



ELECTRICAL SWITCHBOARD OPERATION  
AND MAINTENANCE MANUAL FOR  
QUEENSLAND URBAN UTILITIES  
SEWAGE PUMPING STATION

SP089 – HALL STREET

Developed by:



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### DOCUMENT CHANGE HISTORY

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# 1 INTRODUCTION

These operating instructions cover the Sewage Pumping Station electrical equipment supplied by J & P Richardson Industries Pty Ltd in 2013.

## 1.1 OPERATING INSTRUCTIONS

Normal operation of the pumping station is in the automatic mode with control by means of a Motorola RTU, which receives level signals from the Level Measurement System in the wet well.

Manual controls and Manual Emergency operation of the station is available by means of selector switches on the common control compartment of the switchboard.

## 2 DESCRIPTION OF OPERATION

### 2.1 MODE SELECTOR

The station can be operated either in Local-Remote (automatic) or manual emergency mode with selection being made by means of the mode selector switches mounted on common control section escutcheon of the switchboard. The selector switch designated for Manual Emergency Mode is made by means with the following mode selections OFF-ON.

### 2.2 MANUAL EMERGENCY CONTROL

Each pumping unit can be run in manual emergency control from the common control section by: -

1. Selecting the "ON" setting on the "MODE SELECTOR SWITCH" as described in Clause 2.1.
2. The Duty Pump will start.
3. After a time delay, the Standby Pump will start.
4. Return the selector switch back to "OFF".

**N.B. DO NOT LEAVE THE STATION IN MANUAL EMERGENCY CONTROL WHILE UNATTENDED**

### 2.3 MANUAL CONTROL

For manual control of the station: -

1. Select the "MANUAL" position on the "MODE SELECTOR SWITCH" on the common control section escutcheon.
2. Starting and stopping of each pump is now controlled via the "START" and "STOP" push buttons located on the common control section escutcheon.
3. To return to Automatic Control, return the selector switch back to "REMOTE".

**N.B. DO NOT LEAVE THE STATION IN MANUAL CONTROL WHILE UNATTENDED**

## 2.4 AUTOMATIC CONTROL

For automatic control of the station: -

1. The "MODE SELECTOR SWITCH" on the common control section should be in the "REMOTE" position.
2. The automatic starting and stopping of the pumps is controlled by signals from the Motorola RTU.

For NORMAL OPERATION, each of the pump selector switches should have "EMERGENCY PUMP OFF" mode selected.

In the REMOTE mode the selected Duty Pump unit will start automatically as pre-set by the level in the wet well. In the event of the duty pump not being capable of supplying enough flow to continue draining the wet well and the well level rises to a second pre-set level, then the Standby Pump unit will automatically start to provide additional pumping. The supplementary pump unit also takes over for the respective pump duty on the occurrence of the Duty Pump unit failing. Duty and Standby pump delegation is assigned via the RTU programming.

### 3 ELECTRICAL EQUIPMENT LIST

*This list is to be used in conjunction with Sheet 18 of the electrical switchboard drawings (refer Section 5).*

ITEM	DESCRIPTION	SUPPLIER	MANUFACTURER	CATALOGUE NUMBER
	QLD SERVICE LINK	IPD	ALSTOM	QLD SERVICE LINK
2	MANUAL TRANSFER SWITCH	NHP	TERASAKI	S250PE3125
2	CABLE INTERLOCK HEAD PIECE	NHP	TERASAKI	T2MW25CA
2	1m INTERLOCK CABLE	NHP	TERASAKI	T2MW00SA
2	VARIABLE DEPTH HANDLE	NHP	TERASAKI	T2HS25R5GM
2	STANDARD TERMINAL COVER	NHP	TERASAKI	T2CF253LLNG
2	AUX CONTACT	NHP	TERASAKI	T2AX00M3STA
4	Q4 PUMP CIRCUIT BREAKER	NHP	TERASAKI	S125GJ363
4	Q4 PUMP CIRCUIT BREAKER	NHP	TERASAKI	S125GJ350
4	Q4 PUMP CIRCUIT BREAKER	NHP	TERASAKI	S125GJ332
4	Q4 PUMP CIRCUIT BREAKER	NHP	TERASAKI	S125GJ320
4	VARIABLE DEPTH HANDLE	NHP	TERASAKI	T2HS12R5GM
4	STANDARD TERMINAL COVER	NHP	TERASAKI	T2CF123SLNG
5	Q5 PUMP CIRCUIT BREAKER	NHP	TERASAKI	S125GJ363
5	Q5 PUMP CIRCUIT BREAKER	NHP	TERASAKI	S125GJ350
5	Q5 PUMP CIRCUIT BREAKER	NHP	TERASAKI	S125GJ332
5	Q5 PUMP CIRCUIT BREAKER	NHP	TERASAKI	S125GJ320
5	VARIABLE DEPTH HANDLE	NHP	TERASAKI	T2HS12R5GM
5	STANDARD TERMINAL COVER	NHP	TERASAKI	T2CF123SLNG
7	Q7 PHASE FAILURE CIRCUIT BREAKER	NHP	TERASAKI	DTCB15306C
8	Q8 EM. STORAGE DEWATERING PUMP CIRCUIT BREAKER	NHP	TERASAKI	S125GJ320
8	VARIABLE DEPTH HANDLE	NHP	TERASAKI	T2HS12R5GM
8	STANDARD TERMINAL COVER	NHP	TERASAKI	T2CF123SLNG
9	Q9 SUB-DISTRIBUTION CIRCUIT BREAKER	NHP	TERASAKI	S125NJ363
9	VARIABLE DEPTH HANDLE	NHP	TERASAKI	T2HS12R5GM
9	STANDARD TERMINAL COVER	NHP	TERASAKI	T2CF123SLNG
10	Q10 PHASE FAILURE CIRCUIT BREAKER	NHP	TERASAKI	DTCB6306C
11	Q11 15A GPO RCBO	NHP	TERASAKI	DSRCBH-16-30A
12	Q12 RTU LAPTOP GPO RCBO	NHP	TERASAKI	DSRCBH-10-30A
13	Q13 SPARE CIRCUIT BREAKER	NHP	TERASAKI	DSRCBH-06-30A
14	Q14 SPARE CIRCUIT BREAKER	NHP	TERASAKI	DSRCBH-10-30A
15	Q15 GENERATOR AUXILLARY SUPPLY RCBO	NHP	TERASAKI	DSRCBH-10-30A
16	Q16 EXTERNAL AERA LIGHTING RCBO	NHP	TERASAKI	DSRCBH-06-30A
17	Q17 SURGE FILTER CIRCUIT BREAKER	NHP	TERASAKI	DTCB6110C
18	Q18 EM PUMP CONTROL & SURCHARGE IMMINENT CB	NHP	TERASAKI	DTCB6106C
19	Q19 SPARE CIRCUIT BREAKER	NHP	TERASAKI	DTCB6106C

20	Q20 3 PHASE OUTLET CIRCUIT BREAKER	NHP	TERASAKI	DTCB6310C
20	Q20 DIN SAFE M ADD-ON E/L	NHP	TERASAKI	DSRCM-32-30-3PN
21	Q21 CATHODIC PROTECTION POWER SUPPLY CB	NHP	TERASAKI	DTCB6106C
24	Q30 RTU POWER SUPPLY CIRCUIT BREAKER	NHP	TERASAKI	DTCB6104C
25	Q31 SURGE FILTERS ALARM RELAY CIRCUIT BREAKER	NHP	TERASAKI	DTCB6104C
26	Q32 SPARE CIRCUIT BREAKER	NHP	TERASAKI	DTCB6104C
27	Q33 SPARE CIRCUIT BREAKER	NHP	TERASAKI	DTCB6104C
31	Q4-1,Q5-1 PUMP 240VAC CONTROL CIRCUIT BREAKER	NHP	TERASAKI	DTCB6104C
32	QD4,QD6,QD18 PUMP 24VDC CONTROL CIRCUIT BREAKER	NHP	TERASAKI	DTCB6110C
33	QD8 BATTERY SHORT CCT PROTECTION CIRCUIT BREAKER	NHP	TERASAKI	DTCB6210C
34	240VAC-24VDC POWER SUPPLY 120W 5A@24VDC	RAMELEC	WEIDMULLER	8951340000
36	DISTRIBUTION BOARD CHASSIS	NHP	TERASAKI	NC2-24/18-3U
37	F1 FUSE HOLDER	NHP	NHP	NV63FW
37	F1 FUSE CARTRIDGE	NHP	NHP	NES63
38	SURGE DIVERTER	ECO	CRITEC	TDS11002SR277
39	SURGE FILTER ALARM RELAY - SFAR	ECO	CRITEC	DAR-275V
40	SURGE REDUCTION FILTER - SRF	ECO	CRITEC	TDF-10A-240V
41	ENERGEX MAINS PHASE FAILURE RELAY - PFRE	NHP	CARLO GAVAZZI	DPB01CM48W4
43	STATION MAINS PHASE FAILURE RELAY- PFRS	NHP	CARLO GAVAZZI	DPB01CM48W4
45	MAIN NEUTRAL LINK	JPR	JPR	CUSTOM BUS BAR
45	MOUNTING FEET	JPR	JPR	BOBBINS
46	MAIN EARTH LINK	JPR	JPR	CUSTOM BUS BAR
47	DIST. BD NEUTRAL LINK	DORE	DORE	165E24
47	DIST. BD NEUTRAL LINK MOUNTING FEET	DORE	DORE	E/N FEET
48	DIST. BD EARTH LINK	DORE	DORE	165E24
49	SURGE DIVERTER NEUTRAL LINK	CLIPSAL	CLIPSAL	L5A
50	INSTRUMENT EARTH LINK	DORE	DORE	165E12
50	INSTRUMENT EARTH LINK MOUNTING FEET	DORE	DORE	E/N FEET
51	FILTERED SUPPLY NEUTRAL LINK	CLIPSAL	CLIPSAL	L7
52	3 PHASE SWITCHED OUTLET	CLIPSAL	CLIPSAL	56C410
53	1 PHASE OUTLET - 15A	CLIPSAL	CLIPSAL	2015/15
53	1 PHASE OUTLET INSULATING SHROUD	CLIPSAL	CLIPSAL	90B
54	LAPTOP GPO TWIN 10A	CLIPSAL	CLIPSAL	2025
54	LAPTOP GPO MOUNTING BLOCK	CLIPSAL	CLIPSAL	449A
54	LAPTOP GPO INSULATING BACK PLATE	CLIPSAL	CLIPSAL	449AP
55	1 PHASE OUTLET - GENERATOR AUX POWER	CLIPSAL	CLIPSAL	56S0310
56	GENERATOR INLET	DKSH	MENNEKES	MEN 368
56	PROTECTIVE CAP	DKSH	MENNEKES	40788
56	GENERATOR INLET	DKSH	MENNEKES	MEN 361

56	PROTECTIVE CAP	DKSH	MENNEKES	40787
59	22kW PUMP SOFT STARTER	DANFOSS	DANFOSS	MCD500 MCD5-0053B 175G5503
59	18kW PUMP SOFT STARTER	DANFOSS	DANFOSS	MCD500 MCD5-0043B 175G5502
59	15kW PUMP SOFT STARTER	DANFOSS	DANFOSS	MCD500 MCD5-0037B 175G5501
59	7.8kW PUMP SOFT STARTER	DANFOSS	DANFOSS	MCD500 MCD5-0021B 175G 5500
59	PUMP SOFT STARTER MODBUS	DANFOSS	DANFOSS	MCD500 175G 9000
60	PUMP SOFT STARTER KEYPAD KIT	DANFOSS	DANFOSS	MCD500 175G 0096
64	PUMP LINE CONTACTOR - K1 (24VDC COIL)	NHP	SPRECHER & SCHUH	CA7-43C-00-24VDC
64	PUMP LINE CONTACTOR - K1 (24VDC COIL)	NHP	SPRECHER & SCHUH	CA7-30C-00-24VDC
65,66, 68,69	PUMPCONTROL RELAYS K2, K3, K5, K6	IPD	IDEC	RH2B-ULD-24VDC
65,66, 68,69	PUMPCONTROL RELAY BASES K2, K3, K5, K6	IPD	IDEC	SH2B-05C
67	PUMPCONTROL RELAYS K4	IPD	IDEC	RH4B-ULD-24VDC
67	PUMPCONTROL RELAY BASES	IPD	IDEC	SH4B-05C
73,74, 75	PUMPCONTROL RELAYS K20, K21, K22	IPD	IDEC	RH2B-ULD-24VDC
73,74, 75	PUMPCONTROL RELAY BASES K20, K21, K22	IPD	IDEC	SH2B-05C
77	LOCAL START PUSHBUTTON -S1	NHP	SPRECHER & SCHUH	D7P-F3-PX10
78	LOCAL STOP (N/O) PUSHBUTTON-S2	NHP	SPRECHER & SCHUH	D7P-F4-PX10
79	LOCAL ESTOP PUSHBUTTON-S3	NHP	SPRECHER & SCHUH	D7P-MT44 -PX01S
79	LOCAL ESTOP PUSHBUTTON-S3	NHP	SPRECHER & SCHUH	D7-PX01S
79	LOCAL ESTOP PUSHBUTTON-S3	NHP	SPRECHER & SCHUH	D7-15YE112
80	LOCAL RESET PUSHBUTTON-S4	NHP	SPRECHER & SCHUH	D7P-F6-PX10
80	N/O AUX	NHP	SPRECHER & SCHUH	D7-PX10
81	HOURS RUN	NHP	NHP	RQ4801080VDC
82	PUMP POWER SOCKET OUTLET	MARECHAL	MARECHAL	DS3 3134013972
82	PUMP POWER SOCKET OUTLET	MARECHAL	MARECHAL	DS1 3114013972
82	PUMP POWER SOCKET INCLINE SLEEVE	MARECHAL	MARECHAL	51CA058
82	PUMP POWER SOCKET INCLINE SLEEVE	MARECHAL	MARECHAL	51BA058
83	PUMP POWER INLET PLUG	MARECHAL	MARECHAL	DS3 3138013972
83	PUMP POWER INLET PLUG	MARECHAL	MARECHAL	DS1 3118013972
83	PUMP POWER INLET HANDLE	MARECHAL	MARECHAL	313A013
83	PUMP POWER INLET HANDLE	MARECHAL	MARECHAL	311A013
84	PUMP CONTROL SOCKET OUTLET	MARECHAL	MARECHAL	PN7C 01P4060
84	PUMP CONTROL SOCKET INCLINE SLEEVE	MARECHAL	MARECHAL	01NA053
85	PUMP CONTROL INLET PLUG	MARECHAL	MARECHAL	PN7C 01P8060
85	PUMP CONTROL INLET HANDLE	MARECHAL	MARECHAL	01NA313
93	LR3 - WET WELL HIGH LEVEL RELAY	MULTITRODE	MULTITRODE	MTR-5 (24VDC)
95	SIR - SURCHARGE IMMINENT LEVEL RELAY	MULTITRODE	MULTITRODE	MTRA-FS (24VDC)
97	EMERGENCY PUMPING MODE RELAY PUMP1 - EMG1	IPD	IDEC	RH2B-ULD-24VDC

97	EMERGENCY PUMPING MODE RELAY PUMP1 - EMG1	IPD	IDEC	SH2B-05C
98	SURCHARGE IMMINENT DELAY TIMER - SIDT	NHP	SPRECHER & SCHUH	RZ7-FSA 4U U23
99	EMERGENCY PUMPING MODE TIMER - EMGDT	OMRON	OMRON	OMRON H3CA-A
99	EMERGENCY PUMPING MODE TIMER - EMGDT	OMRON	OMRON	OMRON P2CF-11
99	EMERGENCY PUMPING MODE TIMER - EMGDT	OMRON	OMRON	OMRON Y92A-48B
100	EMERGENCY PUMPING MODE PUMP2 - EMG2	NHP	SPRECHER & SCHUH	RZ7-FSA 3E U23
101	EMERGENCY PUMPING MODE SWITCH & LIGHT S5/H5	NHP	SPRECHER & SCHUH	D7P-LSM25 c/w D7-110, D7-17BE165
101	EMERGENCY PUMPING MODE SWITCH & LIGHT S5/H5	NHP	SPRECHER & SCHUH	D7-X10
101	EMERGENCY PUMPING MODE SWITCH & LIGHT S5/H5	NHP	SPRECHER & SCHUH	D7-NU3W
102	EMERGENCY PUMPING MODE AUX RELAY - EMGDTA	IPD	IDEC	RH2B-ULD-24VDC
102	EMERGENCY PUMPING MODE AUX RELAY BASE - EMGDTA	IPD	IDEC	SH2B-05C
115	LIGHTING CONTROL RELAY - SLCR, DZCR	IPD	IDEC	RH2B-ULD-24VDC
115	LIGHTING CONTROL RELAY BASE - SLCR, DZCR	IPD	IDEC	SH2B-05C
116	AREA LIGHTING CONTROL SWITCH - S11	KRAUS&NAIMER	KRAUS&NAIMER	CAD11-A721-600-FT2-F758 *ENGRAVED "OFF ON"
118	STATION LOCAL REMOTE SWITCH - S10	KRAUS&NAIMER	KRAUS&NAIMER	CAD11-A721-600-FT2-F758 *ENGRAVED "LOCAL REMOTE"
119	ELECTRODE TEST RELAY - ETR	IPD	IDEC	RH4B-ULD-24VDC
119	ELECTRODE TEST RELAY BASE - ETR	IPD	IDEC	SH4B-05C
120	WELL WASHER RELAY - WWR	IPD	IDEC	RH2B-ULD-24VDC
120	WELL WASHER RELAY BASE - WWR	IPD	IDEC	SH2B-05C
121	WET WELL LEVEL INDICATOR 0-100% ADJ RED POINTER	CROMPTON	CROMPTON INSTRUMENTS	244-01KG-HG-IP-SR-4-20MA WITH RED POINTER
122	FIELD DISCONNECT BOX DOOR PROXIMITY SWITCH	PEPPERL & FUCHS	PEPPERL & FUCHS	NCB5-18GM40-Z0
123	MICRO SWITCH	OMRON	OMRON	Z-15GW2A55-B5V
124	PROXIMITY SWITCH	CONTROL LOGIC	PEPPERL & FUCHS	NCB5-18GM40-Z0
125	INTERNAL SWITCHBOARD LED LIGHTING	OMEGA	LUMIFA	LF1B-C3S-2THWW4
126	EM. STORAGE DEWATERING PUMP CONTACTOR	NHP	SPRECHER & SCHUH	CA7-16C-10-24VDC
127	EM. STORAGE DEWATERING PUMP OVERLOAD	NHP	SPRECHER & SCHUH	CT7N-23-B48
128	EM. STORAGE DEWATERING PUMP RELAY	IPD	IDEC	RH2B-ULD-24VDC
128	EM. STORAGE DEWATERING PUMP RELAY BASE	IPD	IDEC	SH2B-05C
129	EM. STORAGE DEWATERING PUMP CNTL SWITCH - 7S1	NHP	SPRECHER & SCHUH	D7P-SR32 c/w D7-110, (black with white text) "OFF - AUTO - TEST"
129	EM. STORAGE DEWATERING PUMP CNTL SWITCH - 7S1	NHP	SPRECHER & SCHUH	D7-X10
129	EM. STORAGE DEWATERING PUMP CNTL SWITCH - 7S1	NHP	SPRECHER & SCHUH	D7-X01
130	BD1 - DIODE BRIDGE SINGLE PHASE	RS COMPONENTS	RS COMPONENTS	227-8772
130	F1 - PANEL MOUNT FUSE HOLDER	NHP	NHP	NV20FW + NNS4
130	F1 - 4A FUSE	RS COMPONENTS	RS COMPONENTS	537-1408
130	H1 - RED LED INDICATOR LIGHT	NHP	SPRECHER & SCHUH	D7P-P4-PN7R

130	H2 - WHITE LED INDICATOR LIGHT	NHP	SPRECHER & SCHUH	D7P-P7-PN7W
130	H3 - AMBER LED INDICATOR LIGHT	NHP	SPRECHER & SCHUH	D7P-P0-PN3A
130	K1 - 24VDC 2 POLE RELAY	IDEC	IDEC	RH2B-ULD-DC24V
130	K1 - 24VDC 2 POLE RELAY BASE	IDEC	IDEC	SH2B-05C
130	M1 - VOLTMETER	RS COMPONENTS	RS COMPONENTS	244-862
130	M2 - AMMETER	RS COMPONENTS	RS COMPONENTS	244-907
130	S1 - RED MOMENTARY PUSH PUTTON	NHP	SPRECHER & SCHUH	D7P-F4-PX01
130	S2 - BLUE MOMENTARY PUSH PUTTON	NHP	SPRECHER & SCHUH	D7P-F6-PX10
130	TDR1 - TRANSDUCER	RAMELEC	WEIDMULLER	FTX/DMV/0-150mV/4-20mA/240VAC
130	T1 - 240VAC to 6,8,10,12 VAC TRANSFORMER (60VA)	PETER MARTIN	PETER MARTIN	TX0150 240/12T 240VAC IN (50Hz) 6,8,10,12V TAPPINGS OUTPUT 12.5A MAX
130	VR1 - VARISTOR	RS COMPONENTS	RS COMPONENTS	543-5215
130	THROUGH TERMINAL GREY	PHOENIX	PHOENIX	UT16 (3044199)
130	END COVER	PHOENIX	PHOENIX	D-UT16 (3047206)
130	TERMINAL BRIDGING BAR	PHOENIX	PHOENIX	FBS2-12 (3005950)
133	WET WELL LEVEL PROBE (27m suspension cable PE)	VEGA	VEGA	WL52XXA4AMD1DD1X
133	WET WELL LEVEL PROBE (12m suspension cable PE)	VEGA	VEGA	WL52XXA4ALD1DD1X
134	WET WELL LEVEL ADJUSTMENT UNIT	VEGA	VEGA	DIS62XXKMAXX
135	EM. STORAGE DEWATERING LEVEL PROBE	VEGA	VEGA	WL52XXA4ATD1CD1X
136	EM. STORAGE DEWATERING LEVEL ADJUSTMENT UNIT	VEGA	VEGA	DIS62XXKMAXX
137	DELIVERY PRESSURE TRANSMITTER (0-5.0bar)	VEGA	VEGA	VEGABAR52 BR52.XXCA1FHPMAS
137	DELIVERY PRESSURE TRANSMITTER (0-1.0bar)	VEGA	VEGA	VEGABAR52 BR52.XXCA1DHPMAS
137	DELIVERY PRESSURE TRANSMITTER (0-2.5bar)	VEGA	VEGA	VEGABAR52 BR52.XXCA1EHPMAS
138	TRICLOVE FITTING FOR VEGABAR52	VEGA	VEGA	TRI CLOVE ADAPTER 4
139	CONTROL SYSTEMS POWER SUPPLY 24V DC	POWERBOX	POWERBOX	PB251A-24CM-CC-T-S
140	RADIO 24/13.8VDC CONVERTER 50W	POWERBOX	POWERBOX	PBIH-2412J-CC
141	PSTN MODEM 24V/9VDC CONVERTER	POWERBOX	POWERBOX	PBBA-2409F-CM-CC
142	300mm TELESCOPIC RAILS	UES	UES	DSCH MD 300MM
142	BATTERIES	CENTURY BATTERIES	YAUSA	UXH50-12
143	RADIO	SCHNEIDER	TRIO	DR900-07A02-D0
143	RADIO	SCHNEIDER	TRIO	DR900-06A02-D0
143	RADIO TO RTU PATCH LEAD	BLACKBOX	BLACKBOX	CONN2298
144	RADIO ANTENNA (15 ELEMENT 13dB ALUM)	SCHNEIDER	TRIO	ANTY13AL
145	RADIO COAX SURGE PROTECTOR	RF INDUSTRIES	POLYPHASER	IS-50-NX-C2
146	ACE 3600 BASIC MODEL (NO RADIO)	MOTOROLA	MOTOROLA	F7509
146	DC POWER SUPPLY	MOTOROLA	MOTOROLA	V251
146	PLUG IN RS-232 PORT	MOTOROLA	MOTOROLA	V184
146	PLUG IN ETHERNET 10/100M PORT	MOTOROLA	MOTOROLA	V212

146	7 SLOT FRAME	MOTOROLA	MOTOROLA	V107
146	SOFTWARE LICENSE - DNP3+ LICENSE	MOTOROLA	MOTOROLA	V283
146	DIGITAL INPUT MODULES - 16 DI FAST 24V DC	MOTOROLA	MOTOROLA	V265
146	RELAY OUTPUT MODULES - 16 DO EE RELAY 2A	MOTOROLA	MOTOROLA	V616
146	MIXED IO CARD - 4AO/ 8AI +/- 20mA	MOTOROLA	MOTOROLA	V562
146	BLANK MODULE	MOTOROLA	MOTOROLA	V20
147	GSM MODEM (BRAYMAC)	BRAYMAC	WAVECOM	FASTRACK Supreme c/w 1.8m CABLE
147	PSTN MODEM	MAESTRO	WOOMERA	56K V.90
148	GSM ANTENNA	RF INDUSTRIES	RF INDUSTRIES	TLA2100
148	PSTN MODEM SURGE PROTECTION UNIT	ECO	CRITEC	SLP1-RJ11-A
150	GRAPHICAL DISPLAY	CONTROL LOGIC	RED LION	G306A000
150	CAT5e PATCH LEAD			RED CAT5e CROSS OVER CABLE
157	INTERNAL COAX CABLE	SCHNEIDER	TRIO	TBURRFTSMAM-NM0.5M 84020878/8530
158	EXTERNAL COAX CABLE	STOCK	RF INDUSTRIES	ANDREW CNT400
159	COAX PLUG	RF INDUSTRIES	PULSE	N-203HS
160	U CLAMP	RF INDUSTRIES	RF INDUSTRIES	UNV
164	10A MINATURE CIRCUIT BREAKER	PHOENIX	PHOENIX	TCP 10 (0712314)
164	TERMINAL MOUNTING BLOCK	PHOENIX	PHOENIX	UK6-FSI/C (3118203)
164	BRIDGING BAR	PHOENIX	PHOENIX	FBI 10-8 (0203263)
164	4A MINATURE CIRCUIT BREAKER	PHOENIX	PHOENIX	TCP 4 (0712259)
164	TERMINAL MOUNTING BLOCK	PHOENIX	PHOENIX	UK6-FSI/C (3118203)
164	2A MINATURE CIRCUIT BREAKER	PHOENIX	PHOENIX	TCP 2 (0712217)
164	TERMINAL MOUNTING BLOCK	PHOENIX	PHOENIX	UK6-FSI/C (3118203)
164	THROUGH TERMINAL GREY	PHOENIX	PHOENIX	PIT2,5 (3209510)
164	THROUGH TERMINAL EARTH	PHOENIX	PHOENIX	PIT2,5 PE (3209536)
164	END COVER	PHOENIX	PHOENIX	D-ST2,5 (3030417)
164	DISCONNECT TERMINAL GREY	PHOENIX	PHOENIX	PIT2,5 MT (3210156)
164	END COVER	PHOENIX	PHOENIX	D-PIT2,5 MT (3211003)
164	GROUP MARKER	PHOENIX	PHOENIX	UBE/D (0800307)
164	END BRACKET	PHOENIX	PHOENIX	E/UK (1201442)
164	PLUG IN BRIDGE 50 WAY	PHOENIX	PHOENIX	FBS 50-5 (3038930)
164	TEST PLUG	PHOENIX	PHOENIX	PS 5 (3030983)
164	TERMINAL MARKER VERTICAL	PHOENIX	PHOENIX	ZB5 QR:FORTL.ZAHLEN 1-10 (1050020:0001)
164	TERMINAL MARKER VERTICAL	PHOENIX	PHOENIX	ZB5 QR:FORTL.ZAHLEN 11-20 (1050020:0011)
164	TERMINAL MARKER VERTICAL	PHOENIX	PHOENIX	ZB5 QR:FORTL.ZAHLEN 21-30 (1050020:0021)
164	TERMINAL MARKER VERTICAL	PHOENIX	PHOENIX	ZB5 QR:FORTL.ZAHLEN 31-40 (1050020:0031)
164	TERMINAL MARKER VERTICAL	PHOENIX	PHOENIX	ZB5 QR:FORTL.ZAHLEN 41-50 (1050020:0041)
164	TERMINAL MARKER VERTICAL	PHOENIX	PHOENIX	ZB5 QR:FORTL.ZAHLEN 51-60 (1050020:0051)

164	TERMINAL MARKER VERTICAL CUSTOM	PHOENIX	PHOENIX	UC-TM 5 CUS L (0824581L) (VERTICAL NUMBERS L1-L40), (VERTICAL NUMBERS 600-611)
170	ENERGEX PADLOCK	H.A.REED LOCKSMITHS	H.A.REED LOCKSMITHS	ENERGEX PADLOCK KEYED 325 WITH S/S SHACKLE AND 2 KEYS PER LOCK
187	LEVEL PROBE (CABLE LENGTH = 30m)	MULTITRODE	MULTITRODE	0.2/01-30 FSP-SHIELD **special shielded cable**
191	EXTERIOR AREA LIGHT	STRATEGIC LIGHTING	STRATEGIC LIGHTING	ECLIPSE T5 2x80W
192	CORROSION INHIBITOR	RS	CORTEC	VPCI-110
189	EM. STORAGE DEWATERING PUMP POWER SOCKET OUTLET	MARECHAL	MARECHAL	DSN1 6114013
189	EM. STORAGE DEWATERING PUMP INCLINE SLEEVE	MARECHAL	MARECHAL	51AA757
190	EM. STORAGE DEWATERING PUMP CONTROL INLET PLUG	MARECHAL	MARECHAL	DSN1 6118013
190	EM. STORAGE DEWATERING PUMP HANDLE	MARECHAL	MARECHAL	611A013

## 4 TEST RESULTS

**J. & P. RICHARDSON INDUSTRIES PTY LTD**

114 Campbell Avenue, WACOL QLD 4076

Ph: (07) 3271 2911 - Fax: (07) 3271 3623

E-mail: jpr@jpr.com.au

**SWITCHBOARD & SHEETMETAL INSPECTION REPORT**

<b>Customer Name: QUU</b>			<b>Job No: M63000/S63000</b>		
<b>Item: SP089 Hall Street</b>			<b>Drawing No: 57-0293set_A</b>		
TASK	PRODUCT DETAIL	INSPECTED BY	DATE	PASS / FAIL	CORRECTIVE ACTION REQUEST OR COMMENTS
<b>Design</b>	Documents	R.B.	1/02/2013	✓	
<b>Drafting</b>	Documents				
<b>Sheetmetal</b> (Refer F1018 for details)	Switchboard				
	Doors				
	Cell/Panels				
<b>Painting</b>					
Process	Powder / Wet				
Min DFT (40 STD)					
Cure Test					
Colour Exterior					
Colour Internal					
Colour Panels					
<b>Cubicle Erection</b>					
<b>Electrical Fitout</b> (In accordance with drawings)					
<b>Inspection &amp; Test</b> (Refer to F1019)					
<b>Packing</b>					
<b>Comments:</b>					
all up and done 12/03/13					
JOHN FOX					
<b>NOTE: - Manufacture is not to proceed to the next process until the item has passed inspection</b>					
<b>Affix Status Here: -</b>					
Yellow	Awaiting Inspection				
Green	Inspection & Test Passed				
Red	Inspection & Test Failed, Awaiting Rectification				

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Ph: (07) 3271 2911 - Fax: (07) 3271 3623

E-mail: jpr@jpr.com.au

**SWITCHBOARD / SHEETMETAL**  
**INSPECTION CHECKLIST**

<b>CLIENT:</b> Queensland Urban Utilities			<b>JOB NO:</b> S63000		
<b>PRODUCT DESCRIPTION:</b> SP089 Hall Street			<b>DRAWING &amp; SCHEDULE NUMBERS</b> 57-0293set A		
CONSTRUCTION	QUALITY		COMPLIANCE WITH DRAWINGS		REMARKS OR ACTION
	GOOD	POOR	YES	NO	
1. Folds			✓		
2. Welds			✓		
3. Edges / File			✓		
4. Gauge			✓		
5. Material			✓		
6. Ventilation Openings / Filter Bracket			✓		
7. Water Ingress Test			✓		
8. Equipment Mounting Arrangement			✓		
9. Doors Stiffened			✓		
10. Escutcheons and Lexan Covers			✓		
11. Cable Saddles			✓		
12. Grinding			✓		
13. Door Stays Fitted			✓		
14. Earth Studs			✓		
15. Rubber Retainer			N/A		
16. Drawing Holder			✓		
17. Hat Sections			—		
18. Locking Bars Fitted			✓		
19. External Crevice Welded and Ground			✓		
20. Legend Cards			✓		
21. General Conditions Satisfactory			✓		
22. Cabinet Clean			✓		
23. Job Name and Number Marked on Board and Panels			✓		
24. Lap Top Tray			✓		
25. Gland Plates Fitted			✓		
26. Sunshields Fitted			✓		

**J. & P. RICHARDSON INDUSTRIES PTY LTD**

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Ph: (07) 3271 2911 - Fax: (07) 3271 3623

E-mail: jpr@jpr.com.au

**SWITCHBOARD ELECTRICAL INSPECTION & TEST REPORT**

Customer Name: <b>QUU</b>							
Project: <b>HALL ST SEWAGE PUMP STATION</b>							
JPR Job No: <b>M62008</b>				Item: <b>SP089</b>			
Constructed by: <b>M. LAWLEY</b>				Tested by: <b>A. VARY</b>		Date: <b>27-3-13</b>	
Item check list: <i>To comply with Drawings, Documents &amp; Specification</i>							
Main Functional Unit/s	Qty	✓	Size	✓	Settings	✓	
Fuse Fittings	Qty	✓	Size	✓	Fuse Size	✓	
Circuit Breakers	Qty	✓	Size	✓	Settings	✓	
Motor Protection C.B.	Rating		Setting		Function	✓	
Neutral	Reqd	✓	Size	✓	ID	✓	
Equipment Earthing	Checked	✓	Size	✓			
C.T.s	Qty		Rating		Pri Inject.		
Meters	Qty		Rating		Function		
Contactors	Qty	✓	Rating	✓	Voltage	✓	
Overloads	Qty		Rating		Function		
Relays	Qty	✓	Rating	✓	Voltage	✓	
Timers	Qty	✓	Rating	✓	Voltage	✓	
Control Switches	Qty	✓	Rating	✓	Function	✓	
Push Buttons	Qty	✓	Rating	✓	Function	✓	
Pilot Lights	Qty	✓	Rating	✓	Voltage	✓	
Transformers	Qty	✓	Rating	✓	Voltage	✓	
ATT/VFD/Soft Starter	Qty	✓	Rating	✓	Function	✓	
DC Supply	Qty	✓	Rating	✓	Voltage	✓	
Terminals	Qty	✓	Size	✓	ID	✓	
Engraving	Qty	✓	Size	✓	ID	✓	
Cabling	Type	✓	Size	✓	ID	✓	
Busbars	Type		Size		ID		
Escutcheons / Shrouds	Type	✓	Label	✓	IP rating	✓	
S.A. Metering CTs	Qty		Rating				
S.A. Metering Links	Type						
S.A. Meters	Type		Size				
JPR Label	Fitted	✓	Stamped	✓	Safety Stkr	✓	
Legend Card	Qty		Correct				
PLC/Telemetry	Qty	✓	Size	✓			
Power Monitor Relay	Qty		Rating		Function		
<b>General Check List:</b>							
IP Sealing	Rating	✓					
Door Latches/Hinges	Qty	✓	Type	✓	Operation	✓	
Ventilation	Required	✓	Type	✓	Operation	✓	
Circuit Schedule	Markup	✓	Checked		Supplied		
Terminal Tightness	Power	✓	Control	✓	Result	✓	
Busbar System	Clearances		Joints		ID		
Earth Continuity	Body to E	✓	Doors to E	✓	Panels to E	✓	
Cubicle Cleaned		✓					
Paint Finish Intact		✓					
Polarity Check	R - R	✓	W - W	✓	B - B	✓	
Function	Power	✓	Control	✓	PLC/Telem	✓	
Continuity Check	R - R	✓	W - W	✓	B - B	✓	N - N
<b>Insulation Test</b>	<b>R to E</b>	<b>W to E</b>	<b>B to E</b>	<b>R to W</b>	<b>R to B</b>	<b>W to B</b>	<b>N to E</b>
<b>MAINS</b> <b>GENERATOR</b>	1000v Test (MΩ)	500	500	500	500	500	500
		500	500	500	500	500	500
<b>Earth Leakage</b>							
Earth Leakage Test		Rated Current		Trip Current		Trip Time	
<b>Comments:</b>							

Customer Name: <u>QUU</u>				
JPR Job No: <u>M62000</u>		Item: <u>SP089</u>		
Constructed by: <u>M. LAWLEY</u>		Tested by: <u>A. VARY</u>		Date: <u>27-3-13</u>
Test Unit	Megger RCDT330	<input checked="" type="checkbox"/>	Other	

[illegible]

**Comments:-**

## SWITCHBOARD ELECTRICAL INSPECTION & TEST REPORT

### VFD & SOFT STARTER SETUP



[illegible]

JOB SAFETY ANALYSISLIVE LOW VOLTAGE WORKTESTING SWITCHBOARDS AND CONTROL PANELS WITHIN OUR MANUFACTURING PREMISES

APPROVED BY: Eric McCulloch (WHSO)

LOCATION: WACOL WORKSHOP

DATE: 28/3/13

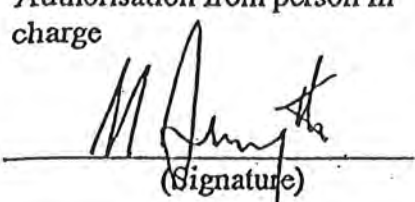
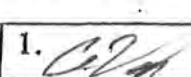
AUTHORISATIONS		PERSONAL PROTECTIVE EQUIPMENT			
<ul style="list-style-type: none"> <li>• Authorisation from person in charge</li> </ul>  (Signature)	<input checked="" type="checkbox"/> YES	<ul style="list-style-type: none"> <li>• Long cotton clothing</li> <li>• Insulating work gloves in test</li> <li>• Insulating mats / covers in test</li> <li>• Switchboard rescue kit in test</li> </ul>	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES		
<b>TASK</b>  <b>LIVE LOW VOLTAGE WORK</b>  <b>TESTING SWITCHBOARDS AND CONTROL PANELS WITHIN OUR MANUFACTURING PREMISES</b>	<ul style="list-style-type: none"> <li>• Isolation points identified and accessible</li> <li>• Work area clear of obstructions</li> <li>• Unauthorised access prevented to work area</li> <li>• P.P.E. is fit for purpose</li> <li>• Test equipment is fit for purpose</li> <li>• Written authority to proceed has been obtained from a person in charge.</li> <li>• JPR authorisation to conduct live work is current</li> <li>• Approved dedicated power supply only used for testing.</li> </ul>	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input type="checkbox"/> YES	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input type="checkbox"/> YES		
<b>OPTION (A)</b>	Approved dedicated power supply in current test RCD protected outputs used at power supply > RCD protection checked daily prior to use > Safety Observer <del>is</del> is not required	<input type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES	<input type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES		
<b>OPTION (B)</b>	Non RCD protected outputs used at power supply > Supervisor consulted prior to use > Safety Observer is in attendance	<input type="checkbox"/> YES <input type="checkbox"/> YES <input type="checkbox"/> YES	<input type="checkbox"/> YES <input type="checkbox"/> YES <input type="checkbox"/> YES		
I understand and am fully aware of the requirements of this job safety analysis.					
Signatures:	1. 	2. S.B.	3.	4.	5.

JOB SAFETY ANALYSISLIVE LOW VOLTAGE WORKTESTING SWITCHBOARDS AND CONTROL PANELS WITHIN OUR MANUFACTURING PREMISES

APPROVED BY: Eric McCulloch (WHSO)

LOCATION: WACOL WORKSHOP

DATE: 29.3.13

AUTHORISATIONS		PERSONAL PROTECTIVE EQUIPMENT			
<ul style="list-style-type: none"> <li>• Authorisation from person in charge</li> </ul>  (Signature)	<input checked="" type="checkbox"/> YES	<ul style="list-style-type: none"> <li>• Long cotton clothing</li> <li>• Insulating work gloves in test</li> <li>• Insulating mats / covers in test</li> <li>• Switchboard rescue kit in test</li> </ul>	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES		
<b>TASK</b>  <b>LIVE LOW VOLTAGE WORK</b>  <b>TESTING SWITCHBOARDS AND CONTROL PANELS WITHIN OUR MANUFACTURING PREMISES</b>	<ul style="list-style-type: none"> <li>• Isolation points identified and accessible</li> <li>• Work area clear of obstructions</li> <li>• Unauthorised access prevented to work area</li> <li>• P.P.E. is fit for purpose</li> <li>• Test equipment is fit for purpose</li> <li>• Written authority to proceed has been obtained from a person in charge.</li> <li>• JPR authorisation to conduct live work is current</li> <li>• Approved dedicated power supply only used for testing.</li> </ul>	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input type="checkbox"/> YES	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input type="checkbox"/> YES		
<b>OPTION (A)</b> RCD protected outputs used at power supply	<ul style="list-style-type: none"> <li>&gt; RCD protection checked daily prior to use</li> <li>&gt; Safety Observer is/ is not required</li> </ul>	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES		
<b>OPTION (B)</b> Non RCD protected outputs used at power supply	<ul style="list-style-type: none"> <li>&gt; Supervisor consulted prior to use</li> <li>&gt; Safety Observer is in attendance</li> </ul>	<input type="checkbox"/> YES <input type="checkbox"/> YES <input type="checkbox"/> YES	<input type="checkbox"/> YES <input type="checkbox"/> YES <input type="checkbox"/> YES		
I understand and am fully aware of the requirements of this job safety analysis.					
Signatures:	1. 	2.	3.	4.	5.

# JOB SAFETY ANALYSIS

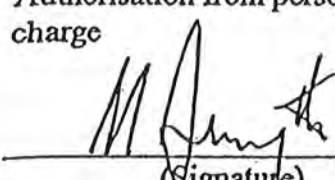
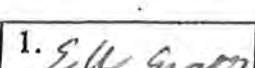
## LIVE LOW VOLTAGE WORK

### TESTING SWITCHBOARDS AND CONTROL PANELS WITHIN OUR MANUFACTURING PREMISES

APPROVED BY: Eric McCulloch (WHSO)

LOCATION: WACOL WORKSHOP

DATE: 2...1...4...13

AUTHORISATIONS		PERSONAL PROTECTIVE EQUIPMENT			
<ul style="list-style-type: none"> <li>• Authorisation from person in charge</li> </ul>  (Signature)	<input checked="" type="checkbox"/> YES	<ul style="list-style-type: none"> <li>• Long cotton clothing</li> <li>• Insulating work gloves in test</li> <li>• Insulating mats / covers in test</li> <li>• Switchboard rescue kit in test</li> </ul>	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES		
<b>TASK</b>  LIVE LOW VOLTAGE WORK  TESTING SWITCHBOARDS AND CONTROL PANELS WITHIN OUR MANUFACTURING PREMISES	<ul style="list-style-type: none"> <li>• Isolation points identified and accessible</li> <li>• Work area clear of obstructions</li> <li>• Unauthorised access prevented to work area</li> <li>• P.P.E. is fit for purpose</li> <li>• Test equipment is fit for purpose</li> <li>• Written authority to proceed has been obtained from a person in charge</li> <li>• JPR authorisation to conduct live work is current</li> <li>• Approved dedicated power supply only used for testing.</li> <li>• Approved dedicated power supply in current test</li> </ul>	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input type="checkbox"/> YES	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES <input type="checkbox"/> YES		
OPTION (A) RCD protected outputs used at power supply	<ul style="list-style-type: none"> <li>&gt; RCD protection checked daily prior to use</li> <li>&gt; Safety Observer <del>X</del> / is not required</li> </ul>	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> YES <input checked="" type="checkbox"/> YES		
OPTION (B) Non RCD protected outputs used at power supply	<ul style="list-style-type: none"> <li>&gt; Supervisor consulted prior to use</li> <li>&gt; Safety Observer is in attendance</li> </ul>	<input type="checkbox"/> YES <input type="checkbox"/> YES	<input type="checkbox"/> YES <input type="checkbox"/> YES		
I understand and am fully aware of the requirements of this job safety analysis.					
Signatures:	1. 	2.	3.	4.	5.

**CA17a - Factory Inspection Tests****Major Projects & Commercial Services***SQUV SP Reliability Improve – Stage2*

SP089 Hall Street	Date	
-------------------	------	--

**A. Electrical Installation Test Records**

AS/NZS 3000:2007 requires that prior to placing an electrical installation or any part thereof in service following its construction, alteration, addition or repair, it shall be inspected and tested to verify that the installation is safe to energize and that it will operate correctly in accordance with the requirements of AS3000:2007.

This section is aimed to ensure that the switchboard manufacturer has carried out and documented all applicable AS3000:2007 tests considered as mandatory, prior to execution of the Factory Acceptance Test.

AS/NZS 3017 Electrical Installations – Verification Guidelines provides inspection, test methods and test acceptance parameters to verify AS3000:2007 safety requirements, however these methods are provided for guidance and other alternative methods are acceptable, AS3017:2007 may be applied through legislative requirements made in each State and Territory of Australia and in New Zealand.

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Printed: 21/02/2013  
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Owner: Alfonso Chavez


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## CA17a - Factory Inspection Tests

**Major Projects & Commercial Services**

SQUV SP Reliability Improve – Stage2

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
A.1	Records for the verification of the continuity and resistance of the earthing system shall include:  a) Main earthing conductor b) Protective earthing conductors c) Earth bonding conductors.	✓ ✓				For acceptance criteria and test methods refer to: AS3000:2007 Section 8.3.5 & AS3017:2007 Section 3.1  

Contractor's Signature .....

Date .....

Company Name J &amp; P Richardson Industries

Company Electrical Licence No. 756

Queensland Urban Utilities Electrical Inspector .....

Date .....

Doc Id: CA-17a

Printed: 21/02/2013

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## CA17a - Factory Inspection Tests

**Major Projects & Commercial Services**

SQUV SP Reliability Improve – Stage2

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
A.2	Records for the verification of Insulation Resistance shall include:  a) Insulation resistance test of complete installation  b) Insulation resistance test of consumers mains  c) Insulation resistance test of single circuits					For acceptance criteria and test methods refer to AS3000:2007 Section 8.3.6 & AS3017:2007 Section 3.2

Contractor's Signature .....

Date .....

Company Name J &amp; P Richardson Industries

Company Electrical Licence No. 756

Queensland Urban Utilities Electrical Inspector .....

Date .....

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## CA17a - Factory Inspection Tests

**Major Projects & Commercial Services**

SQUV SP Reliability Improve – Stage2

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
A.3	<p>Records for the verification of Polarity Tests records shall include:</p> <ul style="list-style-type: none"> <li>a) <del>Consumer mains</del></li> <li>b) <del>Submains incorporating an earthing conductor</del></li> <li>c) <del>Submains not incorporating a protective earthing conductor</del></li> <li>d) Subcircuit polarity connections test (including single pole switches)</li> <li>e) Phase sequence tests</li> </ul>					For acceptance criteria and test methods refer to AS3000:2007 Section 8.3.7 & AS3017:2007 Sections 3.3 and 3.5

Contractor's Signature .....

Date .....

Company Name J &amp; P Richardson Industries

Company Electrical Licence No. 756

Queensland Urban Utilities Electrical Inspector .....

Date .....

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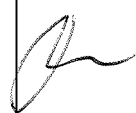
Page 4 of 24



## CA17a - Factory Inspection Tests

**Major Projects & Commercial Services**

SQUV SP Reliability Improve – Stage2

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
A.4	Records for the verification of Correct Circuit connection tests records shall include:  a) Interconnection between conductors of different circuits b) Socket-Outlet Sub-Circuits c) Lighting Points d) Equipment Sub-circuits	✓ ✓ ✓				For acceptance criteria and test methods refer to AS3000:2007 Section 8.3.8 & AS3017:2007 Section 3.4  

Contractor's Signature .....

Date .....

Company Name J &amp; P Richardson Industries

Company Electrical Licence No. 756

Queensland Urban Utilities Electrical Inspector .....

Date .....

Doc Id: CA-17a

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## CA17a - Factory Inspection Tests

**Major Projects & Commercial Services**

SQUV SP Reliability Improve – Stage2

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
A.5	Records for the verification of earth fault-loop for impedance shall include: a) Circuits not protected by an RCD			✓		For acceptance criteria and test methods refer to AS3000:2007 Section 8.3.9 & AS3017:2007 Section 3.6
A.6	Records for the verification of operation of RCDs shall include: a) Circuits protected by an RCD	✓				For acceptance criteria and test methods refer to AS3000:2007 Section 8.3.10 & AS3017:2007 Section 3.7

Contractor's Signature .....

Date .....

Company Name J &amp; P Richardson Industries

Company Electrical Licence No. 756

Queensland Urban Utilities Electrical Inspector .....

Date .....

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## CA17a - Factory Inspection Tests

**Major Projects & Commercial Services**

SQUV SP Reliability Improve – Stage2

**B. Testing Area, Documentation and Test Set Up Arrangements**

This section is aimed to ensure that all documentation and test set up arrangements have been provided to allow execution and readiness to carry out the FAT.

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
B.1	Verify that a suitable test area has been provided, the test area shall be: <ul style="list-style-type: none"> <li>Clearly identified and barricaded</li> <li>Test bench with enough space for testing equipment and documentation</li> <li>Well ventilated</li> </ul>	✓				
B.2	All testing equipment to simulate field inputs and outputs including field instruments and motors shall be pre-connected	✓				
B.3	"As Built" drawings marked up available.	✓				
B.4	"Point to Point" test drawing mark-ups provided	✓				

Contractor's Signature .....

Date .....

Company Name J &amp; P Richardson Industries

Company Electrical Licence No. 756

Queensland Urban Utilities Electrical Inspector .....

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## CA17a - Factory Inspection Tests

**Major Projects & Commercial Services**

SQUV SP Reliability Improve – Stage2

**C. Visual Inspections - Sheet Metal / Mechanical Construction Works**

The following visual inspections shall take place previous to energising the switchboard circuits. All power supplies shall be disconnected, including the main power supply, generator power supplies and battery power supplies.

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
C.1	Switchboard dimensions correct as per contract drawings					
C.2	Panel layout as per drawings	✓			J.T	
C.3	All equipment is to be removable from switchboard via front access.	✓			J.T	
C.4	Power distribution chassis not to be installed too close to the left of the door aperture	✓			J.T	
C.5	Check operation and orientation of doors and door handles	✓			J.T	
C.6	Switchboard mounting feet as per drawing	✓			J.T	
C.7	Material finish as per specification	✓			J.T	

Contractor's Signature .....

Date .....

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Major Projects &amp; Commercial Services

SQUV SP Reliability Improve – Stage2

C.8	IP Rating as per specifications. Fitting of sun shields shall maintain IP56 rating.	✓				J.T
C.9	All bolts fitted / tight	✓				J.T
C.10	All sheet metal edging to be de-burred, special attention given to handle/lock access heat shield cuts.	✓				J.T
C.11	Door, hinges and locks are properly fitted to allow closing without forcing the door or being loose.	✓				J.T
C.12	Lock barrels are mounted neatly. Door penetration and holes shall be suited to the particular lock barrel type.			✓		Waiting on barrels
C.13	Lock barrel types are provided as required and operate correctly			✓		Waiting on barrels
C.14	Energex Padlock Supplied					J.T

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**Major Projects & Commercial Services**

SQUV SP Reliability Improve – Stage2

C.15	All doors sealing shall be properly fitted and firmly secured to the switchboard. Glue shall be provided if necessary.	✓		<i>[Signature]</i>	J.T
C.16	Verify that proximity switch metal plates are fixed to doors as indicated in the drawings.	✓		<i>[Signature]</i>	
C.17	Ensure to pre-drill holes in plates that are difficult to access after the construction or installation of the switchboard on site. Particular attention shall be given to internal barrier plates and access plate on distribution board.	✓		<i>[Signature]</i>	
C.18	Cut outs from one cubicle to another <del>please</del> shall be large enough to accommodate all cables.	✓		<i>[Signature]</i>	
C.19	Sealing between plinth and switchboard.	✓		<i>[Signature]</i>	J.T
C.20	Sealing of disconnect zone.	✓		<i>[Signature]</i>	J.T

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Major Projects &amp; Commercial Services

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C.21	Verify that portable generator cable access plate allows the generator plug pass into the switchboard and reach the generator connection outlet.				
C.22	Inspection plates are properly labelled and not used as gland plates. Inspection plates are only provided to ease access to field wiring.	✓			
C.23	Verify that all gland entries are sealed – No split gland plates	✓			
C.24	All spare holes to be plugged with conduit plugs.	✓			
C.25	Enclosure free of debris	✓			

Contractor's Signature .....

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**Major Projects & Commercial Services**

SQUV SP Reliability Improve – Stage2

C.26	Lap top support tray provided including 1/4 turn wing knob on laptop support shelf. Knobs types that cannot be operated by hand are not acceptable.	✓			J & P R design
C.27	Drawings & log book holder provided	✓			
C.28	Aerial support is adjustable	✓			JPR design
C.29	A minimum clearance of 55mm shall be provided around the Redlion HMI to other components mounted in common controls door.	✓			
C.30	Check that selector switches are correctly engraved	✓			
C.31	Check that Indicators are fitted with correct coloured bezels	✓			

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<b>C.32</b>	Verify that all external labels are fitted to the switchboard.	✓				
<b>C.33</b>	Labelling is correct and complete - wording, size, fixing, material, level.	✓				
<b>C.34</b>	All internal and external labels are to have bevelled edges, sharp edges are not allowed.	✓				
<b>C.35</b>	Verify that 240VAC warning sign is fitted to the switchboard.					NOT FITTED Free issue. <i>for</i>

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**Major Projects & Commercial Services**

SQUV SP Reliability Improve – Stage2

**D. Visual Inspections- Neutral and Earthing**

A visual inspection shall be made when work on an electrical installation has been completed in order to verify that the work complies with the requirements of AS/NZS 3000.

The visual inspection shall be carried out before, or in association with testing, and as far as possible it should be made before the electrical installation is placed in service.

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
D.1	N/L & E/L have adequate bolts for main Neutral & Earth	✓				
D.2	Earth bar / earth connections fitted & OK	✓				
D.3	All neutral connections are accessible	✓				
D.4	MEN connections provided	✓				
D.5	Neutral & earth connections are not in CT section	✓				
D.6	Surge diverter earthed to adjacent stud.					
D.7	Confirm a Direct connection from main earth bar to switchboard chassis	✓				ASA 5.3

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## CA17a - Factory Inspection Tests

**Major Projects & Commercial Services**

SQUV SP Reliability Improve – Stage2

**E. Visual Inspections - Electrical Components Mounting, Wiring and Labelling**

As a minimum a visual inspection shall be made when work on an electrical installation has been completed in order to verify that the work complies with the requirements of AS/NZS 3000. This visual inspection section includes AS/NZS 3000 checks as well as several checks to verify that the electrical installation meets the specific design and quality requirements and scope of work.

The visual inspection shall be carried out before, or in association with testing, and as far as possible it should be made before the electrical installation is placed in service.

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
E.1	Busbars appropriately shielded			✓		
E.2	Verify that main switches/circuit breakers and fuses are supplied to the specification (equipment schedule)	✓				
E.3	Main switches lockable/ defeatable as per spec.	✓				

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## Major Projects &amp; Commercial Services

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E.4	Check operation of Main Supply and Generator supply mechanical and/or key interlocks as applicable.	✓				
E.5	Verify that metering fuses & CT's are fed off from main switch line side					
E.6	Verify that cable lugs are provided into CRITEC 20 kA surge filter circuit breaker (in most cases Q17)	✓				
E.7	Equipment fed from line side shall be appropriately labelled.	✓				
E.8	Include 2nd label for Surge Diverter and Surge Diverter fuses "FED FROM LINE SIDE OF MAIN SWITCH" as applicable (Items 37/38 on switchboard label schedule).	✓				
E.9	All Circuit Breakers shall be set as indicated in the electrical schematic drawings.	✓				

Contractor's Signature .....

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E.10	All circuit breakers shall be wired line side at the top / load side at the bottom	✓				
E.11	Verify that cables current carrying capacity is as indicated in the electrical schematic drawings.	✓				
E.12	Colour coding of wiring as per specification.	✓				
E.13	Wiring in PVC ducting shall be kept tidy.	✓				
E.14	Check cable access dimensions					
E.15	Check cable access & routes for field cabling.					
E.16	Check phasing of circuits are as per drawing.	✓				
E.17	Electrical components fitted are as specified in the equipment schedule	✓				

Contractor's Signature .....

