

Central SEQ Distributor – Retailer

Authority – trading as Queensland Urban Utilities

# Operation & Instruction Manual

Upgrade of Chlorine Disinfection System at  
Bundamba STP

C1011-045 QUU057

Commissioning Date: 30 June 2013



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Type: Final Effluent Disinfection System
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Type: 107 ABS 24V DN25 EPDM PVC-U c/w manual override & solvent cement sockets  
Built on AE11 Electric Actuator
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Supplier: Grundfos
  - 3 x Kit, pump/DDI60-10/PVC/FM  
Part No.: 96688965
  - Acc. Cable 5m analogue output, straight  
Part No.: 96632922
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Supplier: Grundfos  
Type: DDI 60-10 AF-PVC/T/C-S-31B16I  
Part No.: 96684867
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Supplier: Thermo Fisher  
Type: HG-702 Multi-Parameter Analyser  
Part No.: BLU702-B12-00202
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Supplier: HMA Valveco  
Type: M Series  
Part No.: M TYPE-MB5D-2A002A1-1.1

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Supplier: Various

Part No.: Various

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Supplier: Burket

Model: Series 0142 15NB

Part No.: 041980

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Supplier: Vega

Type: VEGASON 61 4 ... 20 mA/HART two-wire

Part No: SN61.XXAGHKMAX

## 11. **Conductivity Transmitter & Probe**

Supplier: Delta OHM

Part No.: DO 9766T-R1 (transmitter)

Part No.: SPTKI-11 (5mtr Probe)

## 12. **Electromagnetic Flow Meter**

Supplier: Endress & Hauser

Type: Proline Promag 50H08-63P2/101 DN08 5/16

Part No.: 50H08-RCBB1AA0ABBD

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Supplier: Altra 9

Type: PDF &amp; Autocad

Drawing No.

486/5/5-0157-001 A	486/5/5-0157-021 A	486/5/5-0157-040 A
486/5/5-0157-002 A	486/5/5-0157-030 A	486/5/5-0157-050 A
486/5/5-0157-003 A	486/5/5-0157-031 A	486/5/5-0157-051 A
486/5/5-0157-004 A	486/5/5-0157-032 A	486/5/5-0157-052 A
486/5/5-0157-005 A	486/5/5-0157-033 A	486/5/5-0157-053 A
486/5/5-0157-006 A	486/5/5-0157-034 A	486/5/5-0157-054 A
486/5/5-0157-010 A	486/5/5-0157-035 A	486/5/5-0157-055 A
486/5/5-0157-011 A	486/5/5-0157-036 A	486/5/5-0157-056 A
486/5/5-0157-012 A	486/5/5-0157-037 A	486/5/5-0157-060 A
486/5/5-0157-013 A	486/5/5-0157-038 A	
486/5/5-0157-020 A	486/5/5-0157-039 A	

**15. Electrical Drawings**

Supplier: Lend Lease

Type: PDF &amp; Autocad

Drawing No.

486/5/7-0157-015	486/5/7-0157-026	486/5/7-0157-037
486/5/7-0157-016	486/5/7-0157-027	486/5/7-0157-038
486/5/7-0157-017	486/5/7-0157-028	486/5/7-0157-039
486/5/7-0157-018	486/5/7-0157-029	486/5/7-0157-040
486/5/7-0157-019	486/5/7-0157-030	486/5/7-0157-041
486/5/7-0157-020	486/5/7-0157-031	486/5/7-0157-042
486/5/7-0157-021	486/5/7-0157-032	486/5/7-0157-043
486/5/7-0157-022	486/5/7-0157-033	486/5/7-0157-044
486/5/7-0157-023	486/5/7-0157-034	486/5/7-0157-045
486/5/7-0157-024	486/5/7-0157-035	486/5/7-0157-046
486/5/7-0157-025	486/5/7-0157-036	486/5/7-0157-047



# 1. Functional Specification

**Registered as TMS796 in Q-Pulse.**  
**Click here to open.**

# Equipment Manuals – Sections 2 to 12

Manual Section	Q-Pulse Id (link)
2. SCADA User Manual	<a href="#"><u>TMS797</u></a>
3. Electrically Actuated Ball Valve	
4. Grundfos Dosing Pump Spares	
5. Grundfos Dosing Pump DDI 60 10	
6. Water Quality Analyser	
7. Magnetic Bypass Level Indicator	
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9. Burkert Fluid Control System	
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12. Flow Meter	

# **13. SAT, ITPs & Compliance Certificate of Compliance**



# Lend Lease

Water Queensland: 39 Suscatand Street, Rocklea Qld 4106

## CERTIFICATE OF:

(Please mark relevant check-box)

☒ **TESTING AND COMPLIANCE** ( **Electrical installations** )

Issued in accordance with s159 of the *Electrical Safety Regulation 2002*

☐ **TESTING AND SAFETY** ( **Electrical equipment** )

Issued in accordance with s15 of the *Electrical Safety Regulation 2002*

\* Work performed for:

* Name	Queensland Urban		Utilities
	Title	Given name/s	Surname
* Address	BWWTP - River Road		
	Street		
	Bundamba	4304	
	Suburb/town	Postcode	

\* Electrical installation / equipment tested (detailed list of all work done):

- of new conductivity meters (2), new level sensors (2), new flow meters (2), new actuating valves (2), new solenoid valves (2) and new level switches (2) into existing switchboard at Chlorine Shed - Bundamba Waste Water Treatment Plant.

\* Date of test 12 / 4 / 2013      \* Electrical contractor licence number 66516

Name on contractor licence Lend Lease Infrastructure Services Pty Ltd

Electrical contractor phone number 07 3717 7217

For **electrical installations**, this certifies that the electrical installation, to the extent it is affected by the electrical work, has been tested to ensure that it is electrically safe and is in accordance with the requirements of the wiring rules and any other standard applying under the *Electrical Safety Regulation 2002* to the electrical installation.

For **electrical equipment**, this certifies that the electrical equipment, to the extent it is affected by the electrical work, is electrically safe.

Name Shane Holding

Person who performed, or person who is responsible for work

Signature       Date 12 / 4 / 2013

\* Indicates a mandatory field

V2.02-2008

# **13. SAT, ITPs & Compliance (cntd.) Control System FAT**

# Bundamba STP Chlorine Contact Tank Upgrade (2012) - FAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes:	QUU Representative:
LIT0710 100	AI	✓	✓	✓	na	CCT Flow Splitter Level High-High	Pass	Alarm Change 18	Vogerson-Gel
LIT0710 100	HI	✓	✓	na	✓	CCT Flow Splitter Level High	Pass	CAT 2	
LIT0710 100	Hi	✓	✓	na	✓	CCT Flow Splitter Level Low	Pass	3	
LIT0710 100	Lo	✓	✓	na	✓	CCT Flow Splitter Level Low	Pass	3	
LIT0710 100	LL	✓	✓	na	✓	CCT Flow Splitter Level Low Low	Pass	3	
LIT0710 100	Invalid	✓	✓	na	✓	CCT Flow Splitter Level Invalid Signal	Pass	3	
LSH0710 102	LSH	✓	na	na	✓	Was Chlorine Contact Tanks Flow Splitter High Level Sw Alarm.	Pass	Was called LSH0710 - 004 Now	
LSL0710 101	LSL	✓	na	na	✓	Now CCT Flow Splitter High Level Switch	Pass	Was called LSL0710 - 004 Now	
VLV3700 412	FO	✓	✓	na	✓	Hypo Pump 4 to CCT Valve Fail to Open	Pass	Valve from Hypo Pump 4 to CCT1 Fail to Open	
VLV3700 412	FC	✓	✓	na	✓	Hypo Pump 4 to CCT Valve Fail to Close	Pass	CCT1 Fail to Close	
VLV3700 412	Total operations	na	na	na	na		Pass		
VLV3700 423	FO	✓	✓	na	✓	Hypo Pump 4 to CCT Valve Fail to Open	Pass	Valve from Hypo Pump 4 to CCT1 Fail to Open	
VLV3700 423	FC	✓	✓	na	✓	Hypo Pump 4 to CCT Valve Fail to Close	Pass	Valve from Hypo Pump 4 to CCT1 Fail to Close	
VLV3700 423	Total operations	na	na	na	na		Pass	Want Kasek Fix	
FSL3700 510	No Flow	✓	na	na	✓	CCT1 Chlorine Carry Water Low Flow	Pass		
FSL3700 520	No Flow	✓	na	na	✓	CCT2 Chlorine Carry Water Low Flow	Pass		
VLV3700 710	OpenCmd	✓	✓	na	na	CCT1 Degassing Valve Fail To Open	Pass		
VLV3700 710	CloseCmd	✓	✓	na	na	CCT1 Degassing Valve Fail To Close	Pass		
VLV3700 710	Total operations	na	na	na	na		Pass		
VLV3700 720	OpenCmd	✓	✓	na	na	CCT2 Degassing Valve Fail To Open	Pass		
VLV3700 720	CloseCmd	✓	✓	na	na	CCT2 Degassing Valve Fail To Close	Pass		
VLV3700 720	Total operations	na	na	na	na		Pass		
FIT3700 710	AI	✓	✓	na	✓	CCT1 + Filtered + Outside Reservoir Alarm	Pass	0-1000 L/hr	
FIT3700 710	HI	✓	✓	na	✓	CCT1 Sodium Hypochlorite Low Solenoid Alarm	Pass	5% = 35 L/hr	
FIT3700 710	Hi	✓	✓	na	✓	CCT1 Sodium Hypochlorite Low Solenoid Alarm	Pass	8.5% = 235 L/hr	
FIT3700 710	Lo	✓	✓	na	✓	CCT1 Sodium Hypochlorite Low Solenoid Alarm	Pass	3.5% = 10 L/hr	
FIT3700 710	LL	✓	✓	na	✓	CCT1 Sodium Hypochlorite Low Solenoid Alarm	Pass	1.0% = 10 L/hr	
FIT3700 710	Invalid CAT1	✓	✓	na	na	CCT1 Sodium Hypochlorite Low Solenoid Alarm	Pass	Changed 2nd day - 700 to 1	
FIT3700 710	Flow Total	✓	✓	na	na	CCT1 Sodium Hypochlorite Low Solenoid Alarm	Pass	Fixed ✓ Relocated ✓	
FIT3700 710	Daily Total	✓	✓	na	na	CCT1 Sodium Hypochlorite Low Solenoid Alarm	Pass	Fixed ✓ Relocated ✓	
FIT3700 720	AI	✓	✓	na	✓	CCT2 Sodium Hypochlorite Low Solenoid Alarm	Pass	0-1000 L/hr	
FIT3700 720	HI	✓	✓	na	✓	CCT2 Sodium Hypochlorite Low Solenoid Alarm	Pass	5% = 35 L/hr	
FIT3700 720	Hi	✓	✓	na	✓	CCT2 Sodium Hypochlorite Low Solenoid Alarm	Pass	8.5% = 235 L/hr	
FIT3700 720	Lo	✓	✓	na	✓	CCT2 Sodium Hypochlorite Low Solenoid Alarm	Pass	3.5% = 10 L/hr	
FIT3700 720	LL	✓	✓	na	✓	CCT2 Sodium Hypochlorite Low Solenoid Alarm	Pass	1.0% = 10 L/hr	
FIT3700 720	Invalid CAT1	✓	✓	na	na	CCT2 Sodium Hypochlorite Low Solenoid Alarm	Pass	Changed 2nd day - 700 to 1	
FIT3700 720	Flow Total	✓	✓	na	na	CCT2 Sodium Hypochlorite Low Solenoid Alarm	Pass	Fixed ✓ Relocated ✓	
FIT3700 720	Daily Total	✓	✓	na	na	CCT2 Sodium Hypochlorite Low Solenoid Alarm	Pass	Fixed ✓ Relocated ✓	
CIT0710 001	AI	✓	✓	na	na	Chlorine Contact Tank Conductivity High High	Pass	0-1500 µS	
CIT0710 001	HH	✓	✓	na	na	Chlorine Contact Tank Conductivity High High	Pass	Existing 20 µS	



# Bundamba STP Chlorine Contact Tank Upgrade (2012) - FAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes:	QUU Representative:
CI0710_001	HI	✓	✓	na	✓	Chlorine Contact Tank Conductivity High	Pass	15% 2.65	
CI0710_001	Lo	✓	✓	na	✓	Chlorine Contact Tank Conductivity Low	Pass	1.25	
CI0710_001	LL	✓	✓	na	✓	Chlorine Contact Tank Conductivity Low-Low	Pass	Existing	
CI0710_001	Probe Healthy	✓	✓	na	✓	o - CCT Conductivity Probe 1 - Alarm	Pass		
CI0710_002	Probe Healthy	✓	✓	na	✓	o - CCT Conductivity Probe 2 - Alarm	Pass		
CI0710_003	Probe Healthy	✓	✓	na	✓	o - CCT Conductivity Probe 3 - Alarm	Pass		
LI0710_120	AI	✓	✓	na	✓	Chlorine Storage Tank 2 Basin Level High-High	Pass	97%	
LI0710_120	HH	✓	✓	na	✓	Chlorine Storage Tank 2 Basin Level High	Pass	95%	
LI0710_120	HI	✓	✓	na	✓	Chlorine Storage Tank 2 Basin Level Low	Pass	90%	
LI0710_120	Lo	✓	✓	na	✓	Chlorine Storage Tank 2 Basin Level Low	Pass	25%	
LI0710_120	Invalid	✓	✓	na	✓		Pass		
LI0710_120	UnderRange	✓	✓	na	✓		Pass		

Duty operation of valves which divert pump 4 to either CCT1 or CCT2 but not both.

Manual

Send open command

✓

Simulate open feedback

✓

Send close command

✓

Simulate close feedback

✓

With all three low flow pumps starting as healthy.

✓

With both Valves starting as healthy and in automatic.

✓

Simulate a fault on low flow pump 3.

✓

Confirm that valve automatically opens to allow pump 4 to pump into CCT1 line.

✓

Confirm that request for pump 4 to run is active.

✓

Automatic

Simulate a fault on low flow pump 5.

✓

Confirm that pump 4 continues to pump into CCT1 line.

✓

Repeat above for CCT2 line.

✓

Simulate Flow Splitter level / Flow meter and calculated flow and dosing functionality.

Simulate a level in the Flow Splitter.

✓

Confirm that as the level raises above the bottom of the v-notch that the CCT1 and CCT2 calculated flows increase.

✓

Confirm that as the level falls below the bottom of the v-notch that the CCT1 and CCT2 calculated flows show 0 unless the recirculation or bleed pumps are running.

✓

Confirm that as the level falls above the top of the v-notch that the CCT1 and CCT2 calculated flows shows ??? (not specified in functional spec).

✓

Simulate when one penstock is closed that the flow still correct for the CCT which is still on line.

✓

Simulate dosing calculation with different dosing ranges and values.

✓

Need to simulate Hypo pumps duty rotation daily (See SAT tests)

✓

Recirc pumps run when flow is less than 40L/s (See SAT tests)

✓

Storage Tanks logic to change during cut over. Out of service tank leak fault, low and high level lights. In use tank leak fault level drops by 500L + estimated flow rate. (See SAT tests)

✓

Simulate 5 minutes

✓

Simulate 5 minutes

✓

Simulate 5 minutes

✓

Simulate 5 minutes

✓

Simulate 5 minutes

✓

Simulate 5 minutes

✓

Simulate 5 minutes

✓

Simulate 5 minutes

✓

Lendlease

Operative:

Miles Puno

Signature:

[Signature]

Date:

25/11/2013

QUU Witness:

Signature:

FAHEEM SALEH

Signature:

[Signature]

Date:

25/11/2013

(+ you checked only)

SD0710-016  
Passing  
duty tests  
fixed valves  
on valve

# **13. SAT, ITPs & Compliance (cntd.) Control System SAT**



# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes:	QUU Representative:
LIT0710 100	AI	✓	✓	✓	na	QCT Flow Splitter Level High-High	✓		
LIT0710 100	HH	✓	✓	na	CAT1	QCT Flow Splitter Level High-High	✓		
LIT0710 100	Hi	✓	✓	na	CAT3	QCT Flow Splitter Level High	✓		
LIT0710 100	Lo	✓	✓	na	CAT3	QCT Flow Splitter Level Low	✓		
LIT0710 100	LL	✓	✓	na	CAT4	QCT Flow Splitter Level Low	✓		
LIT0710 100	Invalid	✓	✓	na	CAT1	QCT Flow Splitter Level Invalid Signal	✓		
LSH0710 102	LSH	✓	na	na	CAT3	Was Chlorine Contact Tanks Flow Splitter High Level Sw Alarm - New CCT Flow Splitter High Level Switch	✓	Existing	
LSL0710 101	LSL	✓	na	na	CAT3	Was Chlorine Contact Tanks Flow Splitter Low Level Sw Alarm - New CCT Flow Splitter Low Level Switch	✓	Existing	
VLV3700 412	FO	✓	✓	na	CAT1	Hypo Pump 4 <del>to CCT2 valve</del> Fail to Open	✓		
VLV3700 412	FC	✓	✓	na	CAT1	Hypo Pump 4 <del>to CCT2 valve</del> Fail to Close	✓		
VLV3700 412	Total operations	na	na	✓	na	CCT1 valve	✓		
VLV3700 423	FO	✓	✓	na	CAT1	Hypo Pump 4 to CCT2 valve Fail to Open	✓		
VLV3700 423	FC	✓	✓	na	CAT1	Hypo Pump 4 to CCT2 valve Fail to Close	✓		
VLV3700 423	Total operations	na	na	✓	na	CCT2 valve	✓		
FSL3700 610	No Flow	✓	na	na	CAT2	CCT1 Chlorine Carry Water Low Flow	✓		
FSL3700 620	No Flow	✓	na	na	CAT2	CCT2 Chlorine Carry Water Low Flow	✓		
VLV3700 710	OpenCmd	✓	✓	na	na	CCT1 Degassing Valve Fail To Open	✓		
VLV3700 710	CloseCmd	✓	✓	na	na	CCT1 Degassing Valve Fail To Close	✓		
VLV3700 710	Total operations	na	na	✓	na		✓		
VLV3700 720	OpenCmd	✓	na	na	na	CCT2 Degassing Valve Fail To Close	✓		
VLV3700 720	CloseCmd	✓	na	na	na	CCT2 Degassing Valve Fail To Close	✓		
VLV3700 720	Total operations	na	na	✓	na		✓		
FIT3700 710	AI	✓	✓	✓	na	CCT1 (Filtered + Outside Range Alarm)	✓		
FIT3700 710	HH	✓	✓	na	CAT1	CCT1 Sodium Hypochlorite Raw Solution Flow High High	✓	0-1000 L/hr	
FIT3700 710	Hi	✓	✓	na	CAT3	CCT1 Sodium Hypochlorite Raw Solution Flow High	✓	95% = 356 L/hr	
FIT3700 710	Lo	✓	✓	na	CAT3	CCT1 Sodium Hypochlorite Raw Solution Flow Low	✓	85% = 326 L/hr	
FIT3700 710	LL	✓	✓	na	CAT1	CCT1 Sodium Hypochlorite Raw Solution Flow Low	✓	25 L/hr	
FIT3700 710	Invalid	✓	✓	na	CAT1	CCT1 Sodium Hypochlorite Raw Solution Flow Invalid	✓	10% = 40 L/hr	
FIT3700 710	Flow Total	✓	✓	✓	na		✓	Raw input less than 1	
FIT3700 710	Daily Total	✓	✓	✓	na		✓	0 - 24kL/day - yesterday, (1x10**10 total) 0.001kL/Pulse	
FIT3700 710	Daily Total	✓	✓	✓	na		✓	0 - 24kL/day	
FIT3700 720	AI	✓	✓	✓	na	CCT2 (Filtered + Outside Range)	✓		
FIT3700 720	HH	✓	✓	na	CAT1	CCT2 Sodium Hypochlorite Raw Solution Flow High High	✓	0-1000 L/hr	
FIT3700 720	Hi	✓	✓	na	CAT3	CCT2 Sodium Hypochlorite Raw Solution Flow High	✓	95% = 356 L/hr	
FIT3700 720	Lo	✓	✓	na	CAT3	CCT2 Sodium Hypochlorite Raw Solution Flow Low	✓	85% = 326 L/hr	
FIT3700 720	LL	✓	✓	na	CAT1	CCT2 Sodium Hypochlorite Raw Solution Flow Low	✓	25 L/hr	
FIT3700 720	Invalid	✓	✓	na	CAT1	CCT2 Sodium Hypochlorite Raw Solution Flow Invalid	✓	10% = 40 L/hr	
FIT3700 720	Flow Total	✓	✓	✓	na		✓	Raw input less than 1	
FIT3700 720	Daily Total	✓	✓	✓	na		✓	0 - 24kL/day - yesterday, (1x10**10 total) 0.001kL/Pulse	
FIT3700 720	Daily Total	✓	✓	✓	na		✓	0 - 24kL/day	

# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes:	QUU Representative:
CIT0710_001	AI	✓	✓	✓	na		✓	0-1500uS	Existing
CIT0710_001	HH	✓	✓	na	CAT3	Chlorine Contact Tank Conductivity High High	✓	1000uS	Faulty instrument?
CIT0710_001	HI	✓	✓	na	CAT3	Chlorine Contact Tank Conductivity High	✓	400uS	
CIT0710_001	Lo	✓	✓	na	CAT3	Chlorine Contact Tank Conductivity Low	✓	2uS	Delta Ohm DO 9766T-R1, SPTKI-11 (K=1)
CIT0710_001	LL	✓	✓	na	CAT3	Chlorine Contact Tank Conductivity Low Low	✓	1uS	Notes:
CIT0710_001	Probe Healthy	✓	✓	na	CAT3	o - CCT Conductivity Probe 1 - Alarm	✓	4ms setting for alarm relay	Tap water is around 0.200mS = 200uS
CIT0710_002	Probe Healthy	✓	✓	na	CAT3	o - CCT Conductivity Probe 2 - Alarm	✓	4ms setting for alarm relay	Hypo is around 65mS to 200mS
CIT0710_003	Probe Healthy	✓	✓	na	CAT3	o - CCT Conductivity Probe 3 - Alarm	✓	4ms setting for alarm relay	depending on concentration of solution.
LIT0710_110	AI	✓	✓	✓	na		✓	0-100%	Existing
LIT0710_110	HH	✓	✓	na	CAT3	Chlorine Storage Tank 1 Channel 1 Level High-High	✓	97%	
LIT0710_110	Hi	✓	✓	na	CAT3	Chlorine Storage Tank 1 Channel 1 Level High	✓	95%	✓
LIT0710_110	Lo	✓	✓	na	CAT3	Chlorine Storage Tank 1 Channel 1 Level Low	✓	80%	✓
LIT0710_110	LL	✓	✓	na	CAT3	Chlorine Storage Tank 1 Channel 1 Level Low-Low	✓	25%	✓
LIT0710_110	Invalid	✓	✓	na	CAT3	Chlorine Storage Tank 1 Channel 1 Level Invalid Signal	✓		
LIT0710_110	UnderRange	✓	✓	na	CAT3	Chlorine Storage Tank 1 Channel 1 Level Invalid Signal	✓		
LIT0710_120	AI	✓	✓	✓	na		✓	0-100%	
LIT0710_120	HH	✓	✓	na	CAT3	Chlorine Storage Tank 2 Channel 4 Level High-High	✓	97%	
LIT0710_120	Hi	✓	✓	na	CAT3	Chlorine Storage Tank 2 Channel 4 Level High	✓	95%	
LIT0710_120	Lo	✓	✓	na	CAT3	Chlorine Storage Tank 2 Channel 4 Level Low	✓	80%	
LIT0710_120	LL	✓	✓	na	CAT3	Chlorine Storage Tank 2 Channel 4 Level Low-Low	✓	25%	
LIT0710_120	Invalid	✓	✓	na	CAT3	Chlorine Storage Tank 2 Channel 4 Level Invalid Signal	✓		
LIT0710_120	UnderRange	✓	✓	na	CAT3	CCT Flow Splitter Level Invalid Signal	✓		

Dosing Pump Settings  
DDI60

DME375

Vega Settings

Flow Meter settings

Duty operation of valves which divert pump 4 to either CCT1 or CCT2 but not both.

Manual

Simulate Fail to Open conditions  
Send open command  
Confirm Fail to Open alarm raised.  
Simulate open feedback  
Simulate Fail to Close conditions  
Send close command

# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes	QUU Representative:
Automatic	Confirm Fail to Close alarm raised						✓		
	Simulate close feedback.						✓		
	With all three low flow pumps starting as healthy.						✓		
	With both Valves starting as healthy and in automatic.						✓		
	Simulate a fault on low flow pump 3.						✓		
	Confirm that valve automatically opens to allow pump 4 to pump into CCT1 line.						✓		
	Confirm that request for pump 4 to run is active.						✓		
	Simulate a fault on low flow pump 5.						✓		
	Confirm that pump 4 continues to pump into CCT1 line.						✓		
	Repeat above for CCT2 line.						✓		
Simulate Flow Splitter level / Flow meter and calculated flow and dosing functionality.	Simulate a level in the Flow Splitter.						✓		
	Confirm that as the level raises above the bottom of the v-notch that the CCT1 and CCT2 calculated flows increase.						✓		
	Confirm that as the level falls below the bottom of the v-notch that the CCT1 and CCT2 calculated flows show 0 unless the recirculation or feed pumps are running.						✓		
	Confirm that as the level falls above the top of the v-notch that the CCT1 and CCT2 calculated flows shows <del>not</del> not specified in functional spec.						✓		
	Simulate when one penstock is closed that the flow still correct for the CCT which is still on line.						✓		
	Simulate dosing calculation with different dosing ranges and values.						✓		

The system is working well with irregular flow - level is variable.  
 Tested closing junction on CCT as level needed to recirculate.  
 = pumps in recirculation mode then two contact switches in working order, but the pump  
 closed then recirculation flow was not triggered.  
 in manual

# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes:	QUU Representative:
<i>Test CCT1 pump logic.</i>									
	With CCT2 flow simulated to 0						✓		
	With Pump 1 Available						✓		
	With Pump 2 Available						✓		
	With Pump 3 Available						✓		
	With Pump 5 Available						✓		
	Set Pump 1 to duty.						✓		
	Simulate CCT1 flow to request 0 L/hr hypo.						✓		
	Confirm that all pumps are stopped.						✓		
	Simulate CCT1 flow to request 33 L/hr hypo.						✓		
	Confirm that Pump 3 runs at 33 L/hr						✓		
	Simulate CCT1 flow to request 47 L/hr hypo.						✓		
	Confirm that Pump 3 runs at 47 L/hr						✓		
	Simulate CCT1 flow to request 55 L/hr hypo.						✓	Note: Pump 3 runs because of the Hysteresis associated. Pump 1 remains stopped.	
	Confirm that Pump 3 stops and Pump 1 runs at 55 L/hr						✓		
	Simulate CCT1 flow to request 100 L/hr hypo.						✓		
	Confirm that Pump 1 runs at 100 L/hr						✓		
	Simulate CCT1 flow to request 374 L/hr hypo.						✓		
	Confirm that Pump 1 runs at 374 L/hr						✓	Note: Pump 1 only runs because of the Hysteresis associated. Pump 2 remains stopped.	
	Simulate CCT1 flow to request 377 L/hr hypo.						✓		
	Confirm that Pump 1 runs at 375 L/hr and Pump 2 runs at 2 L/hr						✓		
	Simulate CCT1 flow to request 480 L/hr hypo.						✓		
	Confirm that Pump 1 runs at 375 L/hr and Pump 2 runs at 105 L/hr						✓		
	Simulate CCT1 flow to request 900 L/hr hypo.						✓		
	Confirm that Pump 1 runs at 375 L/hr and Pump 2 runs at 525 L/hr						✓	Note it is not possible for the second pump to run at 525 L/s. This is allowed to emphasize that the pumps can't keep up.	
	Simulate CCT1 flow to request 480 L/hr hypo.						✓		
	Confirm that Pump 1 runs at 375 L/hr and Pump 2 runs at 105 L/hr						✓		
	Simulate CCT1 flow to request 377 L/hr hypo.						✓		
	Confirm that Pump 1 runs at 375 L/hr and Pump 2 runs at 2 L/hr						✓		
	Simulate CCT1 flow to request 374 L/hr hypo.						✓		
	Confirm that Pump 1 runs at 374 L/hr and Pump 2 runs at 0 L/hr						✓	Note: Pump 1 and Pump 2 run because of the Hysteresis associated.	
	Simulate CCT1 flow to request 100 L/hr hypo.						✓		
	Confirm that Pump 1 runs at 100 L/hr and Pump 2 stopped						✓		
	Simulate CCT1 flow to request 55 L/hr hypo.						✓		
	Confirm that Pump 1 runs at 55 L/hr						✓		
	Simulate CCT1 flow to request 47 L/hr hypo.						✓	Note: Pump 1 runs because of the Hysteresis associated. Pump 3 remains stopped.	
	Confirm that Pump 1 runs at 47 L/hr						✓		
	Simulate CCT1 flow to request 33 L/hr hypo.						✓		
	Confirm that Pump 3 runs at 33 L/hr. Pump 1 stopped.						✓		
	Simulate CCT1 flow to request 0 L/hr hypo.						✓		
	Confirm that All Pumps are stopped						✓		



## Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics	Pumps	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes:	QUU Representative(s)
<b>Test CCT2 pump logic.</b>	With CCT1 flow simulated to 0						✓		
	With Pump 7 Available						✓		
	With Pump 6 Available						✓		
	With Pump 5 Available						✓		
	With Pump 3 Available						✓		
	Set pump 7 to duty.						✓		
	Simulate CCT2 flow to request 0 L/hr hypo.						✓		
	Confirm that all pumps are stopped.						✓		
	Simulate CCT2 flow to request 33 L/hr hypo.						✓		
	Confirm that Pump 5 runs at 33 L/hr						✓		
	Simulate CCT2 flow to request 47 L/hr hypo.						✓		
	Confirm that Pump 5 runs at 47 L/hr						✓		
	Simulate CCT2 flow to request 55 L/hr hypo.						✓	Note: Pump 5 runs because of the Hysteresis associated. Pump 7 remains stopped.	
	Confirm that Pump 5 stops and Pump 7 runs at 55 L/hr						✓		
	Simulate CCT2 flow to request 100 L/hr hypo.						✓		
	Confirm that Pump 7 runs at 100 L/hr						✓		
	Simulate CCT2 flow to request 374 L/hr hypo.						✓		
	Confirm that Pump 7 runs at 374 L/hr						✓	Note: Pump 7 only runs because of the Hysteresis associated. Pump 6 remains stopped.	
	Simulate CCT2 flow to request 377 L/hr hypo.						✓		
	Confirm that Pump 7 runs at 375 L/hr and Pump 6 runs at 2 L/hr						✓		
	Simulate CCT2 flow to request 480 L/hr hypo.						✓		
	Confirm that Pump 7 runs at 375 L/hr and Pump 6 runs at 105 L/hr						✓		
	Simulate CCT2 flow to request 900 L/hr hypo.						✓		
	Confirm that Pump 7 runs at 375 L/hr and Pump 6 runs at 525 L/hr						✓	Note it is not possible for the second pump to run at 525 L/s. This is allowed to emphasize that the pumps can't keep up.	
	Simulate CCT2 flow to request 480 L/hr hypo.						✓		
	Confirm that Pump 7 runs at 375 L/hr and Pump 6 runs at 105 L/hr						✓		
	Simulate CCT2 flow to request 377 L/hr hypo.						✓		
	Confirm that Pump 7 runs at 375 L/hr and Pump 6 runs at 2 L/hr						✓		
	Simulate CCT2 flow to request 374 L/hr hypo.						✓	Note: Pump 7 and Pump 6 run because of the Hysteresis associated.	
	Confirm that Pump 7 runs at 374 L/hr and Pump 6 runs at 0 L/hr						✓		
	Simulate CCT2 flow to request 100 L/hr hypo.						✓		
	Confirm that Pump 7 runs at 100 L/hr and Pump 6 stopped						✓		
	Simulate CCT2 flow to request 55 L/hr hypo.						✓		
	Confirm that Pump 7 runs at 55 L/hr						✓		
	Simulate CCT2 flow to request 47 L/hr hypo.						✓	Note: Pump 7 runs because of the Hysteresis associated. Pump 5 remains stopped.	
	Confirm that Pump 7 runs at 47 L/hr						✓		
	Simulate CCT2 flow to request 33 L/hr hypo.						✓		
	Confirm that Pump 5 runs at 33 L/hr. Pump 7 stopped.						✓		
	Simulate CCT2 flow to request 0 L/hr hypo.						✓		
	Confirm that All Pumps are stopped						✓		

# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes:	QUU Representative:
<i>Duty logic - Pump 1 -&gt; Pump 2</i>									
	Set Pump 1 duty						✓		
	With Pump 1 available						✓		
	Start pump 1 running by simulating hypo demand. 370 L/hr						✓		
	Confirm that pump 1 runs						✓		
	Simulate a fault on pump 1						✓		
	Confirm that pump 2 starts						✓		
<i>Duty logic - Pump 2 -&gt; Pump 1</i>									
	Set Pump 2 duty.						✓		
	With Pump 1 available						✓		
	Start pump 2 running by simulating hypo demand. 370 L/hr						✓		
	Confirm that pump 2 runs						✓		
	Simulate a fault on pump 2						✓		
	Confirm that pump 1 starts						✓		
<i>Duty logic - Pump 7 -&gt; Pump 6</i>									
	Set Pump 7 duty.						✓		
	With Pump 7 available						✓		
	Start pump 7 running by simulating hypo demand						✓		
	Confirm that pump 7 runs						✓		
	Simulate a fault on pump 7						✓		
	Confirm that pump 6 starts						✓		
<i>Duty logic - Pump 6 -&gt; Pump 7</i>									
	Set Pump 6 duty.						✓		
	With Pump 6 available						✓		
	Start pump 6 running by simulating hypo demand.						✓		
	Confirm that pump 6 runs						✓		
	Simulate a fault on pump 6						✓		
	Confirm that pump 7 starts						✓		
<i>Duty logic - Pump 3 and Pump 4 - Normal Operation</i>									
	Simulate CCT1 hypo to 33 L/hr.						✓	Normal.	
	Simulate CCT2 hypo to 0 L/hr.						✓		
	With Valve23 is closed.						✓		
	With Pump 3 available						✓		
	With Pump 4 available						✓		
	Pump 3 running at 33 L/hr.						✓		
	Pump 4 not requested for CCT1 or CCT2.						✓		

# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes:	QUU Representative:
Duty Logic - Pump 3 -> Pump 4	Simulate fault on Pump 3.						✓	Standby Test	
	Pump 3 not requested any more.						✓		
	Confirm Valve 12 opens.						✓		
	Confirm Pump 4 runs at 33 L/hr						✓		
Duty Logic - Pump 4 dead head (CCT1).	With Pump 3 unavailable						✓	Dead head prevention if Valve 12 closes.	
	With Valve 12 open.						✓		
	With Pump 4 running at 33 L/hr						✓		
	Change Valve 12 to Manual Mode and then close the valve.						✓		
	Confirm Valve 12 closes.						✓		
	Confirm Pump 3 requested to run at 33 L/hr but can't run as its faulted.						✓		
Duty Logic - Pump 4 requested 0 L/hr.	Confirm Pump 4 requested 0 L/hr.						✓		
	Duty Logic - Pump 4 dead head -> recover.						✓		
	With Pump 3 unavailable						✓	Standby Test to show when Valve 12 opens	
	With Valve 12 returned to Automatic Mode.						✓	pump 4 continues to dose.	
	Confirm Valve 12 Opens.						✓		
	Confirm Pump 3 is not requested						✓		
Duty Logic - Pump 4 runs at 33 L/hr	Confirm Pump 4 runs at 33 L/hr						✓		
	Duty Logic - Pump 3 recovers. Valve 12 has close delay						✓		
	Reset simulated fault on Pump 3						✓	Return to normal.	
	Confirm Pump 3 becomes available again.						✓	Standby valve remains opened for a period of time	
	Confirm that Pump 3 runs at 33 L/hr						✓	just in case there is another fault on pump.	
	Confirm that Pump 4 stops.						✓		
Duty Logic - Pump 4 remains opened for a period of time (5 minutes) then closes.	Confirm that Valve 12 remains opened for a period of time (5 minutes) then closes.						✓		
	Duty Logic - Pump 3, Pump 4 and Pump 5 - Normal Operation						✓		
	Simulate CCT1 hypo to 33 L/hr						✓	Normal with both CCTs calling for Hypo.	
	Simulate CCT2 hypo to 11 L/hr.						✓		
	With Pump 3 available.						✓		
	With Pump 4 available.						✓		
Duty Logic - Pump 5 -> Pump 4	With Pump 5 available.						✓		
	Confirm Valve 12 is closed.						✓		
	Confirm Valve 23 is closed.						✓		
	Confirm Pump 3 runs at 33 L/hr.						✓		
	Confirm Pump 4 is not requested for either CCT1 or CCT2.						✓		
	Confirm Pump 5 runs at 11 L/hr.						✓		
Duty Logic - Pump 5 -> Pump 4	Simulate fault on Pump 5.						✓	Standby Test	
	Confirm Pump 5 is no longer requested to run.						✓		
	Confirm Valve 23 opens.						✓		
	Confirm Pump 4 runs at 11 L/hr.						✓		

# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes:	QUU Representative:
Duty Logic - Pump 4 dead head (CCT2).	With Pump 5 unavailable.						✓	Dead head test.	
	With Valve23 opened.						✓		
	With Pump 4 running at 11 L/hr.						✓		
	Change Valve23 to Manual and then Close the valve.						✓		
	Confirm that Pump 5 is requested to run at 11 L/hr but is unavailable.						✓		
Duty Logic - Pump 5 dead head -> recover.	Confirm that Pump 4 is requested to run at 0 L/hr but is interlocked and can't run.						✓		
	With Pump 5 dead head -> recover.						✓	Standby Test	
	With Pump 5 unavailable.						✓		
	Return Valve23 back to Automatic.						✓		
	Confirm Pump 5 not requested						✓		
Duty Logic - Pump 5 recovers. Valve23 has close delay	Confirm Valve23 opens.						✓		
	Confirm Pump 4 runs at 11 L/hr.						✓		
	Reset simulated fault on Pump 5.						✓	Return to normal.	
	Confirm Pump 5 is now available						✓	Standby valve remains opened for a period of time	
	Confirm Pump 4 stops.						✓		
Duty Logic - Pump 5 runs at 11 L/hr.	Confirm Pump 5 runs at 11 L/hr.						✓		
	Confirm that Valve23 remains opened for a period of time (5 minutes) then closes.						✓		
Duty Logic - Pump 3, Pump 4 and Pump 5 - Normal Operation	Simulate CCT1 hypo to 33 L/hr.						✓		
	Simulate CCT1 hypo to 11 L/hr.						✓		
	With Pump 3 available.						✓		
	With Pump 4 available.						✓		
	With Pump 5 available.						✓		
	Confirm Pump 3 runs at 33 L/hr.						✓		
	Confirm Pump 5 runs at 11 L/hr.						✓		
	Confirm Valve12 is Closed.						✓		
	Confirm Valve23 is Closed.						✓		
							✓		
Duty Logic - Pump 3 -> Pump 4	Simulate fault on Pump 3.						✓	Pump 3 fail, standby to CCT1	
	Confirm Valve12 opens.						✓		
	Confirm Valve23 closed.						✓		
	Confirm Pump 3 not requested.						✓		
	Confirm Pump 4 starts at 33 L/hr and is requested by CCT1 only.						✓		
Duty Logic - Pump 5 runs at 11 L/hr.	Confirm Pump 5 runs at 11 L/hr.						✓		
							✓		



# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics (Popups)	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes:	QUU Representative:
Duty Logic - Pump 3 -> Pump 4, and then Pump 5 gets a fault.	With Pump 3 faulted					✓	Both Pump 3 and 5 failed. standby valving to support first in first served.	
	With Pump 4 running at 33 L/hr and requested by CCT1 only					✓		
	With Pump 5 running at 11 L/hr					✓		
	With Valve12 Open					✓		
	With Valve23 Closed.					✓		
	Simulate fault on Pump 5.					✓		
	Confirm that Pump 4 remains running at 33 L/hr but is requested by both CCT1 and 2. Confirm that Valve23 is interlocked and cant open.					✓		
Duty Logic - Pump 3 recovers, then Pump 5 -> Pump 4.	With Pump 5 unavailable.					✓	Pump 3 recover after being called by both CCT lines.	
	Reset fault with Pump 3					✓		
	Confirm that Pump 3 runs at 33 L/h.					✓		
	Confirm that Valve12 closes immediately (timer logic overridden).					✓		
	Confirm that Valve23 opens.					✓		
Duty Logic - Pump 4 runs at 11 L/h and is requested by CCT2 only	Confirm that Pump 4 runs at 11 L/h and is requested by CCT2 only					✓		
Duty Logic - Pump 5 -> Pump 4, and then Pump 3 gets a fault.	With Pump 5 unavailable.					✓	Both Pump 3 and 5 failed. standby valving to support first in first served.	
	Simulate fault on Pump 3 (again)					✓		
	Confirm that Pump 4 runs at 11 L/hr and is requested by both CCT1 and 2.					✓	(This time pump 5 was faulted hence Pump 4 runs with CCT2's hypo).	
	Confirm that Pump 3 requested to run at 33 L/hr although it is faulted.					✓		
	Confirm that Pump 5 is not requested as it is faulted.					✓		
	Confirm that Valve12 is closed.					✓		
	Confirm that Valve23 is Open.					✓		

# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics (Popups)	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes:	OUU Representative:
	Duty logic - Pump 5 -> Pump 4, then Pump 3 faults but standby in use. Hypo flow increases, Pump 7 takes over, Pump 3 -> Pump 4							
	Simulate CCT1 demand as 33 L/h hypo.					✓		
	Simulate CCT2 demand as 11 L/h hypo.					✓		
	With Pump 1 Duty.					✓		
	With Pump 7 Duty.					✓		
	With Pump 3 available.					✓		
	With Pump 5 unavailable.					✓		
	With Valve12 available.					✓		
	With Valve23 available.					✓		
	Confirm Valve 12 is Closed.					✓		
	Confirm Valve23 is Opened.					✓	Note Valve closes a period of time after it is no longer requested to open. (ie TOFF open request)	
	Confirm Pump 3 running at 33 L/h CCT1 hypo.					✓		
	Confirm Pump 4 running at 11 L/h hypo (standby requested for CCT2)					✓		
	Confirm Pump 5 faulted					✓		
	Simulate a fault on Pump 3. (note Pump 5 already faulted).					✓		
	Confirm that Valve 12 can't open because it is interlocked by Valve 23 being opened.					✓	Only one standby pump. When there is a fault on both pumps the first pump gets access to the valve.	
	Confirm that Valve 23 remains open.					✓		
	Confirm that Pump 4 continues to run at 11 L/h hypo.					✓		
	Increase simulated CCT2 demand from 11 L/h hypo to 47 L/hr hypo.					✓		
	Confirm that pump 3 remains requested to run at 33 L/h but is faulted.					✓		
	Increase simulated CCT2 demand from 47 L/h hypo to 55 L/hr hypo.					✓		
	Confirm that Valve 23 is closes.					✓		
	Confirm that Valve 12 opens.					✓		
	Confirm that Pump 7 runs at 55 L/h					✓		
	Confirm that Pump 6 not requested.					✓		
	Confirm that Pump 5 not requested.					✓	Because the flow has increased the 'High Flow' pumps take the demand and the standby pump 4 is not required by that CCT line.	
	Confirm that Pump 4 swaps to speed setpoint for CCT1 (33 L/hr)					✓	This then frees up pump 4 to immediately take over supplying flow (as standby pump) to the other CCT line.	
	Confirm that Pump 3 is still faulted.					✓		
	Confirm that Pump 2 not requested.					✓		
	Confirm that Pump 1 not requested.					✓		

# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes	QUU Representative
<b>Duty logic - Degassing Valves</b>									
	With CCT1 Degassing Valve in Automatic.						✓		
	With CCT2 Degassing Valve in Automatic.						✓		
	With all CCT1 Hypo dosing pumps stopped.						✓		
	With all CCT2 Hypo dosing pumps stopped.						✓		
	Pump start Hypo Dosing Pump 1.						✓		
	Confirm that Degassing valve opens for a period of time ( 3 seconds).						✓		
	Pump start Hypo Dosing Pump 2.						✓		
	Confirm that Degassing valve opens for a period of time ( 3 seconds).						✓		
	Pump start Hypo Dosing Pump 3.						✓		
	Confirm that Degassing valve opens for a period of time ( 3 seconds).						✓		
	Open Valve 12.						✓		
	Pump start Hypo Dosing Pump 4 (to CCT1).						✓		
	Confirm that Degassing valve opens for a period of time ( 3 seconds).						✓		
	Close Valve 12.						✓		
	Open Valve 23.						✓		
	Pump start Hypo Dosing Pump 4 (to CCT2).						✓		
	Confirm that Degassing valve opens for a period of time ( 7 seconds).						✓		
	Pump start Hypo Dosing Pump 5.						✓		
	Confirm that Degassing valve opens for a period of time ( 3 seconds).						✓		
	Pump start Hypo Dosing Pump 6.						✓		
	Confirm that Degassing valve opens for a period of time ( 3 seconds).						✓		
	Pump start Hypo Dosing Pump 7.						✓		
	Confirm that Degassing valve opens for a period of time ( 3 seconds).						✓		
<b>Duty logic - Recirc Pump runs when flow low (CCT1)</b>									
	Set Recirculation Pump 1 duty.						✓		
	With Pump 1 available						✓		
	With CCT1 enabled						✓		
	With Flow Splitter Penstock 1 not closed.						✓		
	With flow through CCT1 weir simulated at 100 L/hr.						✓		
	Start pump 1 running by simulating CCT1 weir flow dropping to 30 L/hr						✓		
	Confirm that pump 1 runs						✓		
<b>Duty logic - Recirc Pump stops when flow high (CCT1)</b>									
	With Pump 1 available						✓		
	With CCT1 enabled						✓		
	With Flow Splitter Penstock 1 not closed.						✓		
	With flow through CCT1 weir simulated at 30 L/hr.						✓		
	With pump 1 running						✓		
	Stop pump 1 by simulating CCT1 weir flow rising to 50 L/hr						✓		
	Confirm that pump 1 stops						✓		

# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes:	QUU Representative:
Duty logic - Recirc Pump runs when flow low (CCT2)	Set Recirculation Pump 1 duty.						✓		
	With Pump 1 available						✓		
	With CCT2 enabled						✓		
	With Flow Splitter Penstock 2 not closed.						✓		
	With flow through CCT2 weir simulated at 100 L/hr.						✓		
	Start pump 1 running by simulating CCT2 weir flow dropping to 30 L/hr						✓	Note Hysteresis.	
Duty logic - Recirc Pump stops when flow high (CCT2)	Confirm that pump 1 runs						✓		
	Stop pump 1 by simulating CCT2 weir flow rising to 50 L/hr						✓		
	Confirm that pump 1 stops.						✓		
	With Pump 1 available						✓		
	With CCT2 enabled						✓		
	With Flow Splitter Penstock 2 not closed.						✓		
Duty logic - Recirc Pump interlocked with Penstock	With flow through CCT2 weir simulated at 30 L/hr.						✓		
	With pump 1 running						✓		
	Stop pump 1 by simulating CCT2 weir flow rising to 50 L/hr						✓		
	Confirm that pump 1 stops.						✓		
	With Pump 1 interlocked with Penstock.						✓		
	With Pump 1 available CCT1						✓		
Duty logic - Recirc Pump interlocked with Penstock	With CCT1 and CCT2 enabled						✓		
	With Flow Splitter Penstock 1 and 2 not closed.						✓		
	With flow through CCT1 weir simulated at 30 L/hr.						✓		
	With pump 1 CCT1 running						✓		
	Stop pump 1 CCT1 by simulating Penstock Closed feedback.						✓		
	Confirm that pump 1 stops.						✓		
Duty logic - Recirc Pump interlocked with Penstock	With flow through CCT2 weir simulated at 30 L/hr.						✓		
	With pump 1 CCT2 running						✓		
	Stop pump 1 CCT2 by simulating Penstock Closed feedback.						✓		
	Confirm that pump 1 stops.						✓		
	With Pump 1 disabled when CCT disabled.						✓		
	With Pump 1 available CCT1						✓		
Duty logic - Recirc Pump interlocked with Penstock	With CCT1 and CCT2 enabled						✓		
	With Flow Splitter Penstock 1 and 2 not closed.						✓		
	With flow through CCT1 weir flow simulated at 30 L/hr.						✓		
	With pump 1 CCT1 running						✓		
	Stop pump 1 CCT1 by disabling CCT1 (using tickbox on graphics popup).						✓		
	Confirm that pump 1 stops.						✓		
Duty logic - Recirc Pump interlocked with Penstock	With flow through CCT2 weir flow simulated at 30 L/hr						✓		
	With pump 1 CCT2 running						✓		
	Stop pump 1 CCT2 by disabling CCT2 (using tickbox on graphics popup).						✓		
	Confirm that pump 1 stops.						✓		
	With Pump 1 disabled when CCT disabled.						✓		
	With Pump 1 available CCT1						✓		

# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes:	QUU Representative:
<i>Duty logic - Recirc Pump 1 -&gt; Pump 2 (CCT1)</i>									
	Set Recirculation Pump 1 duty						✓		
	With Pump 1 available						✓		
	With Pump 2 available						✓		
	With CCT1 enabled						✓		
	With Flow Splitter Penstock 1 not closed						✓		
	Start pump 1 running by simulating weir flow 37 L/hr						✓		
	Confirm that pump 1 runs						✓		
	Simulate a fault on pump 1						✓		
	Confirm that pump 2 starts						✓		
<i>Duty logic - Recirc Pump 2 -&gt; Pump 1 (CCT1)</i>									
	Set Recirculation Pump 2 duty						✓		
	With Pump 1 available						✓		
	With Pump 2 available						✓		
	With CCT1 enabled						✓		
	With Flow Splitter Penstock 1 not closed						✓		
	Start pump 2 running by simulating CCT1 weir flow 37 L/hr						✓		
	Confirm that pump 2 runs						✓		
	Simulate a fault on pump 2						✓		
	Confirm that pump 1 starts						✓		
<i>Duty logic - Recirc Pump 1 -&gt; Pump 2 (CCT2)</i>									
	Set Recirculation Pump 1 duty						✓		
	With Pump 1 available						✓		
	With Pump 2 available						✓		
	With CCT1 enabled						✓		
	With Flow Splitter Penstock 2 not closed						✓		
	Start pump 1 running by simulating CCT2 weir flow 37 L/hr						✓		
	Confirm that pump 1 runs						✓		
	Simulate a fault on pump 1						✓		
	Confirm that pump 2 starts						✓		
<i>Duty logic - Recirc Pump 2 -&gt; Pump 1 (CCT2)</i>									
	Set Recirculation Pump 2 duty						✓		
	With Pump 1 available						✓		
	With Pump 2 available						✓		
	With CCT1 enabled						✓		
	With Flow Splitter Penstock 2 not closed						✓		
	Start pump 2 running by simulating CCT2 weir flow 37 L/hr						✓		
	Confirm that pump 2 runs						✓		
	Simulate a fault on pump 2						✓		
	Confirm that pump 1 starts						✓		



# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes	QUU Representative:
<b>Duty logic - Hypo Storage Tank low displayed when tank low.</b>									
	With Hypo Storage Tank 1 level at 50%						✓		
	Simulate Hypo Storage Tank 1 level at 10%						✓		
	Confirm graphics show text saying Storage Tank Level Low.						✓	Low Low and Low alarms are separate from text	
	With Hypo Storage Tank 2 level at 50%						✓		
	Simulate Hypo Storage Tank 2 level at 10%						✓		
	Confirm graphics show text saying Storage Tank Level Low.						✓		
	With Hypo Storage Tank 3 level at 50%						✓		
	Simulate Hypo Storage Tank 3 level at 10%						✓		
	Confirm graphics show text saying Storage Tank Level Low.						✓		
<b>Duty logic - Feed Pumps fill the CCT's</b>									
	With Feed Pump 1 selected as Duty.						✓		
	With Feed Pump 1 available						✓		
	With Feed Pump 2 available						✓		
	With CCT1 enabled						✓		
	With CCT2 enabled						✓		
	With CCT1 level above 70%						✓		
	With CCT2 level above 70%						✓		
	With CCT1 low float switch healthy.						✓		
	With CCT2 low float switch healthy.						✓		
	With CCT1 high float switch healthy.						✓		
	With CCT2 high float switch healthy.						✓		
	Start pump 1 running by simulating CCT1 level dropping to 59%.						✓	Note Hysteresis.	
	Confirm that pump 1 runs						✓		
	Stop pump 1 by simulating CCT1 level rising to 71%						✓		
	Confirm that pump 1 stops						✓		
	Repeat above with Feed Pump 2 selected as Duty.						✓		
	Start pump 1 running by simulating CCT2 level dropping to 59%.						✓	Note Hysteresis.	
	Confirm that pump 1 runs						✓		
	Stop pump 1 by simulating CCT2 level rising to 71%						✓		
	Confirm that pump 1 stops						✓		
	Repeat above with Feed Pump 2 selected as Duty.						✓		
	Start pump 1 running by simulating CCT1 low float switch.						✓		
	Confirm that pump 1 runs						✓		
	Stop pump 1 by simulating both CCT1 and CCT2 high float switch.						✓		
	Confirm that pump 1 stops						✓		
	Repeat with Feed Pump 2 selected as Duty.						✓		

# Bundamba STP Chlorine Contact Tank Upgrade (2012/13) - SAT Test Sheet

ID	Signal	Graphics	Popups	Trend	Alarms	Alarm Raised Text / Result	Pass/Fail	Notes	QUU Representative:
Duty logic - Feed Pumps fill the CCTs (continued...)									
	Start pump 1 running by simulating CCT2 low float switch.						✓		
	Confirm that pump 1 runs						✓		
	Stop pump 1 by simulating both CCT1 and CCT2 high float switch.						✓		
	Confirm that pump 1 stops						✓		
	Repeat with Feed Pump 2 selected as Duty.						✓		
	Storage Tanks logic to change during cut over. Out of service tank leak fault, low and high level lights. In use tank leak fault level drops by 500L + estimated flow rate. (See SAT tests)						✓		

Lendlease  
Operator: Nicola's Pump

Signature: [Signature]

Date: 15/4/2013

RePump / QUU Witness: QUU

Signature: F. Sady

Date: 15/4/2013

Notes:

Both tanks up when service closed on CCT1 low on CCT2 - other  
water changing stage change over all systems in use

OK to proceed with  
proving period.

[Signature]  
15/4/2013

# 13. SAT, ITPs & Compliance (cntd.) Test Sheets



Job No	3S0026	Contract / PO Number	
Job Name	Bundamba Waste Water Treatment Plant - CCT Upgrade		
ITP Description			
Component		Item / Tag Number / Panel No	Chlorine Shed Switchboard
Drawing Reference		Client Document Number	
Drawing Reference			
Cable Schedule			
Technical Ref			

**\* Do not energise equipment during this stage of checks. All equipment is to be correctly tagged and isolated. \***  
**Do not begin any testing until the surrounding area is safe to work and appropriate Job Safety Analysis' or equivalent have been consulted.**

Cable checks: Each of the below tests are to be completed on the cables included in this test sheet.	
A	Cable glands appropriate size, with shrouds and lock nuts tight.
B	Cable installed correctly, supported and protected from damage.
C	Cable numbers fitted and correct as per cable schedule.
D	All terminations completed and tested as per the termination drawing.
E	Cable schedule and termination drawing updated when required.

<b>Note:</b>	Resistance test each earth conductor to earth (Maximum reading of 0.5Ω allowed). <b>DO NOT INSULATION RESISTANCE TEST THE CONTROL CABLES!!</b>
--------------	---

[illegible]

Tests have been carried out in accordance with AS/NZS 3000:2007 and AS/NZS 3012

**Authorised Person Comments & Notes:**

	Tested By: (Authorised Person)	Witnessed By: (Client if applicable)
	(Name) <u>SIMONE HOUSING</u>	(Name) _____
	(Sign) <u>MAL</u>	(Sign) _____
	Date <u>12 / 4 / 13</u>	Date <u>  /  /  </u>

NOTE: Ensure relevant items or comments are recorded on the HIL List (SF-500)

**NOTE: Ensure relevant items or comments are recorded on the HIT List (SF-500)**

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[illegible]

Tested By: (Authorised Person)	Witnessed By: (Client if applicable)
(Name) <u>Sirina Howard</u>	(Name) _____
(Sign) <u>[Signature]</u>	(Sign) _____
Date <u>12/4/13</u>	Date <u>  /  /  </u>

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[illegible]

Tested By: (Authorised Person)	Witnessed By: (Client if applicable)
(Name) <u>Shirley Harding</u>	(Name) _____
(Sign) <u>[Signature]</u>	(Sign) _____
Date <u>12/4/13</u>	Date <u>  /  /  </u>

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[illegible]

Tested By: (Authorised Person) (Name) <u>Suman Hossain</u> (Sign) <u>[Signature]</u> Date <u>12/4/13</u>		Witnessed By: (Client if applicable) (Name) _____ (Sign) _____ Date <u>  /  /  </u>	
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[illegible]

Tested By: (Authorised Person)	Witnessed By: (Client if applicable)
(Name) <u>Shane Housie</u>	(Name) _____
(Sign) <u>[Signature]</u>	(Sign) _____
Date <u>12/4/13</u>	Date <u>  /  /  </u>

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[illegible]

		Tested By: (Authorised Person)	Witnessed By: (Client if applicable)
		(Name) <u>Singapore Housing</u>	(Name) _____
		(Sign) <u>[Signature]</u>	(Sign) _____
		Date <u>21/4/13</u>	Date <u>  /  /  </u>

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[illegible]

Tested By: (Authorised Person) (Name) <u>Shane Howard</u> (Sign) <u>[Signature]</u> Date <u>12/4/13</u>		Witnessed By: (Client if applicable) (Name) _____ (Sign) _____ Date <u>  /  /  </u>	
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# **13. SAT, ITPs & Compliance (cntd.) Training Record**

## Training Record Sheet

— CCT Zebat  
ncppsw ?



# 14. Mechanical Drawings

# QUU - BUNDAMBA WWC

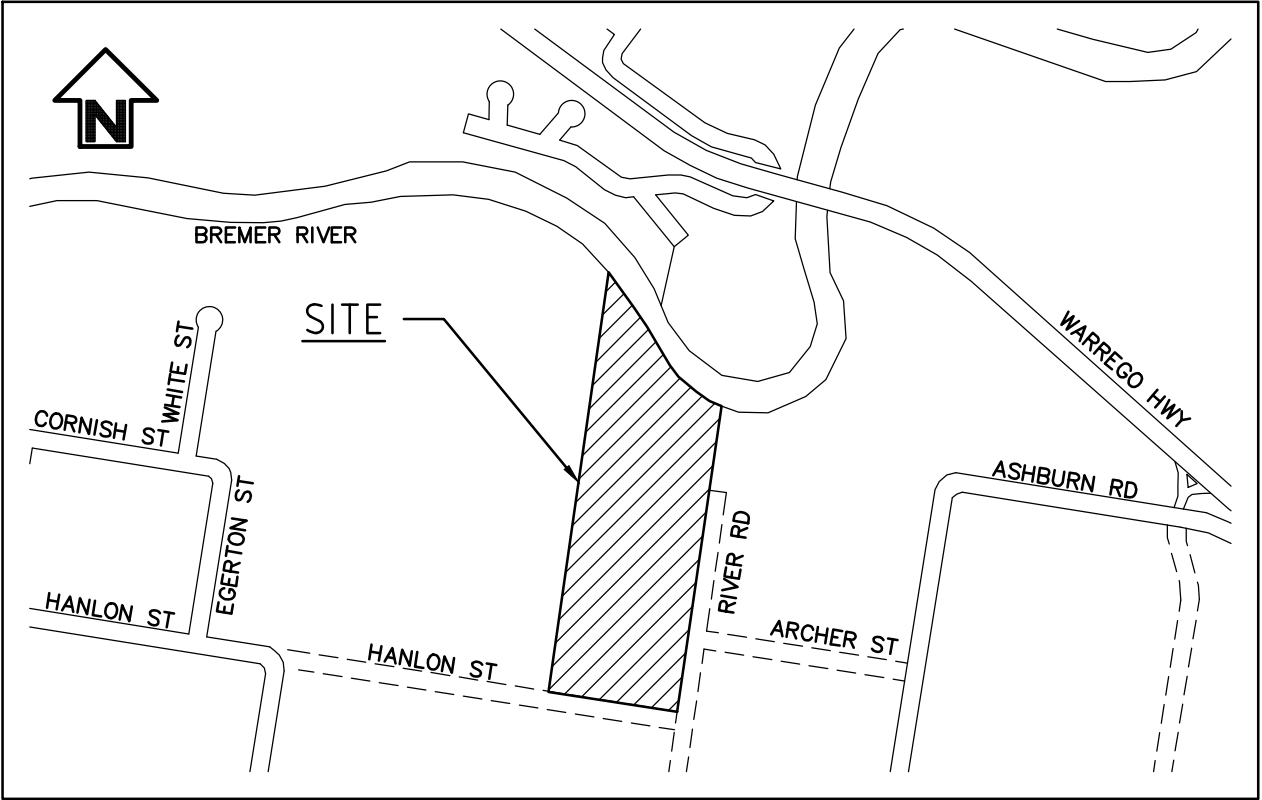
## PROJECT DRAWING INDEX

### CHEMICAL STORAGE FACILITY

NUMBER	DESCRIPTION
486/5/5-0157-001	LOCALITY PLAN, NOTES AND DRAWING INDEX
486/5/5-0157-002	SITE LAYOUT
486/5/5-0157-003	SITE LAYOUT GENERAL ARRANGEMENT
486/5/5-0157-004	CHEMICAL STORAGE & DOSING FACILITY, GENERAL ARRANGEMENT
486/5/5-0157-005	CHEMICAL STORAGE & DOSING FACILITY, SECTIONS
486/5/5-0157-006	CHEMICAL STORAGE & DOSING FACILITY, DOSING PUMPS PIPE G.A. & SECTIONS
486/5/5-0157-010	P & ID, LEGEND & DRAWING INDEX
486/5/5-0157-011	P & ID, CHEMICAL STORAGE & DOSING
486/5/5-0157-012	P & ID, CHLORINE CONTACT TANK
486/5/5-0157-013	DOSING PIPE ENVELOPER
486/5/5-0157-020	SINGLE LINE DIAGRAM
486/5/5-0157-021	ELECTRICAL LIGHTING & WIRING, GENERAL ARRANGEMENT
486/5/5-0157-030	STRUCTURAL NOTES
486/5/5-0157-031	CHEMICAL STORAGE FACILITY, CONCRETE SETOUT DETAILS
486/5/5-0157-032	CHEMICAL STORAGE FACILITY, REINFORCEMENT PLAN & ELEVATIONS
486/5/5-0157-033	CHEMICAL STORAGE FACILITY, REINFORCEMENT SECTIONS & DETAILS
486/5/5-0157-034	CHEMICAL STORAGE FACILITY, ROOF FRAMING PLAN & ELEVATIONS
486/5/5-0157-035	CHEMICAL STORAGE FACILITY, ROOF FRAMING TYPICAL DETAILS
486/5/5-0157-036	CHEMICAL STORAGE FACILITY, UNLOADING PAD SETOUT DETAILS
486/5/5-0157-037	CHEMICAL STORAGE FACILITY, ELEVATIONS
486/5/5-0157-038	CHEMICAL STORAGE FACILITY, GRATED WALKWAY STEEL DETAILS SHEET 1
486/5/5-0157-039	CHEMICAL STORAGE FACILITY, GRATED WALKWAY STEEL DETAILS SHEET 2
486/5/5-0157-040	CHEMICAL STORAGE FACILITY, GRATED WALKWAY STEEL DETAILS SHEET 3

### EFFLUENT RECIRCULATION SYSTEM

486/5/5-0157-050	EFFLUENT RECIRCULATION SYSTEM, GENERAL ARRANGEMENT
486/5/5-0157-051	EFFLUENT RECIRCULATION SYSTEM, PUMP ARRANGEMENT PLAN & SECTIONS
486/5/5-0157-052	EFFLUENT RECIRCULATION SYSTEM, FEED PUMP ARRANGEMENT PLAN & SECTIONS
486/5/5-0157-053	EFFLUENT RECIRCULATION SYSTEM, PIPE SUPPORT BRACKET DETAILS
486/5/5-0157-054	EFFLUENT RECIRCULATION SYSTEM, FLOW SPLITTER V NOTCH WEIR PLATE DETAILS
486/5/5-0157-055	EFFLUENT RECIRCULATION SYSTEM, FLOW SPLITTER V NOTCH WEIR PLATE SHOP DETAILS
486/5/5-0157-056	EFFLUENT RECIRCULATION SYSTEM, SAMPLE WATER BASKET DETAILS
486/5/5-0157-060	EFFLUENT RECIRCULATION SYSTEM, SLAB REINFORCEMENT DETAILS & SECTIONS



### LOCALITY PLAN

### GENERAL

- G1. THE SURVEY HAS BEEN PROVIDED BY IPSWICH CITY COUNCIL. LEVELS TO AHD. VERTICAL DATUM-PSM66984, RL13.775. COORDINATE DATUM-TERRAIN 2001.
- G2. THESE DRAWINGS TO BE READ IN CONJUNCTION WITH SURVEY, OTHER ENGINEERING DRAWINGS, SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED.
- G3. NOMINATION OF PROPRIETARY ITEMS INDICATES THE REQUIRED PROPERTIES OF THE ITEM. SIMILAR ALTERNATIVES HAVING THE REQUIRED PROPERTIES MAY BE OFFERED FOR APPROVAL.
- G4. DO NOT SCALE FROM THE DRAWINGS. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES.
- G5. ALL DIMENSIONS ARE TO BE VERIFIED ON SITE BY THE CONTRACTOR BEFORE FABRICATION AND CONSTRUCTION.
- G6. REFER ANY DISCREPANCY TO THE SUPERINTENDENT BEFORE PROCEEDING WITH THE WORK.
- G7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING EXISTING STRUCTURES IN A SAFE AND STABLE CONDITION DURING CONSTRUCTION. NO PART OF ANY STRUCTURE SHALL BE OVERSTRESSED.
- G8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL WORKS AGAINST FLOTATION DURING CONSTRUCTION.
- G9. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS, THE REQUIREMENTS OF THE RELEVANT SAA CODES, BCA AND THE LOCAL LAWS AND ORDINANCES OF THE RELEVANT GOVERNMENT AUTHORITY.
- G10. FOR REFERENCED DOCUMENTS USE THE LATEST EDITIONS WITH AMENDMENTS, EXCEPT WHERE OTHER EDITIONS OR AMENDMENTS ARE REQUIRED BY STATUTORY AUTHORITIES.

### PIPELINES

- P1. ALL SERVICES WHERE SHOWN ARE APPROXIMATE ONLY. EXACT LOCATION AND DEPTH OF SERVICES ARE TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION.
- P2. CONTRACTOR TO TAKE ALL ACTIONS NECESSARY TO PROTECT AND MAINTAIN EXISTING SERVICES.
- P3. THE MINIMUM VERTICAL CLEARANCE TO EXISTING SERVICES TO BE 300mm AND HORIZONTAL 400mm.
- P4. REMOVE AND REINSTATE OBJECTS ALONG LINE OF CONSTRUCTION.
- P5. RESTORE ALL SURFACES TO MATCH EXISTING SURFACES.
- P6. EXCAVATION FOR TRENCHES SHALL BE THE MINIMUM NECESSARY TO INSTALL THE PIPELINE AND ASSOCIATED STRUCTURES.
- P7. CONTRACTOR TO OBTAIN PRIOR APPROVAL OF THE SUPERINTENDENT FOR ANY MINOR DEVIATIONS REQUIRED TO AVOID EXISTING SERVICES.
- P8. PIPELINE COVER TO BE 900mm GENERALLY AS SHOWN TO AVOID EXISTING SERVICES. MINIMUM COVER 600mm IN FOOTPATHS, 900mm UNDER ROADS.
- P9. REFER SPECIFICATION FOR PIPELINE BEDDING AND BACKFILL.
- P10. PIPELINE TEST PRESSURE TO BE 1200kPa.

AS CONSTRUCTED

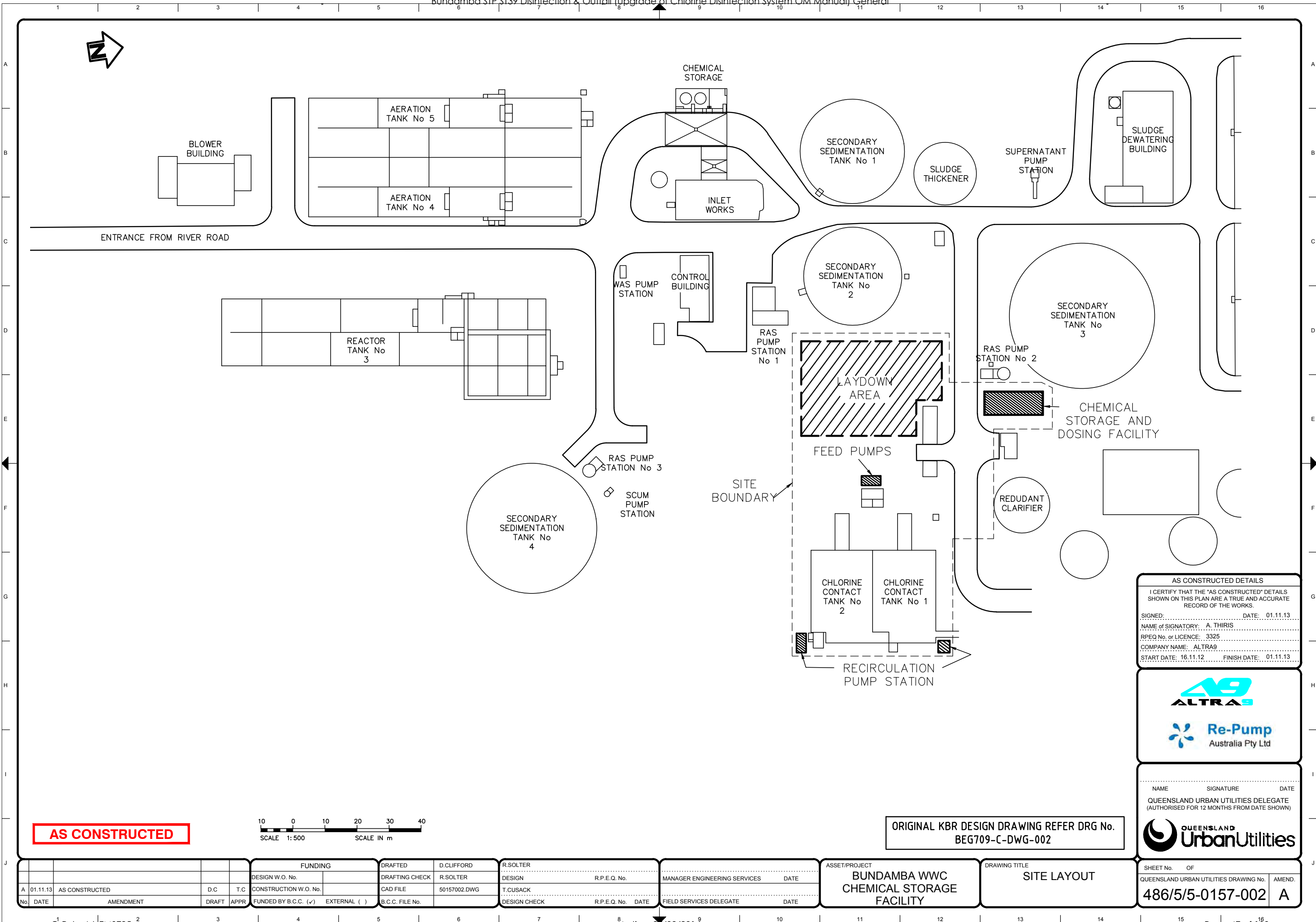
ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-C-DWG-001

AS CONSTRUCTED DETAILS	
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.	
SIGNED: .....	DATE: 01.11.13
NAME of SIGNATORY: A. THIRIS	
RPEQ No. or LICENCE: 3325	
COMPANY NAME: ALTRA9	
START DATE: 16.11.12	FINISH DATE: 01.11.13



NAME	SIGNATURE	DATE
QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)		

					FUNDING		DRAFTED	D.CLIFFORD	R.SOLTER		ASSET/PROJECT	DRAWING TITLE	SHEET No. OF			
					DESIGN W.O. No.		DRAFTING CHECK	R.SOLTER	DESIGN	R.P.E.Q. No.			MANAGER ENGINEERING SERVICES	DATE	QUEENSLAND URBAN UTILITIES DRAWING No.	AMEND.
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No.	DATE	AMENDMENT	DRAFT	APPR	FUNDED BY B.C.C. (✓)	EXTERNAL ( )	B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No.	DATE	FIELD SERVICES DELEGATE	DATE			
												BUNDAMBA WWC CHEMICAL STORAGE FACILITY	LOCALITY PLAN NOTES AND DRAWING INDEX			



## AS CONSTRUCTED DETAILS

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

SIGNED: DATE: 01.11.13

NAME of SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

START DATE: 16.11.12 FINISH DATE: 01.11.13



NAME SIGNATURE DATE

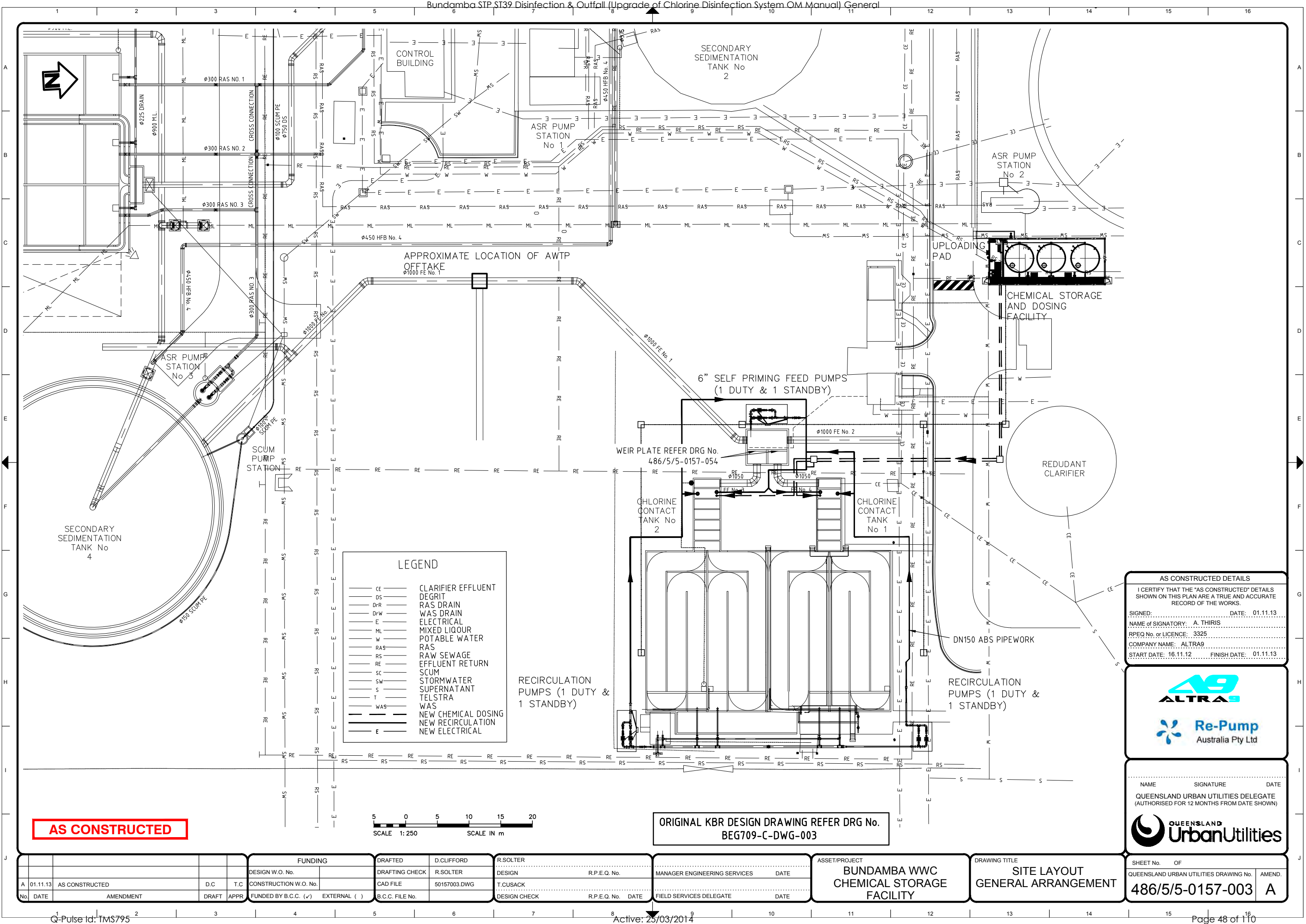
QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)



SHEET No. OF

QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.

486/5/5-0157-002 A



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CLARIFIER EFFLUENT

DEGRIT

RAS DRAIN

WAS DRAIN

ELECTRICAL

MIXED LIQUOR

POTABLE WATER

RAW SEWAGE

EFFLUENT RETURN

SCUM

STORMWATER

SUPERNATANT

TELSTRA

WAS

NEW CHEMICAL DOSING

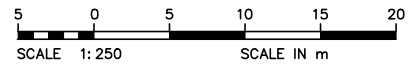
NEW RECIRCULATION

NEW ELECTRICAL

RECIRCULATION PUMPS (1 DUTY & 1 STANDBY)

RECIRCULATION PUMPS (1 DUTY & 1 STANDBY)

AS CONSTRUCTED



ORIGINAL KBR DESIGN DRAWING REFER DRG No. BEG709-C-DWG-003

AS CONSTRUCTED DETAILS

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

SIGNED: \_\_\_\_\_ DATE: 01.11.13

NAME OF SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

START DATE: 16.11.12 FINISH DATE: 01.11.13



NAME \_\_\_\_\_ SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

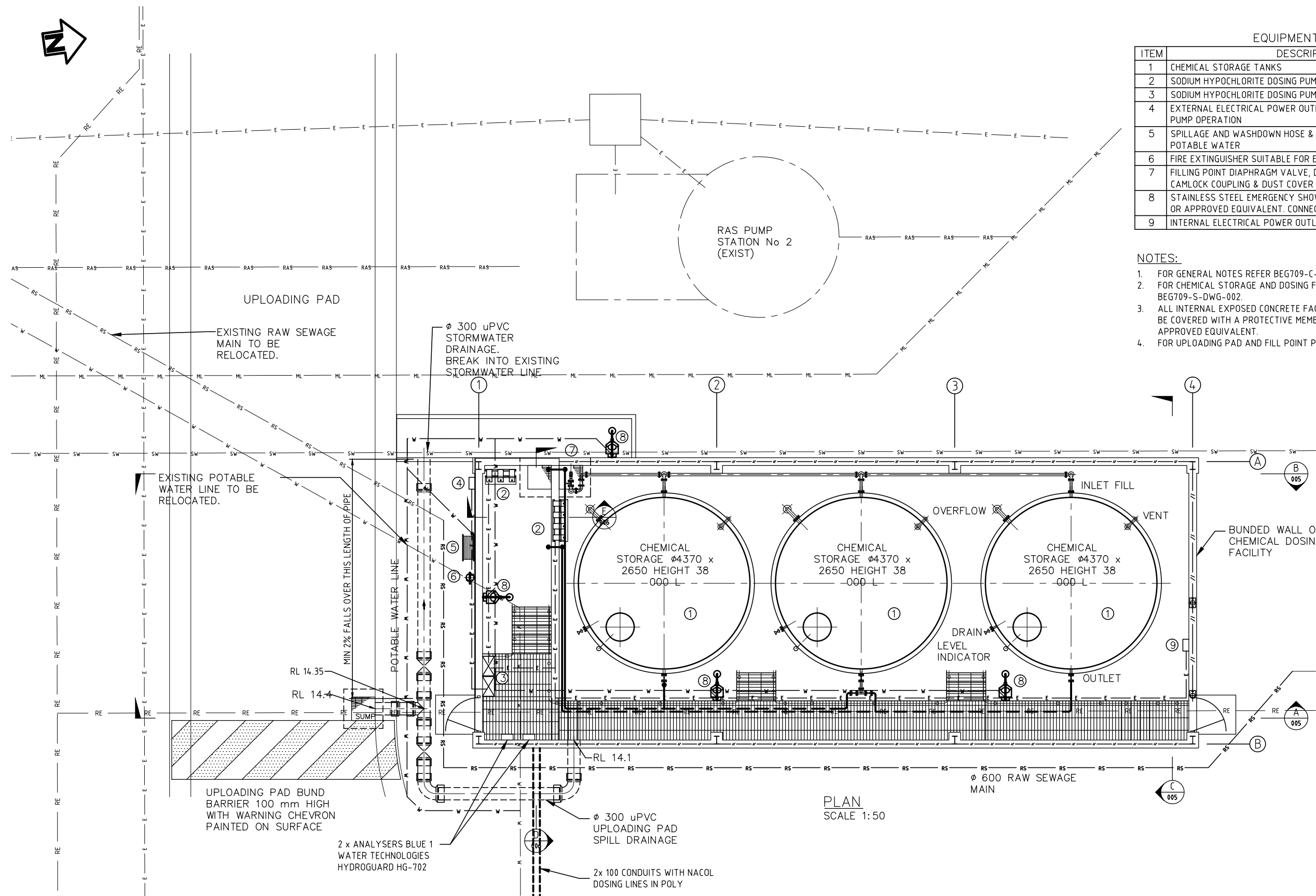
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DESIGN W.O. No.				DRAFTING CHECK		R. SOLTER		DESIGN		R.P.E.Q. No.		MANAGER ENGINEERING SERVICES	DATE		
CONSTRUCTION W.O. No.				CAD FILE		50157003.DWG		T. CUSACK		R.P.E.Q. No.		FIELD SERVICES DELEGATE	DATE		
FUNDED BY B.C.C. (✓)				B.C.C. FILE No.											
AMENDMENT				DRAFT		APPR									
No.	DATE														

QUEENSLAND UrbanUtilities

486/5/5-0157-003 A



EQUIPMENT SCHEDULE

ITEM	DESCRIPTION	QTY
1	CHEMICAL STORAGE TANKS	3
2	SODIUM HYPOCHLORITE DOSING PUMPS	7
3	SODIUM HYPOCHLORITE DOSING PUMPS SWITCHBOARD	2
4	EXTERNAL ELECTRICAL POWER OUTLET FOR DELIVERY TANKER PUMP OPERATION	1
5	SPILLAGE AND WASHDOWN HOSE & TAP (20mm) CONNECT TO POTABLE WATER	1
6	FIRE EXTINGUISHER SUITABLE FOR ELECTRICAL FIRES	1
7	FILLING POINT DIAPHRAGM VALVE, DRAIN LINE & VALVE, MALE CAMLOCK COUPLING & DUST COVER (50mm)	1
8	STAINLESS STEEL EMERGENCY SHOWER & EYE WASH ENWARE EC 270 OR APPROVED EQUIVALENT. CONNECT TO POTABLE WATER	4
9	INTERNAL ELECTRICAL POWER OUTLET FOR MAINTANENCE	1

## NOTES:

- FOR GENERAL NOTES REFER BEG709-C-DWG-001.
- FOR CHEMICAL STORAGE AND DOSING FACILITY AREA DIMENSIONS REFER BEG709-S-DWG-002.
- ALL INTERNAL EXPOSED CONCRETE FACES (SLABS AND BUND WALLS) TO BE COVERED WITH A PROTECTIVE MEMBRANE, "SIKAGARD - 62" OR APPROVED EQUIVALENT.
- FOR UPLOADING PAD AND FILL POINT PAD REFER BEG709-S-DWG-007.

