BRISBANE CITY COUNCIL

Pressure Gauge Switchboard P0564

Honeybee Place

Contract : **BW 70103-038**

Job Number : **WT400085**

ELECTRICAL INSTALLATION

OPERATIONS and MAINTENANCE MANUAL

INSTALLATION BY:

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

Telephone: 07 3256 1522 Fax: 07 3256 1533

INDEX

1. General

1.1 General Workplace Health and Safety

- The Workplace Health and Safety Act (1995) 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 BW70103-038 was for the manufacture and testing of ten (10) new Pressure switchboards for various locations throughout Brisbane.

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

- Switchboards
- Instrumentation
- Civil Works

The switchboard incorporates the latest technology in 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 <u>any</u> 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.
- RTU panels should be maintained as dust free as possible. Dusting with a dry rag is recommended - taking care not allows 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.
- Distribution Section.
- RTU Section.

1.5 Control and Monitoring System.

The control and monitoring of the system is performed by the Brisbane Water telemetry system and was not included in this contract.

2. MANUFACTURER'S TECHNICAL DATA

TECHNICAL DATA SHEET

For

PRESSURE STATION PO564
Honeybee Pl

Equipment Type:	Surge Filter Alarm Relay
Location:	Main Incomer
Model Numbers:	DAR-275V
Manufacturer:	Critec
Supplier:	Energy Correction Options PO Box 431 Kelvin Grove, QLD. 4059 Ph: 07 3356 0577 Fx: 07 3356 1432 Web: www.ecoptions.com.au

TECHNICAL DATA SHEET

For

PRESSURE STATION PO564
Honeybee Pl

Equipment Type:	Radio
Location:	RTU Section
Model Numbers:	DR900-06A02-D0
Manufacturer:	Trio
Supplier:	Brisbane Water

TECHNICAL DATA SHEET

For

PRESSURE STATION PO564
Honeybee Pl

Equipment Type:	Impulse Suppressor
Location:	RTU Section
Model Numbers:	IS-50NX-C2
Manufacturer:	Polyphaser
Supplier:	Brisbane Water

TECHNICAL DATA SHEET

For

PRESSURE STATION PO564
Honeybee Pl

Equipment Type:	Radio/DC Converter
Location:	RTU Section
Model Numbers:	PB1H-2412G-CC
Manufacturer:	Powerbox
Supplier:	Brisbane Water

TECHNICAL DATA SHEET

For

PRESSURE STATION PO564
Honeybee Pl

Equipment Type:	Modem/DC Converter
Location:	RTU Section
Model Numbers:	24VDC-SP-CC
Manufacturer:	Powerbox
Supplier:	Brisbane Water

2. MANUFACTURER'S TECHNICAL DATA

2.1 Critec DAR-275V Alarm Relay

ERICO

DINLINE ALARM RELAY (DAR)

INSTALLATION INSTRUCTIONS

MODEL NUMBER
DAR 275V

1. PREPARATION

DANGER: *Electrical shock or burn hazard. Installation of this device should only be made by qualified personnel. Failure to lockout electrical power during installation or maintenance can result in fatal electrocution or severe burns. Before making any connections be sure that power has been removed from all associated wiring, electrical panels, and other electrical equipment.*

CAUTION NOTES:

1. *The installation of this device should follow all applicable electrical codes, such as the National Electrical Code.*
2. *Check to make sure line voltage does not exceed DAR275V voltage ratings.*
3. *Follow all instructions to ensure correct and safe operation.*
4. *Do not attempt to open or tamper with the DAR in any way as this may compromise performance and will void warranty. No user serviceable parts are contained.*

2. INTRODUCTION

Selected DSD, TDS & TDF DINLINE Surge Protection Devices include status monitoring circuits which provide visual status display of device capacity. They may also provide a low voltage opto-coupler alarm output circuit that can be connect to the DAR to provide potential free (Form C) change-over contacts. The DAR alarm contacts may be used to provide output to external alarm systems or remote monitoring circuits.

One DAR can be used per DSD/TDS/TDF opto-coupler alarm or up to 16 DSD opto-coupler alarms can be connected in series to the one DAR to provide a common output. It is recommended that the DAR be powered from the same power circuit that feeds the device(s) being monitored, however the DAR can be powered from other circuits. This allows for example, one DAR unit to be connected to separate SPDs that are protecting a three phase circuit.

Note. Depending upon the usage of the DAR output contacts, failure of power to the DAR may be interpreted as a failure of one or more of the SPDs being monitored. Visual inspection of the DAR and SPDs status displays would determine this.

3. MOUNTING

The DAR is designed to clip to 35mm (top hat) DIN rails (standard EN50022). Unless otherwise mechanically restrained, use horizontal DIN rails with the DAR module spring clips to the bottom and the label text the correct way up.

NOTE: The DAR must be installed in an enclosure or panel that:

- *prevents the DAR temperature from exceeding 131°F (55°C)*
- *provides adequate electrical and safety protection*
- *prevents the ingress of moisture and water*
- *allows DAR status indicators to be inspected*

4. ELECTRICAL CONNECTION

The interconnecting wiring should:

- be of size #10 to #14 AWG (2.5mm² to 6mm²) solid or stranded conductor.
- The wire insulation should be stripped back 5/16" (8mm).
- NOTE: Do not use greater than 9inlbs (1Nm) of torque when tightening the terminals.

CONNECTION TO TELECOMMUNICATIONS NETWORKS

The DAR is approved for use in Australia where the alarm contacts may be connected to private lines or building cabling associated with the telecommunications network. NO direct connection to the public switched network should be made.

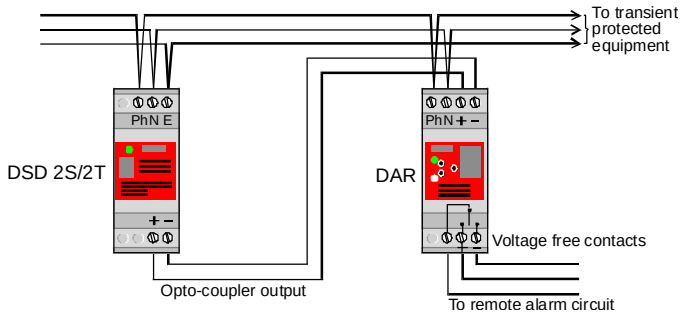
ERICO

DINLINE ALARM RELAY

INSTALLATION INSTRUCTIONS

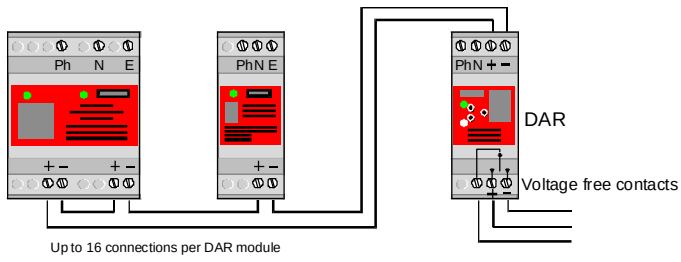
5. INTERCONNECTION

When connecting the DAR to a single opto-coupler output the + terminal of the SPD should connect to the + terminal on the DAR. The – terminal should connect to the -- terminal.



+/- terminal connections are polarity sensitive. Do not reverse.

When connecting the DAR to multiple opto-couplers the opto-couplers should be connected in series with + terminal of one connected to the – terminal of the next. The DAR + terminal should connect to + SPD terminal at one end of the series connection and the – DAR terminal connect to the – SPD terminal at the other end of the series connection.



+/- terminal connections are polarity sensitive. Do not reverse.

5. STATUS INDICATION

	✓	!	✗
STATUS	Protection Operational	Protection Alarm	Fault Mode
DISPLAY	Normal / Fault (8, 4, 6)	Normal / Fault (8, 4, 6)	Normal / Fault (8, 4, 6)
EXPLANATION	Normal operation Normal (green) indicator ON Red indicator OFF Relay is energised Power is supplied	DSD in alarm mode or power to DSD has been removed Normal (green) indicator OFF Red indicator ON Relay is de-energised Power is supplied	Power to DAR removed Protection status unknown Normal (green) indicator OFF Red indicator OFF Relay is de-energised Power is OFF

6. FUSING AND ISOLATION

Overcurrent protection must be installed in the upstream circuit of the power supply to the DAR to provide protection to the unit itself and the wiring in case of fault conditions.

The fuse rating should be based on the wiring size used to connect to the DAR Ph & N terminals. Australian regulations AS3000-1991, Table B2 specifies the following upstream protection for single phase circuits, unenclosed in air.

Cable Size	HRC Fuse or	CB Rewirable Fuse
1.5mm^2	16A	12A
2.5mm^2	20A	16A
4mm^2	25A	20A
6mm^2	32A	25A

Where overcurrent protection of the appropriate rating or smaller is already fitted in the upstream circuit, overcurrent protection at the DAR will not be required

6. MAINTENANCE & TESTING

Before removing a DAR unit from service, ensure that the power has been removed. Maintenance, testing and replacement should only be undertaken by qualified personnel.

Testing of a DAR unit which is connected to a fully functional DSD unit can be accomplished by removing power to the DSD only. The DAR Status indication and output contacts should alter from the Normal to Fault condition.

Testing of the DAR unit alone may be accomplished by disconnecting the + / -connections to the unit. When power is applied the DAR “Fault” Status Indicator should be illuminated. By connecting the + / - terminals together, the “Normal” Status Indicator should be illuminated. The output contacts should alter to the appropriate state.

7. USE OF OTHER INTERFACES

Only DAR units are recommended for the interfacing of equipment to the DSD, TDS & TDF opto-coupler alarm output circuit(s). The direct connection of other equipment to these opto-coupler alarm outputs may not provide sufficient isolation or exceed the opto-coupler specifications. This may damage the SPD and/or the connected equipment. Warranty may be voided under such circumstances.

NOTE: *In connecting to the SPD opto-coupler alarm output(s), do not reverse the +/- connections as damage may occur.*

2. MANUFACTURER'S TECHNICAL DATA

2.2 Trio DR900-06A02-D0 Radio.

TC-900DR USER GUIDE

41 Aster Avenue Carrum Downs 3201 Australia Tel: 61 3 9775 0505 Fax: 61 3 9775 0606

GENERAL

The Trio DataCom TC-900DR is a full duplex 900 MHz Radio featuring a fully integrated 4800/9600 bps data radio modem and antenna diplexer. Configuration of the unit is fully programmable, with parameters held in non volatile memory (NVRAM). All configuration parameters are accessible using the TC-DRPROG installation package, consisting of a programming lead, manual and software which will run on a PC under Windows 95/98/NT. It is essential that each unit is programmed to suit individual requirements prior to operation. *For detailed information refer to the TC-900DR Handbook.*

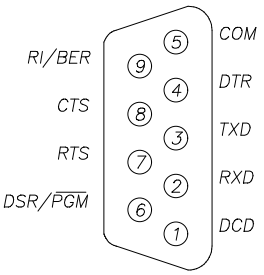
DATA CONNECTION

The data connection is via a DB9 connector labeled 'Port A' (shown below), which is wired as a DCE.

User Serial "Port A" Pin Assignment.

EXTERNAL VIEW OF `**PORT A**

NOTE: Pin 6 and pin 9 provide a dual function which depends on the mode that the TC-900DR is operating in.

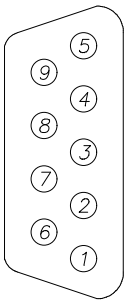


PIN NO. & FUNCTION
1. DATA CARRIER DETECT (DCD)
2. RECEIVE DATA OUTPUT (RXD)
3. TRANSMIT DATA IN (TXD)
4. DATA TERMINAL READY (DTR)
5. COMMON (COM) ___
6. PROGRAM PIN (PGM)
7. REQUEST TO SEND (RTS)
8. CLEAR TO SEND (CTS)
9. BIT ERROR RATE PIN (BER)

User Serial "Port B" Pin Assignment.

Port B can be used as a secondary data steam (independent of Port A) once configured by the programmer. Port B also has one connection that may be of use for installation. This connection (Pin 9) is Receive Signal Strength Indicator (RSSI) output. 0-5V where 1.5V typically indicates -110dBm and every 0.5V increase indicates an improvement of » 10dBm.

EXTERNAL VIEW OF `**PORT B'**



PIN NO. & FUNCTION
1. DATA CARRIER DETECT (DCD)
2. RECEIVE DATA O/P (RxD)
3. TRANSMIT DATA O/P (TxD)
4. UNUSED
5. COMMON
6. DATA SET RECEIVE (DSR)
7. UNUSED
8. UNUSED
9. RECEIVE SIGNAL STRENGTH

NOTE: Port B Pin 9 output has a high impedance of around 50K OHMS and loading will decrease accuracy of the RSSI measurement.

POWER CONNECTIONS

The power required is 13.8VDC nominal, at 600mA (Tx) nominal. If the POWER LED indicator is not illuminated once power is applied, check the internal 1Amp fuse fitted within the unit.

POWER CONNECTOR	PIN ASSIGNMENT
TOP PIN	***+VE SUPPLY (13.8vdc)***
BOTTOM PIN	***GROUND***

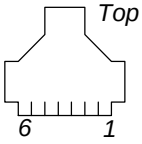
Ext. view of socket

AUXILIARY CONNECTOR

The auxiliary connector is primarily for use with the optional audio handset. The connections to this auxiliary 6 pin RJ11 connector are as follows:

PIN NUMBER	FUNCTION
1	***8 VOLTS***
2	***AUDIO OUT***
3	***GROUND***
4	***MIC INPUT/SENSE***
5	***GROUND***
6	***MANUAL PTT***

External view of socket



The optional audio handset is recommended as an aid in checking installations for radio path viability. This audio handset will only function when fitted prior to applying power to the unit.

The modem upon power up will check the presence of the handset and will inhibit data being transmitted so that voice communications can be established.

Once the path tests have been conducted the audio handsets **MUST be REMOVED** and the unit powered up with the handset removed before data communication can commence.

USER INDICATIONS

The TC-900DR provides 4 LED's that show status information to the user - POWER, RXSIG, SYNC, and TXMIT indications.

The POWER is indicated by a green LED and simply signifies that power has been applied to the unit.

The RXSIG LED (yellow) indicates the level of RSSI signal from the radio IF strip, compared to a threshold level set in the configuration data programmed by the user. If the signal is above the threshold, then the LED indicator is turned on.

In all operation modes except "Programmer mode", the SYNC LED (yellow) indicates when the modem has detected a valid data stream. The SYNC LED is activated, when the modem detects a valid HDLC flag sequence, and remains active until an invalid sequence of seven or more consecutive "1" bits is detected.

The SYNC LED will not be turned on if the RSSI signal strength (as indicated by the RXSIG LED) is below the minimum threshold. This prevents false SYNC detection from noise.

