
2.3	Teraski Residual Current Device	VM87
2.4	Terasaki Circuit Breakers	VM88
2.5	Critec DAR 275V	VM89
2.6	TDF Critec	VM90
2.7	TDS Critec	VM91
2.8	900dr User Guide	VM92
2.9	Carlo Gavazzi DPB01CM48W4	VM93
2.1	Impulse Suppressor	VM94
2.11	Power Box PB251	VM95
2.12	Power Box PBIH	VM96
2.13	Multitrode Probe	VM97
2.14	Vegabar 52	VM98
2.15	Vegadis 62	VM99
2.16	Vegawell 52	VM100
2.17	Sprecher & Schuh Timer	VM101
2.18	IDEC Relays	VM102
2.19	Moxa Ethernet Switch	VM103
2.2	Lumifa LED Lights	VM104
2.21	Pilz PNOZX3	VM105

2.1. Terasaki S400/S125

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Circuit Breaker

Location:

Model Numbers: S400/S125

Manufacturer: Terasaki

Supplier: NHP Pty Ltd
25 Turbo Drive
Coorparoo QLD 4151

Ph: 07 3891 6008

Fax: 07 3891 6139

2.2. Weidmuller Power Supply

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Power Supply

Location:

Model Numbers: 8951340000

Manufacturer: Weidmüller

Supplier: Ramlec
2/5 Breene Place
Morningside, QLD 4170

Ph: 07 3899 1322

Fax: 07 3899 1422

2.3. Teraski Residual Current Device

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Residual Current Devices

Location:

Model Numbers:

Manufacturer: Terasaki

Supplier: NHP Pty Ltd
25 Turbo Drive
Coorparoo QLD 4151

Ph: 07 3891 6008

Fax: 07 3891 6139

2.4. Terasaki Circuit Breakers

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Circuit Breakers

Location:

Model Numbers:

Manufacturer: Terasaki

Supplier: NHP Pty Ltd
25 Turbo Drive
Coorparoo QLD 4151

Ph: 07 3891 6008

Fax: 07 3891 6139

2.5. Critec DAR 275V

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Surge Reduction Filter

Location:

Model Numbers: DAR-275V

Manufacturer: Critec

Supplier: Energy Correction Options
PO Box 431
Kelvin Grove, QLD 4059

Ph: 07 3356 0577
Fax: 07 3356 1432
Web: www.ecoptions.com.au

2.6. TDF Critec

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Surge Filter Alarm Relay

Location:

Model Numbers: TDF-10A-240V

Manufacturer: Critec

Supplier: Energy Correction Options
PO Box 431
Kelvin Grove, QLD 4059

Ph: 07 3356 0577
Fax: 07 3356 1432
Web: www.ecoptions.com.au

2.7. TDS Critec

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Surge Diverter

Location:

Model Numbers: TDS1100-2SR-277

Manufacturer: Critec

Supplier: Energy Correction Options
PO Box 431
Kelvin Grove, QLD 4059

Ph: 07 3356 0577
Fax: 07 3356 1432
Web: www.ecoptions.com.au

2.8. 900dr User Guide

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type:	Radio
Location:	RTU Section
Model Numbers:	TC-900DR
Manufacturer:	Trio
Supplier:	Trio Data 41 Aster Avenue Carrum Downs, VIC 3201 Ph: 03 9775 0505 Fax: 03 9775 0606 Web: www.triodatacom.com

2.9. Carlo Gavazzi DPB01CM48W4

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Phase Failure Relay

Location:

Model Numbers: DPB01CM48W4

Manufacturer: Carlo Gavazzi

Supplier: NHP Pty Ltd
25 Turbo Drive
Coorparoo QLD 4151

Ph: 07 3891 6008
Fax: 07 3891 6139

2.10. Impulse Suppressor

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Impulse Suppressor

Location: RTU Section

Model Numbers: IS-50NX-C2

Manufacturer: Polyphaser

Supplier: RFI Industries
30 Raubers Road
Banyo, QLD 4010

Ph: 07 3621 9400
Fax: 07 3621 5505
Web: www.rfi.com.au

2.11. Power Box PB251

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type:	Modem/Power Supply
Location:	RTU Section
Model Numbers:	PB251
Manufacturer:	Powerbox
Supplier:	Powerbox Australia Pty Ltd 433 Logan Road Stones Corner, QLD 4120 Ph: 07 3394 8372 Fax: 07 3394 8373 Web: www.powerbox.com.au