## LEGEND (SERVICES)

CLARIFIER EFFLUENT	CE
NEW ELECTRICAL	E
ELECTRICAL	E
MIXED LIQUOR	ML
NEW POTABLE WATER	W
POTABLE WATER	W
RAS	RAS
RETURN EFFLUENT	RE
RAW SEWAGE	RS
STORMWATER	SW
NEW RAW SEWAGE	RS

## AS CONSTRUCTED DETAILS

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

SIGNED: DATE: 01.11.13

NAME OF SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

START DATE: 16.11.12 FINISH DATE: 01.11.13

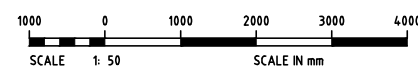


NAME SIGNATURE DATE  
QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)



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486/5/5-0157-004 A

AS CONSTRUCTED

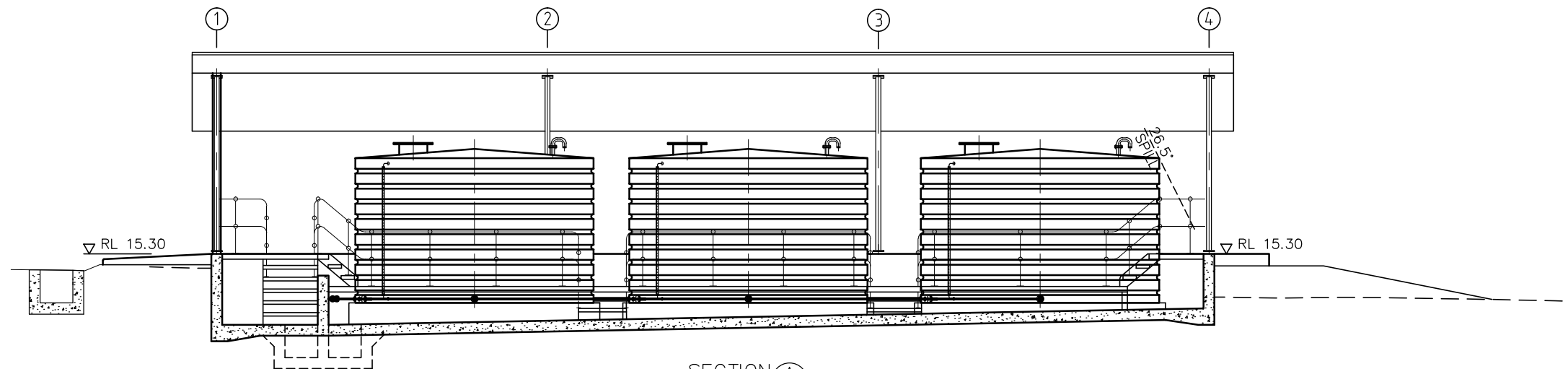


PLAN  
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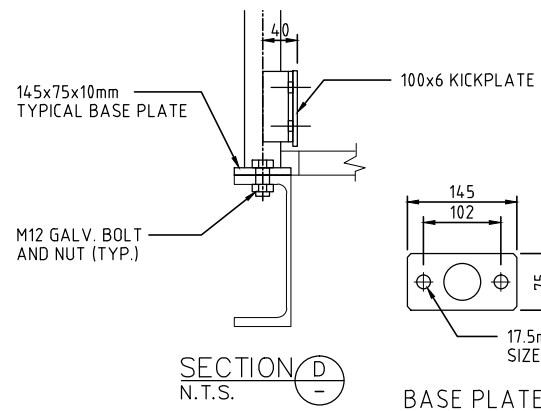
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CONSTRUCTION W.O. No.				CAD FILE	50157004.DWG	T. CUSACK		FIELD SERVICES DELEGATE	DATE				
FUNDED BY B.C.C. (✓)	EXTERNAL ( )			B.C.C. FILE No.									

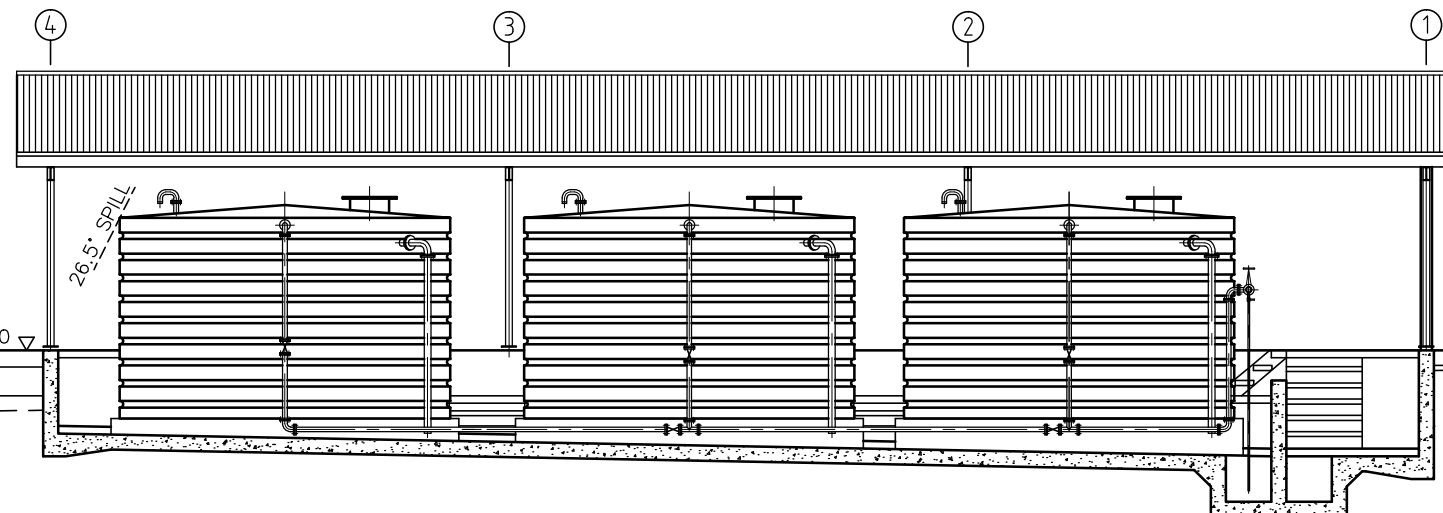
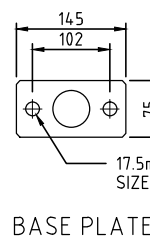




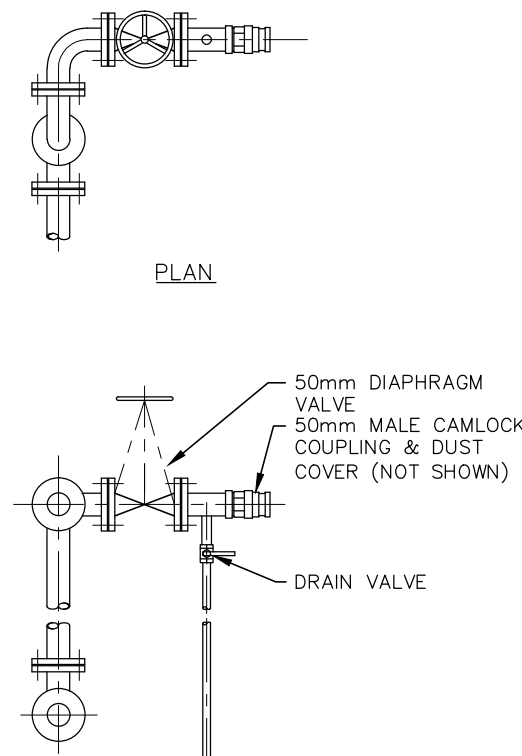
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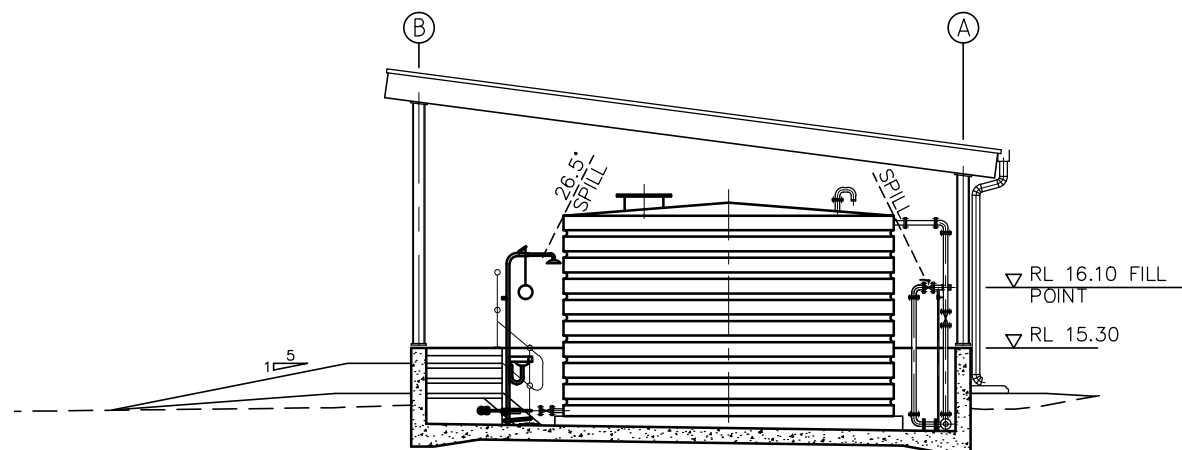
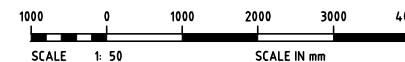
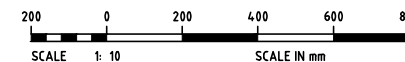
SECTION D  
N.T.S.



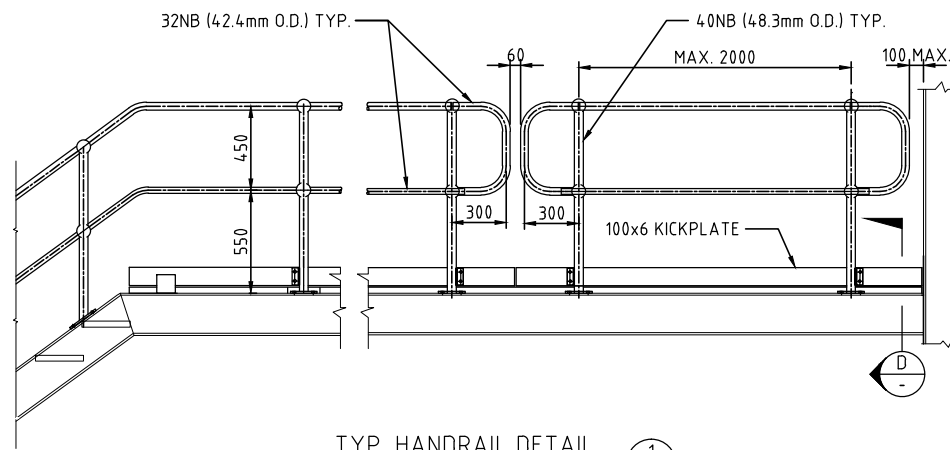
SECTION B  
SCALE 1:50,000



FILL POINT ARRANGEMENT DETAIL  
SCALE 1:10



SECTION C  
SCALE 1:50,000



TYP. HANDRAIL DETAIL  
N.T.S.

AS CONSTRUCTED

ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-C-DWG-005

AS CONSTRUCTED DETAILS  
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.  
SIGNED: DATE: 01.11.13  
NAME of SIGNATORY: A. THIRIS  
RPEQ No. or LICENCE: 3325  
COMPANY NAME: ALTRA9  
START DATE: 16.11.12 FINISH DATE: 01.11.13

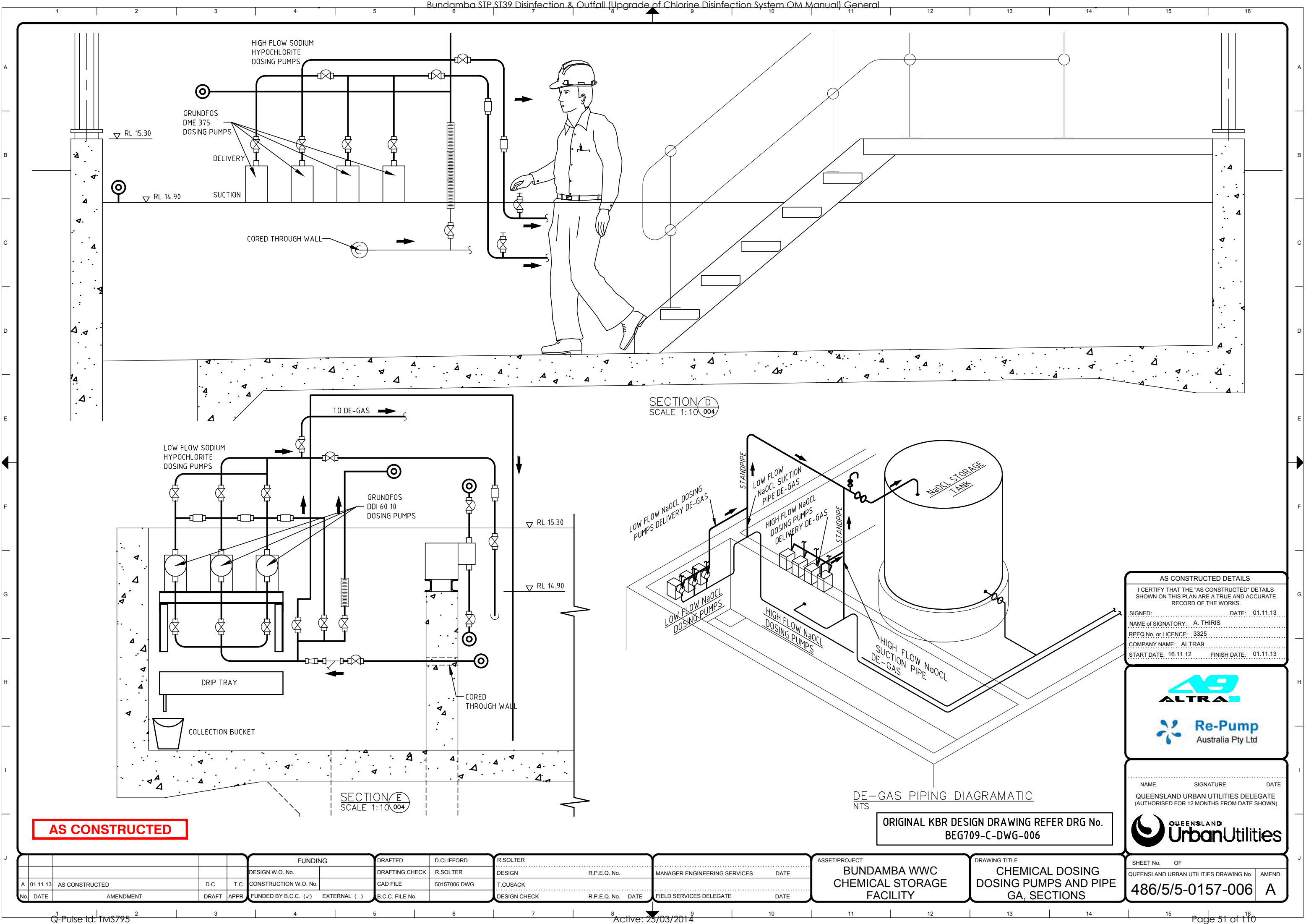


NAME SIGNATURE DATE  
QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)



SHEET No. OF  
QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.  
486/5/5-0157-005 A

FUNDING				DRAFTED				ASSET/PROJECT			
DESIGN W.O. No.		DRAFT	T.C.	DRAFTING CHECK	R.SOLTER	DESIGN	R.P.E.Q. No.	MANAGER ENGINEERING SERVICES	DATE	BUNDAMBA WWC CHEMICAL STORAGE FACILITY	
CONSTRUCTION W.O. No.		APPR		CAD FILE	50157005.DWG	T.CUSACK	R.P.E.Q. No.	FIELD SERVICES DELEGATE	DATE		
FUNDED BY B.C.C. (✓)	EXTERNAL ( )			B.C.C. FILE No.		DESIGN CHECK	DATE			CHEMICAL DOSING SECTIONS	



P&ID SYMBOLS

	BALL VALVE		ECCENTRIC PLUG VALVE
	GLOBE VALVE		FOOT VALVE
	GATE VALVE		SOLENOID ACTUATOR
	NEEDLE VALVE		PNEUMATIC ACTUATOR OPEN / CLOSE
	CHECK VALVE		PNEUMATIC ACTUATOR (MODULATING)
	THREE WAY VALVE		SILENCER
	DIAPHRAGM VALVE		CALIBRATION CYLINDER
	BUTTERFLY VALVE		FILTER
	KNIFE GATE VALVE		SPRAYER
	PLUG VALVE		VENTURI METER
	FLOAT VALVE		STRAINER
	PRESSURE RELIEF VALVE		DRAIN
	PRESSURE CONTROL VALVE		KAMLOCK COUPLING - FEMALE
	PRESSURE REDUCING VALVE		KAMLOCK COUPLING - MALE
	DIAPHRAGM SEAL		HOSE CONNECTION
	AIR RELIEF VALVE		MAGNETIC FLOW METER
	STATIC MIXER		ULTRASONIC FLOW METER
	PROPELLER MIXER		FLUME
	PADDLE MIXER		ROTAMETER
	EJECTOR		MACERATOR/MUNCHER
	PENSTOCK		COMPRESSOR
	STOPBOARD		PROPELLER PUMP
	WEIR		FAN
	TAPER - ECCENTRIC		DIAPHRAGM PUMP
	TAPER - CONCENTRIC		ANNUBAR FLOW METER
	CENTRIFUGAL BLOWER		DAMPER
	MAGNETIC BEARING TURBINE BLOWER		PULSATION DAMPENER
	SUBMERSIBLE PUMP		SATURATION VESSEL
	CENTRIFUGAL PUMP		
	PROGRESSIVE CAVITY PUMP		
	METERING PUMP		

INSTRUMENTATION CODES

	INSTRUMENT, LOCALLY MOUNTED
	INSTRUMENT, LOCAL PANEL MOUNTED, ON FRONT OF PANEL
	INSTRUMENT, LOCAL PANEL MOUNTED, BEHIND PANEL
	INSTRUMENT, CENTRAL PANEL MOUNTED, ON FRONT OF PANEL
	INSTRUMENT, CENTRAL PANEL MOUNTED, BEHIND PANEL
	PLC FUNCTION WITH LOCAL ACCESSIBILITY FOR OPERATOR
	PLC FUNCTION WITH ACCESSIBILITY AT LOCAL PANEL
	PLC FUNCTION WITH ACCESSIBILITY BEHIND LOCAL PANEL
	PLC FUNCTION WITH ACCESSIBILITY AT CENTRAL CONTROL PANEL
	PLC FUNCTION WITH ACCESSIBILITY BEHIND CENTRAL CONTROL PANEL
	PLC/DISPLAY FUNCTION WITH LOCAL ACCESSIBILITY FOR OPERATOR
	PLC/DISPLAY FUNCTION WITH ACCESSIBILITY AT LOCAL PANEL
	PLC/DISPLAY FUNCTION WITH ACCESSIBILITY BEHIND LOCAL PANEL
	PLC/DISPLAY FUNCTION WITH ACCESSIBILITY AT CENTRAL CONTROL PANEL
	PLC/DISPLAY FUNCTION WITH ACCESSIBILITY BEHIND CENTRAL CONTROL PANEL

INSTRUMENTATION CODES

TOP: ALPHA CODE  
BOTTOM: ASSET TAG NUMBER

FIRST LETTER

A	ANALYSER
B	BURNER/FLAME
C	CONDUCTIVITY
D	DENSITY
E	ELECTRIC
F	FLOW
G	GAUGING POSITION OR LENGTH
H	HAND OPERATED
K	TIME
L	LEVEL
M	MOISTURE/HUMIDITY
P	PRESSURE
R	RADIATION
S	SPEED/FREQUENCY
T	TEMPERATURE
V	VIBRATION
W	WEIGHT/TORQUE
X	ON/OFF
Z	POSITION

SECOND LETTER

A	ALARM
B	STATUS
C	CONTROL
E	SENSING ELEMENT
H	HIGH
I	INDICATOR
L	LOW
P	PROBE
Q	INTEGRATOR
R	RECORDER
S	SWITCH
T	TRANSMITTER
V	VALVE

THIRD LETTER

C	CONTROL
H	HIGH
L	LOW
Q	INTEGRATOR
R	RECORDER
T	TRANSMITTER
X	NULL

EXCEPTIONS

ADO	DISSOLVED OXYGEN TRANSMITTER
ApH	pH TRANSMITTER
ARC	RESIDUAL CHLORINE TRANSMITTER
ATU	TURBIDITY TRANSMITTER
AUI	UV INTENSITY TRANSMITTER
DPI	DIFFERENTIAL PRESSURE INDICATOR
LCI	LEVEL CUT IN
LCO	LEVEL CUT OUT
ZSC	LIMIT SWITCH CLOSED
ZSO	LIMIT SWITCH OPEN
HSE	EMERGENCY STOP OR PULL-WIRE

SOURCE / DESINATION

MOTOR

VARIABLE SPEED DRIVE

EQUIPMENT CODES

ACT	ACTUATOR
ACV	AIR RELIEF VALVE
AGT	AGITATOR
BIN	BIN
BLR	BLOWER
CHN	CHANNEL
CLR	CLARIFIER
CNV	CONTROL VALVE
CON	BELT CONVEYOR
CYL	CYLINDER
DIF	DIFFUSER
DIG	DIGESTER
FAN	FAN
FLT	FILTER
FTR	FLAME TRAP
GDD	GRAVITY DRAINAGE DECK
MIX	MIXER
MTR	MOTOR
NRV	NON RETURN VALVE
PCV	PRESSURE CONTROL VALVE
PEN	PENSTOCK
PRS	PRESS
PRV	PRESSURE RELIEF VALVE
SBD	STOPBOARD
SCN	SCREEN
SCW	SCREW CONVEYOR
SCP	SCRAPER
SHW	SAFETY SHOWER
SIL	SILENCER
SKM	SCUM EQUIPMENT
SOV	SOLENOID VALVE
STN	STRAINER
TNK	TANK
UVB	UV DISINFECTION SYSTEM
VIB	VIBRATOR
VLV	VALVE
VSL	VESSEL
WBR	WEIGHBRIDGE

PIPE CONTENTS CODES

A	AIR (LOW PRESSURE)
AL	ALUM
BC	BIOSOLIDS CAKE
CAS	COMPRESSED AIR
CBW	CLEAN BACKWASH
CL	SATURATED CHLORINATED WATER
CL <sub>2</sub>	CHLORINE GAS
DBW	DIRTY BACKWASH
DR	DRAIN
DWAS	DIGESTED WASTE ACTIVATED SLUDGE
F	FILTRATE
FA	FOUL AIR
FE	FINAL EFFLUENT
FTE	FILTERED EFFLUENT
GR	GRIT
GRS	GRIT SLURRY
LP	LIME POWDER
MET	METHANOL
ML	MIXED LIQUOR
P	POLYMER SOLUTION
PP	POLYMER POWDER
PW	POTABLE WATER
RAS	RETURN ACTIVATED SLUDGE
RE	RECLAIMED EFFLUENT (CLASS A)
RS	RAW SEWAGE
RSL	RAW SLUDGE
SCM	SCUM
SCR	SCOUR
SN	SUPERNATANT
SW	STORMWATER
TWAS	THICKENED WAS
WAS	WASTE ACTIVATED SLUDGE
WW	WASH DOWN WATER

LINE TYPES

	PROCESS LINE
	PLANT OUTLINE
	CHANNEL OUTLINE
	INSTRUMENT CONNECTION
	PNEUMATIC SIGNAL
	ELECTRICAL SIGNAL
	HYDRAULIC SIGNAL
	ELECTROMAGNETIC SIGNAL
	SOFTWARE LINK

PIPE MATERIAL CODES

ABS9	AS 3518 ABS CLASS 9
ABS12	AS 3518 ABS CLASS 12
CH	REINFORCED CONCRETE CHANNEL
CS	CARBON STEEL
CU	COPPER TUBE
DICL	DUCTILE IRON CEMENT LINED
DWV8	AS 1254 PVC SN8
GRP	GLOSS FILAMENT REINFORCED PLASTIC
HDPE12	AS 4130 PE100 PN12.5
MSCL	AS 1281 MSCL
PE80	POLYETHYLENE TYPE 80 SDR 11
PVC9	AS 1477 PVC SERIES 2 CLASS 9
PVC16	PVC PN16
RC4	AS 4058 RC CLASS 4
SS10S	AS TM A269 GRADE 316 SS TUBE SCHEDULE 10S
SWSS3	GRADE 304 SPIRAL WOUND SS 3mm WALL

LINE DESCRIPTIONS

0000-RS-D19-DN450	PIPE SIZE
	PIPE MATERIAL
	CONTENTS
	LINE NUMBER

AS CONSTRUCTED DETAILS

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

SIGNED: DATE: 01.11.13

NAME OF SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

START DATE: 16.11.12 FINISH DATE: 01.11.13



NAME SIGNATURE DATE  
QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)



SHEET No. OF  
QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.

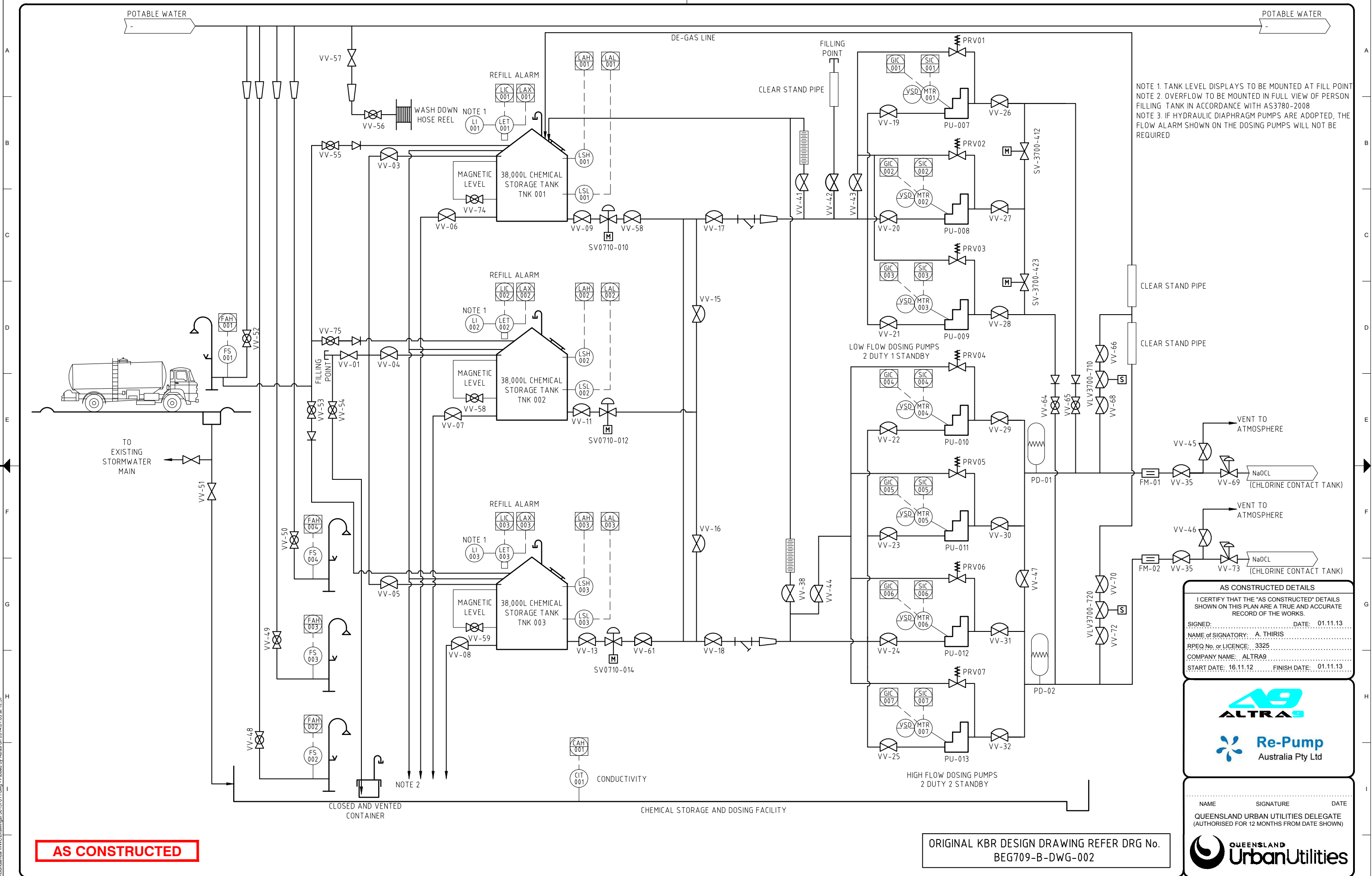
486/5/5-0157-010 A

AS CONSTRUCTED

ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-B-DWG-001

DESIGN W.O. No.		DRAFTED		D.CLIFFORD		R.SOLTER		ASSET/PROJECT		DRAWING TITLE		SHEET No. OF	
CONSTRUCTION W.O. No.		DRAFTING CHECK		R.SOLTER		DESIGN		BUNDAMBA WWC		P & ID LEGEND		QUEENSLAND URBAN UTILITIES DRAWING No.	
FUNDING		CAD FILE		50157010.DWG		T.CUSACK		CHEMICAL STORAGE		AND DRAWING INDEX		486/5/5-0157-010	
FUNDING		DESIGN CHECK		R.P.E.Q. No.		DATE		FACILITY				A	
FUNDING		B.C.C. FILE No.											
FUNDING		FIELD SERVICES DELEGATE											





NOTE 1. TANK LEVEL DISPLAYS TO BE MOUNTED AT FILL POINT  
NOTE 2. OVERFLOW TO BE MOUNTED IN FULL VIEW OF PERSON FILLING TANK IN ACCORDANCE WITH AS3780-2008  
NOTE 3. IF HYDRAULIC DIAPHRAGM PUMPS ARE ADOPTED, THE FLOW ALARM SHOWN ON THE DOSING PUMPS WILL NOT BE REQUIRED

**AS CONSTRUCTED DETAILS**  
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.  
SIGNED: \_\_\_\_\_ DATE: 01.11.13  
NAME OF SIGNATORY: A. THIRIS  
RPEQ No. or LICENCE: 3325  
COMPANY NAME: ALTRA9  
START DATE: 16.11.12 FINISH DATE: 01.11.13

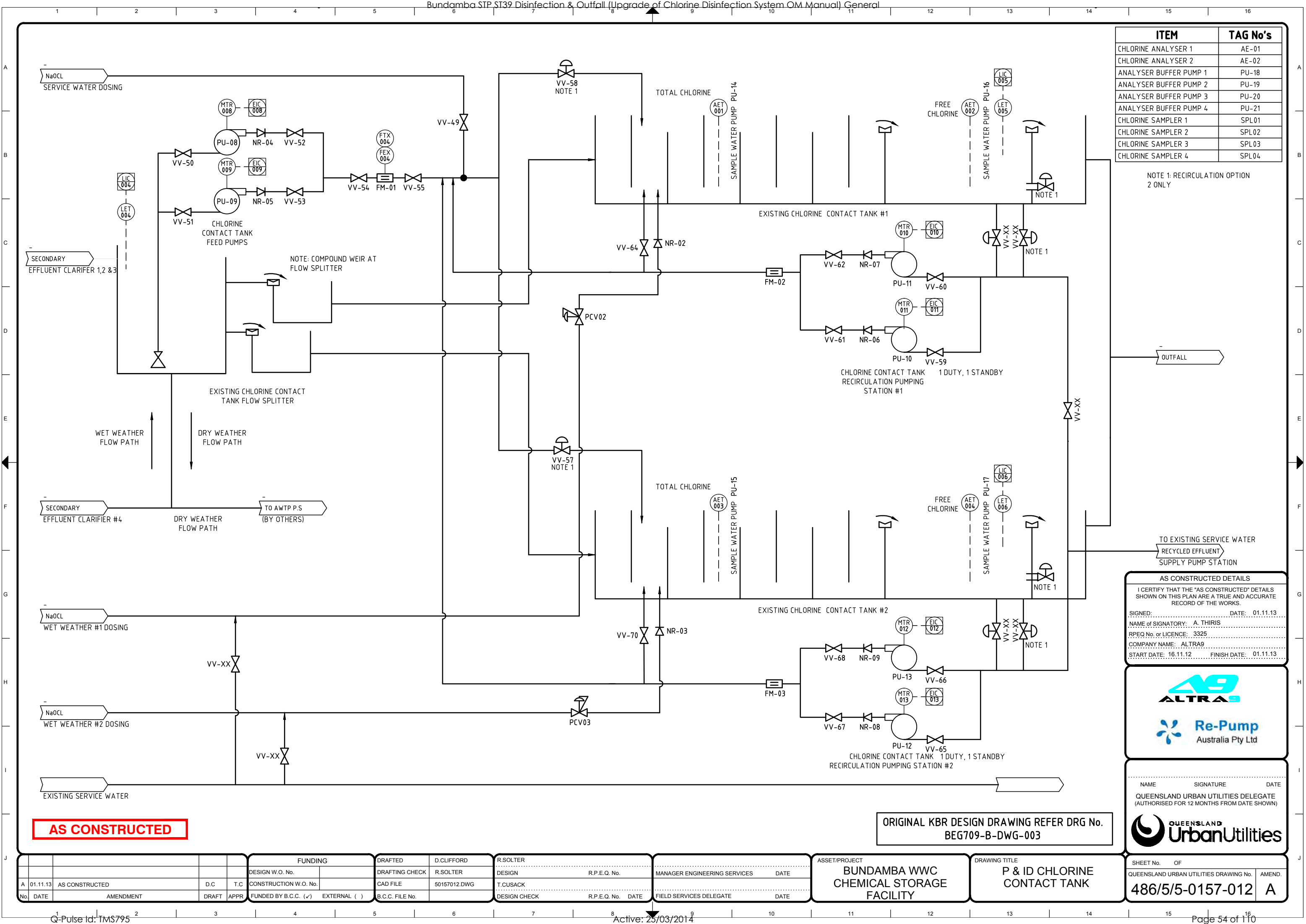


NAME \_\_\_\_\_ SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)  
**QUEENSLAND UrbanUtilities**

ORIGINAL KBR DESIGN DRAWING REFER DRG No. BEG709-B-DWG-002

						FUNDING			DRAFTED		D.CLIFFORD		R.SOLTER				ASSET/PROJECT				DRAWING TITLE				SHEET No. OF																															
						DESIGN W.O. No.					DRAFTING CHECK		R.SOLTER		DESIGN				R.P.E.Q. No.		MANAGER ENGINEERING SERVICES				DATE		BUNDAMBA WWC				P & ID CHEMICAL				QUEENSLAND URBAN UTILITIES DRAWING No.				AMEND.																	
A			01.11.13			AS CONSTRUCTED			D.C			T.C			CONSTRUCTION W.O. No.					CAD FILE		50157011.DWG		T.CUSACK								CHEMICAL STORAGE				STORAGE AND DOSING				486/5/5-0157-011				A												
No			DATE			AMENDMENT			DRAFT			APPR			FUNDED BY B.C.C. (✓)			EXTERNAL ( )			B.C.C. FILE No.				DESIGN CHECK				R.P.E.Q. No.		DATE		FIELD SERVICES DELEGATE				DATE		FACILITY																	

Z:\Altra 9 - Engineering\Re-Pump\Bundamba WWC\Drawings\50157011.dwg - Plotted by Altra9 on 20/04/01 at 12:57



ITEM	TAG No's
CHLORINE ANALYSER 1	AE-01
CHLORINE ANALYSER 2	AE-02
ANALYSER BUFFER PUMP 1	PU-18
ANALYSER BUFFER PUMP 2	PU-19
ANALYSER BUFFER PUMP 3	PU-20
ANALYSER BUFFER PUMP 4	PU-21
CHLORINE SAMPLER 1	SPL01
CHLORINE SAMPLER 2	SPL02
CHLORINE SAMPLER 3	SPL03
CHLORINE SAMPLER 4	SPL04

NOTE 1: RECIRCULATION OPTION  
2 ONLY

AS CONSTRUCTED DETAILS	
I CERTIFY THAT THE 'AS CONSTRUCTED' DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.	
SIGNED: .....	DATE: 01.11.13
NAME of SIGNATORY: A. THIRIS	
RPEQ No. or LICENCE: 3325	
COMPANY NAME: ALTRA9	
START DATE: 16.11.12	FINISH DATE: 01.11.13

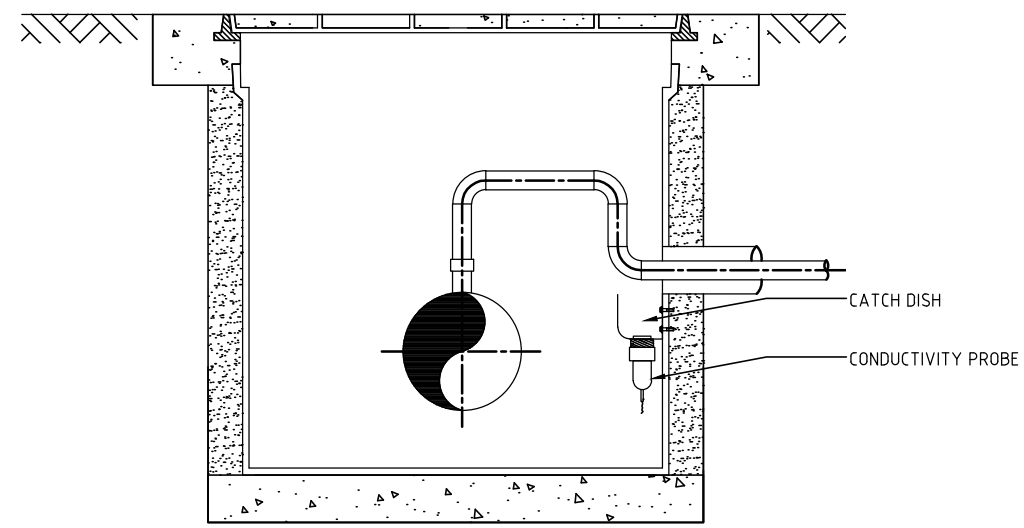


NAME	SIGNATURE	DATE
QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)		

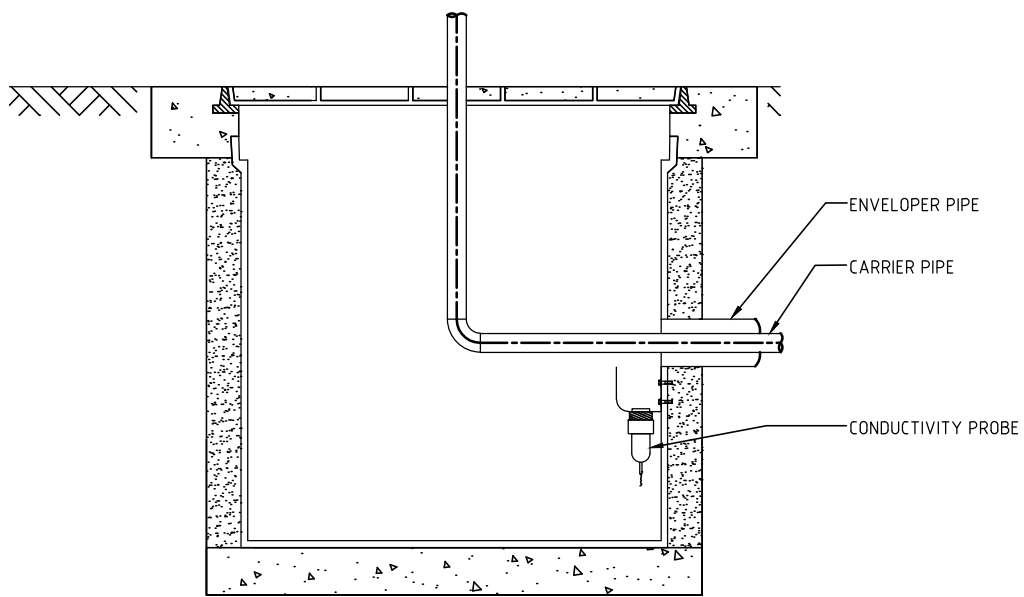
AS CONSTRUCTED

ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-B-DWG-003

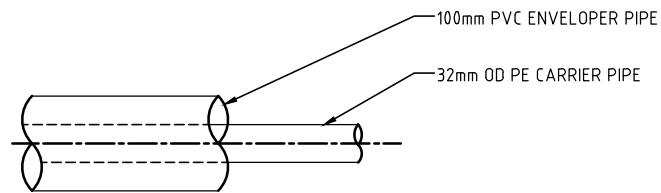
FUNDING				DRAFTED		D.CLIFFORD		R.SOLTER		ASSET/PROJECT		DRAWING TITLE		SHEET No. OF		DRAWING No. OF	
DESIGN W.O. No.				DRAFTING CHECK		R.SOLTER		DESIGN		BUNDAMBA WWC CHEMICAL STORAGE FACILITY		P & ID CHLORINE CONTACT TANK		486/5/5-0157-012		AMEND.	
CONSTRUCTION W.O. No.				CAD FILE		50157012.DWG		T.CUSACK		MANAGER ENGINEERING SERVICES		DATE					
FUNDED BY B.C.C. (✓) EXTERNAL ( )				B.C.C. FILE No.				DESIGN CHECK		FIELD SERVICES DELEGATE		DATE				A	



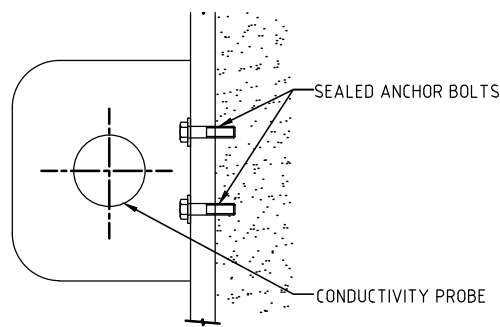
LOW FLOW DOSING POINT  
N.T.S.