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E.18	Verify that quantity and location of GPOs are provided as required in the drawings.	✓				
E.19	Confirm all Idéc relays are LED type and wired the correct polarity	✓				
E.20	Verify that digital timer is mounted on its own specific base (IDEC base) as specified in the equipment list (Item 99 -EMGDT)	✓				Omron Timer
E.21	Check that generator plug has protective cover fitted	✓				
E.22	Verify that power disconnection outlets and plugs are supplied with the switchboard as required	✓				
E.23	Verify that terminals & busbar connections are tight	✓				

Contractor's Signature .....

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**Major Projects & Commercial Services**  
SQUV SP Reliability Improve – Stage2

E.24	Verify that terminals are identified as per drawings and spares are provided	✓				
E.25	All terminals shall be correct part number, shrouded to IP20 and labelled.	✓				
E.26	All cable cores ferruled & numbered.	✓				
E.27	24VDC power supply shall be mounted to prevent obstruction to the field instrument terminals.	✓				
E.28	Multicore cables shall be used for RTU harnesses to provide neat wiring installation. Use of individual wires for each I/O is not acceptable.	✓				
E.29	Verify that adequate access to RTU and communication plug is provided	✓				

Contractor's Signature .....

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## Major Projects &amp; Commercial Services

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E.30	Modbus communication cables (RS 485) shall be 120ohm impedance twisted pair's.	✓				
E.31	Aerial surge arrestor shall be mounted with a small section of DIN rail the earthed as directly as possible	✓				
E.32	When externally installing soft starter CT's for bypass circuit, verify proper size to match the SS and wiring polarity. (if SS is MSF-017 the corresponding CT shall be CTS-017)				N/A	
E.33	When externally installing soft starter CT's for bypass circuit, please ensure proper Bypass operation parameter [340] shall be enabled.					
E.34	Motor Starter CT ratios are as specified and mounted to correct polarity					
E.35	Soft starter CT leads to be cut to size / kept short.					

Contractor's Signature .....

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## CA17a - Factory Inspection Tests

**Major Projects & Commercial Services**

SQUV SP Reliability Improve – Stage2

**F. Live Power and Operational Tests**

The following tests shall be made with all switchboard electrical circuits energized in order to check that the switchboard meets all operational requirements.

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
F.1	Verify that all circuit breakers isolate their stated circuits	✓				
F.2	Verify that all electrical components energize when power circuits are energized	✓				
F.3	Switchboard lights operate	✓				
F.4	Confirm that E-Stops actually stop its corresponding drive.	✓				
F.5	<del>Thermal overloads</del> or soft starter protection appropriately set	✓				
F.6	Set up all of the soft starter parameters	✓				

Contractor's Signature .....

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## CA17a - Factory Inspection Tests

Major Projects &amp; Commercial Services

SQUV SP Reliability Improve – Stage2

F.7	Verify that all Soft starter operation and all display parameters are displaying correctly. <del>Confirm current CTs are the correct polarity</del>				
F.8	A copy of Soft Starter <del>and/or VSD parameter</del> configuration to match site equipment shall be provided to the switchboard manufacturer by the commissioning manager.				
F.9	Record output of 24VDC power supply when connected to 240 VAC main.	✓			27-7 ✓
F.10	Record output of 24VDC power supply when disconnected to 240 VAC main.	✓			
F.11	Logica RTU provided with corresponding firmware/ software				Software Version: _____
F.12	Redlion HMI provided with corresponding software configuration				Software Version: SPIRF-19-110-18019
F.13	I/O tested to RTU terminals	✓			
F.14	Manual functions tested	✓			

Contractor's Signature .....

Date .....

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## CA17a - Factory Inspection Tests

**Major Projects & Commercial Services**

SQUV SP Reliability Improve – Stage2

**G. Non-Conformances and Unauthorised Modifications**

G.1	
G.2	
G.3	
G.4	
G.5	
G.6	
G.7	
G.8	
G.9	
G.10	

Contractor's Signature .....

Date .....

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## CA17a - Factory Inspection Tests

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This section is to be completed only at the conclusion of the FAT:

Final FAT Results	YES	NO	Results and comments
Pre-FAT Completed	✓		
Minor NCRs Generated		✓	
Major NCRs Generated		✓	
Pre-FAT Accepted	✓		very good

**Notes:**

1. FAT results to be recorded above by Contractor.
2. FAT results to be approved by Queensland Urban Utilities Electrical Inspector.
3. Pre-FAT results to be approved by Queensland Urban Utilities Electrical Inspector at Pre-FAT (if present) or at the start of the FAT.
4. NCRs are to be generated by the Queensland Urban Utilities Electrical Inspector for all NCRs not resolved by the end of the test.

Contractor's Signature .....

Date .....

Company Name J &amp; P Richardson Industries

Company Electrical Licence No. 756

Queensland Urban Utilities Electrical Inspector John Cloyon

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## CA17 - Site Inspection Tests

**Major Projects & Commercial Services**  
SQUV SP Reliability Improve – Stage2

SP089 Hall Street

Date

7/5/13

## A. Site Inspection Checks – De-Energised Switchboard Inspection and Tests (CA-17g)

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
A.1	"As Built" marked Up drawings available	✓				
A.2	Switchboard Manufacturer Test Certificate Provided	✓				NOT yet
A.3	FAT defect/punch list items arranged	✓				
A.4	Switchboard location and orientation correct as per contract drawings	✓				

Contractor's Signature

Date 7/5/13

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

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Date 7/5/13

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## CA17 - Site Inspection Tests

**Major Projects & Commercial Services**  
SQUV SP Reliability Improve – Stage2

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
A.5	Non-hydroscopic sealant material (Bitumastic 300M) to be provided between switchboard plinth & concrete slab	✓				
A.6	Switchboard shall be level and plumb before bolting to concrete plinth (slab)	✓				
A.7	All anchor bolts fitted and tight. Anchors shall be M12 S/Steel chemical anchors.	✓				
A.8	Minimum anchorage shall be 110 mm and filled with non-shrink grout where required.	✓				
A.9	MEN Connection provided	✓				

Contractor's Signature .....

Date 7/5/13

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

Queensland Urban Utilities Electrical Inspector John Dayron

Date 7/5/13

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## CA17 - Site Inspection Tests

**Major Projects & Commercial Services**  
SQUV SP Reliability Improve – Stage2

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
A.10	Earth Rod/Earth Connections Fitted & OK	✓				
A.11	Internal compartments free of debris	✓				
A.12	Check antenna cable lead between radio and surge arrester for broken or damaged connector contacts	✓				
A.13	GSM modem connection baud rate to 9600 baud/sec.	✓				

Contractor's Signature .....

Date 7/5/13

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

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**Major Projects & Commercial Services**  
SQUV SP Reliability Improve – Stage2

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
A.14	Thermistors connections shall be paralleled at the de-contactor.	✓				This is usually applicable to Soft Starter installations and not for VSDs. Please refer to the electrical schematic drawings.
A.15	Verify that all possible gas penetrations have been eliminated	✓				

Contractor's Signature .....

Date 7/5/13

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## CA17 - Site Inspection Tests

**Major Projects & Commercial Services**  
SQUV SP Reliability Improve – Stage2

## B. Site Inspection Checks - Cable Ladder/Tray/Duct (CA-17h )

Item No.	Activity Description	Results			Signed QUU	Comments
		Acc	Rej	N/A		
B.1	Ladder/Tray/Duct Correct Size/Type as per Spec.			✓		
B.2	Correct Routing as per Specification/Drawings			✓		
B.3	Clearance from Other Trades Satisfactory			✓		
B.4	Sufficient Brackets/Fixings to Suit Span			✓		
B.5	Brackets/Fixings Secure			✓		
B.6	Verify provision of anaconda to protect mains supply cable under the plinth			✓		

Contractor's Signature ..... 

Date ..... 7/5/13

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## CA17 - Site Inspection Tests

**Major Projects & Commercial Services**  
SQUV SP Reliability Improve – Stage2

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
B.7	Ladder/Tray/Duct Earthed/Bonded Correctly			/		
B.8	Covers Fitted & Secured Correctly			/		
B.9	Protrusions & Sharp Edges Removed			/		
B.10	Dissimilar Metals Not in Contact			/		
B.11	Segregation Barriers Fitted Correctly			/		
B.12	Adequate Mechanical Protection Provided	/		/		
B.13	Integrity of Finish/Coating Maintained	/				

Contractor's Signature ..... 

Date ..... 7/5/13

Company Name J & P Richardson Industries Pty Ltd

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## CA17 - Site Inspection Tests

**Major Projects & Commercial Services**  
SQUV SP Reliability Improve – Stage2

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
B.14	Penetrations Sealed Correctly	✓				
B.15	"As Built" Drawings Marked Up	✓				

Contractor's Signature

Date 7/5/13

Company Name J &amp; P Richardson Industries Pty Ltd

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## CA17 - Site Inspection Tests

**Major Projects & Commercial Services**  
SQUV SP Reliability Improve – Stage2

## C. Site Inspection Checks – Cables ( CA-17c )

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
C.1	Cables Sized as per Cable Schedule	✓				
C.2	Correct Cable Types Installed	✓				
C.3	Cables Glanded/Bushed Satisfactorily	✓				
C.4	Cables Terminated Satisfactorily	✓				
C.5	Sheathes/Insulation not Damaged	✓				
C.6	Bending Radius not Exceeded	✓				

Contractor's Signature .....

Date 7/5/13

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

Queensland Urban Utilities Electrical Inspector John Clayton

Date 7/5/13

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Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
C.7	Mechanical Protection Provided as Required	✓				
C.8	Cables Adequately Supported	✓				
C.9	Power & Signal Cable Clearances Adequate	✓				
C.10	All Cables Identified as per Cable Schedule	✓				
C.11	Overall Appearance Satisfactory	✓				

Contractor's Signature

Date

7/5/13

Company Name

J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No:

756

Queensland Urban Utilities Electrical Inspector

Date

7/5/13

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## D. Site Inspection Checks - Field Equipment and Instrumentation (CA-17e / CA-17f)

Item No.	Activity Description	Results			Signed QUU	Comments
		Acc	Rej	N/A		
D.1	Appropriate Instrument box access cover plate available and properly fitted			✓		
D.2	Appropriate level transmitter stilling pipe available and properly fitted			✓		

Contractor's Signature ..... 

Date ..... 7/5/13

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

Queensland Urban Utilities Electrical Inspector ..... 

Date ..... 7/5/13

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Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
D.3	Instrument Types/Model and Range as per Specification					
	a) Level Transmitter	✓				
	b) High Level Probe	✓				
	c) Surcharge Imminent Probe	✓				
	d) Delivery Pressure Transmitter	✓				
	e) Flow Level Transmitters			✓		

Contractor's Signature .....

Date .....

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

Queensland Urban Utilities Electrical Inspector .....

Date .....

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Item No.	Activity Description	Results			Signed QUU	Comments
		Acc	Rej	N/A		
D.4	All Instrument calibration certificates supplied					
	a) Level Transmitter					
	b) High Level Probe					
	c) Surcharge Imminent Probe					
	d) Delivery Pressure Transmitter					
	e) Flow Level Transmitters					

Contractor's Signature .....

Date 7/5/13

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

Queensland Urban Utilities Electrical Inspector John Clayton

Date 7/5/13

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Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
D.5	Clearances Adequate, suitable mounting and orientation for Correct Operation a) Level Transmitter b) High Level Probe c) Surcharge Imminent Probe d) Delivery Pressure Transmitter e) Flow Level Transmitters	✓ ✓ ✓ ✓ ✓		✓		
D.6	Adequate Mechanical Protection Provided a) Level Transmitter b) High Level Probe c) Surcharge Imminent Probe d) Delivery Pressure Transmitter e) Flow Level Transmitters	✓ ✓ ✓ ✓ ✓		✓		

Contractor's Signature .....

Date 7/5/13

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

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Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
D.7	Identification tags and data Plate Fitted & Legible a) Level Transmitter b) High Level Probe c) Surcharge Imminent Probe d) Delivery Pressure Transmitter e) Flow Level Transmitters					
D.8	Termination Covers & Seals Securely Fitted a) Level Transmitter b) High Level Probe c) Surcharge Imminent Probe d) Delivery Pressure Transmitter e) Flow Level Transmitters					

Contractor's Signature .....

Date 7/5/13

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

Queensland Urban Utilities Electrical Inspector John .....

Date 7/5/13

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Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
D.9	Level Transmitter and Probes hanging lengths adjusted correctly a) Level Transmitter b) High Level Probe c) Surcharge Imminent Probe d) Delivery Pressure Transmitter e) Flow Level Transmitters					a) RL: _____ 1.20 Temporary b) RL: _____ 1.25 c) RL: <u>H/LENGTH</u> - 2.5
D.10	All redundant equipment shall be removed from the dry well and the wet well.					
D.11	Existing Junction boxes that are not longer to be used shall be removed.					In general, existing J boxes in the dry well shall not be used. Usually the design will indicate direct wiring to equipment in dry wells. The use of J boxes inside dry wells is usually limited to wiring of VSDs to motors and wiring of level transmitters.

Contractor's Signature ..... [Signature]Date 7/5/13

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

Queensland Urban Utilities Electrical Inspector [Signature: John Clayton]Date 7/5/13

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**E. Electrical Installation Safety Tests – Prior to Switchboard Energization**

AS/NZS 3000:2007 requires that prior to place an electrical installation or any part thereof in service following its construction, alteration, addition or repair, it shall be inspected and tested to verify that the installation is safe to energize and that it will operate correctly in accordance with the requirements of AS3000:2007.

This section is aimed to ensure that the switchboard manufacturer has carried out and documented all applicable AS3000:2007 tests considered as mandatory, prior to energising and operating the new electrical installation on site.

AS/NZS 3017 Electrical Installations – Verification Guidelines provides inspection, test methods and test acceptance parameters to verify AS3000:2007 safety requirements, however these methods are provided for guidance and other alternative methods are acceptable, AS3017:2007 may be applied through legislative requirements made in each State and Territory of Australia and in New Zealand.

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
E.1	Records for the verification of the continuity and resistance of the earthing system shall include:  a) Main earthing conductor b) Protective earthing conductors c) Earth bonding conductors.					For acceptance criteria and test methods refer to AS3000:2007 Section 8.3.5 & AS3017:2007 Section 3.1  <i>As Per Contractors Documentation</i>

Contractor's Signature ..... Date *7/5/13*

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

Queensland Urban Utilities Electrical Inspector .....

Date .....

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Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
E.2	Records for the verification of Insulation Resistance shall include:  a) Insulation resistance test of complete installation  b) Insulation resistance test of consumers mains  c) Insulation resistance test of single circuits					For acceptance criteria and test methods refer to AS3000:2007 Section 8.3.6 & AS3017:2007 Section 3.2  <i>As Per Contractors Documentation</i>

Contractor's Signature .....

Date *7/5/13*

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

Queensland Urban Utilities Electrical Inspector

Date *7/5/13*

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Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
E.3	Records for the verification of Polarity Tests records shall include:					For acceptance criteria and test methods refer to:  AS3000:2007 Section 8.3.7 AS3017:2007 Sections 3.3 and 3.5
	a) Consumer mains	✓				
	b) Submains incorporating an earthing conductor			✓		
	c) Submains not incorporating a protective earthing conductor			✓		
	d) Submains incorporating a MEN connection at outbuilding			✓		
	e) Subcircuit polarity connections test (including single pole switches)			✓		
	f) Phase sequence tests	✓				

 Contractor's Signature .....  .....

Date ..... 7/5/13 .....

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

 Queensland Urban Utilities Electrical Inspector .....  .....

Date ..... 7/5/13 .....

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Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
E.4	Records for the verification of Correct Circuit connection tests records shall include: a) Interconnection between conductors of different circuits b) Socket-Outlet Sub-Circuits c) Lighting Points d) Equipment Sub-circuits					For acceptance criteria and test methods refer to:  AS3000:2007 Section 8.3.8 AS3017:2007 Section 3.4
E.5	Records for the verification of earth fault-loop for impedance shall include: a) Circuits not protected by an RCD					For acceptance criteria and test methods refer to:  AS3000:2007 Section 8.3.9 AS3017:2007 Section 3.6 <i>As Per Contractors TEST SLIP</i>

Contractor's Signature ..... *[Signature]*Date ..... *7/5/13*

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

Queensland Urban Utilities Electrical Inspector *John Clayton*Date ..... *7/5/13*

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Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
E.6	Records for the verification of operation of RCDs shall include: a) Circuits protected by an RCD	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		For acceptance criteria and test methods refer to: AS3000:2007 Section 8.3.10 AS3017:2007 Section 3.7

AS Per FAT

Contractor's Signature ..... 

Date ..... 7/5/13

Company Name J & P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

Queensland Urban Utilities Electrical Inspector ..... 

Date ..... 7/5/13

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## CA17 - Site Inspection Tests

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### F. Site Inspection Checks - Energised Switchboard Inspection and Tests (CA-17g)

The following tests shall be made with all switchboard electrical circuits energized in order to check that the switchboard meets all operational requirements.

Item No.	Activity Description	Results			Signed QUU	Results and comments
		Acc	Rej	N/A		
F.1	Check Operation of Automatic Transfer Switches & Circuit Breaker Interlocks			✓		
F.2	Switchboard Lights Operate OK	✓				
F.3	Intruder Detection Operate OK	✓				
F.4	Motor phase rotation checked	✓				
F.5	Thermal Overloads appropriately set	✓				soft starter
F.6	Manual Functions Tested	✓				
F.7	Automatic / Remote Functions Tested	✓				

Contractor's Signature ..... *SHH* .....

Date ..... *7/5/13* .....

Company Name J & P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

Queensland Urban Utilities Electrical Inspector

*John Clayton*

Date ..... *7/5/13* .....

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SQUV SP Reliability Improve – Stage2

**G. Non-Conformances and Unauthorised Modifications**

G.1	
G.2	
G.3	
G.4	
G.5	
G.6	
G.7	
G.8	
G.9	
G.10	

Contractor's Signature .....

Date .....

Company Name J &amp; P Richardson Industries Pty Ltd

Company Electrical Licence No: 756

Queensland Urban Utilities Electrical Inspector .....

Date .....

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**This section is to be completed only at the conclusion of the SAT:**

Final SAT Results	YES	NO	Comments
Minor NCRs Generated			
Major NCRs Generated			
SAT Accepted			

**Notes:**

1. SAT results to be recorded above by Contractor.
2. SAT results to be approved by Queensland Urban Utilities Electrical Inspector.
3. NCRs are to be generated by the Queensland Urban Utilities Electrical Inspector for all NCRs not resolved by the end of the test.

**Contractor's Signature** .....

**Date** .....

**Company Name** J & P Richardson Industries Pty Ltd

**Company Electrical Licence No:** 756

**Queensland Urban Utilities Electrical Inspector** .....

**Date** .....

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Ph: (07) 3271 2911 - Fax: (07) 3271 3623  
E-mail: [jpr@jpr.com.au](mailto:jpr@jpr.com.au) ABN: 23 001 952 325

## LV CIRCUIT TEST SHEET

CUSTOMER: QUU

JOB NO: C63000 DESCRIPTION: MAIL ST BRINGTON

MCC / DISTRIBUTION BOARD NO:

Tested By: G. CERVETTO	Date: 7/5/13	Certificate No: C18199
------------------------	--------------	------------------------

[illegible]



**J & P RICHARDSON INDUSTRIES PTY LTD**  
Electrical Contractors and Engineers

Telephone 07 3271 2911 Website [www.jpr.com.au](http://www.jpr.com.au)  
Wacol - Gold Coast - Ipswich  
Sunshine Coast - Eagle Farm - Toowoomba - Chinchilla



**WORKING IN PARTNERSHIP WITH**



**QUUC1011045-QUU068 FOR SPRI 11A MANUFACTURE,  
SUPPLY & INSTALL 12 SPS S/BOARDS**

**SEWAGE PUMP STATION**

**COMMISSIONING PLAN**

Site ID and Name	SP089 Hall Street
Commissioning Date	7/5/13

In Attendance

Name	Role During Commissioning	Company
Simon Truboff	Electrician	SPR
John Clayton	Commissioning Manager	QUU

QUUC1011045QUU068 FOR SPRI 11A MANUFACTURE, SUPPLY & INSTALL 12 SPS S/BOARDS  
Commissioning Plan Standard Pumping Station

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## 1 INTRODUCTION

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

- Install temporary pumping system (pump controller and generator).
- Disconnect sewage Pump #2 from existing switchboard and connect to temporary pumping system. **PUMP #1 IS NOW RUNNING THE STATION FROM EXISTING SWITCHBOARD**
- Fully commission Pump #2 on the temporary pumping system. **PUMP #2 IS NOW RUNNING THE STATION FROM TEMPORARY PUMPING SYSTEM**
- Disconnect Pump #1, consumer mains, on site generator and all field instrumentation from the existing switchboard.
- Install new switchboard and connect to consumer mains.
- Connect Pump #1 to the new switchboard and test in “emergency pumping” mode (via the “Emergency Start” switch). **PUMP #2 IS STILL RUNNING THE STATION FROM THE TEMPORARY PUMPING SYSTEM AND PUMP #1 CAN BE RUN UNDER “EMERGENCY PUMPING” MODE FROM NEW SWITCHBOARD.**
- Connect all field instrumentation.
- Test Pump #1 on the new switchboard to operate in “Local” and “Remote” modes. Full commissioning done separately **PUMP #1 IS NOW RUNNING THE STATION FROM NEW SWITCHBOARD**
- Connect Pump #2 to the new switchboard and Test on the new switchboard. Full commissioning done separately.
- Complete the Site Acceptance Test (SAT) including pumps, RTU and SCADA testing.

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

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

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

QUUC1011045QUU068 FOR SPRI 11A MANUFACTURE, SUPPLY & INSTALL 12 SPS S/BOARDS  
Commissioning Plan Standard Pumping Station

## 2 PRE-CHANGE OVER WORKS CHECKLIST

The following checklist is to be completed and signed by the electrical J&P Richardson.

### 2.1 SWITCHBOARD FACTORY ACCEPTANCE TEST

J&P Richardson Task	Completed
FAT has been completed as per QUU FAT Document and all defects that were identified have been rectified.	<input checked="" type="checkbox"/>

### 2.2 CONCRETE SLAB EXTENSION

J&P Richardson Task	Result
Confirm the concrete slab extension is complete including all necessary conduits.	OK <input checked="" type="checkbox"/>

### 2.3 SUPPLY AUTHORITY

J&P Richardson Task	Outcome
The relevant supply authority has been organised to install the metering into the New Switchboard. If direct metering supply authority not required. NA <input type="checkbox"/>	Company <u>Energen</u> — Booked for <u>17/5/13</u> @ <u>11:00 AM</u> (time) Ref # _____ _____

### 2.4 NEW RADIO ANTENNA MAST LOCATION

J&P Richardson Task	Result
Check the location of the antenna mast and ensure that the new position will not be directly below electrical transmission lines.  <u>Remote Antenna Not Moved</u>	Location OK <input checked="" type="checkbox"/> Antenna dir. <input checked="" type="checkbox"/> O

QUUC1011045QUU068 FOR SPRI 11A MANUFACTURE, SUPPLY & INSTALL 12 SPS S/BOARDS  
Commissioning Plan Standard Pumping Station


## 2.5 DISCHARGE MAINS PRESSURE TRANSDUCER

J&P Richardson Task	Completed
<p>Install delivery pressure transducer on the discharge rising main. Transducer is calibrated to the specified range (as per spec).</p> <p>0kPA to <u>300</u> kPA</p>	<p>Installed OK <input type="checkbox"/></p> <p>Range <u>0</u> (m) to <u>30</u> (m)</p>

## 2.6 TEMPORARY GENERATOR SIZE

J&P Richardson Task	Completed
Note the kW of each pump.	<p>Pump #1 <u>7.8</u> kW</p> <p>Pump #2 <u>7.8</u> kW</p>
<p>Determine the type of generator required (J&amp;P Richardson Specific)</p> <p>If the submersible pump's kW less than 25kW, A.W.E.S generator set is suitable.</p> <p>If the submersible pump is greater than 25kW, arrange the generator set through for example Coates Hire. Phone 13 1552</p> <p><i>JPR Gen Set</i></p>	<p>AWES <input type="checkbox"/></p> <p>Coates <input type="checkbox"/></p> <p>Genset Size _____ kVA</p> <p>Date Booked / /</p> <p>Delivery Date / /</p> <p>Delivery Time _____</p>

## 2.7 PUMP STATION PRELIMINARY OPERATIONAL CHECKS

BW Task	Checked
<p>These are checks are helpful to ensure the pump station is fully operational and that no delay will be incurred due to any pump station problem out side of the contract. These task are desirable to have completed before the SAT but are not essential. The job can proceed if they are not done.</p> <p>Commissioning Manager to request networks maintenance to inspect and rectify if necessary</p>	
The reflux valves and associated limit switches are working correctly.	OK <input type="checkbox"/> <i>NA</i>
The discharge pressure connection point is available and that the isolation valve is functioning correctly.	OK <input checked="" type="checkbox"/> <i>NOT FITTED</i>


QUUC1011045QUU068 FOR SPRI 11A MANUFACTURE, SUPPLY & INSTALL 12 SPS S/BOARDS  
Commissioning Plan Standard Pumping Station

The dry well exhaust fan is working correctly and quietly.	OK <input type="checkbox"/> N/A
The wet well does not need pumping out.	OK <input checked="" type="checkbox"/>
The flow meter is functioning correctly.	OK <input type="checkbox"/> N/A
The stand by generator can start and has sufficient fuel.	OK <input type="checkbox"/> N/A

Electrical Contactor's Supervisor

Name: ..Simon Trubee.....

Date: .....7/5/13.....

Signature: .....

QUU Commissioning Manager

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

Date: .....7/5/13.....

Signature: .....

### 3 CHANGE OVER WORKS

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

#### 3.1 INSTALL TEMPORARY PUMPING SYSTEM

##### 3.1.1 Register with Control Room

J&P Richardson Task	Outcome
Call the QUU Control Room Operator (CRO) and inform him that you are on site. Record the CRO's Name and Officer Code and record the time of the call. Advise CRO that you are performing a switchboard changeover and that you will initially be taking one pump off line. Give the operator your contact name and number and advise the operator that communications will be lost to the pump station until the job is finished.	Name: <u>Ben</u> CRO: _____ Time: <u>7:00</u>

##### 3.1.2 Existing Switchboard Parameters

J&P Richardson Task	Outcome
Ensure that the station is fully functional (pumps can run)	OK <input checked="" type="checkbox"/>
Record the direction of the installed antenna for later reference.	Antenna dir. <u>✓</u> O
Record the kWhr meter serial numbers.	#- <u>4-304870</u>
Record 3 phase motor currents Pump #1	U <u>9.6V</u> <u>9</u> W. <u>8.8</u>
Pump #2	U. <u>9.7</u> V <u>9.9</u> W. <u>8.9</u>

QUUC1011045QUU068 FOR SPRI 11A MANUFACTURE, SUPPLY & INSTALL 12 SPS S/BOARDS  
Commissioning Plan Standard Pumping Station

### 3.1.3 Prepare and Install Temporary Pump controller and Generator

J&P Richardson Task	Outcome
Position generator in an appropriate location. Locate away from the work site to reduce noise and fumes.	OK <input checked="" type="checkbox"/>
Position fire extinguisher and oil spill bund as per risk analysis.	OK <input checked="" type="checkbox"/>
Connect the temporary pump controller 3 phases to the generator.	OK <input checked="" type="checkbox"/>
Install Multitrode level sensors and set the Start and Stop levels to be equivalent to the current Start and Stop levels of the existing switchboard parameters.	OK <input checked="" type="checkbox"/>
Install the backup audible and visual alarm system (powered by separate battery). Test electrodes back to temporary pump controller to confirm operation.	OK <input checked="" type="checkbox"/>
Ensure that the generator fuel will be sufficient to enable the generator to run loaded for 12 hours. (This may require extra fuel – arrange if required).	OK <input checked="" type="checkbox"/>
Start the generator and measure the 3 phase volts	OK <input checked="" type="checkbox"/>

Electrical Contactor's Supervisor

Name: *Simon Trubee*

Date: *7/5/13*

Signature: *[Signature]*

QUU Commissioning Manager

Name: *John Clayton*

Date: *7/5/13*

Signature: *[Signature]*

QUUC1011045QUU068 FOR SPR111A MANUFACTURE, SUPPLY & INSTALL 12 SPS S/BOARDS  
Commissioning Plan Standard Pumping Station

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

J&P Richardson Task	Outcome
On the existing switchboard, Isolate sewage pump (Pump #2) as per BW Isolation Tag and Lock Out procedure. (Unplug from Decontactor).	OK <input checked="" type="checkbox"/>
Disconnect Pump #2 from the existing switchboard and remove the power cables from the switchboard.	OK <input checked="" type="checkbox"/>
Connect Pump #2 power cables to the temporary pump controller.	OK <input checked="" type="checkbox"/>
Electrically test Pump #2 to temporary pump controller connections.	OK <input checked="" type="checkbox"/>
Switch the existing switchboard to "Local" and confirm Pump #1 is stopped.	OK <input checked="" type="checkbox"/>
Manual Test of Temporary Pumping System: (Confirm Pump Direction) Manually start the submersible pump and closely monitor wet well level to confirm that the level is dropping. When confirmed, stop pump.	OK <input checked="" type="checkbox"/>
Auto Test of Temporary Pumping System: (Confirm Pump Cycle) Allow the temporary pumping system to complete one full start and stop cycle automatically to confirm complete system is functioning correctly. This is a HOLD point. Do not proceed until the temporary pump is confirmed to be controlling the wet well level.	OK <input checked="" type="checkbox"/>  TIME: <u>8:10 AM</u>

Electrical Contactor's Supervisor

Name: Simon Trubee

Date: 7/5/13

Signature: [Signature]

QUU Commissioning Manager

Name: John Clayton

Date: 7/5/13

Signature: [Signature]

**3.3 DISCONNECT AND REMOVE EXISTING SWITCHBOARD****3.3.1 Disconnect Pump#1 and Remove Existing Switchboard**

J&P Richardson Task	Outcome
On the existing switchboard, Isolate sewage pump (Pump #1) as per BW Isolation Tag and Lock Out procedure. (Unplug from Decontactor).	OK <input checked="" type="checkbox"/>
Disconnect Pump #1 from the existing switchboard and remove the power and control cables from the switchboard consider the possible need for a quick changeover from the temporary system, Pump #2 to Pump #1. if required.	OK <input checked="" type="checkbox"/>
Isolate main incomer at the switchboard. Ensure all secondary sources of power (ie on site Generator) are also isolated from the switchboard. Confirm there is no load.	OK <input checked="" type="checkbox"/>
Remove primary 3-phase fuses from power pole. Lock fuses in lockout box as per QUU Isolation and Lock Out procedure.	OK <input checked="" type="checkbox"/>
Disconnect supply authority mains cable from the switchboard.	OK <input checked="" type="checkbox"/>
Disconnect all other control and communication cables from the switchboard then remove the switchboard away from adjacent job site so not to interfere with the work.	OK <input checked="" type="checkbox"/>

Electrical Contactor's Supervisor

Name: Simon TruloffDate: 7/5/13Signature: [Signature]

QUU Commissioning Manager

Name: John ClaytonDate: 7/5/13Signature: [Signature]

QUUC1011045QUU068 FOR SPRI 11A MANUFACTURE, SUPPLY & INSTALL 12 SPS S/BOARDS  
Commissioning Plan Standard Pumping Station

### 3.4 INSTALL NEW SWITCHBOARD

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

J&P Richardson Task	Outcome
Install and connect the required (new or existing) earth cable	New <input checked="" type="checkbox"/> Existing <input type="checkbox"/>
Install and connect the required (new or existing) mains cable	New <input checked="" type="checkbox"/> Existing <input type="checkbox"/>
Record the 3 phases mains cable insulation resistance to earth. <i>&gt; 200 m2</i>	A ___ Megohm B ___ Megohm. C ___ Megohm
Record earth resistance	<i>9.1</i> ohms
Point to point phase continuity	R to L1 OK <input checked="" type="checkbox"/> W to L2 OK <input checked="" type="checkbox"/> B to L3 OK <input checked="" type="checkbox"/> N to Neutral OK <input checked="" type="checkbox"/>

#### 3.4.2 Install Supply Authority Metering

Task	Outcome
Install the direct connected kWhr Meter	OK <input checked="" type="checkbox"/>

#### 3.4.3 Energise New Switchboard

J&P Richardson Task	Outcome
Retrieve mains 3-phase pole fuses from lock out box as per BW Isolation and Lock Out procedure.	OK <input checked="" type="checkbox"/>
Ensure new switchboard main incomer is turned "Off".	OK <input checked="" type="checkbox"/>
Install the 3-phase pole fuses.	OK <input checked="" type="checkbox"/>
Turn on mains switch	OK <input checked="" type="checkbox"/>
Check 3 phase voltages	AB <i>418</i> V BC <i>419</i> V CA <i>419</i> V
Check phase rotation and ensure it is the same as determined earlier.	OK <input checked="" type="checkbox"/>
Check MEN connection.	OK <input checked="" type="checkbox"/>

Electrical Contactor's Supervisor

Name: *Simon Trulecc*

Date: *7/5/13*

Signature: *[Signature]*

QUU Commissioning Manager

Name: *John Clayton*

Date: *7/5/13*

Signature: *[Signature]*

**3.5 CONNECT PUMP #1 TO THE NEW SWITCHBOARD**

J&P Richardson Task	Outcome
At the beginning of this procedure, Pump #2 is operating under the control of the temporary switchboard running from the Generator.	OK <input checked="" type="checkbox"/>
Isolate submersible Pump #1 and Pump #2 at the new switchboard, as per QUU Isolation and Lock Out procedure. (Decontactors)	OK <input checked="" type="checkbox"/>
Via the MERACHAL plug in sockets provided on the switchboard reconnect the power and control cables for Pump #1 (this is the pump that is not connected to the generator set)	OK <input checked="" type="checkbox"/>
Install and connect the hydrostatic level probe to the transmitter.	Range 0 to <u>2</u> m
Confirm that level is indicating on the display.	OK <input checked="" type="checkbox"/>
Before beginning the next step ensure that the well level is between 'Start' and 'Stop' level and Pump #2 is not running. Isolate Pump #2 to prevent it from running during the next test	OK <input checked="" type="checkbox"/>
De-isolate this now connected Pump #1. Check the rotation by starting the pump via the local "Emergency Start" switch and confirming the wet well level drops by at least 1%.	OK <input checked="" type="checkbox"/>
Start Pump # 1 again and Check the 3 phase motor current and compare with original readings.  PUMP #1 Can now be run in emergency and local, under the control of the new switchboard.	A <u>10.2</u> Amps B <u>10.2</u> Amps C <u>10.2</u> Amps
De-isolate Pump #2 so that the station is again under the control of the temporary switchboard.	OK <input checked="" type="checkbox"/>

**3.6**

**3.7 CONNECT FIELD INSTRUMENTATION TO THE NEW SWITCHBOARD****3.7.1 Field Devices**

J&P Richardson Task	Outcome
Connect the delivery pressure probe to the transmitter	OK <input checked="" type="checkbox"/> 0 to <u>30</u> Mtrs
Install and connect the Multitrode LR3 wet well high level relay Probe	OK <input checked="" type="checkbox"/> at <u>1.25</u> Mtrs
Install and connect the Multitrode SIR surcharge imminent level relay Probe	OK <input checked="" type="checkbox"/> at <u>1.2</u> Mtrs
Connect the thermistors for each pump (sites with option I only)	OK <input checked="" type="checkbox"/> N/A <input type="checkbox"/>
Connect the moisture in oil sensor for each pump (sites with option A only)	OK <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Connect the moisture in stator for each pump (sites with option B1 only)	OK <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Connect the motor bearing temperature for each pump (sites with option B2 only)	OK <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Connect the reflux valve micro switch for each pump (sites with option C only)	OK <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Connect the upstream manhole surcharge imminent probe (sites with option D only)	OK <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Connect the Multitrode LR2 sump pump start/ stop probes (sites with option E only)	OK <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Connect the Multitrode LR4 sump pump high/trip probes (sites with option E only)	OK <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Connect the sump pump (sites with option E only)	OK <input type="checkbox"/> N/A <input checked="" type="checkbox"/>

Electrical Contactor's Supervisor

Name: Simon TruloveDate: 7/5/13Signature: [Signature]

QUU Commissioning Manager

Name: John CraggDate: 7/5/13Signature: [Signature]

QUUC1011045QUU068 FOR SPRI 11A MANUFACTURE, SUPPLY & INSTALL 12 SPS S/BOARDS  
Commissioning Plan Standard Pumping Station

### 3.8 CONNECT PUMP #2 TO THE NEW SWITCHBOARD

#### 3.8.1 Connect Pump #2 to New Switchboard

J&P Richardson Task	Outcome
At the beginning of this procedure, Pump #1 is operating under the control of the new switchboard running from the supply authority.	OK <input checked="" type="checkbox"/>
Shut down the generator and disconnect Pump #2 from the temporary switchboard	OK <input checked="" type="checkbox"/>
Ensure Pump #2 circuit breaker at the new switchboard is still isolated and locked out as per BW Isolation and Lock Out procedure.	OK <input checked="" type="checkbox"/>
Via the MERACHAL plug in sockets provided on the switchboard, connect the power and control cables for Pump #2.	OK <input checked="" type="checkbox"/>
De-isolate this now connected submersible pump. Check the rotation by starting the pump via the local "Emergency Start" switch and confirming the wet well level drops by at least 1%.	OK <input checked="" type="checkbox"/>
Start Pump # 2 again and Check the 3 phase motor current and compare with original readings.	A <u>10.9</u> Amps B <u>10.9</u> Amps C <u>10.9</u> Amps
PUMP #2 Can now be run in emergency and local, under the control of the new switchboard.	

### 3.9 COMMISSIONING OF THE PUMP STATION COMMUNICATIONS

#### 3.9.1 Radio Antenna Installation

QUU Programmer Task	Outcome
Install new mast with Antenna, orientate antenna to the position determined in section 3.1.2 connect coaxial cable plugs.	OK <input checked="" type="checkbox"/> Existing Antenna

#### 3.9.2 Telemetry and SCADA Communications Checks

QUU Programmer Task	Outcome
QUU programmer must complete the following procedures From the SSM086 Standard Fixed Speed Sewage Pumping Station (S.A.T.) Section 1: Setup and Pre-Commissioning Checks 1.1 to 1.8	OK <input checked="" type="checkbox"/>

Electrical Contactor's Supervisor  
Name: Simon Trubee  
Date: 7/5/13  
Signature: [Signature]

QUU Commissioning Manager  
Name: John G. Glyn  
Date: 7/5/13  
Signature: [Signature]

QUUC1011045QUU068 FOR SPRI 11A MANUFACTURE, SUPPLY & INSTALL 12 SPS S/BOARDS  
Commissioning Plan Standard Pumping Station

### 3.10 COMMISSIONING OF THE PUMP STATION PUMPING SYSTEM

#### 3.10.1 Commissioning of Pump #1 and Pump#2

QUU Programmer & J&P Richardson Task	Outcome
Before beginning the next step ensure that the well level is between "Start and Stop" level (Station under the control of the new board)	OK <input checked="" type="checkbox"/>
QUU Programmer must complete the following procedures From the SSM086 Standard Fixed Speed Sewage Pumping Station (S.A.T.) <i>Section2: On Site Commissioning Procedure 2.1 to 2.9</i>	OK <input checked="" type="checkbox"/>

#### 3.10.2 Commissioning of the SCADA Monitor and Control System

QUU Programmer & J&P Richardson Task	Outcome
QUU Programmer must complete the following procedures From the SSM086 Standard Fixed Speed Sewage Pumping Station (S.A.T.) <i>Section3: On Site Commissioning Procedure</i>	OK <input checked="" type="checkbox"/>

### 3.11 INSTALL GENERATOR MAINS (FOR SITES WITH PERMANENT GENERATORS - OPTION F)

J&P Richardson Task	Outcome
Record insulation resistance of the 3-phases	A __ Megohm B __ Megohm. C __ Megohm
Record earth resistance	__ ohms
Connect the generator IO cables	OK <input type="checkbox"/>
Point to point phase continuity	R to L1 OK <input type="checkbox"/> W to L2 OK <input type="checkbox"/> B to L3 OK <input type="checkbox"/>

Electrical Contactor's Supervisor

Name: Simon Trubesc

Date: 7/5/13

Signature: [Signature]

QUU Commissioning Manager

Name: John Olyta

Date: 7/5/13

Signature: [Signature]

QUUC1011045QUU068 FOR SPRI 11A MANUFACTURE, SUPPLY & INSTALL 12 SPS S/BOARDS  
Commissioning Plan Standard Pumping Station

### 3.12 SITE ACCEPTANCE TESTING

#### 3.12.1 Site Acceptance Testing (S.A.T) - Remaining Tests

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

#### 3.12.2 SCADA Testing

QUU Programmer & J&P Richardson Task	Outcome
The QUU Programmer must complete the following procedures with the assistance from the Commissioning Engineer and SCADA Commissioning Engineer in the Control Room. From the SSM086 Standard Fixed Speed Sewage Pumping Station (S.A.T.) Section3 : SCADA Commissioning Procedure	OK <input checked="" type="checkbox"/>

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### 3.12.3 Preliminary Work Completion by Electrical J&P Richardsons

J&P Richardson Task	Outcome
Leave the site clean and tidy and hazard free.	OK <input checked="" type="checkbox"/>
Confirm with QUU that the job is complete and their staff can leave.	OK <input checked="" type="checkbox"/>
Confirm with QUU that QUU staff will lock up the site on completion of the switchboard change over work.	OK <input checked="" type="checkbox"/>
Note: If there is a problem with finishing the work due to unforeseen circumstance refer to the Risk Analysis attached.	OK <input checked="" type="checkbox"/>

### 3.12.4 Register Control Room

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

Electrical Contactor's Supervisor

Name: Simon Trubee

Date: 7/5/13

Signature: [Signature]

QUU Commissioning Manager

Name: Clayton

Date: 7/5/13

Signature: [Signature]

## 4 POST CHANGE OVER CHECKLIST

### 4.1 DELIVERABLES FROM RTY PROGRAMMER

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

### 4.2 DELIVERABLES FROM ELECTRICAL J&P RICHARDSON

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

### 4.3 DELIVERABLES FROM COMMISSIONING MANAGER

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

QUUC1011045QUU068 FOR SPRI 11A MANUFACTURE, SUPPLY & INSTALL 12 SPS S/BOARDS  
Commissioning Plan Standard Pumping Station

#### 4.4 SUGGESTIONS FOR IMPROVEMENT

Suggestion	Recommended By

Electrical Contactor's Supervisor

Name: ..... *Simon Trueman* .....

Date: ..... *7/5/13* .....

Signature: ..... *[Signature]* .....

QUU Commissioning Manager

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

Date: ..... *7/5/13* .....

Signature: ..... *[Signature]* .....



Lic No. 756

# J. & P. RICHARDSON INDUSTRIES PTY. LTD.

A.B.N. 23 001 952 325

114 CAMPBELL AVENUE, WACOL, BRISBANE, QLD. 4076  
 POSTAL ADDRESS: P.O. BOX 124, SUMNER PARK, QLD. 4074

Phone: (07) 3271 2911 - All Hours Fax: (07) 3271 3623

**ELECTRICAL CONTRACTORS & ENGINEERS**  
**INDUSTRIAL - COMMERCIAL - MINING**

Email: jpr@jpr.com.au

Web: www.jpr.com.au

- ELECTRICAL INSTALLATION AND MAINTENANCE
- 24 HOUR BREAKDOWN SERVICE
- SWITCHBOARD DESIGN AND MANUFACTURE
- DATA & COMMUNICATIONS
- HIGH VOLTAGE INSTALLATIONS
- ELECTRICAL ENGINEERING, PLC & PROCESS SOFTWARE DESIGN
- OVERHEAD RETICULATION & UNDERGROUND RETICULATION
- ROADWAY LIGHTING & TRAFFIC SIGNALLING
- MUNICIPAL PUMPING INSTALLATIONS
- SHEETMETAL FABRICATION

## BRANCHES

EAGLE FARM  
 PH: (07) 3868 3535

IPSWICH  
 PH: (07) 3281 1399

TOOWOOMBA  
 PH: (07) 4659 9900

GOLD COAST  
 PH: (07) 5591 6340

SUNSHINE COAST  
 PH: (07) 5476 5133

CHINCHILLA  
 PH: (07) 4662 7452

YATALA  
 PH: (07) 3386 1355



Q-Pulse Id TMS352

FORM F 1025 - October 12

rb0038/lb

Job Ref: C63000

Email To: Andrew.Hanlon@urbanutilities.com.au

3 May 2013

Queensland Urban Utilities

Attention: Mr. Andrew Hanlon

Dear Sir,

### Certificate of Compliance SP089 Hall Street

Please be advised the above mentioned switchboard and its containing equipment has been manufactured as per our offer and supplied drawings 57-0293set\_A.

All applicable work was carried out to AS3000:2007 and has been tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the electrical safety regulation 2002.

Should you require any further information or clarification please do not hesitate to contact the undersigned.

Yours faithfully,

**J & P Richardson Industries Pty Ltd**

**Roland Barrett**  
**Technical Officer**



Lic No. 756

# J. & P. RICHARDSON INDUSTRIES PTY. LTD.

A.B.N. 23 001 952 325

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GOLD COAST  
 PH: (07) 5591 6340

SUNSHINE COAST  
 PH: (07) 5476 5133

CHINCHILLA  
 PH: (07) 4662 7452

Letter Ref: ca1215/bn

Job No. C63000

08 May 2013

Queensland Urban Utilities

Attention: Mr. Andrew Hanlon

Dear Sir,

**C1011-045 QUU068**  
**Sewage Pump Station – Reliability Improvement Project**  
**SPRI-11a**

Please be advised that the switchboard replacement at SP089 Hall Street has been completed as per the contract requirements.

All applicable work was carried out to AS3000:2007 and has been tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the electrical safety regulation 2002.

Thank you for your order, we trust that yourself and your team has been impressed by our commitment to QUU and we look forward to assisting you in the future.

Should you require any further information or clarification please do not hesitate in contacting the undersigned.

Yours Faithfully  
**J & P Richardson Industries Pty Ltd**

Chris Andersen  
**Electrical Installation Assistant Manager**



J &amp; P Richardson Electrical Contractors Licence Number: 756



QUEENSLAND  
**UrbanUtilities**

# SP089 HALL STREET SEWAGE PUMPING STATION SITE COVER SHEET

FUNCTION TEST	
J & P RICHARDSON IND.	
NAME: <u>ANDREW VARY</u>	LICENCE: 756
DATE: <u>9-4-13</u>	
SIGNATURE: <u>[Signature]</u>	

ELECTRICAL DRAWINGS INDEX					
DWG N°.	TITLE	SHEET	REVISIONS		
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486/5/7-0293-002	PUMP 01 SCHEMATIC DIAGRAM	02	P1	0	A
486/5/7-0293-003	PUMP 02 SCHEMATIC DIAGRAM	03	P1	0	A
486/5/7-0293-004	RESERVED FOR PUMP 03 SCHEMATIC DIAGRAM	04			
486/5/7-0293-005	RESERVED (DRY WELL SUMP & EM STORAGE DEWATERING PUMP)	05			
486/5/7-0293-006	RESERVED (GENERATOR CONTROL)	06			
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486/5/7-0293-009	RTU POWER DISTRIBUTION SCHEMATIC DIAGRAM	09	P1	0	A
486/5/7-0293-010	RTU DIGITAL INPUTS TERMINATION DIAGRAM - SHEET 1 OF 3	10	P1	0	A
486/5/7-0293-011	RTU DIGITAL INPUTS TERMINATION DIAGRAM - SHEET 2 OF 3	11	P1	0	A
486/5/7-0293-012	RTU DIGITAL INPUTS TERMINATION DIAGRAM - SHEET 3 OF 3	12	P1	0	A
486/5/7-0293-013	RTU DIGITAL OUTPUTS TERMINATION DIAGRAM - SHEET 1 OF 2	13	P1	0	A
486/5/7-0293-014	RTU DIGITAL OUTPUTS TERMINATION DIAGRAM - SHEET 2 OF 2	14	P1	0	A
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486/5/7-0293-023	SWITCHBOARD CONSTRUCTION DETAILS - SHEET 3 of 3	23	P1	0	A
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486/5/7-0293-031	SWITCHBOARD SLAB AND CONDUIT DETAILS - SHEET 2 of 3	31	P1	0	A
486/5/7-0293-032	SWITCHBOARD AND ELECTRICAL CONDUIT LAYOUT - SHEET 3 of 3	32	P1	0	A

STANDARD VARIABLES	
DESCRIPTION	VALUES
CT METERING ISOLATOR	NOT APPLICABLE
NORMAL SUPPLY MAIN SWITCH	125A S250PE/125
GENERATOR SUPPLY MAIN SWITCH	125A S250PE/125
PUMP1 CIRCUIT BREAKER	32A S125GJ/32
PUMP2 CIRCUIT BREAKER	32A S125GJ/32
DRY WELL SUMP PUMP CIRCUIT BREAKER	NOT APPLICABLE
EM STORAGE DEWATERING PUMP CCT BREAKER	NOT APPLICABLE
PUMP SOFT STARTER SIZE	MCD5-0021B + 17A
PUMP RATING	7.8kW 15A
PUMP LINE CONTACTOR	CA7-30
DRY WELL SUMP PUMP RATING	NOT APPLICABLE
DRY WELL SUMP PUMP CONTACTOR & TOL	NOT APPLICABLE
PUMP SOCKET OUTLET + INCLINE SLEEVE	DS1 3114013972 + 51BA058
PUMP INLET PLUG + HANDLE	DS1 3118013972 + 311A013
WET WELL LEVEL TRANSMITTER	WLS2XXA4AMD1DD1X 2m
EMERGENCY STORAGE WELL LEVEL TRANSMITTER	NOT APPLICABLE
EM STORAGE DEWATERING PUMP RATING	NOT APPLICABLE
EM STORAGE DEWATERING PUMP CONTR & TOL	NOT APPLICABLE
FLOWMETER RANGE	NOT APPLICABLE
WET WELL ULTRASONIC LEVEL SENSOR	NOT APPLICABLE
DELIVERY PRESSURE TRANSMITTER	BR52XXCA1FHPMAS L=25 30m
RADIO	DR900-07A02-D0
EMERGENCY PUMPING TIME	16 Bsec
No of SINGLE POINT PROBES	2
INCOMING MAINS SUPPLY CABLE	16mm <sup>2</sup>
MAIN EARTHING CABLE	6mm <sup>2</sup>
INCOMING GENERATOR SUPPLY CABLE	NOT APPLICABLE
SOFT STARTER 3 PHASE SUPPLY	6mm <sup>2</sup>

STANDARD DESIGN OPTIONS		
OPTION	DESCRIPTION	FITTED
A	INDIVIDUAL PUMP MOISTURE IN OIL (MIO) SENSOR AND FAULT RELAY	<input checked="" type="checkbox"/> NO
B	INDIVIDUAL PUMP MOTOR AUX PROTECTION SENSORS AND FAULT RELAYS	<input checked="" type="checkbox"/> NO
C	INDIVIDUAL PUMP REFLUX VALVE POSITION SWITCH	<input checked="" type="checkbox"/> NO
D	STATION MANHOLE SURCHARGE IMMINENT	<input checked="" type="checkbox"/> NO
E	STATION DRY WELL SUMP PUMP AND LEVEL INDICATION SENSORS AND RELAYS	<input checked="" type="checkbox"/> NO
F	PERMANENT GENERATOR INSTALLED	<input checked="" type="checkbox"/> NO
G	STATION EMERGENCY STORAGE LEVEL SENSOR & DEWATERING PUMP	<input checked="" type="checkbox"/> NO
H	STATION DELIVERY FLOWMETER	<input checked="" type="checkbox"/> NO
I	BACKUP COMMUNICATION - GSM	YES <input checked="" type="checkbox"/>
J	PUMP CONNECTION (Via De-contactors)	YES <input checked="" type="checkbox"/>
K	CATHODIC PROTECTION	<input checked="" type="checkbox"/> NO
L	MOTOR THERMISTORS (Via De-contactors)	YES <input checked="" type="checkbox"/>
M	ODOUR CONTROL	<input checked="" type="checkbox"/> NO
N	DIRECT CONNECTED METERING	YES <input checked="" type="checkbox"/>
O	PUMPS ELECTRICAL INTERLOCK	<input checked="" type="checkbox"/> NO
P	WET WELL WASHER	<input checked="" type="checkbox"/> NO
Q	AUX PIT SUMP PUMP AND LEVEL PROBE	<input checked="" type="checkbox"/> NO
R	TELEMETRY RADIO	YES <input checked="" type="checkbox"/>
S	WET WELL SECONDARY LEVEL SENSOR	<input checked="" type="checkbox"/> NO
T	WET WELL PRIMARY LEVEL SENSOR (Direct Connected)	YES <input checked="" type="checkbox"/>
U	DELIVERY PRESSURE TRANSMITTER (Direct Connected)	YES <input checked="" type="checkbox"/>
V	CHEMICAL DOSING	<input checked="" type="checkbox"/> NO
W	PUMP START METHOD - SOFT STARTER	YES <input checked="" type="checkbox"/>
X	3rd PUMP INSTALLED	<input checked="" type="checkbox"/> NO
Y	POWER METER	<input checked="" type="checkbox"/> NO

TEST  
"ISSUED FOR CONSTRUCTION" S97  
SIGN R.B. M63000 25/3/13

Sheet 00

FOR CONSTRUCTION

01.13	ISSUED FOR CONSTRUCTION	P.H.	A.W.	DRAFTED	P.HAGUE	Original Signed by P.HAGUE	6-11-12
11.12	ISSUED FOR TENDER	P.H.	A.W.	DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No. DATE
10.12	ISSUED FOR REVIEW	P.H.	A.W.	CAD FILE	57-0293set_A	Original signed by A.WITTHOFT	8895 6-11-12
No	DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No.	DESIGN CHECK	R.P.E.Q. No. DATE



SITE  
SP089  
HALL STREET  
SEWAGE PUMP STATION

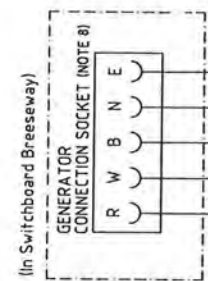
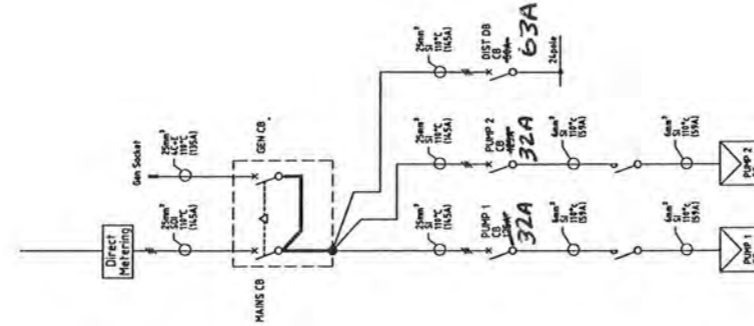
TITLE  
SITE COVER SHEET

SHEET No. 0  
Queensland Urban Utilities DRAWING No.  
486/5/7-0293-000  
AMEND.  
A

## NOTES

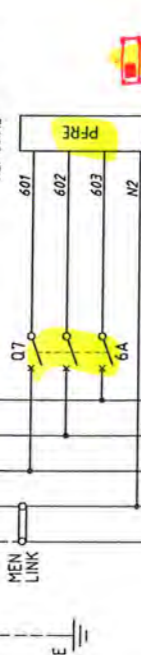
1. INCOMING MAIN, GENSET, PUMP & DB CIRCUIT BREAKERS SHALL BE LINE SIDE SHROUDED.
2. M.E.N. LINK TO BE PROVIDED AS PER AS-3000.2007 SECTION 7.
3. SURGE PROTECTION DEVICE TO BE AS CLOSE TO THE INCOMER AS POSSIBLE. CONDUCTORS SHALL BE A MINIMUM 6mm<sup>2</sup> AT A MAXIMUM LENGTH OF 600mm TO BE USED OVER THE SHORTEST AND MOST DIRECT PATH WITH NO LOOPS CONNECTED TO NEUTRAL.
4. ALL CIRCUIT BREAKERS TO BE PADLOCKABLE. LOCKING IS TO BE INDEPENDENT OF ESCUTCHION.
5. CIRCUIT BREAKER RATINGS TO SUIT FAULT LEVEL & LOAD TO ENSURE TYPE 2 CO-ORDINATION WITH CONTACTORS AND OVERLOADS TO AS3947-4-1.
6. ALL LIGHT AND POWER CIRCUITS SHALL BE FITTED WITH RCD PROTECTION, SET AT 30mA.
7. ALL WIRES & CABLE CORES ARE FERRULED WITH GRAFOPLAST S2000 COMPATIBLE LABELLING.
8. CABLE TO GENERATOR CONNECTION SOCKET AND AUXILIARY SUPPLY SOCKET TO BE DOUBLE INSULATED. CABLEING FROM APPLIANCE INLET & AUX OUTLET INTO SWITCHBOARD TO BE IN PVC SHEATHED FLEXIBLE METAL CONDUIT SUCH AS 'ADAPTAFLEX'. TERMINATE USING PROPRIETARY GLANDS.