The TXMIT LED (red) indicator is connected directly to the modem's PTT output transistor. Whenever the radio is transmitting, this TXMIT LED indicator will be on.

SPECIAL MODES OF OPERATION

Part of the power-up/reset initialisation phase of the TC-900DR are tests to determine if the modem should enter one of 3 "special operation" modes. I*n these modes the TC-900DR won't operate in its standard run mode.*

- Programmer mode.
- Bit error rate test mode.
- Handset mode.

These modes are only entered if the required setup conditions are present at power up. An error mode of operation can also be entered into, if during normal operation, an error condition occurs.

PROGRAMMER MODE

CABLE - Pins 2, 3, 4, 5 straight through with Pin 6 on the DB9 connector of Port A, connected to pin 5. When the modem is powered up with this fitted, the controller senses this and attempts to enter "Programmer mode" and the "SYNC" LED will flash approx. once per second. (Note, the TC-DRPROG programming software and lead has the required connections). Failure to supply the correct password in time, will cause the modem to abandon the "Programmer mode" attempt, and go on with it's normal power-up procedure.

BIT ERROR RATE TEST MODE

Pin 9 of the DB9 connector of Port A, is normally the Ring Indicate output line. However, if this pin is driven positive (connecting it to pin 6 [DSR] and pin 7 [RTS]), then the modem's data transmitter and receiver will enter the BER test mode. This will activate the RF transmitter, and generate a scrambled bit pattern which should be decoded at a receiver as a constant logic "1" level in the unscrambled data. Any errors in the decoded bitstream, will be "0", and the receiver portion of the modem in this mode, will activate the SYNC LED every time it sees a "0" bit.

Note: As the TC-900DR is full duplex this test can operate in both directions simultaneously.

Every error bit detected, will activate the SYNC LED. For error rates of 1 in 10^3 and above, the SYNC LED will be ON most of the time. A 1 in 10^4 error rate will show the SYNC LED active for approximately 10% of the time. This function provides a crude indication of Bit Error Rate for installation purposes. Note: Error count messages (ET:XXXX) for every 10,000 bits are presented to Port A for the user. If pin 9 ceases to be driven positive, then the BER Test mode is terminated, and the modem restarts it's initialisation phase.

HANDSET MODE

The DFM4-9 modem tests for the presence of a handset plugged into the handset auxiliary port at power up. If a handset is plugged in, the modem will not generate a data stream. However, it will continue to indicate received RF signal strength. The handset has a PTT button, and this signal is connected across the modem's PTT output. Thus the handset PTT switch will activate the TXMIT LED. It is essential to remove the handset from the unit and reapply power to the unit in order to return to normal operation.

ERROR INDICATION MODES

There are 3 error conditions that cause the RXSIG & SYNC LEDs to be used for error indications and not their normal purpose. Two are fatal conditions, that cause the modem to restart after the duration of the error indication phase.

TRANSMIT POWER LOW

While the modem activates the radio transmitter, it periodically checks the transmit power. If the power measurement is less than a threshold set in the non-volatile memory, then the RXSIG and SYNC LEDs are made to alternate, approximately 4 times per second. The TXMIT LED will also be on during this process. This indication condition will persist for the duration of the transmission. As soon as the transmission is discontinued, the error indication will cease, and the two LEDs revert to their normal function. Factory set to 100 milliWatts.

NVRAM READ ERROR

The DFM4-9DR modem accesses the non-volatile memory as part of it's initialisation phase, to read programming configuration data. If the communication protocol with the device is violated, or the non-volatile memory CRC checksum is found to be incorrect, then the modem indicates this by flashing the RXSIG and SYNC LEDs twice alternately. That is, one LED operates ON and OFF twice, then the other. A total of five cycles of this occurs, then the modem restarts initialisation.

SYNTHESISER LOCK DETECT ERROR

If at any time during normal operation, BER mode, or handset mode, the TBB206 frequency synthesiser indicates an out of lock condition, the modem enters an error indication mode for a short time before restarting.

One LED is turned ON (☼), the LEDs are swapped, then both turned OFF (●). Then the latter LED ON again, swap LEDS, and then OFF. This will give the appearance of a sweeping motion between the LEDs. The following table shows all error condition displays.

Tx PWR Err		NVRAM Err		SYNTH Err	
RXSIG	SYNC	RXSIG	SYNC	RXSIG	SYNC
☼	●	☼	●	☼	●
●	☼	●	●	●	☼
☼	●	☼	●	●	●
●	☼	●	●	●	☼
☼	●	●	☼	☼	●
●	☼	●	●	●	●
☼	●	●	☼		repeat
●	☼	●	●		
continue			repeat		

MOUNTING AND ANTENNA CONNECTION

The TC-900DR should be mounted in a cool, dry, vibration free environment, whilst providing easy access to screws and connections. There are 4 mounting holes on the unit. The antenna should be an external yagi antenna but can be a ground independent dipole mounted via a feeder to the antenna connector (SMA type) for short range applications. However the whole radio modem should be clear of the associated data equipment to prevent mutual interference.

ASSEMBLY OF POWER LEAD

A small plastic bag containing a molex connector (M5557-2R) and two pins (M5556-TL) is provided in the packing box.

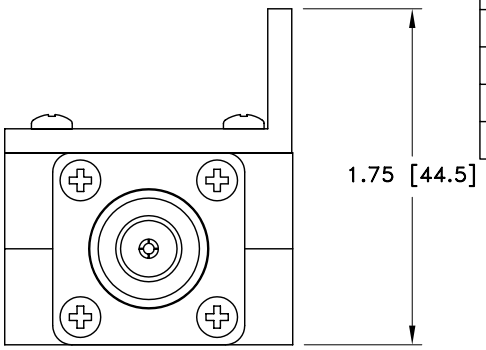
The pins are designed to take 18-24 (AWG) wire size with insulation range 1.3 - 3.10mm.

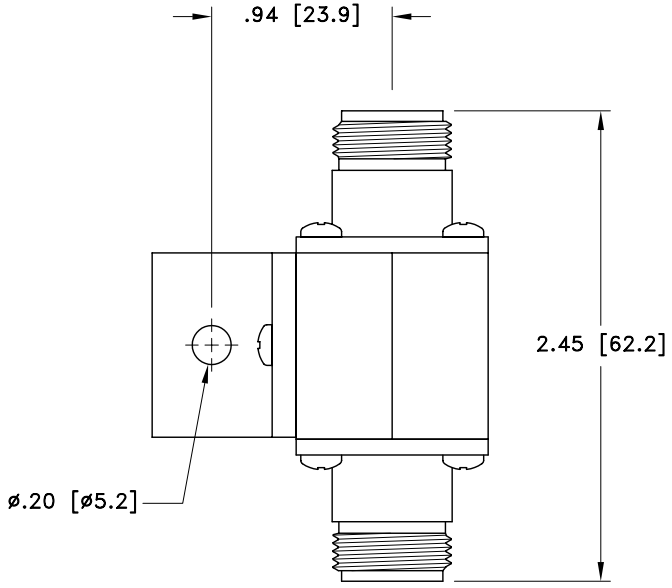
Please take care when crimping the pins. 04/01

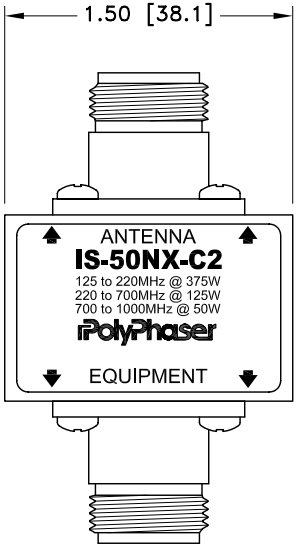
2. MANUFACTURER'S TECHNICAL DATA

2.3 Polyphaser IS-50NX Impulse Suppressor.

REVISIONS				
REV LTR	DATE	ENG	MKTG	Q.A.
A	01/30/96 PJP	T. K.	– –	R. M.
B	06/30/99 JCG	K.C.B.	T.G.F.	R. M.
C	01/16/01 SH	KCB	PH	RM
D	11/18/02 SH	LC	SD	LJ







MAXIMUM CHARACTERISTICS

SURGE:
50kA IEC 1000–4–5 8/20µs WAVEFORM 500 JOULES

TURN ON:
600Vdc ±20%

TURN ON TIME:
2.5ns FOR 2kV/ns

FREQUENCY RANGE:
125MHz TO 1GHz

VSWR:
≤1.1:1 OVER FREQUENCY RANGE

INSERTION LOSS:
≤0.1dB OVER FREQUENCY RANGE

TEMPERATURE:
–45°C TO +85°C STORAGE/OPERATING +50°C

CUSTOMER APPROVAL: _____ DATE: _____

ALL DIMENSIONS SHOWN ABOVE ARE FOR REFERENCE ONLY.

DRAFTER: J. CALLISTER	DATE: 09/21/93	PolyPhaser CORPORATION			
MECH ENGINEER: – – – –	DATE: – – –	P.O. BOX 9000, MINDEN, NV 89423–9000 (775) 782–2511 FAX (775) 782–4476			
ELEC ENGINEER: J. JONES	DATE: 04/12/95	DWG NO/PART NO/DESCRIPTION: IS–50NX–C2 CUSTOMER PRINT			
MARKETING: – – – –	DATE: – – –				
QUALITY DEPT: R. MATHEUS	DATE: 04/12/95	CAGE CODE: 61114	FILE NAME: –C1	SCALE: 1/1	SHEET: 1 OF 1

2. MANUFACTURER'S TECHNICAL DATA

2.4 Powerbox Radio/DC converter.

OPEN FRAME & ENCLOSED

PBIH Series

15-150 WATTS DC/DC SINGLE OUTPUT

Features

- **Wide selection of models**
- **4 input voltage ranges**
- **High efficiency**
- **Low output ripple**
- **Proven reliability**
- **Good thermal margins**

Specifications

INPUT

Input voltage	12VDC (9.2–16) 24VDC (19–32) 48VDC (38–63) 110VDC (85–140)
Inrush current	20A max. for 110V only

OUTPUT

Output voltage	See table
Voltage adjustment	±10%, ±5% for PBIH-F
Output current	See table
Ripple & noise	Output Volts x 1% + 50mV to -100mV pk-pk
Line regulation	0.8% over input range
Load regulation	0.9%, 0%–100% load
Temperature coefficient	0°C to 50°C, 0.03% per °C
Overvoltage protection	O.V. clamp, PBIH-F Output shutdown, PBIH-G, J, M, R – input must be switched off for at least 30S to reactivate
Overcurrent protection	Fold back – PBIH-F Current limiting, PBIH-G, J, M, R (PBIH-R series is adjustable); PBIH110xxR models are not adjustable
Drift	Output V x 0.5% + 15(mV) per 8 hrs after 1 hr warm-up
Rise Time	200mS max. – PBIH-F, M, R 100mS max. – PBIH-G, J (at 25°C)
Holdup time	10mS (only 110V input)
Remote sense	PBIH-R Series only

OPERATING

Efficiency	70%–89%
Safety isolation (1 minute)	Type – 12, 24, 48V input Input – Output: 1500VAC Input– Case: 1500VAC Output– Case: 500VAC Type– 110V input Input– Output: 2000VAC Input– Case: 2000VAC Output– Case: 500VAC
Insulation resistance	50M (500VDC) Input – Case
Parallel operation	Consult sales office for details
Remote control	PBIH-R Series: Open link: output normal Short link: output off

ENVIRONMENTAL

Operating temperature	0°C to 50°C full load
Cooling	Convection cooled
Storage temperature	-20°C to +85°C
Humidity	85%
Shock	30G, PBIH-F, G and J
Vibration	(5Hz–10Hz, 10mm), (10Hz–50Hz) 2G, PBIH-F, G and J

STANDARDS AND APPROVALS

Safety	Designed to UL1950
C-tick	AS/NZS CISPR11 Group 1, Class A

MECHANICAL

Weight	PBIH-F : 250g PBIH-G : 380g PBIH-J : 410g PBIH-M : 800g PBIH-R : 1.4kg

PBIH Series

15-150 WATTS DC/DC SINGLE OUTPUT

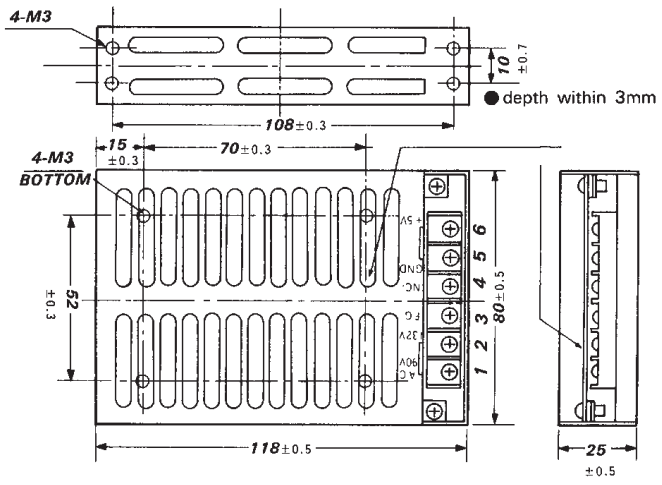
Selection Table

MODEL NUMBER	INPUT	OUTPUT		OUTPUT POWER
PBIH-1205F	9.2-16V	5V	3A	15W
PBIH-1212F	9.2-16V	12V	1.2A	15W
PBIH-1215F	9.2-16V	15V	1A	15W
PBIH-1224F	9.2-16V	24V	0.62A	15W
PBIH-2405F	19-32V	5V	3A	15W
PBIH-2412F	19-32V	12V	1.2A	15W
PBIH-2415F	19-32V	15V	1A	15W
PBIH-2424F	19-32V	24V	0.62A	15W
PBIH-4805F	38-63V	5V	3A	15W
PBIH-4812F	38-63V	12V	1.2A	15W
PBIH-4815F	38-63V	15V	1A	15W
PBIH-4824F	38-63V	24V	0.62A	15W
PBIH-11005F	85-140V	5V	3A	15W
PBIH-11012F	85-140V	12V	1.2A	15W
PBIH-11015F	85-140V	15V	1A	15W
PBIH-11024F	85-140V	24V	0.62A	15W
PBIH-1205G	9.2-16V	5V	5A	25W
PBIH-1212G	9.2-16V	12V	2.1A	25W
PBIH-1215G	9.2-16V	15V	1.7A	25W
PBIH-1224G	9.2-16V	24V	1.1A	25W
PBIH-1248G	9.2-16V	48V	0.5A	25W
PBIH-2405G	19-32V	5V	5A	25W
PBIH-2412G	19-32V	12V	2.1A	25W
PBIH-2415G	19-32V	15V	1.7A	25W
PBIH-2424G	19-32V	24V	1.1A	25W
PBIH-2448G	19-32V	48V	0.5A	25W
PBIH-4805G	38-63V	5V	5A	25W
PBIH-4812G	38-63V	12V	2.1A	25W
PBIH-4815G	38-63V	15V	1.7A	25W
PBIH-4824G	38-63V	24V	1.1A	25W
PBIH-4848G	38-63V	48V	0.5A	25W
PBIH-11005G	85-140V	5V	5A	25W