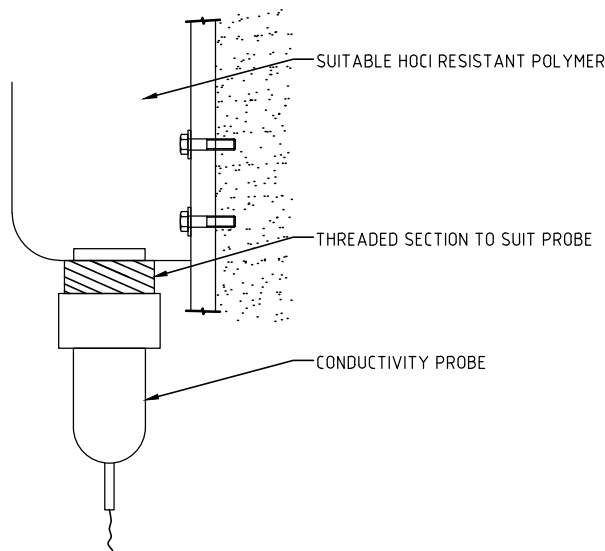
HIGH FLOW DOSING POINT (x2)  
N.T.S.



DETAIL OF ENVELOPER  
N.T.S.



PLAN



ELEVATION

PROBE COLLECTION DETAIL  
N.T.S.

AS CONSTRUCTED

ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-B-DWG-004

AS CONSTRUCTED DETAILS  
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS  
SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE  
RECORD OF THE WORKS.  
SIGNED: DATE: 01.11.13  
NAME of SIGNATORY: A. THIRIS  
RPEQ No. or LICENCE: 3325  
COMPANY NAME: ALTRA9  
START DATE: 16.11.12 FINISH DATE: 01.11.13



NAME SIGNATURE DATE  
QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

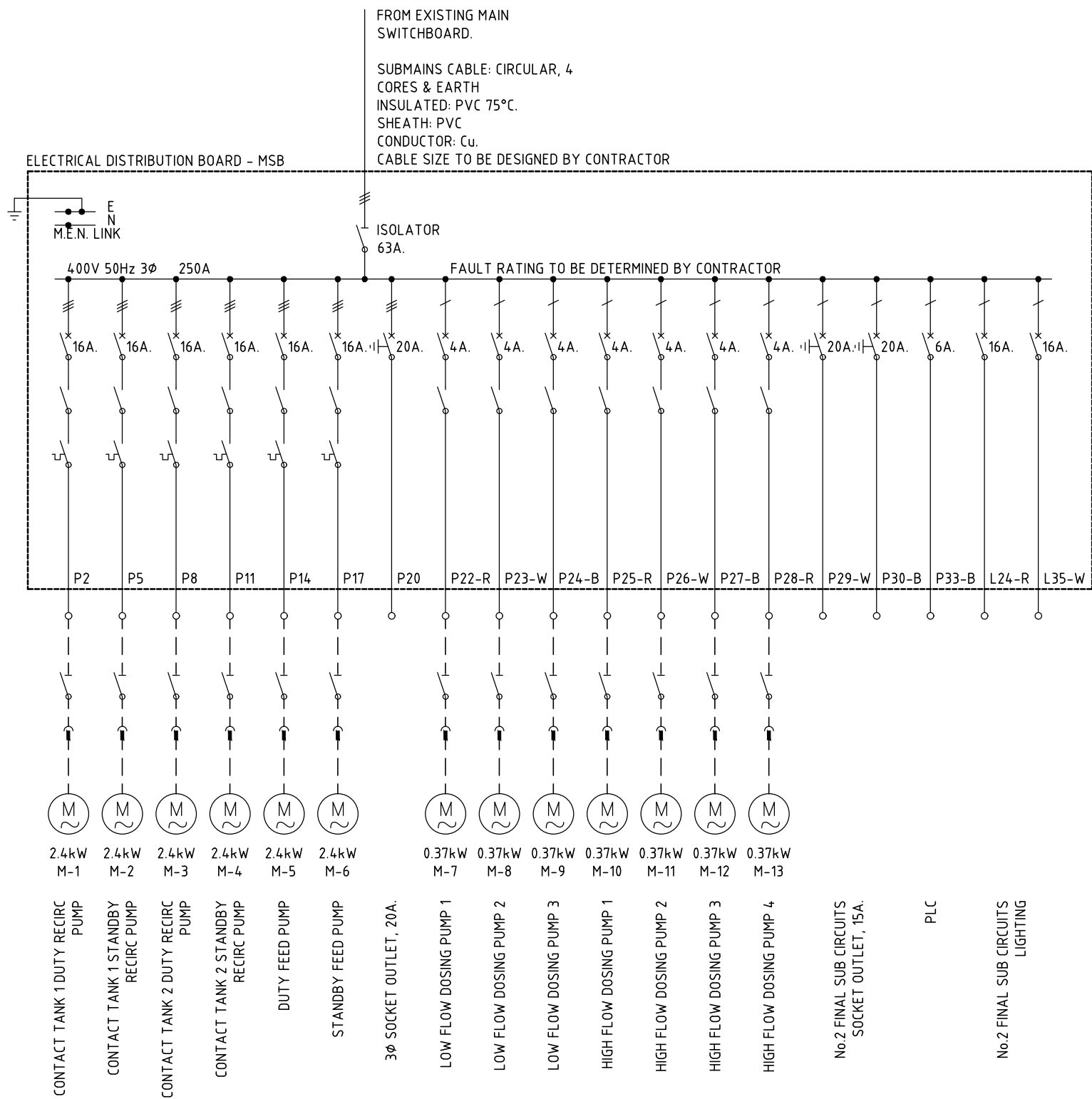


SHEET No. OF  
QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.  
486/5/5-0157-013 A

DESIGN W.O. No.		FUNDING		DRAFTED		D.CLIFFORD		R.SOLTER	
CONSTRUCTION W.O. No.		DESIGN W.O. No.		DRAFTING CHECK		R.SOLTER		DESIGN	
FUNDED BY B.C.C. (✓)		EXTERNAL ( )		CAD FILE		50157013.DWG		T.CUSACK	
B.C.C. FILE No.				DESIGN CHECK		R.P.E.Q. No.		DATE	
FIELD SERVICES DELEGATE									

ASSET/PROJECT  
BUNDAMBA WWC  
CHEMICAL STORAGE  
FACILITY

DRAWING TITLE  
DOSING PIPE  
ENVELOPER



AS CONSTRUCTED

ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-E-DWG-001

No.	DATE	AMENDMENT	DRAFT	APPR
A	01.11.13	AS CONSTRUCTED	D.C	T.C

DESIGN W.O. No.	CONSTRUCTION W.O. No.	FUNDED BY B.C.C. (✓)	EXTERNAL ( )

DRAFTED	D.CLIFFORD	R.SOLTER
DRAFTING CHECK	R.SOLTER	
CAD FILE	50157020.DWG	T.CUSACK
B.C.C. FILE No.		DESIGN CHECK

R.SOLTER		
DESIGN	R.P.E.Q. No.	
T.CUSACK		
DESIGN CHECK	R.P.E.Q. No.	DATE

ASSET/PROJECT	BUNDAMBA WWC CHEMICAL STORAGE FACILITY
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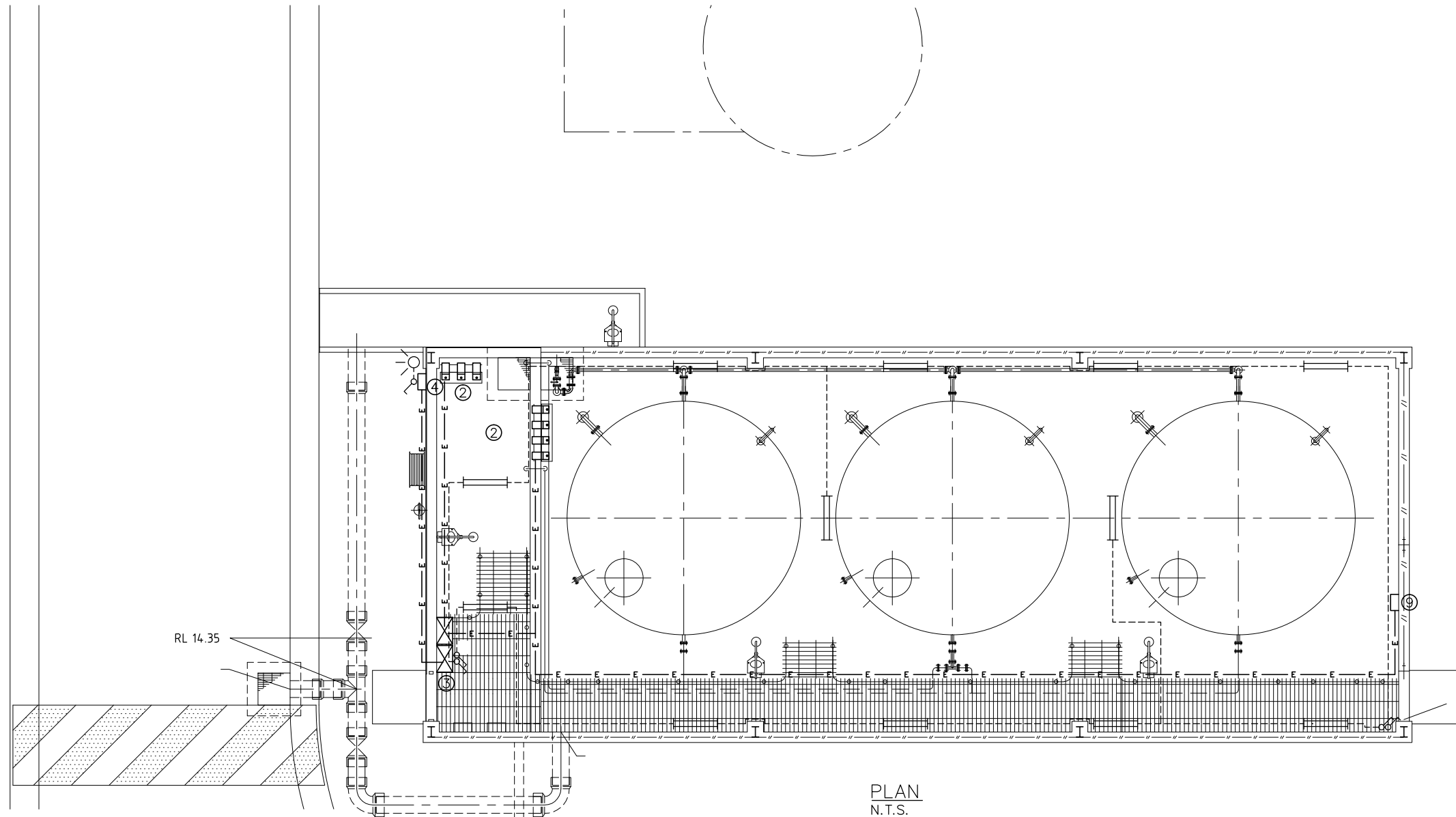
DRAWING TITLE	SINGLE LINE DIAGRAM
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SHEET No.	OF	AMEND.
486/5/5-0157-020		A

AS CONSTRUCTED DETAILS	
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.	
SIGNED:	DATE: 01.11.13
NAME of SIGNATORY: A. THIRIS	
RPEQ No. or LICENCE: 3325	
COMPANY NAME: ALTRA9	
START DATE: 16.11.12	FINISH DATE: 01.11.13



NAME	SIGNATURE	DATE
QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)		

PLAN  
N.T.S.

EQUIPMENT SCHEDULE

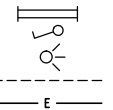
ITEM	DESCRIPTION	QTY
2	SODIUM HYPOCHLORITE DOSING PUMPS	7
3	SODIUM HYPOCHLORITE DOSING PUMPS SWITCHBOARD	2
4	EXTERNAL ELECTRICAL POWER OUTLET FOR DELIVERY TANKER PUMP OPERATION	1
9	INTERNAL ELECTRICAL POWER OUTLET FOR MAINTANENCE	1

**NOTES:**

- GENERAL  
THE ELECTRICAL INSTALLATION AND FACILITIES SHALL CONFORM WITH THE REQUIREMENTS OF THE LATEST ISSUE OF:  
- THE LOCAL SUPPLY AUTHORITY REGULATIONS  
- THE LOCAL BUILDING REGULATIONS  
- AS 3000, WIRING RULES.  
THE CURRENT AUSTRALIAN STANDARDS SHALL IN GENERAL BE REGARDED AS PERSUASIVE AND SHALL BE COMPLIED WITH EXCEPT WHERE A HIGHER STANDARD IS CALLED FOR IN THIS DOCUMENT.
- POWER OUTLETS AND WIRING  
GENERAL POWER OUTLETS  
WEATHERPROOF SINGLE PHASE SWITCHES SHALL BE CLIPSAL WEATHERPROTECTED TYPE 56C310  
LABELLING  
ALL GPO'S SHALL BE MARKED WITH THE CIRCUIT TO WHICH THEY ARE CONNECTED.  
WIRING  
POWER CIRCUITS SHALL BE WIRED IN NOT LESS THAN STRANDED 2.5 mm TPS<sup>2</sup> WIRING AND SHALL NOT BE LOADED ABOVE 75% OF THE PERMISSIBLE VALUES OUTLINED IN AS 3000. ALL CABLING SHALL BE WITHIN SURFACE-MOUNTED CONDUITS SECURED WITH PVC SADDLES. SHEATH COLOUR SHALL BE GREY.  
MOUNTING HEIGHTS  
UNLESS STATED OTHERWISE, WALL MOUNTED GENERAL PURPOSE OUTLETS SHALL BE MOUNTED AT CENTRE LINE 450MM ABOVE FINISHED FLOOR LEVEL. THE HEIGHT SHALL BE VARIED IN THE CASE OF FACE BRICK WALLS WHERE THE OUTLET SHALL BE MOUNTED IN THE CENTRE OF THE BRICK NEAREST THE INDICATED MOUNTING POSITION AND NEAREST TO CENTRE LINE 450MM ABOVE FLOOR.
- GENERAL LIGHTING  
WIRING  
LIGHT CIRCUITS SHALL BE WIRED IN NOT LESS THAN 1.5mm STANDARD COPPER CABLES. ALL CABLING SHALL BE WITHIN SURFACE MOUNTED CONDUITS SECURED WITH PVC SADDLES. SHEATH COLOUR SHALL BE GREY.

**LEGEND**

FLOURESCENT LUMINAIRE  
SINGLE GANG SWITCH TO REMAIN  
SPOT LIGHT  
SWITCH WIRE IN SURFACE MOUNTED CONDUIT  
NEW ELECTRICAL

**AS CONSTRUCTED DETAILS**

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

SIGNED: \_\_\_\_\_ DATE: 01.11.13

NAME of SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

START DATE: 16.11.12 FINISH DATE: 01.11.13



NAME SIGNATURE DATE

QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)



SHEET No. OF

QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.

486/5/5-0157-021 A

**AS CONSTRUCTED**

ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-E-DWG-002

					FUNDING		DRAFTED	D.CLIFFORD	R.SOLTER		ASSET/PROJECT		DRAWING TITLE		SHEET No. OF	
					DESIGN W.O. No.		DRAFTING CHECK	R.SOLTER	DESIGN R.P.E.Q. No.		MANAGER ENGINEERING SERVICES	DATE	BUNDAMBA WWC CHEMICAL STORAGE FACILITY		ELECTRICAL LIGHTING AND WIRING GENERAL ARRANGEMENT	
A	01.11.13	AS CONSTRUCTED		D.C	T.C	CONSTRUCTION W.O. No.	CAD FILE	50157021.DWG	T.CUSACK						QUEENSLAND URBAN UTILITIES DRAWING No.	
No.	DATE	AMENDMENT		DRAFT	APPR	FUNDED BY B.C.C. (✓) EXTERNAL ( )	B.C.C. FILE No.		DESIGN CHECK R.P.E.Q. No. DATE		FIELD SERVICES DELEGATE DATE		486/5/5-0157-021		AMEND. A	



GENERAL

- G1. THESE DRAWINGS TO BE READ IN CONJUNCTION WITH SURVEY, OTHER ENGINEERING DRAWINGS, SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED.
- G2. NOMINATION OF PROPRIETARY ITEMS INDICATES THE REQUIRED PROPERTIES OF THE ITEM. SIMILAR ALTERNATIVES HAVING THE REQUIRED PROPERTIES MAY BE OFFERED FOR APPROVAL.
- G3. DO NOT SCALE FROM THE DRAWINGS. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS IN METRES.
- G4. VERIFY SETTING OUT DIMENSIONS SHOWN ON THE DRAWINGS BEFORE CONSTRUCTION AND FABRICATION IS COMMENCED.
- G5. MAINTAIN STRUCTURE IN STABLE CONDITION DURING CONSTRUCTION. NO PART SHALL BE OVERSTRESSED. PROVIDE TEMPORARY BRACING AS REQUIRED.
- G6. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT SAA CODES AND THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITY.
- G7. THE STRUCTURAL WORK SHOWN ON THE DRAWINGS HAS BEEN DESIGNED FOR THE FOLLOWING LOADS :
- (a) WIND LOADS:  
- ASSUMED TERRAIN CATEGORY 2.5  
- V500=57m/s  
- V25=39m/s
- (b) LIVE LOADS :  
- NON-TRAFFICABLE ROOF = 0.25kPa  
- STAIRS/WALKWAYS = 2.5kPa
- (c) PIPE THRUST LOADS:  
TEST PRESSURE 2580 kPa  
WORKING PRESSURE 1720 kPa
- (d) OTHER LOADS :  
EARTH PRESSURE
- G8. ROOF SEGMENT REMOVAL FOR TANK EXTRACTION :  
- REMOVE SHEETING & PURLINS OVER TANK TO BE REPLACED  
- REMOVE M16 RODS AND CHS STRUT OVER TANK TO BE REPLACED  
- REMOVE TANK WITH CRANE  
- REPLACE M16 RODS & CHS STRUT  
- REPLACE SHEETING & PURLINS  
- REPAINT WITH MARINE GRADE PAINT

FOUNDATIONS

- F1. FOOTINGS HAVE BEEN DESIGNED FOR A SAFE WORKING PRESSURE OF 100 kPa. FOUNDATION MATERIAL SHALL BE APPROVED FOR THIS PRESSURE BY THE SUPERINTENDENT / BUILDING AUTHORITY BEFORE CONSTRUCTION COMMENCES.
- F2. FOUNDATION LEVELS SHOWN ARE CONTRACT LEVELS - THE FINAL LEVELS SHALL BE AS DIRECTED BY THE SUPERINTENDENT.
- F3. FOUNDATION MATERIAL BENEATH SLABS ON GROUND SHALL BE COMPACTED TO 98% STANDARD COMPACTION IN ACCORDANCE WITH AS 1289.

STRUCTURAL STEEL

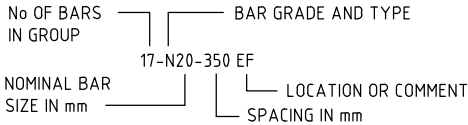
- S1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS4100 AND AS 1554 EXCEPT WHERE VARIED BY THE SPECIFICATION.
- S2. ALL STEEL SHALL BE IN ACCORDANCE WITH AS 3678, AS 3679 OR AS 1163
- S3. MINIMUM PLATE THICKNESS TO BE 10mm UNO.  
PROVIDE ALL CLEATS AND DRILL HOLES FOR FIXINGS, WHETHER OR NOT DETAILED ON THE DRAWINGS, TO THE APPROVAL OF THE ENGINEER.
- S4. ALL WELDS TO BE IN ACCORDANCE WITH AS 1554 :  
ALL WELDS TO BE CATEGORY GP  
ALL BUTT WELDS TO BE FULL PENETRATION U.N.O.  
ALL FILLET WELDS TO BE 6 CONTINUOUS U.N.O.  
ELECTRODES TO BE CLASSIFICATION E41XX
- S5. REFER TO AISC 'STANDARDISED STRUCTURAL CONNECTIONS' FOR DESIGNATION AND DETAILS OF CONNECTIONS.
- BOLT TYPE AND TIGHTENING PROCEDURE ARE DESIGNATED :-  
NUMBER, SIZE - STRENGTH GRADE / TIGHTENING PROCEDURE  
STRENGTH GRADE 4.6 TO BE COMMERCIAL BOLTS TO AS 1111  
STRENGTH GRADE 8.8 TO BE HIGH STRENGTH STRUCTURAL BOLTS, NUTS AND WASHERS TO AS 1252.
- TIGHTENING PROCEDURES :  
S - 'SNUG TIGHT'  
TB - BEARING MODE JOINT, BOLTS FULLY TENSIONED IN ACCORDANCE WITH AS 1511  
TF - FRICTION MODE JOINT, BOLTS FULLY TENSIONED IN ACCORDANCE WITH AS 1511
- E.G. 4M24 - 8.8 / TB  
4 OFF 24 DIAMETER METRIC HIGH STRENGTH STRUCTURAL BOLTS FULLY TENSIONED IN A BEARING MODE.
- S6. CONTACT SURFACES FOR BOLTED CONNECTIONS USING 8.8 / TF PROCEDURE NOT TO BE PAINTED AND TO BE PREPARED AS SPECIFIED.
- S7. THE CONTRACTOR SHALL PREPARE WORKSHOP DRAWINGS AND SUBMIT THREE COPIES OF EACH FOR SUPERINTENDENT'S REVIEW OF GENERAL COMPLIANCE WITH THE DESIGN CONCEPT. FABRICATION SHALL NOT COMMENCE UNTIL THE SHOP DRAWINGS HAVE BEEN REVIEWED AND ACCEPTED.
- S8. ALL STRUCTURAL STEEL & PURLINS TO BE DOUBLE HOT DIP GALVANIZED.
- S9. UNLESS OTHERWISE NOTED, ALL STEEL SHALL BE IN ACCORDANCE WITH:  
AS/NZS.3679 GRADE 300 PLUS FOR ROLLED SECTIONS & ANGLES.  
AS.1163 GRADE 350 FOR RHS AND CHS SECTIONS.  
AS.3678 GRADE 250 MIN. FOR ALL HOT ROLLED PLATES.
- S10. PROVIDE 2mm THICK POLYPROPYLENE (OR NEOPRENE) WASHERS BETWEEN STAINLESS STEEL BOLT HEADS OR NUTS WHERE IN CONTACT WITH GALVANISED MILD STEEL.

CONCRETE

- C1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600 CURRENT EDITION WITH AMENDMENTS,
- C2. QUALITY OF CONCRETE ELEMENTS SHALL BE AS FOLLOWS :
- | STRUCTURAL ELEMENT        | EXPOSURE CLASS | COVER TO REINF (mm) | CONCRETE CLASS | MAX AGG. SIZE (mm) | SLUMP mm | TESTING |
|---------------------------|----------------|---------------------|----------------|--------------------|----------|---------|
| WALLS & BASE OF BUND AREA | B1             | INTERNAL 40 MIN     | N32            | 20                 | 80±10    | PROJECT |
|                           |                | EXTERNAL 50 MIN     |                |                    |          |         |
- NOTE: EXPOSURE CLASS 'B1' IS ADOPTED IN THE PRESENCE OF "SIKAGARD-62" OR APPROVED EQUIVALENT.  
ALL INTERNAL EXPOSED CONCRETE FACES IN BUNDED AREA TO BE COVERED WITH A PROTECTIVE MEMBRANE "SIKAGARD-62" OR APPROVED EQUIVALENT.  
MEMBRANE TO BE INSPECTED AND MAINTAINED AS PER MANUFACTURERS SPECIFICATIONS.
- C3. ALL CONCRETE SHALL BE READY MIXED CONCRETE COMPLYING WITH AS 1379.
- C4. ADDITIVES SHALL NOT BE USED WITHOUT THE SUPERINTENDENT'S PRIOR APPROVAL.
- C5. CONCRETE SHALL BE COMPACTED BY MECHANICAL VIBRATION.
- C6. SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
- C7. BEAM SIZES ARE DESIGNATED DEPTH (INCLUDING SLAB, IF ANY) x WIDTH.
- C8. PROVIDE ALL EXPOSED EDGES AND CORNERS WITH 20 CHAMFERS OR FILLETS.
- C9. FORM ALL CONSTRUCTION JOINTS AND USE ONLY WHERE SHOWN OR APPROVED BY THE SUPERINTENDENT.
- C10. NO HOLES, CHASES OR EMBEDMENT OF PIPES, OTHER THAN THOSE SHOWN ON THE STRUCTURAL ENGINEER'S DRAWINGS SHALL BE MADE WITHOUT THE APPROVAL OF THE SUPERINTENDENT.
- C11. CURING OF CONCRETE SHALL BE COMMENCED AS SOON AS POSSIBLE AFTER PLACING OR STRIPPING TO AS 3600 & THE SPECIFICATION.  
ACCEPTABLE CURING METHODS ARE AS FOLLOWS:-  
- WATER IMMERSION  
- WATER SPRAY BENEATH APPROVED PLASTIC SHEETING  
- APPROVED WAX EMULSION CURING COMPOUND  
- APPROVED CHLORINATED RUBBER CURING COMPOUND
- C12. FORMWORK AND ITS REMOVAL TO BE IN ACCORDANCE WITH AS 3610.
- C13. LAP AND SEAL 0.2mm POLYTHENE MEMBRANE BELOW SLABS TO ENSURE A COMPLETE VAPOUR BARRIER.
- C14. FORMED SURFACES TO BE CLASS 3 IN ACCORDANCE WITH AS 3610.

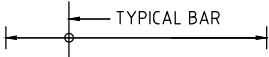
REINFORCEMENT

- R1. STEEL REINFORCEMENT SHALL BE TO AS 4671 CURRENT EDITION WITH AMENDMENTS.
- R2. SYMBOLS ON DRAWINGS FOR GRADE AND TYPE OF REINFORCEMENT ARE AS FOLLOWS :  
N DENOTES NORMAL DUCTILITY BAR  
SL & RL DENOTES HARD DRAWN WIRE REINFORCING FABRIC
- R3. DESIGNATION OF REINFORCEMENT BARS IS AS FOLLOWS:



- R4. THE FOLLOWING ABBREVIATIONS APPLY TO THE LOCATION OF REINFORCEMENT :-  
EW EACH WAY  
FF FAR FACE  
CP CENTRALLY PLACED  
EF EACH FACE  
B BOTTOM  
B/U BOTTOM UNDER (LAID FIRST)  
NF NEAR FACE  
T TOP  
T/O TOP OVER (LAID LAST)

- R5. EXTENT OF BARS SHOWN THUS :



- R6. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.
- R7. COGS AND HOOKS TO BE STANDARD IN ACCORDANCE WITH AS 3600.
- R8. MAINTAIN NOMINAL CLEAR CONCRETE COVER TO REINFORCEMENT (INCLUDING FITMENTS) BY APPROVED CHAIRS, SPACERS, OR TIES AS REQUIRED TO PROVIDE ADEQUATE SUPPORT.
- R9. SPLICE REINFORCEMENT ONLY AT LOCATIONS SHOWN ON DRAWINGS, OR AS APPROVED BY SUPERINTENDENT. LAP LENGTH BARS SHALL BE AS BELOW:

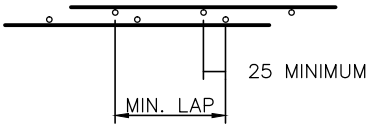
- (1) HORIZONTAL BARS WITH 300 OR MORE CONCRETE CAST BELOW.

BAR	LAP
N12	375
N16	500
N20	750
N24	1100
N28	1450

- (2) ALL OTHER BARS

BAR	LAP
N12	300
N16	400
N20	600
N24	850
N28	1150

- R10. LAPPING OF FABRIC SHALL BE AS FOLLOWS:



- R11. WELDING OF REINFORCEMENT IS ONLY PERMITTED WHERE SHOWN ON THE DRAWINGS OR OTHERWISE APPROVED BY THE SUPERINTENDENT.
- R12. DOWELS SHALL BE SAWN TO LENGTH. IN SKEWED JOINTS DOWELS SHALL BE ALIGNED WITH THE LONGITUDINAL JOINTS. DOWEL ALIGNMENT TO BE MAINTAINED BY USE OF A SUPPORT ASSEMBLY SUITABLE TO ENSURE A HORIZONTAL AND VERTICAL ALIGNMENT TOLERANCE OF 5 IN 400.

- R13. NEAR FACE BARS SHOWN CONTINUOUS  
FAR FACE BARS SHOWN DASHED

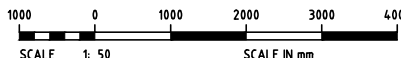
AS CONSTRUCTED

ORIGINAL KBR DESIGN DRAWING REFER DRG No. BEG709-S-DWG-001

				FUNDING		DRAFTED	D.CLIFFORD	R.SOLTER	ASSET/PROJECT BUNDAMBA WWC CHEMICAL STORAGE FACILITY	DRAWING TITLE STRUCTURAL NOTES	SHEET No. OF QUEENSLAND URBAN UTILITIES DRAWING No. AMEND. 486/5/5-0157-030 A
				DESIGN W.O. No.		DRAFTING CHECK	R.SOLTER	DESIGN			
				CONSTRUCTION W.O. No.		CAD FILE	50157030.DWG	T.CUSACK			
No.	DATE	AMENDMENT		DRAFT	APPR	FUNDED BY B.C.C. (✓)	EXTERNAL ( )	B.C.C. FILE No.	R.P.E.Q. No.	DATE	DATE

SETOUT PLAN  
SCALE 1:50


## AS CONSTRUCTED



ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-S-DWG-002

<b>AS CONSTRUCTED DETAILS</b>	
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.	
SIGNED:	DATE: 01.11.13
NAME of SIGNATORY: A. THIRIS	
RPEQ No. or LICENCE: 3325	
COMPANY NAME: ALTRA9	
START DATE: 16.11.12	FINISH DATE: 01.11.13



NAME	SIGNATURE	DATE
<b>QUEENSLAND URBAN UTILITIES DELEGATE</b> (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)		
 <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> <b>QUEENSLAND</b>  <b>UrbanUtilities</b> </div>		
SHEET No.      OF		
QUEENSLAND URBAN UTILITIES DRAWING No.		AMEND.
486/5/5-0157-031		A

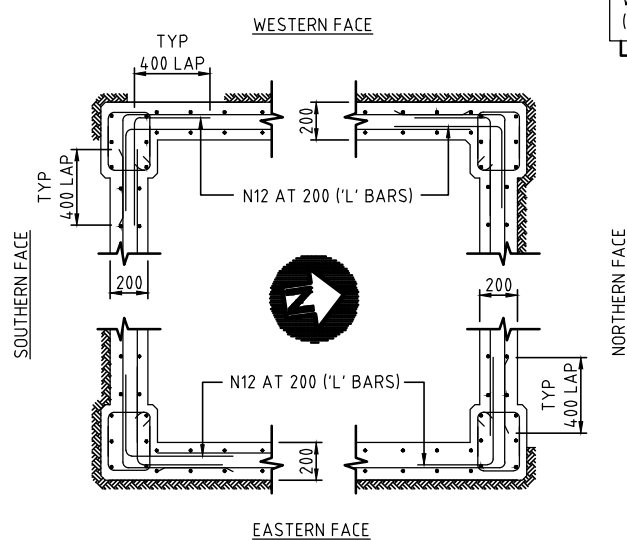
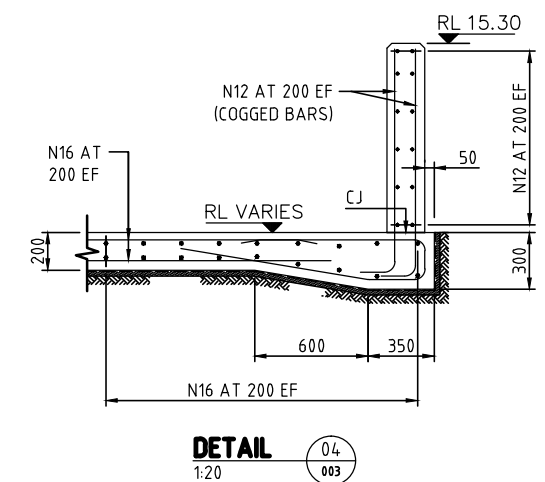
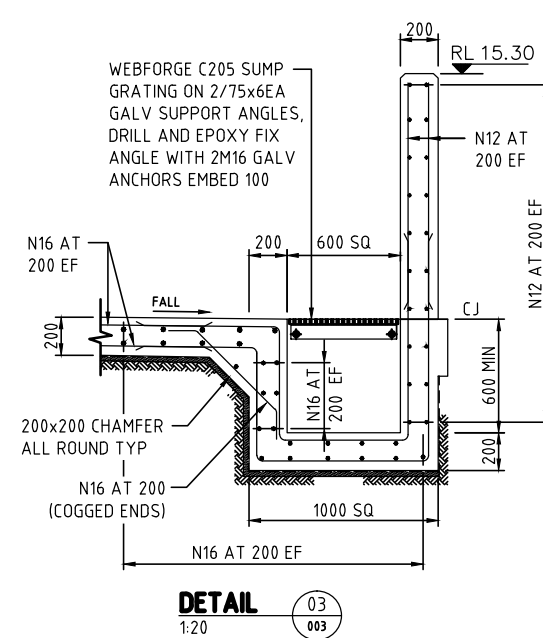
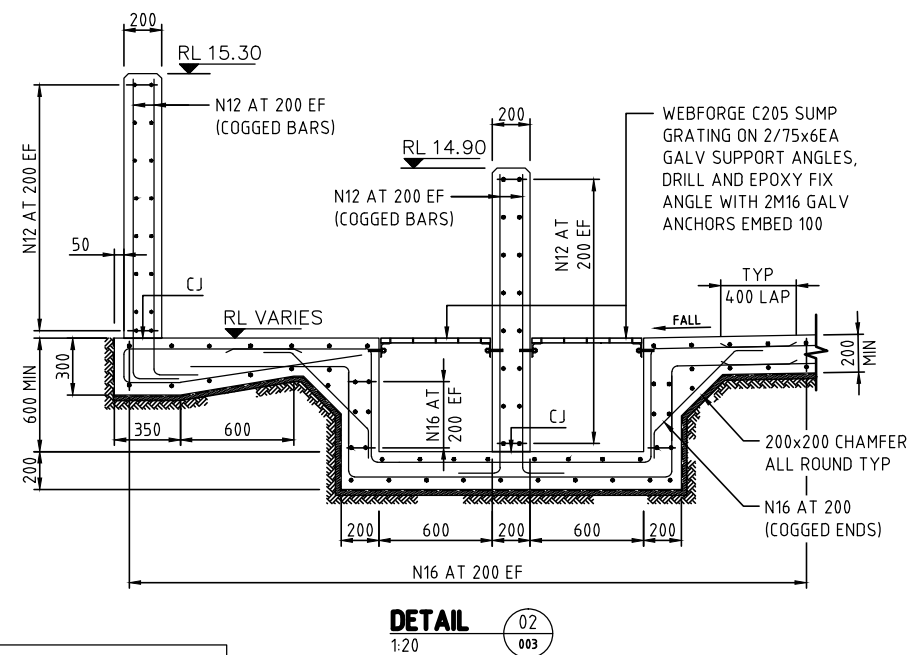
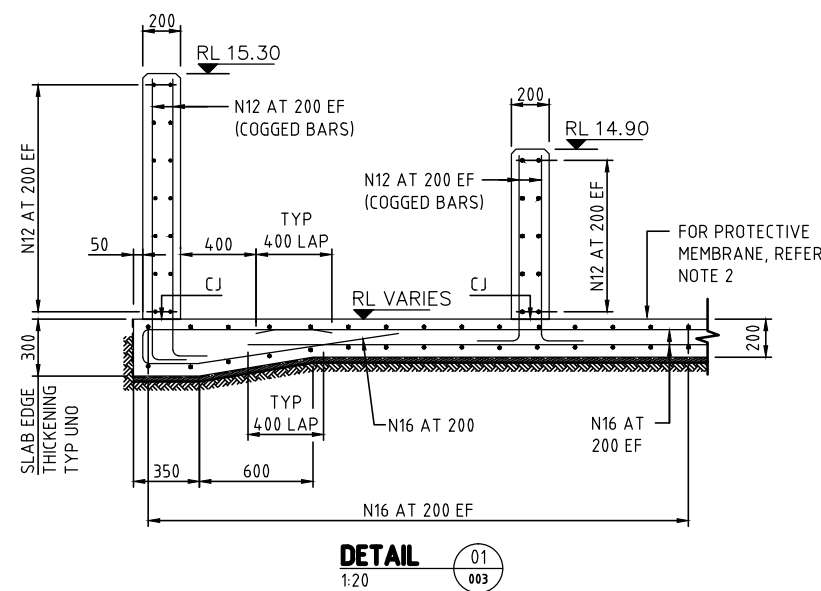
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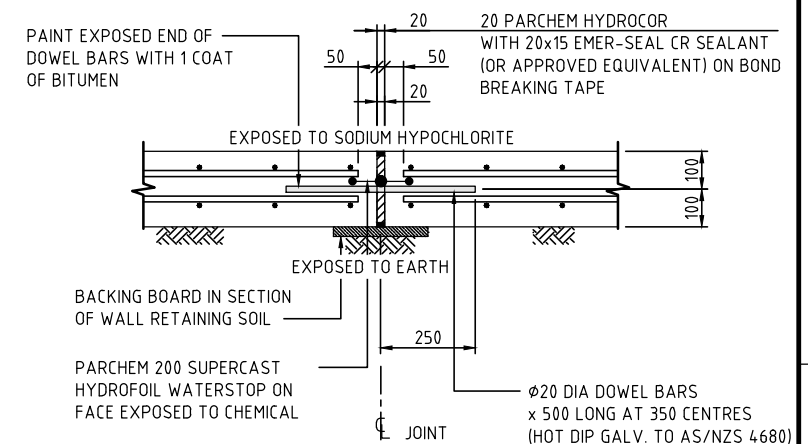
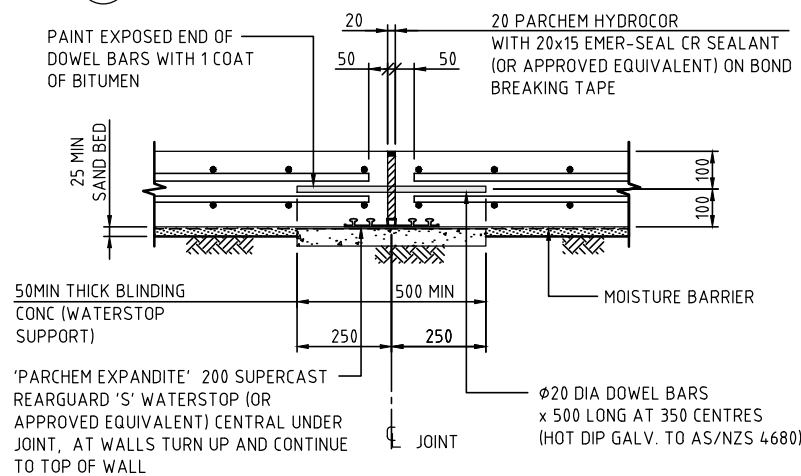
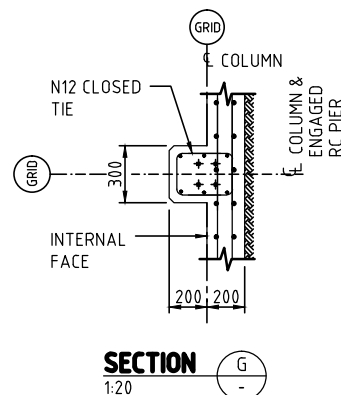
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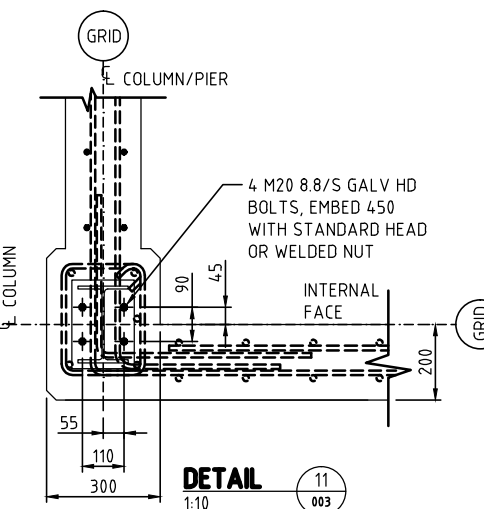
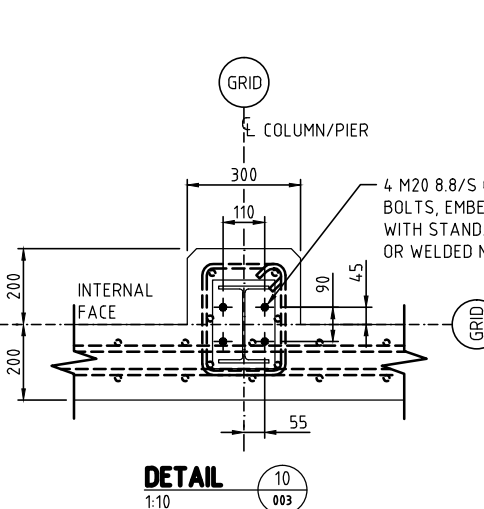
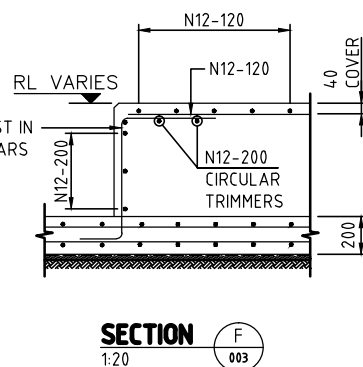
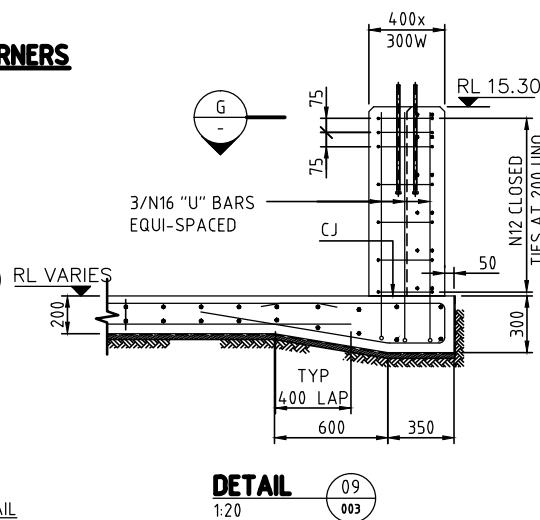
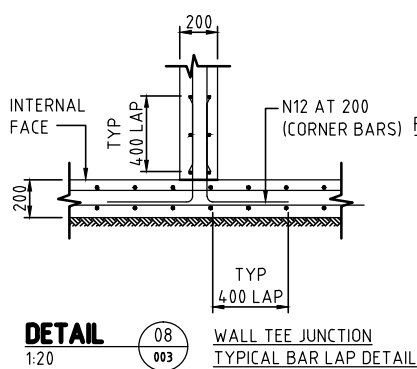


ALL INTERNAL CONCRETE SURFACES TO BE COVERED WITH 'SIKAGARD-62 MEMBRANE' TYPICAL. (MEMBRANE NOT SHOWN FOR CLARITY)



**DETAIL 06**  
1:10

**DETAIL 07**  
1:10



**NOTES:**  
1. FOR GENERAL NOTES REFER TO DWG. No. BEG709-S-DWG-001.

ORIGINAL KBR DESIGN DRAWING REFER DRG No. BEG709-S-DWG-004

**AS CONSTRUCTED DETAILS**  
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.  
SIGNED: \_\_\_\_\_ DATE: 01.11.13  
NAME OF SIGNATORY: A. THIRIS  
RPEQ No. or LICENCE: 3325  
COMPANY NAME: ALTRA9  
START DATE: 16.11.12 FINISH DATE: 01.11.13

**ALTRA9**

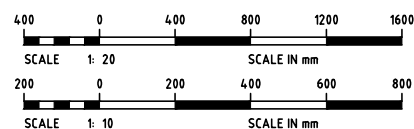
**Re-Pump**  
Australia Pty Ltd

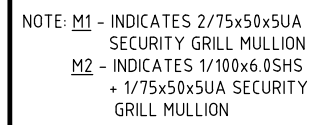
NAME SIGNATURE DATE  
QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

**QUEENSLAND UrbanUtilities**

SHEET No. OF  
QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.  
**486/5/5-0157-033 A**

**AS CONSTRUCTED**

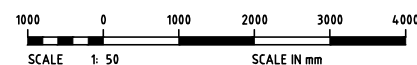




NOTE:  
1. FOR GENERAL NOTES REFER TO DWG. No. BEG-S-DWG-001.