## POWER CABLING ARRANGEMENT



SWITCHBOARD RATING 425A 100A  
MAX DEMAND 50A

ENERGEX MAINS  
POWER FAILURE RELAY  
REF 08A2



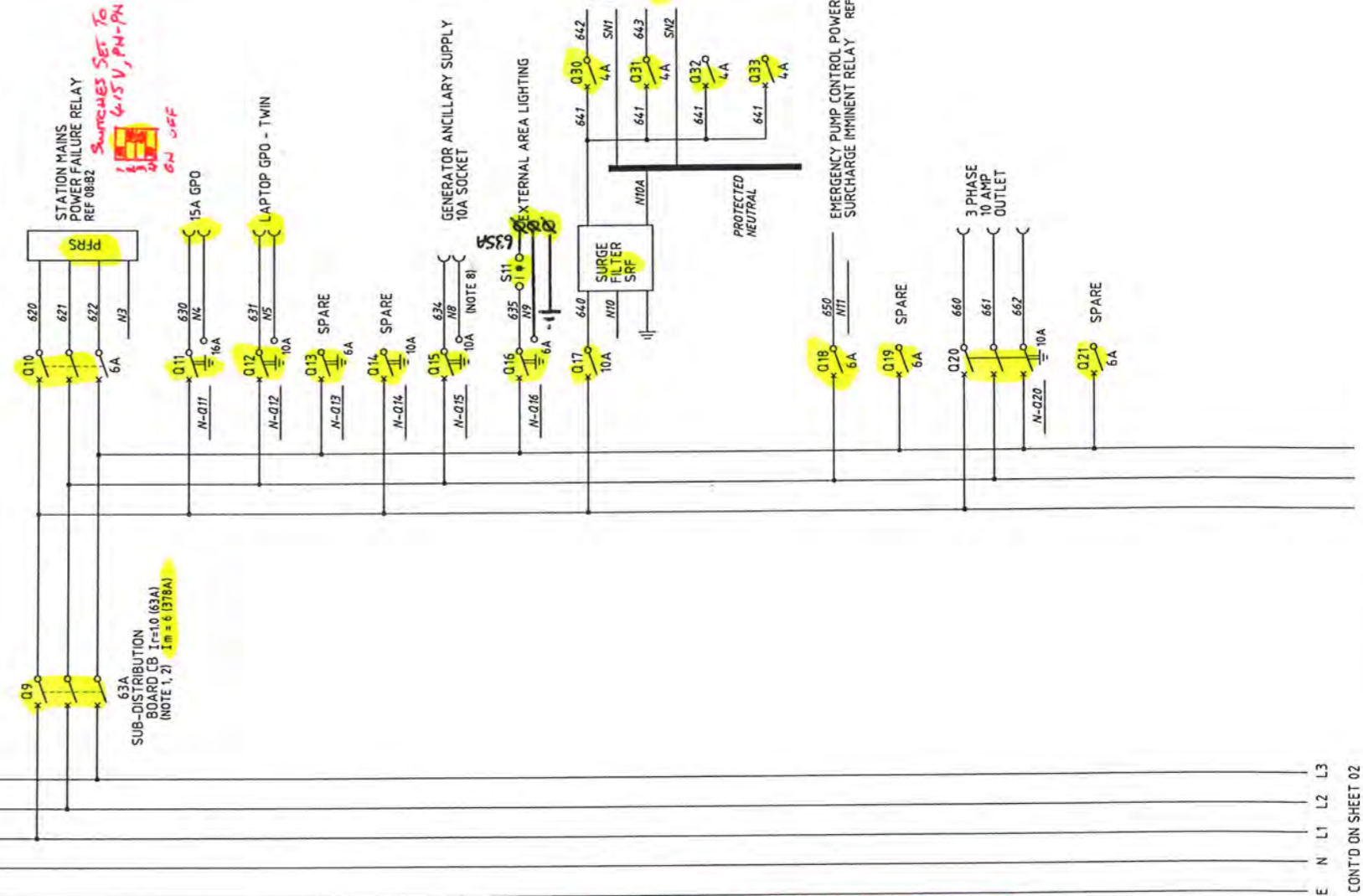
NORMAL SUPPLY  
MAIN SWITCH  
125A (NOTE 1, 2)  
I<sub>n</sub>=0.63 (78A)  
Char=1

NOTE

MANUAL TRANSFER SWITCH

GEN SUPPLY  
MAIN SWITCH  
125A (NOTE 1, 2)  
I<sub>n</sub>=0.63 (78A)  
Char=1

NOTE



## FUNCTION TEST

J & P RICHARDSON IND.

NAME: ANDREW VARY LICENCE: 756

DATE: 9-4-13

SIGNATURE: [Signature]

Sheet 01

FOR CONSTRUCTION

A 01.13	ISSUED FOR CONSTRUCTION	P.H. A.W.	DRAFTED	P.HAGUE	Original Signed by P.HAGUE	6-11-12	SITE	SP089	TITLE	POWER DISTRIBUTION SCHEMATIC DIAGRAM	SHEET No. 1
O 11.12	ISSUED FOR TENDER	P.H. A.W.	DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No. DATE	PRINCIPAL DESIGN MANAGER	HALL STREET SEWAGE PUMP STATION	Queensland Urban Utilities DRAWING No.	AMEND.	486/57-0293-001 A
P1 10.12	ISSUED FOR REVIEW	P.H. A.W.	CAD FILE	57-0293set_A	Original signed by A.WITTHOFT	8895 6-11-12	CLIENT DELEGATE				
No DATE	AMENDMENT	DRN. APD.	B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No. DATE					



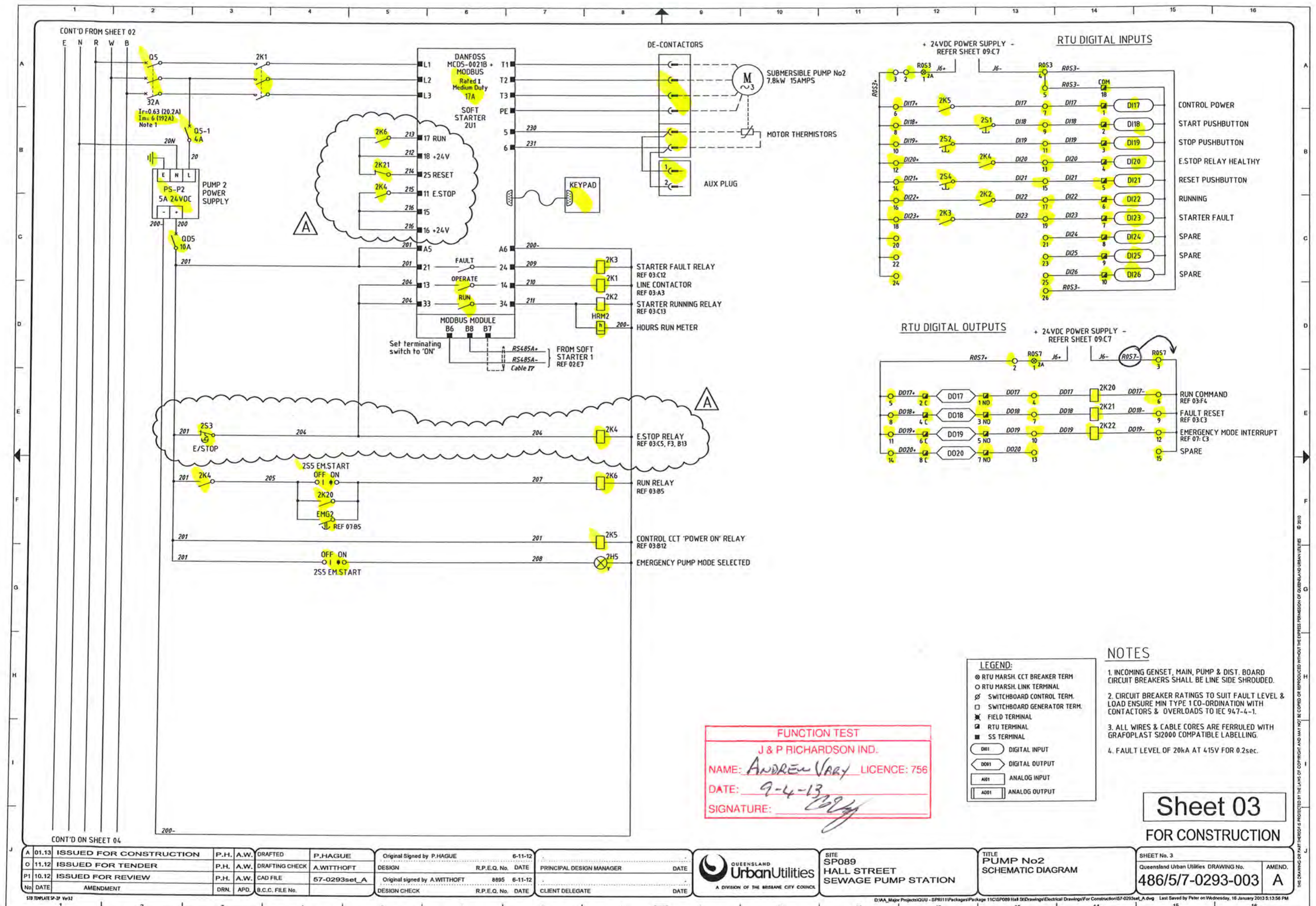
SITE  
SP089  
HALL STREET  
SEWAGE PUMP STATION

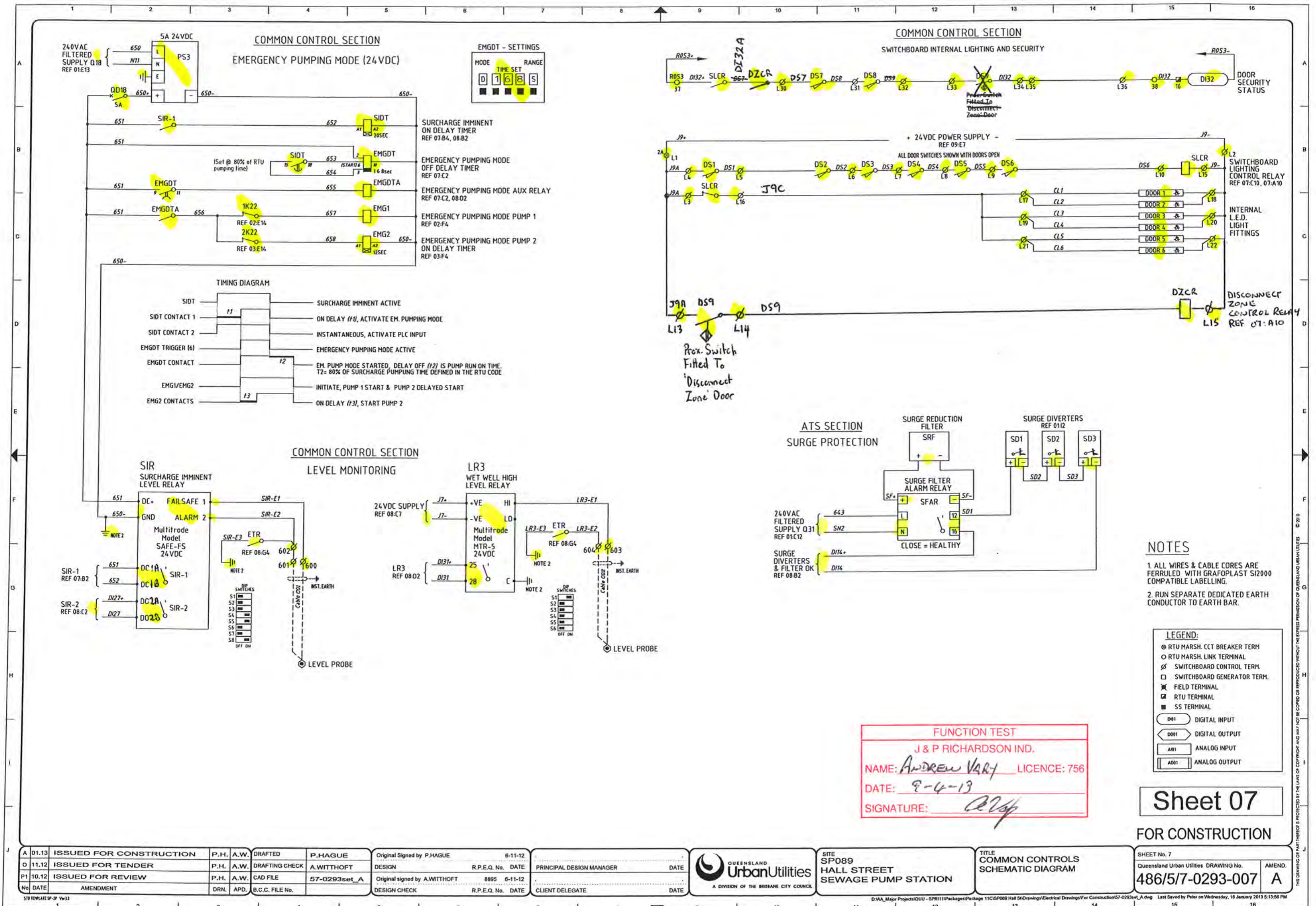
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POWER DISTRIBUTION  
SCHEMATIC DIAGRAM

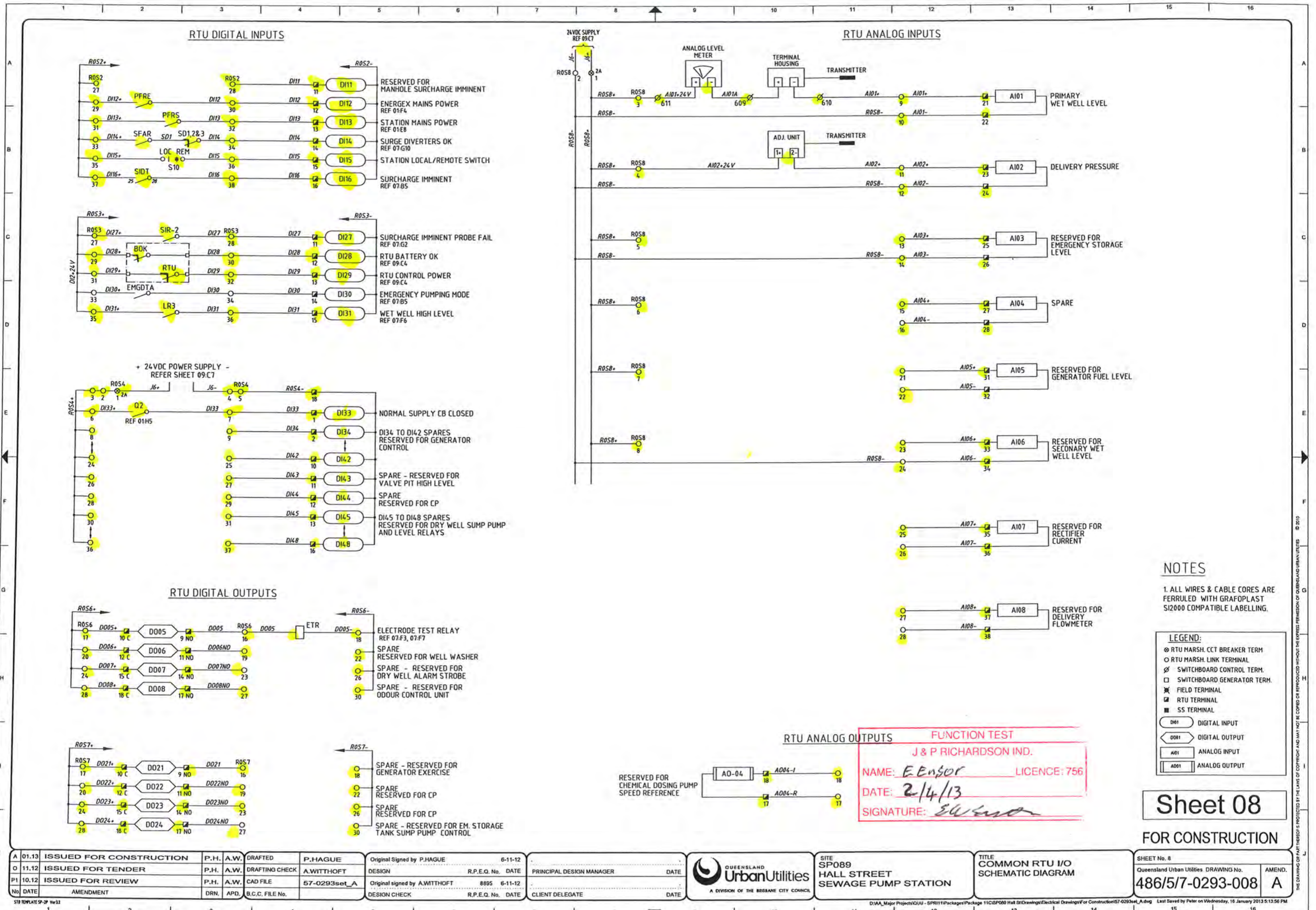
SHEET No. 1  
Queensland Urban Utilities DRAWING No.  
486/57-0293-001  
AMEND. A

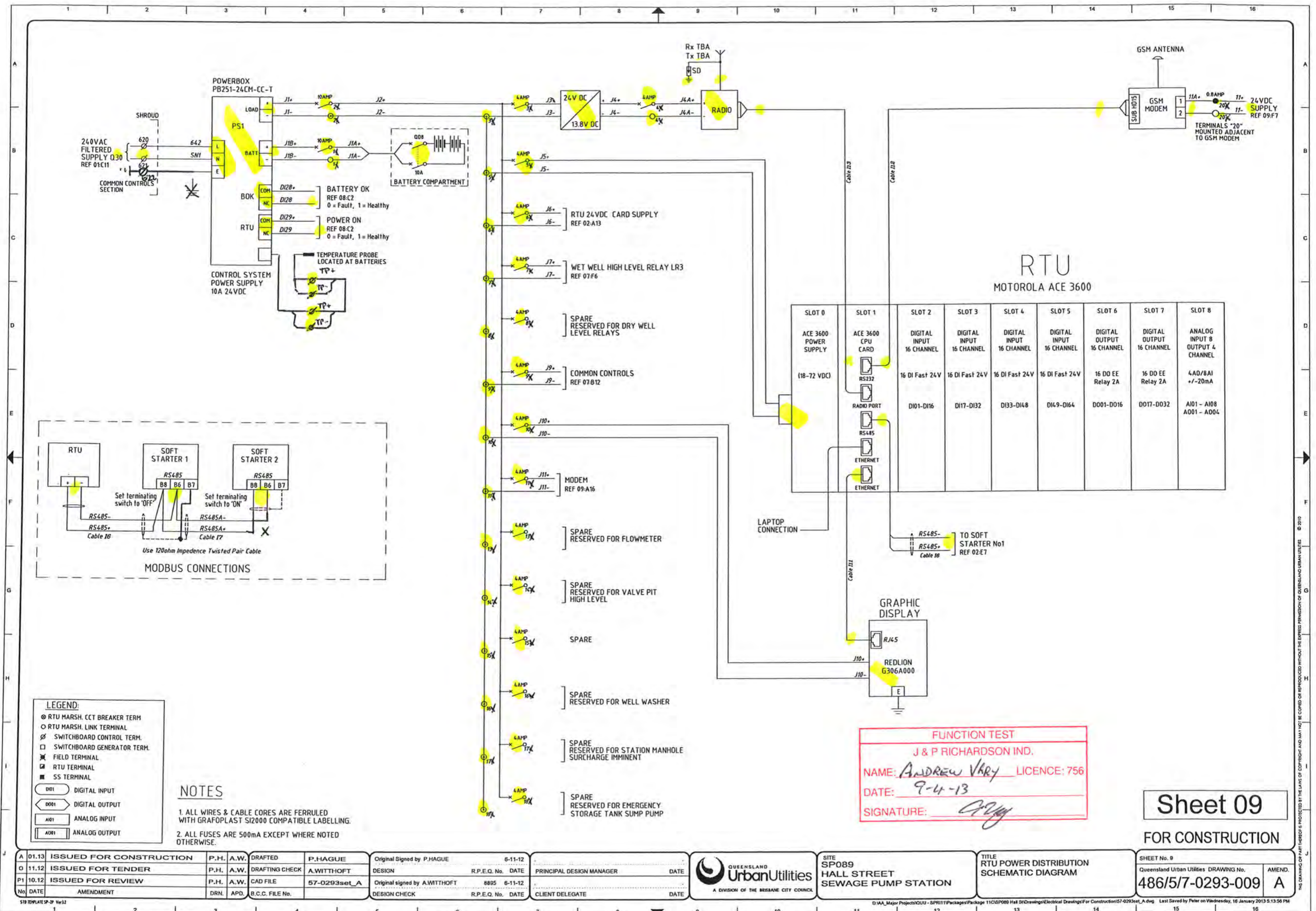
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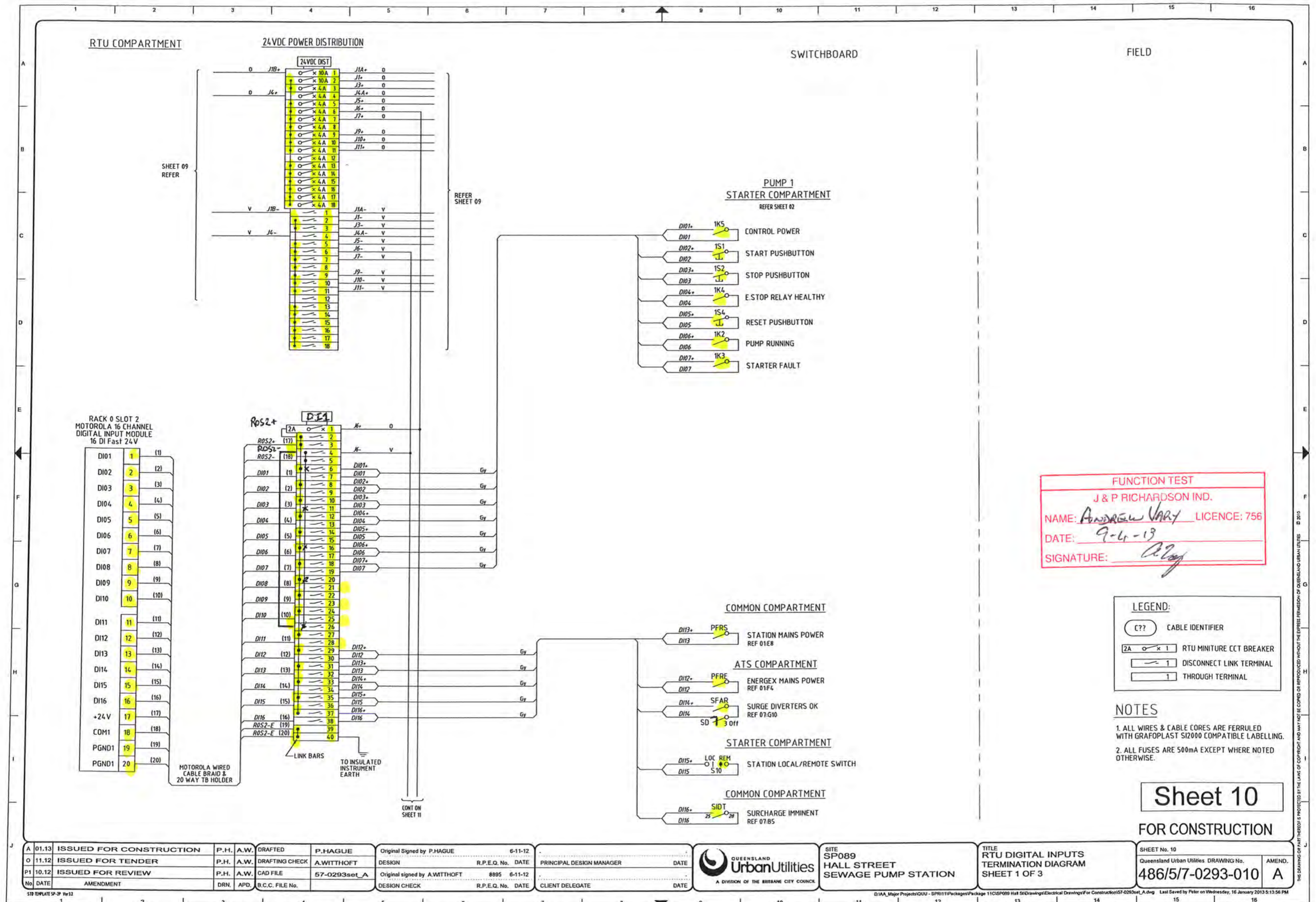