2.12. Power Box PBIH

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type:	Radio/DC Converter
Location:	RTU Section
Model Numbers:	PB1H-2412G-CC1
Manufacturer:	Powerbox
Supplier:	Powerbox Australia Pty Ltd 433 Logan Road Stones Corner, QLD 4120 Ph: 07 3394 8372 Fax: 07 3394 8373 Web: www.powerbox.com.au

2.13. Multitrode Probe

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type:	Level Probe
Location:	Common Control
Model Numbers:	020130FSP
Manufacturer:	Multitrode
Supplier:	Multitrode Pty Ltd 130 Kinston Road Underwood, QLD 4119 Ph: 07 3340 7000 Fax: 07 3340 7077

2.14. Vegadis 62, Vegabar 52 & Vegawell 52

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Pressure Measurement, Valve
Measurement & Delivery
Pressure Transmitter

Location:

Model Numbers: VEGAWELL 52, VEGADIS 62 &
VEGABAR 52

Manufacturer: Vega

Supplier: Vega
398 The Boulevard
Kerrawee, NSW 2232

Ph: 02 9542 6662
Fax: 02 9542 6665
Web: www.vega.com/au

2.15. Sprecher & Schuh Timer

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Delay Timer

Location:

Model Numbers: RZ7-FSA 3A 023

Manufacturer: Sprecher & Schuh

Supplier: NHP Pty Ltd
25 Turbo Drive
Coorparoo QLD 4151

Ph: 07 3891 6008

Fax: 07 3891 6139

2.16. IDEC Relays

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Relays

Location:

Model Numbers:

Manufacturer: IDEC

Supplier: IPD Australia Pty Ltd
Unit 17
104 Ferntree Gully Road
Oakleigh, Victoria 3166,

Ph: 03 8523 5900
Fax: 03 8523 5999
Web: www.idec.com

2.17. Moxa Ethernet Switch

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Ethernet Switch

Location:

Model Numbers: FDS-208A

Manufacturer: Mox

Supplier: Moxa
10 Wotton Street East,
Cheltenham, SA 5014

Ph: 08 8268 8000
Fax: 08 8268 8700
Web: www.moxa.com

2.18. Lumifa LED Lights

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: LED Lights

Location:

Model Numbers: Lumifa LF1B-N Series

Manufacturer: IDEC

Supplier: IPD Australia Pty Ltd
Unit 17
104 Ferntree Gully Road
Oakleigh, Victoria 3166,

Ph: 03 8523 5900
Fax: 03 8523 5999
Web: www.idec.com

2.19. Pilz PNOZX3

TECHNICAL DATA SHEET

For

SP011 CASWELL STREET **Sewage Pump Station**

Equipment Type: Pump Safety Relay

Location:

Model Numbers: PN0ZX3

Manufacturer: Pilz

Supplier: Pilz
C1/756 Blackburn Road
Clayton, VIC 3168

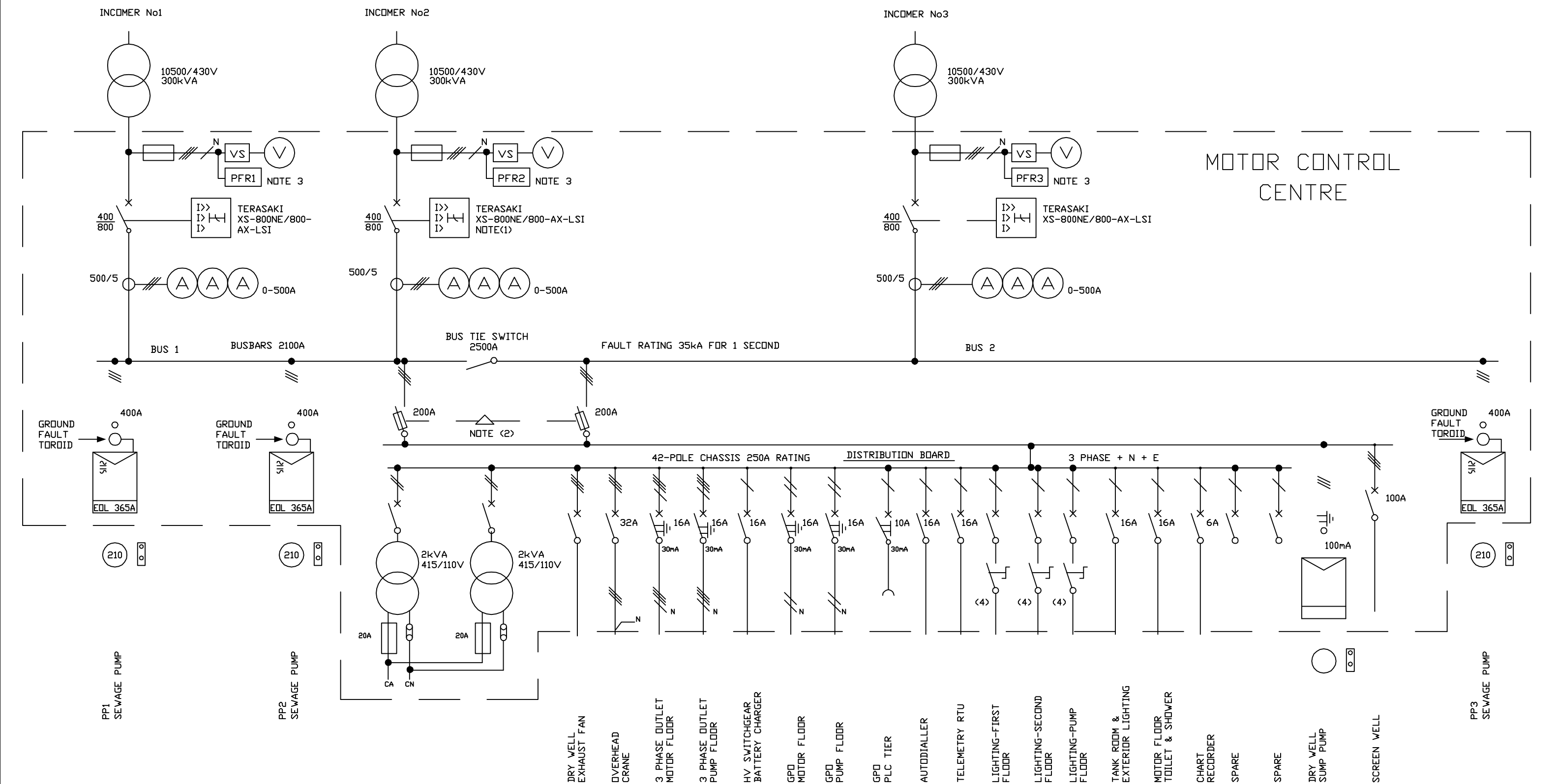
Ph: 03 9544 6300
Fax: 03 9544 6311
Web: www.pilaz.com.au

3. Drawings

[3.1 Point to point drawings - link](#)

[3.2 As built drawings - link](#)

Drawings are also available via
Trim - search on "Caswell".



NOTES

- 1) INCOMER No2 INCOMER COMPARTMENT HAS BEEN SIZED TO PROVIDE MOUNTING FACILITIES TO ALLOW SUBSTITUTION OF EXISTING CIRCUIT BREAKER WITH A 2500A UNIT (TERASAKI XS-2500NE) IN THE FUTURE. INCOMER No2 BUSBARS ARE RATED FOR 2100A.
- 2) MECHANICAL OR KEY INTERLOCK 1 ONLY TO BE CLOSED
- 3) PHASE UNBALANCE/UNDER VOLTAGE RELAY
- 4) FRONT OF PANEL MOUNTED SWITCHES

CST-E450

	COPYRIGHT ©	PATERSON FLOOD ENGINEERS								PROJECT APPR.	BY	DATE	CLIENT	SIZE	SCALE
This drawing remains the property of PATERSON FLOOD ENGINEERS and may not be copied in any way without prior written permission from the company.		GROUND FLOOR, 31 SHERWOOD ROAD, TOOWONG, QUEENSLAND 4066. TELEPHONE : (07) 871 0533 FACSIMILE : (07) 871 0538	D PH 12/93 AS BUILT						DESIGN APPR.	MJ	12/92		BRISBANE CITY COUNCIL	A3	N.T.S.
			C WM 7/93 AS WORKS TESTED						DESIGNED	CK			TITLE CASWELL STREET SEWAGE PUMPING STATION MOTOR CONTROL CENTRE SINGLE LINE DIAGRAM	REV D No.	
			B WM 1/93 ISSUED FOR CONSTRUCTION						CHECKED					DRAWING NO.	
			A WM 12/92 ISSUED FOR TENDER												
DRAWING No Q-Pulse I-REFUS-200E DRAWINGS			No BY DATE OF 2013 REVISION CHECKED APPROV.						DRAWN	WM	12/92				Page 50 of 70