MODEL NUMBER	INPUT	OUTPUT		OUTPUT POWER
PBIH-11012G	85-140V	12V	2.1A	25W
PBIH-11015G	85-140V	15V	1.7A	25W
PBIH-11024G	85-140V	24V	1.1A	25W
PBIH-11048G	85-140V	48V	0.5A	25W
PBIH-1205J	9.2-16V	5V	8A	50W
PBIH-1212J	9.2-16V	12V	3.3A	50W
PBIH-1215J	9.2-16V	15V	2.7A	50W
PBIH-1224J	9.2-16V	24V	1.7A	50W
PBIH-1248J	9.2-16V	48V	0.8A	50W
PBIH-2405J	19-32V	5V	10A	50W
PBIH-2412J	19-32V	12V	4.3A	50W
PBIH-2415J	19-32V	15V	3.4A	50W
PBIH-2424J	19-32V	24V	2.5A	50W
PBIH-2448J	19-32V	48V	1A	50W
PBIH-4805J	38-63V	5V	10A	50W
PBIH-4812J	38-63V	12V	4.3A	50W
PBIH-4815J	38-63V	15V	3.4A	50W
PBIH-4824J	38-63V	24V	2.5A	50W
PBIH-4848J	38-63V	48V	1A	50W
PBIH-11005J	85-140V	5V	10A	50W
PBIH-11012J	85-140V	12V	4.3A	50W
PBIH-11015J	85-140V	15V	3.4A	50W
PBIH-11024J	85-140V	24V	2.5A	50W
PBIH-11048J	85-140V	48V	1A	50W
PBIH-1205M	9.2-16V	5V	18A	100W
PBIH-1212M	9.2-16V	12V	9A	100W
PBIH-1215M	9.2-16V	15V	7A	100W
PBIH-1224M	9.2-16V	24V	4.5A	100W
PBIH-1248M	9.2-16V	48V	2A	100W
PBIH-2405M	19-32V	5V	20A	100W
PBIH-2412M	19-32V	12V	9A	100W
PBIH-2415M	19-32V	15V	7A	100W

MODEL NUMBER	INPUT	OUTPUT		OUTPUT POWER
PBIH-2424M	19-32V	24V	5A	100W
PBIH-2448M	19-32V	48V	2A	100W
PBIH-4805M	38-63V	5V	20A	100W
PBIH-4812M	38-63V	12V	9A	100W
PBIH-4815M	38-63V	15V	7A	100W
PBIH-4824M	38-63V	24V	5A	100W
PBIH-4848M	38-63V	48V	2A	100W
PBIH-11005M	85-140V	5V	20A	100W
PBIH-11012M	85-140V	12V	9A	100W
PBIH-11015M	85-140V	15V	7A	100W
PBIH-11024M	85-140V	24V	5A	100W
PBIH-11048M	85-140V	48V	2A	100W
PBIH-1205R	9.2-16V	5V	27A	150W
PBIH-1212R	9.2-16V	12V	13A	150W
PBIH-1215R	9.2-16V	15V	10A	150W
PBIH-1224R	9.2-16V	24V	6.5A	150W
PBIH-1248R	9.2-16V	48V	3.3A	150W
PBIH-2405R	19-32V	5V	30A	150W
PBIH-2412R	19-32V	12V	14A	150W
PBIH-2415R	19-32V	15V	11A	150W
PBIH-2424R	19-32V	24V	7A	150W
PBIH-2448R	19-32V	48V	3.5A	150W
PBIH-4805R	38-63V	5V	30A	150W
PBIH-4812R	38-63V	12V	14A	150W
PBIH-4815R	38-63V	15V	11A	150W
PBIH-4824R	38-63V	24V	7A	150W
PBIH-4848R	38-63V	48V	3.5A	150W
PBIH-11005R	85-140V	5V	30A	150W
PBIH-11012R	85-140V	12V	14A	150W
PBIH-11015R	85-140V	15V	11A	150W
PBIH-11024R	85-140V	24V	7A	150W
PBIH-11048R	85-140V	48V	3.5A	150W

PBIH-F



• Dimensions in mm

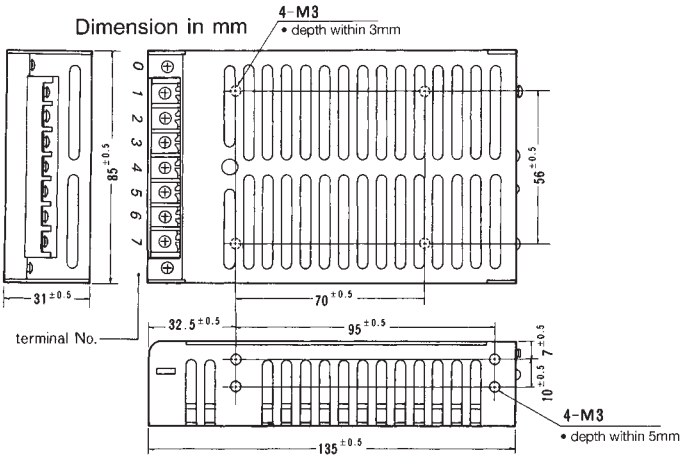
terminal No.	
1	0 V (DC in)
2	+V (DC in)
3	FG
4	NO Connection
5	−V out
6	+V out

OPEN FRAME & ENCLOSED

PBIH Series

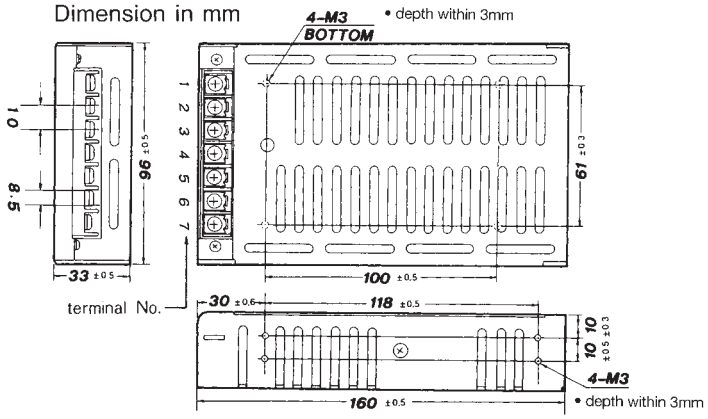
15-150 WATTS SINGLE OUTPUT

PBIH-G



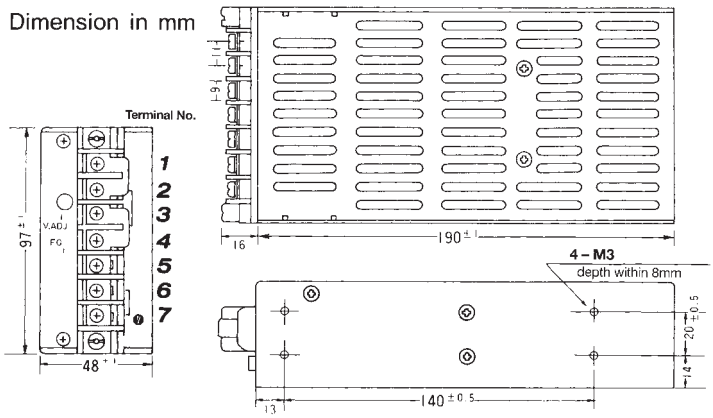
Terminal	Connection
0	FG
1	DC +V in
2	0V in
3	LFG
4	NO
5	NO
6	-V out
7	+V out

PBIH-J



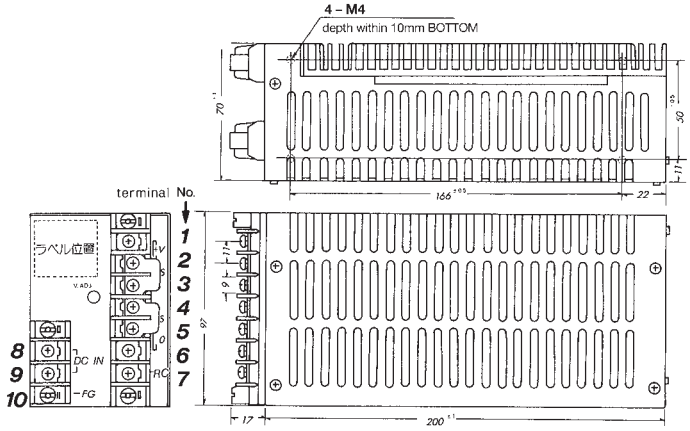
Terminal	Connection
1	FG
2	DC +V in
3	0V in
4	LFG
5	-V out
6	+V out
7	NC

PBIH-M



Terminal	Connection
1	+V out
2	+V out
3	-V out
4	-V out
5	FG
6	-V in
7	+V in

PBIH-R



Terminal	Connection
1, 2	+V out
3	+S
4	-S
5, 6	-V out
7	Remote Control
8	DC +V in
9	DC 0V in
10	FG

2. MANUFACTURER'S TECHNICAL DATA

2.5 Powerbox Modem/DC converter.

PB251 Series

220-330 WATTS DC UPS

Features

- **Ultra-low noise output**
- **Independent battery charging output**
- **DC output OK & battery OK alarms & LEDs**
- **Battery-LVD and alarm**
- **Over-temperature protection**
- **Battery fuse fail LED**

Specifications

INPUT

Voltage:	190 to 264 vac, or 190 to 400VDC
Line regulation:	0.2%typical
Current:	1.4A maximum
Inrush current:	10A maximum
Frequency:	45 to 65 Hz

OUTPUT

Voltage	See table
Current	See table
Load regulation	0.5%typical
Current limit type - load cct	Constant current
Current limit type - batt. cct	Constant current
Short circuit protection	Indefi nite, auto-resetting
Over-voltage protection	17.5 to 20V latching (13.8Vdc output) 31.5 to 39V latching (27.6Vdc output)
Ripple & noise 100 MHz bandwidth	28mVp-p (13.8Vdc output) 55mVp-p (27.6Vdc output)

ENVIRONMENTAL

Operating temperature	0 to 70^{O}C ambient with derating, 5...90% relative humidity (non-condensing)
Over-temperature protection	Automatic & auto-resetting
Cooling requirement	Natural convection
Efficiency	80% minimum

STANDARDS & APPROVALS

Safety	Complies with AS/NZS 60950, class 1, NSW Office of Fair Trading Approval N20602
EMC	Emissions comply with AS/NZS CISPR11, Group 1, Class B. Complies with ACA EMC Scheme, Safety & EMC Regulatory Compliance Marked
Isolation i/p-o/p i/p-ground o/p-ground	4242VDC for 1 minute 2121VDC for 1 minute 707VDC for 1 minute

ALARMS & BATTERY FUNCTIONS

Converter ON/OK alarm	Indicated by voltage-free changeover relay contacts &
green LED	ON=PSU OK
Battery low (& fuse) alarm	10.2 to 12.6V for 12V battery, adjustable 20.4 to 25.2V for 24V battery, adjustable Indicated by voltage-free changeover relay contacts & green LED: ON=BATT OK
Low voltage disconnect	9.6 to 12V for 12V battery, adjustable 19.2 to 24V2 for 4V battery, adjustable
Charger over-load protection	Auto-resetting electronic circuit breaker
Reverse polarity protection	Internal battery fuse
Battery to load voltage drop	0.2 to. 0.25V typical

MECHANICAL

Case size	264 L x 172 W x 67 H mm
Case size with heatsink	264 L x 186 W x 67 H mm
Rack size	232 D x 19" W x 2RU H
Weight	1.9 kg
Weight with heatsink	2.1 kg
Weight (rack mounted version)	5.5 kg

Selection Table

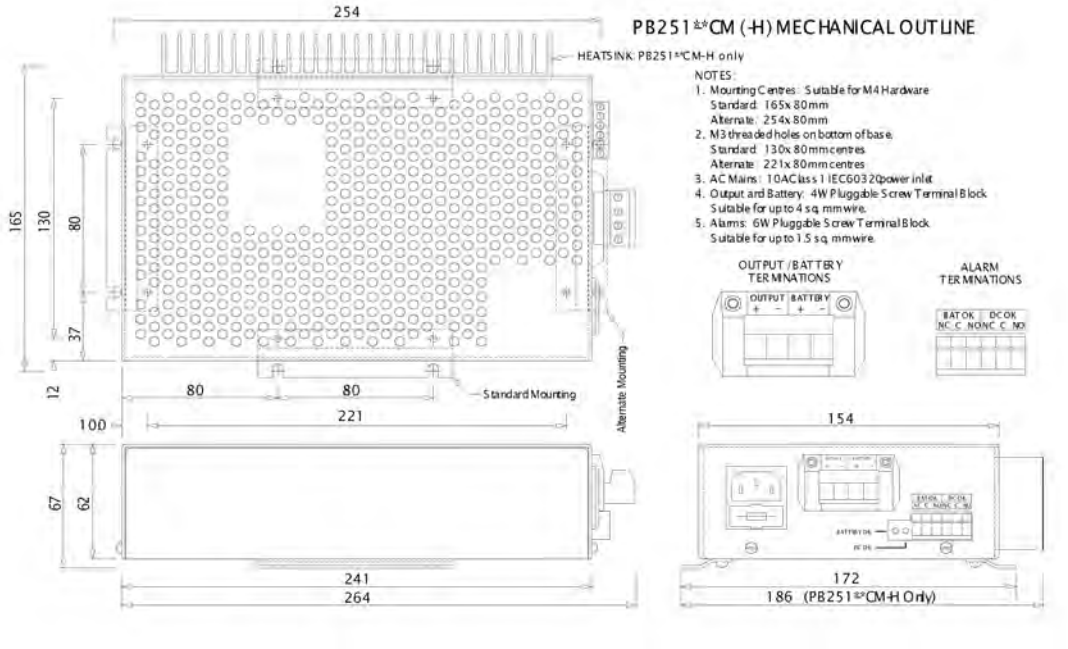
MODEL NUMBER	OUTPUT VDC	OUTPUT I_{LOAD}	OUTPUT I_{BATT}	OUTPUT POWER
PB251-12CM	13.8V	16A	2A	220W
PB251-12CM-H	13.8V	20A	2A	275W
PB251-24CM	27.6V	11A	2A	300W
PB251-24CM-H	27.6V	12A	2A	330W
PB251-12RML	13.8V	20A	4A	275W
PB251-12B	13.8V	20A	4A	275W
PB251-24RML	27.6V	12A	2A	330W