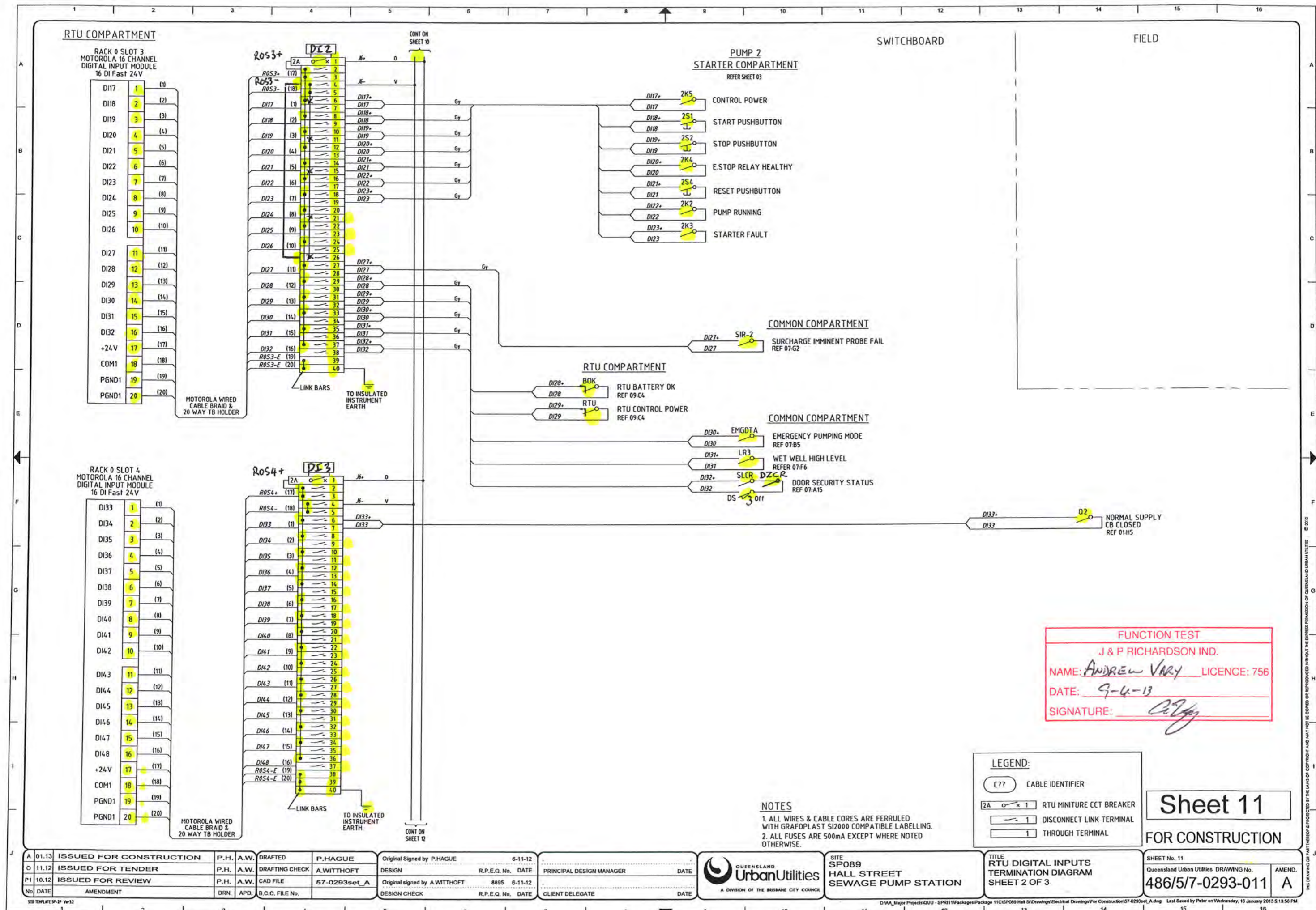


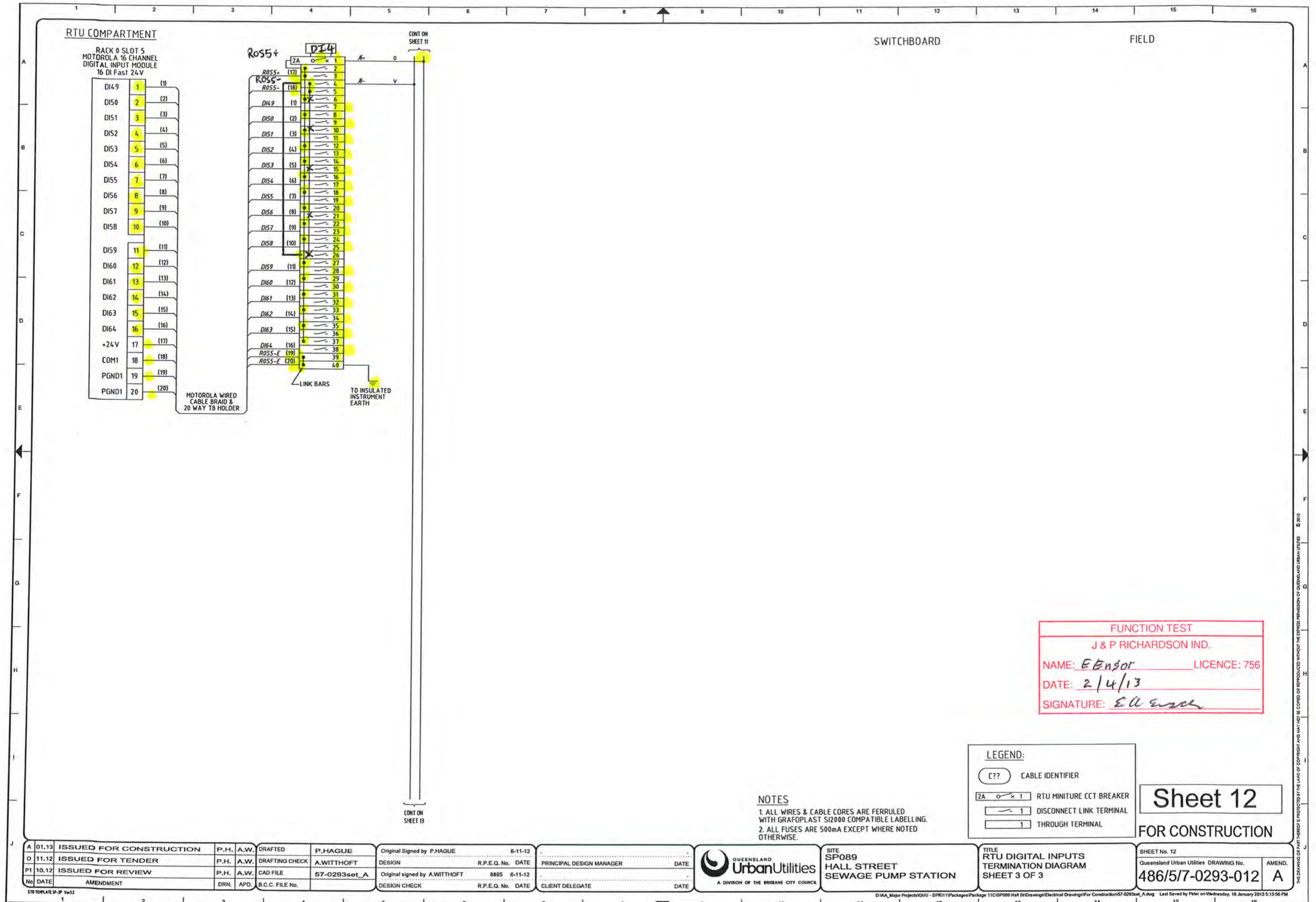


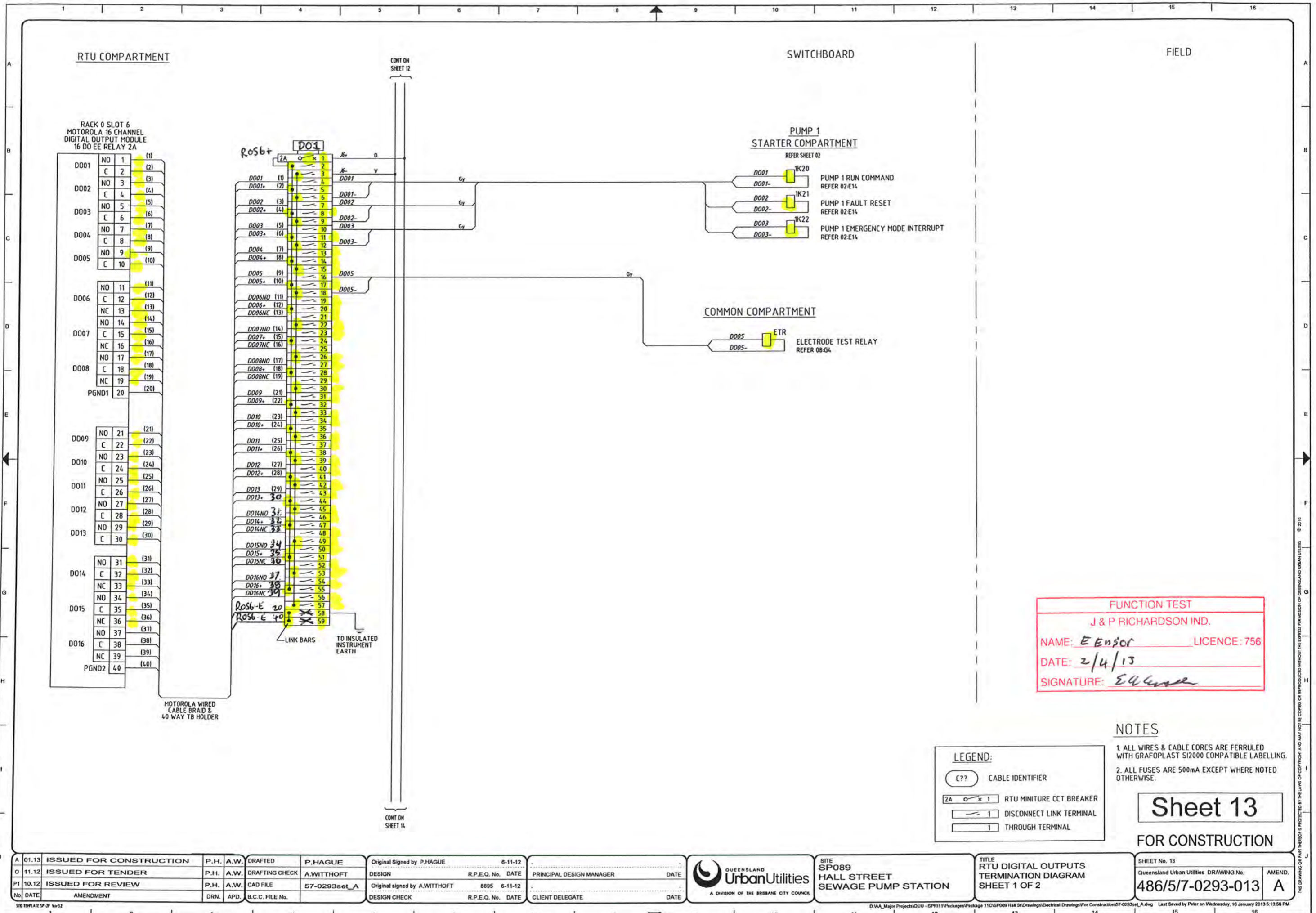


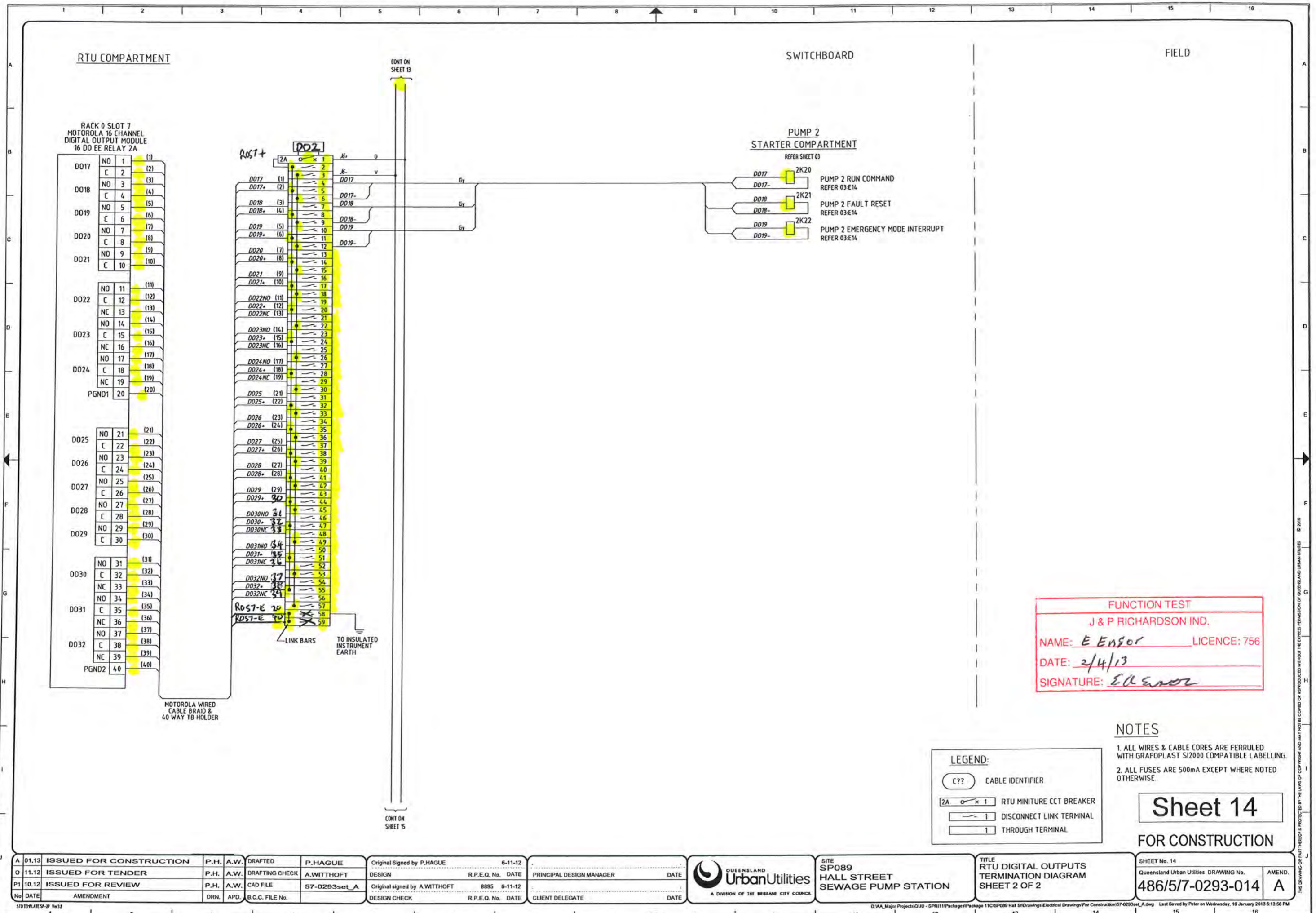


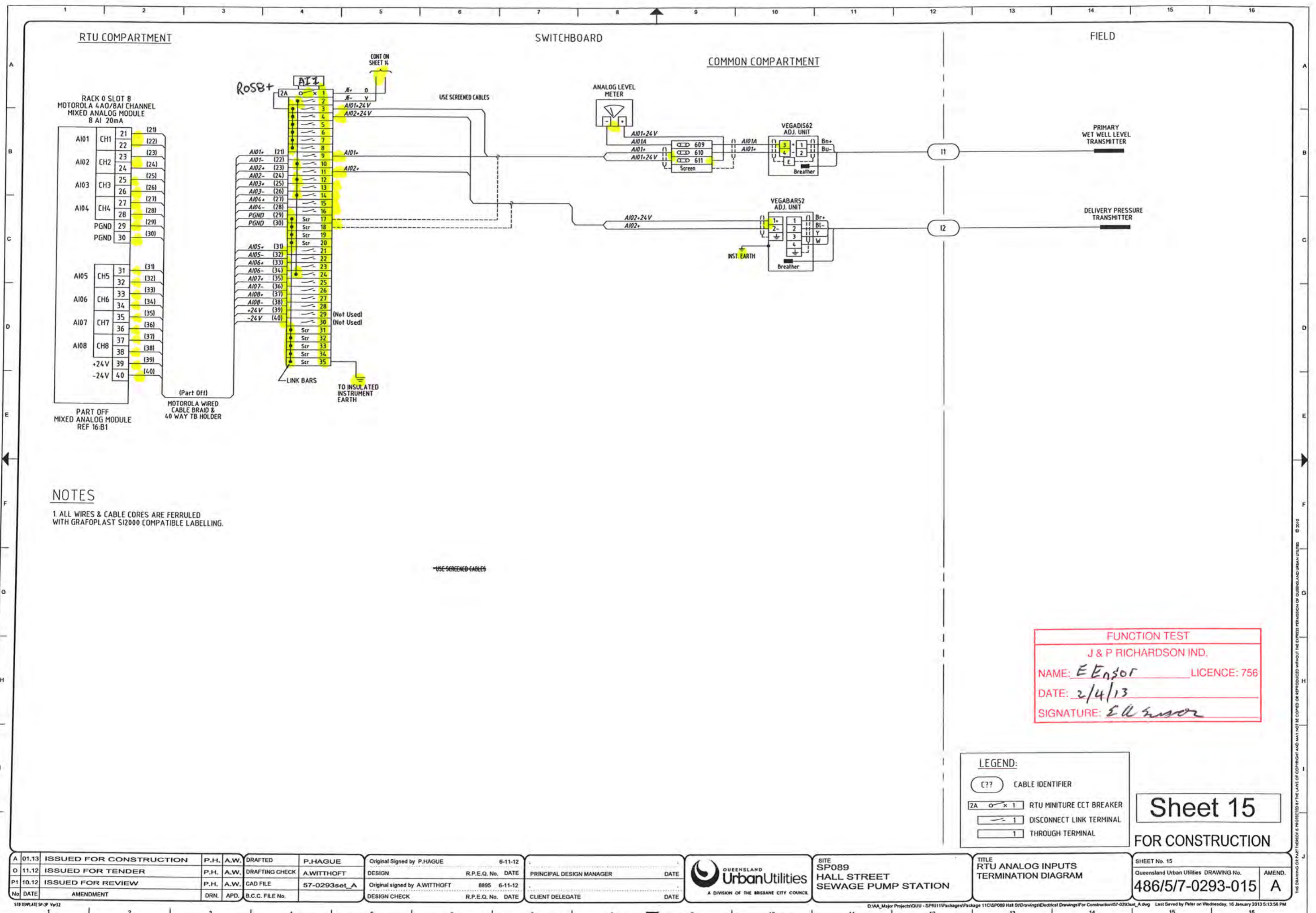


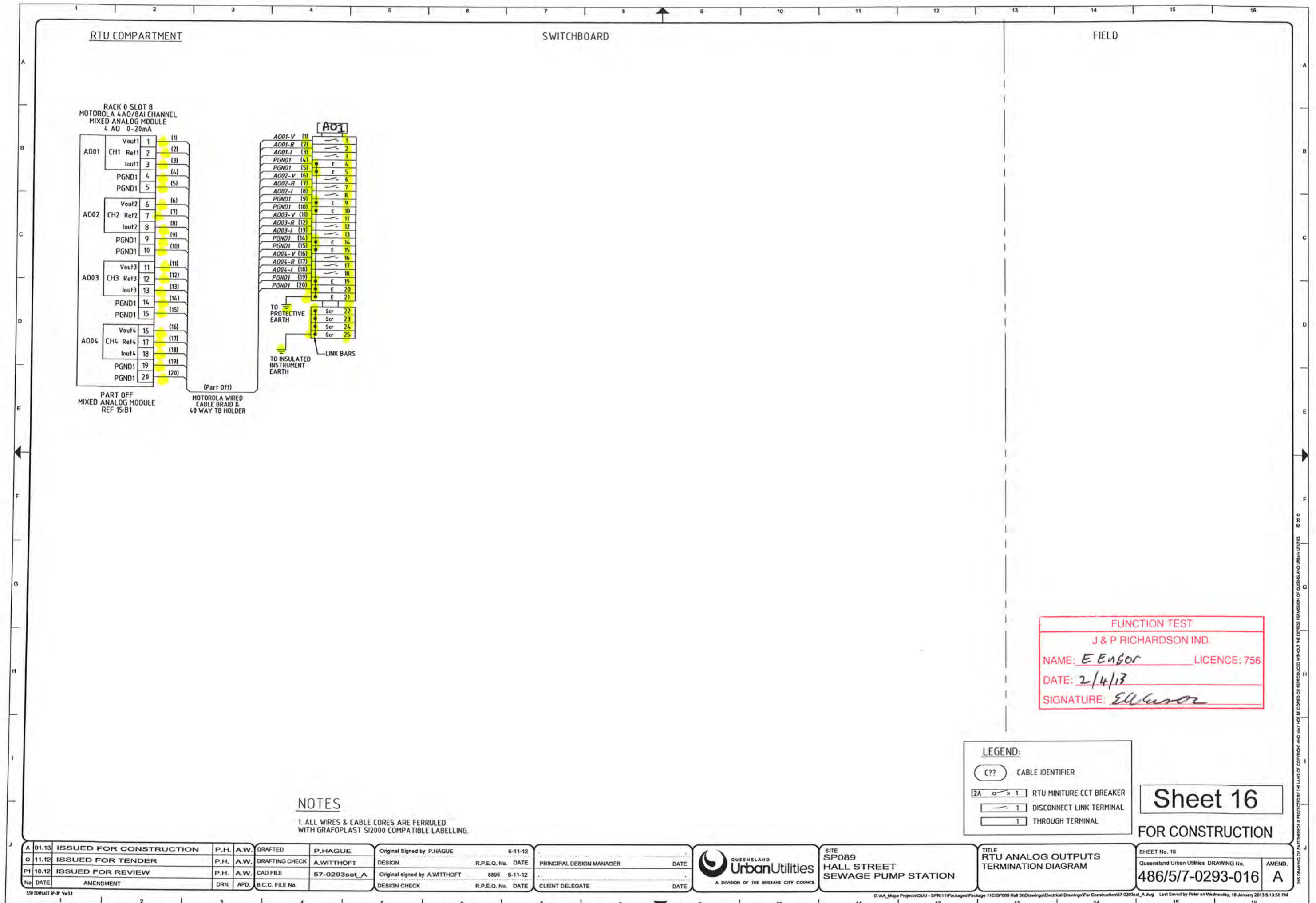


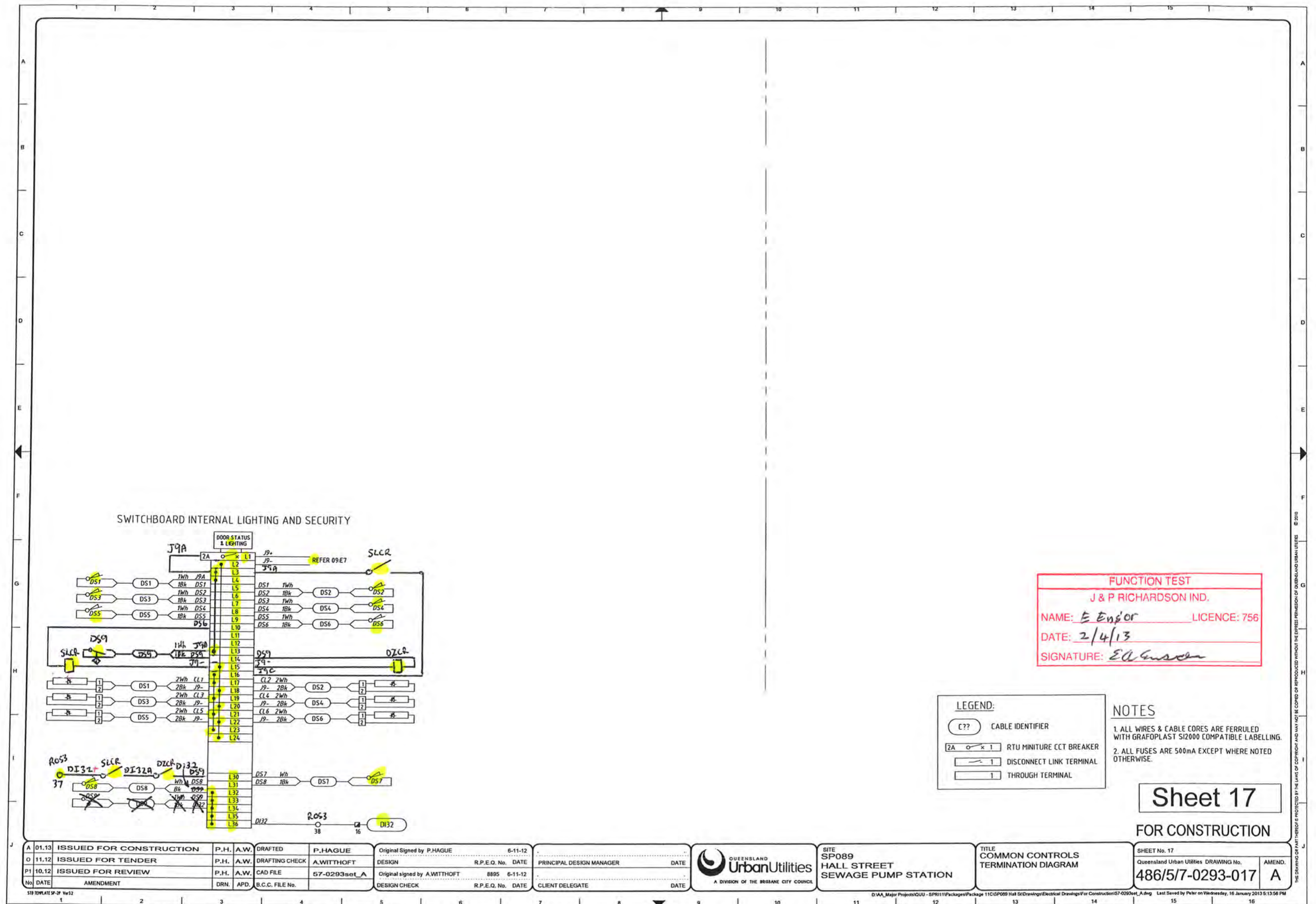













ITEM	QTY	DESCRIPTION	MANUFACTURER	CATALOGUE No	OPT	REMARKS	ITEM	QTY	DESCRIPTION	MANUFACTURER	CATALOGUE No	OPT	REMARKS	ITEM	QTY	DESCRIPTION	MANUFACTURER	CATALOGUE No	OPT	REMARKS
1							65	2	SOFT STARTER RUNNING RELAY - K2	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	129						G
2	1	MANUAL TRANSFER SWITCH	TERASAKI	MTSS2PE12533	F	Set Ir=0.63 (78A) Char=1	66	2	STARTER FAULT RELAY - K3	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	130						K
3		- TO SUIT MAIN SWITCHES Q2 & Q3 S250PE/125	TERASAKI	Q2 - C/W 3 N/O AUX CONTACTS	F		67	2	PUMP EM STOP RELAY - K4	IDEC	RH4B-ULD-DC24V	-	+ SH4B-05	131						S
4	1	04 PUMP1 CIRCUIT BREAKER + T2HS Handle	TERASAKI	S125GJ/32	-	Set Ir=0.63 (20.2A) Im=6 (192A)	68	2	PUMP CONTROL CCT POWER ON RELAY - K5	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	132						H
5	1	05 PUMP2 CIRCUIT BREAKER + T2HS Handle	TERASAKI	S125GJ/32	-	Set Ir=0.63 (20.2A) Im=6 (192A)	69	2	PUMP RUN RELAY - K6	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	133	1	WET WELL LEVEL PROBE	VEGA - VEGAWELLS2	WL52XXAL4MD100IX	-	SET RANGE TO = 2m
6							70							134	1	WET WELL LEVEL ADJUSTMENT UNIT	VEGA - VEGADIS62	DIS62XXHMAXX	-	
7	1	07 ENERGEX PHASE FAILURE CIRCUIT BREAKER	TERASAKI	DTCB15306C	-		71							135						G
8							72							136						-
9	1	09 SUB-DISTRIBUTION BOARD CIRCUIT BREAKER	TERASAKI	S125HJ/63	-	Set Ir=10 (63A) Im=6 (378A)	73	2	PUMP RUN COMMAND RELAY - K20	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	137	1	DELIVERY PRESSURE TRANSMITTER	VEGA - VEGABARS2	BR52XXCA1FHPMAS L=25	U	RANGE = 30m
10	1	010 STATION MAINS PHASE FAILURE CIRCUIT BREAKER	TERASAKI	DTCB6306C	-		74	2	PUMP FAULT RESET RELAY - K21	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	138	1	TRICLOVE FITTING FOR VEGABARS2	VEGA	ADAPTOR 5	U	
11	1	011 15A GPO CIRCUIT BREAKER	TERASAKI	DSRCBH-16-30A	-		75	2	PUMP EMERGENCY MODE INTERRUPT RELAY - K22	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	139	1	CONTROL SYSTEM POWER SUPPLY 24VDC	POWERBOX	PB251A-24CH-CC-T-S	-	
12	1	012 RTU LAPTOP GPO CIRCUIT BREAKER	TERASAKI	DSRCBH-16-30A	-		76							140	1	RADIO 24V/13.8VDC CONVERTER	POWERBOX	PBR-2412J-CC	R	
13	1	013 SPARE	TERASAKI	DSRCBH-6-30A	E		77	2	PUMP START PUSHBUTTON - S1	SPRECHER & SCHUH	D7P-F3-PX10	-		141						I
14	1	014 SPARE	TERASAKI	DSRCBH-10-30A	E		78	2	PUMP STOP PUSHBUTTON - S2	SPRECHER & SCHUH	D7P-F4-PX10	-		142	2	BATTERIES - INCLUDING SPILL TRAYS	YUASA	UXH50-12	-	
15	1	015 GENERATOR AUXILIARY SUPPLY CIRCUIT BREAKER	TERASAKI	DSRCBH-10-30A	-		79	2	PUMP EM/STOP PUSHBUTTON - S3	SPRECHER & SCHUH	D7P-MT34-PX01S	-	c/w D7-15YE112 + PX01S	143	1	RADIO	TRIO	DR900-07A02-009	R	
16	1	016 EXTERNAL AREA LIGHTING CIRCUIT BREAKER	TERASAKI	DSRCBH-6-30A	Y		80	2	PUMP RESET PUSHBUTTON - S4	SPRECHER & SCHUH	D7P-F6-PX10	-		144	1	RADIO ANTENNA	TRIO	YAG ANT13AL	R	15 ELEMENT 13dB ALUM
17	1	017 SURGE FILTER CIRCUIT BREAKER	TERASAKI	DTCB6100C	-		81	2	PUMP HOUR RUN METER - HRM	NHP	R04801080VDC	-	24VDC	145	1	RADIO COAX SURGE PROTECTION UNIT	POLYPHASE CORPORATION	IS-50NX-C2	R	Mounted on Din Rail
18	1	018 EM PUMP CNTRL & SURCHARGE IMMINENT CB	TERASAKI	DTCB6106C	-		82	2	PUMP POWER SOCKET OUTLET + INCLINE SLEEVE	HARECHAL	DS13114013972 + 518A058	J		146	1	TELEMETRY UNIT	MOTOROLA	ACE - 3600	-	
19	1	019 SPARE CIRCUIT BREAKER	TERASAKI	DTCB6106C	K		83	2	PUMP POWER INLET PLUG + HANDLE	HARECHAL	DS13118013972 + 311A013	J		147	1	GSM MODEM	WAVECOM	FASTRACK Supreme	I	c/w 5 M Cable
20	1	020 3 PHASE OUTLET CIRCUIT BREAKER	TERASAKI	DTCB6310C	-	PLUS DSRCH-32-30-3PN	84	2	PUMP CONTROL SOCKET OUTLET + INCLINE SLEEVE	HARECHAL	PN7C 01P4060 + 01NA053	J		148	1	GSM CELLULAR TRANSIT ANTENNA	RF INDUSTRIES	TLA2000	I	
21	1	021 SPARE	TERASAKI	DTCB6106C	Q		85	2	PUMP CONTROL INLET PLUG + HANDLE	HARECHAL	PN7C 01P8060 + 01NA313	J		150	1	GRAPHIC DISPLAY	REDLION	G306A000		
22							86							153						
23							87							156						R
24	1	030 RTU POWER SUPPLY CIRCUIT BREAKER	TERASAKI	DTCB6104C	-		88							157	1	INTERNAL COAX CABLE (Radio to Lightning Arrester)	TRIO	TRIO - SHAM/NT/TL23	R	Cable No X01
25	1	031 SURGE FILTER ALARM RELAY CIRCUIT BREAKER	TERASAKI	DTCB6104C	-		89							158	1	EXTERNAL COAX CABLE (Lightning Arrester to Aerial)	R.F. INDUSTRIES	ANDREW - CNT400	R	Cable No X02
26	1	032 SPARE	TERASAKI	DTCB6104C	H		90							159	2	COAX PLUS (For CNT400 cable)	PULSE	N-203HS	R	Straight cable plug crimp
27	1	033 SPARE	TERASAKI	DTCB6104C	-		91							160	1	U CLAMPS	R.F. INDUSTRIES	UNV	R	
28							92							164.0	Lot	MINIATURE THERMAL CIRCUIT BREAKER	PHOENIX CONTACT	TEP 'x'A + UK6FS1/C	-	'x' = AMP Rating
29							93	1	LR3 - WET WELL HIGH LEVEL RELAY	MULTITRODE	MTR-5	-	24VDC	164.1	Lot	THROUGH TERMINALS (Grey & Blue as Required)	PHOENIX CONTACT	PIT 25	-	PIT 25-BU (for -ve)
30							94							164.2	Lot	DISCONNECT TERMINALS (Grey & Blue as Required)	PHOENIX CONTACT	PIT 25-MT	-	PIT 25-MT-BU (for -ve)
31	2	PUMP 240VAC CONTROL CIRCUIT BREAKER	TERASAKI	DTCB6104C	-	04-1, 05-1	95							164.3	Lot	GROUP MARKER CARRIER	PHOENIX CONTACT	UBE	-	
32	3	24VDC CONTROL CIRCUIT BREAKER	TERASAKI	DTCB6100C	-	004, 005, 0018	96	1	SR - SURCHARGE IMMINENT LEVEL RELAY	MULTITRODE	MTRA-FS	-	24VDC	164.4	Lot	PLUG-IN BRIDGE	PHOENIX CONTACT	FBS - 50	-	AS REQUIRED
33	1	BATTERY SHORT CCT PROTECTION CIRCUIT BREAKER	TERASAKI	DTCB6210C	-	008	97	1	EMERGENCY PUMPING MODE RELAY PUMP1 - EMG1	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	164.5	2	TEST PLUG	PHOENIX CONTACT	PS-5	-	
34	3	240VAC-24VDC POWER SUPPLY	WEIDMULLER	8951340000	-	120W 5A/24VDC	98	1	SURCHARGE IMMINENT DELAY TIMER - S10T	SPRECHER & SCHUH	RZ7-FSA 4U U23	-	ON DELAY / INSTANTANEOUS	164.6	Lot	COVER PROFILE (SHROUDING) + CARRIER PLATE	PHOENIX CONTACT	AP-2 + AP2-TU	-	AS REQUIRED
35							99	1	EMERGENCY PUMPING MODE TIMER - EMG0T	OMRON	H3CA-A (+ P2CF-11)	-	[+ Y92A-488] OFF DELAY	165						
36	1	DISTRIBUTION BOARD CHASSIS	TERASAKI	NCX2-24/18-3U	-		100	1	EMERGENCY PUMPING MODE TIMER PUMP2 - EMG2	SPRECHER & SCHUH	RZ7-FSA 3E U23	-	ON DELAY	166						
37	3	F1 - SURGE DIVERter CIRCUIT FUSES	NHP	63AMP 63MS	-	FUSES & HOLDERS	101	2	EMERGENCY PUMPING MODE SWITCH & LIGHT - S5/H5	SPRECHER & SCHUH	D7P-LSH25 + D7-X10 (2) + D7-X10 (2), ENGRAVE 'OFF ON'	-		169						
38	3	SURGE DIVERter	CRITEC	TOS1100-2SR-277	-		102	1	EMERGENCY PUMPING MODE AUX RELAY - EMG0TA	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	170	1	ENERGEX PADLOCK - 45mm brass pin tumbler	H.A. REED LOCKSMITHS	KEY No 325 & S/S Shackle	-	c/w 2 KEYS
39	1	SURGE FILTER ALARM RELAY - SFAR	CRITEC	DAR-275V	-		103							171						
40	1	SURGE REDUCTION FILTER - SRF	CRITEC	TDF-10A-240V	-		104							172	Lot	WET WELL CONDUIT END CAPS c/w NYLON CABLE GLANDS	HD PVC	TO SUIT CONDUITS		Detail 'W'
41	1	ENERGEX MAINS PHASE FAILURE RELAY - PFRE	CARLO GAVAZZI	DPB01CM4BW4	-		105							173	Lot	S/STEEL FITTINGS AS DETAILED FOR PRESSURE TX	FITTINGS	STAINLESS STEEL	U	Sheet 24
42							106							174	1	EARTH ROD CONNECTION BOX	NESCO	ERB1	-	
43	1	STATION MAINS PHASE FAILURE RELAY - PFRS	CARLO GAVAZZI	DPB01CM4BW4	-		107							175	1	LINE TAP - BONDING TO EARTHING ROD	CLIPSAL	BP26	-	
44							108							176	1	EARTHING ROD	COPPER ROD	13mm Diameter	-	
45	1	MAIN NEUTRAL LINK	DURE DB-ELEC	DBMH6 16SE12	-	INSULATED C/W EFFECT	109							177						E
46	1	MAIN EARTH LINK	DURE DB-ELEC	DBMH6 16SE12	-		110							178						Q
47	1	DIST. BD NEUTRAL LINK	DURE DB-ELEC	DBMH6 16SE24	-	INSULATED C/W EFFECT	111							179						E
48	1	DIST. BD EARTH LINK	DURE DB-ELEC	DBMH6 16SE24	-		112							180						E
49	1	SURGE-DIVERter NEUTRAL LINK	CLIPSAL DB-ELEC	CLPSAL DB-ELEC	-	INSULATED	113							181						E
50	1	INSTRUMENT EARTH LINK	CLIPSAL DB-ELEC	CLPSAL DB-ELEC	-	INSULATED	114							182						E
51	1	FILTERED SUPPLY NEUTRAL LINK	CLIPSAL	L7	-	INSULATED	115	2	SW/BD LIGHTING CONTROL RELAY - SLCR, DZC2	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	183						E
52	1	3 PHASE SWITCHED OUTLET	CLIPSAL	56C410	-	USE ENCLOSURE AS SHROUD	116	1	AREA LIGHTING CONTROL SWITCH - S11	KRAUS & NAIMER	CAD11-600-600-F72-F758	-	ENGRAVE 'OFF ON'	184						E
53	1	1 PHASE OUTLET 15A	CLIPSAL	15/15-908 (SHROUD)	-		117							185						E
54	1	LAPTOP GPO - TWIN 10A	CLIPSAL	25-449A-449AP	-		118	1	STATION LOCAL/REMOTE SWITCH - S10	KRAUS & NAIMER	CAD11-600-600-F72-F758	-	ENGRAVE 'LOCAL REMOTE'	186						E
55	1	1 PHASE OUTLET - GENERATOR ANKLLARY POWER	CLIPSAL	56S0310	F	IP56	119	1	ELECTRODES TEST RELAY - ETR	IDEC	RH4B-ULD-DC24V	-	+ SH4B-05	187	2	SINGLE POINT PROBES	MULTITRODE	2 off - 020130SP-SHield	-	
56	1	3 PHASE N&E APPLIANCE INLET - GENERATOR POWER	HENNEKES	HEN361	F	c/w PROTECTIVE CAP 40787	120							188						C
57							121	1	WET WELL LEVEL INDICATOR	CROMPTON INSTRUMENTS	244-0116-HG-IP-SR 4-20mA	-	0-100% ADJ RED POINTER	189						G
58							122							190						G
59	2	PUMP SOFT STARTER	DANFOSS MCD500	MCD5-00218 + MODBUS COMMS	-	175G5500 + 175G9900	123	8	SW/BD DOOR MICRO SWITCHES - SINGLE POLE	OMRON	Z-15GW2 55 B	-	8 OFF N/O	191	1	EXTERIOR AREA LIGHT	STRATEGIC LIGHTING	ECLIPSE - T5 2x80W	J	High Impact Resistant
60	2	EXTERNAL KEYPAD KIT	DANFOSS	175G3061	-		124	1	SW/BD DISCONNECT COMPART DOOR PROXIMITY SWITCH	PEPPERL & FUCHS	NEB5-180M40-20	-		192	4	CORROSION INHIBITOR	CORTEC	VPCI-110 OR 111	-	FROM AP CONTROLS
61							125	6	SW/BD INTERNAL LED LIGHTS	LUMIFA	LF18-C35-21HMM4	-								
62							126													
63							127													
64	2	PUMP LINE CONTACTOR - K1 (24VDC COIL)	SPRECHER & SCHUH	CA7-30	-	24VDC COIL	128													

Sheet 18  
FOR CONSTRUCTION

A 01.13 ISSUED FOR CONSTRUCTION	P.H. A.W. DRAFTED	P.HAGUE	Original Signed by P.HAGUE	6-11-12	 <p>QUEENSLAND UrbanUtilities A DIVISION OF THE BRISBANE CITY COUNCIL</p>	SITE SP089 HALL STREET SEWAGE PUMP STATION	TITLE EQUIPMENT LIST	SHEET No. 18	Queensland Urban Utilities. DRAWING No.	AMEND.
O 11.12 ISSUED FOR TENDER	P.H. A.W. DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No. DATE		PRINCIPAL DESIGN MANAGER	DATE		486/5/7-0293-018	A
P1 10.12 ISSUED FOR REVIEW	P.H. A.W. CAD FILE	57-0293set A	Original signed by A.WITTHOFT	8895 6-11-12		CLIENT DELEGATE	DATE			
No DATE AMENDMENT	DRN. APD. B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No. DATE						

S10 TEMPLATE SP-27 Ver32

D:\AA\_Major Projects\QUU - SP111\Package\Package 110\SP089 Hall St Drawings\Electrical Drawings\For Construction\57-0293set A.dwg Last Saved by Peter on Wednesday, 18 January 2012 5:13:56 PM

SHEET No. 19	
Queensland Urban Utilities DRAWING No.	AME
486/5/7-0293-019	A

ITEM #	OPT.	DESCRIPTION - INTERNAL LABEL	LABEL 1	LABEL 2 (IF NECESSARY)	TEXT HEIGHT	MATERIAL / COLOUR	ITEM #	OPT.	DESCRIPTION - INTERNAL LABEL	LABEL 1	LABEL 2 (IF NECESSARY)	TEXT HEIGHT	MATERIAL / COLOUR	ITEM #	OPT.	DESCRIPTION - INTERNAL LABEL	LABEL 1	LABEL 2 (IF NECESSARY)	TEXT HEIGHT	MATERIAL / COLOUR
02		ENERGEX SUPPLY	NORMAL SUPPLY MAIN SWITCH 125A	REFER SHEET 01 NOTE 11	10mm	ABS PLASTIC W/B	73		PUMP RUN COMMAND RELAY	W28	2K28	4mm	ABS PLASTIC W/B			TERMINAL HEADER	24VDC POWER DISTRIBUTION	DIGITAL INPUTS 01	4mm	ABS PLASTIC W/B
03		GENERATOR SUPPLY	GENERATOR SUPPLY MAIN SWITCH 125A		10mm	ABS PLASTIC W/B	74		PUMP FAULT RESET RELAY	W21	2K21	4mm	ABS PLASTIC W/B			TERMINAL HEADER	DIGITAL INPUTS 02	DIGITAL INPUTS 03	4mm	ABS PLASTIC W/B
04/05		PUMP CIRCUIT BREAKER	PUMP No1 32A	PUMP No2 32A	4mm	ABS PLASTIC W/B	75		PUMP EMERGENCY MODE INTERRUPT RELAY	W22	2K22	4mm	ABS PLASTIC W/B			TERMINAL HEADER	DIGITAL OUTPUTS 01	DIGITAL OUTPUTS 02	4mm	ABS PLASTIC W/B
07		PHASE FAILURE CIRCUIT BREAKER	ENERGEX PHASE FAILURE RELAY 07	FED FROM LINE SIDE OF MAIN SWITCH	4mm	ABS PLASTIC W/B	77		PUMP START PUSHBUTTON	START	START	4mm	ABS PLASTIC W/B			TERMINAL HEADER	DIGITAL OUTPUTS 03	DIGITAL OUTPUTS 04	4mm	ABS PLASTIC W/B
09		SUB-DISTRIBUTION BOARD CB	SUB-DISTRIBUTION BOARD 03A	Mounted On Escutcheon	6mm	ABS PLASTIC W/B	78		PUMP STOP PUSHBUTTON	STOP	STOP	4mm	ABS PLASTIC W/B			TERMINAL HEADER	ANALOG INPUTS 01	ANALOG INPUTS 02	4mm	ABS PLASTIC W/B
10		PHASE FAILURE CIRCUIT BREAKER	STATION PHASE FAILURE RELAY 010		4mm	ABS PLASTIC W/B	79		PUMP ENSTOP PUSHBUTTON	(use label supplied with P/Buttons)	(use label supplied with P/Buttons)	4mm	Y/B			TERMINAL HEADER	ANALOG OUTPUTS 01	ANALOG OUTPUTS 02	4mm	ABS PLASTIC W/B
11		1 PHASE OUTLET CIRCUIT BREAKER	W/GPO 011		4mm	ABS PLASTIC W/B	80		PUMP RESET PUSHBUTTON	FAULT RESET	FAULT RESET	4mm	ABS PLASTIC W/B			HEADER LABELS (Above DB Circuit Breakers)	NON FILTERED SUPPLY	FILTERED SUPPLY	6mm	ABS PLASTIC W/B
12		RTU LAPTOP CIRCUIT BREAKER	RTU LAPTOP GPO 012		4mm	ABS PLASTIC W/B	81		PUMP-HOURS-MON-METER	HOURS-RUN	HOURS-RUN	4mm	ABS PLASTIC W/B			HEADER LABEL (Incomer Section)	MON BEHIND		6mm	ABS PLASTIC W/B
13		SPARE CIRCUIT BREAKER	SPARE 013		4mm	ABS PLASTIC W/B	82/83	J	PUMP DE-CONTACTOR	PUMP No1	PUMP No2	6mm	ABS PLASTIC W/B			HEADER LABEL (Over Terminals 600-613)	LEVEL TX AND LEVEL PROBES		4mm	ABS PLASTIC W/B
14		SPARE CIRCUIT BREAKER	SPARE 014		4mm	ABS PLASTIC W/B	84/85	J	PUMP AUX CONTROL PLUG & SOCKET	PUMP No1	PUMP No2	6mm	ABS PLASTIC W/B			HEADER LABEL (Over Shrouded Terminals)	WARNING 240VAC		4mm	ABS PLASTIC R/V
15		GENERATOR ANCHLARY SUPPLY CB	GENERATOR ANCHLARY SUPPLY 015		4mm	ABS PLASTIC W/B														
16		EXT. AREA LIGHTING CIRCUIT BREAKER	AREA LIGHTING 016		4mm	ABS PLASTIC W/B														
17		SURGE FILTER CIRCUIT BREAKER	SURGE FILTER 017		4mm	ABS PLASTIC W/B														
18		EM PUMP CONTROL & SR CIRCUIT BREAKER	EM PUMPING C/T & SR 018		4mm	ABS PLASTIC W/B														
19		SPARE CIRCUIT BREAKER	SPARE 019		4mm	ABS PLASTIC W/B														
20		3 PHASE OUTLET CIRCUIT BREAKER	3P OUTLET 020		4mm	ABS PLASTIC W/B														
21		SPARE CIRCUIT BREAKER	SPARE 021		4mm	ABS PLASTIC W/B														
24		RTU POWER SUPPLY CIRCUIT BREAKER	RTU POWER SUPPLY 024		4mm	ABS PLASTIC W/B														
25		SURGE FILTER ALARM RELAY CIRCUIT BREAKER	SURGE FILTER ALARM RELAY 025		4mm	ABS PLASTIC W/B														
26		SPARE CIRCUIT BREAKER	SPARE 026		4mm	ABS PLASTIC W/B														
27		SPARE CIRCUIT BREAKER	SPARE 027		4mm	ABS PLASTIC W/B														
31		PUMP 240VAC CONTROL CIRCUIT BREAKER	PUMP No1 031-1	PUMP No2 031-2	4mm	ABS PLASTIC W/B														
32		24VDC CONTROL CIRCUIT BREAKER	PUMP No1 032	PUMP No2 032	4mm	ABS PLASTIC W/B														
33		BATTERY CIRCUIT BREAKER	BATTERY 033		4mm	ABS PLASTIC W/B														
34		240VAC-24VDC POWER SUPPLY	PS-P1	PS-P2 PS3	4mm	ABS PLASTIC W/B														
37		SURGE DIVERTER FUSES	SURGE DIVERTER FUSES 037	FED FROM LINE SIDE OF MAIN SWITCH	4mm	ABS PLASTIC W/B - R/W														
38		SURGE DIVERTERS	SURGE DIVERTERS	FED FROM LINE SIDE OF MAIN SWITCH	4mm	ABS PLASTIC W/B - R/W														
39		SURGE FILTER ALARM RELAY	SFAR		4mm	ABS PLASTIC W/B														
40		SURGE REDUCTION FILTER	SURGE REDUCTION FILTER		4mm	ABS PLASTIC W/B														
41		PHASE FAILURE RELAY	ENERGEX MAINS POWER FAULT - PFRS	FED FROM LINE SIDE OF MAIN SWITCH	4mm	ABS PLASTIC W/B - R/W														
43		PHASE FAILURE RELAY	STATION MAINS POWER FAULT - PFRS		4mm	ABS PLASTIC W/B														
45		MAIN NEUTRAL LINK	MAIN NEUTRAL		4mm	ABS PLASTIC W/B														
46		MAIN EARTH LINK	MAIN EARTH		4mm	ABS PLASTIC W/B														
47		SUB-BOARD NEUTRAL LINK	NEUTRAL		4mm	ABS PLASTIC W/B														
48		SUB-BOARD EARTH LINK	EARTH		4mm	ABS PLASTIC W/B														
49		SURGE DIVERTER NEUTRAL LINK	SURGE DIVERTER NEUTRAL		4mm	ABS PLASTIC W/B														
50		INSTRUMENT EARTH LINK	INSTRUMENT EARTH		4mm	ABS PLASTIC W/B														
51		FILTERED SUPPLY NEUTRAL LINK	FILTERED SUPPLY NEUTRAL	← LEAVE IN SPS ONLY	4mm	ABS PLASTIC W/B														
54		LAPTOP GPO	LAPTOP GPO		4mm	ABS PLASTIC W/B														
55	M	GENERATOR 240VAC CONNECTION SOCKET	GENERATOR ANCHLARY SUPPLY		4mm	ABS PLASTIC W/B														
56	M	GENERATOR POWER CONNECTION SOCKET	GENERATOR CONNECTION		4mm	ABS PLASTIC W/B														
59		PUMP SOFT STARTER	PUMP No1 311	PUMP No2 311	4mm	ABS PLASTIC W/B														
60		PUMP SOFT STARTER KEYPAD	PUMP No1	PUMP No2	8mm	ABS PLASTIC W/B														
61																				
63																				
64		LINE CONTACTOR	PUMP 1 1K1	PUMP 2 2K1	4mm	ABS PLASTIC W/B														
65		SOFT STARTER RUNNING RELAY	1K2	2K2	4mm	ABS PLASTIC W/B														
66		SOFT STARTER FAULT RELAY	1K3	2K3	4mm	ABS PLASTIC W/B														
67		EM STOP RELAY	1K4	2K4	4mm	ABS PLASTIC W/B														
68		PUMP POWER ON RELAY	1K5	2K5	4mm	ABS PLASTIC W/B														
69		PUMP RUN RELAY	1K6	2K6	4mm	ABS PLASTIC W/B														
73		PUMP RUN COMMAND RELAY	W28	2K28	4mm	ABS PLASTIC W/B														
74		PUMP FAULT RESET RELAY	W21	2K21	4mm	ABS PLASTIC W/B														
75		PUMP EMERGENCY MODE INTERRUPT RELAY	W22	2K22	4mm	ABS PLASTIC W/B														
77		PUMP START PUSHBUTTON	START	START	4mm	ABS PLASTIC W/B														
78		PUMP STOP PUSHBUTTON	STOP	STOP	4mm	ABS PLASTIC W/B														
79		PUMP ENSTOP PUSHBUTTON	(use label supplied with P/Buttons)	(use label supplied with P/Buttons)	4mm	Y/B														
80		PUMP RESET PUSHBUTTON	FAULT RESET	FAULT RESET	4mm	ABS PLASTIC W/B														
81		PUMP-HOURS-MON-METER	HOURS-RUN	HOURS-RUN	4mm	ABS PLASTIC W/B														
82/83	J	PUMP DE-CONTACTOR	PUMP No1	PUMP No2	6mm	ABS PLASTIC W/B														
84/85	J	PUMP AUX CONTROL PLUG & SOCKET	PUMP No1	PUMP No2	6mm	ABS PLASTIC W/B														
93		WET WELL HIGH LEVEL RELAY	WET WELL HIGH LEVEL - LRS		4mm	ABS PLASTIC W/B														
96		SURCHARGE IMMINENT LEVEL RELAY	WET WELL SURCHARGE IMMINENT - SR		4mm	ABS PLASTIC W/B														
97		EMERGENCY PUMPING MODE PUMP 1 RELAY	EMG1		4mm	ABS PLASTIC W/B														
98		SURCHARGE IMMINENT ON DELAY TIMER	SIDT		4mm	ABS PLASTIC W/B														
99		EMERGENCY PUMPING MODE OFF DELAY TIMER	EMGOT		4mm	ABS PLASTIC W/B														
100		EMERGENCY PUMPING MODE PUMP 2 TIMER	EMG2		4mm	ABS PLASTIC W/B														
101		EMERGENCY PUMPING MODE START SWITCH	EMERGENCY PUMPING MODE	EMERGENCY PUMPING MODE	4mm	ABS PLASTIC W/B														
102		EMERG. PUMPING MODE OFF DELAY AUX RELAY	EMGOTA		4mm	ABS PLASTIC W/B														
115		SWITCHBOARD LIGHTING CONTROL RELAY	SLCR	DZC2	4mm	ABS PLASTIC W/B														
116		AREA LIGHTING CONTROL SWITCH	AREA LIGHTING		4mm	ABS PLASTIC W/B														
118		STATION LOCAL/REMOTE SELECTOR SWITCH	STATION CONTROL MODE		4mm	ABS PLASTIC W/B														
119		ELECTRODES TEST RELAY	ETR		4mm	ABS PLASTIC W/B														
121		WET WELL LEVEL INDICATOR	WET WELL LEVEL		4mm	ABS PLASTIC W/B														
134		WET WELL PRIMARY LEVEL ADJ. UNIT	PRIMARY WET WELL LEVEL (located in SW/Bd)		4mm	ABS PLASTIC W/B														
137	U	DELIVERY PRESSURE ADJ. UNIT	DELIVERY PRESSURE (located in SW/Bd)		4mm	ABS PLASTIC W/B														
139		CONTROL SYS 240VAC/24VDC POWER SUPPLY	CONTROL SYSTEM 24VDC POWER SUPPLY		4mm	ABS PLASTIC W/B														
140	R	RADIO 24V/13.8VDC CONVERTER	24V/12 VDC CONVERTER - RADIO		4mm	ABS PLASTIC W/B														
143	R	RADIO	RADIO		4mm	ABS PLASTIC W/B														
145	R	RADIO COAX SURGE PROTECTION	RADIO SURGE PROTECTION		4mm	ABS PLASTIC W/B														
146		TELEMETRY UNIT	RTU		4mm	ABS PLASTIC W/B														
147	I	MODEM	MODEM		4mm	ABS PLASTIC W/B														

LABEL	TEXT	TEXT HEIGHT	PAINT FILL LETTERING	QTY
A	SP089	25mm	Black	1
B	RTU	10mm	Black	1
C	PUMP 1 CONTROL	10mm	Black	2
D	WARNING THIS SITE IS MONITORED BY THE CONTROL ROOM. PLEASE INFORM THE OPERATOR BEFORE ISOLATING PUMPS OR STATION.	8mm	Black	2
E	PLEASE CHECK THAT THE STATION IS IN REMOTE MODE BEFORE LEAVING SITE.	8mm	Black	1
F	COMMON CONTROL	10mm	Black	1
G				
H				
I	MAIN SWITCHES	10mm	Black	1
J	DISTRIBUTION BOARD	10mm	Black	1
K				
L	GENERATOR BUSBAR CONNECTIONS	10mm	Black	1
M	PUMP DE-CONTACTORS	10mm	Black	1
N	GENERATOR PLUG CONNECTIONS	10mm	Black	1
O	BATTERIES	10mm	Black	1
P	SUPPLY AUTHORITY METERING	10mm	Black	1
Q				
R	DANGER - 2 SOURCES OF SUPPLY	10mm	Red	1
S				
T	SURGE DIVERTERS	10mm	Black	1
U				
V	Phone: 340 78414 (Built up directly under Label 'X')	8mm	Black	1
W	DANGER - ELECTRICAL EQUIPMENT Queensland Urban Utilities Phone 340 78414	8mm	Black	1
X	NOTE: LABEL DESIGN IS ISSUED FROM DUU			


LABEL	TEXT	TEXT HEIGHT	PAINT FILL LETTERING	QTY
AA	MAIN EARTH CONDUCTOR - DO NOT DISCONNECT (On Main Earth Electrode)	5mm		1

**LABEL 'X'**

WARNING  
THIS SITE IS CONTINUOUSLY MONITORED  
CONTACT CONTROL ROOM  
BEFORE OPENING METER DOOR  
AND PRIOR TO LEAVING SITE.

8mm Black 1

**Sheet 20**  
FOR CONSTRUCTION

A 01.13	ISSUED FOR CONSTRUCTION	P.H.	A.W.	DRAFTED	P.HAGUE	Original Signed by P.HAGUE	6-11-12		 <div>QUEENSLAND UrbanUtilities</div> <div>A DIVISION OF THE BRISBANE CITY COUNCIL</div>	SITE SP089 HALL STREET SEWAGE PUMP STATION	TITLE SWITCHBOARD LABEL SCHEDULE	SHEET No. 20			
O 11.12	ISSUED FOR TENDER	P.H.	A.W.	DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No.	DATE				PRINCIPAL DESIGN MANAGER	DATE	Queensland Urban Utilities DRAWING No.	AMEND.
P1 10.12	ISSUED FOR REVIEW	P.H.	A.W.	CAD FILE	57-0293set_A	Original signed by A.WITTHOFT	8895	6-11-12						486/5/7-0293-020	A
No DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No.	DATE				CLIENT DELEGATE	DATE		

STD TEMPLATE SP-08 Ver12

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### LABELS

Cubic construction 306 Marine grade Aluminium (5251).

Plinth construction 306 channel 6061 T6 Grade Aluminium.

Folded, "Pulse MIG" & "TIG welded with all visible seams and joints fully welded, free from splatter and ground smooth where needed.

External doors and covers fitted with Emka 1011-207 self grip seal.

Stainless Steel "D" Handles fitted where indicated on the drawings.

M6 Earth studs fixed to the interior of all doors and hinged escutcheons and on adjacent cubic interior surfaces. Fit dedicated earth stud adjacent main earth bar for switchboard earth.

Door stiffeners, door stays, cable straps, and document holders etc fitted where shown on the drawings.

Door stay arms to be S/Steel and of sufficient strength to prevent being deformed when subjected to reasonable loads. Minimum 3mm S/Steel.

Lift-off covers and mounting panels fixed with M8 studs & stainless steel dome nuts.

Gland plates manufactured from 3mm aluminium, unless otherwise shown.

Inspection/Access plates manufactured from 3mm aluminium.

Gland/Inspection/Access plate openings fitted with M6x10 flat head closed end rivet nuts. (Detail F)

Cable glands to be fitted with compression side installed within cubic. (Detail G)

Gland/Inspection/Access plates to be fitted with seals attached to cubic.

Gland/Inspection/Access plate fixings at 100mm.

Gland/Inspection/Access plates to maintain a 50mm clearance from section dividers.

Gland/Inspection/Access plates are NOT to be split.

Inspection/Access plates are NOT to be earthed.

Provide Shrouding to all live parts to IP20 where required.

Hinges (external) Selectrix HB650ss-316. Stainless steel.

Star washers fitted under all hinge screws.

Hinged escutcheons fixed with Emka 1/4 turn 1000-U142

All equipment to be removable via front access.

Install switchboard with non-hydroscopic material between plinth and concrete slab. (Detail E)

All escutcheons to open a minimum of 90°

All sheet metal edging to be de-burred.

Locks Doors 1 - 6 & 8

DORE ELECTRICS - Swing Handle SHKSS Universal Locking - 92268  
DORE ELECTRICS - 3 point lock rod set - TLR24  
Half Profile Cylinder  
Key Codes RC496A, RC496AB, RC496ABC refer to each door for clarification.

Locks Door 9

DORE ELECTRICS - Swing Handle SHKSS Universal Locking - 92268  
DORE ELECTRICS - 3 point lock rod set - TLR22SS (all S/Steel)  
Lockwood Barrel Lock, Key Code RC496AB

Locks Door 7

DORE ELECTRICS - Swing Handle SHPSS Padlockable - 316  
DORE ELECTRICS - 3 point lock rod set - TLR24  
ENERGEX padlock, S/Steel Shackle, 45mm brass pin tumbler  
Energex Key No325. c/w 2 keys.

### OPERATING PARAMETERS

Standard	AS 3439.1
Current & Frequency	AC 50Hz
Rated Operational Voltage Ue	415 VAC
Rated Insulation Voltage Ui	660 V
Rated Auxiliary Voltage	240 VAC / 24 VDC
Rated Current (Main Bus) <b>100</b>	<del>300</del> AMPS
Short Circuit Current Isc	20 kA
Duration of Isc	.2 sec
Degree of Protection	IP 56 to AS 1939
Measure of Protection by barriers and enclosures.	
Service Conditions	Outdoors
Mass	Not exceeding 2000kg
Forms of Segregation	Form 3 <b>(OR SECTION FORM 2)</b>

All wiring to be PVC 90 HT 0.6/1kV Grade with tinned conductor.

Control and instrumentation wiring has flexible copper conductors, and is colour coded as detailed below, each individual wire shall be numbered each end, and terminated by the use of appropriate pre-insulated crimp lugs or pins.

Separate lugs or pins shall be used for each conductor. A proprietary double pin lug may be used to terminate two conductors.

Use proprietary bridging links when required to common up terminals.

Not more than two wires shall be connected to any terminal.

Not more than one wire shall be connected on one side of any tunnel type terminal.

Where multiple connections are required on tunnel terminals, proprietary terminal link bars shall be used.

Power wiring to be minimum 2.5sqmm <sup>V90 0.6/1kV</sup> stranded copper conductors, phase colour coded as detailed below.

Control wiring to be minimum 1.0sqmm flexible copper conductors, colour coded as detailed below.

Low level control signals to be minimum 0.5sqmm flexible copper conductors, colour coded as detailed below.

Wiring between RTU terminals & RTU disconnect plugs to be multicore cable with 0.5sqmm flexible copper conductors.

4-20mA analog signals (internal & external) wired in shielded pair minimum size 0.5sqmm, and earthed at one end only. (Switchboard end for external signals)

All 240VAC wiring in the RTU or PLC sections shall be double insulated and all terminal shall be shrouded and labelled- " Danger 240VAC"

Earth cables minimum 2.5sqmm flexible.

Doors and hinged escutcheons bonded with flexible ~~tinned copper braiding~~ <sup>B/Wire</sup>

Disconnection zone door to be bonded with flexible copper B/Wire. Heat shrink at lugs.

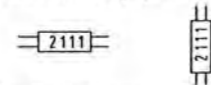
Switchboard to have dedicated earthing cable bonding directly to main earth bar.

Ensure minimum clearance of 100mm is maintained between cable ducting & gland plates.

Wire numbering will be equal to Grafoplast Si2000 system.

Terminal strips to be mounted 30mm off equipment panel to aid termination.

Wire numbers are readable left to right, bottom to top as shown.



~~Supply spare 'RTU fuse terminal' fuses separately, 2x10A, 2x5A, 4x2A, 6x5A~~  
All cable glands to be Stainless Steel type.


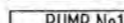


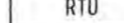
**COLOUR CODE**

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	1.0sqmm
240 VAC Neutral	Black	1.0sqmm
Extra Low VDC Positive supplies	Orange	1.0sqmm
Extra Low VDC Negative supplies	Violet	1.0sqmm
General Extra Low VDC Wiring	Grey	1.0sqmm
RTU & PLC Wiring	Grey	0.5sqmm
Electrode Wiring	Salmon	1.0sqmm
Intrinsically safe wiring	Light Blue	1.5sqmm
Earth	Green/Yellow	2.5sqmm (min)
Door & Escutcheon Earth Bonds	Green/Yellow	4 sqmm

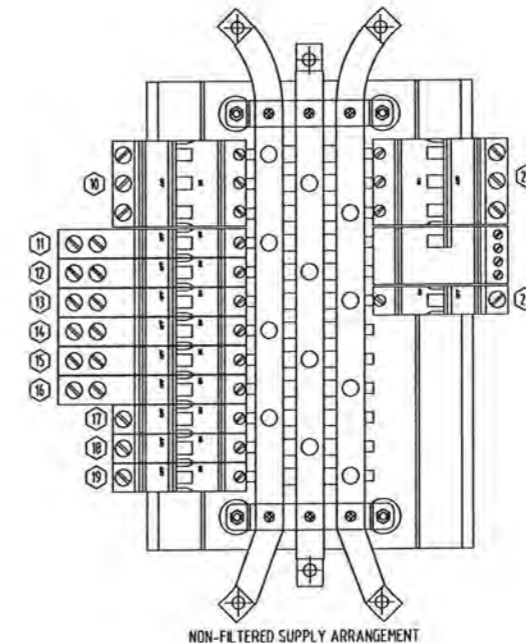
Door & Escutcheon Earth Bonds Green/Yellow 4 sqmm  
Instrument Shield Earth Green/Yellow 1.5 sqmm (min)

## PAINING

**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, Novacox 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 50 microns.

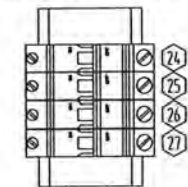
Main switch label		10mm 4mm	Material ABS PLASTIC Colour B/W
Pump CB labels		6mm 4mm	Material ABS PLASTIC Colour W/B
Compartment labels		10mm	Material Stainless Steel
E/Stop labels		4mm	Material ABS PLASTIC Colour Y/B
Warning labels		7mm 5mm	Material ABS PLASTIC Colour R/W

Internal labels secured by M3 chrome plated metal threads.  
CB's to be identified with individual labels as per label schedule.  
Labels obstructed by switchboard wiring are relocated to adjacent duct lid and secured by M3 nylon threads. Lid to be secured by a single cable tie at one corner.  
External switchboard labels to be 1mm thick 316 grade stainless steel secured by M3 316 stainless steel metal threads.  
All internal and external labels are to have bevelled edges.




DETAIL M  
SUB-DISTRIBUTION BOARD ARRANGEMENT

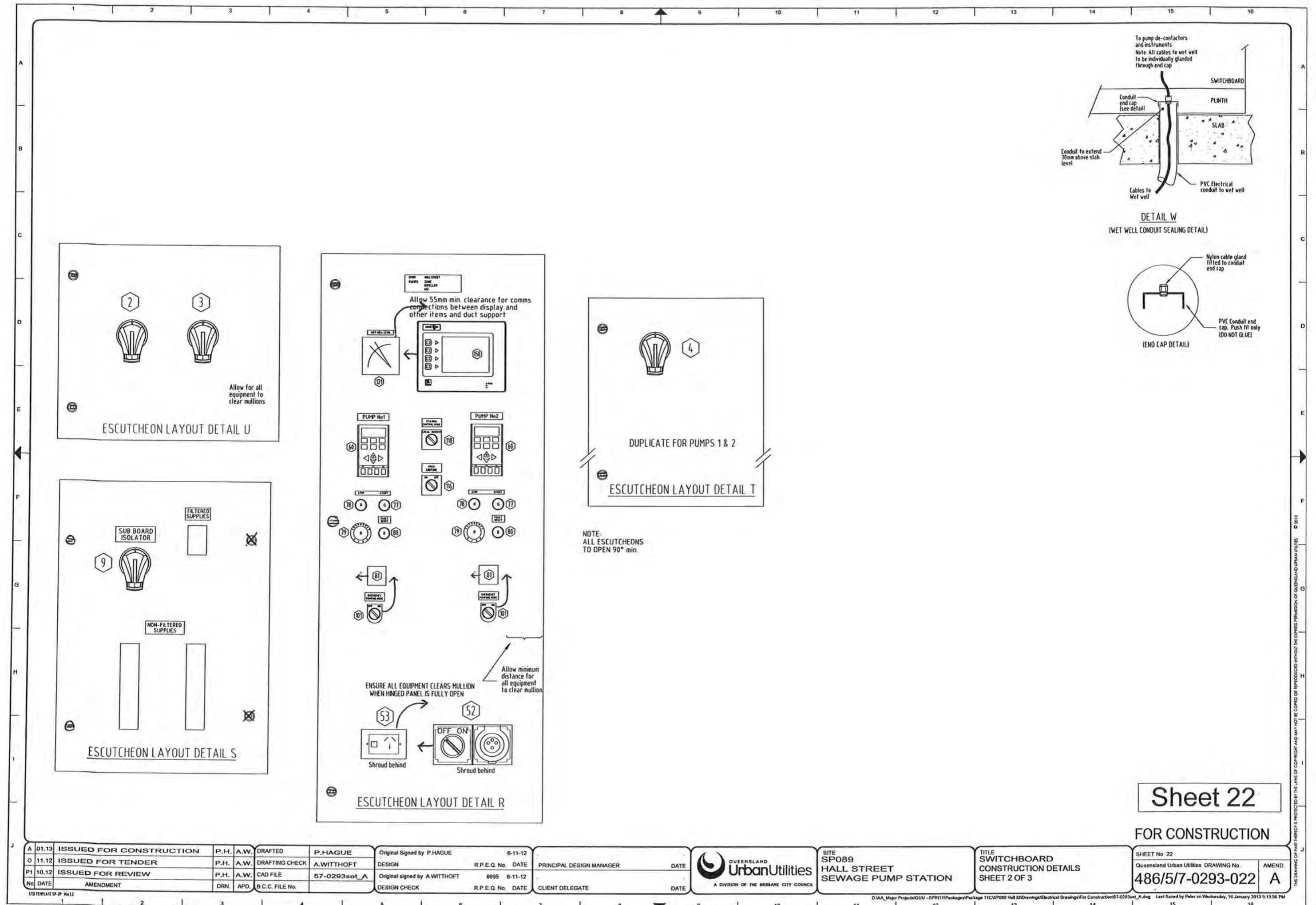
### FILTERED SUPPLY ARRANGEMENT

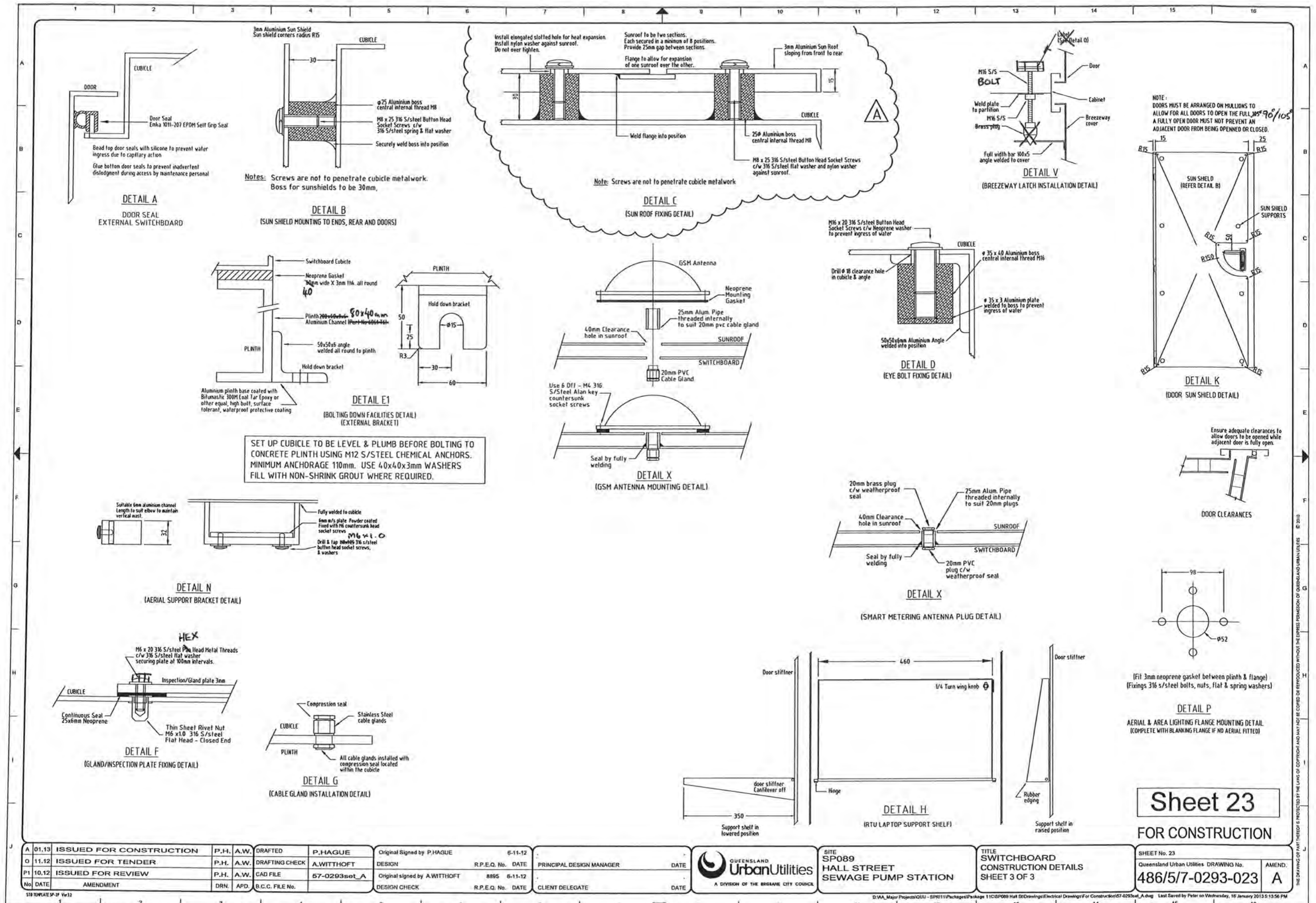


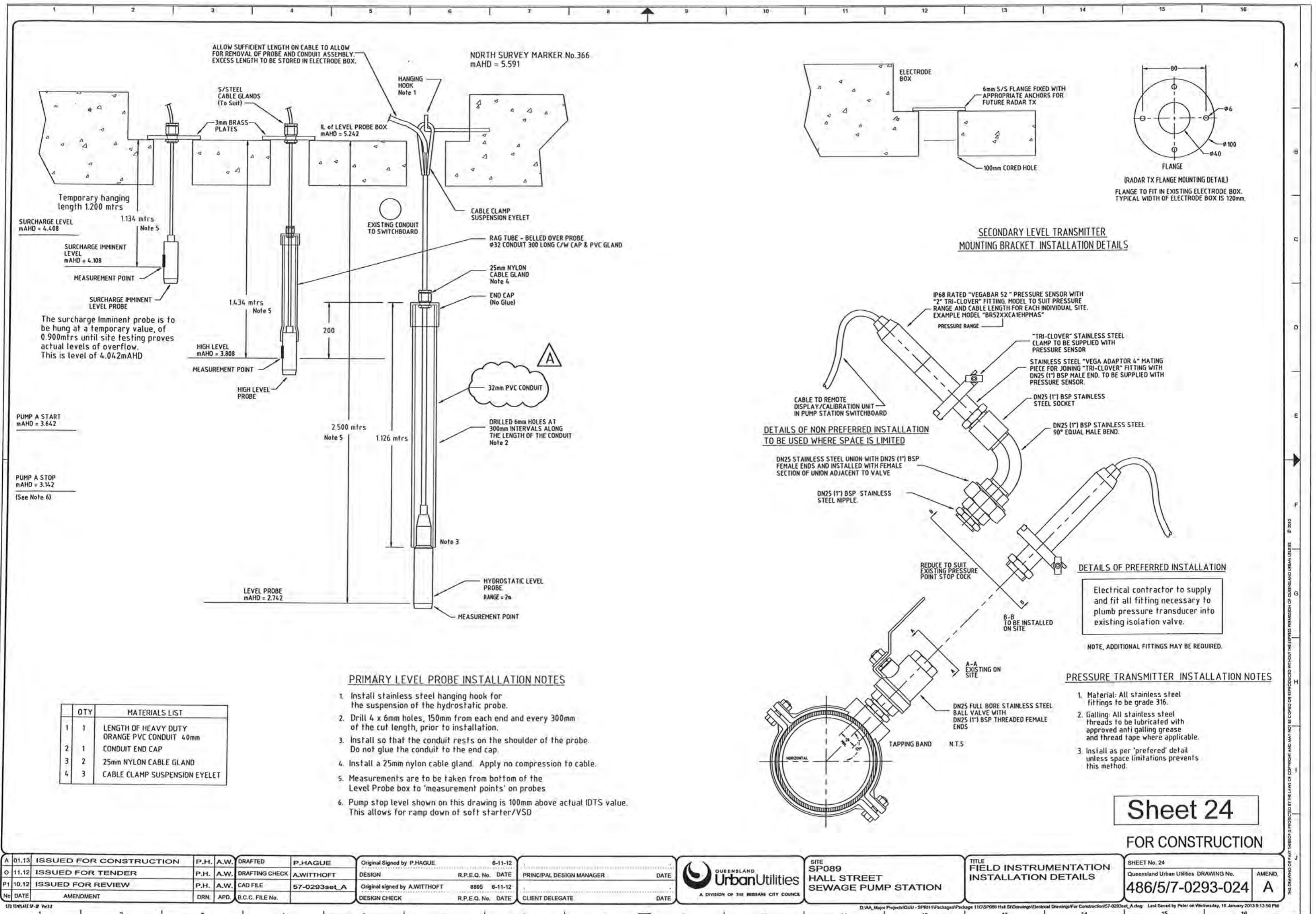
Sheet 21

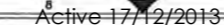
FOR CONSTRUCTION

A	01.13	ISSUED FOR CONSTRUCTION	P.H.	A.W.	DRAFTED	P.HAGUE	Original Signed by P.HAGUE	6-11-12		 <p>QUEENSLAND <b>UrbanUtilities</b> A DIVISION OF THE BRISBANE CITY COUNCIL</p>	SITE SP089 HALL STREET SEWAGE PUMP STATION	TITLE SWITCHBOARD CONSTRUCTION DETAILS SHEET 1 OF 3	SHEET No. 21			
O	11.12	ISSUED FOR TENDER	P.H.	A.W.	DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No.	DATE				PRINCIPAL DESIGN MANAGER	DATE	Queensland Urban Utilities DRAWING No.	AMEND.
PI	10.12	ISSUED FOR REVIEW	P.H.	A.W.	CAD FILE	57-0293set_A	Original signed by A.WITTHOFT	8895	6-11-12						486/5/7-0293-021	A
No	DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No.	DATE				CLIENT DELEGATE	DATE		

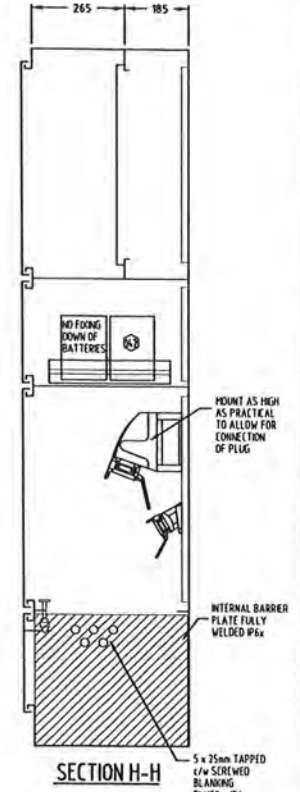
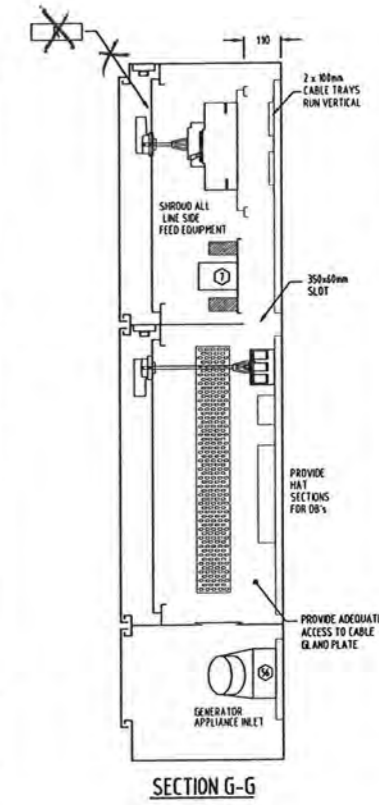
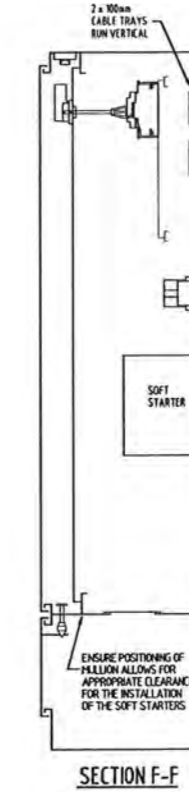
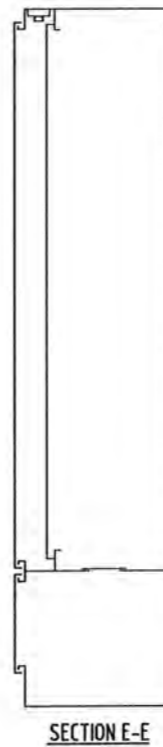
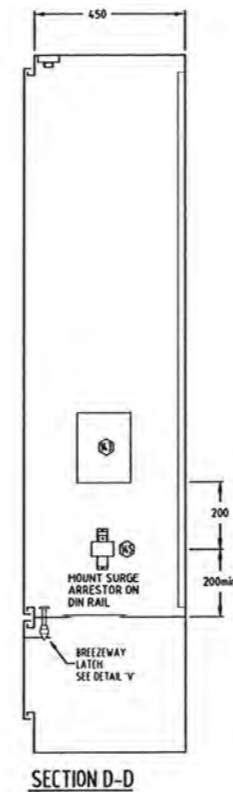
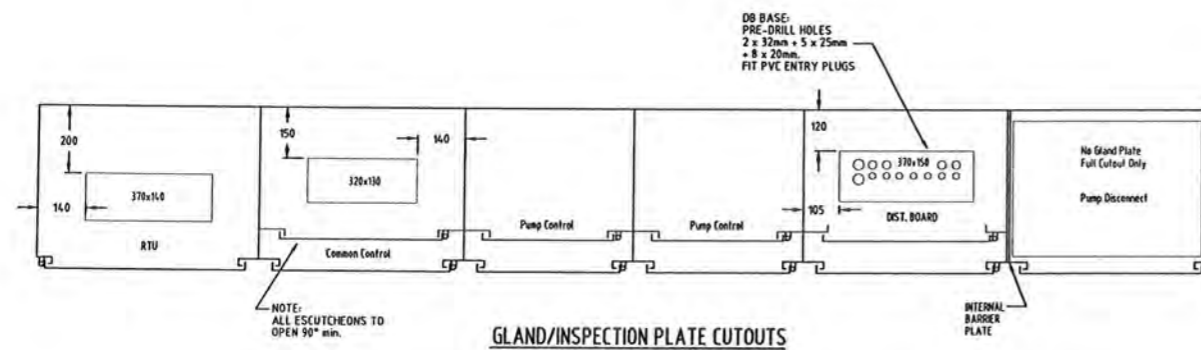
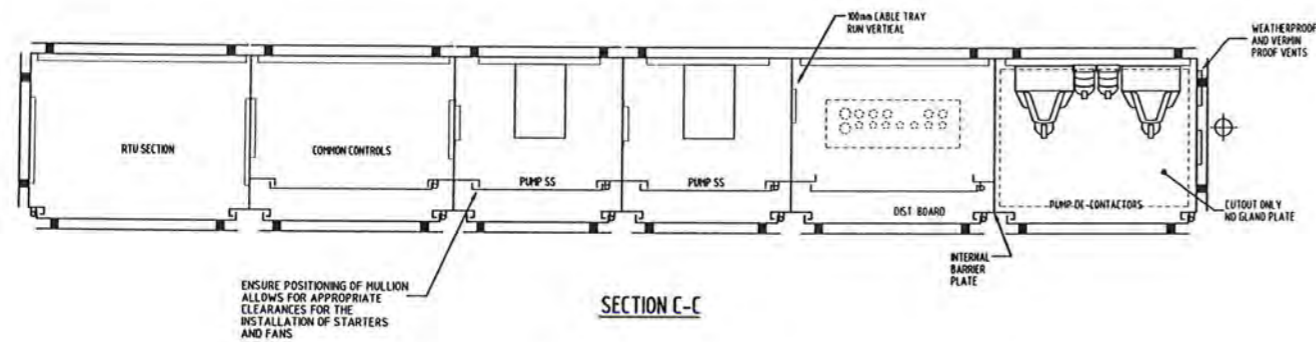
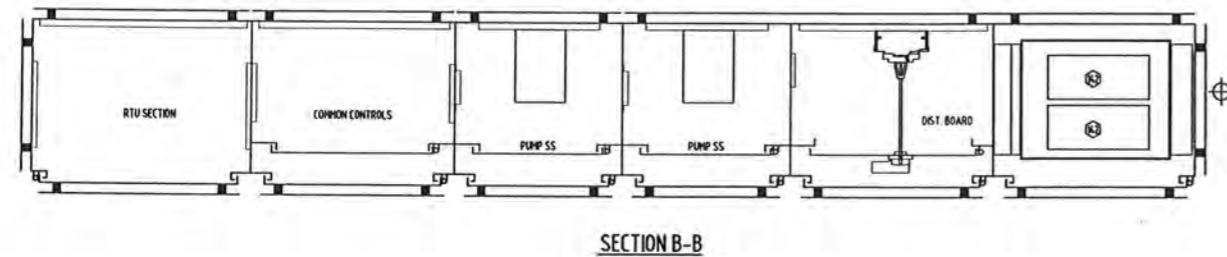
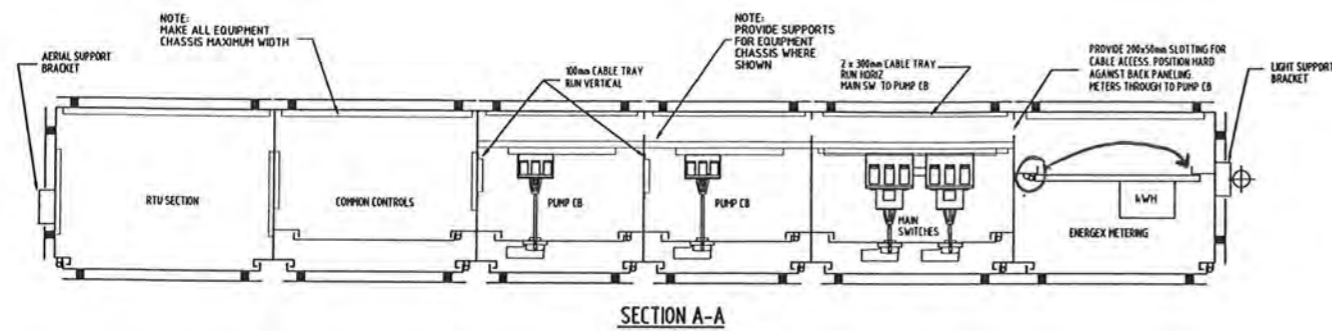








25-7-17



# Sheet 28

## FOR CONSTRUCTION

A	01.13	ISSUED FOR CONSTRUCTION	P.H.	A.W.	DRAFTED	P.HAGUE	Original Signed by P.HAGUE	6-11-12	
O	11.12	ISSUED FOR TENDER	P.H.	A.W.	DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No. DATE	PRINCIPAL DESIGN MANAGER DATE
P1	10.12	ISSUED FOR REVIEW	P.H.	A.W.	CAD FILE	57-0293set_A	Original signed by A.WITTHOFT	8895 6-11-12	
No	DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No. DATE	CLIENT DELEGATE DATE



SITE  
SP089  
HALL STREET  
SEWAGE PUMP STATION

TITLE  
SWITCHBOARD  
GENERAL ARRANGEMENT  
SECTIONS

SHEET No. 28  
Queensland Urban Utilities DRAWING No.  
486/5/7-0293-028  
AMEND. A

# SP089 HALL STREET SEWAGE PUMPING STATION SITE COVER SHEET

POINT TO POINT TEST

J & P RICHARDSON IND.