**AS CONSTRUCTED**



					FUNDING		DRAFTED	D.CLIFFORD	R.SOLTER			
					DESIGN W.O. No.		DRAFTING CHECK	R.SOLTER	DESIGN	R.P.E.Q. No.	MANAGER ENGINEERING SERVICES	DATE
A	01.11.13	AS CONSTRUCTED		D.C	T.C	CONSTRUCTION W.O. No.		CAD FILE	50157034.DWG	T.CUSACK		
No.	DATE	AMENDMENT		DRAFT	APPR	FUNDED BY B.C.C. (✓)	EXTERNAL ( )	B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No.	DATE
											FIELD SERVICES DELEGATE	DATE

ASSET/PROJECT  
BUNDAMBA WWC  
CHEMICAL STORAGE  
FACILITY

DRAWING TITLE

ROOF FRAMING PLAN  
AND ELEVATIONS

AS CONSTRUCTED DETAILS	
<p>I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.</p>	
SIGNED: _____	DATE: 01.11.13
NAME OF SIGNATORY: A. THIRIS	
RPEQ No. or LICENCE: 3325	
COMPANY NAME: ALTRA9	
START DATE: 16.11.12	FINISH DATE: 01.11.13

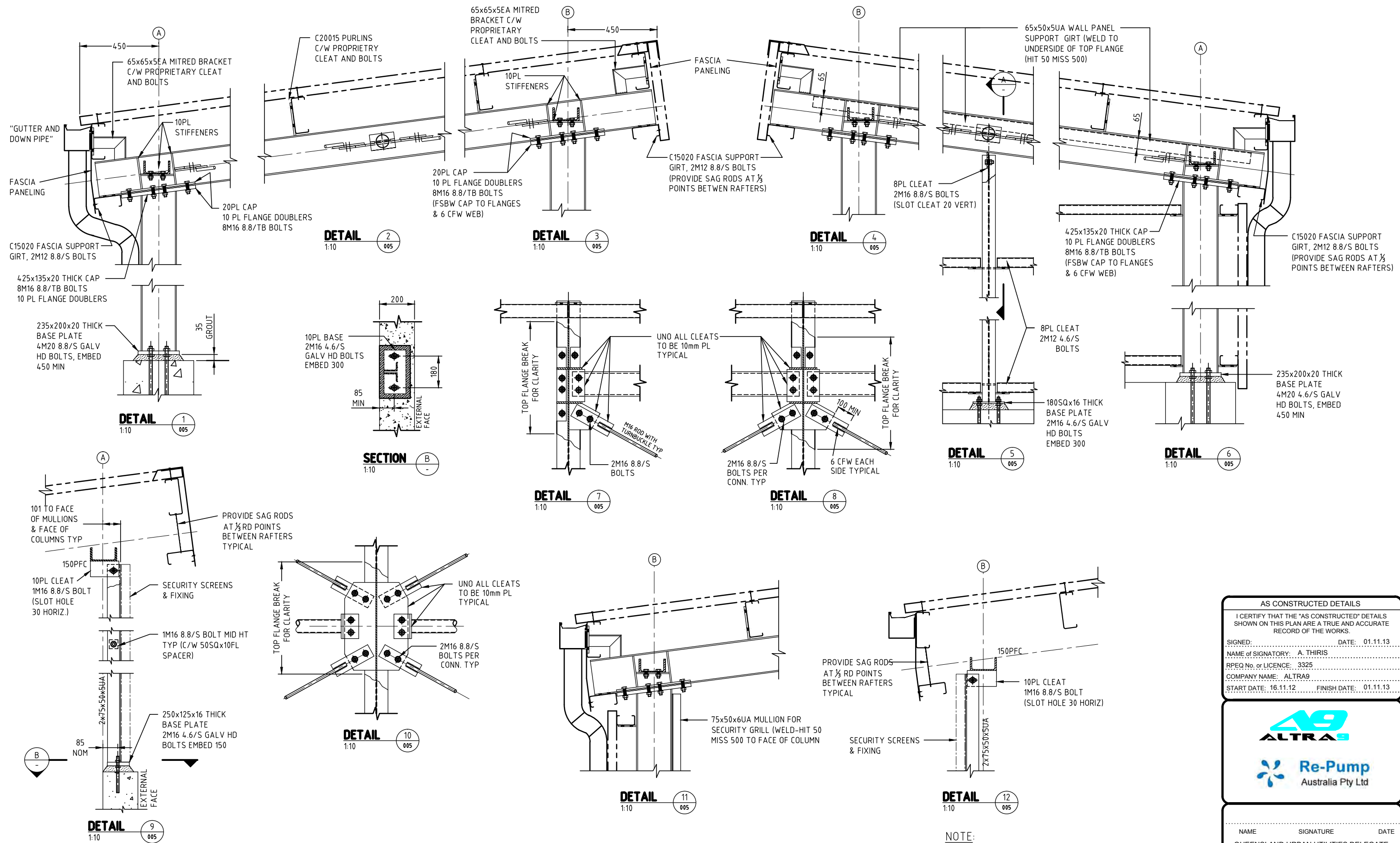


NAME SIGNATURE DATE

QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)



SHEET No.      OF	
QUEENSLAND URBAN UTILITIES DRAWING No.	AMEND.
486/5/5-0157-034	A

**AS CONSTRUCTED**

ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-S-DWG-006

**AS CONSTRUCTED DETAILS**

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

SIGNED: DATE: 01.11.13

NAME OF SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

START DATE: 16.11.12 FINISH DATE: 01.11.13

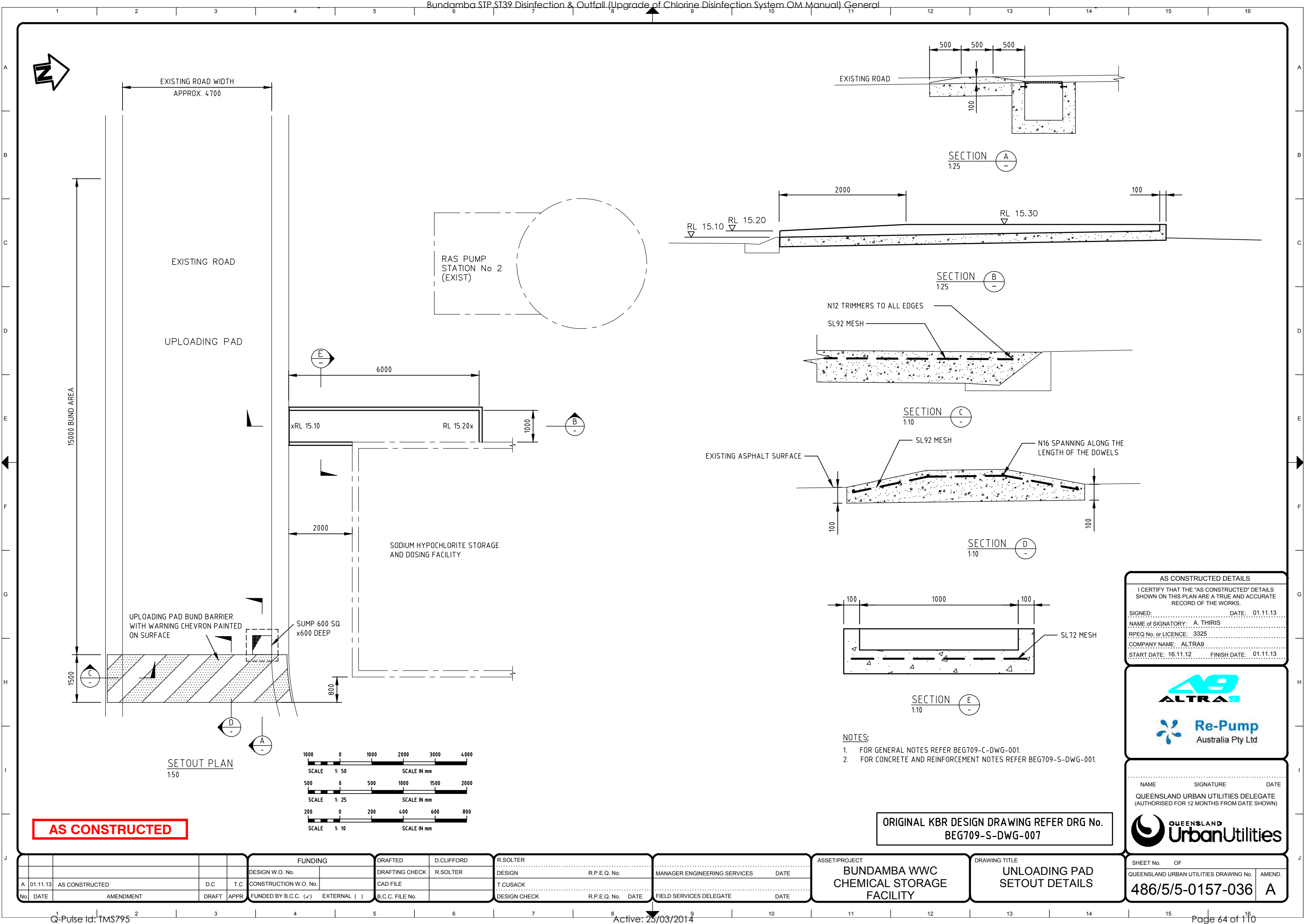


NAME SIGNATURE DATE  
QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)



SHEET No. OF  
QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.  
486/5/5-0157-035 A





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

SIGNED: \_\_\_\_\_ DATE: 01.11.13

NAME of SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

START DATE: 16.11.12 FINISH DATE: 01.11.13



NAME \_\_\_\_\_ SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

**QUEENSLAND UrbanUtilities**

SHEET No. OF

QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.

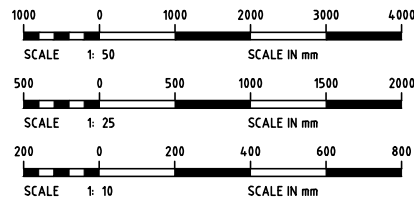
**486/5/5-0157-036 A**

**ORIGINAL KBR DESIGN DRAWING REFER DRG No. BEG709-S-DWG-007**

FUNDING				DRAFTED		D. CLIFFORD		R. SOLTER		ASSET/PROJECT		DRAWING TITLE	
DESIGN W.O. No.		DRAFTING CHECK	R. SOLTER	DESIGN	R.P.E.Q. No.	MANAGER ENGINEERING SERVICES	DATE	BUNDAMBA WWC CHEMICAL STORAGE FACILITY		UNLOADING PAD SETOUT DETAILS			
CONSTRUCTION W.O. No.		CAD FILE		DESIGN CHECK	R.P.E.Q. No.	FIELD SERVICES DELEGATE	DATE						
FUNDED BY B.C.C. (✓)	EXTERNAL ( )	B.C.C. FILE No.											

**AS CONSTRUCTED**

**SETOUT PLAN**  
1:50



STANDARD SIZE GALVANISED  
STEEL BAR GATE TO MATCH  
PANELS C/W FITTINGS AND  
LOCK AS REQUIRED.

APPROX SURFACE FINISH

GALVANISED STEEL BAR  
PANELS MAX WIDTH 2000.  
DETAILS TO BE ADVISED BY  
IPSWICH WATER.

NORTHERN ELEVATION  
1:50

METAL SHEETING COLOURBOND.  
COLOUR TO BE ADVISED BY  
IPSWICH WATER.

APPROX SURFACE FINISH

STANDARD METAL WEATHERPROOF  
EXTERNAL DOOR IN METAL FRAME  
COLOURBOND C/W FITTINGS AND  
LOCK AS REQUIRED. COLOUR TO BE  
ADVISED BY IPSWICH WATER.

SOUTHERN ELEVATION  
1:50

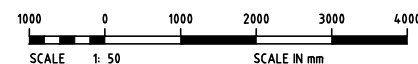
METAL SHEETING COLOURBOND.  
COLOUR TO BE ADVISED BY  
IPSWICH WATER.

300 SQ OPENING IN GALVANISED  
STEEL BAR PANEL FOR FILL PIPE  
ACCESS

WESTERN ELEVATION  
1:50

EASTERN ELEVATION  
1:50

AS CONSTRUCTED



ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-S-DWG-008

AS CONSTRUCTED DETAILS

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

SIGNED: DATE: 01.11.13

NAME of SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

START DATE: 16.11.12 FINISH DATE: 01.11.13

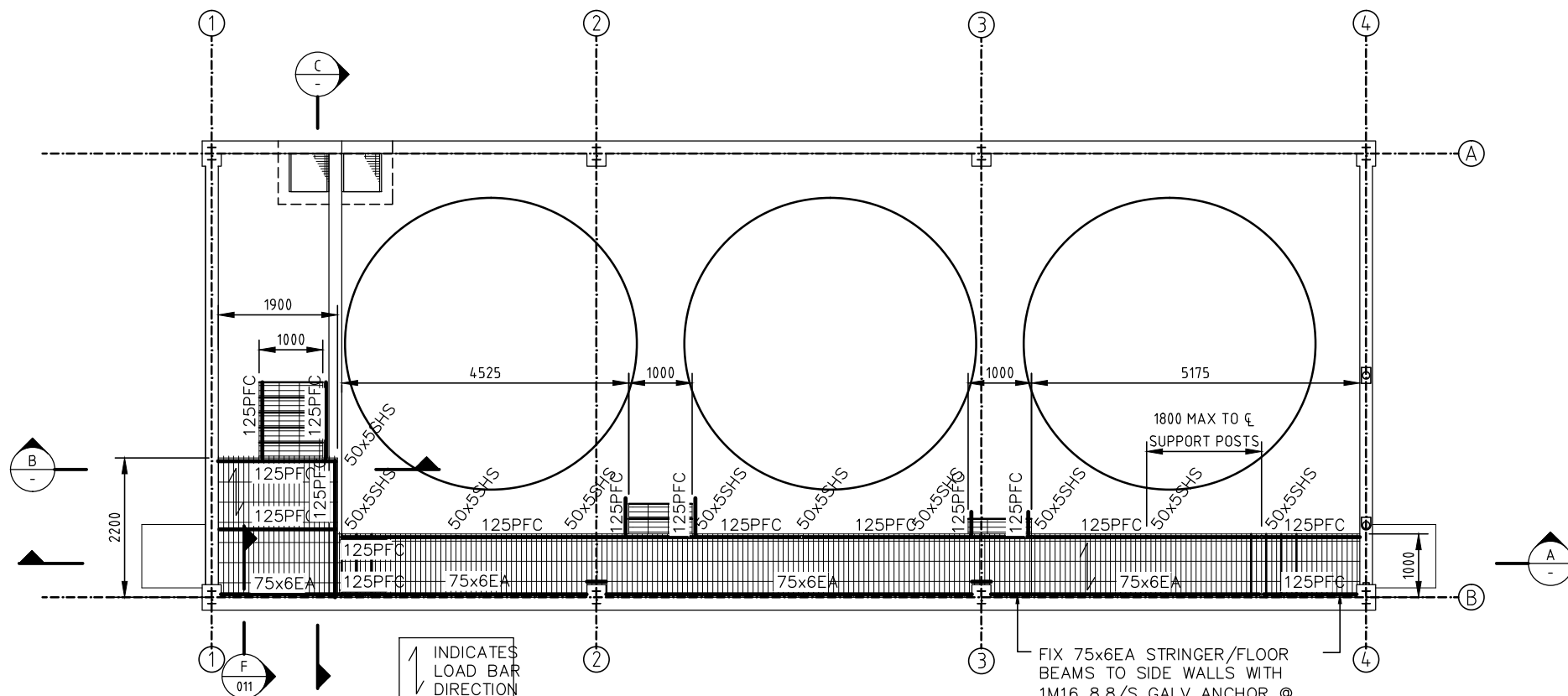


NAME SIGNATURE DATE  
QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)



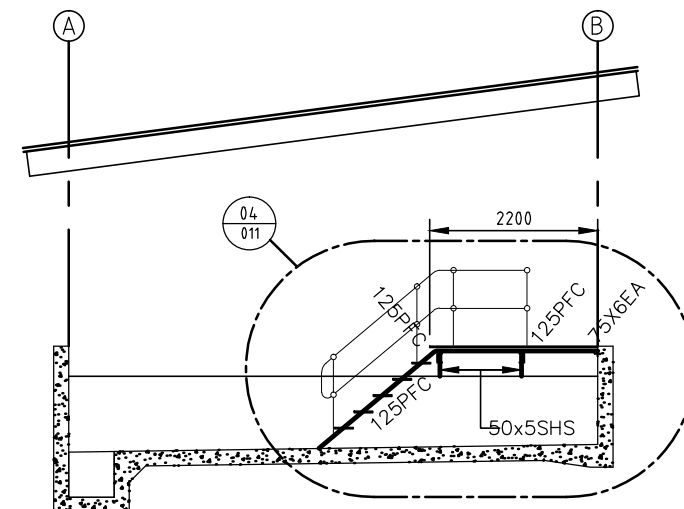
SHEET No. OF  
QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.  
486/5/5-0157-037 A

FUNDING				DRAFTED		D.CLIFFORD		R.SOLTER		ASSET/PROJECT		DRAWING TITLE	
DESIGN W.O. No.		DRAFT	T.C	DRAFTING CHECK	R.SOLTER	DESIGN	R.P.E.Q. No.	MANAGER ENGINEERING SERVICES	DATE	BUNDAMBA WWC CHEMICAL STORAGE FACILITY		CHEMICAL STORAGE ELEVATIONS	
CONSTRUCTION W.O. No.		AMENDMENT	APPR	CAD FILE	50157037.DWG	T.CUSACK	R.P.E.Q. No.	FIELD SERVICES DELEGATE	DATE				
FUNDED BY B.C.C. (✓)	EXTERNAL ( )			B.C.C. FILE No.		DESIGN CHECK	DATE						

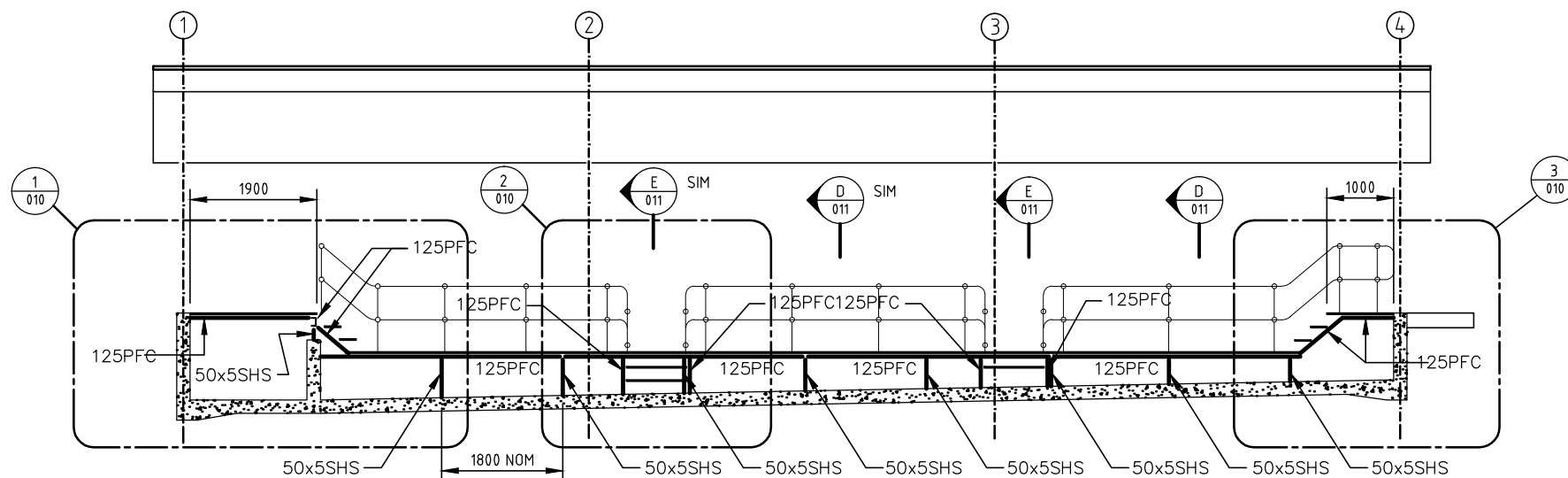


**WALKWAY LAYOUT PLAN**  
SCALE 1:50

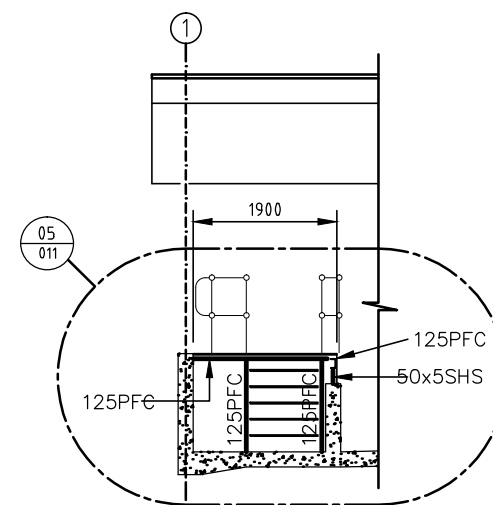
FIX 75x6EA STRINGER/FLOOR BEAMS TO SIDE WALLS WITH 1M16 8.8/S GALV ANCHOR @ 900 CRS MAX (CENTRAL TO WEB), DRILL AND EPOXY GROUT 100.



**SECTION C**  
SCALE 1:50



**SECTION A**  
SCALE 1:50

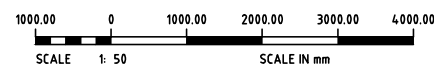


**SECTION B**  
SCALE 1:50

- NOTE:**
- FOR GENERAL NOTES REFER TO DWG. No. BEG709-S-DWG-001.
  - WEBFORGE TO DESIGN GRATING TO SUIT CUT OUT SIZE.

ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-S-DWG-009

**AS CONSTRUCTED**



**AS CONSTRUCTED DETAILS**

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

SIGNED: \_\_\_\_\_ DATE: 01.11.13

NAME of SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

START DATE: 16.11.12 FINISH DATE: 01.11.13

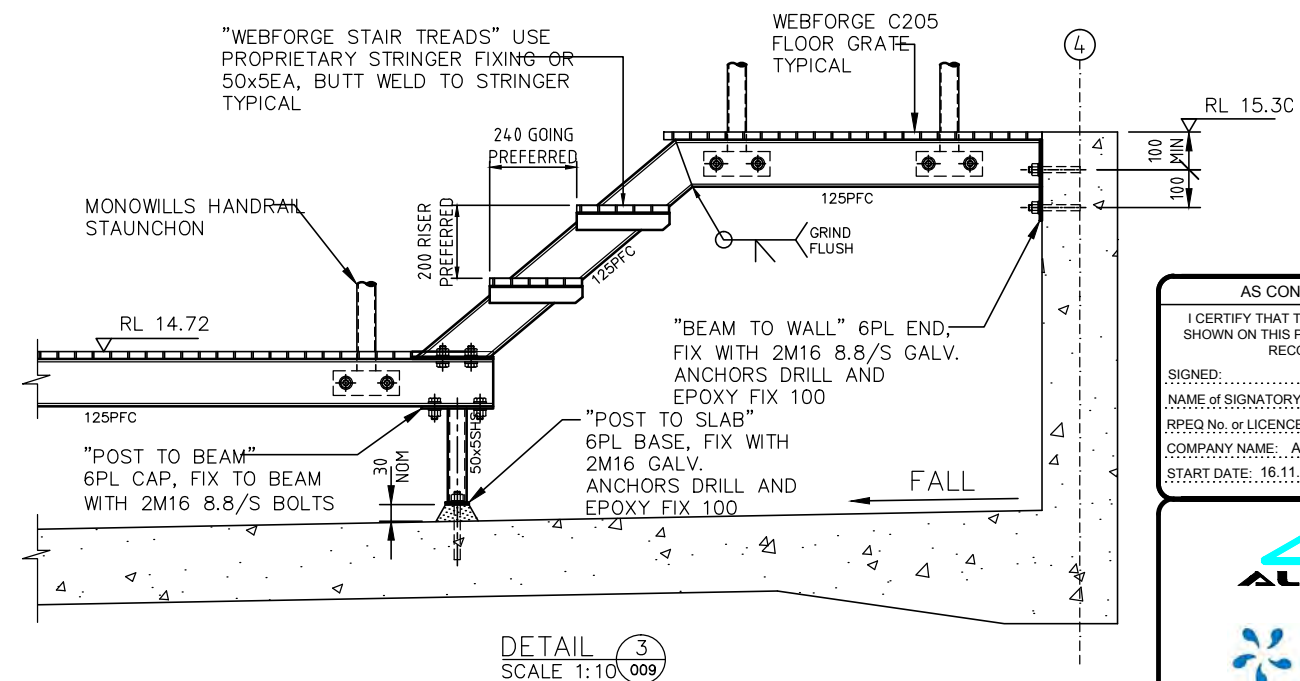
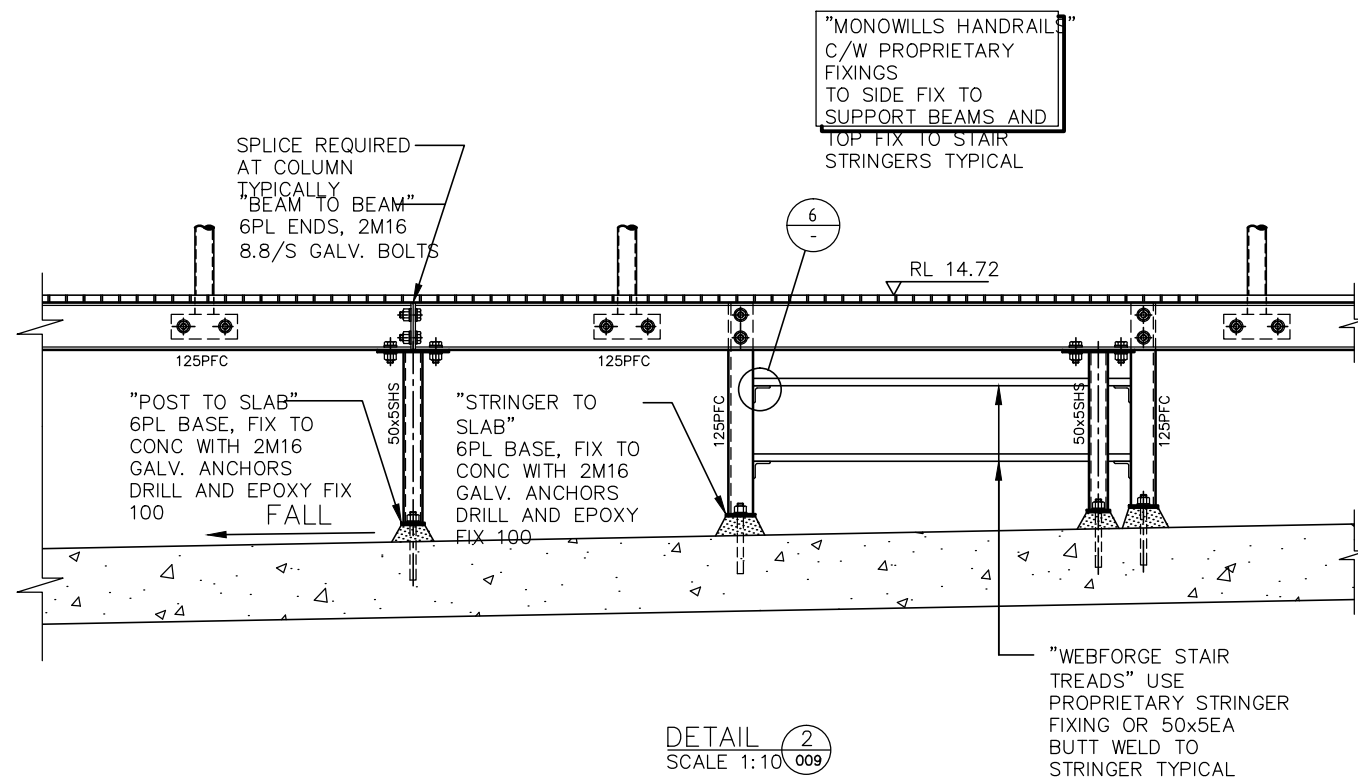
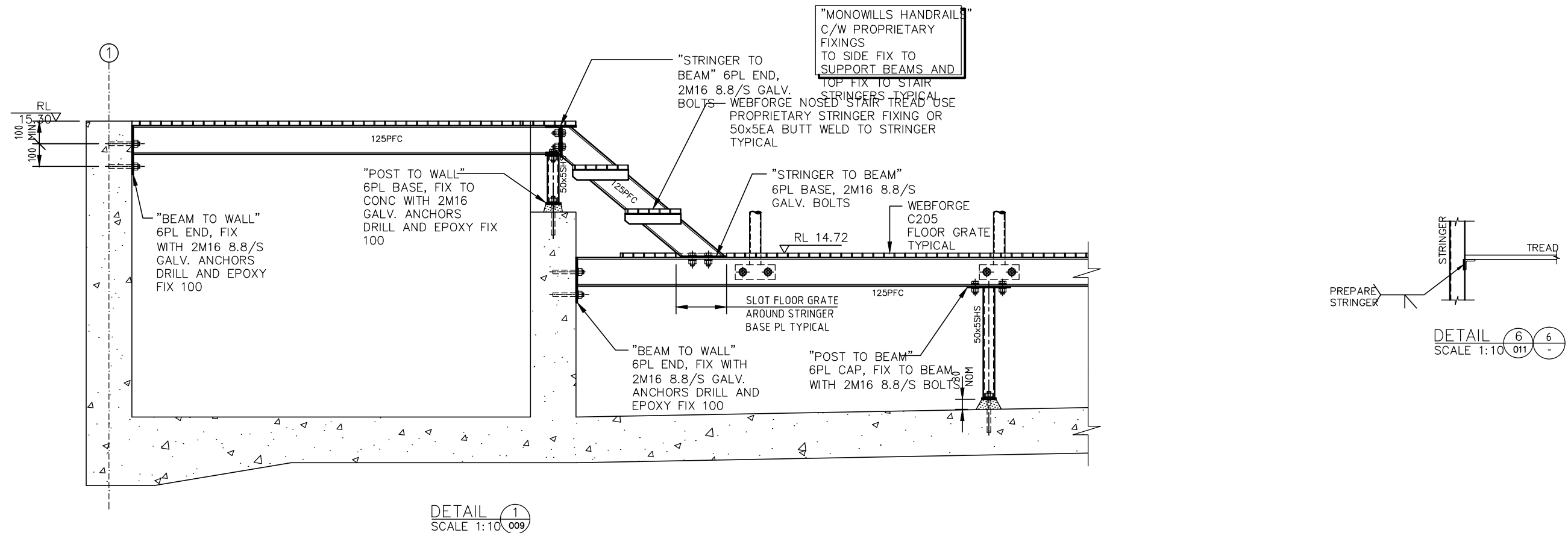


NAME \_\_\_\_\_ SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)



FUNDING				DRAFTED		D.CLIFFORD		R.SOLTER		ASSET/PROJECT		DRAWING TITLE		SHEET No. OF	
DESIGN W.O. No.		DRAFT	T.C	DRAFTING CHECK	R.SOLTER	DESIGN	R.P.E.Q. No.	MANAGER ENGINEERING SERVICES	DATE	BUNDAMBA WWC CHEMICAL STORAGE FACILITY		GRATED WALKWAY STEEL DETAILS SHEET 1		846/5/5-0157-038	
CONSTRUCTION W.O. No.		AMENDMENT	APPR	CAD FILE	50157038.DWG	T.CUSACK	R.P.E.Q. No.	FIELD SERVICES DELEGATE	DATE						
FUNDED BY B.C.C. (✓)	EXTERNAL ( )			B.C.C. FILE No.		DESIGN CHECK	DATE								



AS CONSTRUCTED

200.00 0 200.00 400.00 600.00 800.00  
SCALE 1: 10 SCALE IN mm

NOTE:  
1. FOR GENERAL NOTES REFER TO DWG. No. BEG709-S-DWG-001.

ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-S-DWG-010

AS CONSTRUCTED DETAILS  
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.  
SIGNED: DATE: 01.11.13  
NAME of SIGNATORY: A. THIRIS  
RPEQ No. or LICENCE: 3325  
COMPANY NAME: ALTRA9  
START DATE: 16.11.12 FINISH DATE: 01.11.13

ALTRA9

Re-Pump  
Australia Pty Ltd

NAME SIGNATURE DATE  
QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

QUEENSLAND  
UrbanUtilities

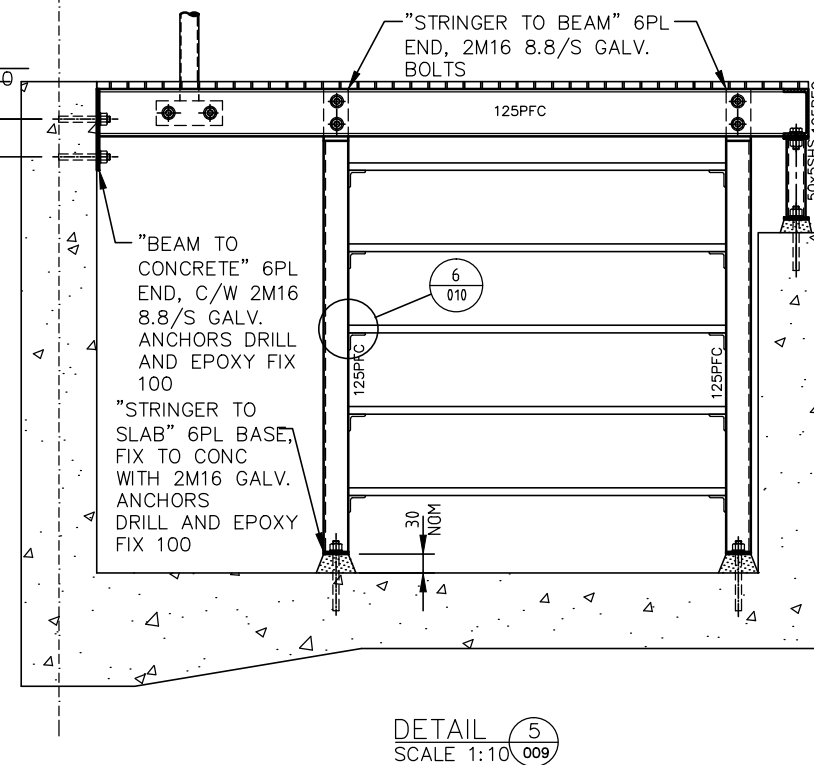
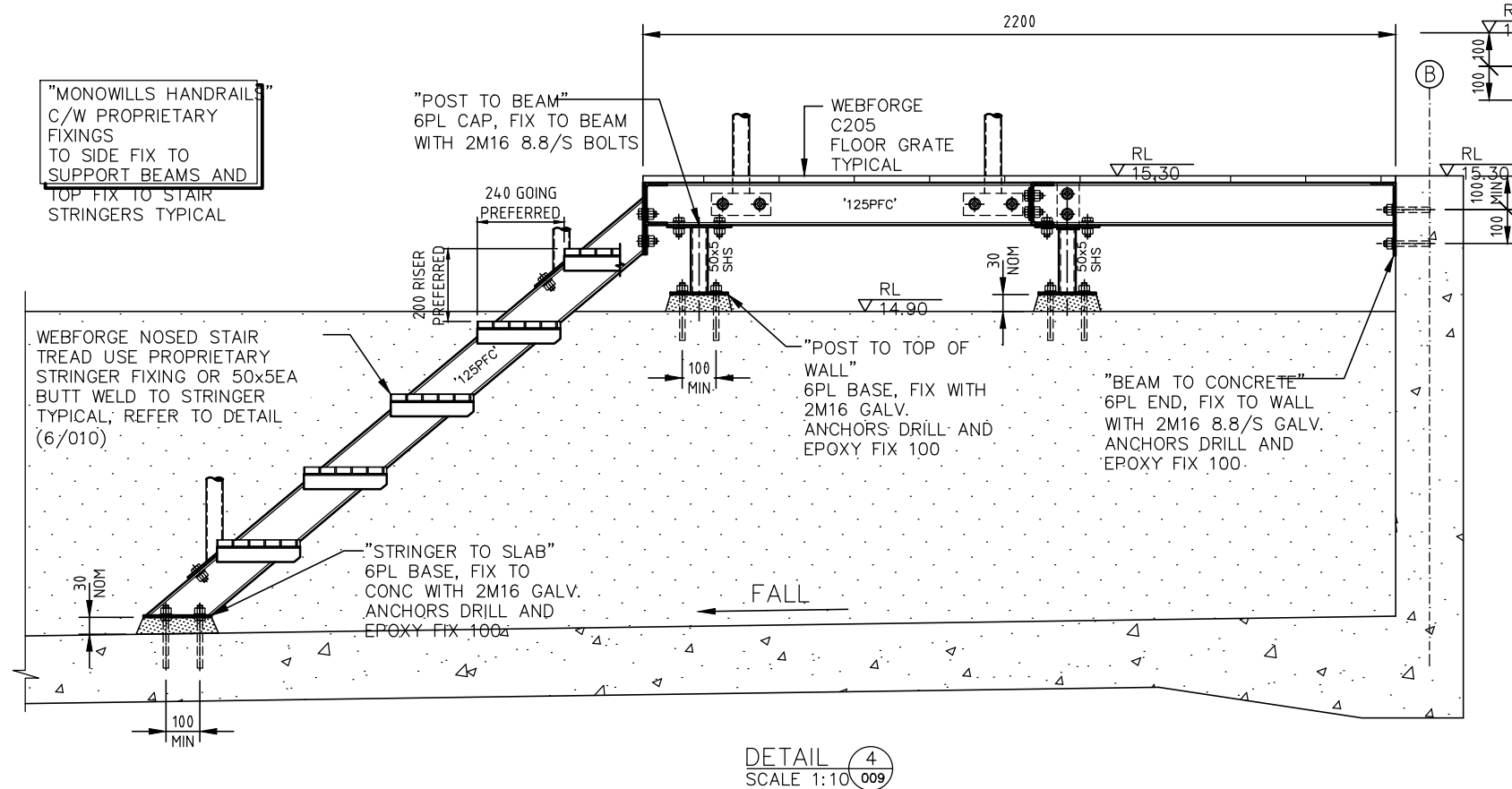
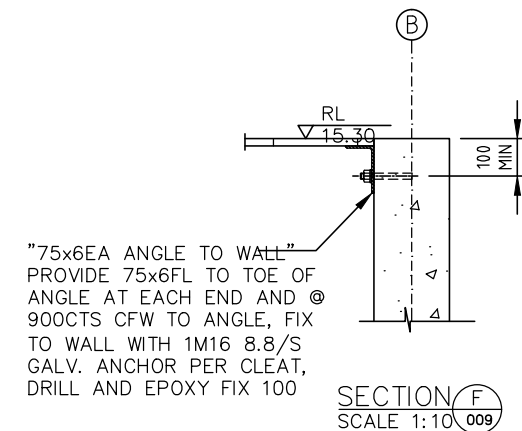
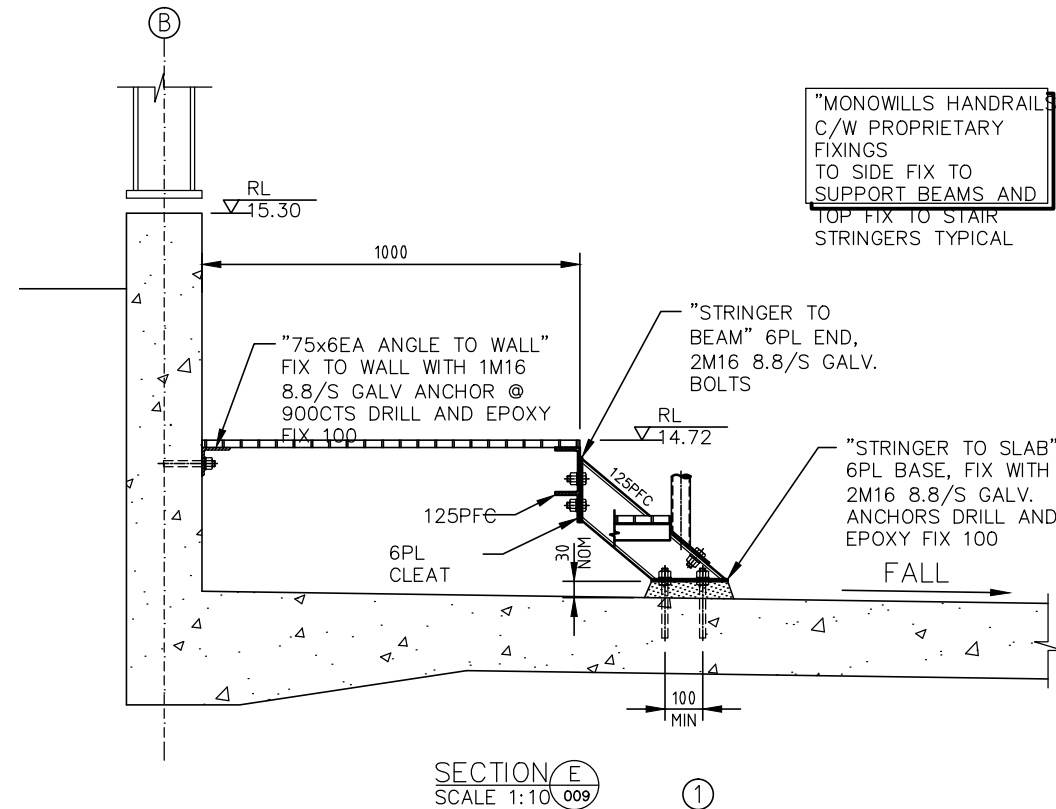
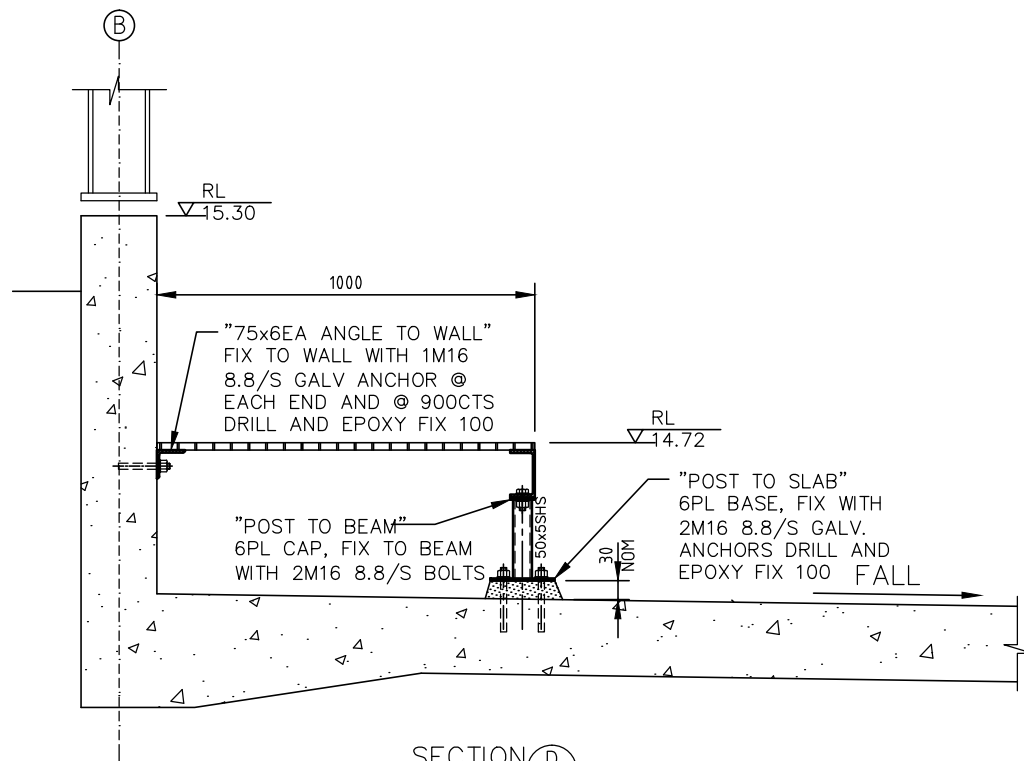
SHEET No. OF  
QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.  
486/5/5-0157-039 A

FUNDING				DRAFTED		D.CLIFFORD		R.SOLTER	
DESIGN W.O. No.				DRAFTING CHECK		R.SOLTER		DESIGN	
CONSTRUCTION W.O. No.				CAD FILE		50157039.DWG		T.CUSACK	
FUNDED BY B.C.C. (✓) EXTERNAL ( )				B.C.C. FILE No.				R.P.E.Q. No. DATE	
								MANAGER ENGINEERING SERVICES DATE	
								FIELD SERVICES DELEGATE DATE	

ASSET/PROJECT  
BUNDAMBA WWC  
CHEMICAL STORAGE  
FACILITY

DRAWING TITLE  
GRATED WALKWAY  
STEEL DETAILS  
SHEET 2





NOTE:  
1. FOR GENERAL NOTES REFER TO DWG. No. BEG709-S-DWG-001.

**AS CONSTRUCTED**

SCALE 1:10  
SCALE IN mm

ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-S-DWG-011

AS CONSTRUCTED DETAILS  
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.  
SIGNED: DATE: 01.11.13  
NAME of SIGNATORY: A. THIRIS  
RPEQ No. or LICENCE: 3325  
COMPANY NAME: ALTRA9  
START DATE: 16.11.12 FINISH DATE: 01.11.13

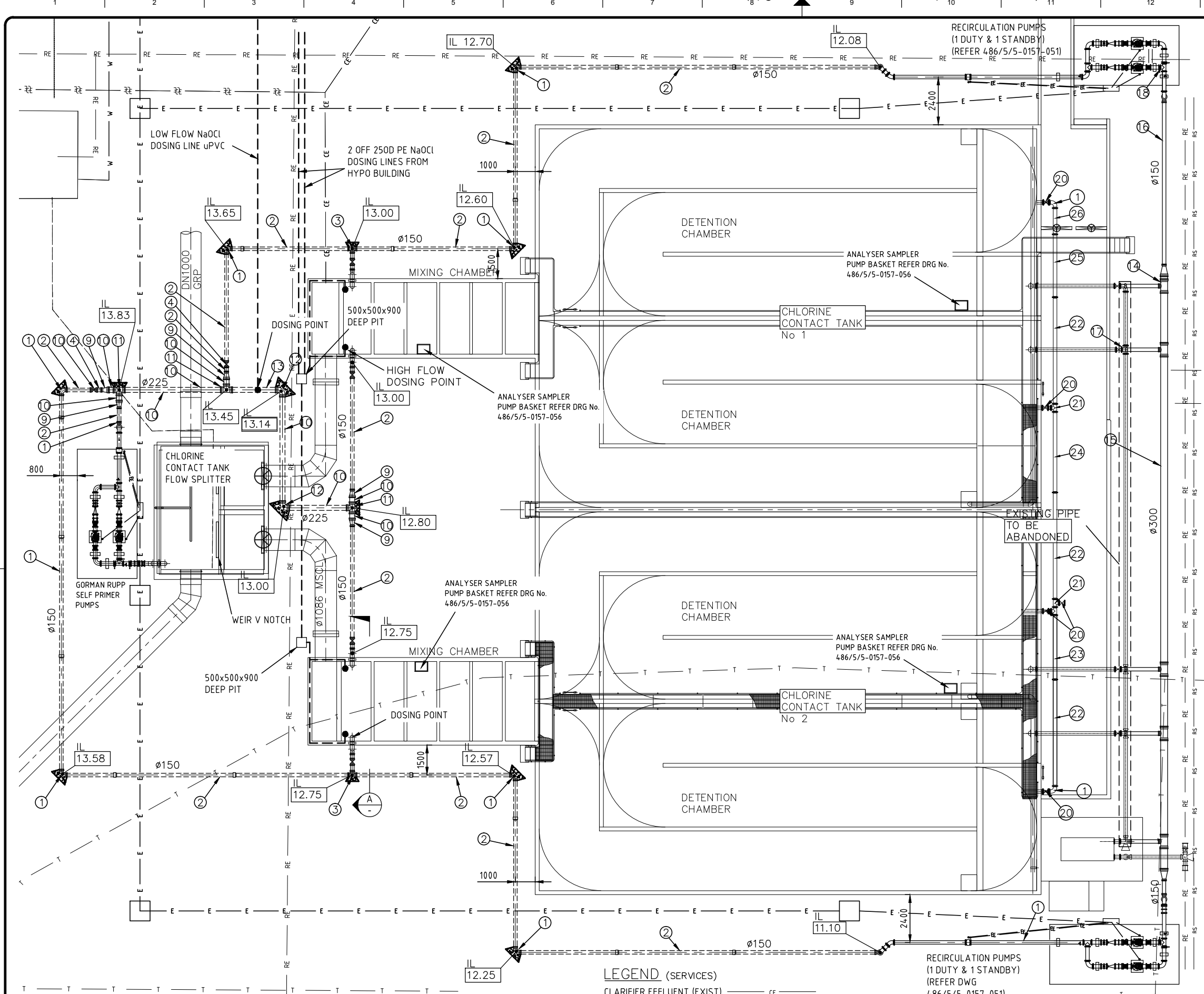
**ALTRA9**

**Re-Pump**  
Australia Pty Ltd

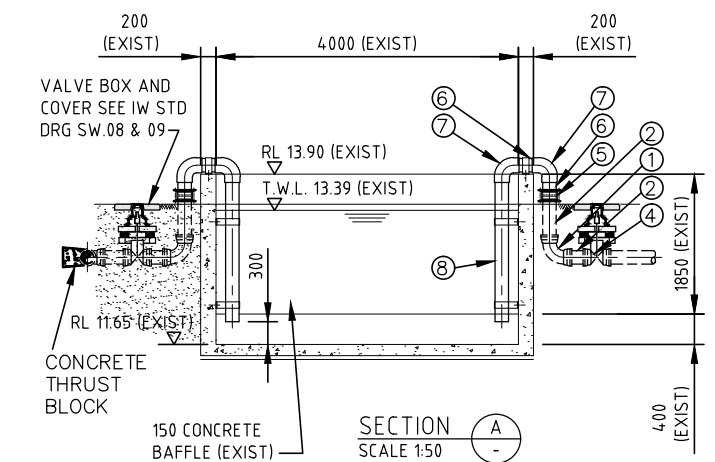
NAME SIGNATURE DATE  
QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

**QUEENSLAND UrbanUtilities**

SHEET No. OF  
QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.  
486/5/5-0157-040 A



MARK	DESCRIPTION	QTY
1	DN150 x 90° FL-FL DCL BEND	15
2	Ø150 SP-Soc & SP-SP uPVC SERIES 2 PIPE	154m
3	DN150 x 150 Soc-Soc-Soc DCL TEE	2
4	DN150 Soc-Soc METAL WEDGE SLUICE VALVE	6
5	Ø150 VARI-GIB COUPLING (OR EQUIVALENT)	4
6	Ø150 SP-SP ABS PIPE (400 LONG CUT TO SUIT)	8
7	Ø150 x 90° Soc-Soc ABS BEND	10
8	Ø150 SP-SP ABS PIPE (1920 LONG)	4
9	DN225 x 150 Soc-Soc DCL CONCENTRIC REDUCER	5
10	Ø225 SP-Soc & SP-SP uPVC SERIES 2 PIPE	18m
11	DN225 x 225 Soc-Soc-Soc DCL TEE	3
12	DN225 x 90° FL-FL DCL BEND	2
13	Ø225 SP-SP uPVC SERIES 2 PIPE WITH SOCKET TO	1
14	DN300 x 150 Soc-Soc DCL TEE	5
15	Ø300 SP-Soc & SP-SP uPVC SERIES 2 PIPE	26m
16	Ø150 SP-Soc & SP-SP uPVC SERIES 2 PIPE	20m
17	Ø150 FL-SP DCL CONNECTOR	4
18	DN150 x 150 Soc-Soc DCL TEE	1
19	ACCOMMODATE DOSING LINE (3100 LONG)	1
20	DN150 FL/FL SLUICE VALVE	5
21	DN150 FL/FL/FL DCL EQUAL TEE	3
22	DN150 FL/FL DCL PIPE x 5350 LONG	3
23	DN150 FL/FL DCL PIPE x 3750 LONG	1
24	DN150 FL/FL DCL PIPE x 4480 LONG	1
25	DN150 FL/FL DCL PIPE x 3160 LONG	1
26	DN150 FL/FL DCL PIPE x 1320 LONG	1



LEGEND (SERVICES)	
CLARIFIER EFFLUENT (EXIST)	CE
TELSTRA (EXIST)	T
POTABLE WATER (EXIST)	W
RETURN EFFLUENT (EXIST)	RE
ELECTRICAL (NEW)	E

ORIGINAL KBR DESIGN DRAWING REFER DRG No. BEG709-C-DWG-010

**AS CONSTRUCTED DETAILS**

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

SIGNED: \_\_\_\_\_ DATE: 01.11.13

NAME OF SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

START DATE: 16.11.12 FINISH DATE: 01.11.13



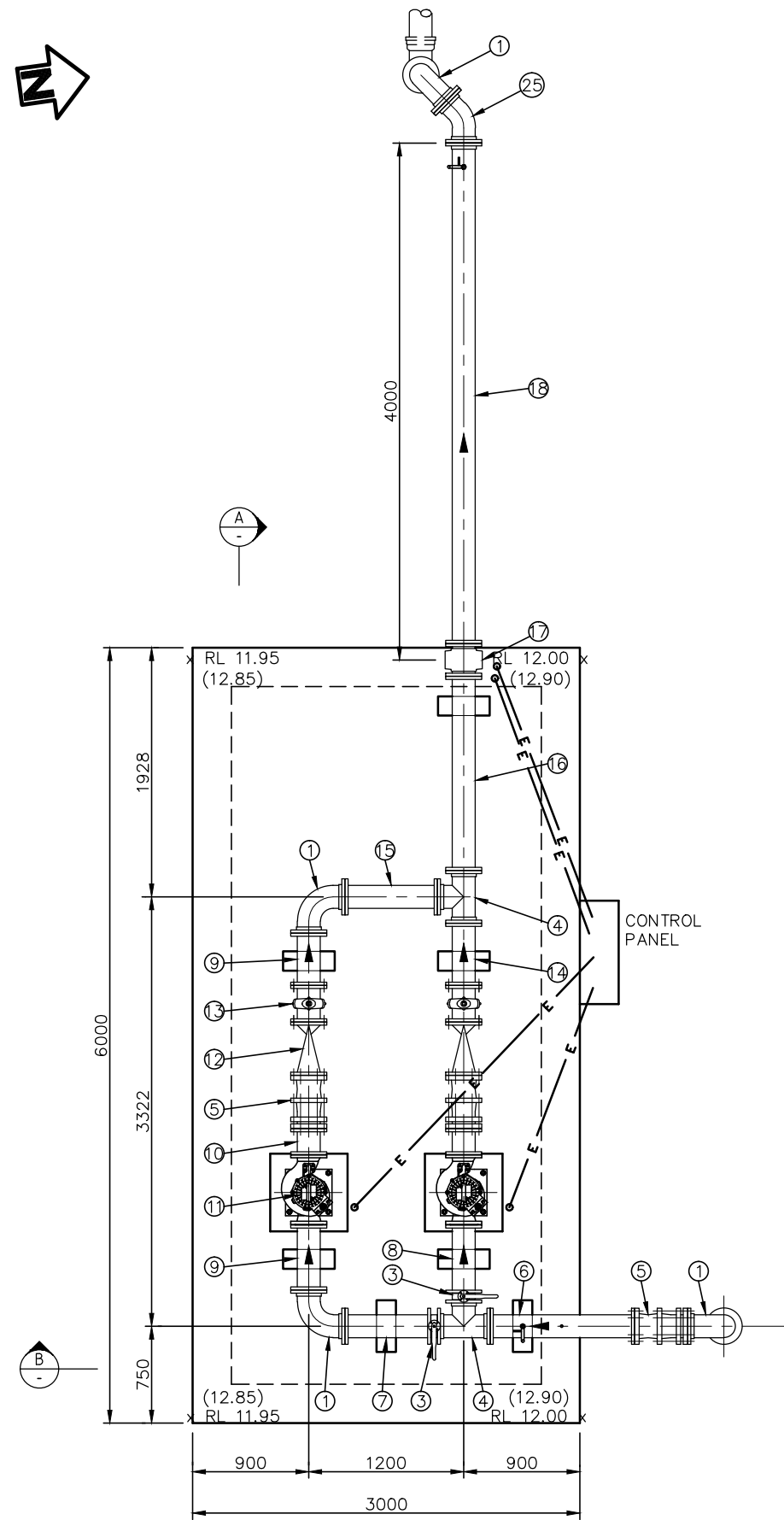
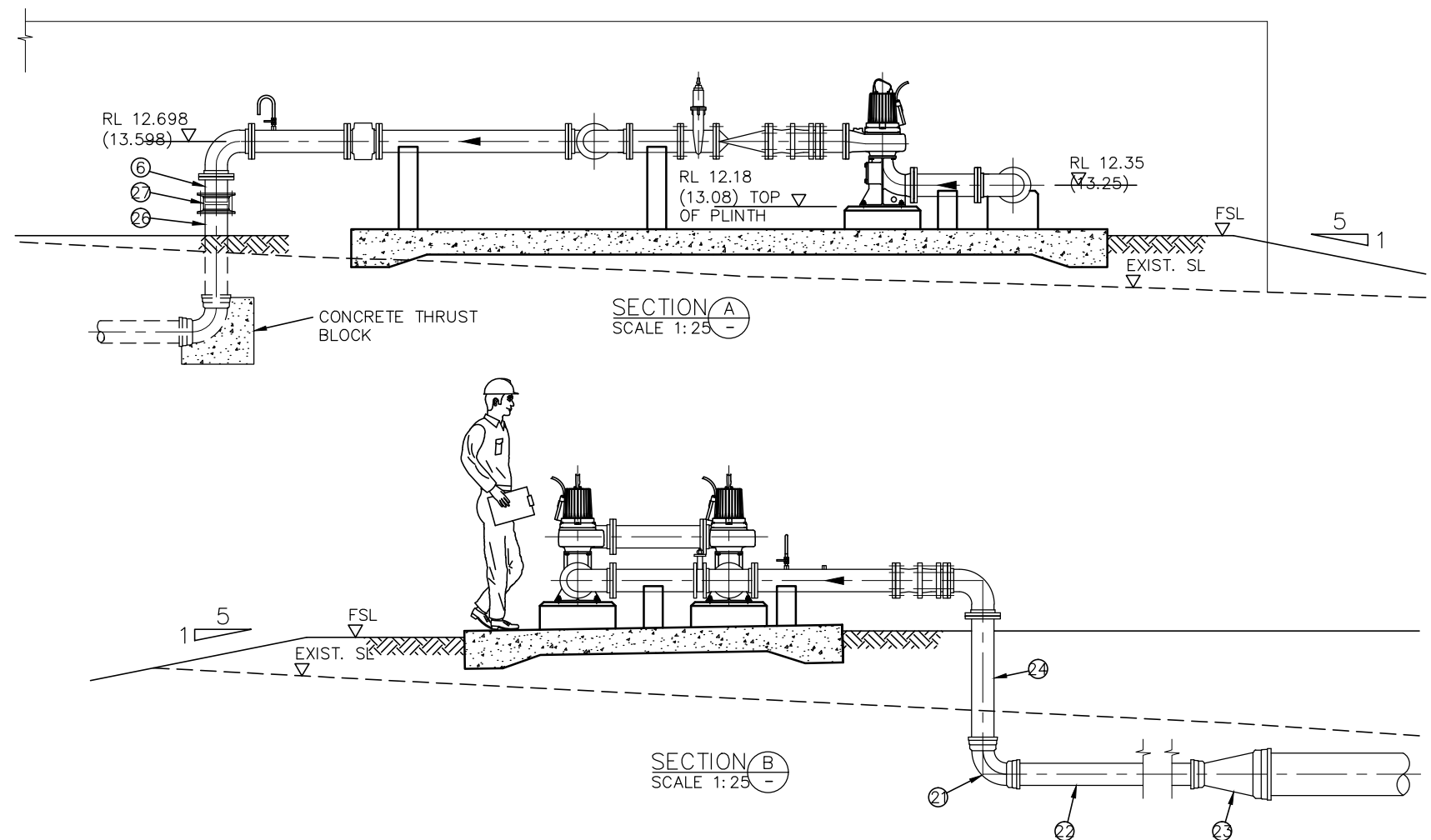
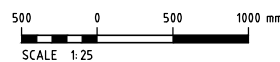
NAME \_\_\_\_\_ SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)



FUNDING		DRAFTED		D. CLIFFORD		R. SOLTER		ASSET/PROJECT		DRAWING TITLE		SHEET No. OF	
DESIGN W.O. No.		DRAFTING CHECK	R. SOLTER	DESIGN	R.P.E.Q. No.	MANAGER ENGINEERING SERVICES	DATE	BUNDAMBA WWC	RECIRCULATION	QUEENSLAND URBAN UTILITIES DRAWING No.	AMEND.		
CONSTRUCTION W.O. No.		CAD FILE	50157050.DWG	T. CUSACK	R.P.E.Q. No.	FIELD SERVICES DELEGATE	DATE	EFFLUENT RECIRCULATION	GENERAL ARRANGEMENT	486/5/5-0157-050	A		
FUNDED BY B.C.C. (✓)	EXTERNAL ( )	B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No.			SYSTEM					

**AS CONSTRUCTED**

PLAN  
SCALE 1:25**AS CONSTRUCTED**SECTION (A)  
SCALE 1:25SECTION (B)  
SCALE 1:25

PIPEWORK SCHEDULE

MARK	DESCRIPTION	QTY
1	DN150 x 90° FL-FL DICL BEND	4
2	DN150 FL-SP DICL PIPE (200 LONG)	1
3	DN150 DICL BUTTERFLY VALVE (WAFFER TYPE)	2
4	DN150 x 150 FL-FL DICL TEE	2
5	DN150 DISMANTLING JOINT THRUST TYPE	3
6	DN150 FL-FL DICL PIPE WITH DN15 BALL VALVE (1115 LONG) & 3/4 INCH SOCKET FOR FEMALE GARDEN HOSE FITTING	1
7	DN150 FL-FL DICL PIPE (660 LONG)	1
8	DN150 FL-FL DICL PIPE (525 LONG)	1
9	DN150 FL-FL DICL PIPE (500 LONG)	2
10	DN150 FL-FL DICL PIPE (200 LONG)	2
11	RECIRCULATION PUMPS, REFER SPEC. (1 DUTY/1 STANDBY)	2
12	DN150 FL-FL CHECK VALVE	2
13	DN150 FL-FL METAL WEDGE SLUICE VALVE	2
14	DN150 FL-FL DICL PIPE (480 LONG)	1
15	DN150 FL-FL DICL PIPE (710 LONG)	1
16	DN150 FL-FL DICL PIPE (1500 LONG)	1
17	DN150 FL-FL FLOWMETER	1
18	DN150 FL-FL DICL PIPE WITH DN15 BALL VALVE (3872 LONG)	1
19	DN150 SP-SP uPVC SERIES 2 PIPE (800 LONG)	1
20	DN150 VARI-GIB COUPLING (OR EQUIVALENT)	1
21	DN150 x 90° Soc-Soc DICL BEND	1
22	DN150 SP-SP uPVC SERIES 2 PIPE (650)	1
23	DN300 x 150 Soc-Soc DICL CONCENTRIC REDUCER	1
24	DN150 SP-FL uPVC SERIES 2 PIPE (950)	1
25	DN150 x 45° FL-FL DICL BEND	1

## NOTE:

- FOR LOCATION OF RECIRCULATION PUMPS REFER TO DRAWING BEG709-C-DWG-010.
- MIRROR IMAGE OF ARRANGEMENT SHOWN ON THIS DRAWING TO BE INSTALLED ON NORTH SIDE OF EXISTING CHLORINE CONTACT TANKS. RL's FOR NORTH SIDE ARRANGEMENT SHOWN IN BRACKETS. SUCTION PIPING TO BE ALTERED TO SUIT RL's.
- FOR RECIRCULATION PUMPS PLINTH CONCRETE DETAIL REFER TO DRAWING BEG709-S-DWG-010.
- FOR PIPE SUPPORT BRACKET DETAILS REFER TO DRAWING BEG709-C-DWG-013.

ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-C-DWG-011

## AS CONSTRUCTED DETAILS

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

SIGNED: DATE: 01.11.13

NAME OF SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

START DATE: 16.11.12 FINISH DATE: 01.11.13

NAME SIGNATURE DATE  
QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)

SHEET No. OF

QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.

486/5/5-0157-051 A

ASSET/PROJECT  
BUNDAMBA WWC  
EFFLUENT RECIRCULATION  
SYSTEMDRAWING TITLE  
PUMP ARRANGEMENT  
PLAN AND SECTIONS

No.	DATE	AMENDMENT	DRAFT	APPR
A	01.11.13	AS CONSTRUCTED	D.C.	T.C.

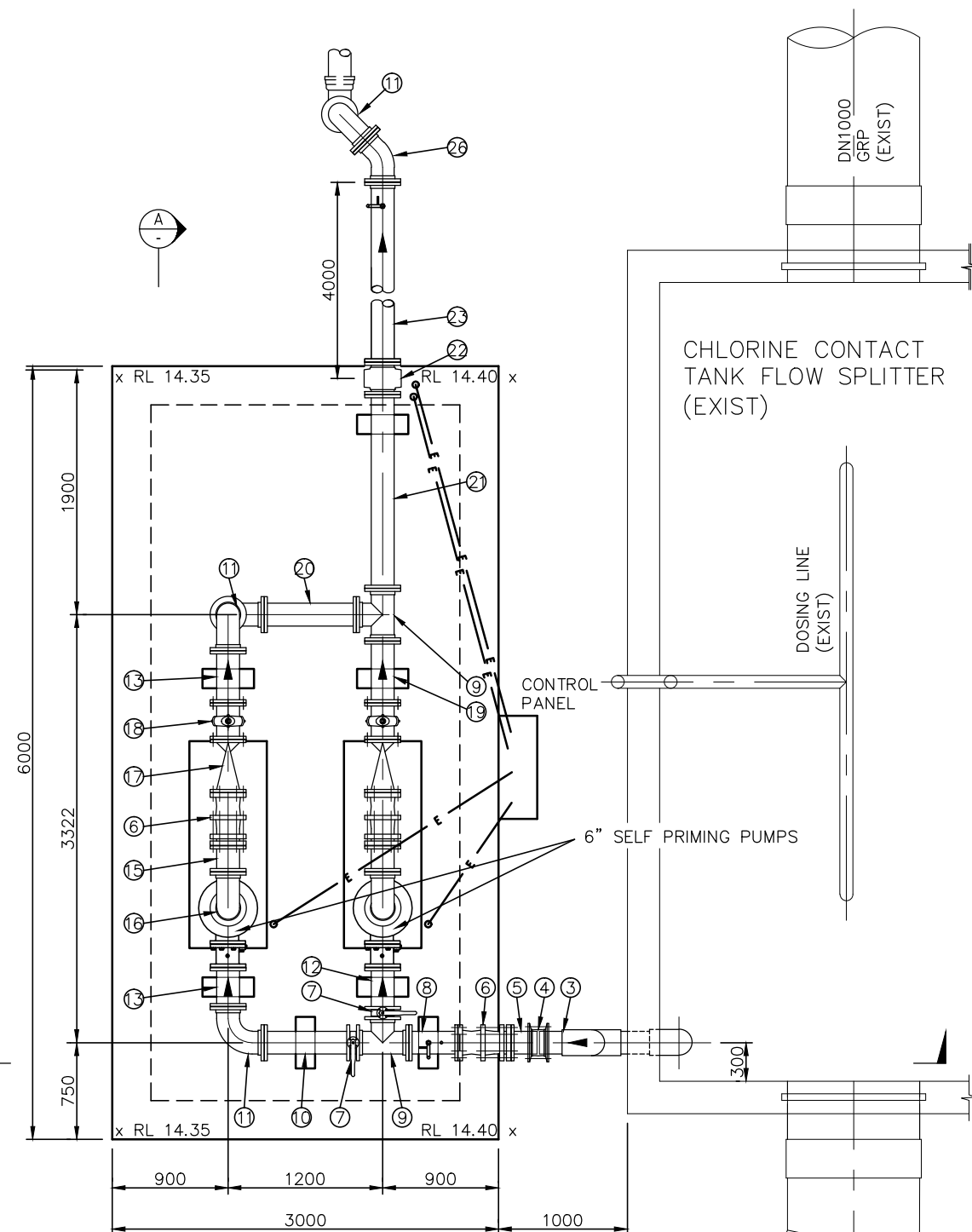
FUNDING
DESIGN W.O. No.
CONSTRUCTION W.O. No.
FUNDED BY B.C.C. (✓) EXTERNAL ( )

DRAFTED	D.CLIFFORD
DRAFTING CHECK	R.SOLTER
CAD FILE	50157051.DWG
B.C.C. FILE No.	

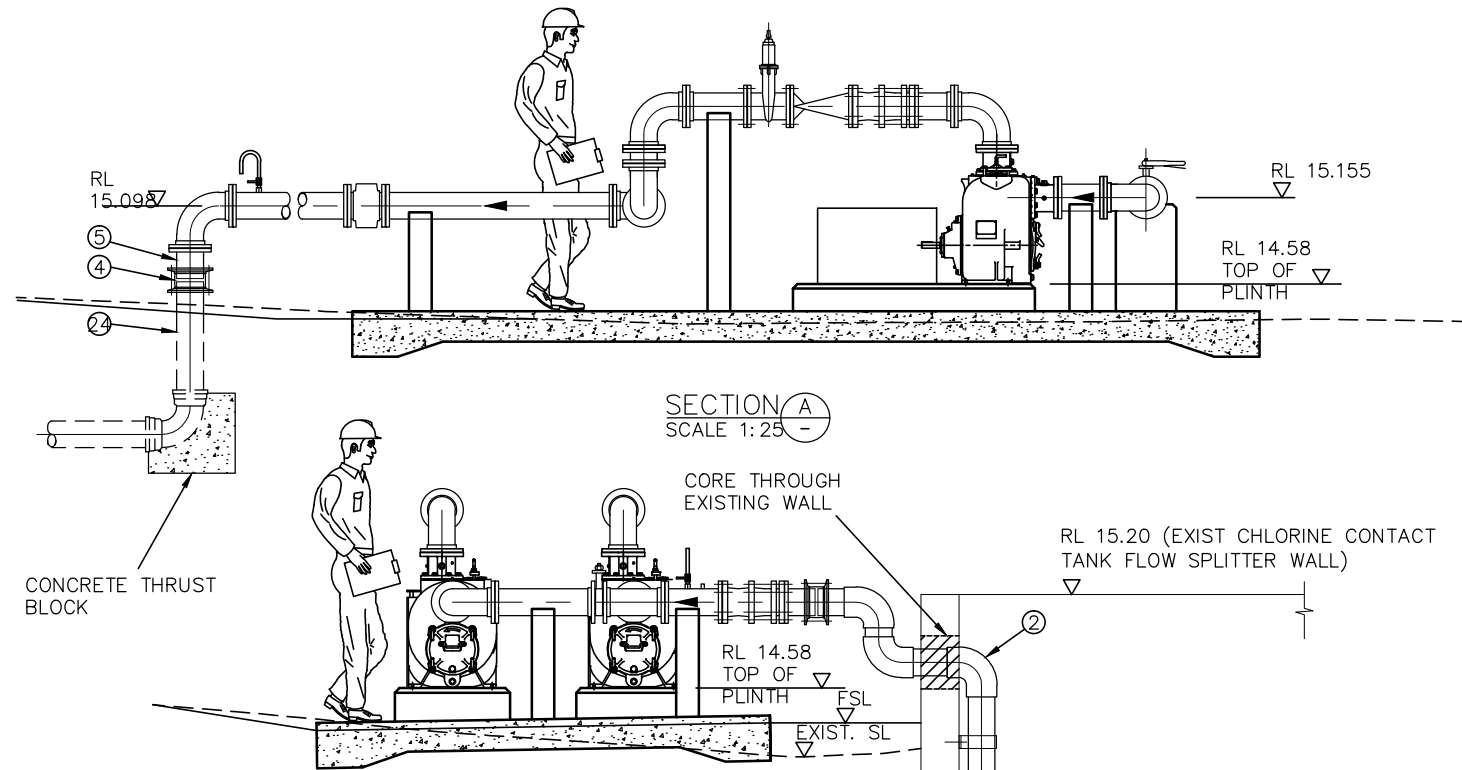
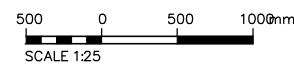
R.SOLTER	R.P.E.Q. No.
DESIGN	
DESIGN CHECK	
R.P.E.Q. No.	
DATE	

MANAGER ENGINEERING SERVICES	DATE
FIELD SERVICES DELEGATE	DATE





PLAN  
SCALE 1:25



SECTION A  
SCALE 1:25

SECTION B  
SCALE 1:25

PIPEWORK SCHEDULE

MARK	DESCRIPTION	QTY
1	Ø150 SP-SP ABS PIPE (3500 LONG)	1
2	Ø150 x 90° Soc-Soc ABS BEND	1
3	Ø150 SP-SP ABS PIPE (400 LONG CUT TO SUIT)	1
4	Ø150 VARI-GIB COUPLING (OR EQUIVALENT)	2
5	DN150 FL-SP DICL PIPE (200 LONG)	2
6	DN150 DISMANTLING JOINT THRUST TYPE	3
7	DN150 BUTTERFLY VALVE (WAFFER TYPE)	2
8	DN150 FL-FL DICL PIPE WITH DN15 BALL VALVE (300 LONG) & 3/4 INCH SOCKET FOR FEMALE GARDEN HOSE FITTING	1
9	DN150 x 150 FL-FL-FL DICL TEE	2
10	DN150 FL-FL DICL PIPE (660 LONG)	1
11	DN150 x 45° FL-FL DICL BEND	3
12	DN150 FL-FL DICL PIPE (425 LONG)	1
13	DN150 FL-FL DICL PIPE (400 LONG)	2
14	-REMOVED-	
15	DN150 FL-FL DICL PIPE (200 LONG)	2
16	RECIRCULATION PUMPS. REFER SPEC. (1 DUTY/1 STANDBY)	2
17	DN150 FL-FL CHECK VALVE	2
18	DN150 FL-FL METAL WEDGE SLUICE VALVE	2
19	DN150 FL-FL DICL PIPE (480 LONG)	1
20	DN150 FL-FL DICL PIPE (710 LONG)	1
21	DN150 FL-FL DICL PIPE (1500 LONG)	1
22	DN150 FL-FL FLOWMETER	1
23	DN150 FL-FL DICL PIPE WITH DN15 BALL VALVE (3872 LONG)	1
24	Ø150 SP-SP uPVC SERIES 2 PIPE (800 LONG)	1
25	Ø150 Soc-Soc NON-RETURN VALVE	1
26	DN150 x 45° FL-FL DICL BEND	1

NOTE:

1. FOR LOCATION OF FEED PUMPS REFER TO DRAWING BEG709-C-DWG-010.
2. FOR FEED PUMPS PLINTH CONCRETE DETAIL REFER TO DRAWING BEG709-S-DWG-010.
3. FOR PIPE SUPPORT BRACKET DETAILS REFER TO DRAWING BEG709-C-DWG-013.

AS CONSTRUCTED

ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-C-DWG-012

AS CONSTRUCTED DETAILS

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SIGNED: DATE: 01.11.13

NAME OF SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

START DATE: 16.11.12 FINISH DATE: 01.11.13



NAME SIGNATURE DATE  
QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)



SHEET No. OF  
QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.  
486/5/5-0157-052 A

No.	DATE	AMENDMENT	DRAFT	APPR
A	01.11.13	AS CONSTRUCTED	D.C.	T.C.