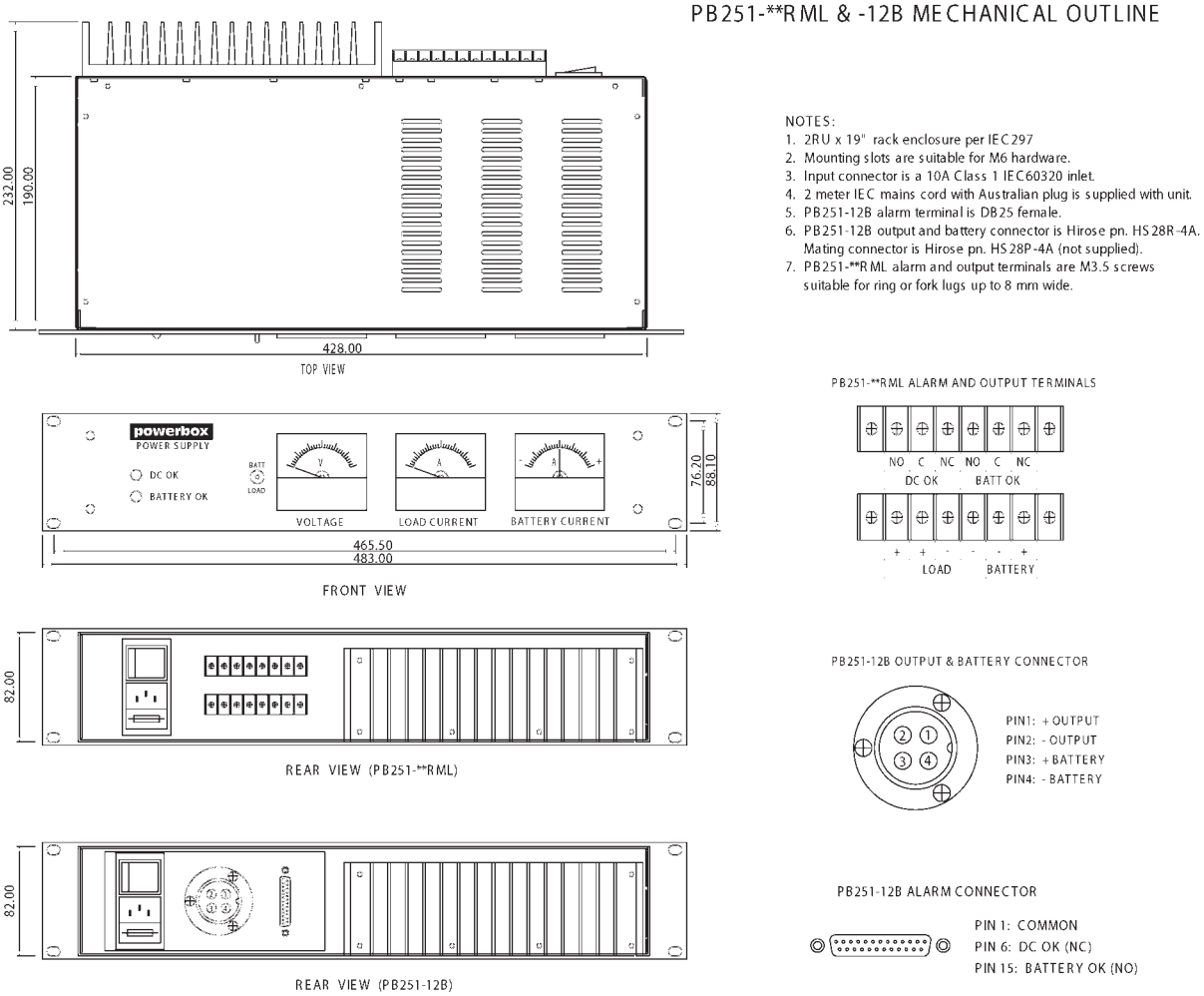
Note: Non standard battery charging current available on request. ie PB251-12CM-H-10 for 10A.

PB251 Series

275-330 WATTS DC UPS

Technical Illustrations





3. DRAWINGS

SJ Electric
Brendan Stringer
7/6/10
114766

QUEENSLAND UrbanUtilities
ABN 72 002 765 795

P0564
HONEYBEE PL, UPPER KEDRON
PRESSURE GAUGE SWITCHBOARD

	VARIABLE / LAYER	VALUE / ON or OFF
DRAWING VARIABLE	SITE ID (01)	P0564
	StreetName (02)	HONEYBEE PL
	SuburbName (03)	UPPER KEDRON
	P1 Gauge No (04)	P0564
	P2 Gauge No (05)	-
	Flowmeter No (06)	-
	RadioPartNo (07)	DP900-07A02-D0
	Drawing No (08)	486/4/9-0774-
	Site Function (09)	PRESSURE GAUGE
	SPARE (10)	----
DRAWING LAYER	11 Main PRV fitted	no
	12 1 Bypass PRV fitted	no
	21 Radio fitted	yes
	211 Side Antenna Mast fitted	yes
	212 Rear Antenna Mast fitted	no
	31 PSTN Modem fitted	no
	32 GSM Modem fitted	no
	41 Flowmeter fitted	no
	511 Pressure Guage 1 fitted	yes
	521 Pressure Guage 2 fitted	no
	61 Sump Pump fitted	no
	71 RTU - MD331 fitted	no
	72 RTU - eNet fitted	yes
	73 RTU plg/skt fitted	yes

ELECTRICAL DRAWINGS INDEX

DWG N°.	TITLE	SHEET	REVISIONS
486/4/9-0774-001	ELECTRICAL DRAWING INDEX	01	0
486/4/9-0774-002	POWER DISTRIBUTION SCHEMATIC DIAGRAM	02	0
486/4/9-0774-003	DIGITAL INPUTS AND OUTPUTS TERMINATION DIAGRAM	03	0
486/4/9-0774-004	ANALOG INPUTS AND OUTPUTS TERMINATION DIAGRAM	04	0
486/4/9-0774-005	SWITCHBOARD GENERAL ARRANGEMENT	05	0
486/4/9-0774-006	SWITCHBOARD CONSTRUCTION DETAILS	06	0
486/4/9-0774-007	SWITCHBOARD EQUIPMENT LIST	07	0
486/4/9-0774-008	SWITCHBOARD CABLE SCHEDULE & LABEL SCHEDULE	08	0
486/4/9-0774-009	SWITCHBOARD SITE LAYOUT	09	0
486/4/9-0774-010	SPARE		

ELECTRICAL AS BUILT DETAILS
REV - | COMPANY - | ELECTRICIAN - | LICENCE No. - | DATE: -

SHEET 01

FOR CONSTRUCTION

					DRAFTED	E.PARANAGAMA 03.10	* A.CHAVEZ-PLASENCIA	29/3/10	* K.VAHEESAN	29/3/10	SITE P0564 HONEYBEE PL, UPPER KEDRON PRESSURE GAUGE ELECTRICAL INSTALLATION	TITLE ELECTRICAL DRAWINGS INDEX	SHEET No.
					DRAFTING CHECK	P.MOSTERT 03.10	DESIGN R.P.E.Q. No.	DATE	PRINCIPAL DESIGN MANAGER	DATE			Queensland Urban Utilities DRAWING No. 486/4/9-0774-001
0	03.10	FOR CONSTRUCTION	E.P.	AW	CAD FILE	49-0774SetO.dwg	* A.WITTHOFT 8895	29/3/10	* P.SHERRIFF	29/3/10	QUEENSLAND UrbanUtilities A DIVISION OF THE BRISBANE CITY COUNCIL		AMEND. 0
No	DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No.	-	DESIGN CHECK R.P.E.Q. No.	DATE	CLIENT DELEGATE	DATE			

* = Original Signed By

G:\184 WATER SUPPLY\68 Drafting\6248 Plans\Electrical\3. WATER NETWORKS\4. Geupel-Meters\P0564 Honeybee Pl Upper Kedron\49-0774SetO.dwg Last Saved by 062670 on Tuesday, 30 March, 2010 @ 56:50 AM

ENERGEX UNMETERED SUPPLY
240VAC 10kA MAX

EARTH STAKE
MEN LINK
EARTH
NEUTRAL
IP30 COVER
Q1 16A
LABEL MAIN SWITCH
101
2A Q2
102
102N
102E
LAPTOP OUTLET 10mA RCD
OUTLET LABEL - LAPTOP ONLY - 2A
SURGE FILTER 6A 275VAC CRITEC DINEMIC DSP-6A-275
SF1
IP30 COVER
6A Q3
103
103N
103E
103A
4A Q4
104
SN1
104E
2A Q5
105
SN1
SURGE DIVERTER 230V 45kA TITAN DR1P45K230DC
SD1
SPR1
SPR3
CLOSED=HEALTHY
SURGE PROTN ALARM RLY 240VAC CRITEC SAR-275V
SAR
RTU "SURGE PROTECTION OK" INPUT REFER SHEET 03 E6
2A Q6
106
106N
POWER FAIL RELAY 240VAC FINDEP 38 51 240VAC
PFR
RTU "MAINS POWER OK" INPUT REFER SHEET 03 E6
DS1A
106A
CLOSED = OPEN DOOR
CABINET LIGHT

RTU POWER SUPPLY 10A 24VDC POWER BOX PB251-24CM
PS1
LOAD
BATT
J2+ J2- 10AMP J2A+ J2A-
J1+ J1- 10AMP J1A+ J1A-
BOK
RTU "BATTERY OK" INPUT REFER SHEET 03 D6 0=FAULT/HEALTHY
RTU
RTU "RTU POWER OK" INPUT REFER SHEET 03 D6 0=FAULT/HEALTHY

SAMP J3+ J3- 24V DC / 13.8V DC J4A+ J4A- SAMP J4+ J4-
RADIO
×01 SD2 ×02
R+ TBA T+ TBA
×03
SAMP J5+ J5- 2-17 2-18
SAMP J6+ J6- RTU 24VDC CARD SUPPLY
SAMP 7+ 7- SPARE
SAMP 8+ 8- SPARE
REFER SHEET 03

NOT USED

PDS COMPACT eNET SERIES RTU
DC IN
DC OUT
PORT 0
PORT 1
PORT 2
RADIO
LAN/MODEM
ETHERNET
INPUTS
OUTPUTS
DIAGNOSTICS
REFER SHEET 04
REFER SHEET 04
REFER SHEET 03
REFER SHEET 03

CABLE ×03 TERMINATION DIAGRAM
eNet RTU ---------- TRIO RADIO

White PJ11-1	DB9-M-1
Black PJ11-2	DB9-M-2
Red PJ11-3	DB9-M-3
Green PJ11-4	DB9-M-4
Yellow PJ11-5	DB9-M-5
Blue PJ11-6	DB9-M-6
	DB9-M-7
	DB9-M-8
	DB9-M-9

LEGEND
- ● PLC/RTU HARSH FUSE TERMINAL
- ○ PLC/RTU HARSH LINK TERMINAL
- (×03) CABLE NUMBER

NOTES
1. CIRCUIT BREAKERS SHALL BE SHROUDED
2. FAULT LEVEL OF 10kA AT 240V FOR 0.2sec
3. ALL FUSES ARE 500mA EXCEPT WHERE NOTED OTHERWISE

Point to Point

ELECTRICAL AS BUILT DETAILS

REV		
-	COMPANY	-
	ELECTRICIAN	-
	LICENCE No.	- DATE: -

SHEET 02

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN	APD
0	03-10	FOR CONSTRUCTION	E.P	AW

DRAFTED	E.PARANAGAMA 03.10	* A.CHAVEZ-PLASENCIA	29/3/10
DRAFTING CHECK	P.MOSTERT 03.10	DESIGN R.P.E.Q. No.	DATE
CAD FILE	49-0778SetO.dwg	* A.WITTHOFT 8895	29/3/10
B.C.C. FILE No.	-	DESIGN CHECK R.P.E.Q. No.	DATE

* K VAHEESAN	29/3/10
PRINCIPAL DESIGN MANAGER	DATE
* P.SHERRIFF	29/03/10
CLIENT DELEGATE	DATE

* = Original Signed By

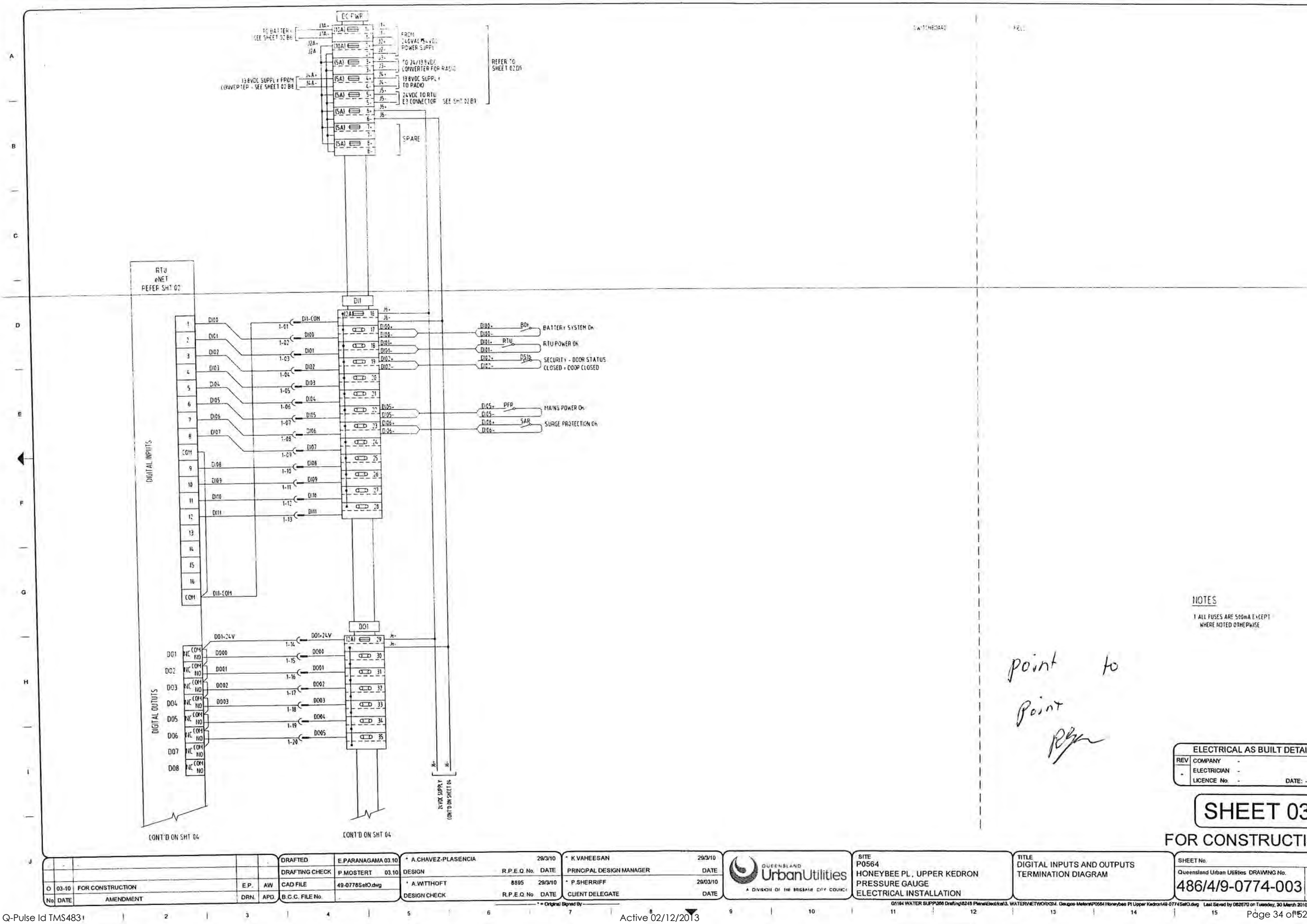
QUEENSLAND UrbanUtilities
A DIVISION OF THE BRISBANE CITY COUNCIL