3.1. Point to Point Drawings

3.2. As Built Drawings

4. Inspection & Test Results



COZENS • REGAN
WILLIAMS • PROVE PTY LTD.

Suite 7 Advanced Business Centre
39 Lawrence Drive Nerang
PO Box 2711 Nerang Q 4211
Ph 07 5578 4100
Fx 07 5578 4092

CERTIFICATION

To : SJ ELECTRIC

Date : 28/10/2012

Attention: DAMIAN WHITE

From : ROD PROVE

Job Number : 12420

Project : CASWELL ROAD, EAST BRISBANE – SEWER PUMP STATION

No of Pages (including this sheet): **1**

Damian

This is to certify that we have inspected the three (maximum 150mm diameter) penetrations made in the first floor slab of the above sewer pump station and that the penetrations have not affected the structural integrity of the slab.

If you have any queries please do not hesitate to contact me.

Yours faithfully

Rod Prove
For and on behalf of
Cozens Regan Williams Prove Pty Ltd

Bodo Kehren

From: Chris Perazza <perazza.c@protech-power.com>
Sent: Saturday, 22 September 2012 6:47 AM
To: Damian White
Cc: Ben Eastoe; Anton Nel; ram.k
Subject: RE: 13-7272 SJ Electric Bus tie investigations
Attachments: 13-7272 Closed.pdf; Caswell Street - Single Line.pdf

Hi Damien,

Based on the information provided & gathered from site the 415V bus tie circuit breaker can be closed. Please note that the name plate for the switchboard could not be located & the fault rating of the switchboard was based on the single line drawing showing this to be 35kA for 1 second. Attached is the test simulation showing the expected fault currents.

In regards to the 11kV oil circuit breakers – I would suggest that these be maintained to ensure their future reliability. This would require the dielectric break down testing of the oil to ensure it is within specification, full operational checks and electrical testing. If the oil is outside the limits this can be replaced during the works. The 11kV drawing shows that two of the five circuit breakers belong to Energex so the 3 others could be maintained. I would suggest maintaining the spare 11kV circuit breaker first to confirm an appropriate backup if one of the others are found faulty. For the 11kV protection relays & ammeters we can carry out secondary injection & confirm if the relays operation is within the manuals protection curve limits.

Please advise if you would like me to arrange a team to return to site to close the bus tie circuit breaker & carry out testing on the 11kV equipment.

Many thanks

Chris Perazza
 Brisbane Supervisor



2 Prospect Place
 Berrinba QLD 4117
 Phone: 07 3440 6500
 Mobile: 0417 759 035

Email: perazza.c@protech-power.com



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From: Damian White [mailto:Damian.White@sjelectric.com.au]
Sent: Thursday, 13 September 2012 2:42 PM
To: Chris Perazza
Subject: RE: 13-7272 SJ Electric Bus tie investigations

See below

Damian White
Project Manager - Water



P 07 3256 1522
 F 07 3256 1533

M 0418 163 891
E damian.white@sjelectric.com.au

Please visit our website at: www.trivantage.com.au



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From: Chris Perazza [<mailto:perazza.c@protech-power.com>]
Sent: Thursday, 13 September 2012 2:37 PM
To: Damian White
Cc: Ben Eastoe; ram.k
Subject: RE: 13-7272 SJ Electric Bus tie investigations

Hi Damien,

Could you please also confirm the following;

- Are the protection relays on the CB's to be tested or has this been done recently? **Not Known**
- Are any works required on T2 transformer and the CB? **No**
- For us to close the bus tie CB we would need confirmation from the protection study or else this would have to be done prior to energizing. **ok**
- What is the preferred work start time & are any inductions required? **We are on site from 6.00 am no inductions required**

I will give you a call shortly to discuss further.