FUNDING	
DESIGN W.O. No.	
CONSTRUCTION W.O. No.	
FUNDED BY B.C.C. (✓)	EXTERNAL ( )

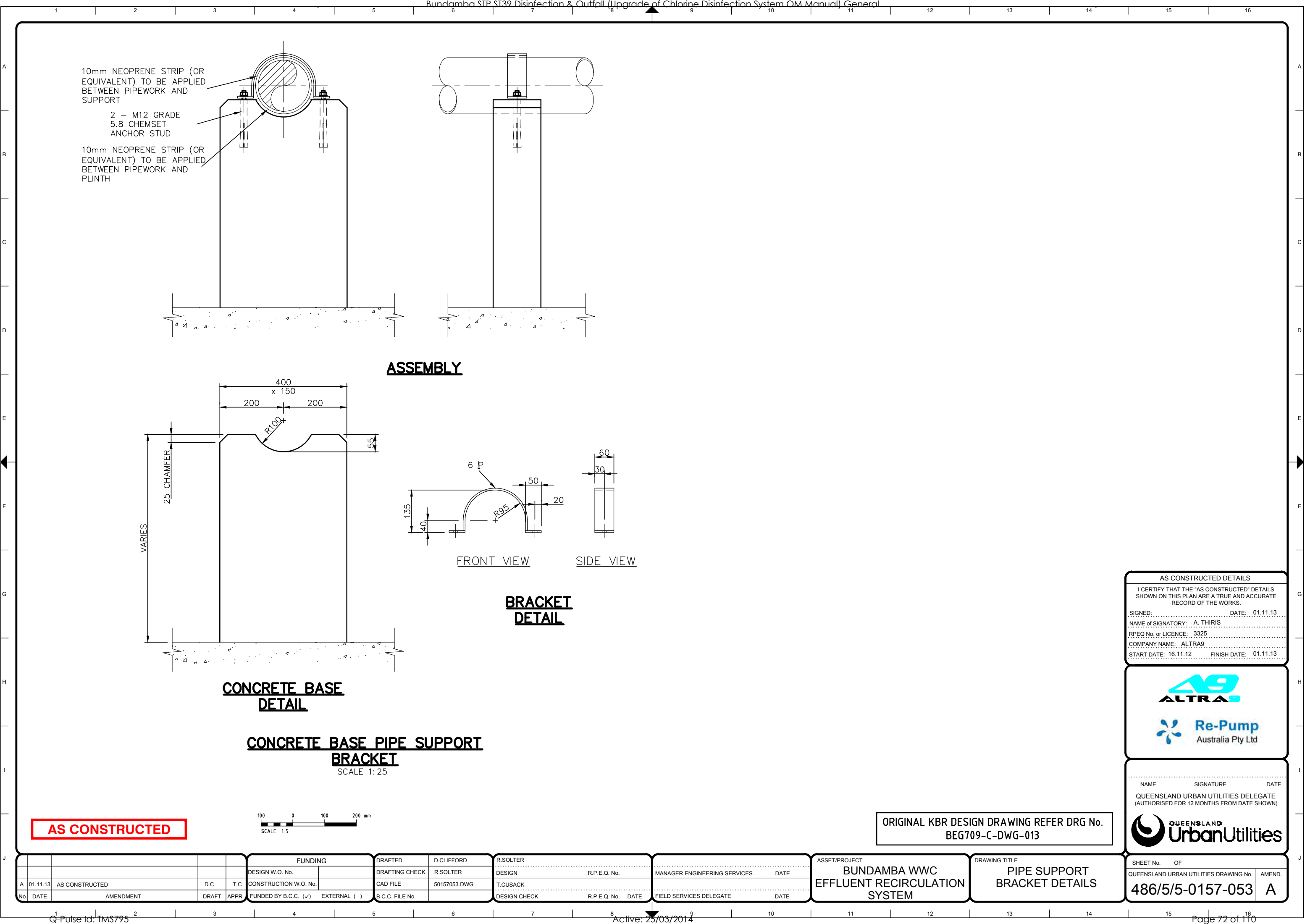
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DRAFTING CHECK	R. SOLTER	DESIGN
CAD FILE	50157052.DWG	T. CUSACK
B.C.C. FILE No.		DESIGN CHECK

ASSET/PROJECT	BUNDAMBA WWC EFFLUENT RECIRCULATION SYSTEM
DRAWING TITLE	FEED PUMP ARRANGEMENT PLAN AND SECTIONS

MANAGER ENGINEERING SERVICES	DATE
FIELD SERVICES DELEGATE	DATE

DATE	DATE
------	------

DATE	DATE
------	------



AS CONSTRUCTED DETAILS

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SIGNED: \_\_\_\_\_ DATE: 01.11.13

NAME of SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

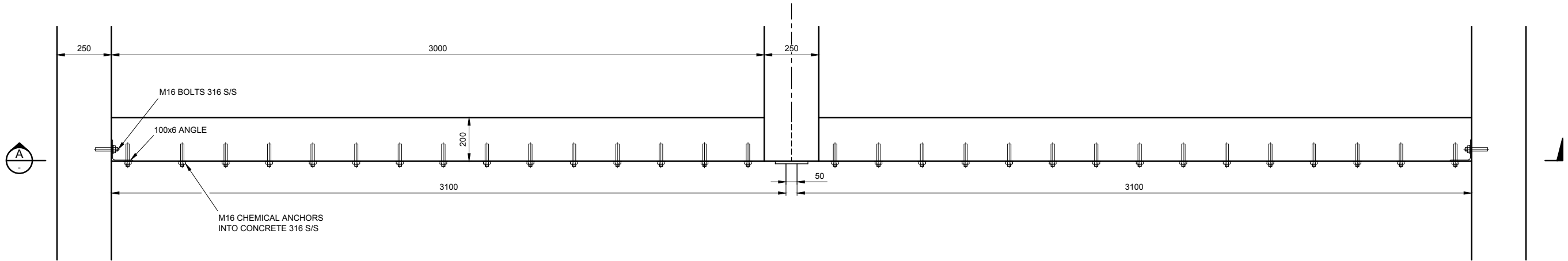
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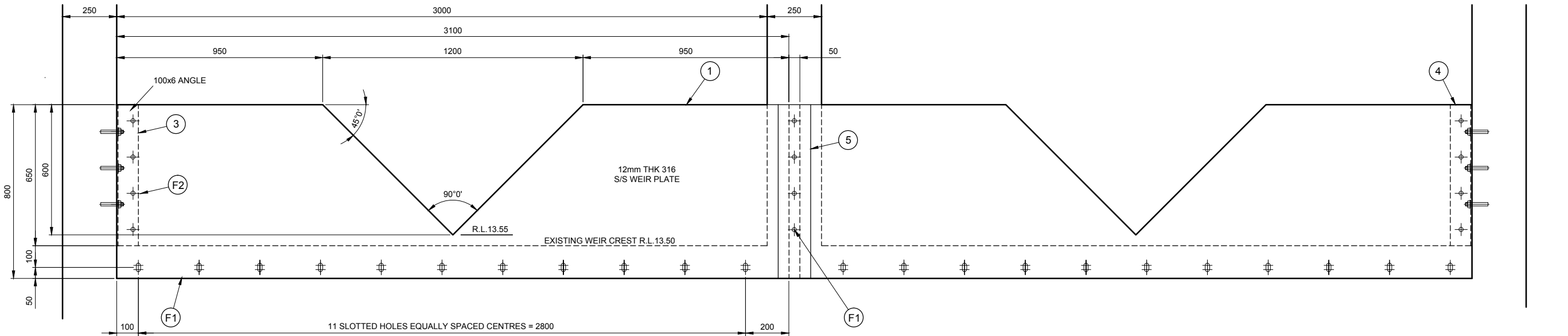
NAME SIGNATURE DATE

QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)





PLAN  
1:10

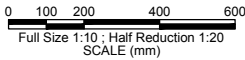


SECTION A  
1:10

NOTES:

- WEIR WALL SURFACE THAT COMES INTO CONTACT WITH WEIR PLATES TO BE CLEARED AND GROUND SMOOTH (BUILT UP WITH EPOXY IF NECESSARY)
- MASTIC SEAL TO BE PLACED BETWEEN WEIR PLATES AND WEIR WALL
- MATERIAL FOR WEIR PLATES TO BE 316 S/S 12mm MINIMUM THICKNESS
- RC WALL HAS BEEN ASSUMED FOR ATTACHMENT OF ANGLE
- REFER TO DWG 486/5/5-0157-055 FOR ITEM DETAILS

AS CONSTRUCTED



AS CONSTRUCTED DETAILS	
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.	
SIGNED:	DATE: 01.11.13
NAME of SIGNATORY: A. THIRIS	
RPEQ No. or LICENCE: 3325	
COMPANY NAME: ALTRA9	
START DATE: 16.11.12	FINISH DATE: 01.11.13



NAME	SIGNATURE	DATE
QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)		

				FUNDING		DRAFTED	S.WILKINSON	D.DAKIN	16.11.12	ASSET/PROJECT BUNDAMBA WWC EFFLUENT RECIRCULATION SYSTEM	DRAWING TITLE FLOW SPLITTER V NOTCH WEIR PLATE DETAILS	SHEET No. OF QUEENSLAND URBAN UTILITIES DRAWING No. AMEND. 486/5/5-0157-054 A
				DESIGN W.O. No.		DRAFTING CHECK	D.DAKIN	DESIGN	R.P.E.Q. No.			
				CONSTRUCTION W.O. No.		CAD FILE	50157054.DWG	A.THIRIS	3325 16.11.12			
No.	DATE	AMENDMENT	DRAFT	APPR	FUNDED BY B.C.C. (✓) EXTERNAL ( )	B.C.C. FILE No.		DESIGN CHECK	R.P.E.Q. No. DATE	MANAGER ENGINEERING SERVICES	DATE	
										FIELD SERVICES DELEGATE	DATE	

MATERIAL SCHEDULE

ITEM	DESCRIPTION	LENGTH	MAT'L	QTY	REF/REMARKS
1	3100x12mm THK PLATE	800	316 S/S	1	AS SHOWN
2	3100x12mm THK PLATE	800	316 S/S	1	OPPOSITE HAND
3	100x6mm ANGLE	650	316 S/S	1	AS SHOWN
4	100x6mm ANGLE	650	316 S/S	1	OPPOSITE HAND
5	150x12mm FLAT BAR	800	316 S/S	1	AS SHOWN

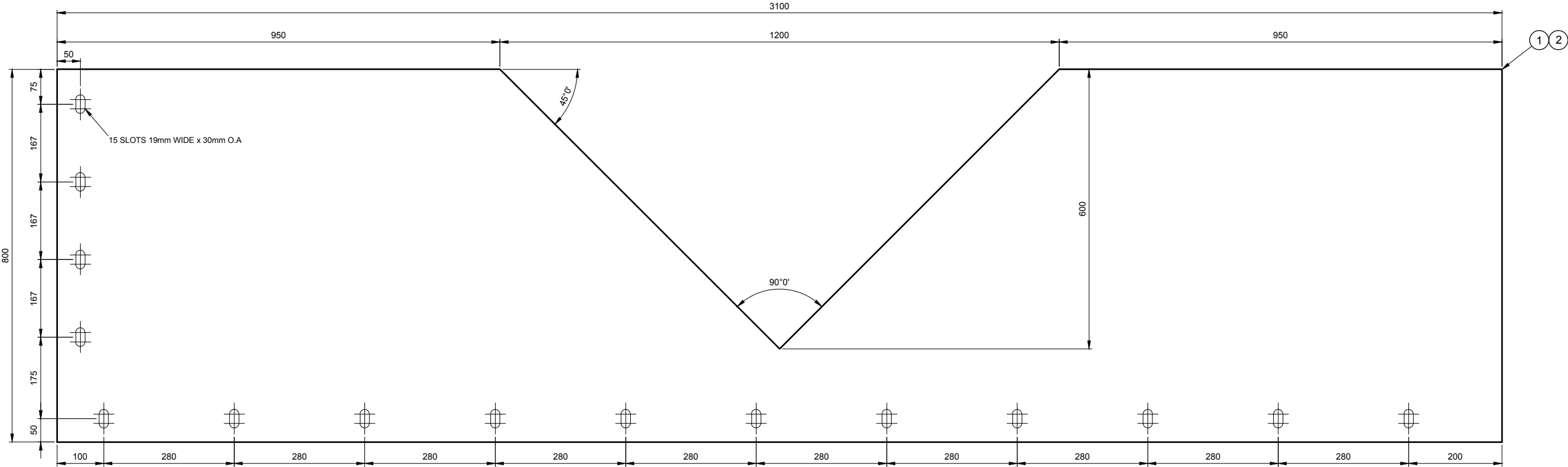
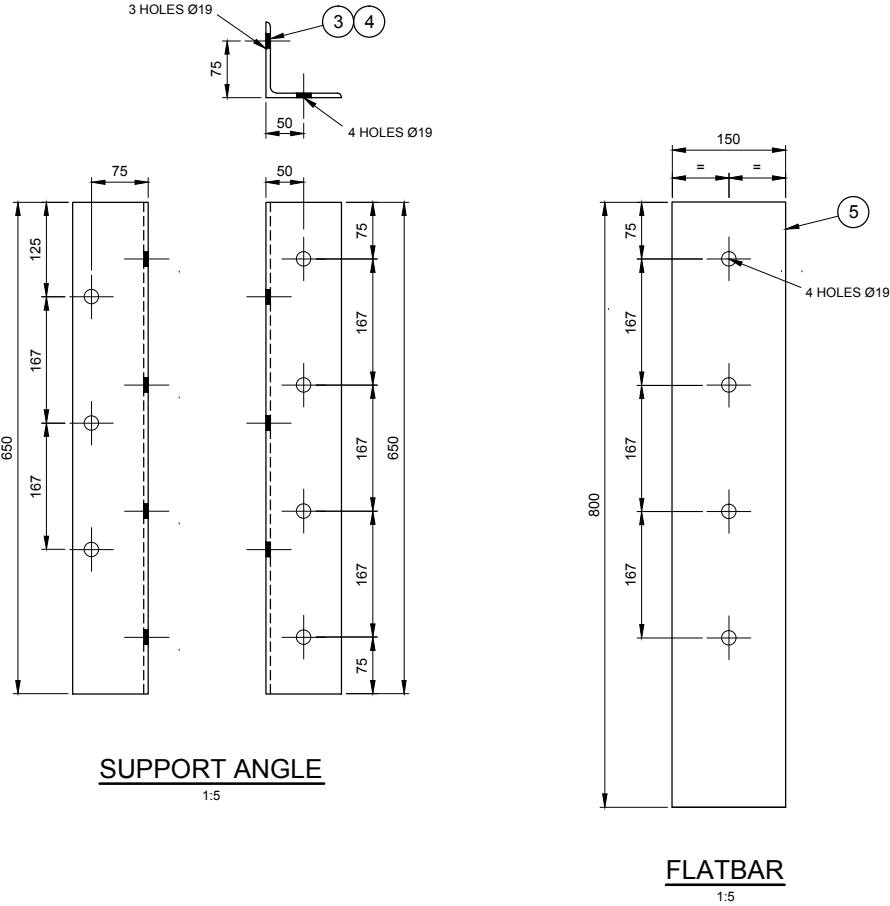
FASTENER SCHEDULE

ITEM	DESCRIPTION	MAT'L	QTY
F1	M16 CHEMICAL ANCHOR x150mm x 1 M16 FLAT WASHER x 1 M16 NUT x 1	316 S/S	32
F2	M16x40mm HEX HEAD BOLT x 1 M16 FLAT WASHERS x 2 M16 NUT x 1	316 S/S	8

NOTE: BOLTS TO AS.1110  
WASHERS TO AS.1237  
NUTS TO AS.1112

NOTES:

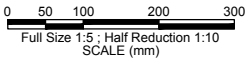
1. REFER TO DWG 486/5/5-0157-054 FOR LOCATION DETAILS



S/S WEIR PLATE

1:5

AS CONSTRUCTED



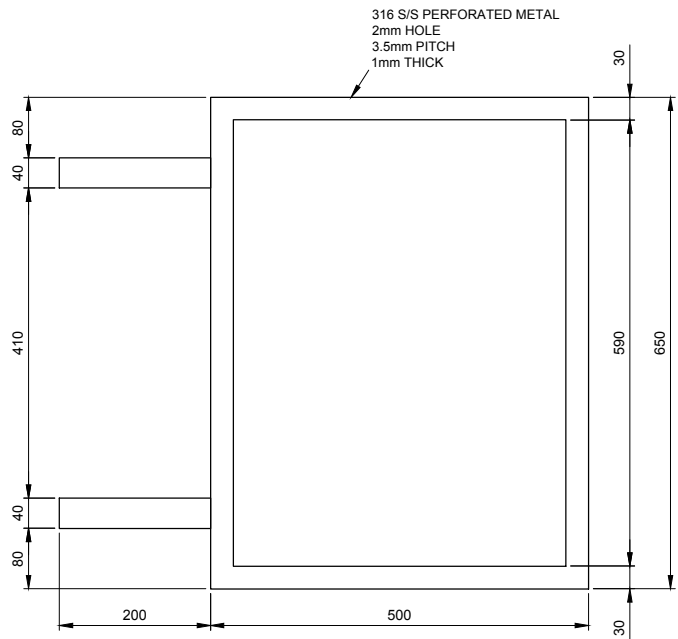
AS CONSTRUCTED DETAILS		
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.		
SIGNED:	DATE: 01.11.13	
NAME of SIGNATORY: A. THIRIS		
RPEQ No. or LICENCE: 3325		
COMPANY NAME: ALTRA9		
START DATE: 16.11.12	FINISH DATE: 01.11.13	



NAME	SIGNATURE	DATE
QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)		

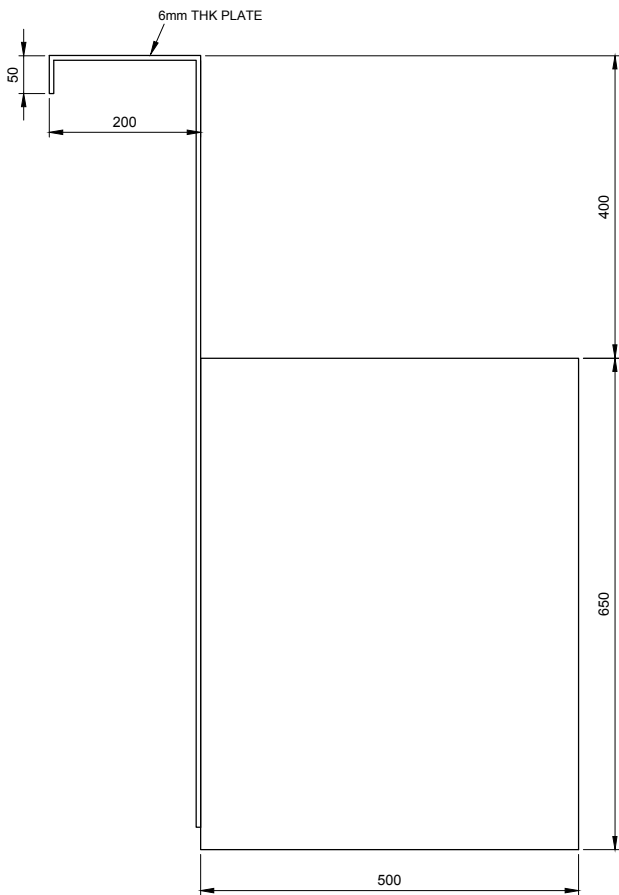
				FUNDING		DRAFTED	S.WILKINSON	D.DAKIN	16.11.12	ASSET/PROJECT		DRAWING TITLE		SHEET No. OF	
				DESIGN W.O. No.		DRAFTING CHECK	D.DAKIN	DESIGN	R.P.E.Q. No.	BUNDAMBA WWC		FLOW SPLITTER		QUEENSLAND URBAN UTILITIES DRAWING No.	
A		01.11.13		AS CONSTRUCTED		CAD FILE	50157055.DWG	A.THIRIS	3325	EFFLUENT RECIRCULATION		V NOTCH WEIR PLATE		486/5/5-0157-055	
No.		DATE		AMENDMENT		FUNDED BY B.C.C. (✓)	EXTERNAL ( )	DESIGN CHECK	R.P.E.Q. No.	SYSTEM		SHOP DETAILS		AMEND.	
				DRAFT	APPR	B.C.C. FILE No.		FIELD SERVICES DELEGATE	DATE					A	





PLAN

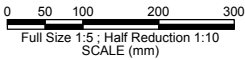
1:5



ELEVATION

1:5

AS CONSTRUCTED



NOTES:

MATERIAL: 316 S/S  
WELDING: STICH WELD BASKET AND SUPPORTS

AS CONSTRUCTED DETAILS

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

SIGNED: DATE: 01.11.13

NAME of SIGNATORY: A. THIRIS

RPEQ No. or LICENCE: 3325

COMPANY NAME: ALTRA9

START DATE: 16.11.12 FINISH DATE: 01.11.13



NAME SIGNATURE DATE  
QUEENSLAND URBAN UTILITIES DELEGATE  
(AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)



SHEET No. OF  
QUEENSLAND URBAN UTILITIES DRAWING No. AMEND.  
486/5/5-0157-056 A

A	01.11.13	AS CONSTRUCTED	S.W	A.T	
No	DATE	AMENDMENT	DRAFT	APPR	

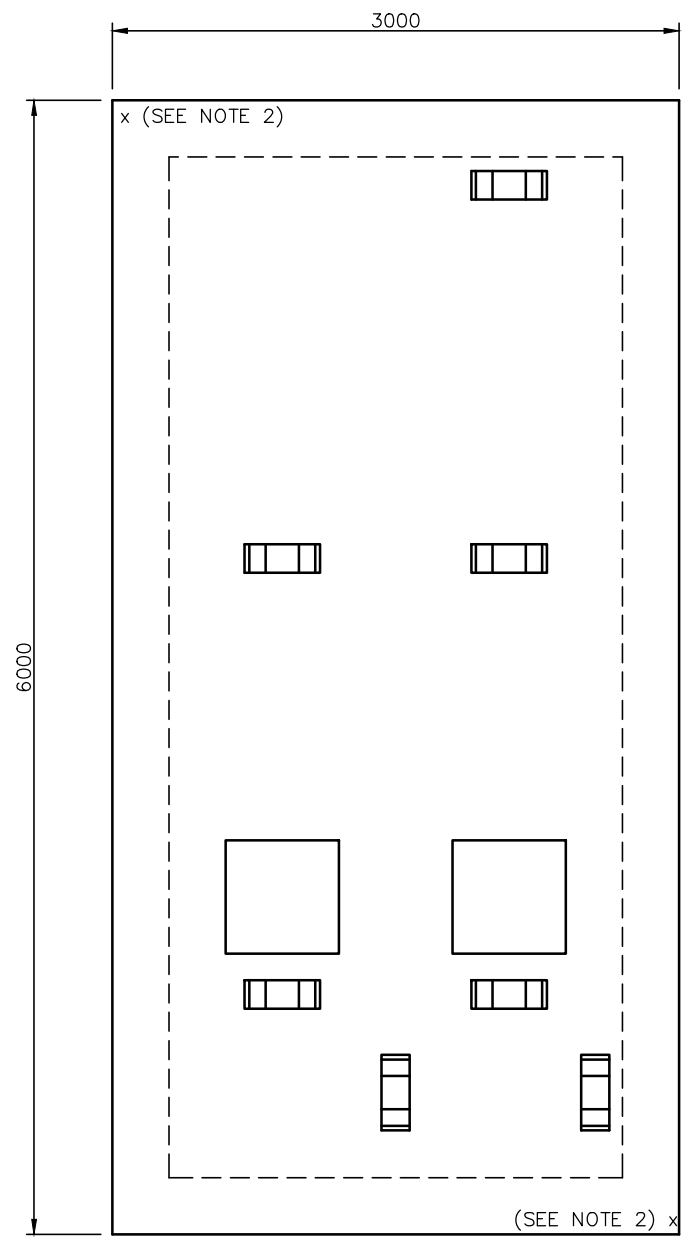
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DESIGN W.O. No.	
CONSTRUCTION W.O. No.	
FUNDED BY B.C.C. (✓)	EXTERNAL ( )

DRAFTED	S.WILKINSON
DRAFTING CHECK	D.DAKIN
CAD FILE	50157056.DWG
B.C.C. FILE No.	

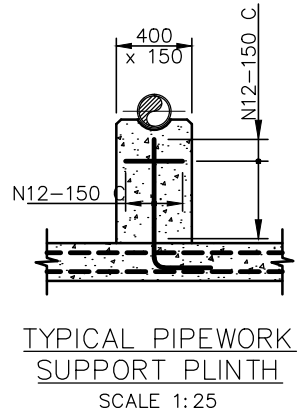
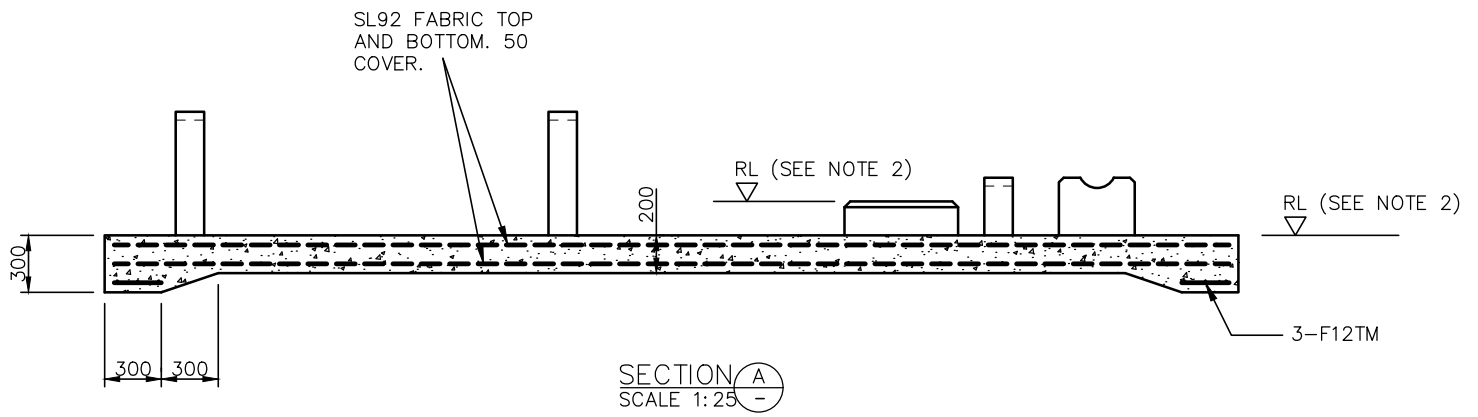
D.DAKIN	16.11.12
DESIGN	R.P.E.Q. No.
A.THIRIS	3325
DESIGN CHECK	16.11.12
R.P.E.Q. No.	DATE
MANAGER ENGINEERING SERVICES	DATE
FIELD SERVICES DELEGATE	DATE

ASSET/PROJECT
BUNDAMBA WWC
EFFLUENT RECIRCULATION
SYSTEM

DRAWING TITLE
SAMPLE WATER BASKET
DETAILS

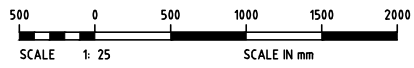


PLAN  
SCALE 1: 25



- NOTE:
1. FOR LOCATION OF RECIRCULATION AND FEED PUMP PLINTHS REFER TO DRAWING BEG709-C-DWG-010.
  2. FOR RECIRCULATION PUMPS PLINTH RL's REFER DRAWING BEG709-C-DWG-011 AND FOR FEED PUMPS PLINTH RL's REFER DRAWING BEG709-C-DWG-012.
  - 3-CONCRETE PLINTHS REQUIRED AS DETAILED.
  3. REFER DRAWING BEG709-S-DWG-001 FOR STRUCTURAL NOTES.

AS CONSTRUCTED



ORIGINAL KBR DESIGN DRAWING REFER DRG No.  
BEG709-S-DWG-020

AS CONSTRUCTED DETAILS	
I CERTIFY THAT THE "AS CONSTRUCTED" DETAILS SHOWN ON THIS PLAN ARE A TRUE AND ACCURATE RECORD OF THE WORKS.	
SIGNED:	DATE: 01.11.13
NAME of SIGNATORY: A. THIRIS	
RPEQ No. or LICENCE: 3325	
COMPANY NAME: ALTRA9	
START DATE: 16.11.12	FINISH DATE: 01.11.13



NAME	SIGNATURE	DATE
QUEENSLAND URBAN UTILITIES DELEGATE (AUTHORISED FOR 12 MONTHS FROM DATE SHOWN)		

				FUNDING		DRAFTED		R.SOLTER		ASSET/PROJECT		DRAWING TITLE		SHEET No. OF	
DESIGN W.O. No.				CONSTRUCTION W.O. No.		DRAFTING CHECK		DESIGN		BUNDAMBA WWC		SLAB REINFORCEMENT		QUEENSLAND URBAN UTILITIES DRAWING No.	
CAD FILE						50157060.DWG		T.CUSACK		EFFLUENT RECIRCULATION		DETAILS AND SECTIONS		486/5/5-0157-060	
FUNDED BY B.C.C. (✓)		EXTERNAL ( )		B.C.C. FILE No.				DESIGN CHECK		SYSTEM				AMEND.	
DATE		AMENDMENT						DATE						A	
DRAFT		APPR													


# 15. Electrical Drawings

QUEENSLAND URBAN UTILITIES  
BUNDAMBA  
EFFLUENT DISINFECTION SYSTEM

ELECTRICAL DRAWING SET


FOR  
QUEENSLAND URBAN UTILITIES

REDRAWN FROM CONTROL IT DWG 02202701-001

REVISIONS				 <div>ABN 21 096 286 207 BRISBANE OFFICE: 185 QUEENSPORT RD NORTH, MURARRIE, QLD 4172 PHONE :- 61 - 7 - 3908 3908 FAX :- 61 - 7 - 3908 3909 <a href="http://www.conneq.com.au">http://www.conneq.com.au</a></div>	TITLE			SCALE	N.T.S	08 MAY 2013	PROJECT			
NO	BY	DATE	DESCRIPTION		QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM COVER SHEET ELECTRICAL DRAWINGS			DRAWN	J.DALZIEL		JOB No. 14286 BUNDAMBA E.D.S.			
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED					CHECKED	-		CUSTOMER			
								DESIGNED	-		QUEENSLAND URBAN UTILITIES			
								APPROVED	-		DRAWING NO.		SHEET	REV
								© 2011 Conneq i.Power Solutions Pty Ltd			A4	486/5/7-0157-015		A


DRAWING No.	REV	DESCRIPTION
486/5/7-0157-015	A	COVER SHEET
486/5/7-0157-016	A	DRAWING INDEX
486/5/7-0157-017	A	ELECTRICAL SYMBOLS
486/5/7-0157-018	A	CONTROL PANEL LAYOUT - EXTERNAL
486/5/7-0157-019	A	CONTROL PANEL LAYOUT - INTERNAL
486/5/7-0157-020	A	TERMINAL STRIP ARRANGEMENT
486/5/7-0157-021	A	THREE LINE DIAGRAM - 1
486/5/7-0157-022	A	THREE LINE DIAGRAM - 2
486/5/7-0157-023	A	THREE LINE DIAGRAM - 3
486/5/7-0157-024	A	THREE LINE DIAGRAM - 4
486/5/7-0157-025	A	THREE LINE DIAGRAM - 5
486/5/7-0157-026	A	24Vdc POWER SUPPLIES
486/5/7-0157-027	A	HARDWIRED CONTROL SCHEMATIC
486/5/7-0157-028	A	DOSING PUMPS
486/5/7-0157-029	A	DOSING PUMPS
486/5/7-0157-030	A	DOSING PUMPS
486/5/7-0157-031	A	DOSING PUMPS
486/5/7-0157-032	A	PLC RACK LAYOUT
486/5/7-0157-033	A	PLC - DIGITAL INPUTS - SLOT 2
486/5/7-0157-034	A	PLC - DIGITAL INPUTS - SLOT 3
486/5/7-0157-035	A	PLC - DIGITAL INPUTS - SLOT 4
486/5/7-0157-036	A	PLC - DIGITAL OUTPUTS - SLOT 5
486/5/7-0157-037	A	PLC - DIGITAL OUTPUTS - SLOT 6
486/5/7-0157-038	A	PLC - DIGITAL OUTPUTS - SLOT 7
486/5/7-0157-039	A	PLC - ANALOG INPUTS - SLOT 8
486/5/7-0157-040	A	PLC - ANALOG INPUTS - SLOT 8
486/5/7-0157-041	A	PLC - ANALOG OUTPUTS - SLOT 9
486/5/7-0157-042	A	PLC - DIGITAL INPUTS - SLOT 10
486/5/7-0157-043	A	HARDWIRED CONTROL SCHEMATIC
486/5/7-0157-044	A	CHLORINE CONTACT TANK 1 - LOCAL CONTROL PANEL
486/5/7-0157-045	A	CHLORINE CONTACT TANK 2 - LOCAL CONTROL PANEL
486/5/7-0157-046	A	FEED PUMPS - LOCAL CONTROL PANEL
486/5/7-0157-047	A	BLOCK DIAGRAM

REDRAWN FROM CONTROL IT DWG 02202701-002

REVISIONS				 <div>ABN 21 096 286 207 BRISBANE OFFICE: 185 QUEENSPORT RD NORTH, MURARRIE, QLD 4172 PHONE :- 61 - 7 - 3908 3908 FAX :- 61 - 7 - 3908 3909 <a href="http://www.conneq.com.au">http://www.conneq.com.au</a></div>	TITLE		SCALE	N.T.S	16 NOV 2011	PROJECT				
NO	BY	DATE	DESCRIPTION		QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM DRAWING INDEX ELECTRICAL DRAWINGS .		DRAWN	R. OLOFERNES		JOB No. 14286 BUNDAMBA E.D.S.				
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED				CHECKED	-		CUSTOMER				
							DESIGNED	J. PETERS		QUEENSLAND URBAN UTILITIES				
							APPROVED	-			DRAWING NO.	SHEET	REV	
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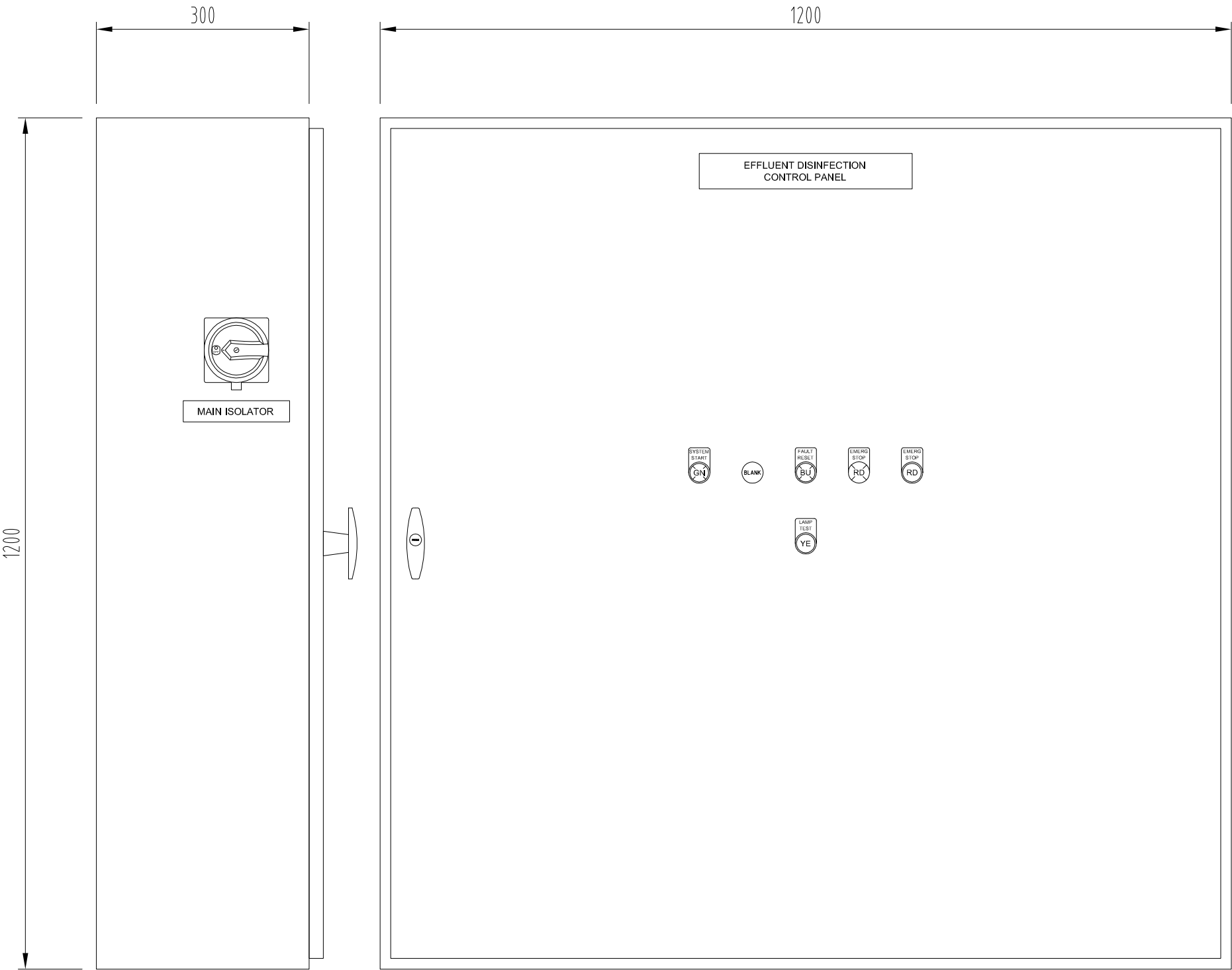
TERMINAL		PUSH BUTTON NORMALLY OPEN		FLOAT SWITCH NORMALLY OPEN		ON DELAY TIMER CONTACT NORMALLY OPEN		WIRE LOOP			
RELAY		FUSE		SWITCH NORMALLY CLOSED		CIRCUIT BREAKER		PUSH TO TEST PILOT LIGHT		LOCATION Ø = PLC PANEL □ = FIELD JB	
TIMER		CONTACT NORMALLY OPEN		SWITCH NORMALLY OPEN		ISOLATOR, 3 PHASE		SOLENOID VALVE		MOTOR	
CONTACTOR		CONTACT NORMALLY CLOSED		LIMIT SWITCH NORMALLY CLOSED		PRESSURE SWITCH NORMALLY CLOSED		TEMPERATURE SWITCH NORMALLY CLOSED		BUZZER	
INTERCONNECTION DOT		KEY SWITCH NORMALLY OPEN		LIMIT SWITCH NORMALLY OPEN		PRESSURE SWITCH NORMALLY OPEN		TEMPERATURE SWITCH NORMALLY OPEN		GROUND	
FLUORESCENT LAMP		PB SELECTOR SWITCH 2 POSITION		TWIST OFF EMERGENCY STOP BUTTON		FLOW SWITCH NORMALLY CLOSED		PROXIMITY NORMALLY CLOSED		THERMAL OVERLOAD	
LED INDICATOR		SELECTOR SWITCH 3 POSITION		MUSHROOM HEAD EMERGENCY STOP BUTTON		FLOW SWITCH NORMALLY OPEN		PROXIMITY NORMALLY OPEN		GPO	
PILOT LAMP		SELECTOR SWITCH 3 POSITION KEY OPERATED		PUSH BUTTON NORMALLY CLOSED		FLOAT SWITCH NORMALLY CLOSED		ON DELAY TIMER CONTACT NORMALLY CLOSED		PHOTOEYE SENSOR	

REDRAWN FROM CONTROL IT DWG 02202701-008

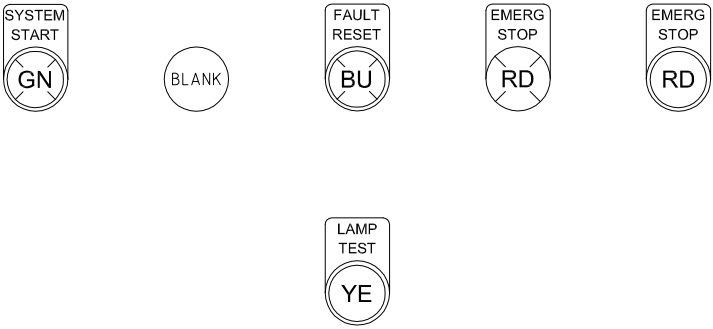
REVISIONS				 <div>ABN 21 096 286 207 BRISBANE OFFICE: 185 QUEENSPORT RD NORTH, MURARRIE, QLD 4172 PHONE :- 61 - 7 - 3908 3908 FAX :- 61 - 7 - 3908 3909 <a href="http://www.conneq.com.au">http://www.conneq.com.au</a></div>	TITLE		SCALE	N.T.S	08 MAY 2013	PROJECT			
NO	BY	DATE	DESCRIPTION		QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM		DRAWN	J.DALZIEL		JOB No. 14286 BUNDAMBA E.D.S.			
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED		ELECTRICAL SYMBOLS		CHECKED	-		CUSTOMER			
					ELECTRICAL DRAWINGS		DESIGNED	-		QUEENSLAND URBAN UTILITIES			
							APPROVED	-		DRAWING NO. A4 486/5/7-0157-017	SHEET	REV A	
							© 2011 Conneq i.Power Solutions Pty Ltd						

SIDE VIEW


FRONT VIEW



NOTE:  
PANEL CONSTRUCTION:  
316 STAINLESS STEEL, IP66 PROTECTION

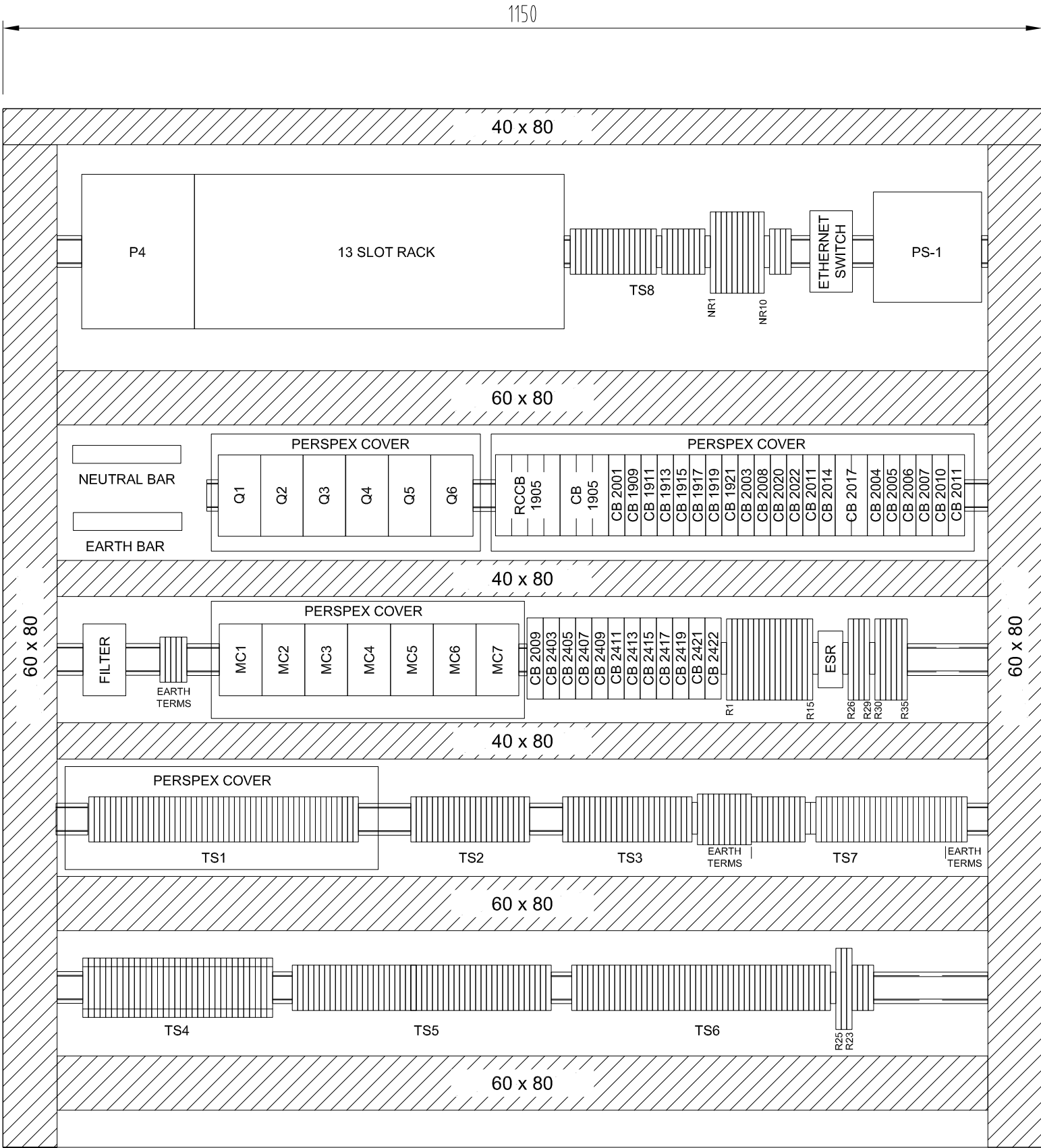


REDRAWN FROM CONTROL IT DWG 02202701-013

REVISIONS				<div><div>ABN 21 096 286 207 BRISBANE OFFICE: 185 QUEENSPORT RD NORTH, MURARRIE, QLD 4172 PHONE :- 61 - 7 - 3908 3908 FAX :- 61 - 7 - 3908 3909 <a href="http://www.conneq.com.au">http://www.conneq.com.au</a></div></div>	TITLE		SCALE	N.T.S	08 MAY 2013	PROJECT		JOB No. 14286 BUNDAMBA E.D.S.		
NO	BY	DATE	DESCRIPTION		QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM CONTROL PANEL LAYOUT - EXTERNAL ELECTRICAL DRAWINGS		DRAWN	J.DALZIEL		CUSTOMER		QUEENSLAND URBAN UTILITIES		
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED				CHECKED	-						
							DESIGNED	-						
							APPROVED	-						
							© 2011 Conneq i,Power Solutions Pty Ltd							
										DRAWING NO.		SHEET	REV	
										A4 486/5/7-0157-018			A	