SITE
P0564
HONEYBEE PL, UPPER KEDRON
PRESSURE GAUGE
ELECTRICAL INSTALLATION

TITLE
POWER DISTRIBUTION
SCHEMATIC DIAGRAM

SHEET No
Queensland Urban Utilities DRAWING No. 486/4/9-0774-002
AMEND. O

03194 WATER SUPP288 Drafting\0245 Plans\Elec\dcd\3. WATER\NETWORK\M. Gauges-Meters\P0564 Honeybee Pl Upper Kedron\49-0774SetO.dwg Last Saved by 082670 on Tuesday, 30 March 2010 9:58:50 AM



NOTES

1 ALL FUSES ARE 500mA EXCEPT WHERE NOTED OTHERWISE

point to Point

ELECTRICAL AS BUILT DETAILS

REV		
-	COMPANY	-
	ELECTRICIAN	-
	LICENCE No.	- DATE: -

SHEET 03

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
O	03-10	FOR CONSTRUCTION	E.P.	AW

DRAFTED	E.PARANAGAMA 03.10	* A.CHAVEZ-PLASENCIA	29/3/10
DRAFTING CHECK	P.MOSTERT 03.10	DESIGN R.P.E.Q. No.	DATE
CAD FILE	49-0778SetO.dwg	* A.WITTHOFT 8895	29/3/10
B.C.C. FILE No.		DESIGN CHECK R.P.E.Q. No.	DATE

* = Original Signed By

* K.VAHEESAN	29/3/10
PRINCIPAL DESIGN MANAGER	DATE
* P.SHERRIFF	29/03/10
CLIENT DELEGATE	DATE

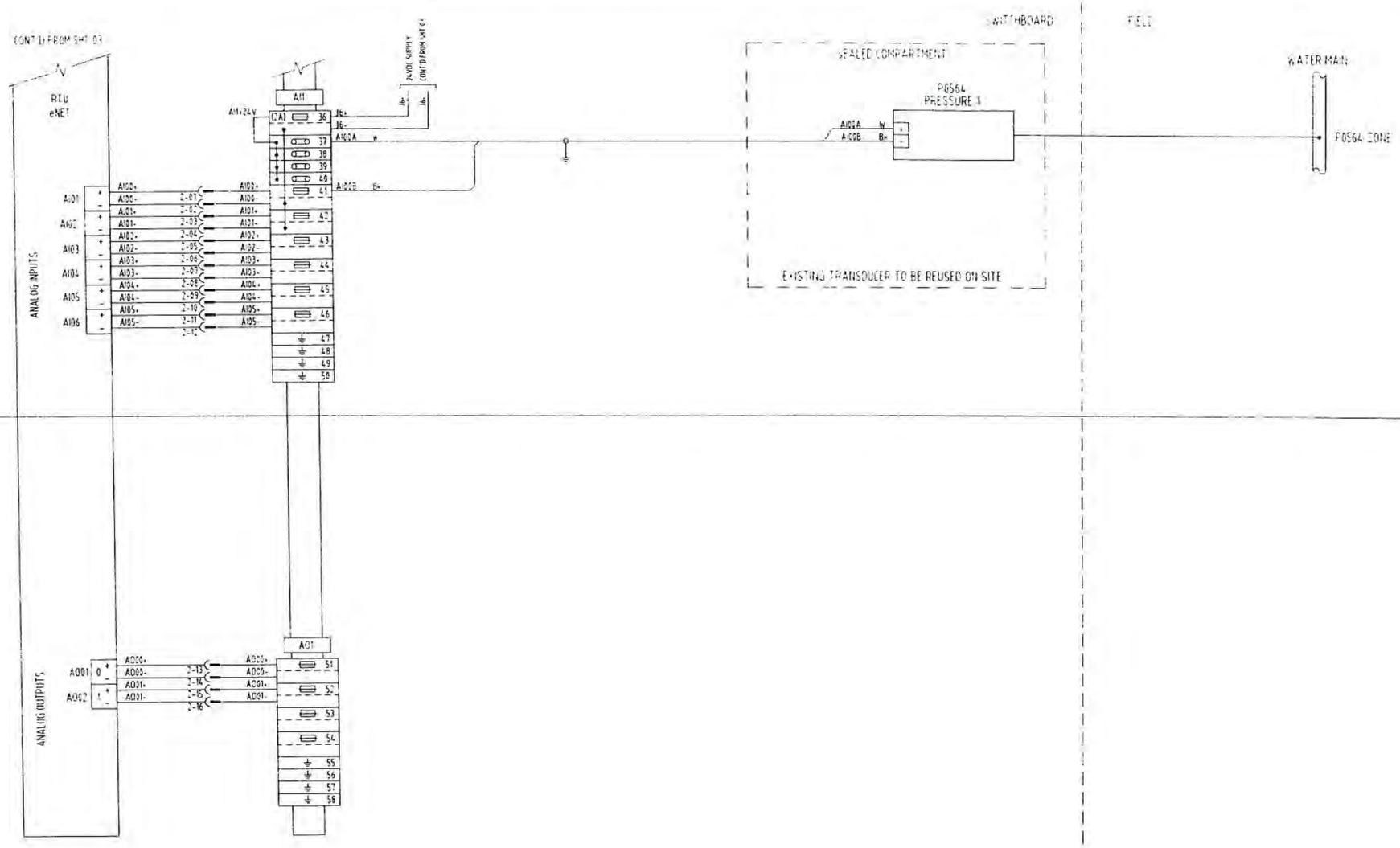
QUEENSLAND UrbanUtilities
A DIVISION OF THE BRISBANE CITY COUNCIL

SITE
P0564
HONEYBEE PL, UPPER KEDRON
PRESSURE GAUGE
ELECTRICAL INSTALLATION

TITLE
DIGITAL INPUTS AND OUTPUTS
TERMINATION DIAGRAM

SHEET No.
Queensland Urban Utilities DRAWING No. 486/4/9-0774-003
AMEND. O

G:\164 WATER SUPPLY\266 Drafting\4246 Plans\Electrical\3. WATER\NETWORK\04. Gauges-Meters\P0564 Honeybee Pl Upper Kedron\49-0774SetO.dwg Last Saved by 062670 on Tuesday, 30 March 2010 9:56:50 AM



point to
Point

NOTES

1 ALL FUSES ARE 500mA EXCEPT WHERE NOTED OTHERWISE

ELECTRICAL AS BUILT DETAILS

REV		
-	COMPANY	-
	ELECTRICIAN	-
	LICENCE No.	- DATE: -

SHEET 04

FOR CONSTRUCTION

				DRAFTED	E.PARANAGAMA 03.10	* A.CHAVEZ-PLASENCIA	29/3/10
				DRAFTING CHECK	P.MOSTERT 03.10	DESIGN	R.P.E.Q. No. DATE
0	03-10	FOR CONSTRUCTION	E.P.	AW	CAD FILE	49-0778SetO.dwg	* A.WITTHOFT 8895 29/3/10
No.	DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No		DESIGN CHECK R.P.E.Q. No. DATE

* Original Signed By

* K.VAHEESAN	29/3/10
PRINCIPAL DESIGN MANAGER	DATE
* P.SHERRIFF	29/03/10
CLIENT DELEGATE	DATE

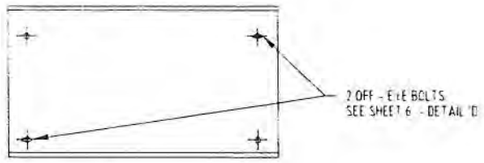
QUEENSLAND UrbanUtilities
A DIVISION OF THE BRISBANE CITY COUNCIL

SITE
P0564
HONEYBEE PL, UPPER KEDRON
PRESSURE GAUGE
ELECTRICAL INSTALLATION

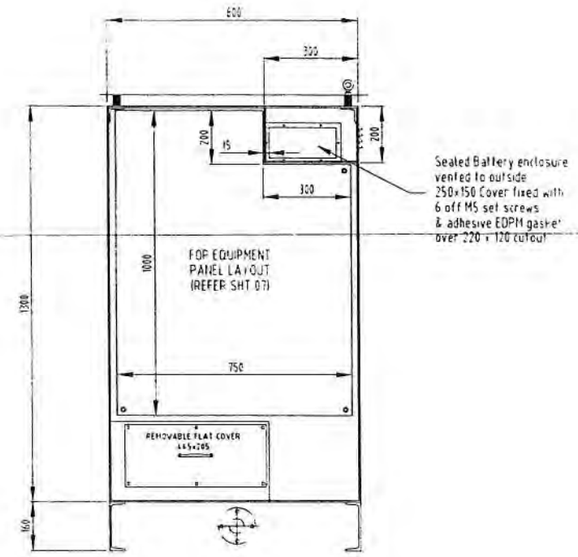
TITLE
ANALOG INPUTS AND OUTPUTS
TERMINATION DIAGRAM

SHEET No.
Queensland Urban Utilities DRAWING No: 486/4/9-0774-004
AMEND: O

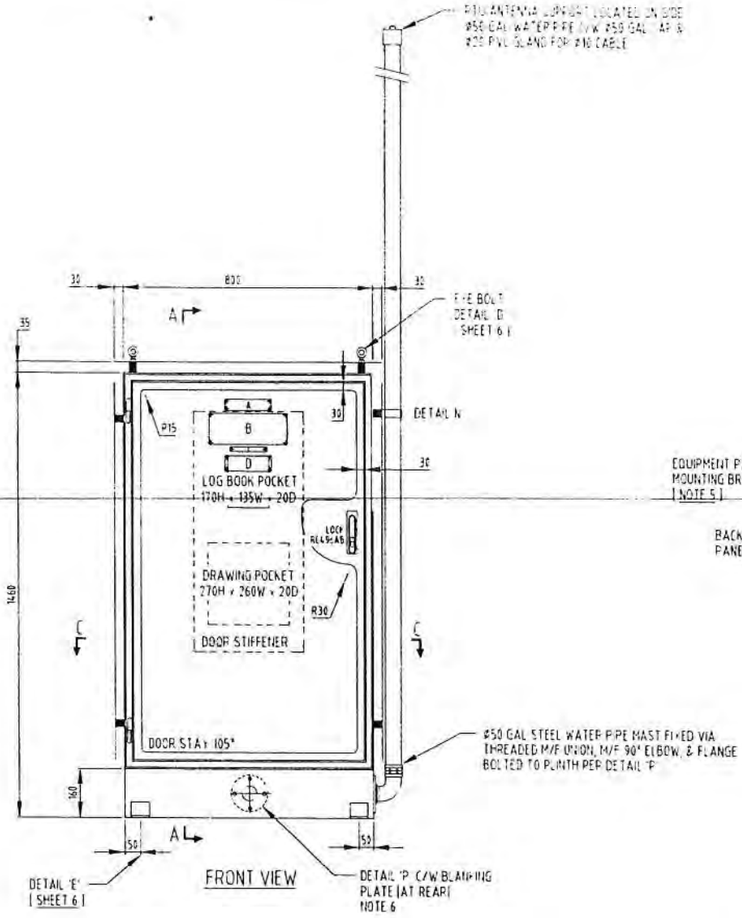
G:\194 WATER SUPP\268 Drafting\6248 Plans\Electrical\3. WATER NETWORKS\4. Gauges-Meters\P0564 Honeybee Pl Upper Kedron\49-0774SetO.dwg Last Saved by D52670 on 30 March 2010 08:50 AM



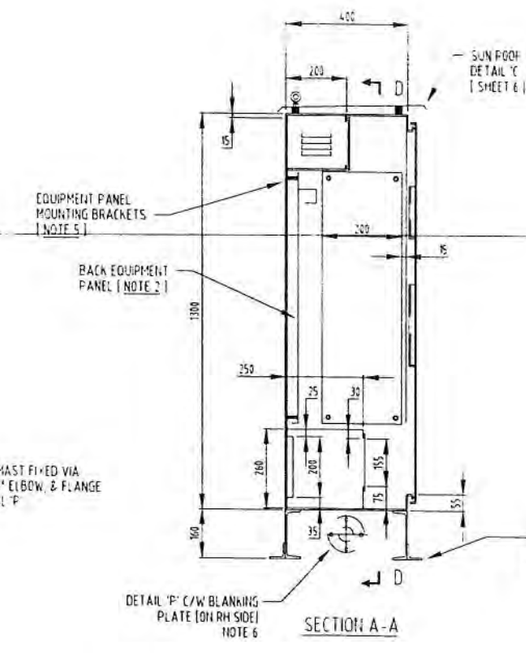
PLAN VIEW



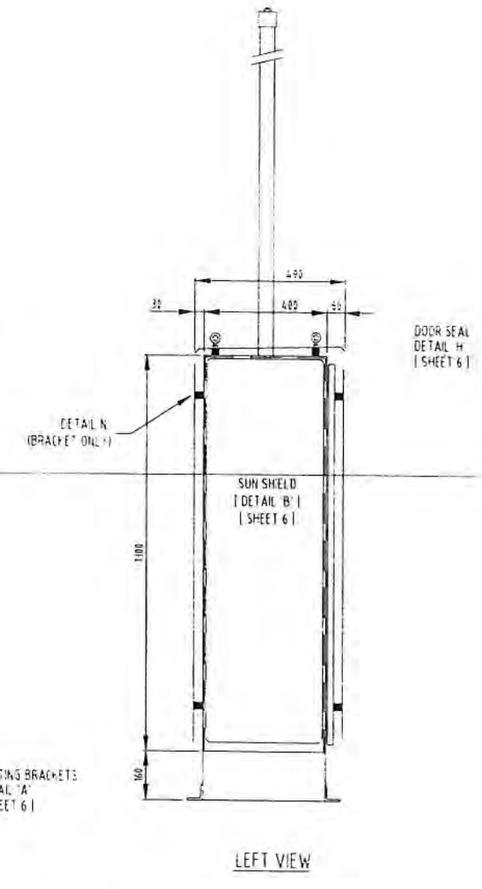
SECTION D-D



FRONT VIEW



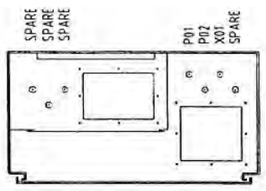
SECTION A-A



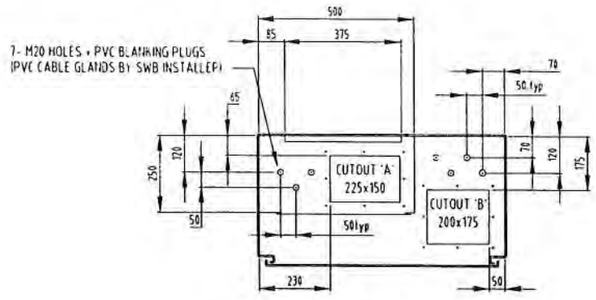
LEFT VIEW

GENERAL ARRANGEMENT

SCALE 1/10 ON A1 SIZE PRINT



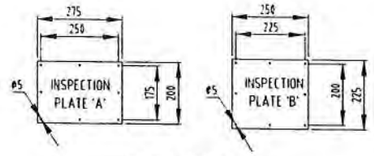
CABLE ENTRY ALLOCATION



FLOOR CUTOUTS

FOR CABLE ENTRY & INSPECTION ACCESS

SECTION C-C



INSPECTION PLATE

3mm AL + GASKET + M4 SCREWS

NOTES

1 REFER TO SHEET 06 FOR THE SWITCHBOARD CONSTRUCTION DETAILS

2 SIDE & BACK EQUIPMENT PANELS TO BE MOUNTED 40mm OFF THE SIDE & BACK WALLS AND OPEN AT BOTH THE TOP AND BOTTOM TO ALLOW FOR AIR FLOW