NAME: ANDREW VARY LICENCE: 756

DATE: 9-4-13

SIGNATURE: C. J. Vary

ELECTRICAL DRAWINGS INDEX						
DWG N°.	TITLE	SHEET	REVISIONS			
486/5/7-0293-000	SITE COVER SHEET	00	P1	0	A	
486/5/7-0293-001	POWER DISTRIBUTION SCHEMATIC DIAGRAM	01	P1	0	A	
486/5/7-0293-002	PUMP 01 SCHEMATIC DIAGRAM	02	P1	0	A	
486/5/7-0293-003	PUMP 02 SCHEMATIC DIAGRAM	03	P1	0	A	
486/5/7-0293-004	RESERVED FOR PUMP 03 SCHEMATIC DIAGRAM	04				
486/5/7-0293-005	RESERVED (DRY WELL SUMP & EM STORAGE DEWATEING PUMP)	05				
486/5/7-0293-006	RESERVED (GENERATOR CONTROL)	06				
486/5/7-0293-007	COMMON CONTROLS SCHEMATIC DIAGRAM	07	P1	0	A	
486/5/7-0293-008	COMMON RTU I/O SCHEMATIC DIAGRAM	08	P1	0	A	
486/5/7-0293-009	RTU POWER DISTRIBUTION SCHEMATIC DIAGRAM	09	P1	0	A	
486/5/7-0293-010	RTU DIGITAL INPUTS TERMINATION DIAGRAM - SHEET 1 OF 3	10	P1	0	A	
486/5/7-0293-011	RTU DIGITAL INPUTS TERMINATION DIAGRAM - SHEET 2 OF 3	11	P1	0	A	
486/5/7-0293-012	RTU DIGITAL INPUTS TERMINATION DIAGRAM - SHEET 3 OF 3	12	P1	0	A	
486/5/7-0293-013	RTU DIGITAL OUTPUTS TERMINATION DIAGRAM - SHEET 1 OF 2	13	P1	0	A	
486/5/7-0293-014	RTU DIGITAL OUTPUTS TERMINATION DIAGRAM - SHEET 2 OF 2	14	P1	0	A	
486/5/7-0293-015	RTU ANALOG INPUTS TERMINATION DIAGRAM	15	P1	0	A	
486/5/7-0293-016	RTU ANALOG OUTPUTS TERMINATION DIAGRAM	16	P1	0	A	
486/5/7-0293-017	COMMON CONTROLS TERMINATION DIAGRAM	17	P1	0	A	
486/5/7-0293-018	EQUIPMENT LIST	18	P1	0	A	
486/5/7-0293-019	CABLE SCHEDULE	19	P1	0	A	
486/5/7-0293-020	SWITCHBOARD LABEL SCHEDULE	20	P1	0	A	
486/5/7-0293-021	SWITCHBOARD CONSTRUCTION DETAILS - SHEET 1 of 3	21	P1	0	A	
486/5/7-0293-022	SWITCHBOARD CONSTRUCTION DETAILS - SHEET 2 of 3	22	P1	0	A	
486/5/7-0293-023	SWITCHBOARD CONSTRUCTION DETAILS - SHEET 3 of 3	23	P1	0	A	
486/5/7-0293-024	FIELD INSTRUMENTATION - INSTALLATION DETAILS	24	P1	0	A	
486/5/7-0293-025	RESERVED (CATHODIC PROTECTION UNIT)	25				
486/5/7-0293-026	RESERVED (FIELD DISCONNECTION BOX)	26				
486/5/7-0293-027	SWBD GENERAL ARRANGEMENT ELEVATIONS	27	P1	0	A	
486/5/7-0293-028	SWBD GENERAL ARRANGEMENT SECTIONS	28	P1	0	A	
486/5/7-0293-029	RESERVED (GENERATOR EXTERNAL CONNECTION BOX)	29				
486/5/7-0293-030	SWITCHBOARD SLAB - LOCALITY AND SITE PLANS - SHEET 1 of 3	30	P1	0	A	
486/5/7-0293-031	SWITCHBOARD SLAB AND CONDUIT DETAILS - SHEET 2 of 3	31	P1	0	A	
486/5/7-0293-032	SWITCHBOARD AND ELECTRICAL CONDUIT LAYOUT - SHEET 3 of 3	32	P1	0	A	


STANDARD VARIABLES	
DESCRIPTION	VALUES
CT METERING ISOLATOR	NOT APPLICABLE
NORMAL SUPPLY MAIN SWITCH	125A S250PE/125
GENERATOR SUPPLY MAIN SWITCH	125A S250PE/125
PUMP1 CIRCUIT BREAKER	32A S125G1/32
PUMP2 CIRCUIT BREAKER	32A S125G1/32
DRY WELL SUMP PUMP CIRCUIT BREAKER	NOT APPLICABLE
EM STORAGE DEWATERING PUMP CCT BREAKER	NOT APPLICABLE
PUMP SOFT STARTER SIZE	MCDS-0021B + 17A
PUMP RATING	7.8kW 15A
PUMP LINE CONTACTOR	CA7-30
DRY WELL SUMP PUMP RATING	NOT APPLICABLE
DRY WELL SUMP PUMP CONTACTOR & TOL	NOT APPLICABLE
PUMP SOCKET OUTLET + INCLINE SLEEVE	DS1 311A013972 + 51BA058
PUMP INLET PLUG + HANDLE	DS1 3118013972 + 311A013
WET WELL LEVEL TRANSMITTER	WL52XXA4AMD101X 2m
EMERGENCY STORAGE WELL LEVEL TRANSMITTER	NOT APPLICABLE
EM STORAGE DEWATERING PUMP RATING	NOT APPLICABLE
EM STORAGE DEWATERING PUMP CONTR & TOL	NOT APPLICABLE
FLOWMETER RANGE	NOT APPLICABLE
WET WELL ULTRASONIC LEVEL SENSOR	NOT APPLICABLE
DELIVERY PRESSURE TRANSMITTER	BR52XXCA1FHPMAS L=25 30m
RADIO	DR900-07A02-D0
EMERGENCY PUMPING TIME	16 Bsec
No of SINGLE POINT PROBES	2
INCOMING MAINS SUPPLY CABLE	16mm <sup>2</sup>
MAIN EARTHING CABLE	6mm <sup>2</sup>
INCOMING GENERATOR SUPPLY CABLE	NOT APPLICABLE
SOFT STARTER 3 PHASE SUPPLY	6mm <sup>2</sup>

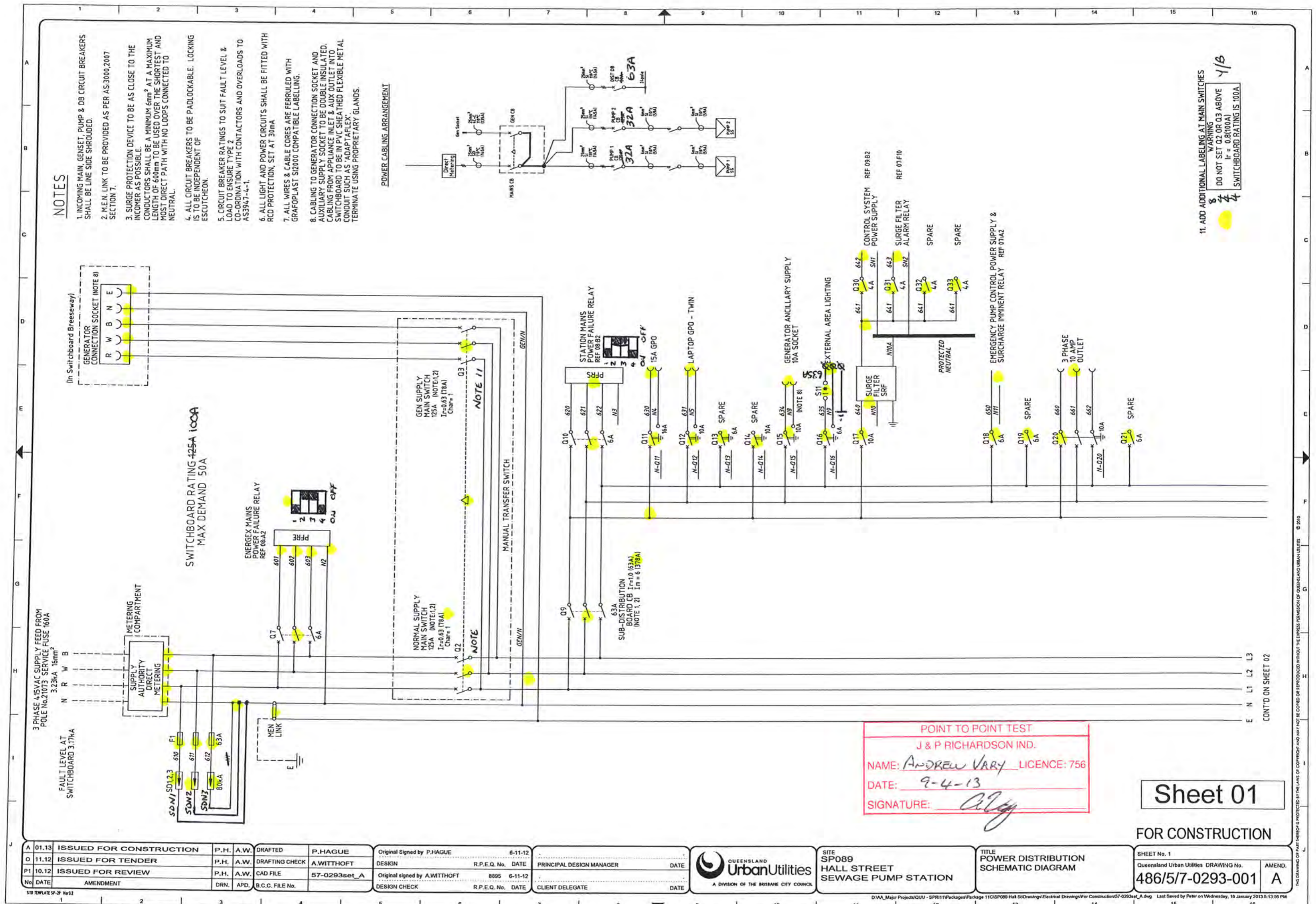
STANDARD DESIGN OPTIONS		
OPTION	DESCRIPTION	FITTED
A	INDIVIDUAL PUMP MOISTURE IN OIL (MIO) SENSOR AND FAULT RELAY	<input checked="" type="checkbox"/> NO
B	INDIVIDUAL PUMP MOTOR AUX PROTECTION SENSORS AND FAULT RELAYS	<input checked="" type="checkbox"/> NO
C	INDIVIDUAL PUMP REFLUX VALVE POSITION SWITCH	<input checked="" type="checkbox"/> NO
D	STATION MANHOLE SURCHARGE IMMINENT	<input checked="" type="checkbox"/> NO
E	STATION DRY WELL SUMP PUMP AND LEVEL INDICATION SENSORS AND RELAYS	<input checked="" type="checkbox"/> NO
F	PERMANENT GENERATOR INSTALLED	<input checked="" type="checkbox"/> NO
G	STATION EMERGENCY STORAGE LEVEL SENSOR & DEWATERING PUMP	<input checked="" type="checkbox"/> NO
H	STATION DELIVERY FLOWMETER	<input checked="" type="checkbox"/> NO
I	BACKUP COMMUNICATION - GSM	YES <input checked="" type="checkbox"/>
J	PUMP CONNECTION (Via De-contactors)	YES <input checked="" type="checkbox"/>
K	CATHODIC PROTECTION	<input checked="" type="checkbox"/> NO
L	MOTOR THERMISTORS (Via De-contactors)	YES <input checked="" type="checkbox"/>
M	ODOUR CONTROL	<input checked="" type="checkbox"/> NO
N	DIRECT CONNECTED METERING	YES <input checked="" type="checkbox"/>
O	PUMPS ELECTRICAL INTERLOCK	<input checked="" type="checkbox"/> NO
P	WET WELL WASHER	<input checked="" type="checkbox"/> NO
Q	AUX PIT SUMP PUMP AND LEVEL PROBE	<input checked="" type="checkbox"/> NO
R	TELEMETRY RADIO	YES <input checked="" type="checkbox"/>
S	WET WELL SECONDARY LEVEL SENSOR	<input checked="" type="checkbox"/> NO
T	WET WELL PRIMARY LEVEL SENSOR (Direct Connected)	YES <input checked="" type="checkbox"/>
U	DELIVERY PRESSURE TRANSMITTER (Direct Connected)	YES <input checked="" type="checkbox"/>
V	CHEMICAL DOSING	<input checked="" type="checkbox"/> NO
W	PUMP START METHOD - SOFT STARTER	YES <input checked="" type="checkbox"/>
X	3rd PUMP INSTALLED	<input checked="" type="checkbox"/> NO
Y	POWER METER	<input checked="" type="checkbox"/> NO

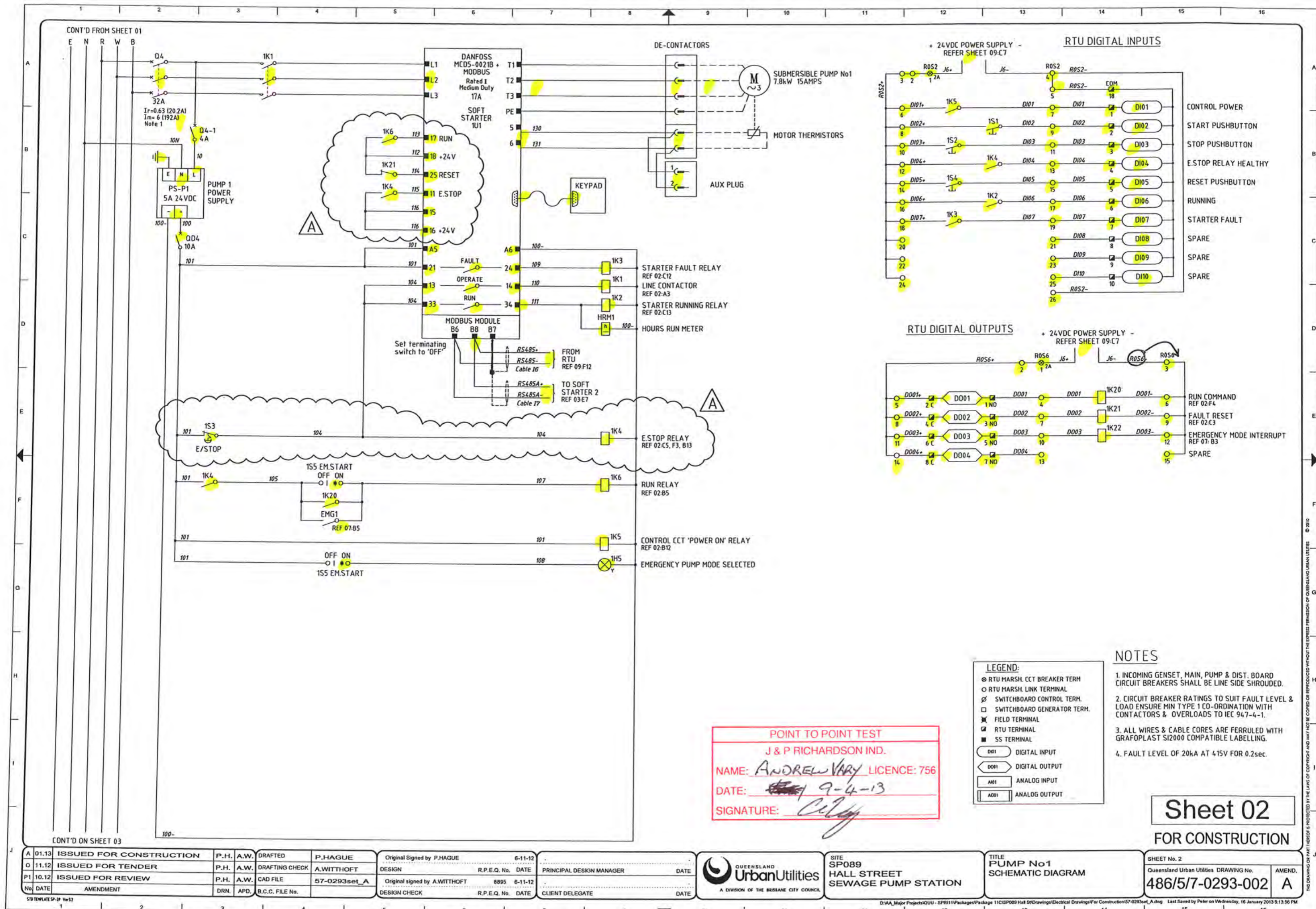
TEST  
"ISSUED FOR CONSTRUCTION" S97  
SIGN R.B. M63000 28/3/13

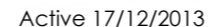
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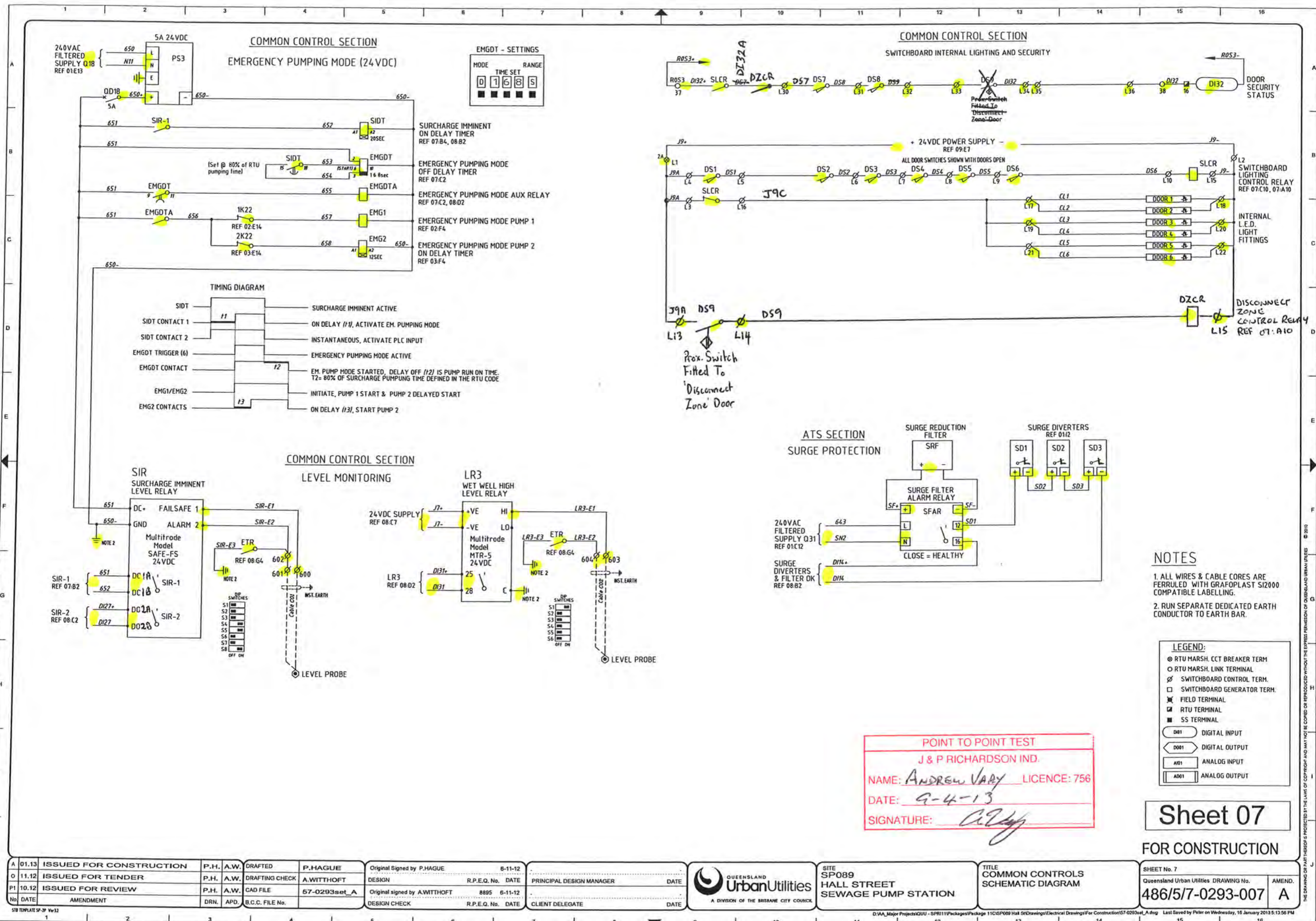
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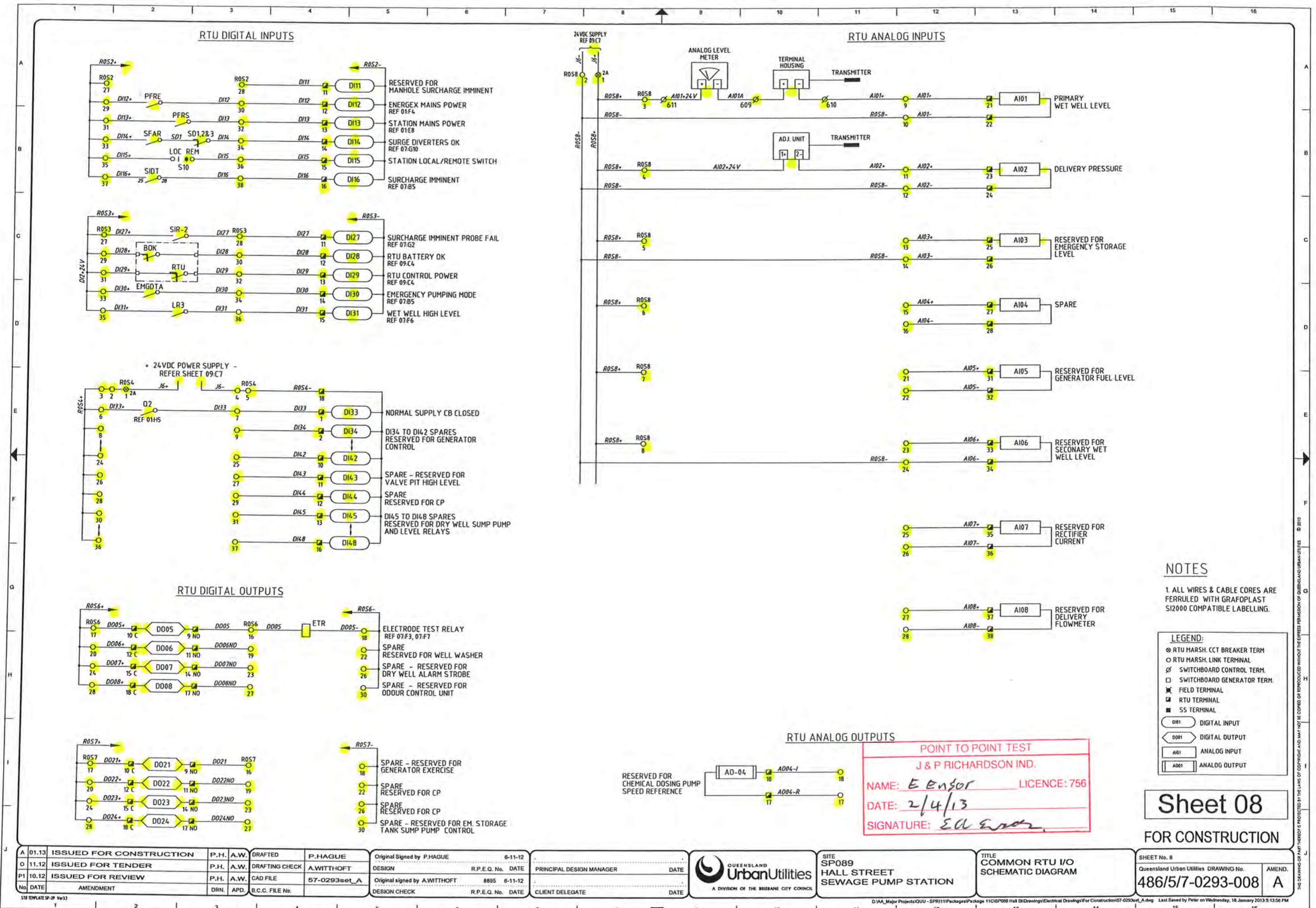
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O	11.12	ISSUED FOR TENDER	P.H.	A.W.	DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No. DATE						PRINCIPAL DESIGN MANAGER	DATE
P1	10.12	ISSUED FOR REVIEW	P.H.	A.W.	CAD FILE	57-0293set_A	Original signed by A.WITTHOFT	8895 6-11-12						CLIENT DELEGATE	DATE
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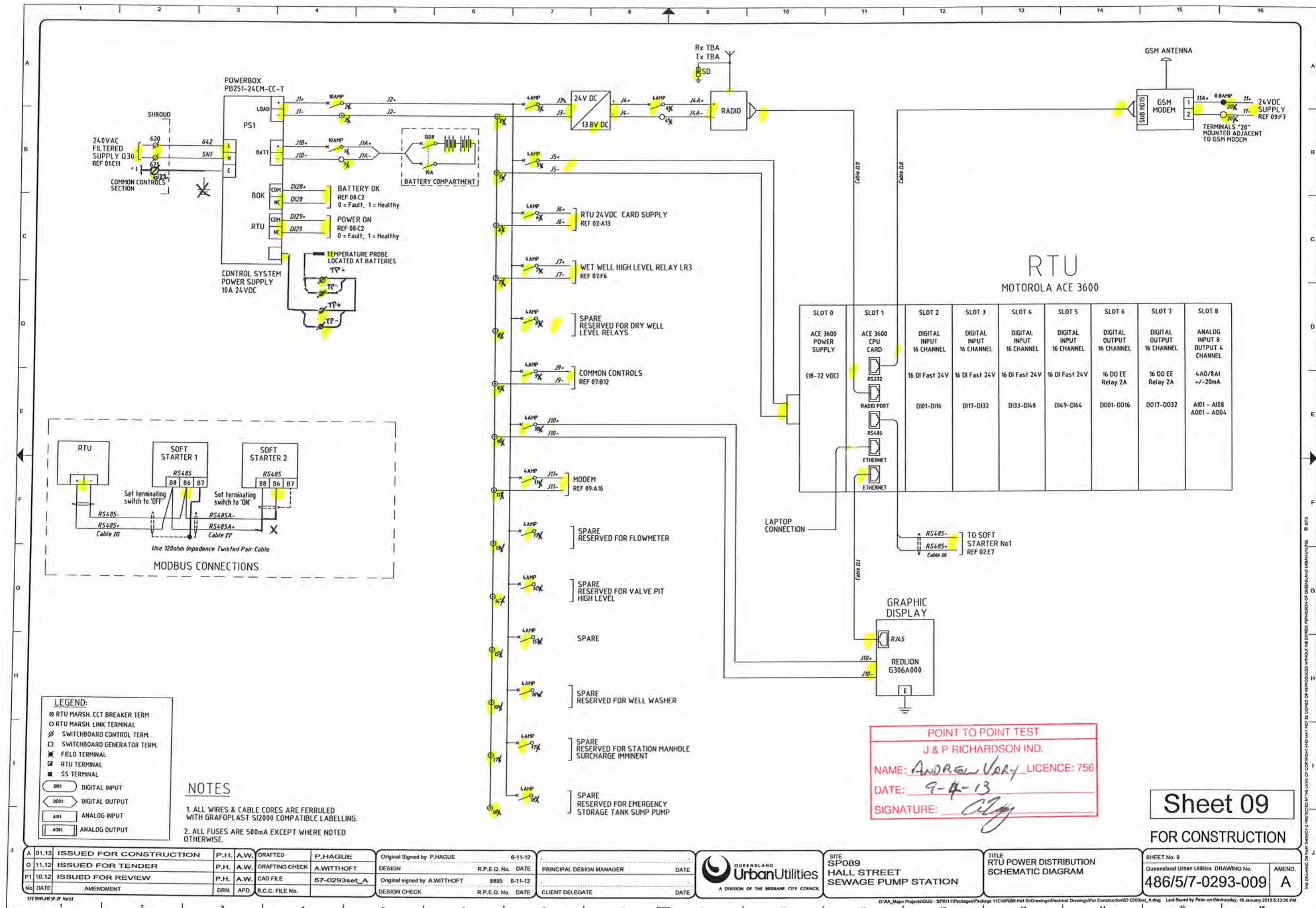