Regards

Chris Perazza
Brisbane Supervisor



2 Prospect Place
Berrinba QLD 4117
Phone: 07 3440 6500
Mobile: 0417 759 035

Email: perazza.c@protech-power.com



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From: Damian White [<mailto:Damian.White@sjelectric.com.au>]
Sent: Thursday, 13 September 2012 10:37 AM
To: Chris Perazza
Subject: RE: 13-7272 SJ Electric Bus tie investigations

Hi Chris

Please see below

Damian White
Project Manager - Water



P 07 3256 1522
F 07 3256 1533
M 0418 163 891

E damian.white@sjelectric.com.au

Please visit our website at: www.trivantage.com.au



A Division of the Trivantage Group

From: Chris Perazza [<mailto:perazza.c@protech-power.com>]

Sent: Wednesday, 12 September 2012 5:00 PM

To: Damian White

Cc: Ben Eastoe

Subject: 13-7272 SJ Electric Bus tie investigations

Hi Damien,

Can you please confirm the scope of works you require with the onsite testing at Caswell street pump station? From our conversation this week I have listed the following works:

- Maintenance of the 3 x incomer CB's & 1 x bus tie CB
 - Includes I.R., continuity, tightness & operational checks
- Testing of phasing at incomer CB's & other possible points
- Check phase rotation

Yes for all above

Can you confirm the following points:

- Is the bus tie CB to be closed during this visit? - if you believe it will not cause any issues .ie go bang
- Can the incomer CB's be isolated during the works? – will need to confirm with on site electrician
- Is there a protection study confirming the settings on the CB's are correct & if individual incomers are rated for the load on the entire board? I have asked for all paperwork from client but it has not been forthcoming

I would like to have a team onsite on Friday to carry out the works if you could please confirm your requirements for me.

Many thanks

Chris Perazza

Brisbane Supervisor



2 Prospect Place

Berrinba QLD 4117

Phone: 07 3440 6500

Mobile: 0417 759 035

Email: perazza.c@protech-power.com



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From: Damian White [<mailto:Damian.White@sjelectric.com.au>]

Sent: Thursday, 6 September 2012 2:26 PM

To: Terry Bradley

Cc: Ben Eastoe; Chris Perazza

Subject: RE: Caswell Street Pump Station Bus tie switching

Hi Terry

I wish to go ahead with this investigation work please forward all company information so we can set you up in our system and issue an order.

I require

Company Name

Address
ABN etc

Thanks

Damian White
Project Manager - Water



P 07 3256 1522
F 07 3256 1533
M 0418 163 891
E damian.white@sjelectric.com.au

Please visit our website at: www.trivantage.com.au



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From: Terry Bradley [<mailto:bradley.t@protech-power.com>]
Sent: Monday, 20 August 2012 9:08 AM
To: Damian White
Cc: Ben Eastoe; Chris Perazza
Subject: Caswell Street Pump Station Bus tie switching

Damian,

Thanks for your enquiry regarding the Bus Tie switching. We would suggest an on site investigation of the existing switchboard, transformers and electrical system, carry out the necessary testing and checking of fault levels to determine the safety of operating the existing bus tie. Due to WHOS requirements a minimum of 2 technicians on site are required to carry out the testing. I have attached our Schedule of Rates for your information. Please Contact Chris Perazza our workshop supervisor if you wish to proceed with this works.

Regards

Terry Bradley
Estimator



2 Prospect Place
Berrinba QLD 4117
PO Box 1086
Browns Plains QLD 4118

Phone: 07 34406500
Fax: 07 34406555
Mobile: 0428 113 398

Email: bradley.t@protech-power.com

Website: <http://www.protech-power.com>



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SJ Electric Pty Ltd

Ref: SJQF 502

Inspection and Test Check List

Date: 19 July 2007

Project: <u>Caswell St Sewage Pump Station</u>		
Contractor / Order No.	SJ Electric Job No. <u>43400 698</u>	
ITC No. 003	Date: <u>23/08/12</u>	Corresponding ITP No. 001