3 REFER TO SHEET 07 FOR THE EQUIPMENT PANEL LAYOUT DETAIL AND EQUIPMENT SCHEDULE

4 BACK & SIDE GEAR MOUNTING BRACKETS
(6 OFF TOTAL) (25 x 25 x 3 (T) x PL)

5 THIS DRAWING TO BE READ IN CONJUNCTION WITH SHEET 06, FOLLOWING

6 ANTENNA FLANGE MOUNTING DETAILS - WHERE NO ANTENNA IS TO BE INSTALLED, PROVIDE #120 BLANKING PLATES WITH GASKETS, TO COVER SIDE AND REAR ANTENNA FLANGE DRILLING POSITIONS

ELECTRICAL AS BUILT DETAILS		
REV	COMPANY -	
-	ELECTRICIAN -	
	LICENCE No. -	DATE: -

SHEET 05

FOR CONSTRUCTION

					DRAFTED	E.PARANAGAMA 03.10	* A.CHAVEZ-PLASENCIA	29/3/10	* K.VAHEESAN	29/3/10
					DRAFTING CHECK	P.MOSTERT 03.10	DESIGN R.P.E.Q. No.	DATE	PRINCIPAL DESIGN MANAGER	DATE
O	03-10	FOR CONSTRUCTION	E.P.	AW	CAD FILE	49-0778SetO.dwg	* A.WITTHOFT 8895	29/3/10	* P.SHERRIFF	29/03/10
No	DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No.	-	DESIGN CHECK R.P.E.Q. No.	DATE	CUENT DELEGATE	DATE

* = Original Signed By

Queensland Urban Utilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE
P0564
HONEYBEE PL, UPPER KEDRON
PRESSURE GAUGE
ELECTRICAL INSTALLATION

TITLE
SWITCHBOARD
GENERAL ARRANGEMENT

SHEET No.
Queensland Urban Utilities DRAWING No. 486/4/9-0774-005
AMEND O

G:\194 WATER SUPP\288 Drafting\6248 Plans\Electrical\3. WATER NETWORK\SM. Gauges-Meters\P0564 Honeybee Pl Upper Kedron\49-0774SetO.dwg Last Saved by 082670 on Tuesday, 30 March 2010 8:58:50 AM

CONSTRUCTION
Full pit construction 3mm Marine grade Aluminium (5251)
Plinth construction 160x60 channel 6061 T6 Grade Aluminium
Folded "Pulse MIG" & TIG welded with all visible seams and joints fully welded
free from spatter and ground smooth where needed
External doors and covers fitted with Emka 1011-207 self grip seal
"D" Handles fitted where indicated on the drawings
M6 Earth studs fixed to the interior of all doors and hinged escutcheons
and on adjacent cubicle interior surfaces
Door stiffeners, door stays, cable straps and document holders etc fitted
where shown on the drawings
Lift-off covers and mounting panels fixed with M6 studs & chrome acorn nuts
Gland plates manufactured from 6mm Bakelite
Gland plate openings reinforced with 25x6mm flat aluminium bar
Gland plate seals attached to cubicle not gland plate
Gland plate fixings are NOT more than 150 mm apart
Hinges Selectrix HI-B650
Star washers fitted under all hinge screws
Lock Door
Selectrix 1107 - PSCU1 handle
Selectrix 1107-U123 3pt cam
Lockwood 71 Barrel Lock
Emka 1049-U3 roller rod
Lock Code RC496AB

PAINTING
Aluminium Surface Preparation
Finish smooth all exposed welds, clean, descale, and degrease all surfaces
Surfaces pretreatment in accordance with AS 1580 & AS 3715 using
Novox LF acid etch cleaner, Novacoat 12 conversion coating, & clean water rinses
Apply DULUX ALPHATECH 3000 powder coat to manufacturer's recommendations
CUBICLE & EXTERNAL COMPONENTS - DULUX Mist Green (36648) matt finish
INTERIOR ITEMS (mounting panels, escutcheons, etc) - DULUX Bright White (32166)
Minimum Dry Film Thickness all surfaces 40 microns

OPERATING PARAMETERS

Standard	AS 3439.1
Current & Frequency	AC 50Hz
Rated Operational Voltage Ue	240 VAC
Rated Insulation Voltage Ui	660 V
Rated Auxiliary Voltage	24 VDC / 240 VAC
Rated Current (Main Bus)	N/A
Short Circuit Current Isc	10 kA
Duration of Isc	1 sec
Degree of Protection	IP 55 to AS 1939
Measure of Protection by barriers and enclosures	
Service Conditions	Outdoors
Mass	Not exceeding 200kg
Forms of Segregation	Form 1
Earthing System	TN-S

WIRING
All wiring to be PVC 90 HT Electrical Grade with tinned conductor
Control and instrumentation wiring has flexible stranded conductors and is colour coded as detailed below. Numbered each end and terminated by the use of appropriate pre-insulated crimp lugs
Power wiring to be minimum 2.5sqmm stranded copper conductors, phase colour coded as detailed below
Low level instrumentation signals & 4-20mA signals wired in shielded pair minimum size 0.5sqmm. Earthed at one end only
Earth cables minimum 2.5sqmm flexible
Doors and hinged escutcheons bonded with 4sqmm flexible earth strap
Wire numbering will be equal to Grafoplast Sc(00 system)
Wire numbers are readable left to right, bottom to top as shown

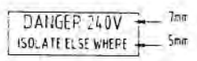
COLOUR CODE

Phase wiring (A,B &C)	Red, White, Blue	2.5sqmm (min)
Potential Metering (240/415 VAC)	Red, White, Blue, Black	1.5sqmm
Current Metering (Secondary)	Red, White, Blue, Grey	2.5sqmm
240 VAC Control Active	Red	1.5sqmm
240 VAC Neutral	Black	1.5sqmm
24 V ELV Positive	Orange	1.5sqmm
24 V ELV Negative	Violet	1.5sqmm
24 V RTU Positive	Orange	0.5sqmm
24 V RTU Negative	Violet	0.5sqmm
RTU Wiring	Grey	0.5sqmm
Intrinsically safe wiring	Blue	1.5sqmm
Earth	Green/Yellow	2.5sqmm (min)
Door & Escutcheon Earth Bonds	Green/Yellow	4 sqmm

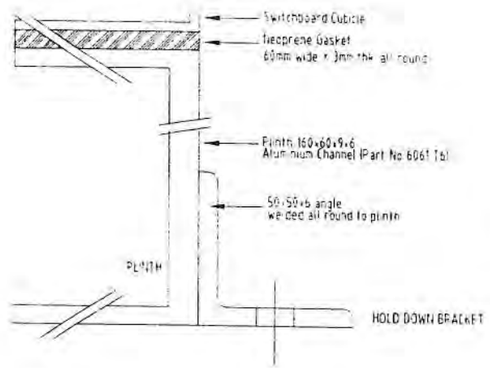
LABELS
Internal labels W/B/W engraved traffolyte to label schedule
Warning labels R/W/P engraved traffolyte

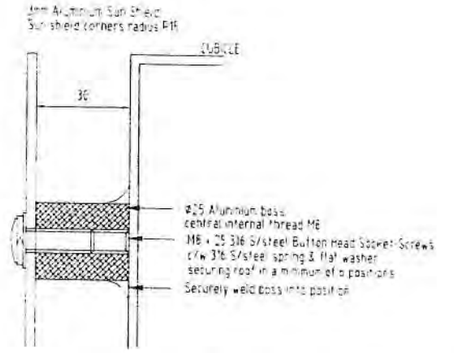
Main switch labels — Material B/W/B

Warning labels — Material R/W/R

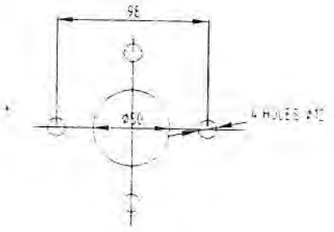


Internal labels secured by M3 chrome plated metal threads
Labels obstructed by switchboard wiring are relocated to adjacent duct lid
The duct lid is secured by a single cable tie at one corner
External labels secured by M3 316 stainless steel metal threads

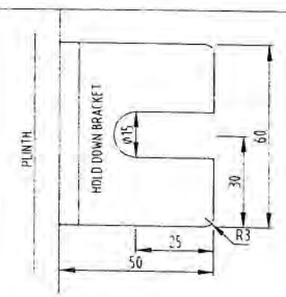




DETAIL B
(SUN SHIELD MOUNTING TO SIDES, REAR AND DOORS)

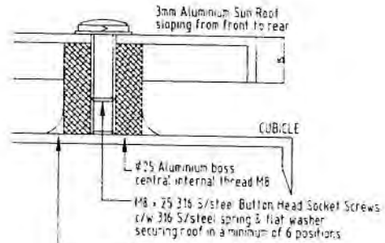


DETAIL P
(FIT 3mm NEOPRENE GASKET BETWEEN PLINTH & FLANGE)
(FIXINGS 316 S/STEEL BOLTS, NUTS, FLAT & SPRING WASHERS)
(AERIAL FLANGE MOUNTING DETAIL)



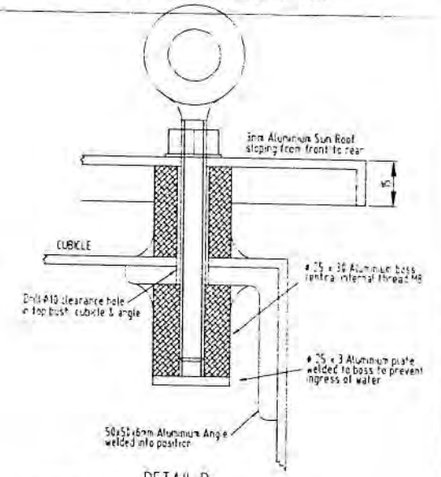
DETAIL E
(BOLTING DOWN FACILITIES DETAIL)

SET UP CUBICLE TO BE LEVEL & PLUMB BEFORE BOLTING TO CONCRETE PLINTH USING M12 BOLTS

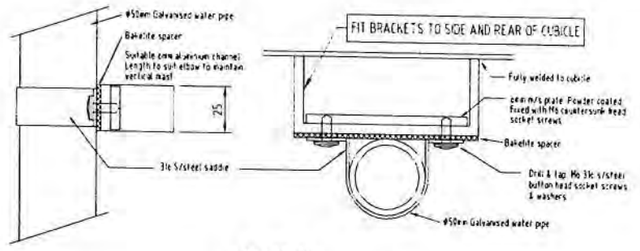


DETAIL C
(SUN ROOF FIXING DETAIL)

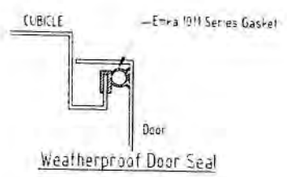
2 OFF M8x80 S/S EYEBOLTS DIAGONALLY OPPOSITE



DETAIL D
(EYE BOLT FIXING DETAIL - 2 OFF M8x80 s/s, DIAGONALLY OPPOSITE)



DETAIL N
(AERIAL SUPPORT BRACKET DETAIL)



ELECTRICAL AS BUILT DETAILS

REV		
-	COMPANY	-
	ELECTRICIAN	-
	LICENCE No.	- DATE: -

SHEET 06

FOR CONSTRUCTION

					DRAFTED	E.PARANAGAMA 03.10	* A.CHAVEZ-PLASENCIA 29/3/10
					DRAFTING CHECK	P.MOSTERT 03.10	DESIGN R.P.E.Q. No. DATE
O	03-10	FOR CONSTRUCTION	E.P.	AW	CAD FILE	49-0778SetO.dwg	* A.WITTHOFT 8895 29/3/10
No.	DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No		DESIGN CHECK R.P.E.Q. No. DATE

* = Original Signed By

* K.VAHEESAN	29/3/10
PRINCIPAL DESIGN MANAGER	DATE
* P.SHERRIFF	29/03/10
CLIENT DELEGATE	DATE

Queensland Urban Utilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE
P0564
HONEYBEE PL, UPPER KEDRON
PRESSURE GAUGE
ELECTRICAL INSTALLATION