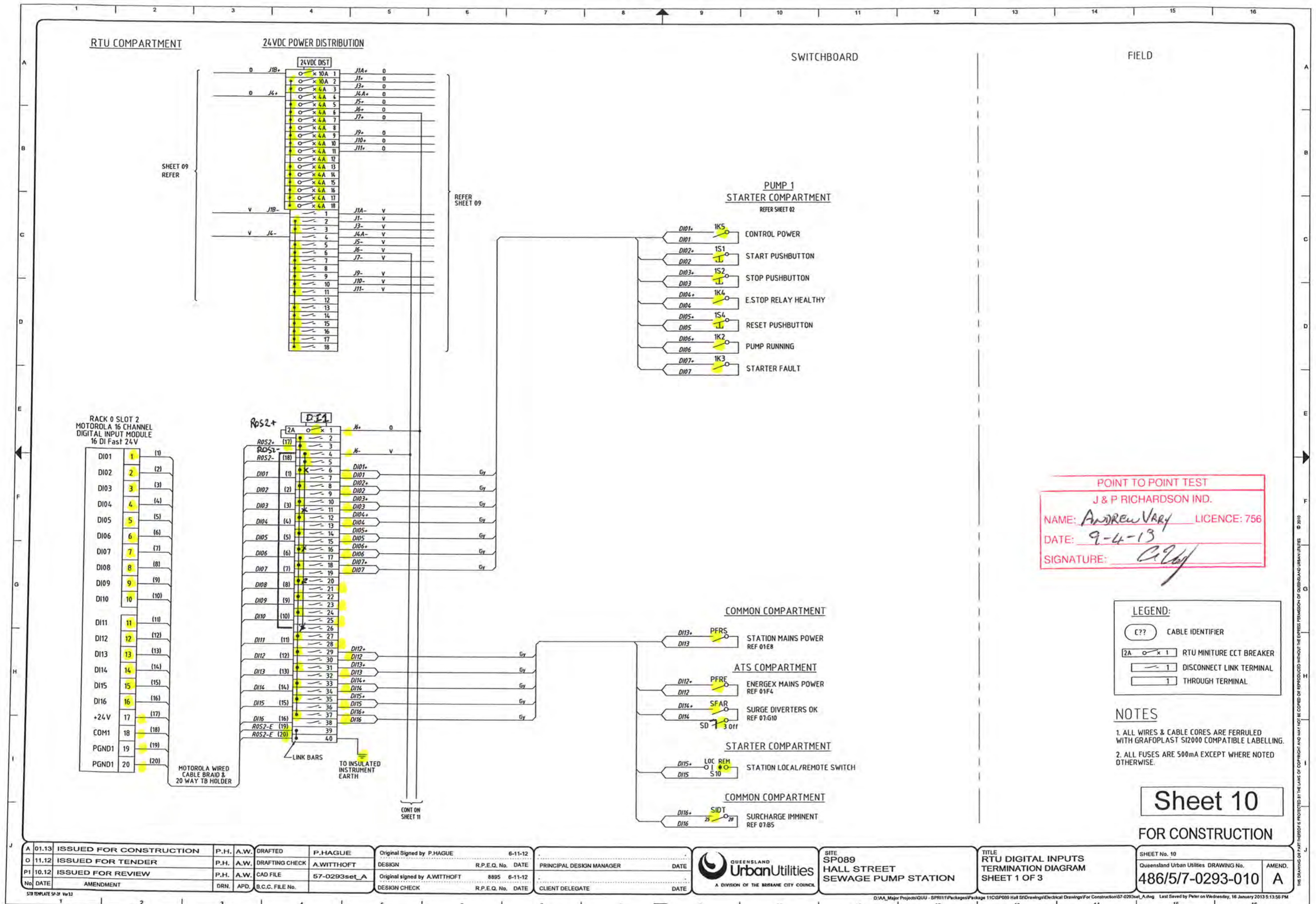


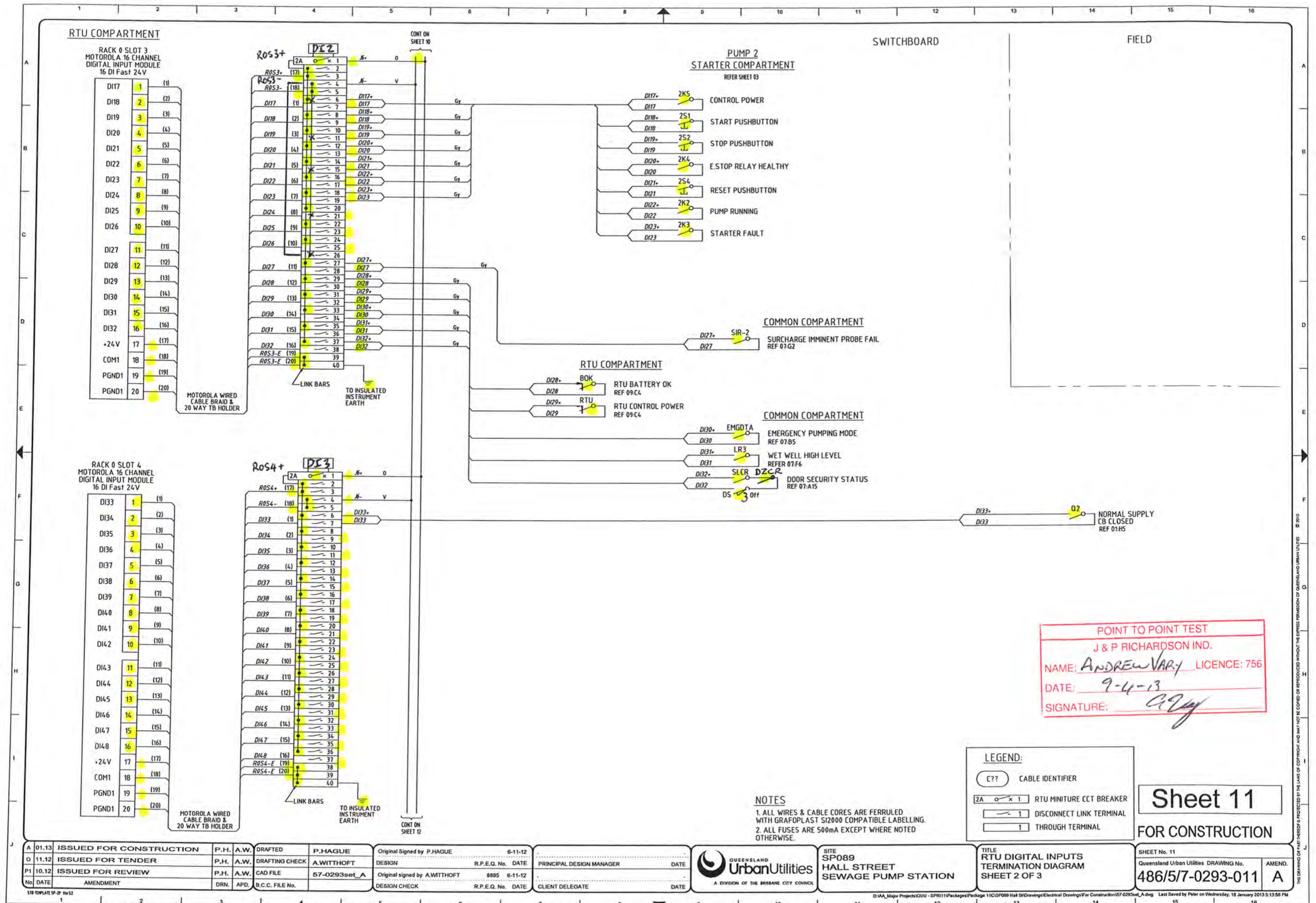


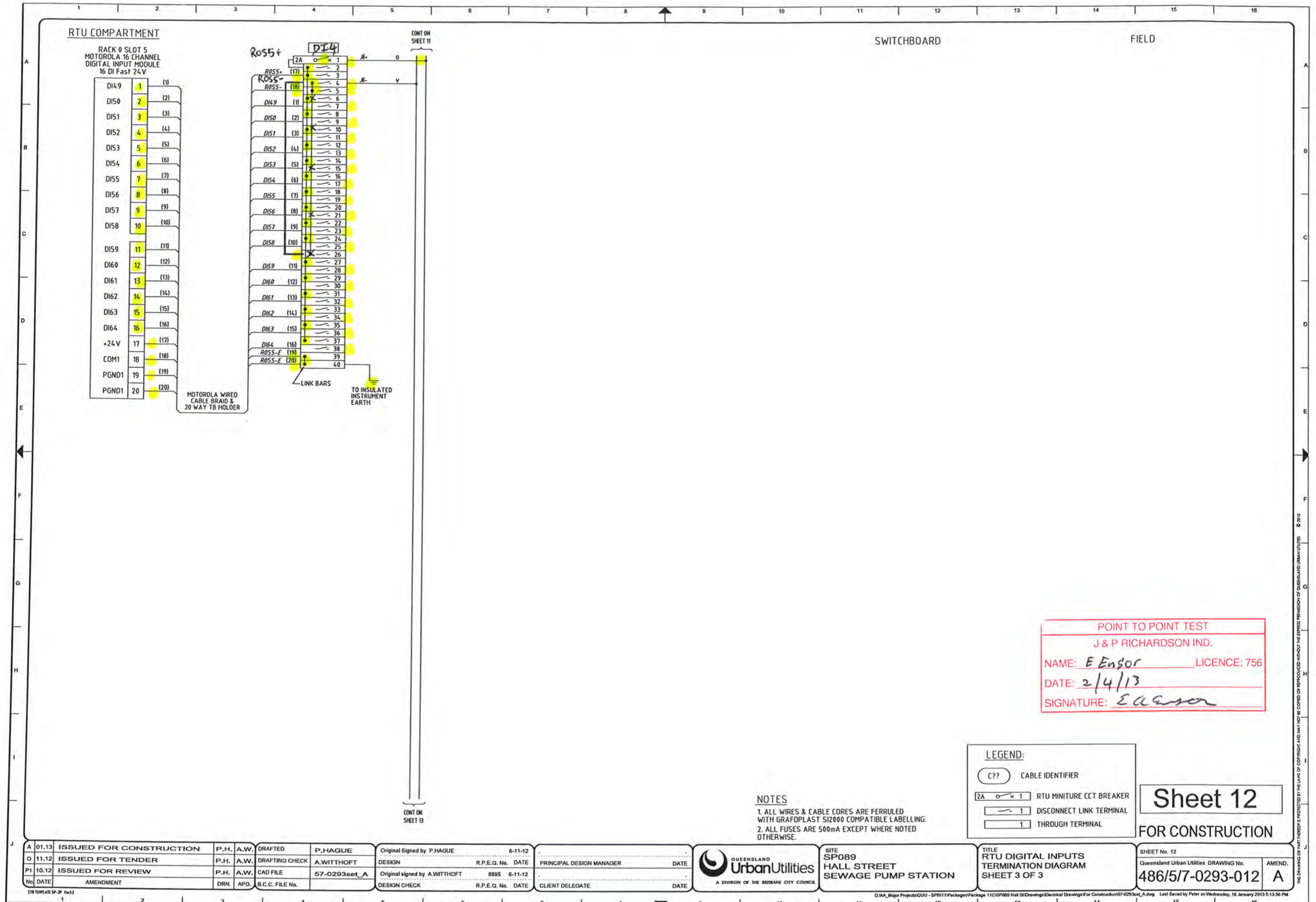


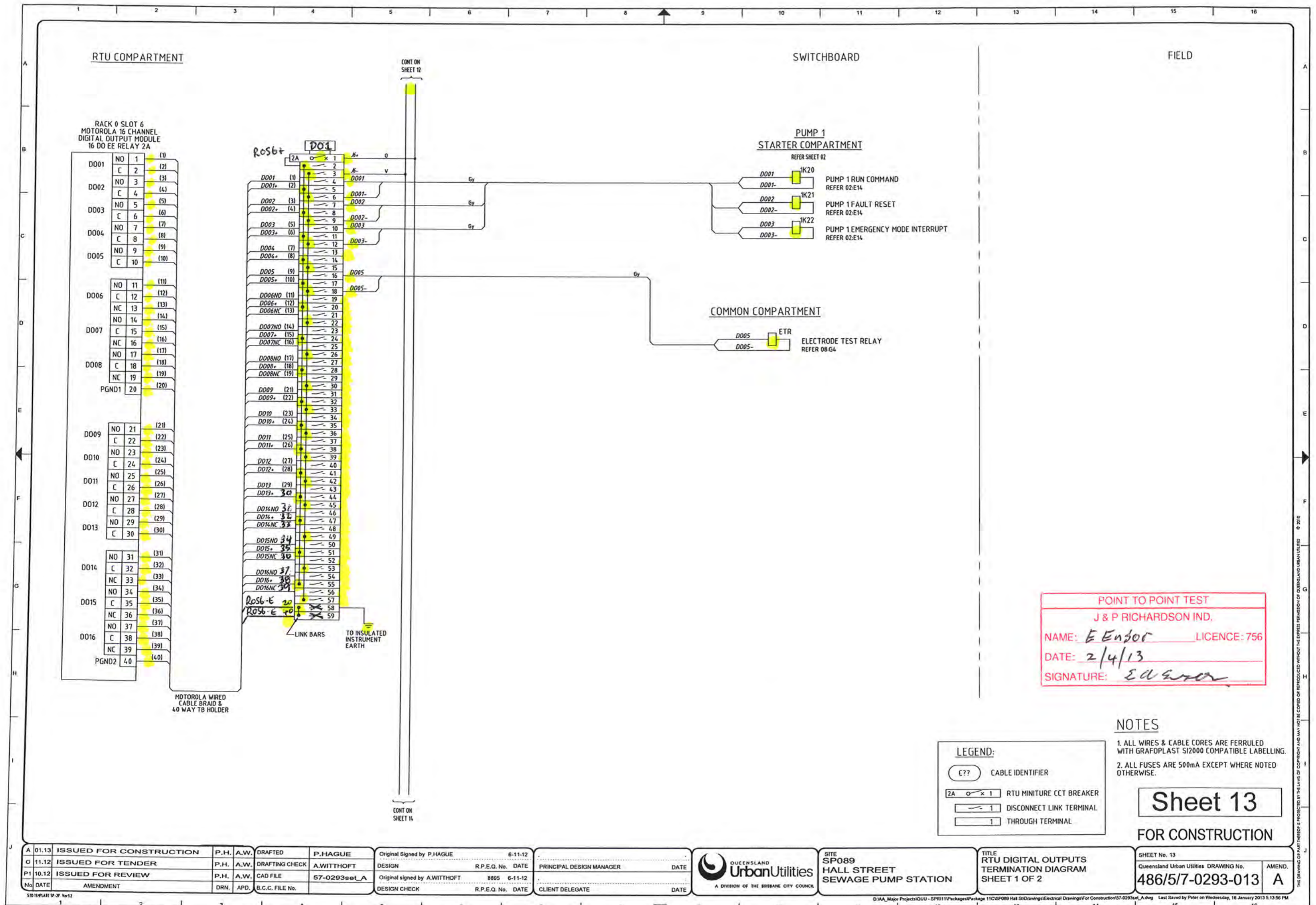


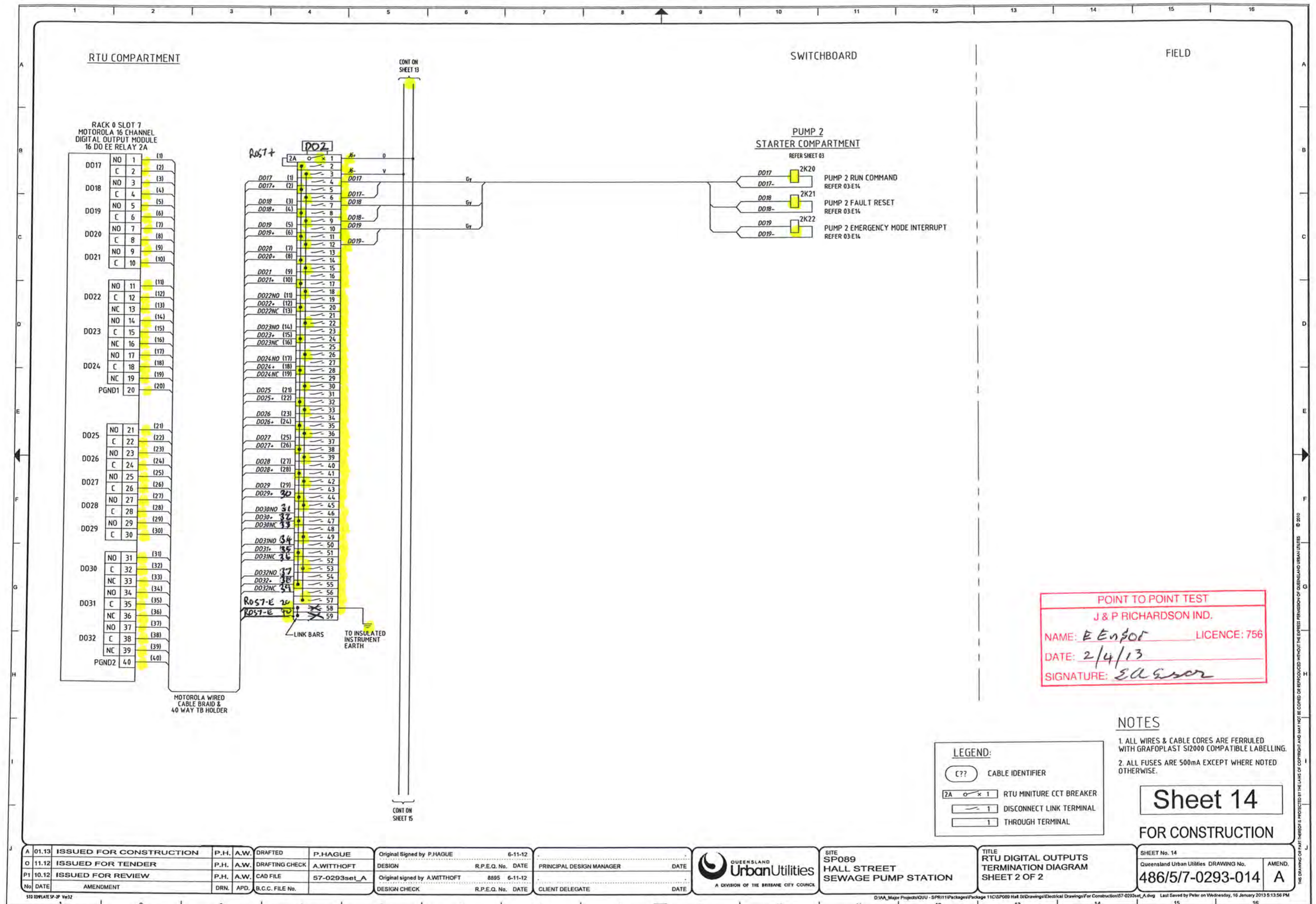


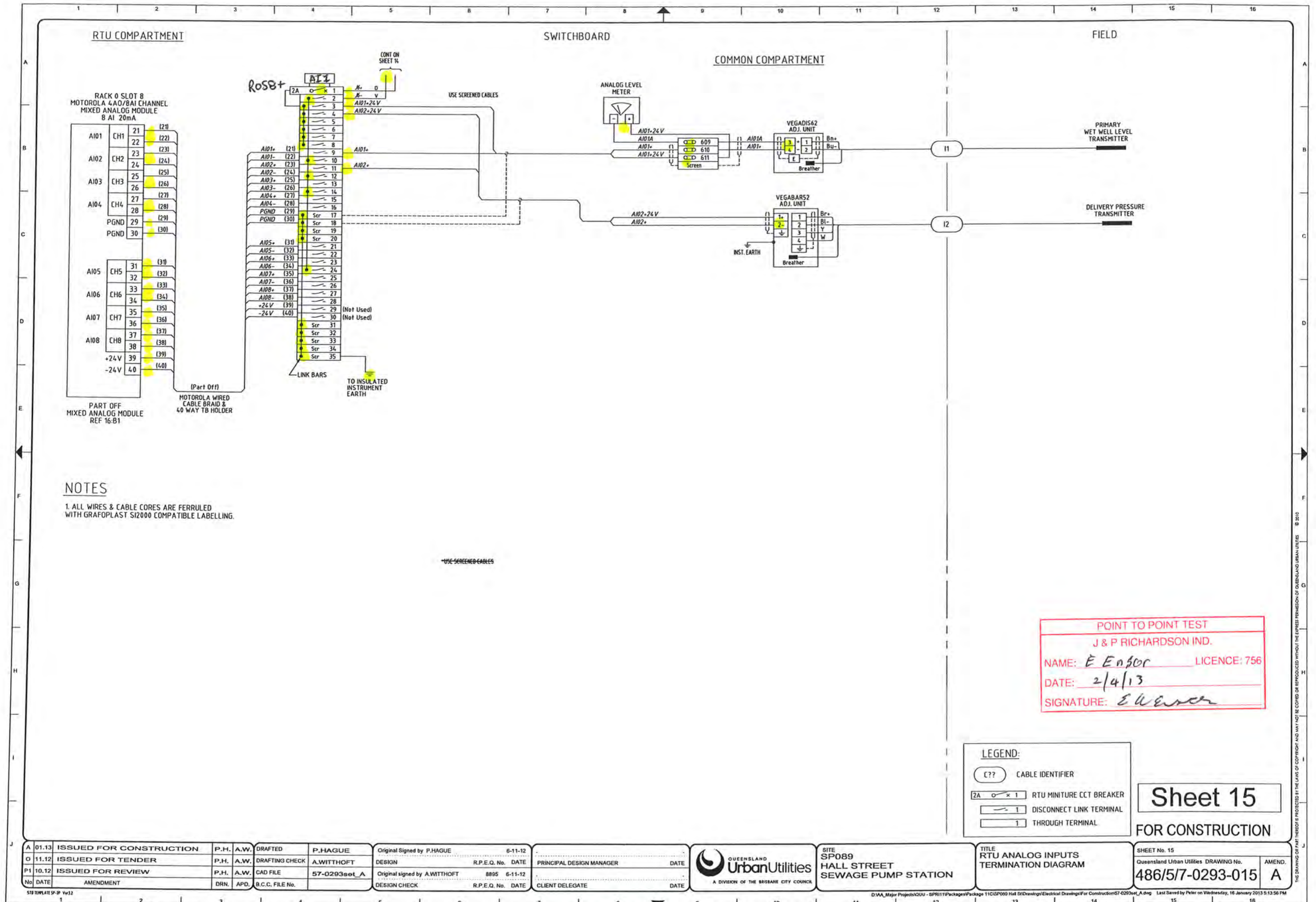


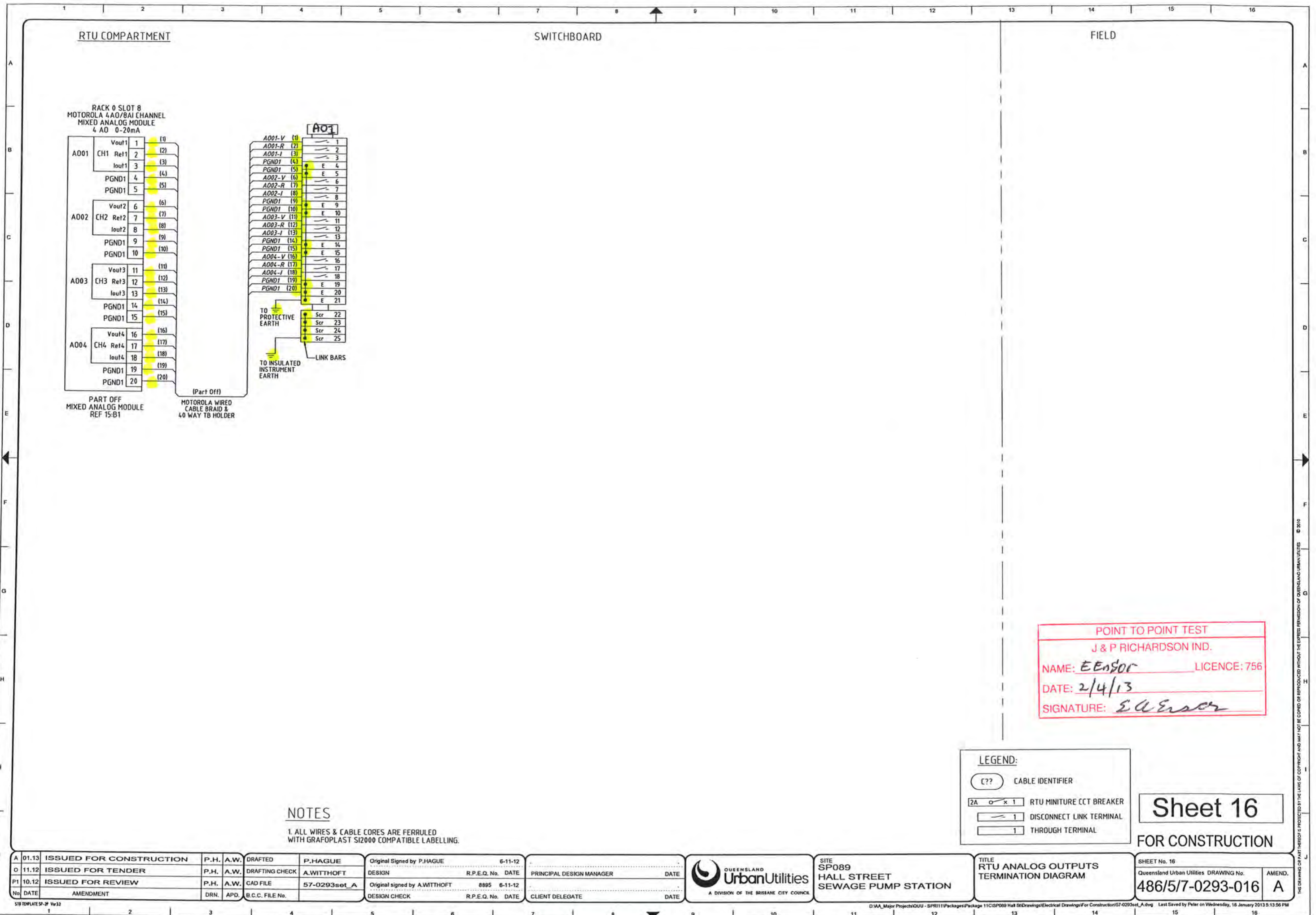


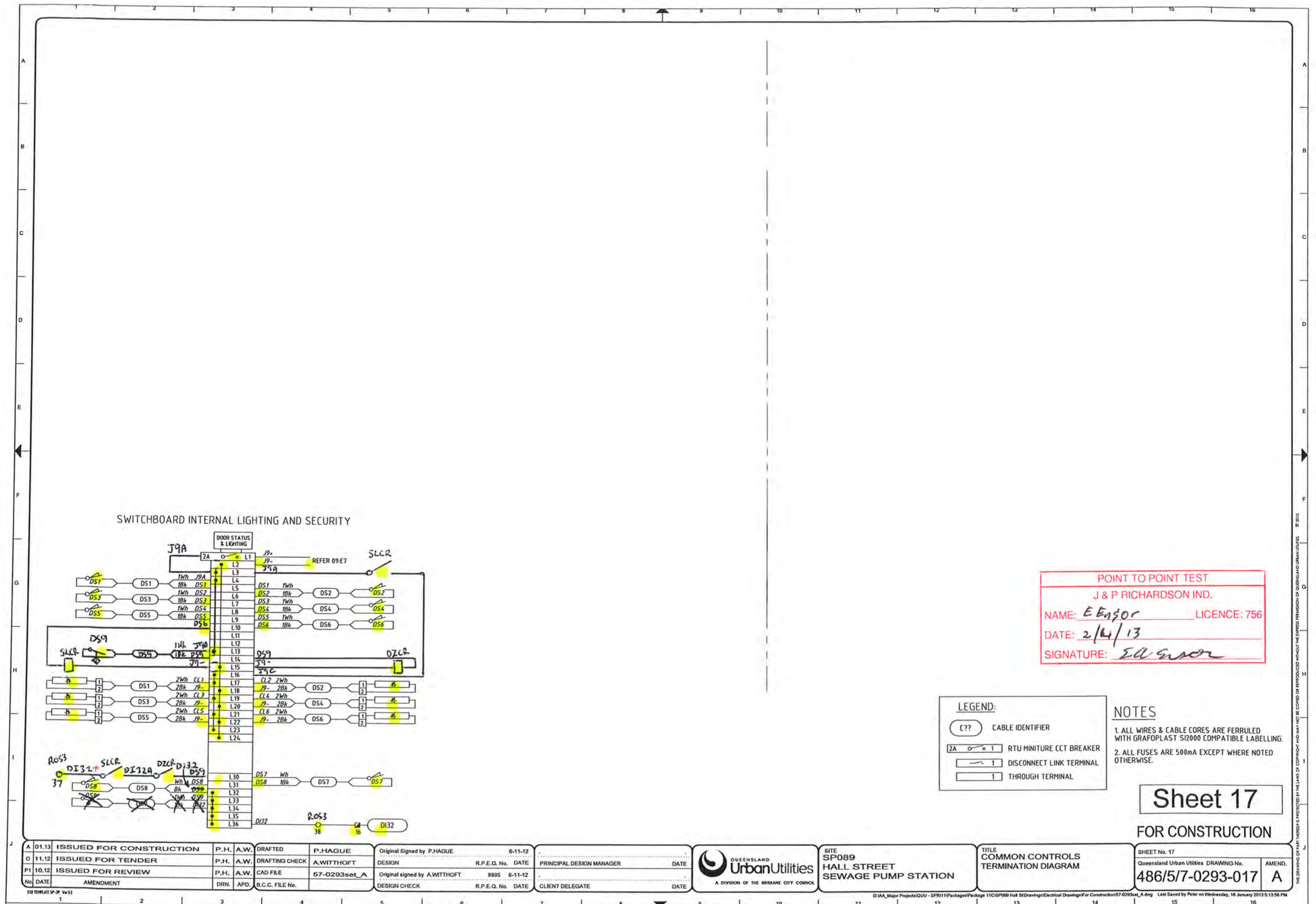












ITEM	QTY	DESCRIPTION	MANUFACTURER	CATALOGUE No	OPT	REMARKS	ITEM	QTY	DESCRIPTION	MANUFACTURER	CATALOGUE No	OPT	REMARKS	ITEM	QTY	DESCRIPTION	MANUFACTURER	CATALOGUE No	OPT	REMARKS
1					N		65	2	SOFT STARTER RUNNING RELAY - K2	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	129					G	
2	1	MANUAL TRANSFER SWITCH	TERASAKI	MTS2PE12533	F	Set Ir=0.63 (78A) Char=1	66	2	STARTER FAULT RELAY - K3	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	130					K	
3		- TO SUIT MAIN SWITCHES Q2 & Q3 S250PE/125	TERASAKI	02 - c/w 3 NO AUX CONTACTS	F		67	2	PUMP EM STOP RELAY - K4	IDEC	RH4B-ULD-DC24V	-	+ SH4B-05	131					S	
4	1	Q4 PUMP1 CIRCUIT BREAKER + T2HS Handle	TERASAKI	S125GJ/32	-	Set Ir=0.63 (20.2A) Im=6 (192A)	68	2	PUMP CONTROL CCT POWER ON RELAY - K5	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	132					H	
5	1	Q5 PUMP2 CIRCUIT BREAKER + T2HS Handle	TERASAKI	S125GJ/32	-	Set Ir=0.63 (20.2A) Im=6 (192A)	69	2	PUMP RUN RELAY - K6	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	133	1	WET WELL LEVEL PROBE	VEGA - VEGAWELLS2	WL52XXA4AM1001X	-	SET RANGE TO = 2m
6					E		70							134	1	WET WELL LEVEL ADJUSTMENT UNIT	VEGA - VEGADIS62	DIS62XXKMAXX	-	
7	1	Q7 ENERGEX PHASE FAILURE CIRCUIT BREAKER	TERASAKI	DTCB15306C	-		71							135					G	
8					G		72							136					-	
9	1	Q9 SUB-DISTRIBUTION BOARD CIRCUIT BREAKER	TERASAKI	S125MJ/63	-	Set Ir=1.0 (63A) Im=6 (378A)	73	2	PUMP RUN COMMAND RELAY - K20	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	137	1	DELIVERY PRESSURE TRANSMITTER	VEGA VEGABARS2	BR52XXCA1FHPHAS L-Z5	U	RANGE = 30m
10	1	Q10 STATION MAINS PHASE FAILURE CIRCUIT BREAKER	TERASAKI	DTCB6306C	-		74	2	PUMP FAULT RESET RELAY - K21	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	138	1	TRICLOVE FITTING FOR VEGABARS2	VEGA	ADAPTOR	U	
11	1	Q11 15A GPO CIRCUIT BREAKER	TERASAKI	DSRCBH-16-30A	-		75	2	PUMP EMERGENCY MODE INTERRUPT RELAY - K22	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	139	1	CONTROL SYSTEM POWER SUPPLY 24VDC	POWERBOX	PB251A-24CH-CC-T-S	-	
12	1	Q12 RTU LAPTOP GPO CIRCUIT BREAKER	TERASAKI	DSRCBH-10-30A	-		76							140	1	RADIO 24V/13.8VDC CONVERTER	POWERBOX	PBM-2412J-CC	R	
13	1	Q13 SPARE	TERASAKI	DSRCBH-6-30A	E		77	2	PUMP START PUSHBUTTON - S1	SPRECHER & SCHUH	07P-F3-PX10	-		141					I	
14	1	Q14 SPARE	TERASAKI	DSRCBH-10-30A	E		78	2	PUMP STOP PUSHBUTTON - S2	SPRECHER & SCHUH	07P-F4-PX10	-		142	2	BATTERIES - INCLUDING SPILL TRAYS	YUASA	UXH50-12	-	
15	1	Q15 GENERATOR AUXILIARY SUPPLY CIRCUIT BREAKER	TERASAKI	DSRCBH-10-30A	-		79	2	PUMP EM/STOP PUSHBUTTON - S3	SPRECHER & SCHUH	07P-MT34-PX01S	-	c/w 07-15YE112 + PX01S	143	1	RADIO	TRIO	DR900-07A02-000	R	
16	1	Q16 EXTERNAL AREA LIGHTING CIRCUIT BREAKER	TERASAKI	DSRCBH-6-30A	Y		80	2	PUMP RESET PUSHBUTTON - S4	SPRECHER & SCHUH	07P-F6-PX10	-		144	1	RADIO ANTENNA	TRIO	YAGI ANT13AL	R	15 ELEMENT 13dB ALUM
17	1	Q17 SURGE FILTER CIRCUIT BREAKER	TERASAKI	DTCB6100C	-		81	2	PUMP HOUR RUN METER - HRM	NHP	RQ4801800VDC	-	24VDC	145	1	RADIO COAX SURGE PROTECTION UNIT	POLYPHASER CORPORATION	IS-50NX-C2	R	Mounted on Din Rail
18	1	Q18 EM PUMP CTRL & SURCHARGE IMMINENT CB	TERASAKI	DTCB6106C	-		82	2	PUMP POWER SOCKET OUTLET + INCLINE SLEEVE	MARECHAL	DS13114013972 + S1BA058	J		146	1	TELEMETRY UNIT	MOTOROLA	ACE - 3600	-	
19	1	Q19 SPARE CIRCUIT BREAKER	TERASAKI	DTCB6106C	K		83	2	PUMP POWER INLET PLUG + HANDLE	MARECHAL	DS13118013972 + 311A013	J		147	1	GSM MODEM	WAVECOM	FASTTRACK Supreme	I	c/w 5 M Cable
20	1	Q20 3 PHASE OUTLET CIRCUIT BREAKER	TERASAKI	DTCB6310C	-	PLUS DSRCBH-32-30-3PN	84	2	PUMP CONTROL SOCKET OUTLET + INCLINE SLEEVE	MARECHAL	PN7C 01P4060 + 01NA053	J		148	1	GSM CELLULAR TRANSIT ANTENNA	RF INDUSTRIES	TLA2000	I	
21	1	Q21 SPARE	TERASAKI	DTCB6106C	Q		85	2	PUMP CONTROL INLET PLUG + HANDLE	MARECHAL	PN7C 01P4060 + 01NA313	J		150	1	GRAPHIC DISPLAY	REDLION	G306A000		
22							86							151						
23					V		87							152					R	
24	1	Q30 RTU POWER SUPPLY CIRCUIT BREAKER	TERASAKI	DTCB6104C	-		88							153						
25	1	Q31 SURGE FILTER ALARM RELAY CIRCUIT BREAKER	TERASAKI	DTCB6104C	-		89							154	1	INTERNAL COAX CABLE (Radio to Lightning Arrester)	TRIO	TRIO - SHAM/NM/TL23	R	Cable No X01
26	1	Q32 SPARE	TERASAKI	DTCB6104C	H		90							155	1	EXTERNAL COAX CABLE (Lightning Arrester to Aerial)	R.F. INDUSTRIES	ANDREW - CNT400	R	Cable No X02
27	1	Q33 SPARE	TERASAKI	DTCB6104C	-		91							156	2	COAX PLUG (For CNT400 cable)	PULSE	N-203HS	R	Straight cable plug crimp
28							92							157	1	U CLAMPS	R.F. INDUSTRIES	UNV	R	
29							93	1	LR3- WET WELL HIGH LEVEL RELAY	MULTITRODE	MTR-5	-	24VDC	158	1	MINIATURE THERMAL CIRCUIT BREAKER	PHOENIX CONTACT	TCP x'A + UK6FS1/C	-	'x' = AMP Rating
30							94							159	1	THROUGH TERMINALS (Grey & Blue as Required)	PHOENIX CONTACT	PIT 2.5	-	PIT 2.5-BU (for -ve)
31	2	PUMP 240VAC CONTROL CIRCUIT BREAKER	TERASAKI	DTCB6104C	-	Q4-1, Q5-1	95							160	1	DISCONNECT TERMINALS (Grey & Blue as Required)	PHOENIX CONTACT	PIT 2.5-MT	-	PIT 2.5-MT-BU (for -ve)
32	3	24VDC CONTROL CIRCUIT BREAKER	TERASAKI	DTCB6100C	-	Q04, Q05, Q018	96	1	SIR - SURCHARGE IMMINENT LEVEL RELAY	MULTITRODE	MTRA-FS	-	24VDC	161	1	GROUP MARKER CARRIER	PHOENIX CONTACT	UBE	-	
33	1	BATTERY SHORT CCT PROTECTION CIRCUIT BREAKER	TERASAKI	DTCB6210C	-	Q08	97	1	EMERGENCY PUMPING MODE RELAY PUMP1 - EMG1	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	162	1	PLUG-IN BRIDGE	PHOENIX CONTACT	FBS - 50	-	AS REQUIRED
34	3	240VAC-24VDC POWER SUPPLY	WIEDMULLER	8951340000	-	120W 5A/24VDC	98	1	SURCHARGE IMMINENT DELAY TIMER - S0T	SPRECHER & SCHUH	RZ7-FSA 4U U23	-	ON DELAY / INSTANTANEOUS	163	2	TEST PLUG	PHOENIX CONTACT	PS-5	-	
35							99	1	EMERGENCY PUMPING MODE TIMER - EMGDT	OMRON	H3CA-A (+ P2CF-11)	-	(+ Y92A-48B) OFF DELAY	164	1	COVER PROFILE (SHROUDED) + CARRIER PLATE	PHOENIX CONTACT	AP-2 + AP2-TU	-	AS REQUIRED
36	1	DISTRIBUTION BOARD CHASSIS	TERASAKI	NCM-2-24/18-3U	-		100	1	EMERGENCY PUMPING MODE TIMER PUMP2 - EMG2	SPRECHER & SCHUH	RZ7-FSA 3E U23	-	ON DELAY	165						
37	3	F1 - SURGE DIVERter CIRCUIT FUSES	NHP	63AMP 63MS	-	FUSES & HOLDERS	101	2	EMERGENCY PUMPING MODE SWITCH & LIGHT - SS/H5	SPRECHER & SCHUH	07P-LSM25 + 07-NM/10W	-	+ 07-X10 (2), ENGRAVE 'OFF ON'	166						
38	3	SURGE DIVERter	CRITEC	TDS1100-25R-277	-		102	1	EMERGENCY PUMPING MODE AUX RELAY - EMGDTA	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	167						
39	1	SURGE FILTER ALARM RELAY - SFAR	CRITEC	DAR-275V	-		103							168	1	ENERGEX PADLOCK - 45mm brass pin tumbler	H.A. REED LOCKSMITHS	KEY No 325 & S/S Shackle	-	c/w 2 KEYS
40	1	SURGE REDUCTION FILTER - SRF	CRITEC	TDF-10A-240V	-		104							169						
41	1	ENERGEX MAINS PHASE FAILURE RELAY - PFRE	CARLO GAVAZZI	DPB0CM48W4	-		105							170						
42							106							171						
43	1	STATION MAINS PHASE FAILURE RELAY - PFRS	CARLO GAVAZZI	DPB0CM48W4	-		107							172	1	WET WELL CONDUIT END CAPS c/w NYLON CABLE GLANDS	HD PVC	TO SUIT CONDUITS		Detail 'W'
44							108							173	1	S/STEEL FITTINGS AS DETAILED FOR PRESSURE TX	FITTINGS	STAINLESS STEEL	U	Sheet 24
45	1	MAIN NEUTRAL LINK	DORE DBLREC	DLAHS 165E12	-	INSULATED c/w EFFECT	109							174	1	EARTH ROD CONNECTION BOX	NESCO	ERB1	-	
46	1	MAIN EARTH LINK	DORE DBLREC	DLAHS 165E12	-		110							175	1	LINE TAP - BONDING TO EARTHING ROD	CLIPSAL	BP26	-	
47	1	DIST. BD NEUTRAL LINK	DORE DBLREC	DLAHS 165E24	-	INSULATED c/w EFFECT	111							176	1	EARTHING ROD	COPPER ROD	13mm Diameter	-	
48	1	DIST. BD EARTH LINK	DORE DBLREC	DLAHS 165E24	-		112							177						
49	+	SURGE DIVERter NEUTRAL LINK	CLIPSAL	LSK	-	INSULATED	113							178						
50	1	INSTRUMENT EARTH LINK	CLIPSAL	DLBER L12	-	INSULATED	114							179						
51	1	FILTERED SUPPLY NEUTRAL LINK	CLIPSAL	L7	-	INSULATED	115	2	SW/BD LIGHTING CONTROL RELAY - SLCR, DZC2	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05	180						
52	1	3 PHASE SWITCHED OUTLET	CLIPSAL	56C410	-	USE ENCLOSURE AS SHROUD	116	1	AREA LIGHTING CONTROL SWITCH - S11	KRAUS & NAIMER	CAD11-AP20-600-F72-F758	-	ENGRAVE 'OFF ON'	181						
53	1	1 PHASE OUTLET 15A	CLIPSAL	15/15-90B (SHROUD)	-		117							182						
54	1	LAPTOP GPO - TWIN 10A	CLIPSAL	25-449A-449AP	-		118	1	STATION LOCAL/REMOTE SWITCH - S10	KRAUS & NAIMER	CAD11-AP20-600-F72-F758	-	ENGRAVE 'LOCAL REMOTE'	183						
55	1	1 PHASE OUTLET - GENERATOR AUXILIARY POWER	CLIPSAL	56S0310	F	IP56	119	1	ELECTRODES TEST RELAY - ETR	IDEC	RH4B-ULD-DC24V	-	+ SH4B-05	184						
56	1	3 PHASE N/E APPLIANCE INLET - GENERATOR POWER	HEWLETT	HEW361	F	c/w PROTECTIVE CAP 40787	120							185						
57							121	1	WET WELL LEVEL INDICATOR	CROMPTON INSTRUMENTS	244-01HG-HG-IP-SR 4-20mA	-	0-100% ADJ RED POINTER	186						
58							122							187	2	SINGLE POINT PROBES	MULTITRODE	2 off - 020130FSP-Shield	-	
59	2	PUMP SOFT STARTER	DANFOSS MCD500	MC05-00210 + MODBUS COMMS	-	175G5500 + 175G9000	123	8	SW/BD DOOR MICRO SWITCHES - SINGLE POLE	OMRON	Z-15GW2 55 B	-	8 OFF N/O	188						
60	2	EXTERNAL KEYPAD KIT	DANFOSS	175G3061	-		124	1	SW/BD DISCONNECT COMPART DOOR PROXIMITY SWITCH	PEPPERL & FUCHS	NCB5-18GM40-20	-		189						
61							125	6	SW/BD INTERNAL LED LIGHTS	LUMIFA	LFIB-C35-2THMW4	-		190						
62							126							191	1	EXTERIOR AREA LIGHT	STRATEGIC LIGHTING	ECLIPSE - T5 2x80W	J	High Impact Resistant
63							127							192	4	CORROSION INHIBITOR	CORTEC	VPCI-110 OR 111	-	FROM AP CONTROLS
64	2	PUMP LINE CONTACTOR - K1 (24VDC COIL)	SPRECHER & SCHUH	CA7-30	-	24VDC COIL	128													

Sheet 18  
FOR CONSTRUCTION

01.13	ISSUED FOR CONSTRUCTION	P.H.	A.W.	DRAFTED	P.HAGUE	Original Signed by P.HAGUE	6-11-12
01.12	ISSUED FOR TENDER	P.H.	A.W.	DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No. DATE
01.10	ISSUED FOR REVIEW	P.H.	A.W.	CAD FILE	57-0293set A	Original signed by A.WITTHOFT	8895 6-11-12
No	DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No.	DESIGN CHECK	R.P.E.Q. No. DATE



SITE  
SP089  
HALL STREET  
SEWAGE PUMP STATION

TITLE  
EQUIPMENT LIST

SHEET No. 18  
Queensland Urban Utilities DRAWING No.  
486/5/7-0293-018  
AMEND. A

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<h1 style="margin: 0;">Sheet 19</h1>
<h2 style="margin: 0;">FOR CONSTRUCTION</h2>
SHEET No. 19
Queensland Urban Utilities DRAWING No.
486/5/7-0293-019
AMEND A

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**CONSTRUCTION - EXTERNAL SWITCHBOARD**

Cubicle construction 30x40 Marine grade Aluminium (5251).  
Plinth construction 75x60 channel 6061 T6 Grade Aluminium.  
Folded, "Pulse MIG" & "TIG" welded with all visible seams & joints fully welded, free from splatter and ground smooth where needed.  
External doors and covers fitted with Emka 1011-207 self grip seal.  
Stainless Steel "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. Fit dedicated earth stud adjacent main earth bar for switchboard earth.  
Door stiffeners, door stays, cable straps, and document holders etc fitted where shown on the drawings.  
Door stay arms to be S/Steel and of sufficient strength to prevent being deformed when subjected to reasonable loads. Minimum 3mm S/Steel.  
Lift-off covers and mounting panels fixed with M8 studs & stainless steel dome nuts.  
Gland plates manufactured from 3mm aluminium, unless otherwise shown.  
Inspection/Access plates manufactured from 3mm aluminium.  
Gland/Inspection/Access plate openings fitted with M6x1.0 flat head closed end rivet nuts. (Detail F)  
Cable glands to be fitted with compression side installed within cubicle. (Detail G)  
Gland/Inspection/Access plates to be fitted with seals attached to cubicle.  
Gland/Inspection/Access plate fixings at 100mm.  
Gland/Inspection/Access plates to maintain a 50mm clearance from section dividers.  
Gland/Inspection/Access plates are NOT to be split.  
Inspection/Access plates are NOT to be earthed.  
Provide Shrouding to all live parts to IP20 where required.  
Hinges (external) Selectrix HIB650ss-316. Stainless steel.  
Star washers fitted under all hinge screws.  
Hinged escutcheons fixed with Emka 1/4 turn 1000-U142.  
All equipment to be removable via front access.  
Install switchboard with non-hydroscopic material between plinth and concrete slab. (Detail E1)  
All escutcheons to open a minimum of 90°  
All sheet metal edging to be de-burred.

**Locks Doors 1 - 6 & 8**

DORE ELECTRICS - Swing Handle SHKSS Universal Locking - 92268  
DORE ELECTRICS - 3 point lock rod set - TLR24  
Half Profile Cylinder  
Key Codes RC496A, RC496AB, RC496ABC refer to each door for clarification.

**Locks Door 9**

DORE ELECTRICS - Swing Handle SHKSS Universal Locking - 92268  
DORE ELECTRICS - 3 point lock rod set - TLR22SS (all S/Steel)  
Lockwood Barrel Lock, Key Code RC496AB

**Locks Door 7**

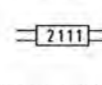
DORE ELECTRICS - Swing Handle SHPSS Padlockable - 316  
DORE ELECTRICS - 3 point lock rod set - TLR24  
ENERGEX padlock, S/Steel Shackles, 45mm brass pin tumbler.  
Energen Key No325. c/w 2 keys.

**OPERATING PARAMETERS**

Standard	AS 3439.1
Current & Frequency	AC 50Hz
Rated Operational Voltage Ue	415 VAC
Rated Insulation Voltage Ui	660 V
Rated Auxiliary Voltage	240 VAC / 24 VDC
Rated Current (Main Bus)	100 - 300 AMPS
Short Circuit Current Isc	20 kA
Duration of Isc	2 sec
Degree of Protection	IP 56 to AS 1939
Measure of Protection by barriers and enclosures.	
Service Conditions	Outdoors
Mass	Not exceeding 2000kg
Forms of Segregation	Form 3 (DB SECTION FORM 1)

**WIRING - Control**

All wiring to be PVC V90 HT 0.6/1kV Grade with tinned conductor.  
Control and instrumentation wiring has flexible copper conductors, and is colour coded as detailed below, each individual wire shall be numbered each end, and terminated by the use of appropriate pre-insulated crimp lugs or pins.  
Separate lugs or pins shall be used for each conductor. A proprietary double pin lug may be used to terminate two conductors.  
Use proprietary bridging links when required to common up terminals.  
Not more than two wires shall be connected to any terminal.  
Not more than one wire shall be connected on one side of any tunnel type terminal.  
Where multiple connections are required on tunnel terminals, proprietary terminal link bars shall be used.  
Power wiring to be minimum 2.5sqmm stranded copper conductors, phase colour coded as detailed below.  
Control wiring to be minimum 1.0sqmm flexible copper conductors, colour coded as detailed below.  
Low level control signals to be minimum 0.5sqmm flexible copper conductors, colour coded as detailed below.  
Wiring between RTU terminals & RTU disconnect plugs to be multicore cable with 0.5sqmm flexible copper conductors.  
4-20mA analog signals (internal & external) wired in shielded pair minimum size 0.5sqmm, and earthed at one end only. (Switchboard end for external signals)  
All 240VAC wiring in the RTU or PLC sections shall be double insulated and all terminals shall be shrouded and labelled- "Danger 240VAC"  
Earth cables minimum 2.5sqmm flexible.  
Doors and hinged escutcheons bonded with flexible tinned copper braiding B/Wire.  
Disconnection zone door to be bonded with flexible copper B/Wire. Heat shrink at lugs.  
Switchboard to have dedicated earthing cable bonding directly to main earth bar.  
Ensure minimum clearance of 100mm is maintained between cable ducting & gland plates.  
Wire numbering will be equal to Grafoplast SI2000 system.  
Terminal strips to be mounted 30mm off equipment panel to aid termination.  
Wire numbers are readable left to right, bottom to top as shown.



Supply spare RTU fuse terminal fuses separately 2x10A, 2x5A 4x2A, 6x5A  
All cable glands to be Stainless Steel type.

**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	1.0sqmm
240 VAC Neutral	Black	1.0sqmm
Extra Low VDC Positive supplies	Orange	1.0sqmm
Extra Low VDC Negative supplies	Violet	1.0sqmm
General Extra Low VDC Wiring	Grey	1.0sqmm
RTU & PLC Wiring	Grey	0.5sqmm
Electrode Wiring	Salmon	1.0sqmm
Intrinsically safe wiring	Light Blue	1.5sqmm
Earth	Green/Yellow	2.5sqmm (min)
Door & Escutcheon Earth Bonds	Green/Yellow	4 sqmm

Instrument Shield Earth Green/Yellow 1.5sqmm (min)

**PAINTING**

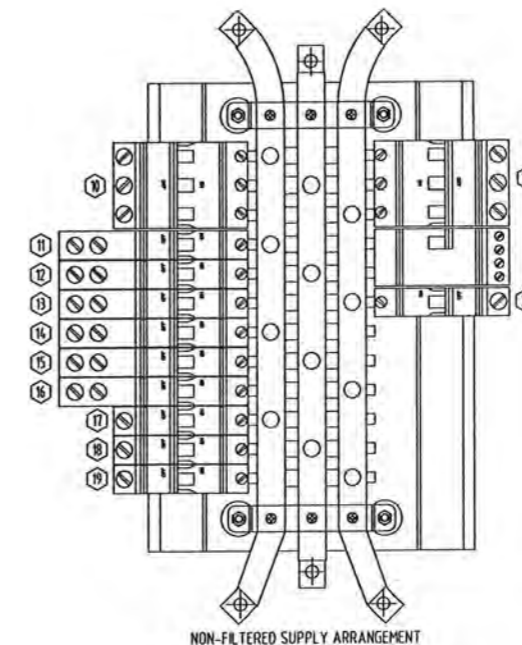
Aluminium Surface Preparation.  
Finish smooth all exposed welds, clean, descale, and degrease all surfaces.  
Surfaces pretreatment in accordance with AS 1580 & AS 3715 using Novox LF acid etch cleaner, Novacoat 12 conversion coating, & clean water rinses.  
Apply DULUX ALPHATECH 3000 powder coat to 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 50 microns.

**LABELS**

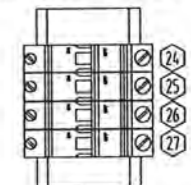
Internal labels W/B engraved ABS PLASTIC to label schedule.  
Warning labels R/W engraved ABS PLASTIC to label schedule.  
E/Stop labels Y/B engraved ABS PLASTIC to label schedule.  
First letter = Background colour, Second letter = Lettering colour.

Main switch label	MAIN SWITCH 400A	10mm 4mm	Material ABS PLASTIC Colour B/W
Pump CB labels	PUMP No1 250A	6mm 4mm	Material ABS PLASTIC Colour W/B
Compartment labels	RTU	10mm	Material Stainless Steel
E/Stop labels	EMERGENCY STOP	4mm	Material ABS PLASTIC Colour Y/B
Warning labels	DANGER 415V ISOLATE ELSE WHERE	7mm 5mm	Material ABS PLASTIC Colour R/W

Internal labels secured by M3 chrome plated metal threads.  
CB's to be identified with individual labels as per label schedule.  
Labels obstructed by switchboard wiring are relocated to adjacent duct lid and secured by M3 nylon threads. Lid to be secured by a single cable tie at one corner.  
External switchboard labels to be 1mm thick 316 grade stainless steel secured by M3 316 stainless steel metal threads.  
All internal and external labels are to have bevelled edges.



FILTERED SUPPLY ARRANGEMENT



NON-FILTERED SUPPLY ARRANGEMENT

DETAIL M

SUB-DISTRIBUTION BOARD ARRANGEMENT

Sheet 21

FOR CONSTRUCTION

A 01.13	ISSUED FOR CONSTRUCTION	P.H.	A.W.	DRAFTED	P.HAGUE
O 11.12	ISSUED FOR TENDER	P.H.	A.W.	DRAFTING CHECK	A.WITTHOFT
P1 10.12	ISSUED FOR REVIEW	P.H.	A.W.	CAD FILE	57-0293set_A
No	DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No.

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Original signed by A.WITTHOFT	8895 6-11-12	DESIGN CHECK	R.P.E.Q. No.	DATE	CLIENT DELEGATE	DATE

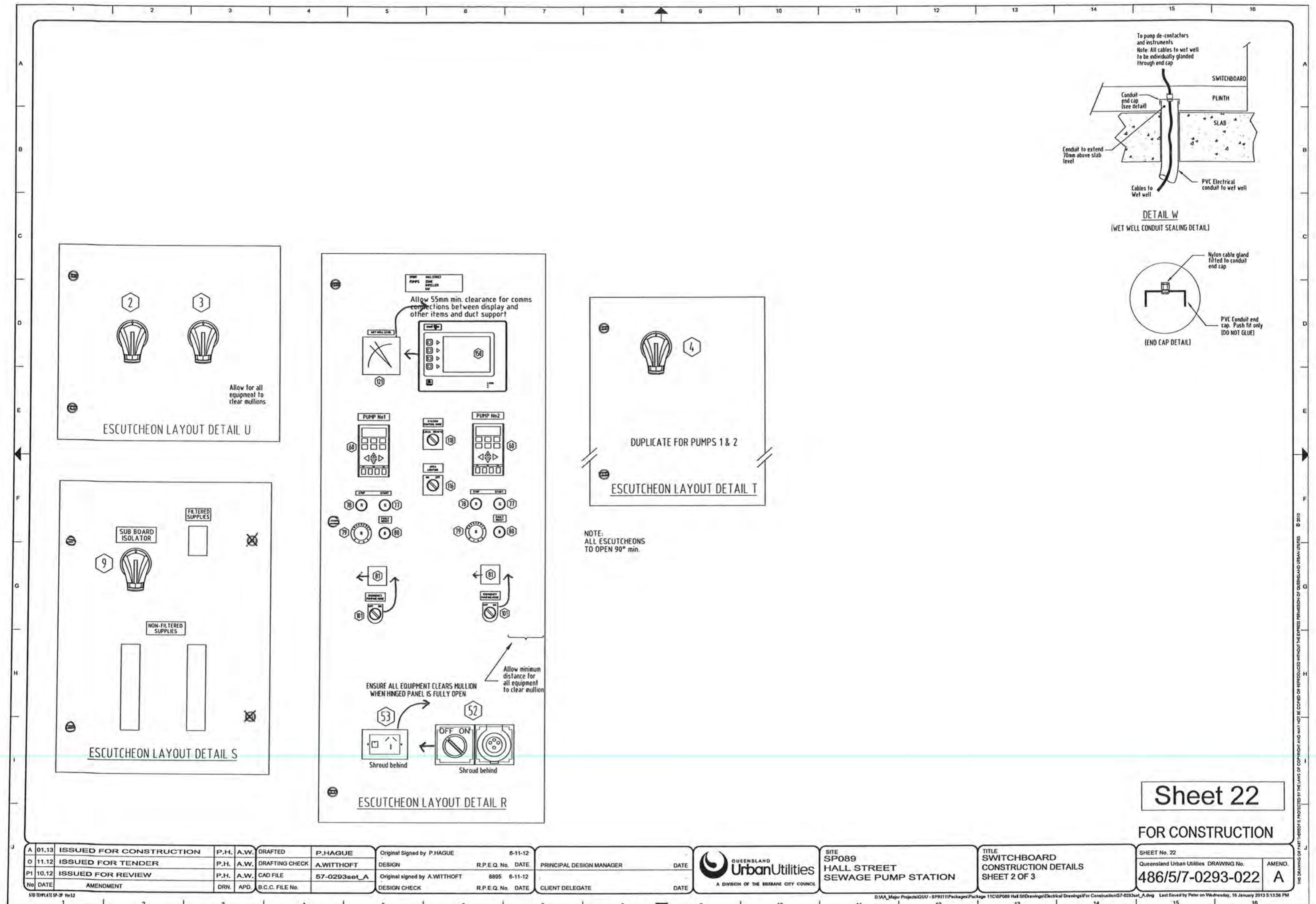


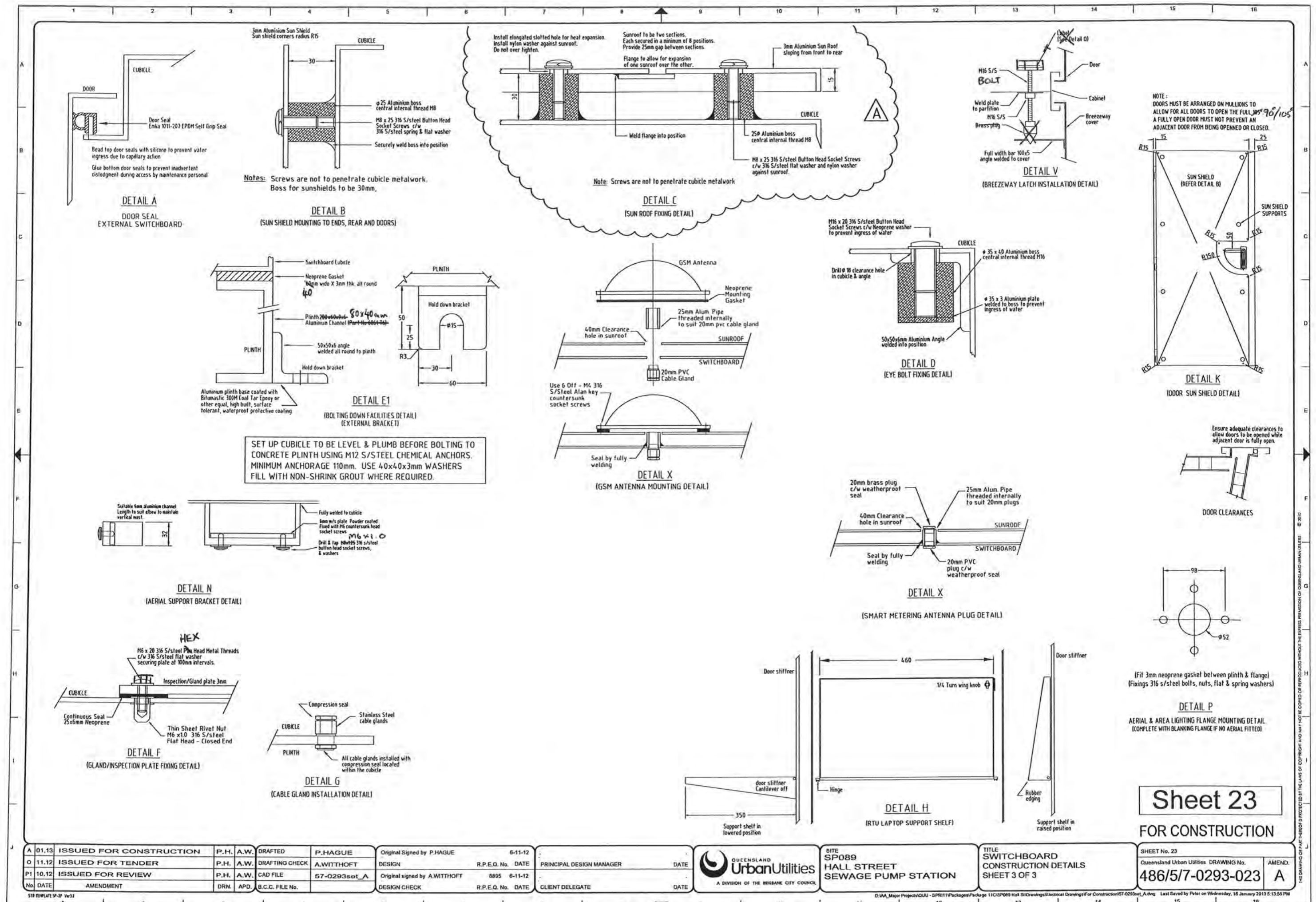
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SP089  
HALL STREET  
SEWAGE PUMP STATION

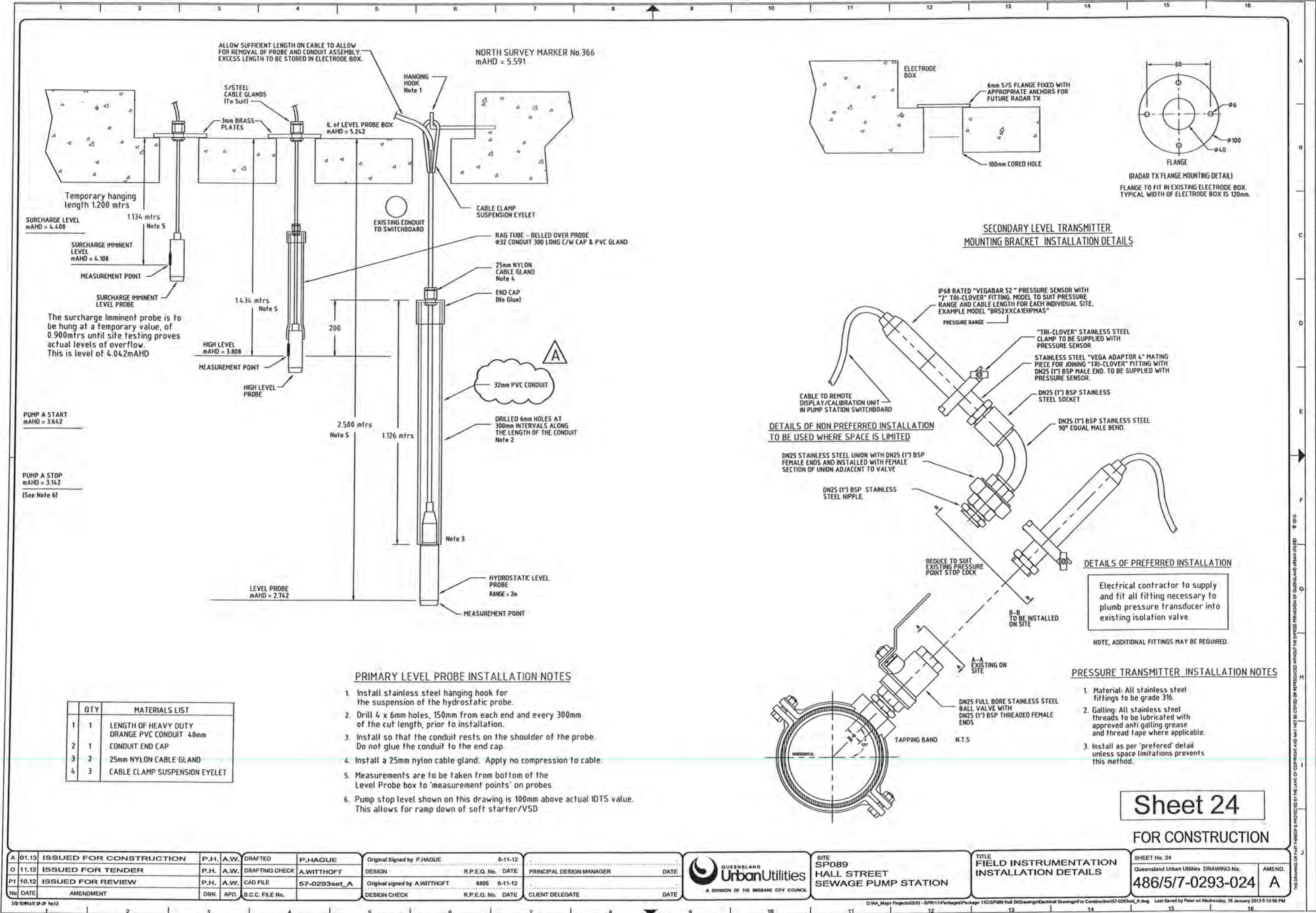
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SWITCHBOARD  
CONSTRUCTION DETAILS  
SHEET 1 OF 3

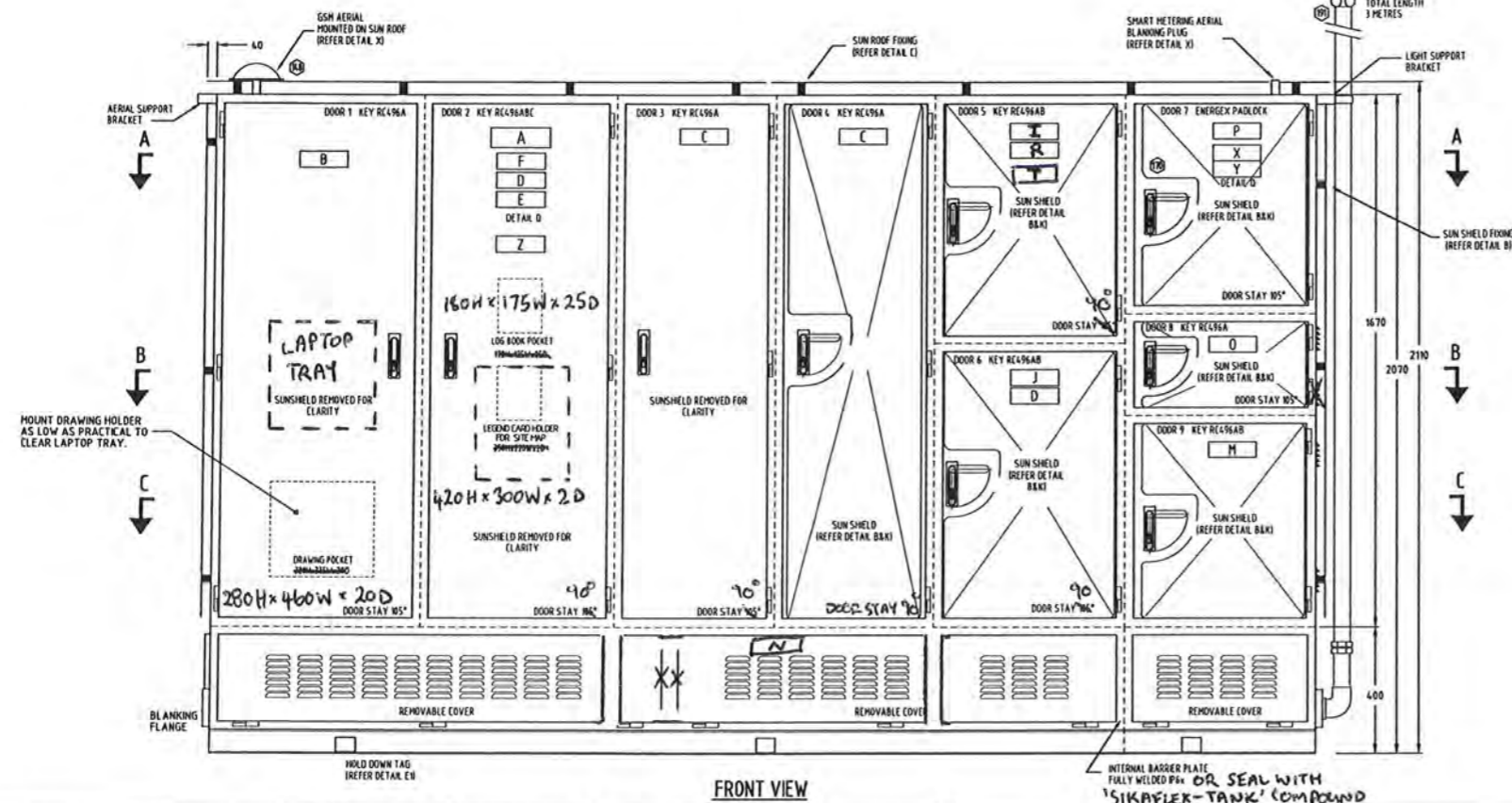
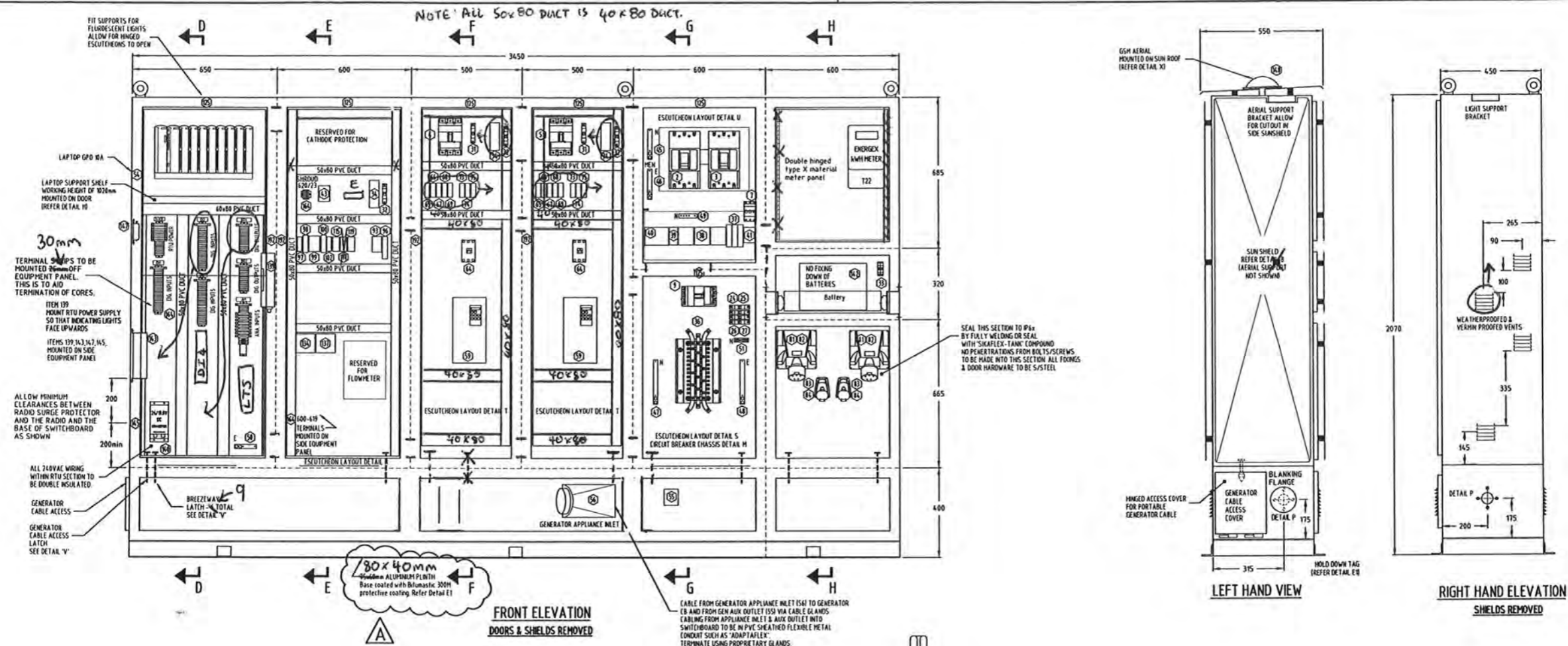
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486/5/7-0293-021	A

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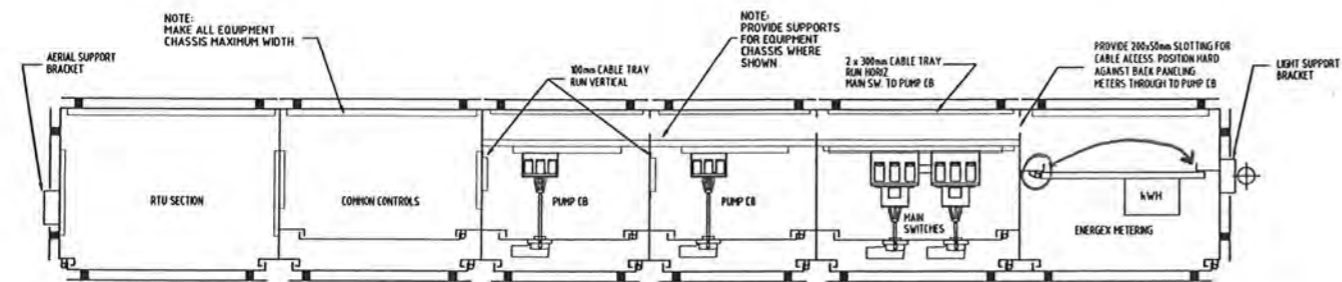




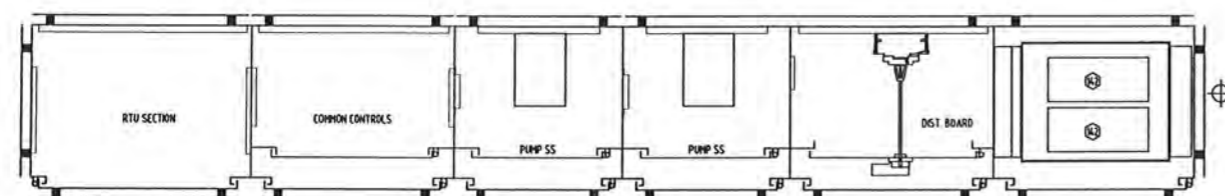
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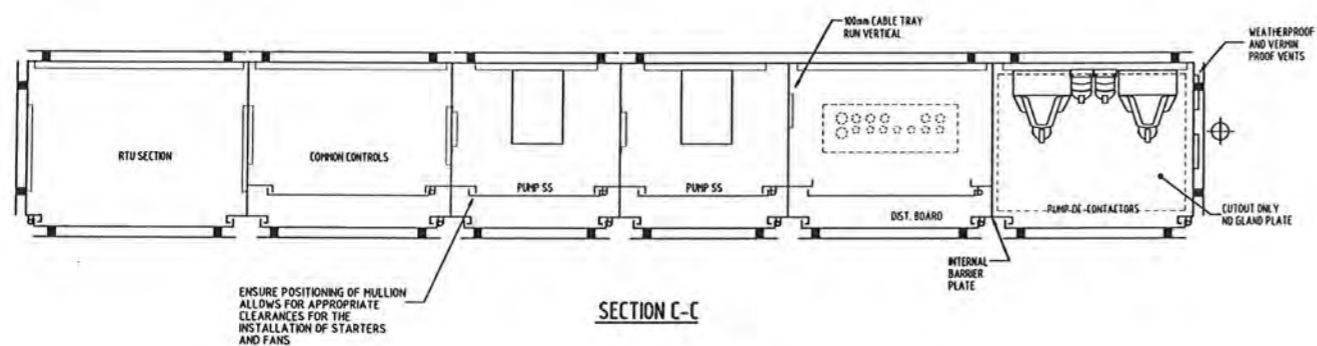
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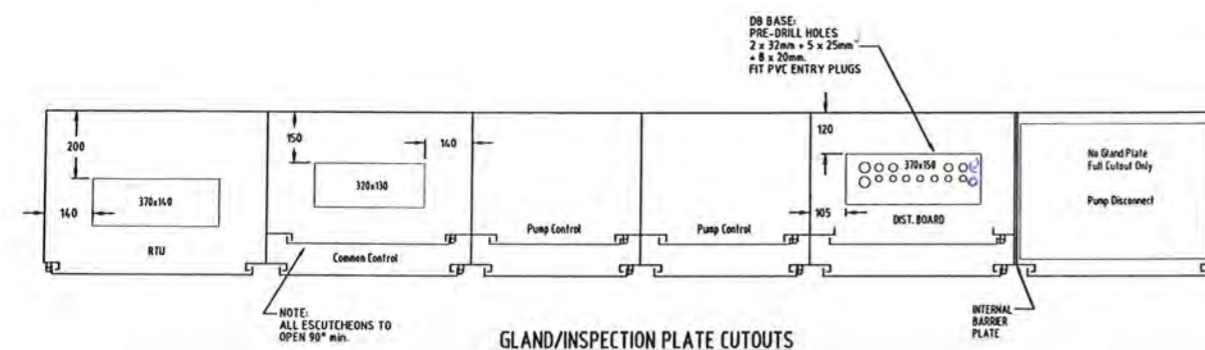
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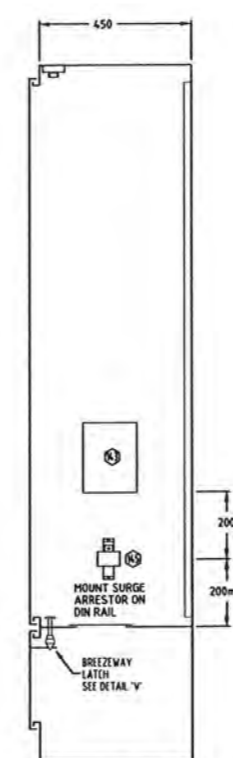
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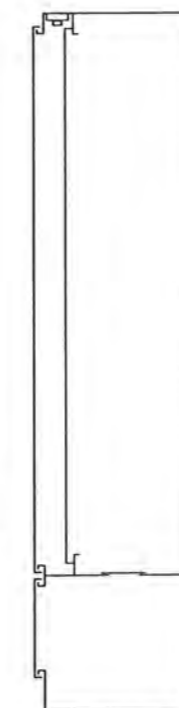
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GLAND/INSPECTION PLATE CUTOUTS



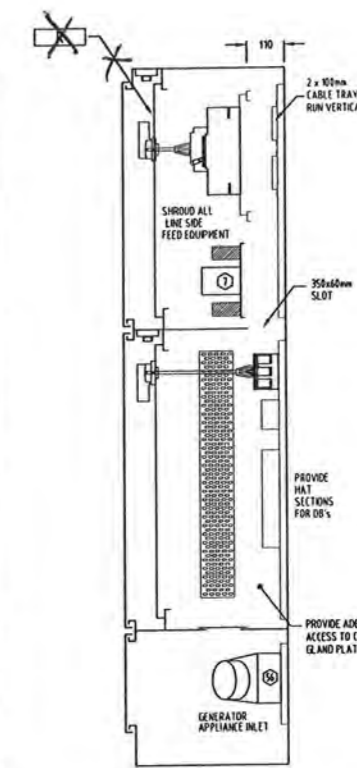
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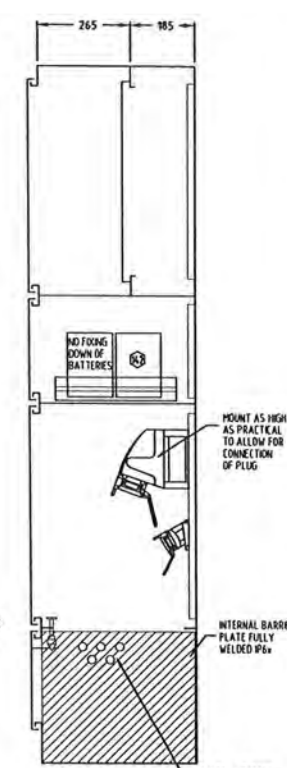
SECTION E-E



SECTION F-F



SECTION G-G



SECTION H-H

**Sheet 28**  
FOR CONSTRUCTION

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P1	10.12	ISSUED FOR REVIEW	P.H.	A.W.	CAD FILE	57-0293set_A	Original signed by A.WITTHOFT	8895 6-11-12	
No.	DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No. DATE	CLIENT DELEGATE

Original Signed by P.HAGUE	6-11-12	
DESIGN	R.P.E.Q. No. DATE	PRINCIPAL DESIGN MANAGER
Original signed by A.WITTHOFT	8895 6-11-12	
DESIGN CHECK	R.P.E.Q. No. DATE	CLIENT DELEGATE



SITE  
SP089  
HALL STREET  
SEWAGE PUMP STATION

TITLE  
SWITCHBOARD  
GENERAL ARRANGEMENT  
SECTIONS

SHEET No. 28  
Queensland Urban Utilities DRAWING No.  
486/5/7-0293-028  
AMEND. A