General Data

Built By: <u>Dave King, Ryan Doyle, Anita Rhodes, Nick Small</u>	Test Equipment: <u>Multimeter/Megger/High Pot.</u>
Location Tested: <u>SJ Workshop</u>	Type: <u>Fuke/Kyoritsu/Kyoritsu</u>
Drg rev No:	Serial No. <u>97290148/5149622/W0296787</u>

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				JP
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		(✓)	
13	Busbar is insulated at supports		(✓)	
Cabling				JP
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:

Approved By: <u>Josh Pardey</u>		
Signature: <u>[Signature]</u>	Checked By: <u>DAVE KWA</u>	
Electrical License No. <u>122714</u>	Signature: <u>D.KWA</u>	Date: <u>23/8/12</u>

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

Inspection and Test Check List

Date: 19 July 2007

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 <ul style="list-style-type: none"> current rating Ka rating. trip settings correct to cabling to labels. shunt trips inter locks 		(/)	JP
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 <input type="checkbox"/> Signature: Date:				
Approved By: <u>Joshua Pardey</u>				
Signature: <u>[Signature]</u>		Checked By: <u>DAVE KING</u>		
Electrical License No. <u>122714</u>		Signature: <u>DAVE KING</u>		Date: <u>23/8/12</u>
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

Inspection and Test Check List

Date: 19 July 2007

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		(✓)	JP	
2	Correct mountings		(✓)		
3	Correct labelling		(✓)		
4	Check that line side conductors are SDI and < 500mm		(✓)		
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 <input type="checkbox"/> Signature: Date:					
Approved By: Joshua Pardey					
Signature: [Signature]		Checked By: DAVE KWE			
Electrical License No. 122714		Signature: D.KWE		Date: 23/8/12	
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

Inspection and Test Check List

Date: 19 July 2007

Switch Board and Control Panels Construction Check List (SJQF 502)				
Item	Activity Description	Hold Points	Test Result	By (Initial)
Earthing Resistance & Continuity Test (Note all readings should be < .5 ohms) Make sure the MEN connection is removed and attach lead to main earth connection point than test with other lead between				
1	The frame of each section		< .5 Ω	JP
2	The doors		< .5 Ω	
3	All mounting bolts to all equipment		< .5 Ω	
4	All brackets		< .5 Ω	
5	All earth links		< .5 Ω	
6	All bolts & threads for the mounting of escutcheon		< .5 Ω	
7	All gland plates		< .5 Ω	
8	All cable trays		< .5 Ω	
9	All earth connection		< .5 Ω	
10	Earth secondary of transformers and power supplies		< .5 Ω	
11	Earth surge diverters		< .5 Ω	
12	Current transformers		< .5 Ω	
Insulation Test				
1	Make sure all control fuses and earths are removed from all electronic equipment before this test is carried out and Set insulation tester (meggar) to 500 volts before proceeding			
	• Red – White		+200M Ω	JP
	• Red – Blue		+200M Ω	
	• Red – Earth		+200M Ω	
	• Red – Neutral		+200M Ω	
	• White – Blue		+200M Ω	
	• White – Earth		+200M Ω	
	• White – Neutral		+200M Ω	
	• Blue – Earth		+200M Ω	
	• Blue – Neutral		+200M Ω	
2	If all readings are clear the insulation tester is to be set at 1000 volts then proceed with the following			
	• Red – White		+200M Ω	JP
	• Red – Blue		+200M Ω	
	• White – Blue		+200M Ω	
Remarks/Remedial Action Required:				
Remedial Actions Completed <input type="checkbox"/> Signature: _____ Date: _____				
Approved By: Joshua Pardey				
Signature: [Signature]		Checked By: DAVID KING		
Electrical License No. 122714		Signature: D.KING		Date: 28/8/12
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

Inspection and Test Check List

Date: 19 July 2007

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		(✓)	JP
2	All the following tests must be set at a 1 minute time period, result should be 0 Amps		(✓)	
		Passed	Test Result	By (Initial)
3	Test between:			JP
	• Red – White	(✓)	5.11 GΩ	
	• Red – Blue	(✓)	3.1 GΩ	
	• Red – Earth	(✓)	>100 GΩ	
	• Red – Neutral	(✓)	74.9 GΩ	
	• White – Blue	(✓)	4.9 GΩ	
	• White – Earth	(✓)	>100 GΩ	
	• White – Neutral	(✓)	60 GΩ	
	• Blue – Earth	(✓)	>100 GΩ	
	• Blue – Neutral	(✓)	70.4 GΩ	
Supply Authority section				
1	Check supply authority main isolator lockable in the on position		(✓)	JP
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	See	(✓)	
5	Check double insulated cable for POT fuses are less than 800 mm	X	(✓)	
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 <input type="checkbox"/> Signature: Date:				
Approved By: Joshua Pardey				
Signature: [Signature]		Checked By: DAVID KING		
Electrical License No. 122714		Signature: D. KING		Date: 23/8/12
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