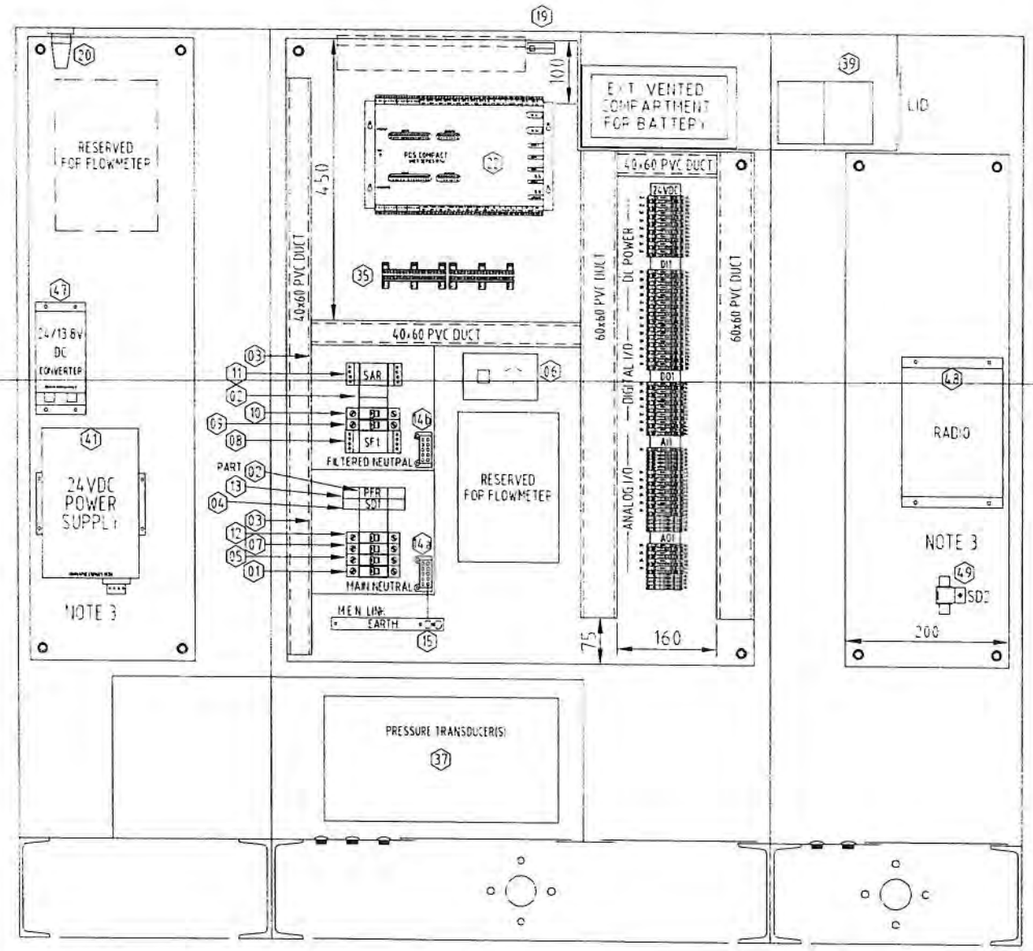
TITLE
SWITCHBOARD
CONSTRUCTION DETAILS

SHEET No.
Queensland Urban Utilities DRAWING No. 486/4/9-0774-006
AMEND O

G:\164 WATER SUPP\208 Drafting\6248 Plans\Electrical\3. WATERNETWORKS\4. Gougar-Meters\P0564 Honeybee Pl Upper Kedron\49-0774SetO.dwg Last Saved by 052870 on Tuesday, 30 March 2010 9:56:50 AM

EQUIPMENT LIST

REF	QTY	DESCRIPTION	MANUFACTURER	CATALOGUE No	REMARKS
01	1	Q1 - MAIN CIRCUIT BREAKER	TEPASAKI	DTCB10_16	10kA
02	5	POLE FILLER	TEPASAKI	DT POLE FILLER	
03	2	IP30 6 POLE COVER	TERASAKI	DTPC6	
04	1	SD1 - SURGE DIVERTER	NHP	TITIAN DRIP45K230DC	45KA MAX
05	1	Q2 - GPO CIRCUIT BREAKER	TEPASAKI	DTCB10_02	
06	1	GPO - COMPUTER OUTLET 30mA RCD	CLIPSAL	2A CB + RCD	
07	1	Q3 - SURGE FILTER CIRCUIT BREAKER	TEPASAKI	DTCB10_06	
08	1	SF1 - SURGE FILTER	CRITEC	DSF-6A-275	
09	1	Q4 - PWR SUPPLY CIRCUIT BREAKER	TERASAKI	DTCB10_04	
10	1	Q5 - SURGE ALARM RLY CIRCUIT BREAKER	TEPASAKI	DTCB10_02	
11	1	SAR- SURGE PROTN ALARM RLY	CRITEC	DAR-275V	
12	1	Q6 - POWER FAILURE RLY CIRCUIT BREAKER	TERASAKI	DTCB10_02	
13	1	PFR - POWER FAILURE RELAY	FINDER	38.51.8.240VAC	
14	2	NEUTRAL LINK	CLIPSAL	LA6	
15	1	EARTH LINK	CLIPSAL	BF165DIN	
16					
17					
18					
19	2	SW/BD DOOR MICRO SWITCHES	CAMSCO	SM20C	1 OFF N/O 1 OFF N/C
20	1	SW/BD 8W INTERNAL FLURO LIGHTS	THORN	BB0108	
21	1	CORROSION INHIBITOR	CORTEC	VPCI-110 OP 111	FROM AP CONTROLS
22	1	RTU	SERCK	eNET -5XEW-EI	eNET RTU WITH 1/2 I/O, 10-30V INPUT
23	2	DISCONNECT PLUGS	PHOENIX CONTACT	MSTB 2,5/20-ST-5,08	
24	2	DISCONNECT BLOCKS	PHOENIX CONTACT	UMSTBVW2,5/20-G-5,08	
25	2	CABLE HOUSING	PHOENIX CONTACT	KGS-MSTB 2,5/20	
26	1	CODING PINS	PHOENIX CONTACT	CP-MSTB + CP-MSTB	
27	Lot	FUSED TERMINALS with LED 24V INDICATION	PHOENIX CONTACT	UT4-HESILED24 (5x20)	
28	Lot	FUSE CARTRIDGES	PHOENIX CONTACT	M205	RATINGS AS REQUIRED
29	Lot	DISCONNECT TERMINALS	PHOENIX CONTACT	UT4-MT P/P	
30	Lot	TERMINALS	PHOENIX CONTACT	UT4-?	
31	8	EARTH TERMINALS	PHOENIX CONTACT	UT4-MTD-PE/S	
32	6	GROUP MARKER CARRIER	PHOENIX CONTACT	UBE	
33	2	TEST PLUG ADAPTOR	PHOENIX CONTACT	PS-6	
34	1	SCREW DRIVER	PHOENIX CONTACT	SZS 0,6 x 3,5	
35	Lot	PLUG-IN BRIDGE	PHOENIX CONTACT	FBS	AS REQUIRED
36					
37	2	PRESSURE TRANSDUCER	EXISTING	EXISTING	INSTALLER TO REUSE EXISTING
38					
39	2	12V 6.5Ah SEALED LEAD ACID BATTERY	YUASA	NP7-12	
40					
41	1	PS1 - RTU 24VDC POWER SUPPLY	POWERBOX	PB251-24CM-CC-T	
42					
43					
44					
45					
46					
47	1	24V/13.8V DC CONVERTER	POWERBOX	PB1H-2412G	
48	1	RADIO	TRIO	DR900-07A02-D0	FREE ISSUE
49	1	SD2 - RADIO COAX SURGE PROTECTOR	POLYPHASER CORPORATION	IS-50NX-C2	
50	1	ANTENNA MAST	SWBD MANUFACTUPER		2.5 METRES
51	1	ANTENNA	TRIO	ANT13AL	SUPPLIED LOOSE BY SWBD MFR & FITTED ON SITE
52	1	COAX CABLE (INTERNAL)	R.F. INDUSTRIES	RG58	SUPPLIED LOOSE BY SWBD MFR & FITTED ON SITE
53	1	COAX CABLE (EXTERNAL)	R.F. INDUSTRIES	RG213	SUPPLIED LOOSE BY SWBD MFR & FITTED ON SITE
54	1	COAX PLUG	R.F. INDUSTRIES	SMA	SUPPLIED LOOSE BY SWBD MFR & FITTED ON SITE
55	1	COAX PLUG	R.F. INDUSTRIES	N88 (MALE)	SUPPLIED LOOSE BY SWBD MFR & FITTED ON SITE
56	2	COAX CABLE PLUG	R.F. INDUSTRIES	N07 (MALE)	SUPPLIED LOOSE BY SWBD MFR & FITTED ON SITE
57	1	'U' CLAMP	R.F. INDUSTRIES	UNV	SUPPLIED LOOSE BY SWBD MFR & FITTED ON SITE
58					
59					
60					
61					
62					



EQUIPMENT PANEL - LAYOUT DETAIL

SCALE 1/5 ON A1 SIZE PRINT

NOTES

1.0 LABELS FITTED ADJACENT ASSOCIATED EQUIPMENT

2.0 LABELS OBSTRUCTED BY SWITCHBOARD WIRING
ARE RELOCATED TO ADJACENT DUCT LID
DUCT LIDS LOCATED BY SINGLE CABLE TIE AT ONE CORNER

3.0 INDICATING LIGHTS ON THE 24V DC POWER SUPPLY
AND THE RADIO MUST FACE UPWARDS

ELECTRICAL AS BUILT DETAILS		
REV	COMPANY	-
-	ELECTRICIAN	-
	LICENCE No.	- DATE: -

SHEET 07

FOR CONSTRUCTION

NO	DATE	AMENDMENT	DRN.	APD.
0	03-10	FOR CONSTRUCTION	E.P	AW

DRAFTED	E.PARANAGAMA 03.10		
DRAFTING CHECK	P.MOSTERT 03.10		
CAD FILE	49-0778SetO.dwg		
B.C.C. FILE No.	.		

* A.CHAVEZ-PLASENCIA		28/3/10	* K.VAHEESAN		28/3/10
DESIGN	R.P.E.Q. No.	DATE	PRINCIPAL DESIGN MANAGER		DATE
* A.WITTHOFT	8895	29/3/10	* P.SHERRIFF		29/03/10
DESIGN CHECK	R.P.E.Q. No.	DATE	CLIENT DELEGATE		DATE

* = Original Signed By

QUEENSLAND UrbanUtilities — A DIVISION OF THE BRISBANE CITY COUNCIL

SITE
P0564
HONEYBEE PL, UPPER KEDRON
PRESSURE GAUGE
ELECTRICAL INSTALLATION

TITLE
SWITCHBOARD
EQUIPMENT LIST

SHEET No.

Queensland Urban Utilities DRAWING No. 486/4/9-0774-007

AMEND O

G:\194 WATER SUPP\266 Drafting\8248 Plans\Electrical\3. WATERNETWORK\SM. Gauges-Meters\P0564 Honeybee Pl Upper Kedron\49-0774SetO.dwg Last Saved by 06267 on 30 March 2012 8:56:50 AM

CABLE SCHEDULE

CABLE No	SIZE mm²	CORES	TYPE	LENGTH (metres)	FROM - TO - VIA ROUTE	CABLE FUNCTION	REMARKS
P01	4	2	PVC/PVC/CIRC	site specific	ENERGEX Pole to new RTU enclosure	Incoming Mains	Electrical installation Contractor
P02	10		Building wire	1	Earth stake to RTU earth bar	Main earth	Electrical Installation Contractor
P03							
x01			Coax RG58	1	RADIO to aerial coax SURGE DIVERTER	Radio Communications	Switchboard Manufacturer
x02			Coax RG213	1	SURGE DIVERTER to ANTENNA	Radio Communications	Switchboard Manufacturer
x03		8	Special	2	RTU data port to MODEM	Data Communications	Switchboard Manufacturer
x04							
C01	15	1PAIR	DEFORON	2	RTU terminal strip to pressure transmitter	Pressure 1 Tx signal	Switchboard Manufacturer
C02						Pressure Guage 2 Not Installed	
C03							
C03A							
C04							
C05							
C06							
C07							

NOTES

EQUIPMENT LABEL LIST

REF	TEXT HEIGHT mm / MATERIAL	TEXT LINE 1 / TEXT LINE 2
01	10mm / 4mm / WBW TRAFFOLYTE	MAIN SWITCH / Q1 - 16A
04	4mm / WBW TRAFFOLYTE	SD1 - SURGE DIVERTER
05	4mm / WBW TRAFFOLYTE	Q2 - LAPTOP GPO - 2A
06	4mm / WBW TRAFFOLYTE	2Amp LAPTOP ONLY
07	4mm / WBW TRAFFOLYTE	Q3 - SURGE FILTER - 6A
08	4mm / WBW TRAFFOLYTE	SF1 - SURGE FILTER
09	4mm / WBW TRAFFOLYTE	Q4 - 24V PWR SUPPLY - 4A
10	4mm / WBW TRAFFOLYTE	Q5 - SURGE ALM RLY - 2A
11	4mm / WBW TRAFFOLYTE	SAR - SURGE ALM RLY
12	4mm / WBW TRAFFOLYTE	Q6 - POWER FAIL RLY - 2A
13	4mm / WBW TRAFFOLYTE	PFR - POWER FAIL RLY
14	4mm / WBW TRAFFOLYTE	NEUTRAL
15	4mm / WBW TRAFFOLYTE	EARTH
18		
19	4mm / WBW TRAFFOLYTE	PS1 - 24VDC10A PWR SUPPLY
20	4mm / WBW TRAFFOLYTE	24/13.8VDC CONVERTER
21	4mm / WBW TRAFFOLYTE	BATTERY COMPARTMENT
22	4mm / WBW TRAFFOLYTE	RTU
24		
25		
28		
29		
45		

EQUIPMENT LABEL LIST

REF	TEXT HEIGHT mm / MATERIAL	TEXT LINE 1 / TEXT LINE 2
45	4mm / WBW TRAFFOLYTE	P0564 ZONE PRESSURE
45		
48		
49	4mm / WBW TRAFFOLYTE	SD2 - RADIO SURGE DIVERTER

EXTERNAL LABELS

LABEL	TEXT	TEXT HEIGHT	PAINT FILL LETTERING	DIMENSIONS	QTY
A	P0564	20mm	BLACK	150 x 35	1
B	WARNING THIS SITE IS MONITORED BY THE CONTROL ROOM OPERATOR PLEASE INFORM THE OPERATOR BEFORE ISOLATING STATION	8mm	BLACK	250 x 100	1
C	DANGER 240V	8mm	RED	120 x 15	1
D	REMINDER THIS IS AN UN-METERED SUPPLY AND ANY ALTERATIONS TO THESE CIRCUITS MUST BE NOTIFIED TO SUPPLY AUTHORITY BILLING DEPARTMENT	3mm	BLACK	TO SUIT	1

EXTERNAL LABELS 1mm THK 316 GRADE STAINLESS STEEL
FIXED WITH M3 316 STAINLESS STEEL METAL THREADS

ELECTRICAL AS BUILT DETAILS

REV		
-	COMPANY	-
	ELECTRICIAN	-
	LICENCE No.	- DATE: -

SHEET 08

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN.	APD.
0	03-10	FOR CONSTRUCTION	E.P.	AW

DRAFTED	E.PARANAGAMA 03.10	
DRAFTING CHECK	P.MOSTERT 03.10	
CAD FILE	49-0778SetO.dwg	
B.C.C. FILE No.		