## 5 “AS INSTALLED” RED PENNED DRAWINGS



QUEENSLAND  
**UrbanUtilities**

# SP089 HALL STREET SEWAGE PUMPING STATION SITE COVER SHEET

## ELECTRICAL AS BUILT DETAILS

I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS

REV

COMPANY: J & P Richardson Industries Pty Ltd

NAME: Justin Read

SIGNATURE: Justin Read

RPEQ No: 1927

DATE: 12/6/13

### ELECTRICAL DRAWINGS INDEX

DWG N°	TITLE	SHEET	REVISIONS
486/5/7-0293-000	SITE COVER SHEET	00	P1 0 A
486/5/7-0293-001	POWER DISTRIBUTION SCHEMATIC DIAGRAM	01	P1 0 A
486/5/7-0293-002	PUMP 01 SCHEMATIC DIAGRAM	02	P1 0 A
486/5/7-0293-003	PUMP 02 SCHEMATIC DIAGRAM	03	P1 0 A
486/5/7-0293-004	RESERVED FOR PUMP 03 SCHEMATIC DIAGRAM	04	
486/5/7-0293-005	RESERVED (DRY WELL SUMP & EM STORAGE DEWATERING PUMP)	05	
486/5/7-0293-006	RESERVED (GENERATOR CONTROL)	06	
486/5/7-0293-007	COMMON CONTROLS SCHEMATIC DIAGRAM	07	P1 0 A
486/5/7-0293-008	COMMON RTU I/O SCHEMATIC DIAGRAM	08	P1 0 A
486/5/7-0293-009	RTU POWER DISTRIBUTION SCHEMATIC DIAGRAM	09	P1 0 A
486/5/7-0293-010	RTU DIGITAL INPUTS TERMINATION DIAGRAM - SHEET 1 OF 3	10	P1 0 A
486/5/7-0293-011	RTU DIGITAL INPUTS TERMINATION DIAGRAM - SHEET 2 OF 3	11	P1 0 A
486/5/7-0293-012	RTU DIGITAL INPUTS TERMINATION DIAGRAM - SHEET 3 OF 3	12	P1 0 A
486/5/7-0293-013	RTU DIGITAL OUTPUTS TERMINATION DIAGRAM - SHEET 1 OF 2	13	P1 0 A
486/5/7-0293-014	RTU DIGITAL OUTPUTS TERMINATION DIAGRAM - SHEET 2 OF 2	14	P1 0 A
486/5/7-0293-015	RTU ANALOG INPUTS TERMINATION DIAGRAM	15	P1 0 A
486/5/7-0293-016	RTU ANALOG OUTPUTS TERMINATION DIAGRAM	16	P1 0 A
486/5/7-0293-017	COMMON CONTROLS TERMINATION DIAGRAM	17	P1 0 A
486/5/7-0293-018	EQUIPMENT LIST	18	P1 0 A
486/5/7-0293-019	CABLE SCHEDULE	19	P1 0 A
486/5/7-0293-020	SWITCHBOARD LABEL SCHEDULE	20	P1 0 A
486/5/7-0293-021	SWITCHBOARD CONSTRUCTION DETAILS - SHEET 1 of 3	21	P1 0 A
486/5/7-0293-022	SWITCHBOARD CONSTRUCTION DETAILS - SHEET 2 of 3	22	P1 0 A
486/5/7-0293-023	SWITCHBOARD CONSTRUCTION DETAILS - SHEET 3 of 3	23	P1 0 A
486/5/7-0293-024	FIELD INSTRUMENTATION - INSTALLATION DETAILS	24	P1 0 A
486/5/7-0293-025	RESERVED (CATHODIC PROTECTION UNIT)	25	
486/5/7-0293-026	RESERVED (FIELD DISCONNECTION BOX)	26	
486/5/7-0293-027	SWBD GENERAL ARRANGEMENT ELEVATIONS	27	P1 0 A
486/5/7-0293-028	SWBD GENERAL ARRANGEMENT SECTIONS	28	P1 0 A
486/5/7-0293-029	RESERVED (GENERATOR EXTERNAL CONNECTION BOX)	29	
486/5/7-0293-030	SWITCHBOARD SLAB - LOCALITY AND SITE PLANS - SHEET 1 of 3	30	P1 0 A
486/5/7-0293-031	SWITCHBOARD SLAB AND CONDUIT DETAILS - SHEET 2 of 3	31	P1 0 A
486/5/7-0293-032	SWITCHBOARD AND ELECTRICAL CONDUIT LAYOUT - SHEET 3 of 3	32	P1 0 A

### STANDARD VARIABLES

DESCRIPTION	VALUES
CT METERING ISOLATOR	NOT APPLICABLE
NORMAL SUPPLY MAIN SWITCH	125A S250PE/125
GENERATOR SUPPLY MAIN SWITCH	125A S250PE/125
PUMP1 CIRCUIT BREAKER	32A S125GJ/32
PUMP2 CIRCUIT BREAKER	32A S125GJ/32
DRY WELL SUMP PUMP CIRCUIT BREAKER	NOT APPLICABLE
EM STORAGE DEWATERING PUMP CCB BREAKER	NOT APPLICABLE
PUMP SOFT STARTER SIZE	MC05-0021B + 17A
PUMP RATING	7.8kW 15A
PUMP LINE CONTACTOR	CA7-30
DRY WELL SUMP PUMP RATING	NOT APPLICABLE
DRY WELL SUMP PUMP CONTACTOR & TOL	NOT APPLICABLE
PUMP SOCKET OUTLET + INCLINE SLEEVE	DS13114013972 + 51BA058
PUMP INLET PLUG + HANDLE	DS13118013972 + 311A013
WET WELL LEVEL TRANSMITTER	WL52XXA4AMD1001X 2m
EMERGENCY STORAGE WELL LEVEL TRANSMITTER	NOT APPLICABLE
EM STORAGE DEWATERING PUMP RATING	NOT APPLICABLE
EM STORAGE DEWATERING PUMP CONTR & TOL	NOT APPLICABLE
FLOWMETER RANGE	NOT APPLICABLE
WET WELL ULTRASONIC LEVEL SENSOR	NOT APPLICABLE
DELIVERY PRESSURE TRANSMITTER	BR52XXCA1FHPMAS L=25 30m
RADIO	DR900-07A02-D0
EMERGENCY PUMPING TIME	1.6 Bsec
No of SINGLE POINT PROBES	2
INCOMING MAINS SUPPLY CABLE	16mm <sup>2</sup>
MAIN EARTHING CABLE	6mm <sup>2</sup>
INCOMING GENERATOR SUPPLY CABLE	NOT APPLICABLE
SOFT STARTER 3 PHASE SUPPLY	6mm <sup>2</sup>

### STANDARD DESIGN OPTIONS

OPTION	DESCRIPTION	FITTED
A	INDIVIDUAL PUMP MOISTURE IN OIL (MIO) SENSOR AND FAULT RELAY	<input checked="" type="checkbox"/> NO
B	INDIVIDUAL PUMP MOTOR AUX PROTECTION SENSORS AND FAULT RELAYS	<input checked="" type="checkbox"/> NO
C	INDIVIDUAL PUMP REFLUX VALVE POSITION SWITCH	<input checked="" type="checkbox"/> NO
D	STATION MANHOLE SURCHARGE IMMINENT	<input checked="" type="checkbox"/> NO
E	STATION DRY WELL SUMP PUMP AND LEVEL INDICATION SENSORS AND RELAYS	<input checked="" type="checkbox"/> NO
F	PERMANENT GENERATOR INSTALLED	<input checked="" type="checkbox"/> NO
G	STATION EMERGENCY STORAGE LEVEL SENSOR & DEWATERING PUMP	<input checked="" type="checkbox"/> NO
H	STATION DELIVERY FLOWMETER	<input checked="" type="checkbox"/> NO
I	BACKUP COMMUNICATION - GSM	YES <input checked="" type="checkbox"/>
J	PUMP CONNECTION (Via De-contactors)	YES <input checked="" type="checkbox"/>
K	CATHODIC PROTECTION	<input checked="" type="checkbox"/> NO
L	MOTOR THERMISTORS (Via De-contactors)	YES <input checked="" type="checkbox"/>
M	ODOUR CONTROL	<input checked="" type="checkbox"/> NO
N	DIRECT CONNECTED METERING	YES <input checked="" type="checkbox"/>
O	PUMPS ELECTRICAL INTERLOCK	<input checked="" type="checkbox"/> NO
P	WET WELL WASHER	<input checked="" type="checkbox"/> NO
Q	AUX PIT SUMP PUMP AND LEVEL PROBE	<input checked="" type="checkbox"/> NO
R	TELEMETRY RADIO	YES <input checked="" type="checkbox"/>
S	WET WELL SECONDARY LEVEL SENSOR	<input checked="" type="checkbox"/> NO
T	WET WELL PRIMARY LEVEL SENSOR (Direct Connected)	YES <input checked="" type="checkbox"/>
U	DELIVERY PRESSURE TRANSMITTER (Direct Connected)	YES <input checked="" type="checkbox"/>
V	CHEMICAL DOSING	<input checked="" type="checkbox"/> NO
W	PUMP START METHOD - SOFT STARTER	YES <input checked="" type="checkbox"/>
X	3rd PUMP INSTALLED	<input checked="" type="checkbox"/> NO
Y	POWER METER	<input checked="" type="checkbox"/> NO

Sheet 00

FOR CONSTRUCTION

A 01.13	ISSUED FOR CONSTRUCTION	P.H.	A.W.	DRAFTED	P.HAGUE	Original Signed by P.HAGUE	6-11-12
O 11.12	ISSUED FOR TENDER	P.H.	A.W.	DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No. DATE
P1 10.12	ISSUED FOR REVIEW	P.H.	A.W.	CAD FILE	57-0293set_A	Original signed by A.WITTHOFT	8895 6-11-12
No	DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No.	DESIGN CHECK	R.P.E.Q. No. DATE

PRINCIPAL DESIGN MANAGER	DATE
CLIENT DELEGATE	DATE

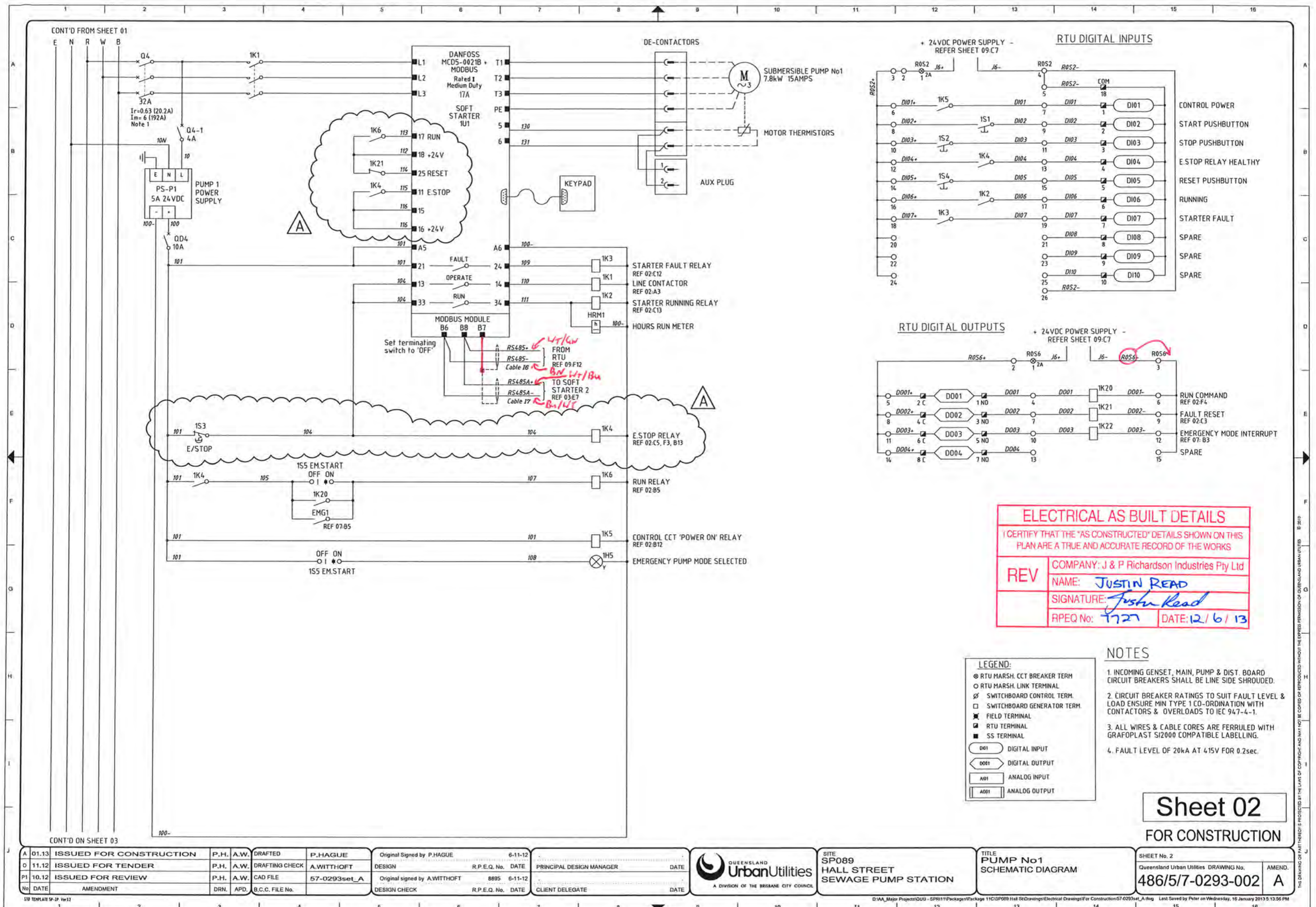


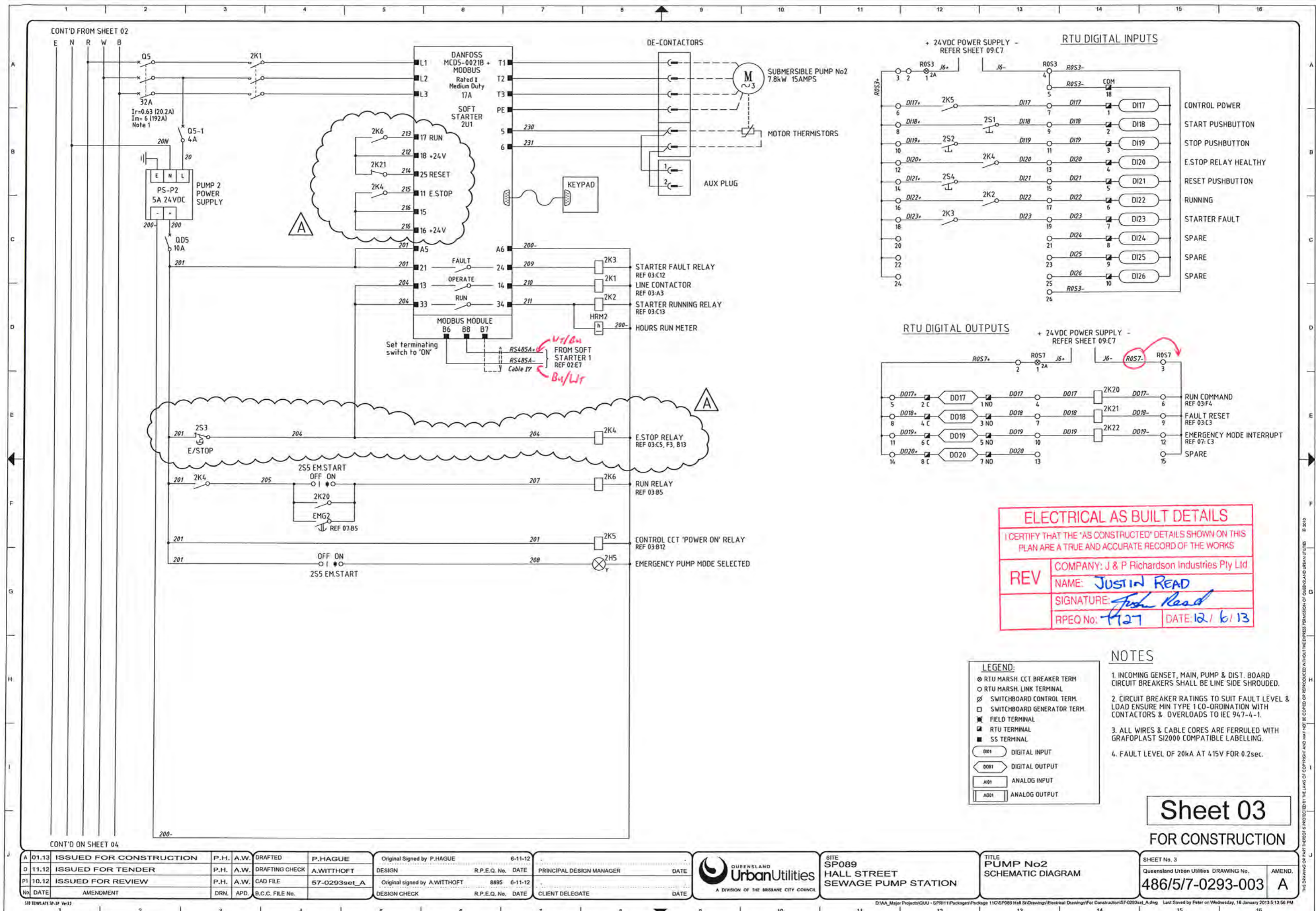
SITE  
SP089  
HALL STREET  
SEWAGE PUMP STATION

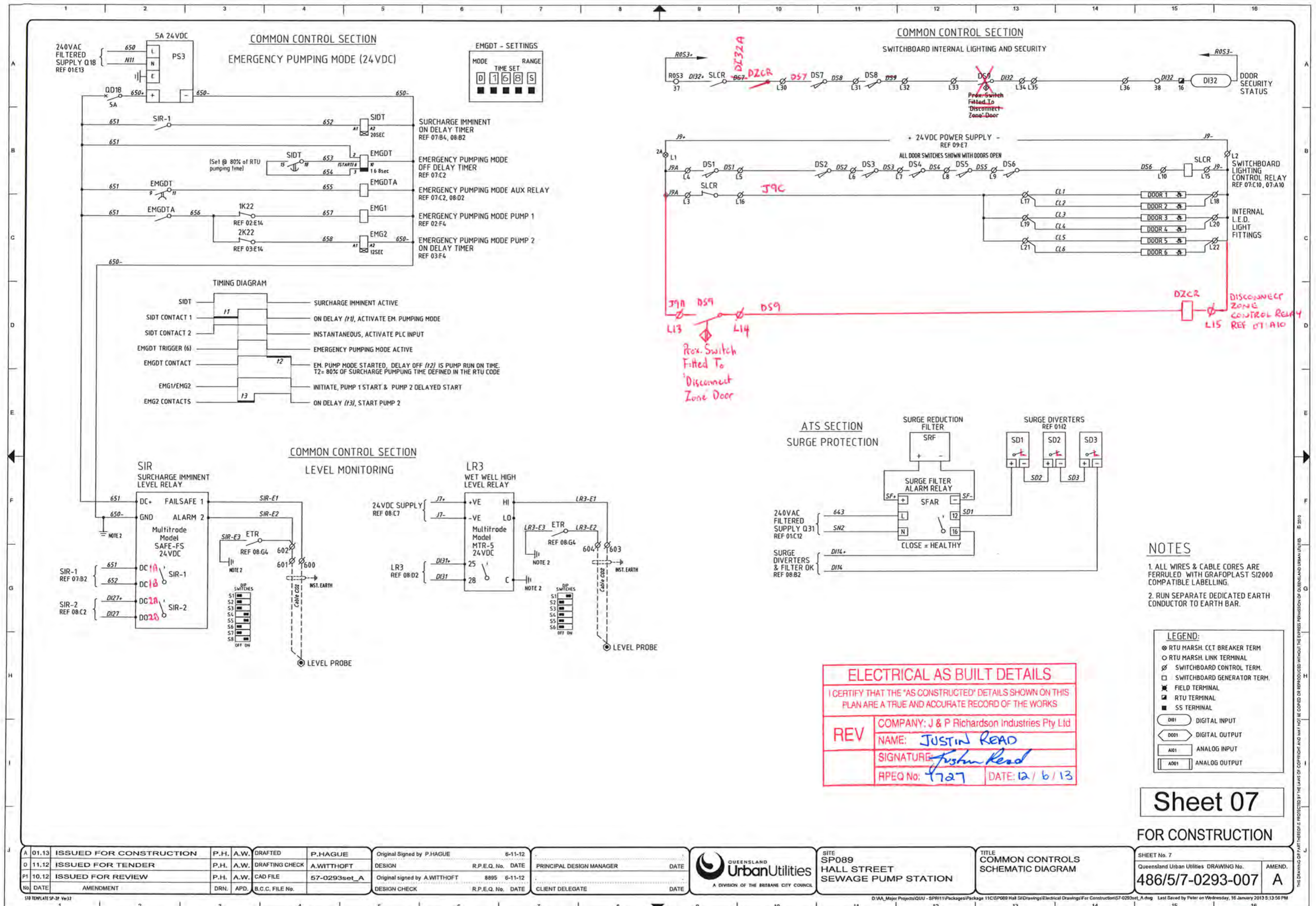
TITLE  
SITE COVER SHEET

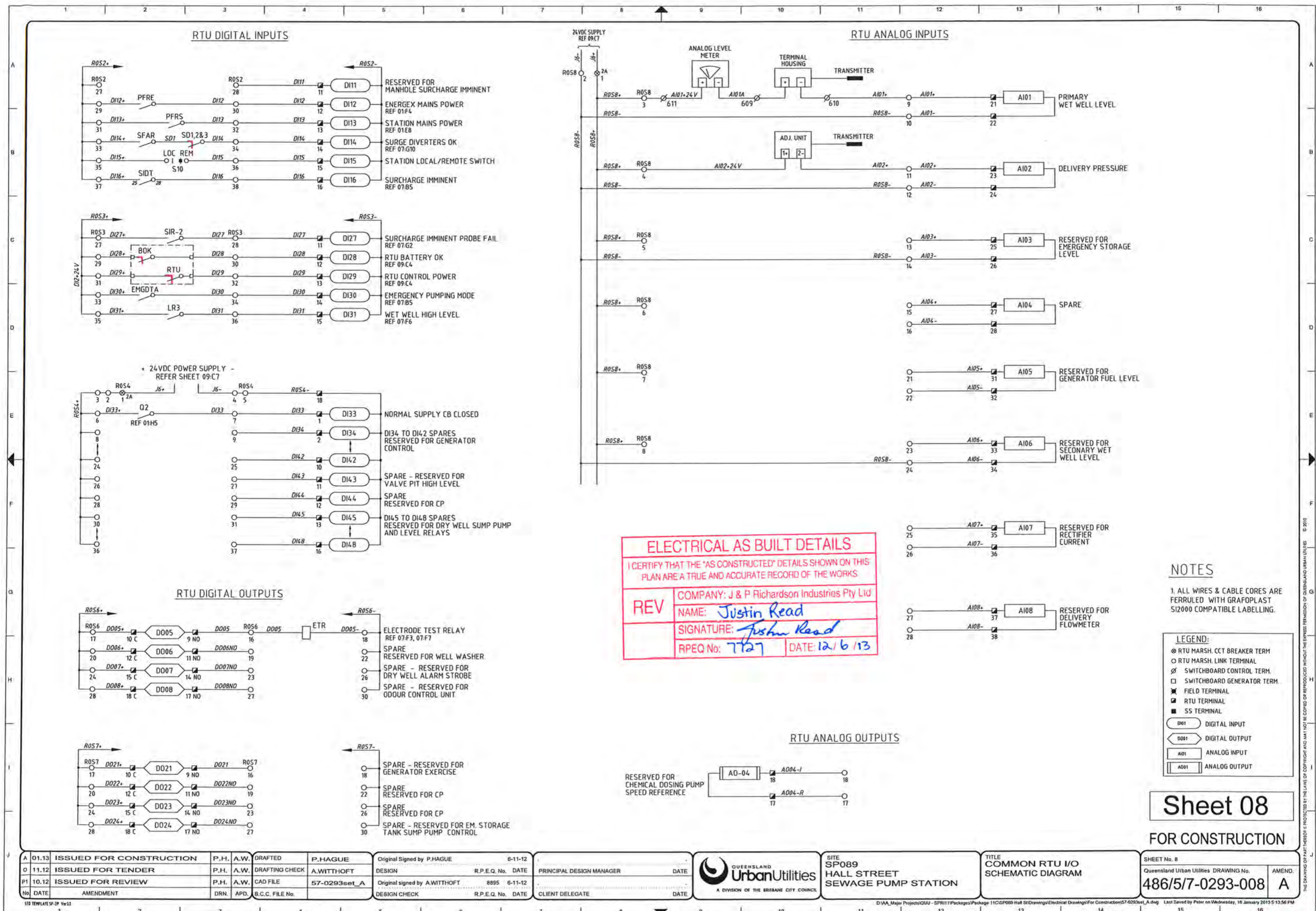
SHEET No. 0  
Queensland Urban Utilities DRAWING No.  
486/5/7-0293-000  
AMEND.  
A

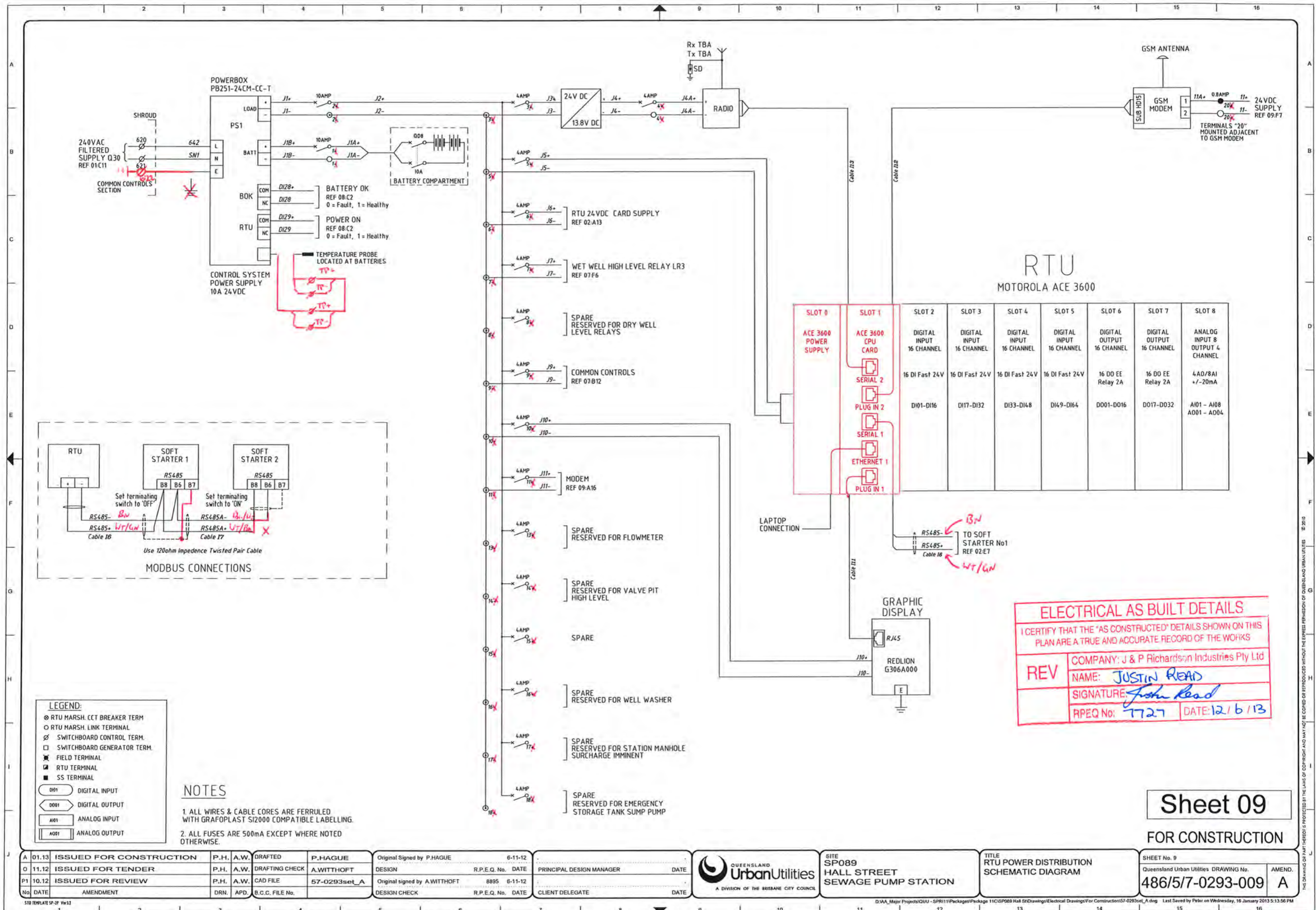


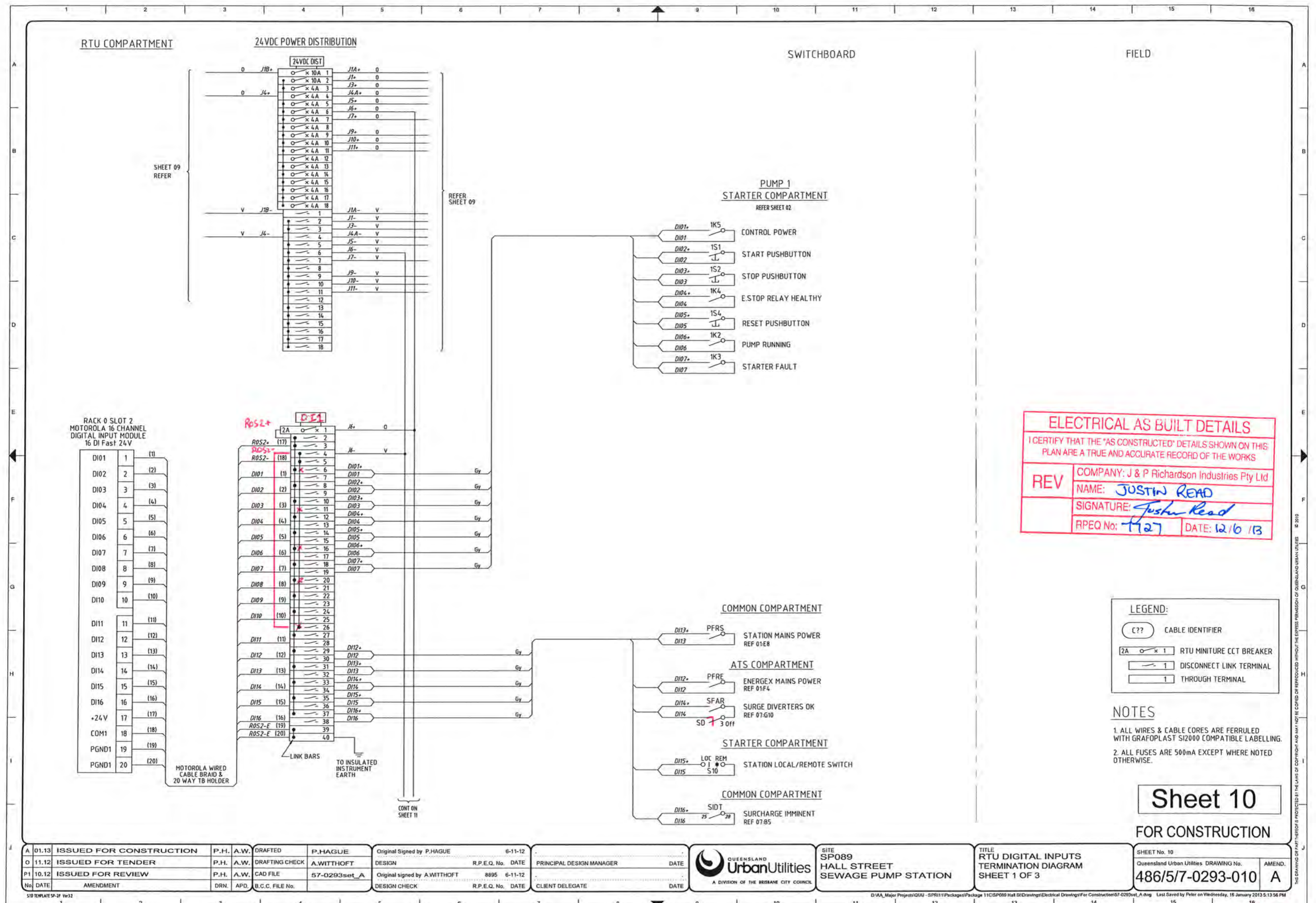


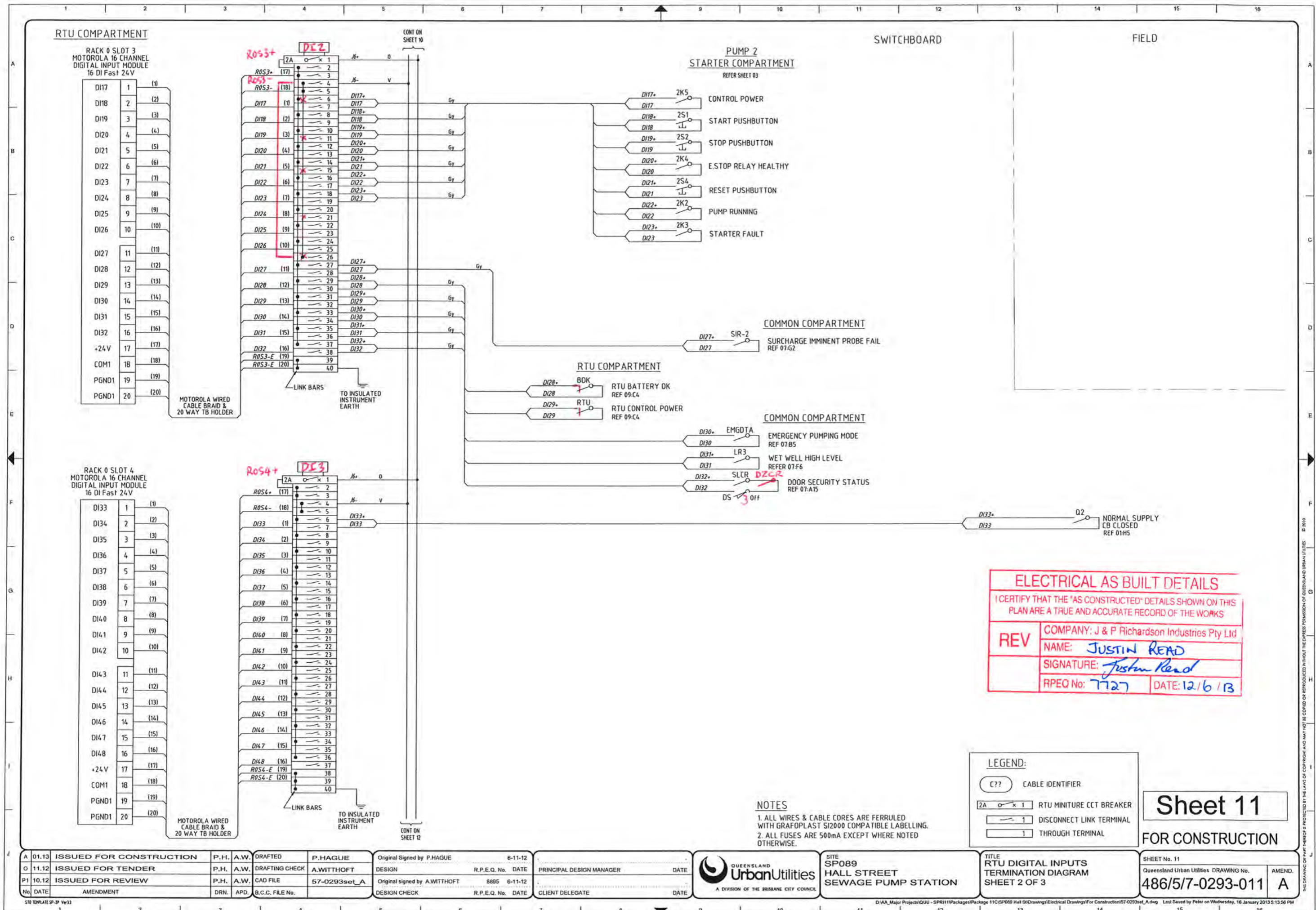


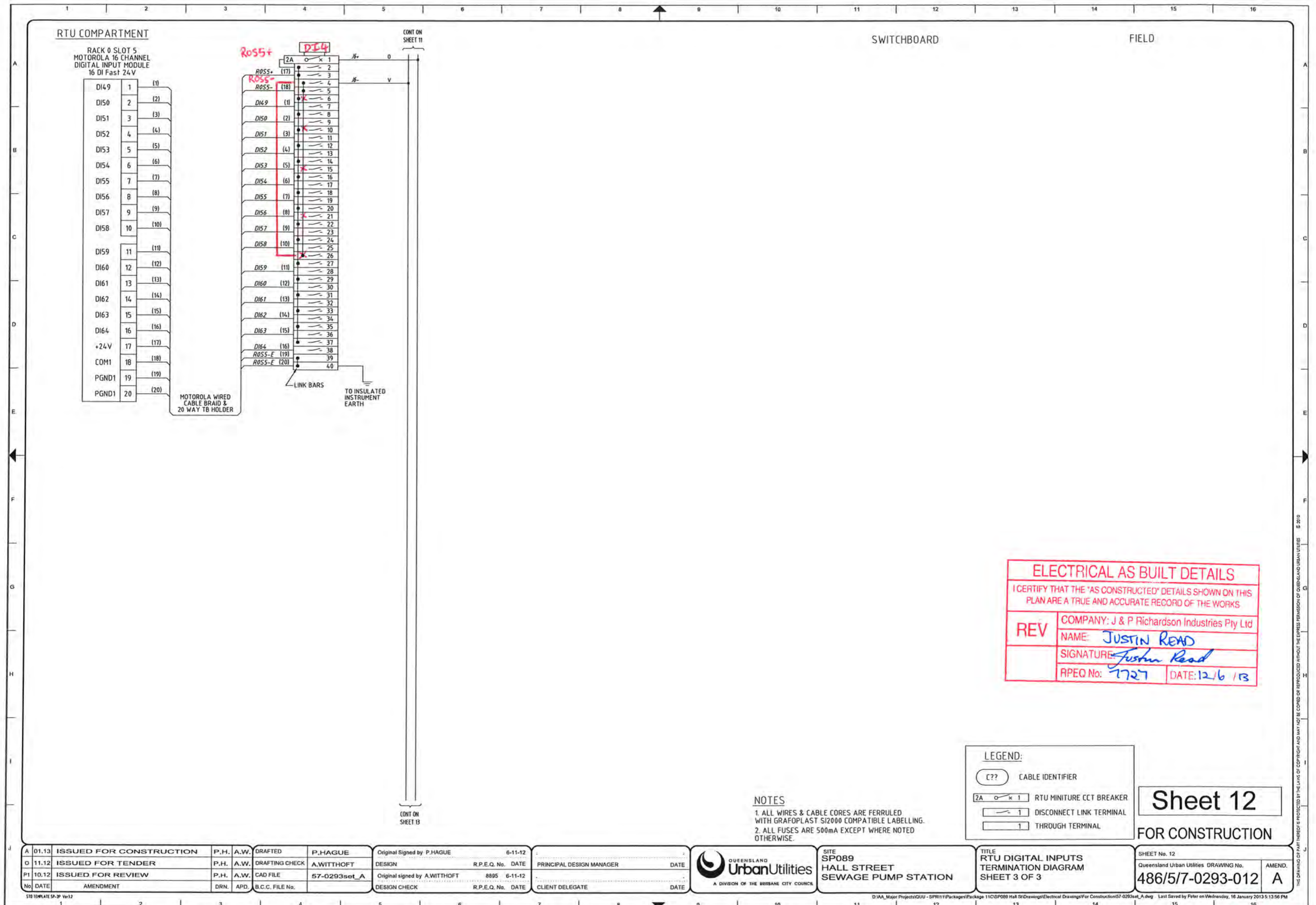


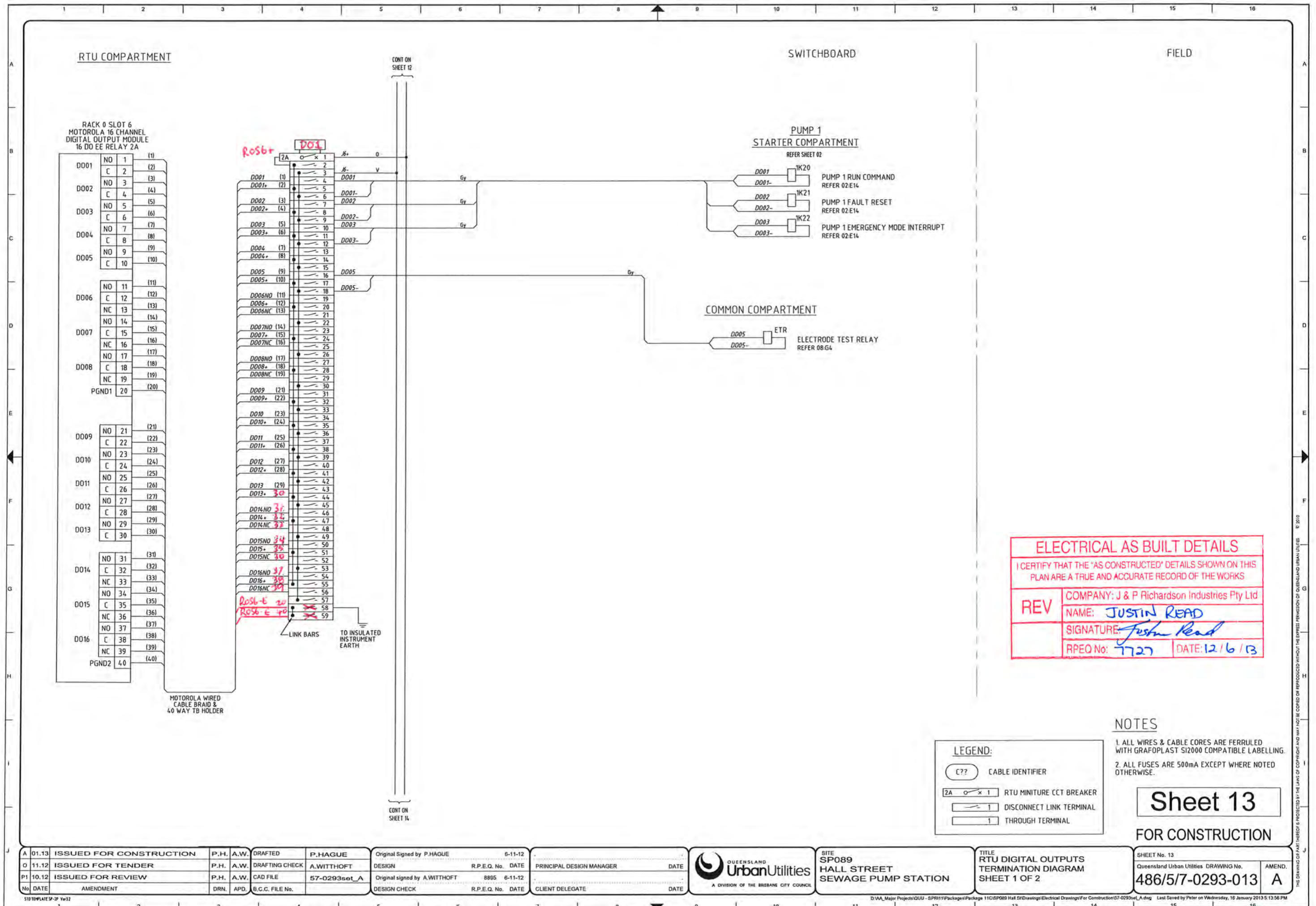


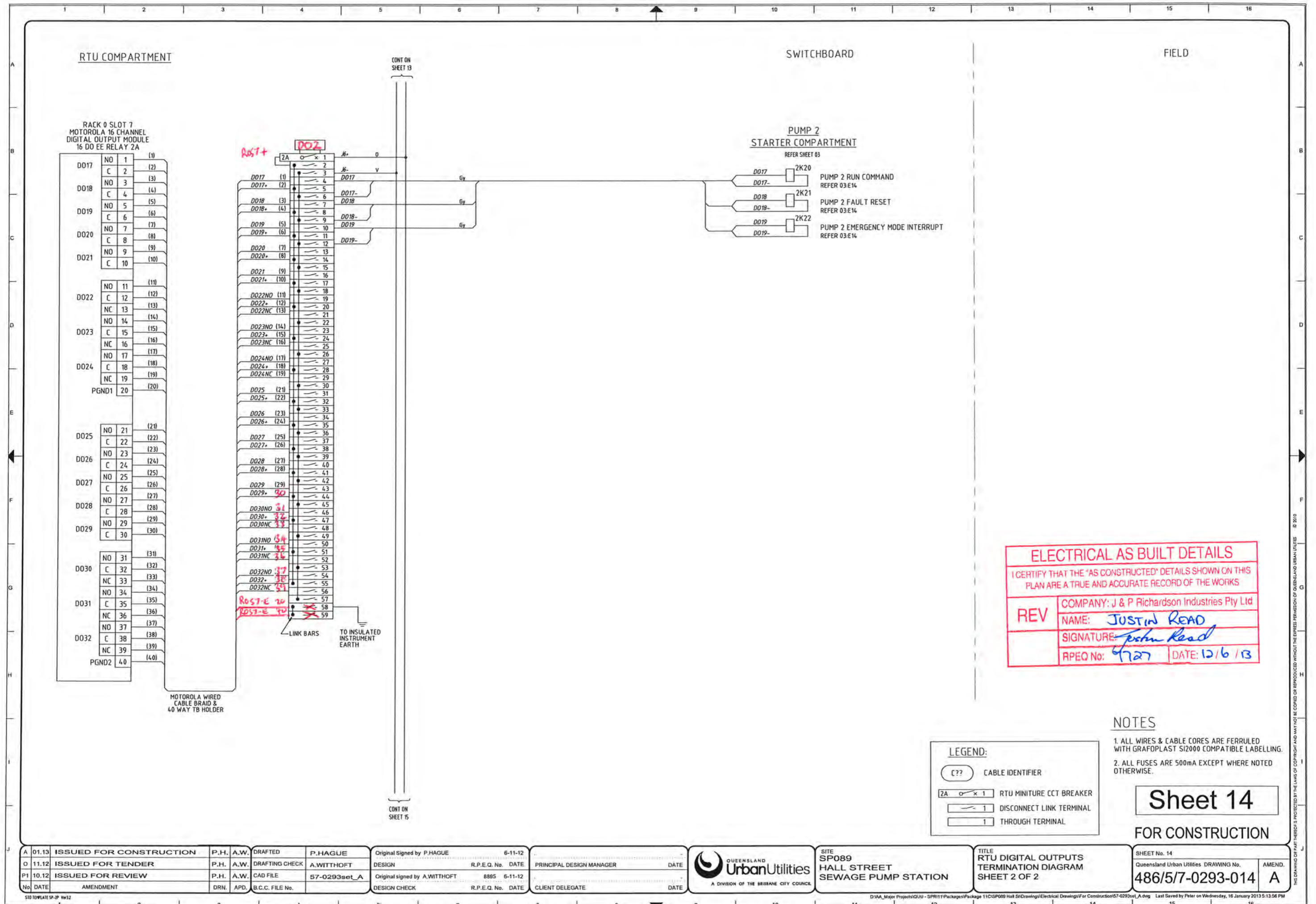


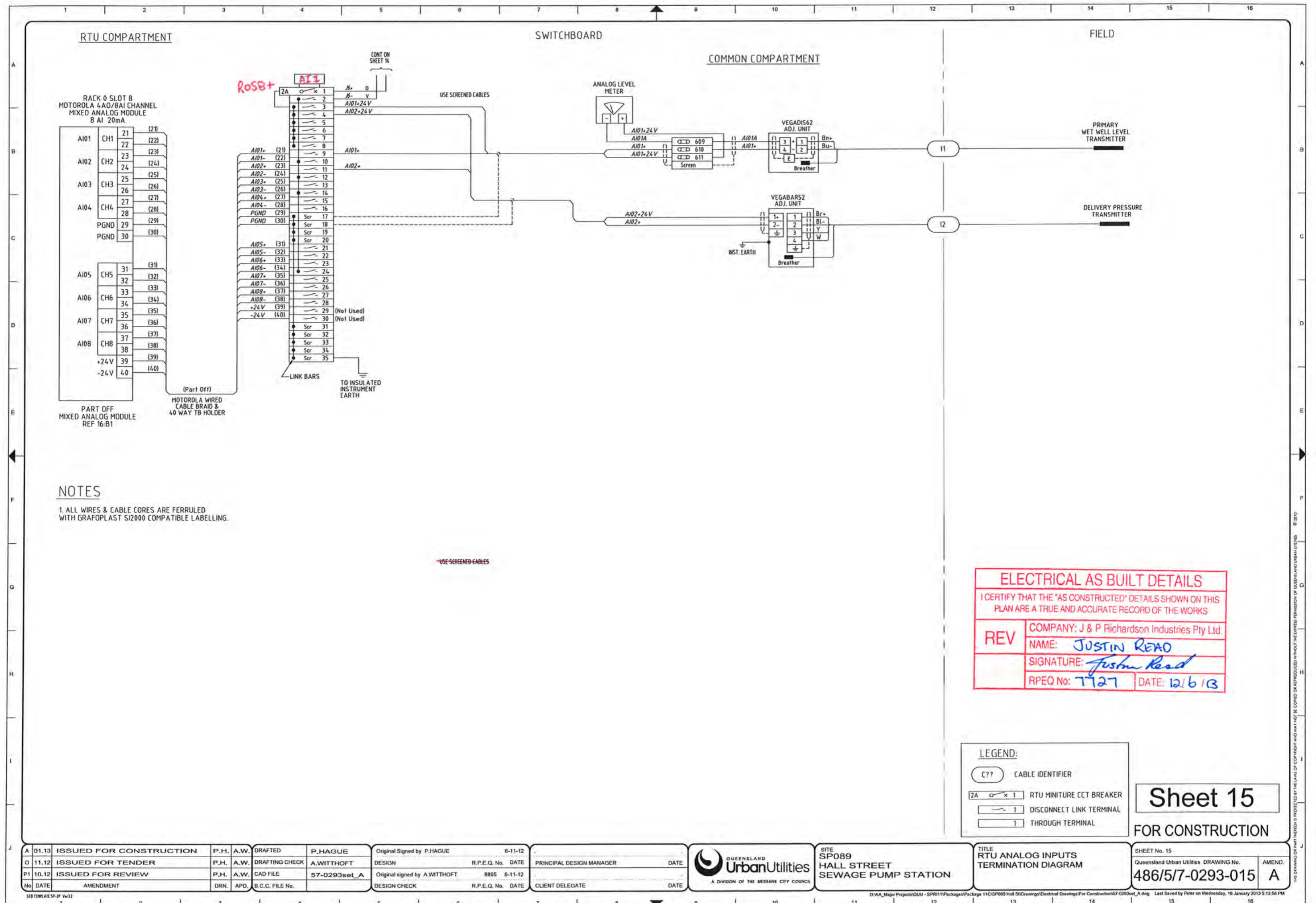


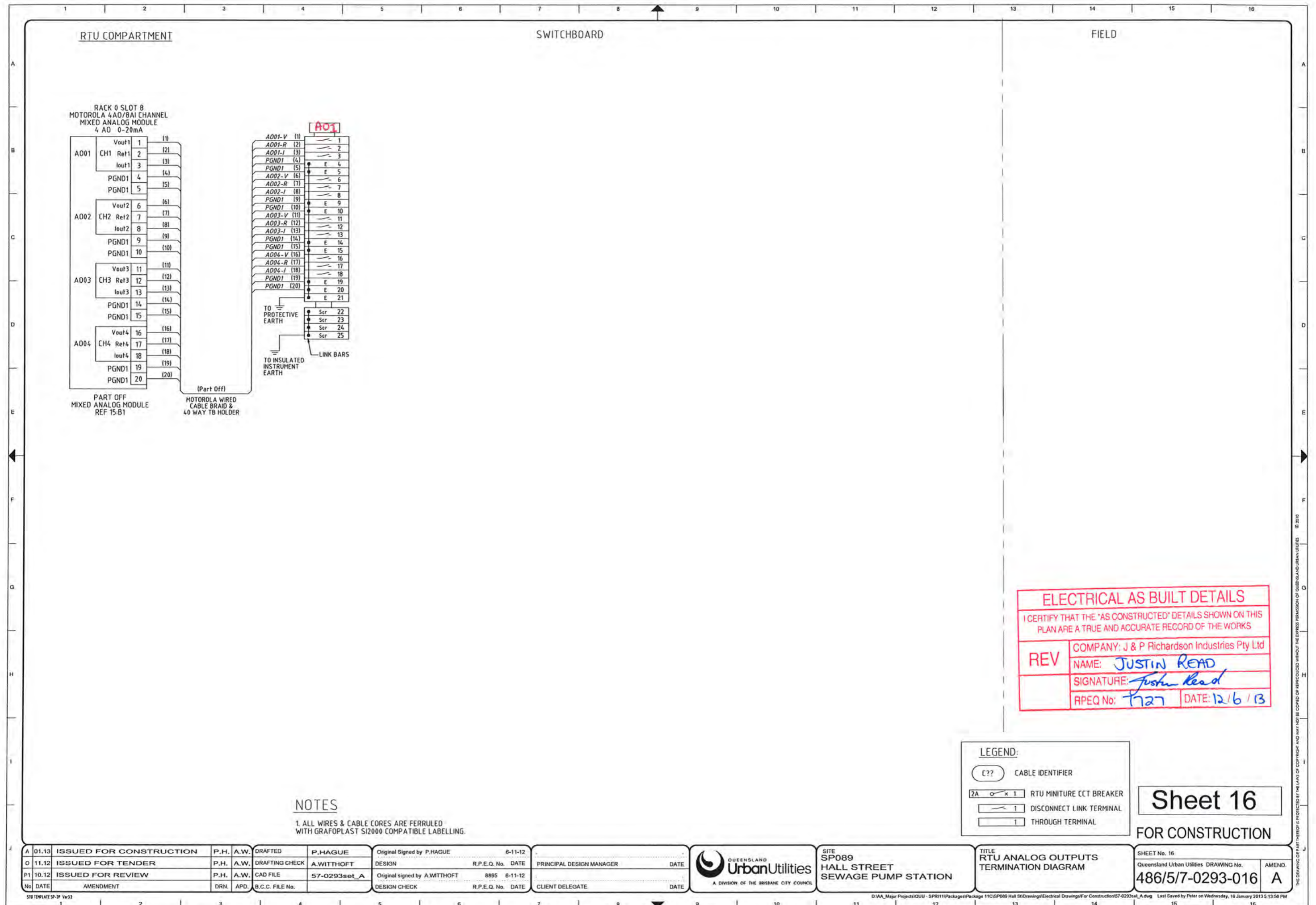


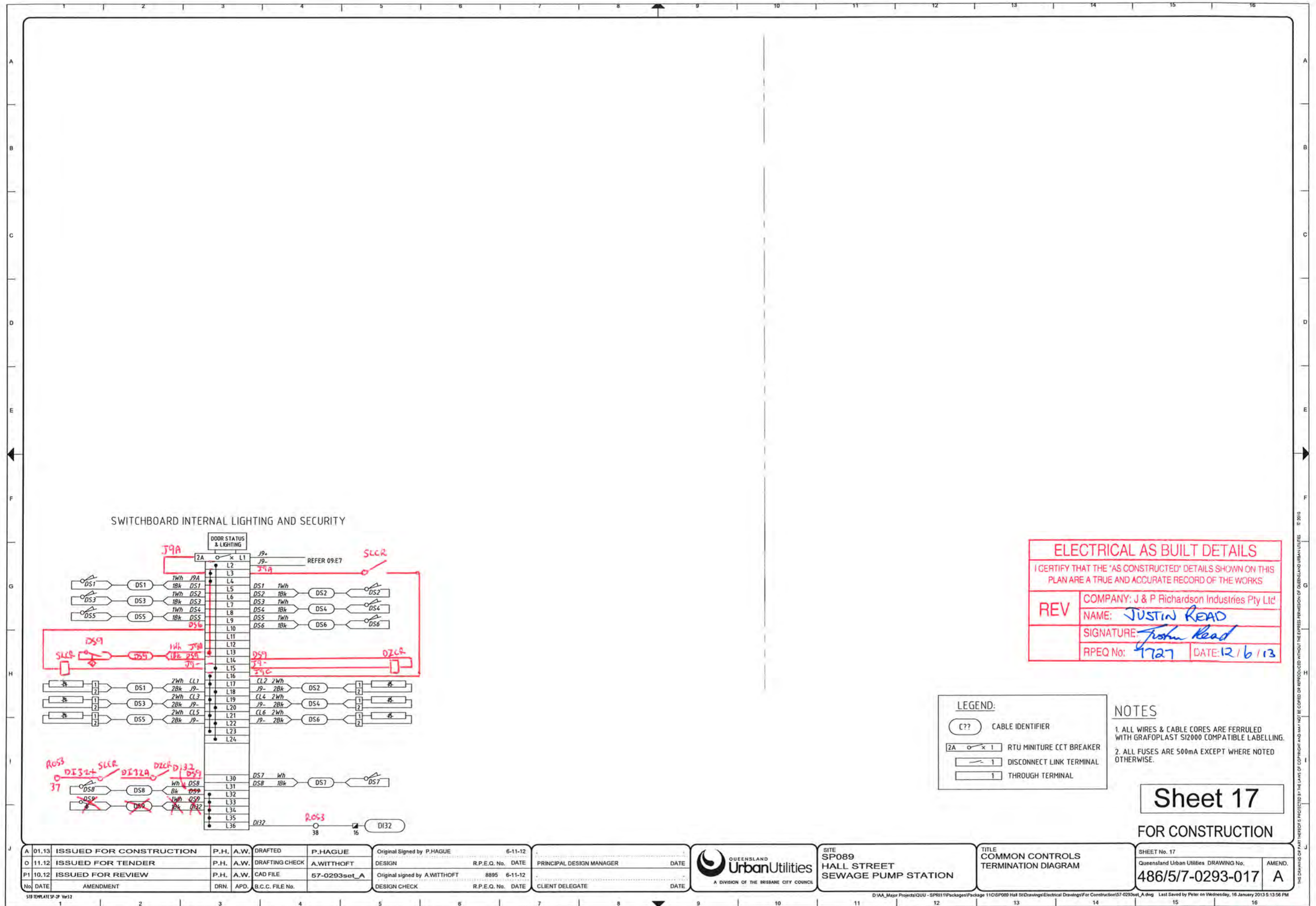












ITEM	QTY	DESCRIPTION	MANUFACTURER	CATALOGUE No	OPT	REMARKS
1					N	
2	1	MANUAL TRANSFER SWITCH	TERASAKI	MTSS2PE12533	F	Set Ir=0.63 (78A) Char=1
3		- TO SUIT MAIN SWITCHES Q2 & Q3 S250PE/125	TERASAKI	Q2 - C/W 3 N/O AUX CONTACTS	F	
4	1	Q4 PUMP1 CIRCUIT BREAKER + T2HS Handle	TERASAKI	S125GJ/32	-	Set Ir=0.63 (20.2A) Im=6 (192A)
5	1	Q5 PUMP2 CIRCUIT BREAKER + T2HS Handle	TERASAKI	S125GJ/32	-	Set Ir=0.63 (20.2A) Im=6 (192A)
6					E	
7	1	Q7 ENERGEX PHASE FAILURE CIRCUIT BREAKER	TERASAKI	DTCB15306C	-	
8					G	
9	1	Q9 SUB-DISTRIBUTION BOARD CIRCUIT BREAKER	TERASAKI	S125NJ/63	-	Set Ir=1.0 (63A) Im=6 (378A)
10	1	Q10 STATION MAINS PHASE FAILURE CIRCUIT BREAKER	TERASAKI	DTCB6306C	-	
11	1	Q11 15A GPO CIRCUIT BREAKER	TERASAKI	DSRCBH-16-30A	-	
12	1	Q12 RTU LAPTOP GPO CIRCUIT BREAKER	TERASAKI	DSRCBH-10-30A	-	
13	1	Q13 SPARE	TERASAKI	DSRCBH-6-30A	E	
14	1	Q14 SPARE	TERASAKI	DSRCBH-10-30A	E	
15	1	Q15 GENERATOR AUXILIARY SUPPLY CIRCUIT BREAKER	TERASAKI	DSRCBH-10-30A	-	
16	1	Q16 EXTERNAL AREA LIGHTING CIRCUIT BREAKER	TERASAKI	DSRCBH-6-30A	Y	
17	1	Q17 SURGE FILTER CIRCUIT BREAKER	TERASAKI	DTCB610C	-	
18	1	Q18 EM PUMP CNTRL & SURCHARGE IMMINENT CB	TERASAKI	DTCB6106C	-	
19	1	Q19 SPARE CIRCUIT BREAKER	TERASAKI	DTCB6106C	K	
20	1	Q20 3 PHASE OUTLET CIRCUIT BREAKER	TERASAKI	DTCB630C	-	PLUS DSRCH-32-30-3PN
21	1	Q21 SPARE	TERASAKI	DTCB6106C	Q	
22						
23					V	
24	1	Q30 RTU POWER SUPPLY CIRCUIT BREAKER	TERASAKI	DTCB6104C	-	
25	1	Q31 SURGE FILTER ALARM RELAY CIRCUIT BREAKER	TERASAKI	DTCB6104C	-	
26	1	Q32 SPARE	TERASAKI	DTCB6104C	H	
27	1	Q33 SPARE	TERASAKI	DTCB6104C	-	
28						
29						
30						
31	2	PUMP 240VAC CONTROL CIRCUIT BREAKER	TERASAKI	DTCB6104C	-	Q4-1, Q5-1
32	3	24VDC CONTROL CIRCUIT BREAKER	TERASAKI	DTCB610C	-	Q04, Q05, Q018
33	1	BATTERY SHORT CCT PROTECTION CIRCUIT BREAKER	TERASAKI	DTCB620C	-	Q08
34	3	240VAC-24VDC POWER SUPPLY	WEDMULLER	8951340000	-	120W 5A/24VDC
35						
36	1	DISTRIBUTION BOARD CHASSIS	TERASAKI	NCDC-2-24/18-3U	-	
37	3	F1 - SURGE DIVERter CIRCUIT FUSES	NHP	63AMP 63MS	-	FUSES & HOLDERS
38	3	SURGE DIVERter	CRITEC	TDS1100-2SR-277	-	
39	1	SURGE FILTER ALARM RELAY - SFAR	CRITEC	DAR-275V	-	
40	1	SURGE REDUCTION FILTER - SRF	CRITEC	TDF-10A-240V	-	
41	1	ENERGEX MAINS PHASE FAILURE RELAY - PFRE	CARLO GAVAZZI	DPB01CH6W4	-	
42						
43	1	STATION MAINS PHASE FAILURE RELAY - PFRS	CARLO GAVAZZI	DPB01CH6W4	-	
44						
45	1	MAIN NEUTRAL LINK	CLIPSAL	LSA	-	INSULATED C/W EFFECT
46	1	MAIN EARTH LINK	CLIPSAL	LSA	-	INSULATED C/W EFFECT
47	1	DIST. BD NEUTRAL LINK	CLIPSAL	LSA	-	INSULATED C/W EFFECT
48	1	DIST. BD EARTH LINK	CLIPSAL	LSA	-	INSULATED C/W EFFECT
49	1	SURGE DIVERter NEUTRAL LINK	CLIPSAL	LSA	-	INSULATED
50	1	INSTRUMENT EARTH LINK	CLIPSAL	LSA	-	INSULATED
51	1	FILTERED SUPPLY NEUTRAL LINK	CLIPSAL	LSA	-	INSULATED
52	1	3 PHASE SWITCHED OUTLET	CLIPSAL	LSA	-	USE ENCLOSURE AS SHROUD
53	1	1 PHASE OUTLET 15A	CLIPSAL	LSA	-	
54	1	LAPTOP GPO - TWIN 10A	CLIPSAL	LSA	-	
55	1	1 PHASE OUTLET - GENERATOR ANCLARY POWER	CLIPSAL	LSA	-	
56	1	3 PHASE NBE APPLIANCE INLET - GENERATOR POWER	CLIPSAL	LSA	-	
57						
58						
59	2	PUMP SOFT STARTER	DANFOSS MC0500	MC05-00218 + MODBUS COMMS	-	175G5500 + 175G9000
60	2	EXTERNAL KEYPAD KIT	DANFOSS	175G3061	-	
61						
62						
63						
64	2	PUMP LINE CONTACTOR - K1 (24VDC COIL)	SPRECHER & SCHUH	CA7-30	-	24VDC COIL