Inspection and Test Check List

Date: 19 July 2007

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		(✓)	JP
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			JP
	• Red - White		415 V	
	• Red - Blue		415 V	
	• Red - Earth		240 V	
	• Red - Neutral		240 V	
	• White - Blue		415 V	
	• White - Earth		240 V	
	• White - Neutral		240 V	
	• Blue - Earth		240 V	
	• Blue - Neutral		240 V	
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		()	
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.		()	
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 <input type="checkbox"/> Signature: Date:				
Approved By: Joshua Pardey				
Signature: [Signature]		Checked By: DAVE KING		
Electrical License No. 122714		Signature: D.KW6		Date: 23/8/12
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				



TEST BEFORE YOU TOUCH

TEST SHEET

CUSTOMER NAME: QOOSWITCHBOARD ID: L+P CONT.DATE: 21-6-12CUSTOMERS ADDRESS: CASWELL ST, EAST BRISBANEJOB No: 43400699

C/B NO.	CABLE SIZE	C/B SIZE	N NO	CIRCUIT DESCRIPTION	VISUAL INSPECTION	CORRECT CIRCUIT CONNECTION	EARTH CONT.	A - E M Ω	N - E M Ω	A - E VOLTS	A - N VOLTS	$\phi - \phi$ VOLTS	RCD TEST		Fault loop Impedance measurement
													mA	mS	
Q34	2.5	16	34	FLOODLIGHT CENTRE OF WALL	OK	OK	0.1	200M	200M	240	240	/	30	20	
Q35	2.5	16	35	FLOODLIGHTS END WALLS	OK	OK	0.4	200M	200M	240	240	/	30	20	
Q36	1.5	10	36	WET WELL LIGHTS	OK	OK	0.05	200M	200M	240	240	/	30	20	
Q37	2.5	10	37	LOADING BAY LIGHTS	OK	OK	0.1	200M	200M	240	240	/	30	20	
Q38	2.5	10	38	FAN ROOM LIGHTS	OK	OK	0.05	200M	200M	240	240	/	30	20	
Q39	2.5	16	39	LOADING BAY EPO	OK	OK	0.1	200M	200M	240	240	/	30	20	
Q40	2.5	16	40	FAN ROOM GPO	OK	OK	0.05	200M	200M	240	240	/	30	20	
Q41	2.5	16	41	3PH GPO FAN ROOM	OK	OK	0.05	200M	200M	240	240	415	30	14	
Q42	6MM	32	42	ODOUR CONTROL	OK	OK	0.1	50M	50M	240	240	415	/	/	
Q43	2.5	16	43	GENERATOR CUBICLE GPO	OK	OK	0.1	200M	200M	240	240	/	30	31	
Q44	2.5	16	44	GND FLOOR (ENTRY) GPO	OK	OK	0.2	200M	200M	240	240	/	30	30	
Q45	2.5	6	45	BMG 7 LIGHT CONTROL	OK	OK		200M	200M	240	240	/	/	/	

TEST EQUIPMENT: MEGGER, LOOP, RCDNAME: AWAY WALMSLEYSERIAL NO: 5171380, 7011093, 0043156LIC. NO: A30723TEST DUE DATE: NOV 2012SIGNATURE: [Signature]