* A.CHAVEZ-PLASENCIA			29/3/10
DESIGN	R.P.E.Q. No.		DATE
* A.WITTHOFT	8895		29/3/10
DESIGN CHECK	R.P.E.Q. No.		DATE

* = Original Signed By

* K.VAHEESAN	29/3/10
PRINCIPAL DESIGN MANAGER	DATE
* P.SHERRIFF	29/03/10
CLIENT DELEGATE	DATE

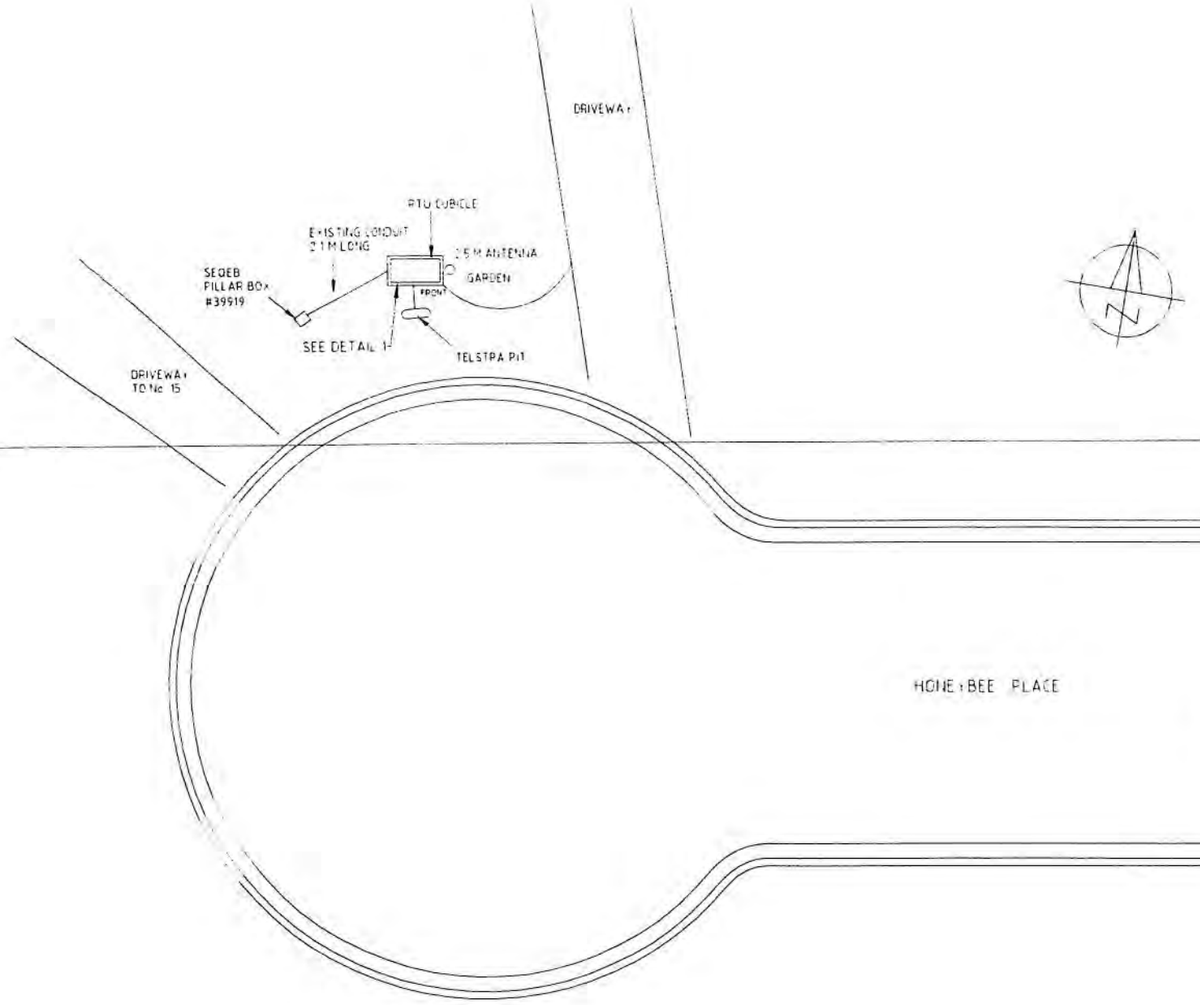
QUEENSLAND UrbanUtilities
A DIVISION OF THE BRISBANE CITY COUNCIL

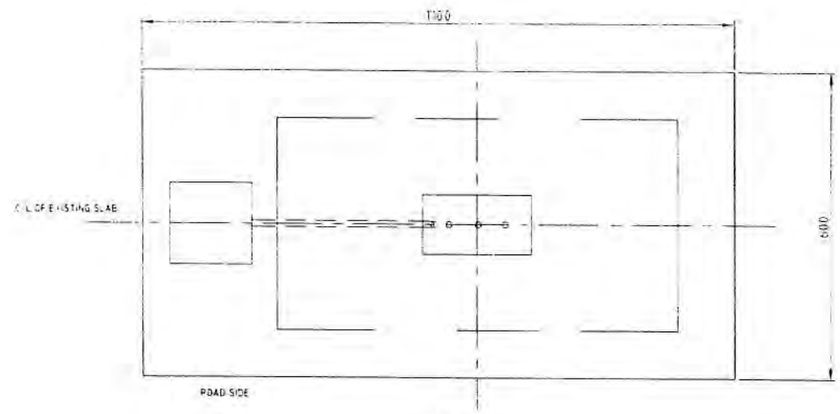
SITE
P0564
HONEYBEE PL, UPPER KEDRON
PRESSURE GAUGE
ELECTRICAL INSTALLATION

TITLE
SWITCHBOARD
CABLE & LABEL SCHEDULE

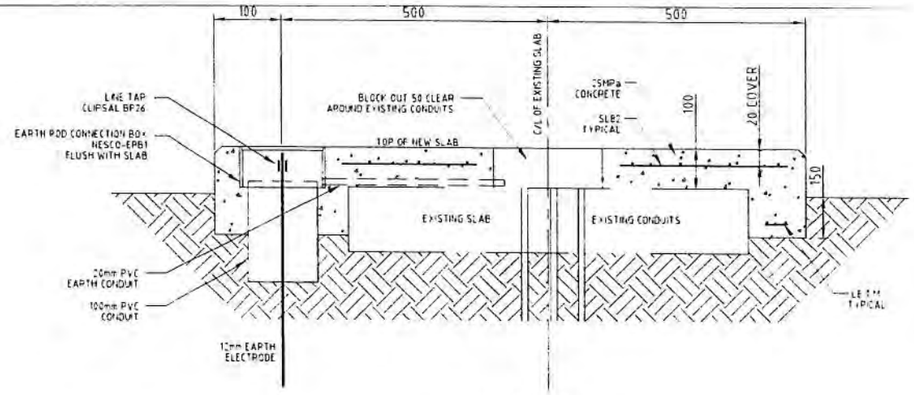
SHEET No.
Queensland Urban Utilities DRAWING No. 486/4/9-0774-008 | AMEND. 0

G:\184 WATER SUPPLY\265 Drafting\5248 Plans\Electrical\3. WATER NETWORKS\M. Gauges-Meters\P0564 Honeybee Pl Upper Kedron\48-0774SetO.dwg Last Saved by 052670 on Tuesday, 30 March 2010 9:56:50 AM





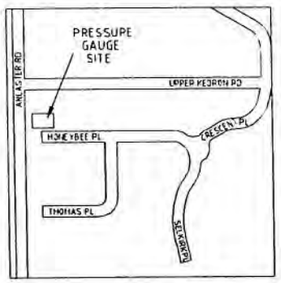
PLAN VIEW



SECTION VIEW

SWITCHBOARD SLAB
DETAIL 1

CONSTRUCTION NOTE
1 NEW CONCRETE SLAB PLACED AROUND AND OVER EXISTING SLAB FOR THE NEW SWITCHBOARD
SEE SHEET 05 FOR SWITCHBOARD DIMENSIONS



LOCALITY MAP

ELECTRICAL AS BUILT DETAILS

REV		
-	COMPANY	-
	ELECTRICIAN	-
	LICENCE No.	- DATE: -

SHEET 09

FOR CONSTRUCTION

No	DATE	AMENDMENT	DRN	APD.
0	03-10	FOR CONSTRUCTION	E.P.	AW

DRAFTED	E.PARANAGAMA 03.10		
DRAFTING CHECK	P.MOSTERT 03.10		
CAD FILE	49-0778SetO.dwg		
B.C.C. FILE No.			

* C.EATON	6511	29/3/10	* K.VAHEESAN		29/3/10
DESIGN	R.P.E.Q. No.	DATE	PRINCIPAL DESIGN MANAGER		DATE
* A.WITTHOFT	8895	29/3/10	* P.SHERRIFF		29/03/10
DESIGN CHECK	R.P.E.Q. No.	DATE	CUENT DELEGATE		DATE

* = Original Signed By –

QUEENSLAND UrbanUtilities
A DIVISION OF THE BRISBANE CITY COUNCIL

SITE
P0564
HONEYBEE PL, UPPER KEDRON
PRESSURE GAUGE
ELECTRICAL INSTALLATION

TITLE
SWITCHBOARD
LOCATION DETAILS

SHEET No.

Queensland Urban Utilities DRAWING No. 486/4/9-0774-009

AMEND. O

G:\184 WATER SUPPLY\268 Drafting\6248 Plans\Electrical\3. WATERNETWORKS\vl Geupse-Meters\P0564 Honeybee Pl Upper Kedron\49-0774SetO.dwg Last Saved by 082670 on Tuesday, 30 March 2010 8:58:50 AM

4. INSPECTION & TEST RESULTS

SJ ELECTRIC

TEST BEFORE YOU TOUCH

№ 10483

TEST SHEET

CUSTOMER NAME: BRISBANE WATER — SWITCHBOARD ID: P0564 DATE: 13/7/10

CUSTOMERS ADDRESS: HONEY BEE PLACE UPPER KEDRON JOB No.: WT4000085

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
	6MM	FUSE 30A	—	MAINS TO SWITCHBOARD	✓	✓	0Ω	∞	∞	249	248	—	—	—	
	2.5MM	2A	—	G.P.O Q2	✓	✓		∞	∞	249	248	—	30	24	

TEST EQUIPMENT: INSULATION / CONTINUITY TESTER NAME: ANDREW BURNELL

SERIAL NO: 512 3060 LIC NO: 39859

TEST DUE DATE: 12/10/2010 SIGNATURE:

SJ-61 ISSUE 2

Honeybee Place SPS Pressure Gauge P0564 Electrical Installation Operation and Maintenance Manual

SJ Electric Pty Ltd

Ref: SJQF 502

Date: 19 July 2007

Inspection and Test Check List

Project: Brisbane Water Pressure Cubicles		
Contractor / Order No.		SJ Electric Job No. BT430021
ITC No. 003	Date: 7/6/10	**Corresponding ITP No. 001**

General Data

Built By: Brendan Stringer, Renee Wardrop	Test Equipment:	Megger / Multimeter
Location: Workshop	Type:	Kyoritsu / Fluke
Drg No. P0564	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			
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 and edges sealed with varnish.		( )	
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			
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:	**Approved By: Renee Wardrop**	
Electrical Licence No. 114766	**Signature:**	**Date: 7/6/10**

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	NA	(~~✓~~)	
	• inter locks	NA	(~~✓~~)	
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: 7/6/10**

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	NA		BH
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	NA		BH
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: BStr	**Approved By: Renee Wardrop**
Electrical Licence No. 114766	**Signature:** ..... **Date: 7/6/10**

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)**
	Earthing Resistance & Continuity Test (Note all readings should be < .5 ohms)	PASS		
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	NA	(-)	
13	Earth surge diverters	TO N	(-)	
14	Current transformers	NA	(-)	
	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			
	• Red - Blue			
	• Red - Earth	PASS	>200MΩ	
	• Red - Neutral	PASS	>200MΩ	
	• White - Blue			
	• White - Earth			
	• White - Neutral			
	• Blue - Earth			
	• Blue - Neutral			
4	If all readings are clear the insulation tester is to be set at 1000 volts then proceed with the following	NA	( )	
5	Test between:			
	• Red - White			
	• Red - Blue			
	• Red - Earth			
	• Red - Neutral			
	• White - Blue			
	• White - Earth			
	• White - Neutral			
	• Blue -Earth			
	• Blue - Neutral			

Remarks/Remedial Action Required:

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

Checked By: Brendan Stringer	
Signature:	**Approved By: Renee Wardrop**
Electrical Licence No. 114766	**Signature:** **Date: 7/6/10**

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

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			
2	All the following tests must be set at a 1 minute time period		( )	
			( )	
		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: 7/6/10**

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	N A	–	PH
Connect supply (personal protection equipment must be used)		**Hold Points**	**Test Result**	**By (Initial)**
3	Check polarity of connection		( )	
	• Red - White			
	• Red - Blue		( )	
	• Red - Earth	240V	(✓)	
	• Red - Neutral	240 V	(✓)	
	• White - Blue		( )	
	• White - Earth		( )	
	• White - Neutral		( )	
	• Blue -Earth		( )	
	• Blue - Neutral			
		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	10mS	(✓)	
	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: 7/6/10**

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 | Inspection and Test Check List | Ref: SJQF 502
Date: 19 July 2007

LOOP

Model CALIBRATOR S/N 9449034 JOB NUMBER BP3002.1 DATE 31-5-10

Brand Fluke

[redacted]

Digital inputs	Pass	Fail	Comments
1	✓		BATT OK
2	✓		24V OK
3	✓		Limit sw. tch
4	✓		
5	✓		
6	✓		Phase Fail
7	✓		swell detector
8	✓		
9	✓		
10	✓		
11	✓		
12	✓		
13			
14			
15			
16			
17			
18			
Digital Outputs			
1	✓		
2	✓		
3	✓		
4	✓		
5	✓		
6	✓		
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			

SJ Electric Pty Ltd | Inspection and Test Check List | Ref: SJQF 502
Date: 19 July 2007

Analog Input			
1	✓		
2	✓		
3	✓		
4	✓		
5	✓		
6	✓		
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
Analog Out puts			
1	✓		
2	✓		
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			

Comments

Name Brendan Skinner

Lic number 114766

Test Equipment Fluke Loop calibrator

5. COMPLIANCE CERTIFCATES

SJ ELECTRIC PTY LTD
Queensland

Ref: Test Certificate P556.doc

TEST CERTIFICATE

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

Attention: Steve Hickins

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

Work performed for Brisbane Water at SP556 at Berkeley Rd under contract BW: 70103-038 (SJ Electric Job Number WT400085)

Installation Tested / Equipment Tested

- New PRV switchboard
- New main earth
- Earth bonding to main earth link and all switchboard components.

All supporting test sheets attached.

Test Date
14/07/10

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.

Andrew Burnell