ITEM	QTY	DESCRIPTION	MANUFACTURER	CATALOGUE No	OPT	REMARKS
65	2	SOFT STARTER RUNNING RELAY - K2	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05
66	2	STARTER FAULT RELAY - K3	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05
67	2	PUMP EM STOP RELAY - K4	IDEC	RH4B-ULD-DC24V	-	+ SH4B-05
68	2	PUMP CONTROL CCT POWER ON RELAY - K5	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05
69	2	PUMP RUN RELAY - K6	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05
70					A	
71					B	
72					B	
73	2	PUMP RUN COMMAND RELAY - K20	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05
74	2	PUMP FAULT RESET RELAY - K21	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05
75	2	PUMP EMERGENCY MODE INTERRUPT RELAY - K22	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05
76					-	
77	2	PUMP START PUSHBUTTON - S1	SPRECHER & SCHUH	D7P-F3-PX10	-	
78	2	PUMP STOP PUSHBUTTON - S2	SPRECHER & SCHUH	D7P-F4-PX10	-	
79	2	PUMP EM/STOP PUSHBUTTON - S3	SPRECHER & SCHUH	D7P-MT34-PX01S	-	c/w D7-15YE112 + PX01S
80	2	PUMP RESET PUSHBUTTON - S4	SPRECHER & SCHUH	D7P-F6-PX10	-	
81	2	PUMP HOUR RUN METER - HRM	NHP	R04801080VDC	-	24VDC
82	2	PUMP POWER SOCKET OUTLET + INCLINE SLEEVE	HARECHAL	DS13114013972 + 518A058	J	
83	2	PUMP POWER INLET PLUG + HANDLE	HARECHAL	DS13118013972 + 311A013	J	
84	2	PUMP CONTROL SOCKET OUTLET + INCLINE SLEEVE	HARECHAL	PN7C 01P4060 + 01NA053	J	
85	2	PUMP CONTROL INLET PLUG + HANDLE	HARECHAL	PN7C 01P8060 + 01NA313	J	
86					E	
87					E	
88					E	
89					E	
90					E	
91					E	
92					E	
93	1	LR3- WET WELL HIGH LEVEL RELAY	MULTITRODE	MTR-5	-	24VDC
94					Q	
95					D	
96	1	SIR - SURCHARGE IMMINENT LEVEL RELAY	MULTITRODE	MTRA-F5	-	24VDC
97	1	EMERGENCY PUMPING MODE RELAY PUMP1 - EMG1	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05
98	1	SURCHARGE IMMINENT DELAY TIMER - S1D1	SPRECHER & SCHUH	RZ7-FSA 4U U23	-	ON DELAY / INSTANTANEOUS
99	1	EMERGENCY PUMPING MODE TIMER - EMGDT	OMRON	H3CA-A (-P2CF-11)	-	(+ Y92A-488) OFF DELAY
100	1	EMERGENCY PUMPING MODE TIMER PUMP2 - EMG2	SPRECHER & SCHUH	RZ7-FSA 3E U23	-	ON DELAY
101	2	EMERGENCY PUMPING MODE SWITCH & LIGHT - S5/S15	SPRECHER & SCHUH	D7P-LSH25 + D7-15YE112 + D7-X10 (2), ENGRAVE 'OFF ON'	-	
102	1	EMERGENCY PUMPING MODE AUX RELAY - EMGDTA	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05
103					F	
104					F	
105					F	
106					F	
107					F	
108					F	
109					F	
110					F	
111					F	
112					F	
113					F	
114					F	
115	2	SW/BD LIGHTING CONTROL RELAY - SLR, DZCR	IDEC	RH2B-ULD-DC24V	-	+ SH2B-05
116	1	AREA LIGHTING CONTROL SWITCH - S11	KRAUS & NAIMER	CAD11-6720-600-F72-F758	-	ENGRAVE 'OFF ON'
117					A7213	
118	1	STATION LOCAL/REMOTE SWITCH - S10	KRAUS & NAIMER	CAD11-A920-600-F72-F758	-	ENGRAVE 'LOCAL REMOTE'
119	1	ELECTRODES TEST RELAY - ETR	IDEC	RH4B-ULD-DC24V	-	+ SH4B-05
120					P	
121	1	WET WELL LEVEL INDICATOR	CROMPTON INSTRUMENTS	244-804-HG-IP-SR 4-20mA	-	0-100% ADJ RED POINTER
122					J	
123	8	SW/BD DOOR MICRO SWITCHES - SINGLE POLE	OMRON	Z-15GW2 55 B	-	8 OFF N/O
124	1	SW/BD DISCONNECT COMPART DOOR PROXIMITY SWITCH	PEPPERL & FUCHS	NCR5-18QM40-20	-	
125	6	SW/BD INTERNAL LED LIGHTS	LUMIFA	LF18-C35-2THW4	-	
126					G	
127					G	
128					G	

ITEM	QTY	DESCRIPTION	MANUFACTURER	CATALOGUE No	OPT	REMARKS
129					G	
130					K	
131					S	
132					H	
133	1	WET WELL LEVEL PROBE	VEGA - VEGAWELL52	WL52XXA4AM0101X	-	SET RANGE TO = 2m
134	1	WET WELL LEVEL ADJUSTMENT UNIT	VEGA - VEGADIS62	DIS62XXKMAXX	-	
135					G	
136					-	
137	1	DELIVERY PRESSURE TRANSMITTER	VEGA VEGABAR52	BR52XXCAIFHPMAS L-25	U	RANGE = 30m
138	1	TRICLOVE FITTING FOR VEGABAR52	VEGA	ADAPTOR	U	
139	1	CONTROL SYSTEM POWER SUPPLY 24VDC	POWERBOX	P8251A-24CH-CC-T-S	-	
140	1	RADIO 24V/13.8VDC CONVERTER	POWERBOX	P8H-2417-CC	R	
141					I	
142	2	BATTERIES - INCLUDING SPILL TRAYS	YUASA	UXH50-12	-	
143	1	RADIO	TRIO	DR900-07A02-00	R	
144	1	RADIO ANTENNA	TRIO	YAGI ANT13AL	R	15 ELEMENT 13dB ALUM
145	1	RADIO COAX SURGE PROTECTION UNIT	POLYPHASE CORPORATION	IS-50NX-C2	R	Mounted on Din Rail
146	1	TELEMETRY UNIT	MOTOROLA	ACE - 3600	-	
147	1	GSM MODEM	WAVECOM	FASTRACK Supreme	I	c/w 5 M Cable
148	1	GSM CELLULAR TRANSIT ANTENNA	RF INDUSTRIES	TLA2000	I	
149	1	GRAPHIC DISPLAY	REDLION	G306A000	-	
150						
151						
152						
153						
154						
155						
156					R	
157	1	INTERNAL COAX CABLE (Radio to Lightning Arrester)	TRIO	TRIO - SHAM/NM/TL23	R	Cable No X01
158	1	EXTERNAL COAX CABLE (Lightning Arrester to Aerial)	R.F. INDUSTRIES	ANDREW - CNT400	R	Cable No X02
159	2	COAX PLUG (For CNT400 cable)	PULSE	N-203HS	R	Straight cable plug crimp
160	1	U CLAMPS	R.F. INDUSTRIES	UNV	R	
161	Lot	MINIATURE THERMAL CIRCUIT BREAKER	PHOENIX CONTACT	TCP 'x'A - UK6FSI/C	-	'x' = AMP Rating
162	Lot	THROUGH TERMINALS (Grey & Blue as Required)	PHOENIX CONTACT	PIT 25	-	PIT 25-BU (for -ve)
163	Lot	DISCONNECT TERMINALS (Grey & Blue as Required)	PHOENIX CONTACT	PIT 25-MT	-	PIT 25-MT-BU (for -ve)
164	Lot	GROUP MARKER CARRIER	PHOENIX CONTACT	UBE	-	
165	Lot	PLUG-IN BRIDGE	PHOENIX CONTACT	FBS - 50	-	AS REQUIRED
166	2	TEST PLUG	PHOENIX CONTACT	PS-5	-	
167	Lot	COVER PROFILE (SHROUding) + CARRIER PLATE	PHOENIX CONTACT	AP-2 + AP2-TU	-	AS REQUIRED
168						
169						
170	1	ENERGEX PADLOCK - 45mm brass pin tumbler	H.A. REED LOCKSMITHS	KEY No 325 & S/S Shackle	-	c/w 2 KEYS
171						
172	Lot	WET WELL CONDUIT END CAPS c/w NYLON CABLE GLANDS	HD PVC	TO SUIT CONDUITS	-	Detail 'W'
173	Lot	S/STEEL FITTINGS AS DETAILED FOR PRESSURE TX	FITTINGS	STAINLESS STEEL	U	Sheet 24
174	1	EARTH ROD CONNECTION BOX	NESCO	ERB1	-	
175	1	LINE TAP - BONDING TO EARTHING ROD	CLIPSAL	BP26	-	
176	1	EARTHING ROD	COPPER ROD	13mm Diameter	-	
177					E	
178					Q	
179					E	
180					E	
181					E	
182					E	
183					E	
184					E	
185					E	
186					E	
187	2	SINGLE POINT PROBES	MULTITRODE	2 off - 020130FSP-Shield	-	
188					C	
189					G	
190					G	
191	1	EXTERIOR AREA LIGHT	STRATEGIC LIGHTING	ECLIPSE - TS 2x80W	J	High Impact Resistant
192	4	CORROSION INHIBITOR	CORTEC	VPEC-110 OR 111	-	FROM AP CONTROLS

**ELECTRICAL AS BUILT DETAILS**

I CERTIFY THAT THE 'AS CONSTRUCTED' DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.

REV: COMPANY: J & P Richardson Industries Pty Ltd  
NAME: JUSTIN READ  
SIGNATURE: Justin Read  
RPEQ No: 9727 DATE: 12/6/13

Sheet 18  
FOR CONSTRUCTION

A 01.13	ISSUED FOR CONSTRUCTION	P.H.	A.W.	DRAFTED	P.HAGUE	Original Signed by P.HAGUE	6-11-12
O 11.12	ISSUED FOR TENDER	P.H.	A.W.	DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No. DATE
P1 10.12	ISSUED FOR REVIEW	P.H.	A.W.	CAD FILE	57-0293set_A	Original signed by A.WITTHOFT	8895 6-11-12
No DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No. DATE



SITE  
SP089  
HALL STREET  
SEWAGE PUMP STATION

TITLE  
EQUIPMENT LIST

SHEET No. 18  
Queensland Urban Utilities DRAWING No.  
486/5/7-0293-018  
AMEND. A

Page 158 of 167

ITEM #	OPT.	DESCRIPTION - INTERNAL LABEL	LABEL 1	LABEL 2 (IF NECESSARY)	TEXT HEIGHT	MATERIAL / COLOUR
02		ENERGEX SUPPLY	NORMAL SUPPLY MAIN SWITCH 175A	REFER SHEET 01 NOTE 11	10mm	ABS PLASTIC W/B
03		GENERATOR SUPPLY	GENERATOR SUPPLY MAIN SWITCH 175A		10mm	ABS PLASTIC W/B
04/05		PUMP CIRCUIT BREAKER	PUMP No1 32A	PUMP No2 32A	6mm	ABS PLASTIC W/B
07		PHASE FAILURE CIRCUIT BREAKER	ENERGEX PHASE FAILURE RELAY 07	FED FROM LINE SIDE OF MAIN SWITCH	4mm	ABS PLASTIC W/B
09		SUB-DISTRIBUTION BOARD CB	SUB-DISTRIBUTION BOARD 63A	Mounted On Escutcheon	6mm	ABS PLASTIC W/B
10		PHASE FAILURE CIRCUIT BREAKER	STATION PHASE FAILURE RELAY 010		4mm	ABS PLASTIC W/B
11		1 PHASE OUTLET CIRCUIT BREAKER	10 GPO 011		4mm	ABS PLASTIC W/B
12		RTU LAPTOP CIRCUIT BREAKER	RTU LAPTOP GPO 012		4mm	ABS PLASTIC W/B
13		SPARE CIRCUIT BREAKER	SPARE 013		4mm	ABS PLASTIC W/B
14		SPARE CIRCUIT BREAKER	SPARE 014		4mm	ABS PLASTIC W/B
15		GENERATOR ANCILLARY SUPPLY CB	GENERATOR ANCILLARY SUPPLY 015		4mm	ABS PLASTIC W/B
16		EXT. AREA LIGHTING CIRCUIT BREAKER	AREA LIGHTING 016		4mm	ABS PLASTIC W/B
17		SURGE FILTER CIRCUIT BREAKER	SURGE FILTER 017		4mm	ABS PLASTIC W/B
18		EM PUMP CONTROL & SR CIRCUIT BREAKER	EM PUMPING C&T & SR 018		4mm	ABS PLASTIC W/B
19		SPARE CIRCUIT BREAKER	SPARE 019		4mm	ABS PLASTIC W/B
20		3 PHASE OUTLET CIRCUIT BREAKER	30 OUTLET 020		4mm	ABS PLASTIC W/B
21		SPARE CIRCUIT BREAKER	SPARE 021		4mm	ABS PLASTIC W/B
24		RTU POWER SUPPLY CIRCUIT BREAKER	RTU POWER SUPPLY 024		4mm	ABS PLASTIC W/B
25		SURGE FILTER ALARM RELAY CIRCUIT BREAKER	SURGE FILTER ALARM RELAY 025		4mm	ABS PLASTIC W/B
26		SPARE CIRCUIT BREAKER	SPARE 026		4mm	ABS PLASTIC W/B
27		SPARE CIRCUIT BREAKER	SPARE 027		4mm	ABS PLASTIC W/B
31		PUMP 240VAC CONTROL CIRCUIT BREAKER	PUMP No1 031-1	PUMP No2 031-2	4mm	ABS PLASTIC W/B
32		24VDC CONTROL CIRCUIT BREAKER	PUMP No1 032-1	PUMP No2 032-2	4mm	ABS PLASTIC W/B
33		BATTERY CIRCUIT BREAKER	BATTERY 033		4mm	ABS PLASTIC W/B
34		240VAC-24VDC POWER SUPPLY	PS-P1	PS-P2 PS3	4mm	ABS PLASTIC W/B
35						
37		SURGE DIVERTER FUSES	SURGE DIVERTER FUSES 037A/037B	FED FROM LINE SIDE OF MAIN SWITCH	4mm	ABS PLASTIC W/B - R/W
38		SURGE DIVERTERS	SURGE DIVERTERS	FED FROM LINE SIDE OF MAIN SWITCH	4mm	ABS PLASTIC W/B - R/W
39		SURGE FILTER ALARM RELAY	SFAR		4mm	ABS PLASTIC W/B
40		SURGE REDUCTION FILTER	SURGE REDUCTION FILTER		4mm	ABS PLASTIC W/B
41		PHASE FAILURE RELAY	ENERGEX MAINS POWER FAIL - PFRE	FED FROM LINE SIDE OF MAIN SWITCH	4mm	ABS PLASTIC W/B - R/W
43		PHASE FAILURE RELAY	STATION MAINS POWER FAIL - PFRS		4mm	ABS PLASTIC W/B
45		MAIN NEUTRAL LINK	MAIN NEUTRAL		4mm	ABS PLASTIC W/B
46		MAIN EARTH LINK	MAIN EARTH		4mm	ABS PLASTIC W/B
47		SUB-BOARD NEUTRAL LINK	NEUTRAL		4mm	ABS PLASTIC W/B
48		SUB-BOARD EARTH LINK	EARTH		4mm	ABS PLASTIC W/B
49		SURGE DIVERTER NEUTRAL LINK	SURGE DIVERTER NEUTRAL		4mm	ABS PLASTIC W/B
50		INSTRUMENT EARTH LINK	INSTRUMENT EARTH		4mm	ABS PLASTIC W/B
51		FILTERED SUPPLY NEUTRAL LINK	FILTERED SUPPLY NEUTRAL	← LEAVE IN	4mm	ABS PLASTIC W/B
54		LAPTOP GPO	LAPTOP GPO	SFO ONLY	4mm	ABS PLASTIC W/B
55	M	GENERATOR 240VAC CONNECTION SOCKET	GENERATOR ANCILLARY SUPPLY		4mm	ABS PLASTIC W/B
56	M	GENERATOR POWER CONNECTION SOCKET	GENERATOR CONNECTION		4mm	ABS PLASTIC W/B
59		PUMP SOFT STARTER	PUMP No1 101	PUMP No2 201	6mm	ABS PLASTIC W/B
60		PUMP SOFT STARTER KEYPAD	PUMP No1	PUMP No2	8mm	ABS PLASTIC W/B
61						
63						
64		LINE CONTACTOR	PUMP 1 1K1	PUMP 2 2K1	4mm	ABS PLASTIC W/B
65		SOFT STARTER RUNNING RELAY	1K2	2K2	4mm	ABS PLASTIC W/B
66		SOFT STARTER FAULT RELAY	1K3	2K3	4mm	ABS PLASTIC W/B
67		EM STOP RELAY	1K4	2K4	4mm	ABS PLASTIC W/B
68		PUMP POWER ON RELAY	1K5	2K5	4mm	ABS PLASTIC W/B
69		PUMP RUN RELAY	1K6	2K6	4mm	ABS PLASTIC W/B
73		PUMP RUN COMMAND RELAY	1K20	2K20	4mm	ABS PLASTIC W/B
74		PUMP FAULT RESET RELAY	1K21	2K21	4mm	ABS PLASTIC W/B
75		PUMP EMERGENCY MODE INTERRUPT RELAY	1K22	2K22	4mm	ABS PLASTIC W/B
77		PUMP START PUSHBUTTON	START	START	4mm	ABS PLASTIC W/B
78		PUMP STOP PUSHBUTTON	STOP	STOP	4mm	ABS PLASTIC W/B
79		PUMP EM STOP PUSHBUTTON	(use label supplied with P/B/Butlon)	(use label supplied with P/B/Butlon)	4mm	Y/B
80		PUMP RESET PUSHBUTTON	FAULT RESET	FAULT RESET	4mm	ABS PLASTIC W/B
81		PUMP HOURS-RUN-METER	HOURS-RUN	HOURS-RUN	4mm	ABS PLASTIC W/B
82/83	J	PUMP DE-CONTACTOR	PUMP No1	PUMP No2	6mm	ABS PLASTIC W/B
84/85	J	PUMP AUX CONTROL PLUG & SOCKET	PUMP No1	PUMP No2	6mm	ABS PLASTIC W/B
93		WET WELL HIGH LEVEL RELAY	WET WELL HIGH LEVEL - LR3		4mm	ABS PLASTIC W/B
96		SURCHARGE IMMINENT LEVEL RELAY	WET WELL SURCHARGE IMMINENT - SIR		4mm	ABS PLASTIC W/B
97		EMERGENCY PUMPING MODE PUMP 1 RELAY	EMG1		4mm	ABS PLASTIC W/B
98		SURCHARGE IMMINENT ON DELAY TIMER	SIDT		4mm	ABS PLASTIC W/B
99		EMERGENCY PUMPING MODE OFF DELAY TIMER	EMGDT		4mm	ABS PLASTIC W/B
100		EMERGENCY PUMPING MODE PUMP 2 TIMER	EMG2		4mm	ABS PLASTIC W/B
101		EMERGENCY PUMPING MODE START SWITCH	EMERGENCY PUMPING MODE	EMERGENCY PUMPING MODE	4mm	ABS PLASTIC W/B
102		EMERG. PUMPING MODE OFF DELAY AUX RELAY	EMGDTA		4mm	ABS PLASTIC W/B
115		SWITCHBOARD LIGHTING CONTROL RELAY	SLCR	0262	4mm	ABS PLASTIC W/B
116		AREA LIGHTING CONTROL SWITCH	AREA LIGHTING		4mm	ABS PLASTIC W/B
118		STATION LOCAL/REMOTE SELECTOR SWITCH	STATION CONTROL MODE		4mm	ABS PLASTIC W/B
119		ELECTRODES TEST RELAY	ETR		4mm	ABS PLASTIC W/B
121		WET WELL LEVEL INDICATOR	WET WELL LEVEL		4mm	ABS PLASTIC W/B
134		WET WELL PRIMARY LEVEL ADJ. UNIT	PRIMARY WET WELL LEVEL (located in Sw/Bd)		4mm	ABS PLASTIC W/B
137	U	DELIVERY PRESSURE ADJ. UNIT	DELIVERY PRESSURE (located in Sw/Bd)		4mm	ABS PLASTIC W/B
139		CONTROL SYS 240VAC/24VDC POWER SUPPLY	CONTROL SYSTEM 24VDC POWER SUPPLY		4mm	ABS PLASTIC W/B
140	R	RADIO 24V/13.8VDC CONVERTER	24/12 VDC CONVERTER - RADIO		4mm	ABS PLASTIC W/B
143	R	RADIO	RADIO		4mm	ABS PLASTIC W/B
145	R	RADIO COAX SURGE PROTECTION	RADIO SURGE PROTECTION		4mm	ABS PLASTIC W/B
146		TELEMETRY UNIT	RTU		4mm	ABS PLASTIC W/B
147	I	MODEM	MODEM		4mm	ABS PLASTIC W/B

ITEM #	OPT.	DESCRIPTION - INTERNAL LABEL	LABEL 1	LABEL 2 (IF NECESSARY)	TEXT HEIGHT	MATERIAL / COLOUR
404		Access Panels - Do Not Remove	Access Panels - Do Not Remove	Do Not Remove	6mm	W/B
		TERMINAL HEADER	24VDC POWER DISTRIBUTION	DIGITAL INPUTS D01	4mm	ABS PLASTIC W/B
		TERMINAL HEADER	DIGITAL INPUTS D01	DIGITAL INPUTS D02	4mm	ABS PLASTIC W/B
		TERMINAL HEADER	DIGITAL OUTPUTS D01	DIGITAL OUTPUTS D02	4mm	ABS PLASTIC W/B
		TERMINAL HEADER	ANALOG INPUTS A01	ANALOG OUTPUTS A01	4mm	ABS PLASTIC W/B
		HEADER LABELS (Above DB Circuit Breakers)	NON FILTERED SUPPLY	FILTERED SUPPLY	6mm	ABS PLASTIC W/B
		HEADER LABEL (Inconer Section)	MEN BEHIND		6mm	ABS PLASTIC W/B
		HEADER LABEL (Over Terminals 600-613)	LEVEL TX AND LEVEL PROBES		4mm	ABS PLASTIC W/B
		HEADER LABEL (Over Shrouded Terminals)	WARNING 240VAC		4mm	ABS PLASTIC R/W
200						
201						
203		GENERATOR SOLTED CONNECTION	BUGBAR LINK WHEN SW/BOARD ENERGISED FROM GENERATOR		4mm	ABS PLASTIC R/W
204						
205						
206		METER PANEL WARNING SIGN	(DUPLICATE LABELS "X" & "Y" FROM EXTERNAL LABEL LIST)	(MOUNT INSIDE METER BOX ADJACENT METERS)	6mm	ABS PLASTIC W/B
208						
209		PUMP INFORMATION LABEL Label size to be approximately 150 x 50	SP089 HALL STREET PUMPS ZONE 5.1 1W 7.8 1PELLER 200		6mm	ABS PLASTIC W/B

LABEL	TEXT	TEXT HEIGHT	PAINT FILL LETTERING	QTY
A	SP089	25mm	Black	1
B	RTU	10mm	Black	1
C	PUMP ? CONTROL	10mm	Black	2
D	THIS SITE IS MONITORED BY THE CONTROL ROOM. PLEASE INFORM THE OPERATOR BEFORE ISOLATING PUMPS OR STATION	8mm	Black	2
E	PLEASE CHECK THAT THE STATION IS IN REMOTE MODE BEFORE LEAVING SITE	8mm	Black	1
F	COMMON CONTROL	10mm	Black	1
I	MAIN SWITCHES	10mm	Black	1
J	DISTRIBUTION BOARD	10mm	Black	1
L	GENERATOR BUSBAR CONNECTIONS	10mm	Black	1
M	PUMP DE-CONTACTORS	10mm	Black	1
N	GENERATOR PLUG CONNECTIONS	10mm	Black	1
O	BATTERIES	10mm	Black	1
P	SUPPLY AUTHORITY METERING	10mm	Black	1
R	DANGER - 2 SOURCES OF SUPPLY	10mm	Red	1
T	SURGE DIVERTERS	10mm	Black	1
Y	Phone: 340 78414 (Built up directly under Label "X")	8mm	Black	1
Z	DANGER - ELECTRICAL EQUIPMENT Queensland Urban Utilities Phone 34078414 NOTE: LABEL DESIGN IS ISSUED FROM ODU			1

EXTERNAL LABELS 1mm THICK, 316 GRADE STAINLESS STEEL, FIXED WITH M3 316 STAINLESS STEEL METAL THREADS.

LABEL	TEXT	TEXT HEIGHT	PAINT FILL LETTERING	QTY
AA	MAIN EARTH CONDUCTOR - DO NOT DISCONNECT 10m Main Earth Electrode	5mm		1

REV	COMPANY: J & P Richardson Industries Pty Ltd
	NAME: JUSTIN READ
	SIGNATURE: Justin Read
	RPEQ No: 7727 DATE: 12/6/13

ISSUED FOR CONSTRUCTION	P.H. A.W. DRAFTED	P.HAGUE	Original Signed by P.HAGUE	6-11-12
11.12 ISSUED FOR TENDER	P.H. A.W. DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No. DATE
10.12 ISSUED FOR REVIEW	P.H. A.W. CAD FILE	57-0293seL_A	Original signed by A.WITTHOFT	8895 6-11-12
No DATE AMENDMENT	DRN. APD. B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No. DATE

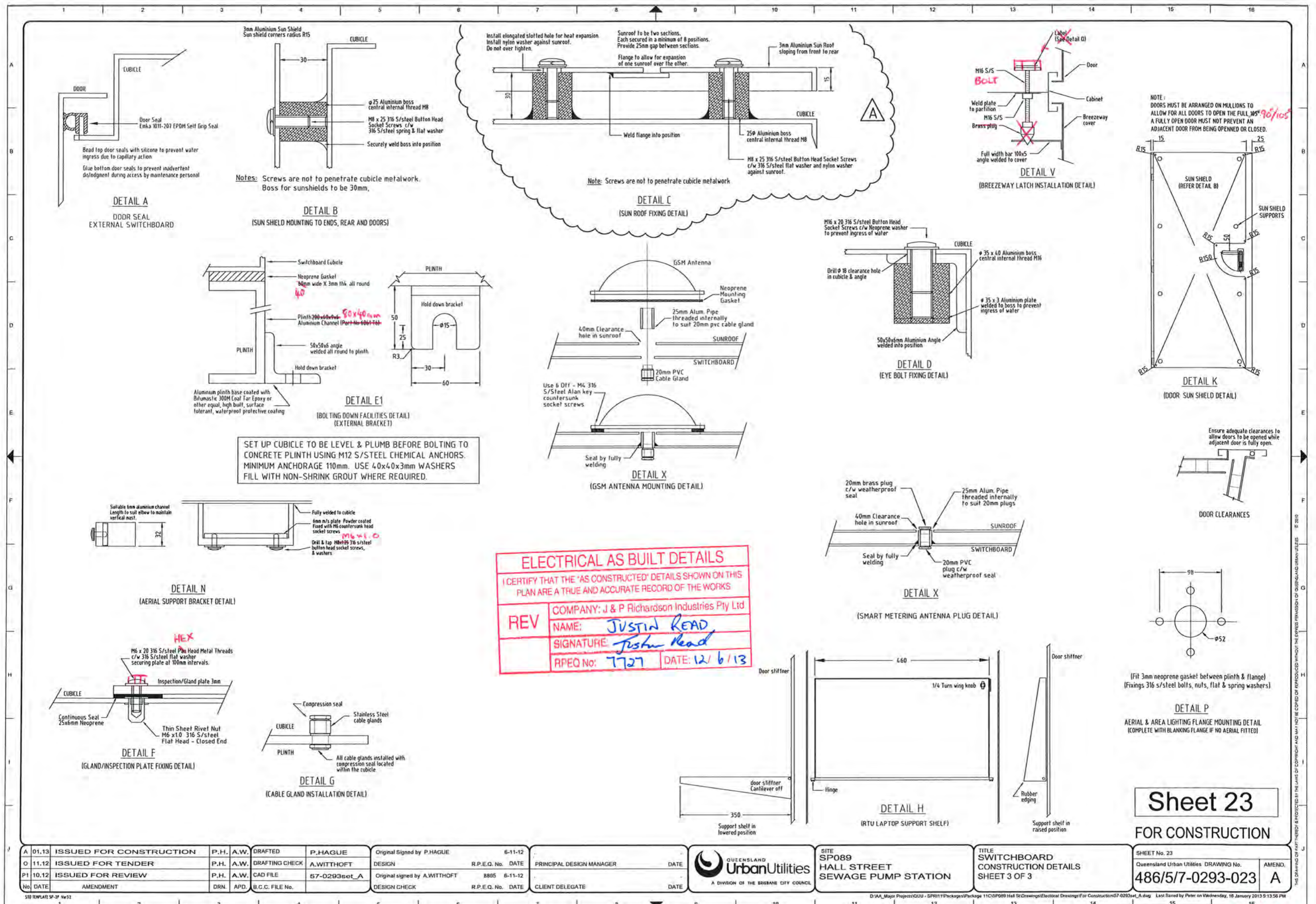
  

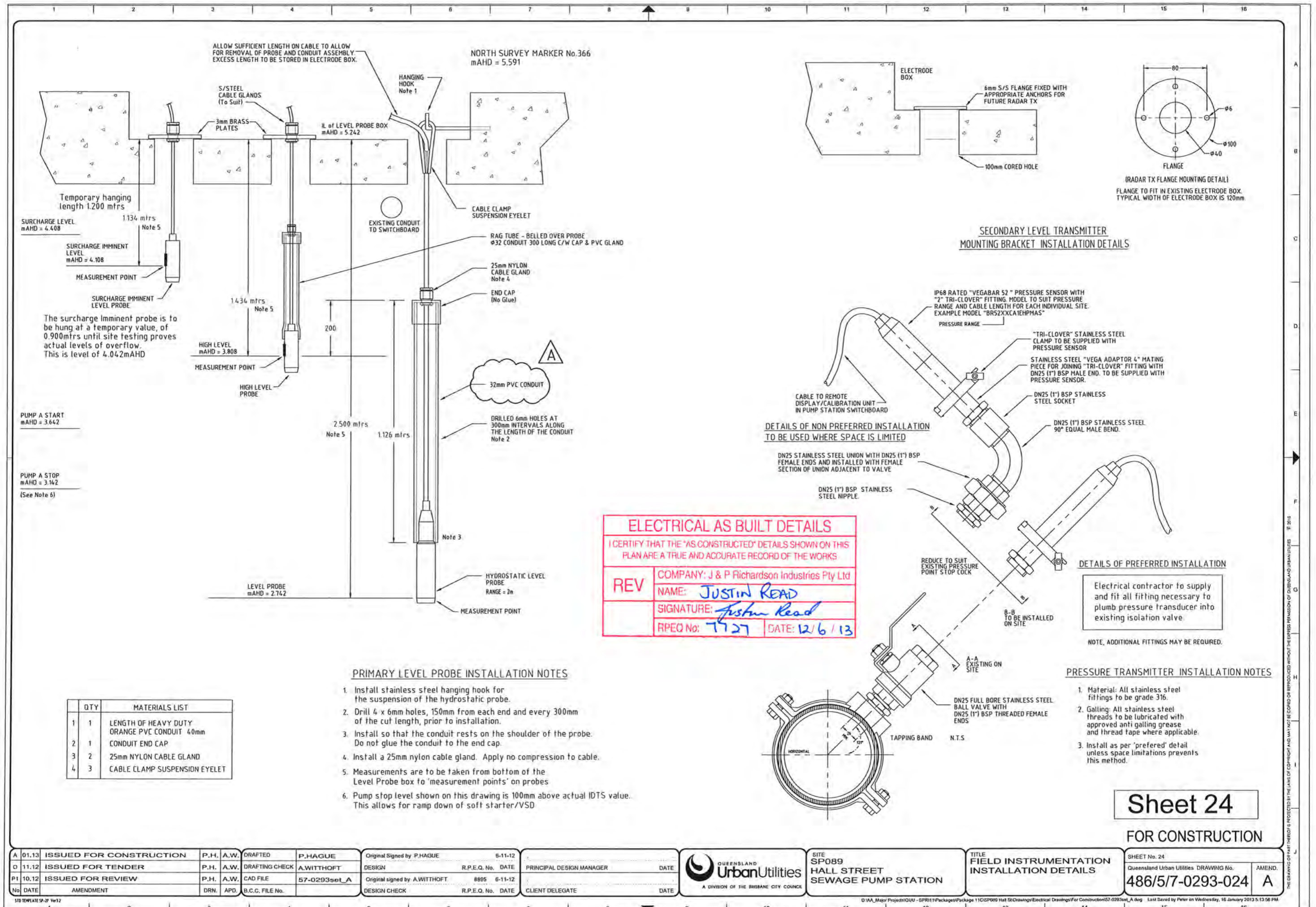
SITE	TITLE	SHEET No. 20	AMEND.
SP089 HALL STREET SEWAGE PUMP STATION	SWITCHBOARD LABEL SCHEDULE	Queensland Urban Utilities DRAWING No. 486/5/7-0293-020	A

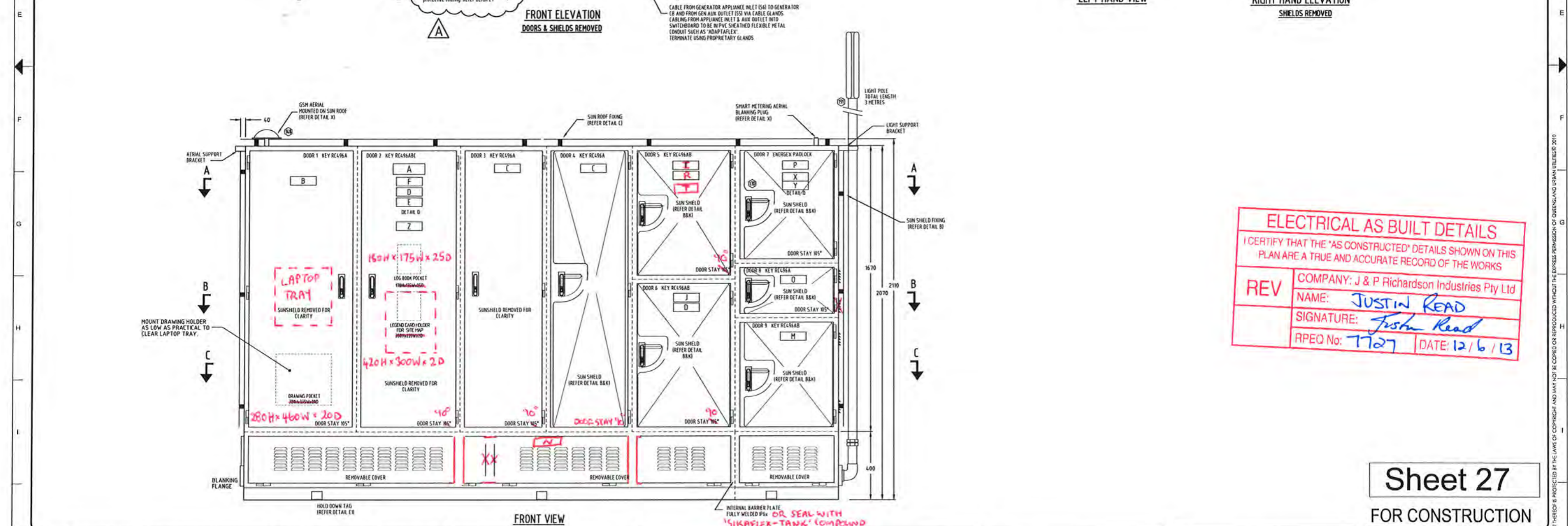
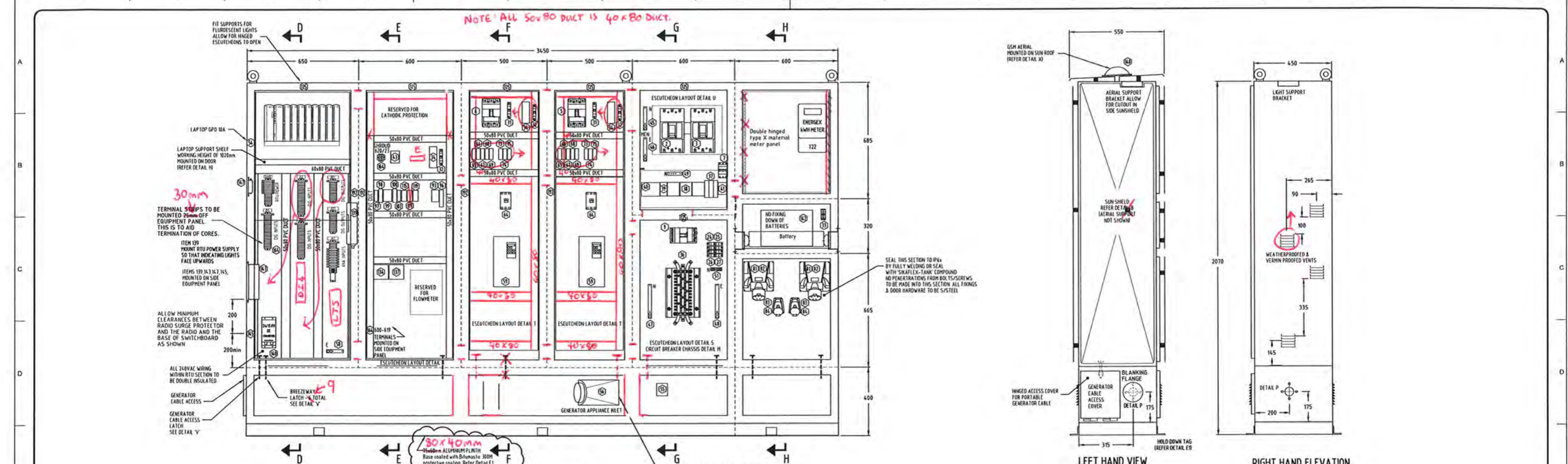
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ELECTRICAL AS BUILT DETAILS	
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS	
REV	COMPANY: J & P Richardson Industries Pty Ltd NAME: JUSTIN READ SIGNATURE: <i>Justin Read</i> RPEQ No: 7727
	DATE: 12/6/13

Sheet 27

A	01.13	ISSUED FOR CONSTRUCTION	P.H.	A.W.	DRAFTED	P.HAGUE	Original Signed by P.HAGUE	6-11-12	
O	11.12	ISSUED FOR TENDER	P.H.	A.W.	DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No. DATE	PRINCIPAL DESIGN MANAGER
P1	10.12	ISSUED FOR REVIEW	P.H.	A.W.	CAD FILE	57-0293set_A	Original signed by A.WITTHOFT	8895 6-11-12	
No	DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No. DATE	CLIENT DELEGATE

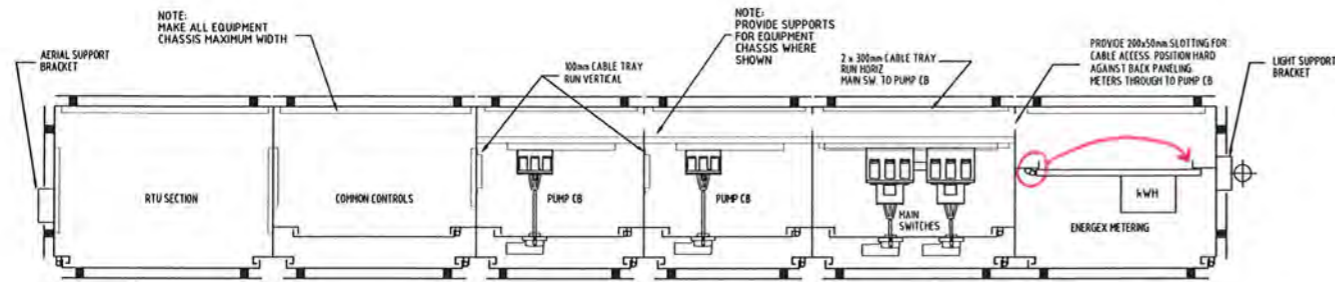


QUEENSLAND  
**UrbanUtilities**  
A DIVISION OF THE BRISBANE CITY COUNCIL

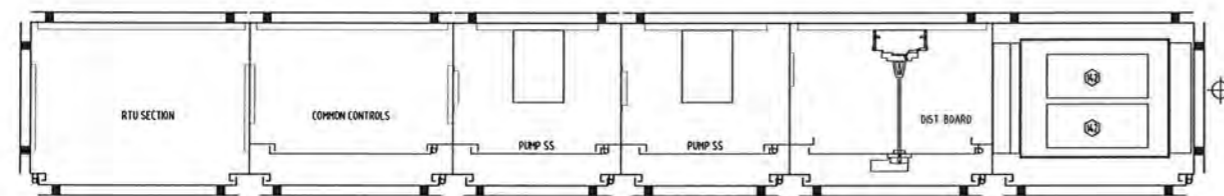
SITE  
SP089  
HALL STREET  
SEWAGE PUMP STATION

TITLE  
SWITCHBOARD  
GENERAL ARRANGEMENT  
ELEVATIONS

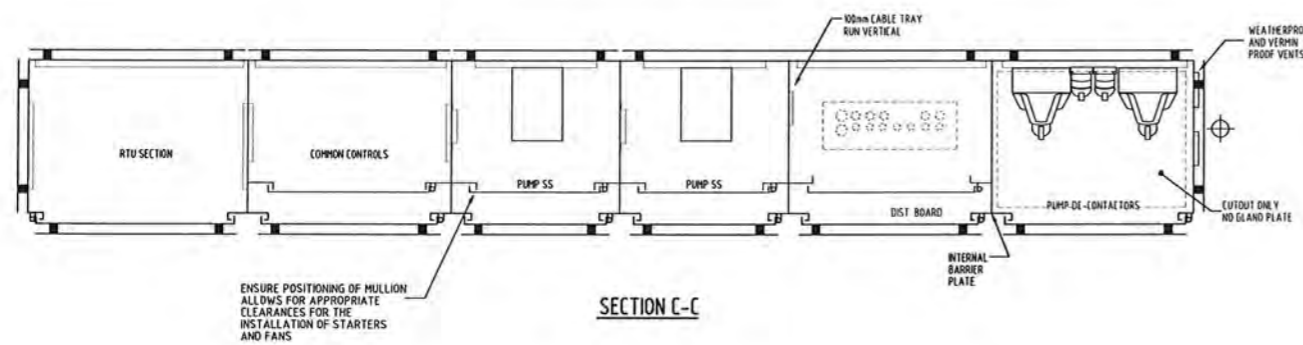
SHEET No. 27	
Queensland Urban Utilities DRAWING No. <b>486/5/7-0293-027</b>	AMEND. <b>A</b>



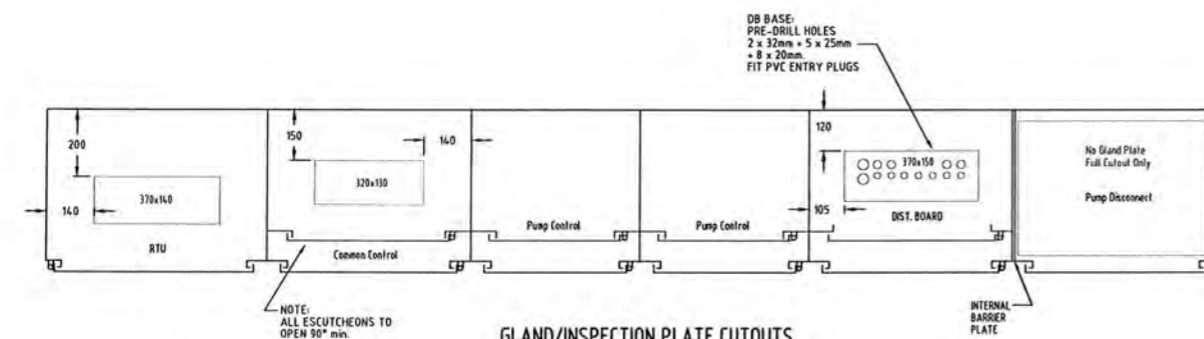
SECTION A-A



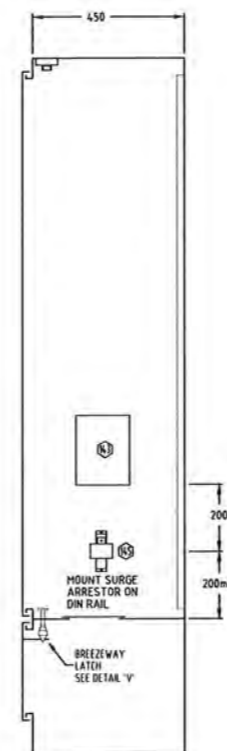
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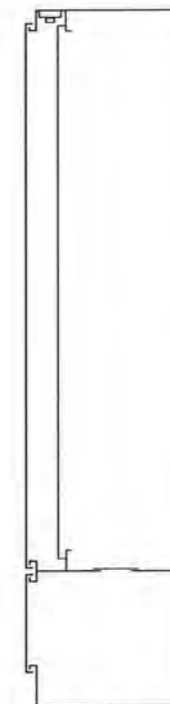
SECTION C-C



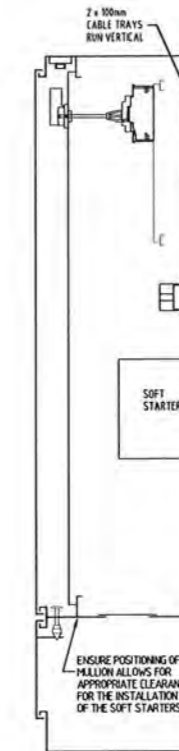
GLAND/INSPECTION PLATE CUTOUTS



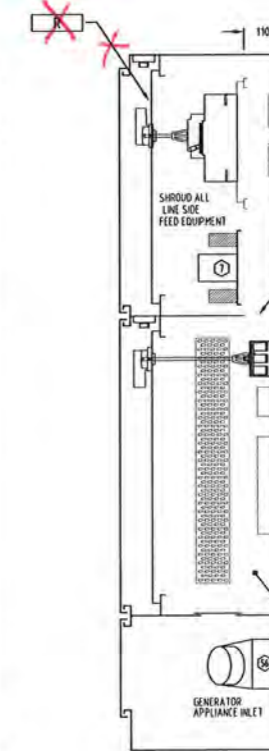
SECTION D-D



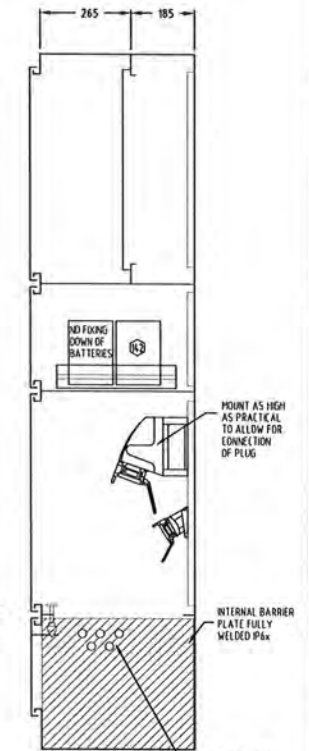
SECTION E-E



SECTION F-F



SECTION G-G



SECTION H-H

## ELECTRICAL AS BUILT DETAILS

I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS

REV

COMPANY: J &amp; P Richardson Industries Pty Ltd

NAME: JUSTIN READ

SIGNATURE: Justin Read

RPEQ No: 7727 DATE: 12/6/13

Sheet 28

FOR CONSTRUCTION

A	01.13	ISSUED FOR CONSTRUCTION	P.H.	A.W.	DRAFTED	P.HAGUE	Original Signed by P.HAGUE	6-11-12	
O	11.12	ISSUED FOR TENDER	P.H.	A.W.	DRAFTING CHECK	A.WITTHOFT	DESIGN	R.P.E.Q. No. DATE	PRINCIPAL DESIGN MANAGER DATE
P1	10.12	ISSUED FOR REVIEW	P.H.	A.W.	CAD FILE	57-0293set_A	Original signed by A.WITTHOFT	8895 6-11-12	
No.	DATE	AMENDMENT	DRN.	APD.	B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No. DATE	CLIENT DELEGATE DATE



SITE  
SP089  
HALL STREET  
SEWAGE PUMP STATION

TITLE  
SWITCHBOARD  
GENERAL ARRANGEMENT  
SECTIONS

SHEET No. 28  
Queensland Urban Utilities DRAWING No.  
486/5/7-0293-028  
AMEND. A

## 6 SERVICE & MAINTENANCE

This product is designed to operate under specific environmental, supply and load conditions. Should these conditions change, consult a licenced electrician or electrical engineer before operating this product.

These procedures are to be performed only by a licenced electrician as they may expose live equipment.

The Switchgear and Control gear Assembly is essentially maintenance free, however the following safety measures and routine maintenance is recommended.

Where fitted, ensure cabinet vents and filters are clear and clean.

During operation, ensure all doors and covers are secure and closed.

All faults are to be investigated and repaired by an appropriately licenced electrician.

All components to be operated in accordance with manufacturers data.

The protective devices within switchboards are designed to operate in the event of a short circuit or overload condition. In the event of these devices operating under such conditions the device or devices must be inspected and tested by a suitably trained person to ascertain its condition prior to reconnecting the protective device to the supply.

### **Periodic checks should ensure**

**The switchboard is clean and free of any contaminants, which could reduce the insulation properties of the switchboard.**

**All entries are sealed to ensure no vermin can enter.**

**There is no evidence of overheating, arcing or moisture.**

**The earthing system is maintained and is adequate to allow correct operation of protective devices.**

**Insulation resistance is maintained to appropriate levels.**

**Check terminations for correct tension.**

**Test operation of protective devices.**

**Re-calibrate instrument loops as required.**

Refer to AS-INSTALLED electrical drawings for details of protection equipment settings.

**No special tools or equipment are required to perform routine maintenance.**

## **7 ELECTRICAL EQUIPMENT TECHNICAL INFORMATION**

**Part 1 - TMS581**

**Part 2 - TMS582**