TEST BEFORE YOU TOUCH

TEST SHEET

CUSTOMER NAME: QWSWITCHBOARD ID: L+P DBDATE: 21-6-12CUSTOMERS ADDRESS: CASWELL ST. EAST BRISBANEJOB No: 1340089T

C/B NO.	CABLE SIZE	C/B SIZE	N NO	CIRCUIT DESCRIPTION	VISUAL INSPECTION	CORRECT CIRCUIT CONNECTION	EARTH CONT.	A - E M Ω	N - E M Ω	A - E VOLTS	A - N VOLTS	φ - φ VOLTS	RCD TEST		Fault loop Impedance measurement
													mA	mS	
	25			3P+N SUPPLY	OK	OK	0.06	200M	200M	240	240	215	/	/	0.12
Q21	6MM	32	/	DRY WELL VENT FAN	OK	OK	0.1	200M	/	240	/	415	/	/	0.39
Q22	2.5	16	/	WET WELL VENT FAN	OK	OK	0.1	200M	/	240	/	415	/	/	0.88
Q23	4-	32	23	MCC ROOM LOW BAY LIGHTS	OK	OK	0.8	200M	200M	240	240	/	30	70	
Q24	2.5	20	24	OVERHEAD CRANE	OK	OK	0.15	200M	/	240	/	415	/	/	
Q25	2.5	16	25	3PH OUTLET LEFT OF DB	OK	OK	0.01	200M	/	240	/	415	30	26	
Q26	2.5	16	26	3PH OUTLET PUMP FLOOR	OK	OK	0.15	200M	/	240	/	415	30	14	
Q27	2.5	16	27	1PH GPO LEFT OF DB	OK	OK	0.01	200M	200M	240	240	/	30	20	0.14
Q28	2.5	16	28	1PH GPO PUMP FLOOR	OK	OK	0.2	200M	200M	240	240	/	30	20	
Q29	2.5	16	29	FIRST FLOOR LIGHTS	OK	OK	0.2	200M	200M	240	240	/	30	20	
Q30	2.5	16	30	SECOND FLOOR LIGHTS	OK	OK	0.2	200M	200M	240	240	/	30	20	
Q31	2.5	16	31	PUMP FLOOR LIGHTS	OK	OK	0.3	200M	200M	240	240	/	30	20	
Q32	2.5	16	32	EXTERIOR LIGHTS	OK	OK	0.2	200M	200M	240	240	/	30	20	
Q33	2.5	16	33	TOILET, SHOWER AND FOYER LIGHTING	OK	OK	0.3	200M	200M	240	240	/	30	20	

TEST EQUIPMENT: Megeyer, Loop Tester, RCDNAME: ANDY WALMSLEYSERIAL NO: 5171380, 7011093, 0043156LIC. NO: A30723TEST DUE DATE: NOV 2012SIGNATURE: [Signature]

TEST BEFORE YOU TOUCH

14006

TEST SHEET

CUSTOMER NAME: QQQ

SWITCHBOARD ID: MCE

DATE: 16-10-12

CUSTOMERS ADDRESS: CASWELL ST. EAST BRIS.

...JOB No.: 43400697

[illegible]

TEST EQUIPMENT: MECCOR LOOP

SERIAL NO: 5171380 7011093

TEST DUE DATE: 18-51-12

NAME: A. WALMSLEY

LIC NO: A 30723

SIGNATURE: 

14007

...JOB No.: 43400697...

SJ-61 ISSUE 2

5. Compliance Certificates



SJ Electric Group (Qld) Pty Ltd
A Division of the Trivantage Group

19 Elliot Street, Albion QLD 4010

P 07 3256 1522 F 07 3256 1533

E mail.qld@sjelectric.com.au ABN 45 124 414 768 REC 73286

www.trivantage.com.au

Ref: Test Certificate SP011

TEST CERTIFICATE

SJ Electric Group (Qld) Pty. Ltd.
19 Elliot Street.
Albion Qld. 4010
R.E.C. 73286

Attention: Mr Brett Lawrence

Senior Project Manager
Major Projects and Commercial Services
Queensland Urban Utilities
GPO Box 13277 George Street
Brisbane Qld 4003

Work performed for Queensland Urban Utilities at SP011 Caswell Street, East Brisbane under contract
BW: 70103-06/07 Oder 87 (SJ Electric Job Number 43400697)

Installation Tested / Equipment Tested

- New Sewage Pump Station Switchboard
- New Main Earth
- Earth Bonding to Main Earth Link and all Switchboard Components.
- New Consumer Mains
- Pump Cables
- Lighting & Power Outlets
- Disconnect Boxes

All supporting test sheets attached.

Test Date
08/11/2012

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 73286)

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 73286)

Signed

A handwritten signature in black ink, appearing to be 'CJ Holmes', written over a light blue horizontal line.