INTERNAL VIEW



WIRE COLOUR CODING	
24V DC POS	BROWN
24V DC 0V	VIOLET
240V AC ACTIVE	RED
240V AC NEUTRAL	BLACK
240V AC CONTROL ACTIVE	ORANGE
PHASES	RED, WHITE, BLUE
EARTH	GREEN / YELLOW

REDRAWN FROM CONTROL IT DWG 02202701-014

REVISIONS					ABN 21 096 286 207 BRISBANE OFFICE: 185 QUEENSPORT RD NORTH, MURARRIE, QLD 4172 PHONE :- 61 - 7 - 3908 3908 FAX :- 61 - 7 - 3908 3909 <a href="http://www.conneq.com.au">http://www.conneq.com.au</a>	TITLE QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM CONTROL PANEL LAYOUT - INTERNAL ELECTRICAL DRAWINGS	SCALE N.T.S.	08 MAY 2013	PROJECT JOB No. 14286 BUNDAMBA E.D.S.	CUSTOMER QUEENSLAND URBAN UTILITIES	DRAWING NO. A4 486/5/7-0157-019	SHEET A	REV A
NO	BY	DATE	DESCRIPTION										
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED										

## CONTROL CABINET

1905R
1905W
1905B
⋮
1909A
1909N
⋮
1911A
1911N
⋮
1913A
1913N
⋮
1915A
1915N
⋮
1917A
1917N
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1919A
1919N
⋮
1921A
1921N
⋮
2011A
2011N
⋮
2014A
2014N
⋮
2017A
2017N
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2020A
2020N
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2022A
2022N
⋮
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240A3
240A3
240A3
240N
240N
240N
240N

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25030
25030
26070
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26170
27070
27080
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28080
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29080
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29170

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A09: 0-
⋮
A09: 1+
A09: 1-
⋮
A09: 2+
A09: 2-
⋮
A09: 3+
A09: 3-
⋮
A010: 0+
A010: 0-
⋮
A010: 1+
A010: 1-
⋮
A010: 2+
A010: 2-
⋮
A010: 3+
A010: 3-
⋮

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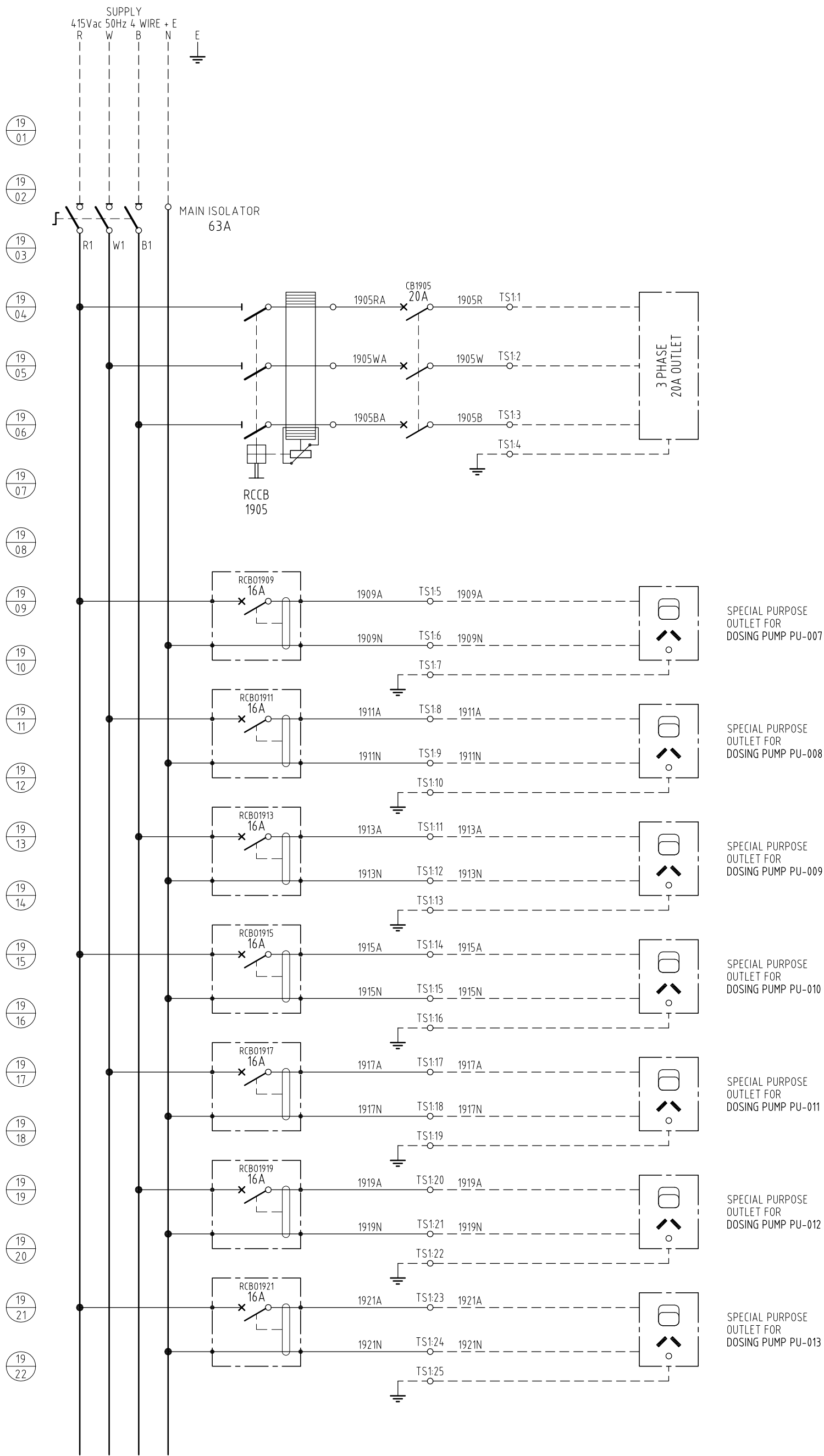
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REDRAWN FROM CONTROL IT DWG 02202701-015

REVISIONS				 <p>ABN 21 096 286 207 BRISBANE OFFICE: 185 QUEENSPORT RD NORTH, MURARRIE, QLD 4172 PHONE :- 61 - 7 - 3908 3908 FAX :- 61 - 7 - 3908 3909 <a href="http://www.conneq.com.au">http://www.conneq.com.au</a></p>	TITLE		SCALE	N.T.S.	08 MAY 2013	PROJECT			
NO	BY	DATE	DESCRIPTION		QUEENSLAND URBAN UTILITIES - BUNDAMBA		DRAWN	J.DALZIEL		JOB No. 14286 BUNDAMBA E.D.S.			
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED		EFFLUENT DISINFECTION SYSTEM		CHECKED	-		CUSTOMER			
					TERMINAL STRIP ARRANGEMENT		DESIGNED	-		QUEENSLAND URBAN UTILITIES			
					ELECTRICAL DRAWINGS		APPROVED	-		DRAWING NO.			
							© 2011 Conneq i.Power Solutions Pty Ltd			A4	486/5/7-0157-020	SHEET	REV
													A



REDRAWN FROM CONTROL IT DWG 02202701-019

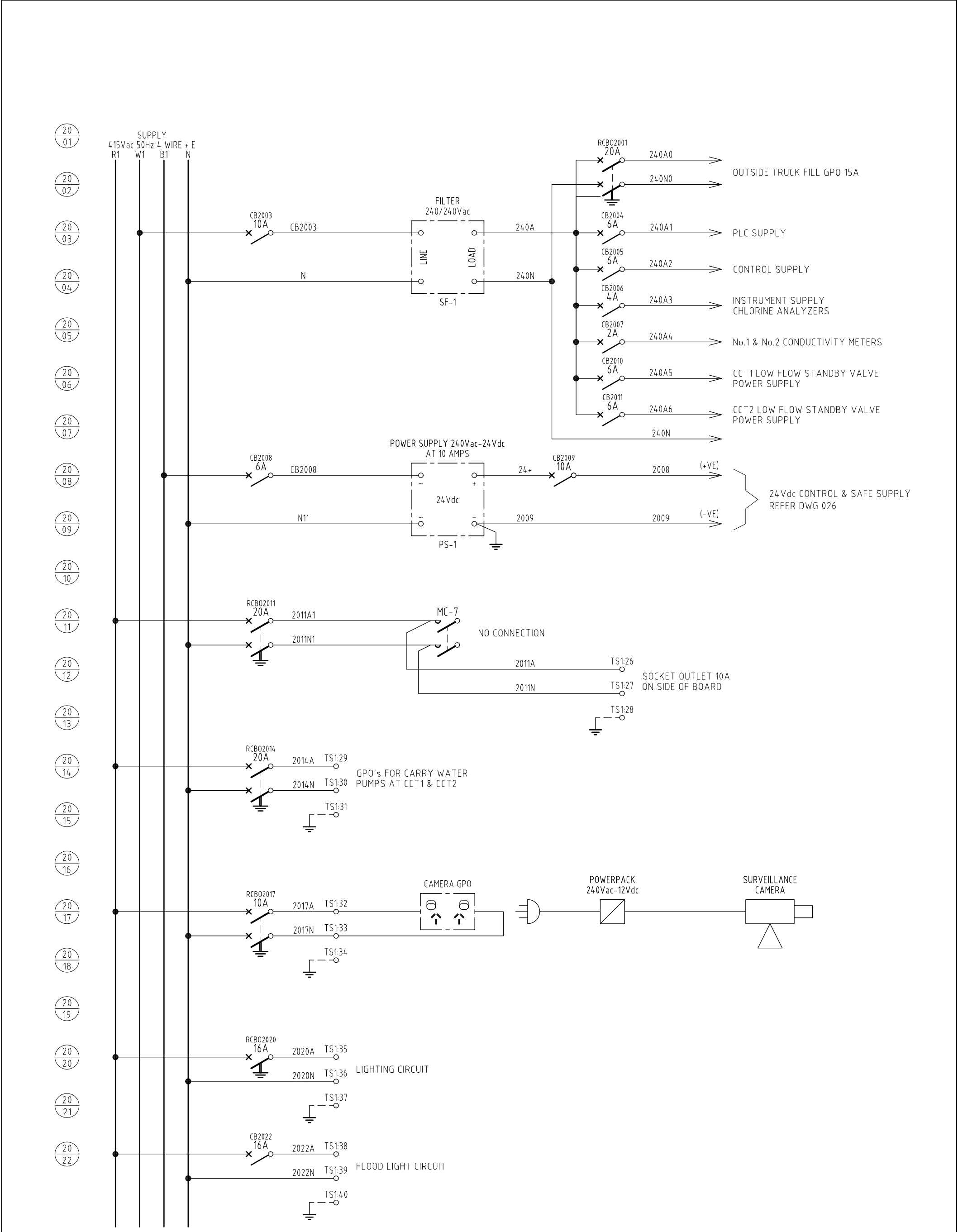
REVISIONS			
NO	BY	DATE	DESCRIPTION
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED



ABN 21 096 286 207  
BRISBANE OFFICE:  
185 QUEENSPORT RD NORTH,  
MURARRIE, QLD 4172  
PHONE :- 61 - 7 - 3908 3908  
FAX :- 61 - 7 - 3908 3909  
<http://www.conneq.com.au>

TITLE
QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM THREE LINE DIAGRAM - 1 ELECTRICAL DRAWINGS

SCALE	N.T.S	16 NOV 2011	PROJECT			
DRAWN	R. OLOFERNES		JOB No. 14286 BUNDAMBA E.D.S.			
CHECKED	-		CUSTOMER			
DESIGNED	J. PETERS		QUEENSLAND URBAN UTILITIES			
APPROVED	-					
© 2011 Conneq I,Power Solutions Pty Ltd			A4	DRAWING NO. 486/5/7-0157-021	SHEET	REV A



REDRAWN FROM CONTROL IT DWG 02202701-020

REVISIONS			
NO	BY	DATE	DESCRIPTION
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED

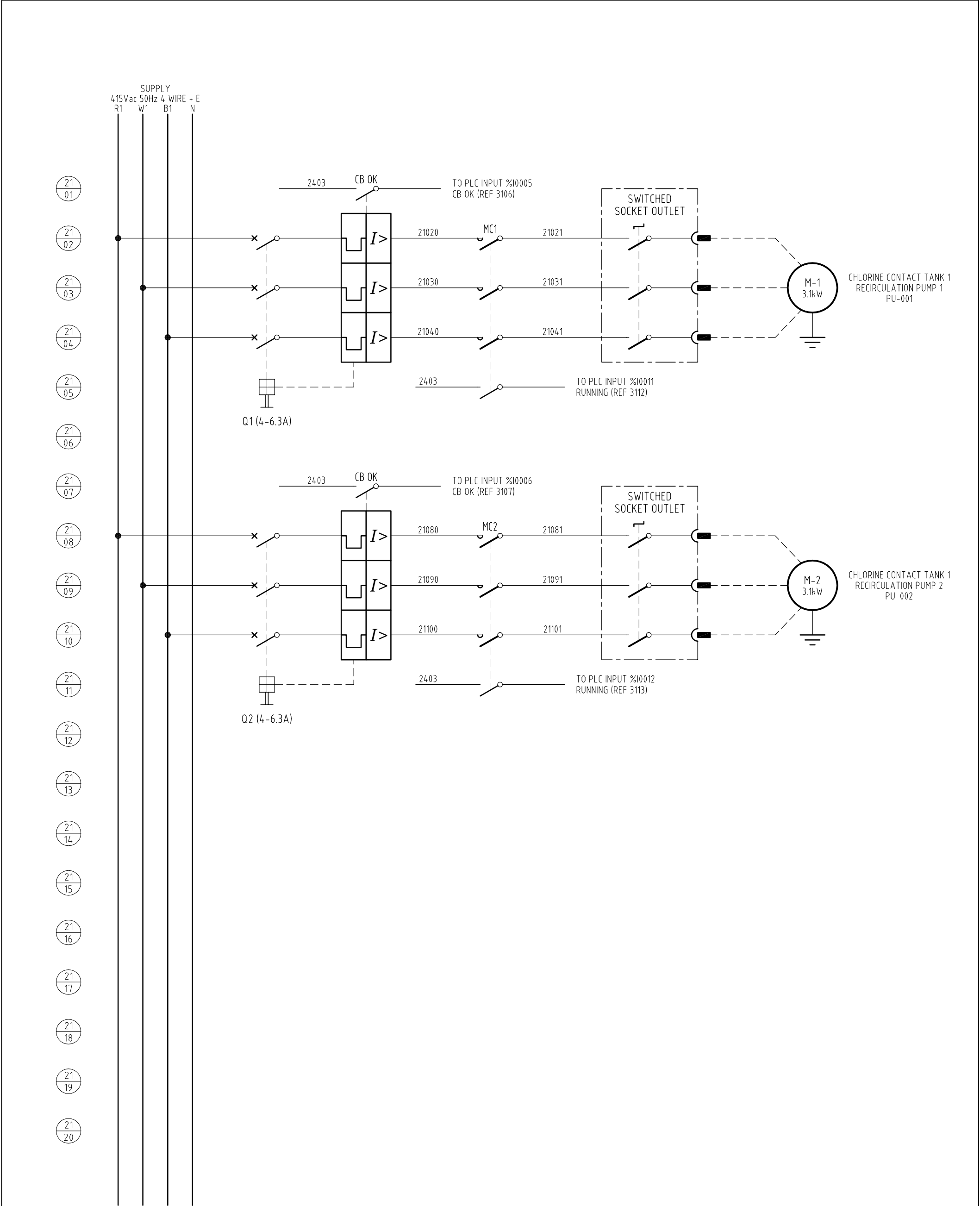


ABN 21 096 286 207  
BRISBANE OFFICE:  
185 QUEENSPORT RD NORTH,  
MURARRIE, QLD 4172  
PHONE :- 61 - 7 - 3908 3908  
FAX :- 61 - 7 - 3908 3909  
http://www.conneq.com.au

TITLE
QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM THREE LINE DIAGRAM - 2 ELECTRICAL DRAWINGS

SCALE	N.T.S	16 NOV 2011
DRAWN	R. OLOFERNES	
CHECKED	-	
DESIGNED	J. PETERS	
APPROVED	-	
© 2011 Conneq i.Power Solutions Pty Ltd		

PROJECT		JOB No. 14286 BUNDAMBA E.D.S.	
CUSTOMER		QUEENSLAND URBAN UTILITIES	
DRAWING NO.	SHEET	REV	
A4	486/5/7-0157-022	A	



REDRAWN FROM CONTROL IT DWG 02202701-021

REVISIONS			
NO	BY	DATE	DESCRIPTION
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED

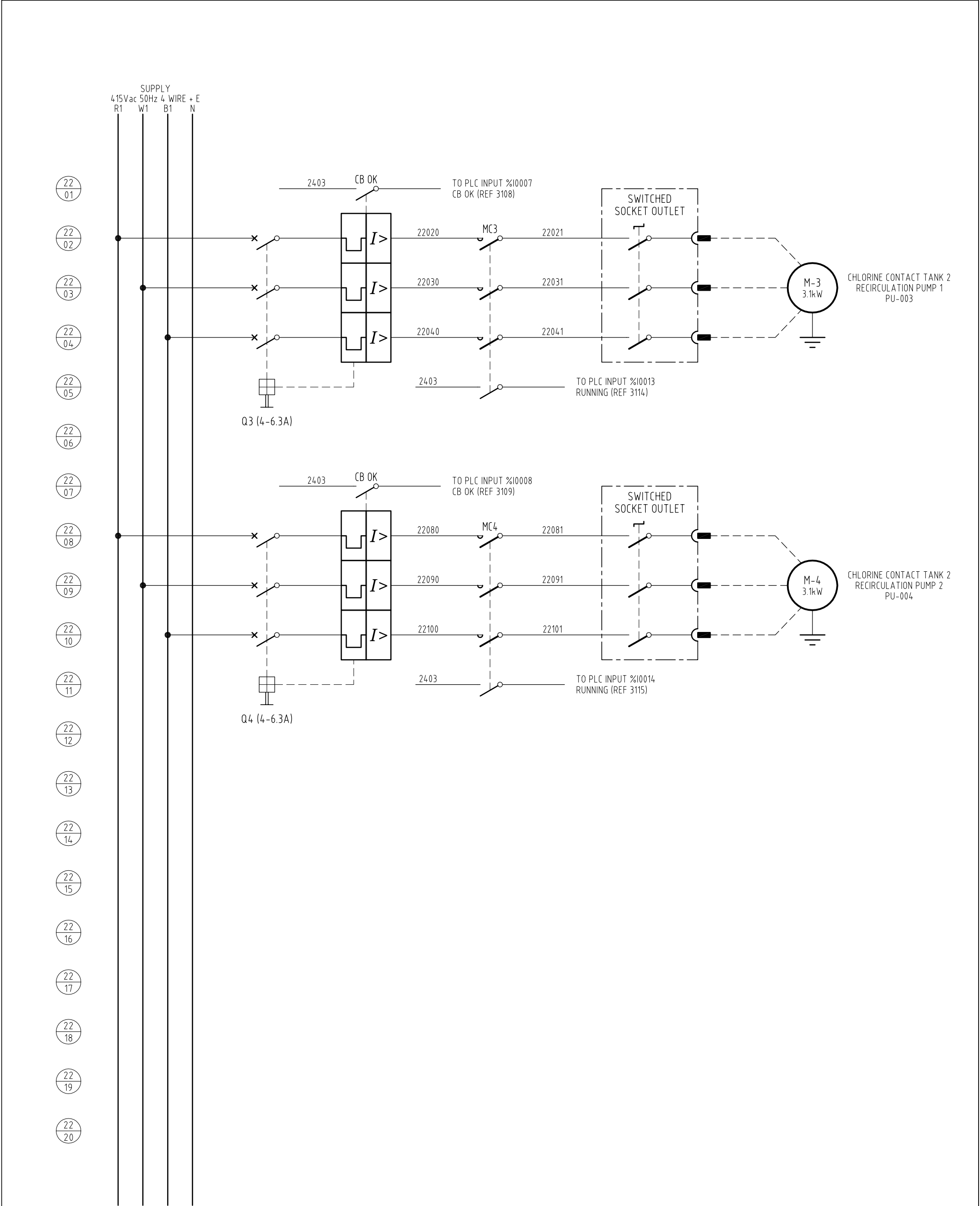


ABN 21 096 286 207  
BRISBANE OFFICE:  
185 QUEENSPORT RD NORTH,  
MURARRIE, QLD 4172  
PHONE :- 61 - 7 - 3908 3908  
FAX :- 61 - 7 - 3908 3909  
<http://www.conneq.com.au>

TITLE	
QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM THREE LINE DIAGRAM - 3 ELECTRICAL DRAWINGS	

SCALE	N.T.S	16 NOV 2011
DRAWN	R. OLOFERNES	
CHECKED	-	
DESIGNED	J. PETERS	
APPROVED	-	
© 2011 Conneq I.Power Solutions Pty Ltd		

PROJECT		JOB No. 14286 BUNDAMBA E.D.S.	
CUSTOMER		QUEENSLAND URBAN UTILITIES	
DRAWING NO.	A4	486/5/7-0157-023	SHEET
REV	A		



REDRAWN FROM CONTROL IT DWG 02202701-022

REVISIONS			
NO	BY	DATE	DESCRIPTION
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED



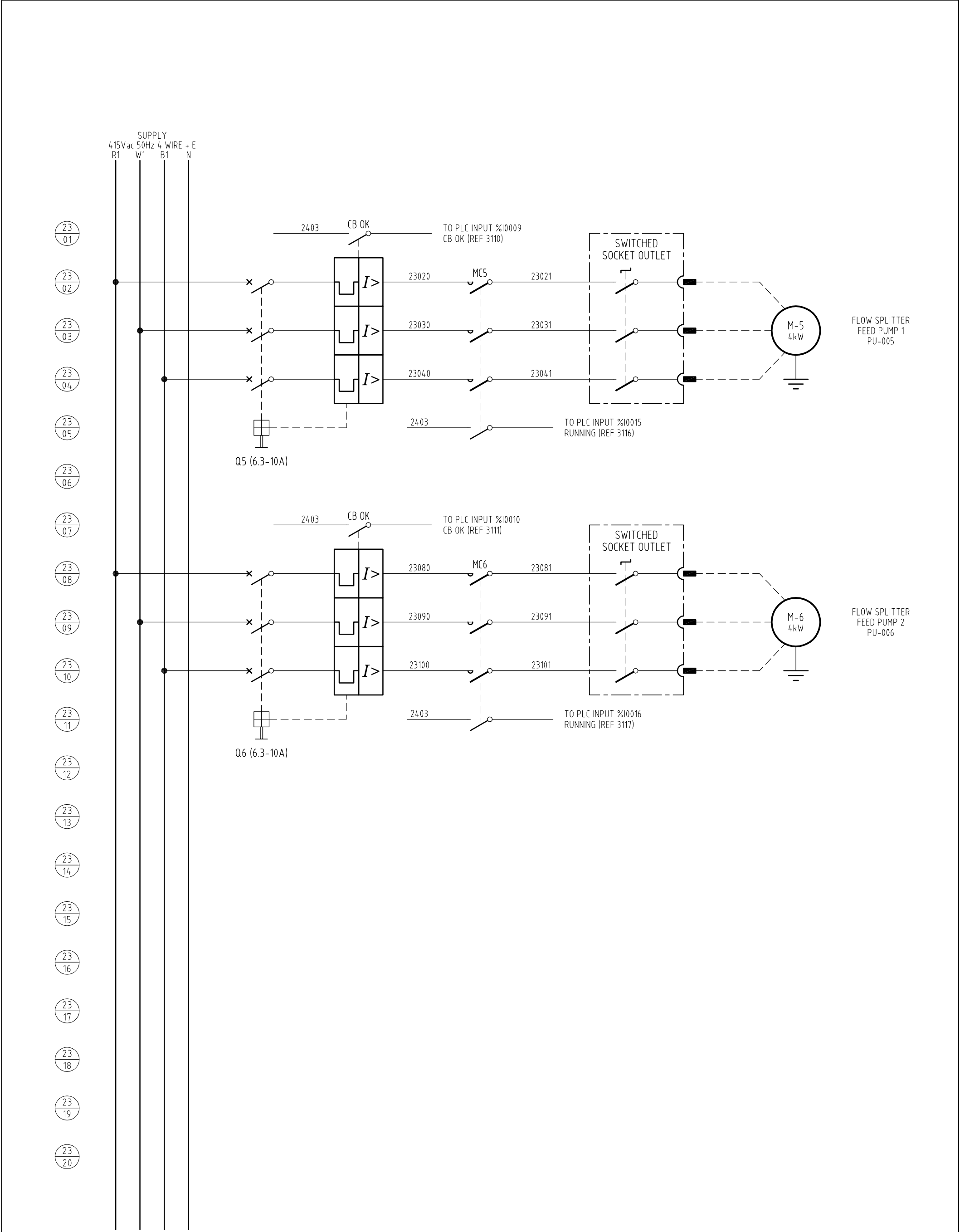
ABN 21 096 286 207  
BRISBANE OFFICE:  
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MURARRIE, QLD 4172  
PHONE :- 61 - 7 - 3908 3908  
FAX :- 61 - 7 - 3908 3909  
<http://www.conneq.com.au>

TITLE
QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM THREE LINE DIAGRAM - 4 ELECTRICAL DRAWINGS

SCALE	N.T.S	16 NOV 2011
DRAWN	R. OLOFERNES	
CHECKED	-	
DESIGNED	J. PETERS	
APPROVED	-	
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PROJECT		JOB No. 14286 BUNDAMBA E.D.S.	
CUSTOMER		QUEENSLAND URBAN UTILITIES	
DRAWING NO.	SHEET	REV	
A4 486/5/7-0157-024		A	





REDRAWN FROM CONTROL IT DWG 02202701-023

REVISIONS			
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A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED

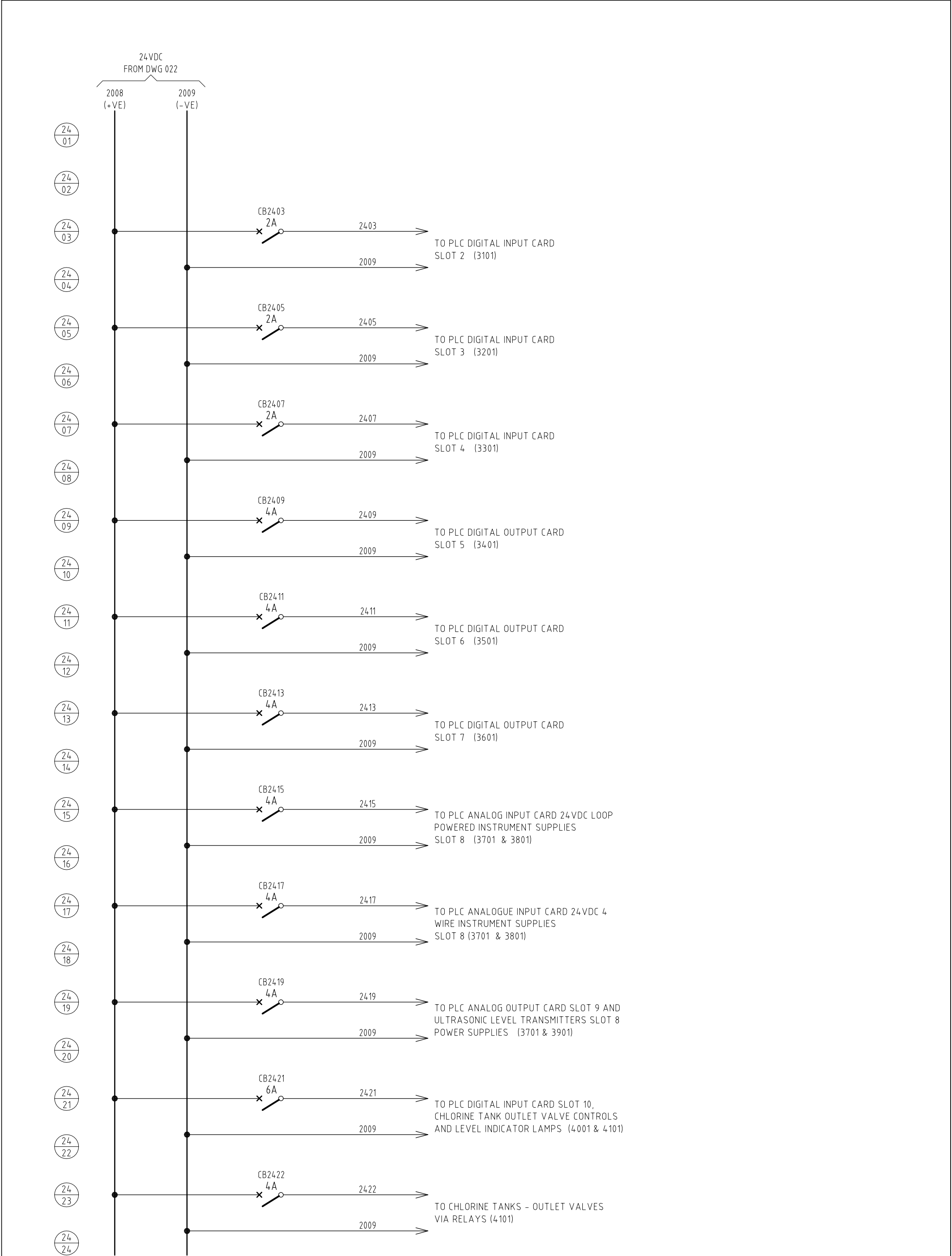


ABN 21 096 286 207  
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MURARRIE, QLD 4172  
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FAX :- 61 - 7 - 3908 3909  
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TITLE	
QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM THREE LINE DIAGRAM - 5 ELECTRICAL DRAWINGS	

SCALE	N.T.S	16 NOV 2011
DRAWN	R. OLOFERNES	
CHECKED	-	
DESIGNED	J. PETERS	
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PROJECT		JOB No. 14286 BUNDAMBA E.D.S.	
CUSTOMER		QUEENSLAND URBAN UTILITIES	
DRAWING NO.	A4	SHEET	REV
486/5/7-0157-025			A



REDRAWN FROM CONTROL IT DWG 02202701-024

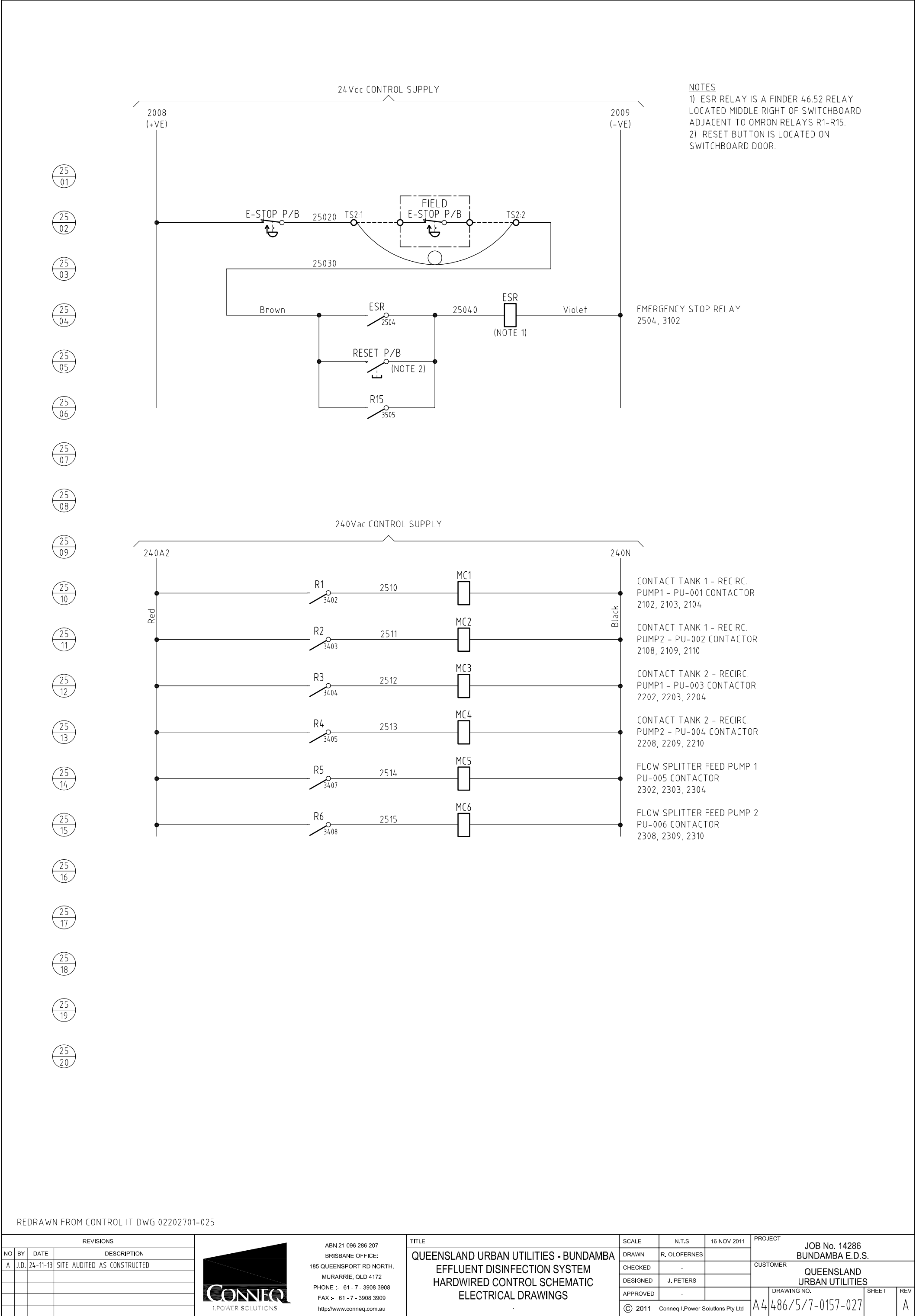
REVISIONS			
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TITLE
QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM 24Vdc POWER SUPPLIES ELECTRICAL DRAWINGS

SCALE	N.T.S	16 NOV 2011	PROJECT			
DRAWN	R. OLOFERNES		JOB No. 14286 BUNDAMBA E.D.S.			
CHECKED	-		CUSTOMER			
DESIGNED	J. PETERS		QUEENSLAND URBAN UTILITIES			
APPROVED	-		DRAWING NO.		SHEET	REV
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TITLE

QUEENSLAND URBAN UTILITIES - BUNDAMBA

EFFLUENT DISINFECTION SYSTEM

HARDWIRED CONTROL SCHEMATIC

ELECTRICAL DRAWINGS

SCALE	N.T.S	16 NOV 2011	PROJECT
DRAWN	R. OLOFERNES		JOB No. 14286
CHECKED	-		BUNDAMBA E.D.S.
DESIGNED	J. PETERS		CUSTOMER
APPROVED	-		QUEENSLAND
© 2011	Conneq I.Power Solutions Pty Ltd		URBAN UTILITIES

DRAWING NO.	SHEET	REV
A4	486/5/7-0157-027	A

REDRAWN FROM CONTROL IT DWG 02202701-025

Q-Pulse Id: TMS795

Active: 25/03/2014

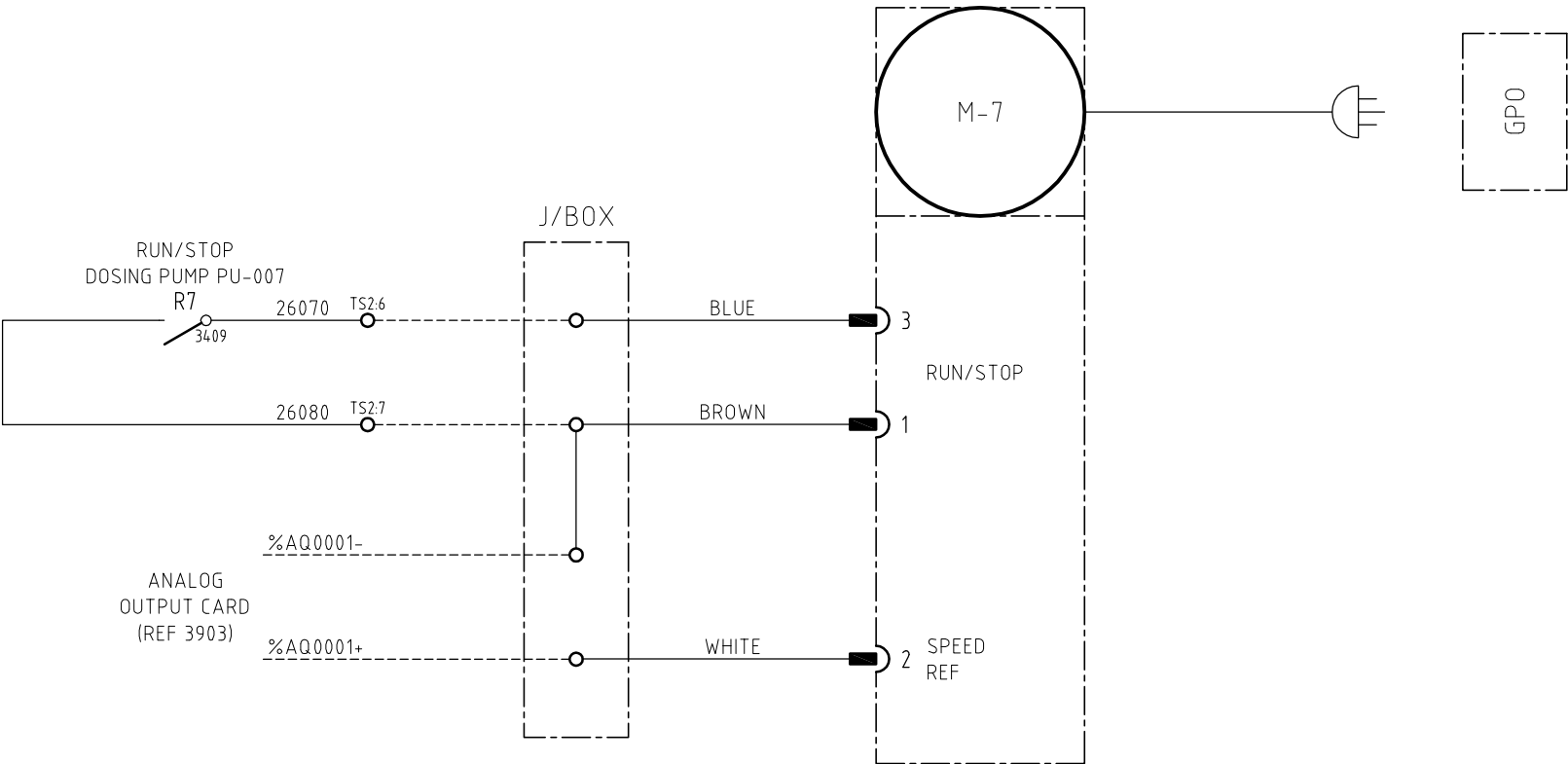
Page 90 of 110

DWG FILE: G:\WATER\JOBS\12012\320026- BUNDAMBA WWTP CCT UPGRADE\21.0 ENGINEERING (FOR SITE USE ONLY)\21.01 DRAWINGS\ILLUS REVISED DRAWINGS\AUTOCAD DWG\486-5-7-0157-027.DWG

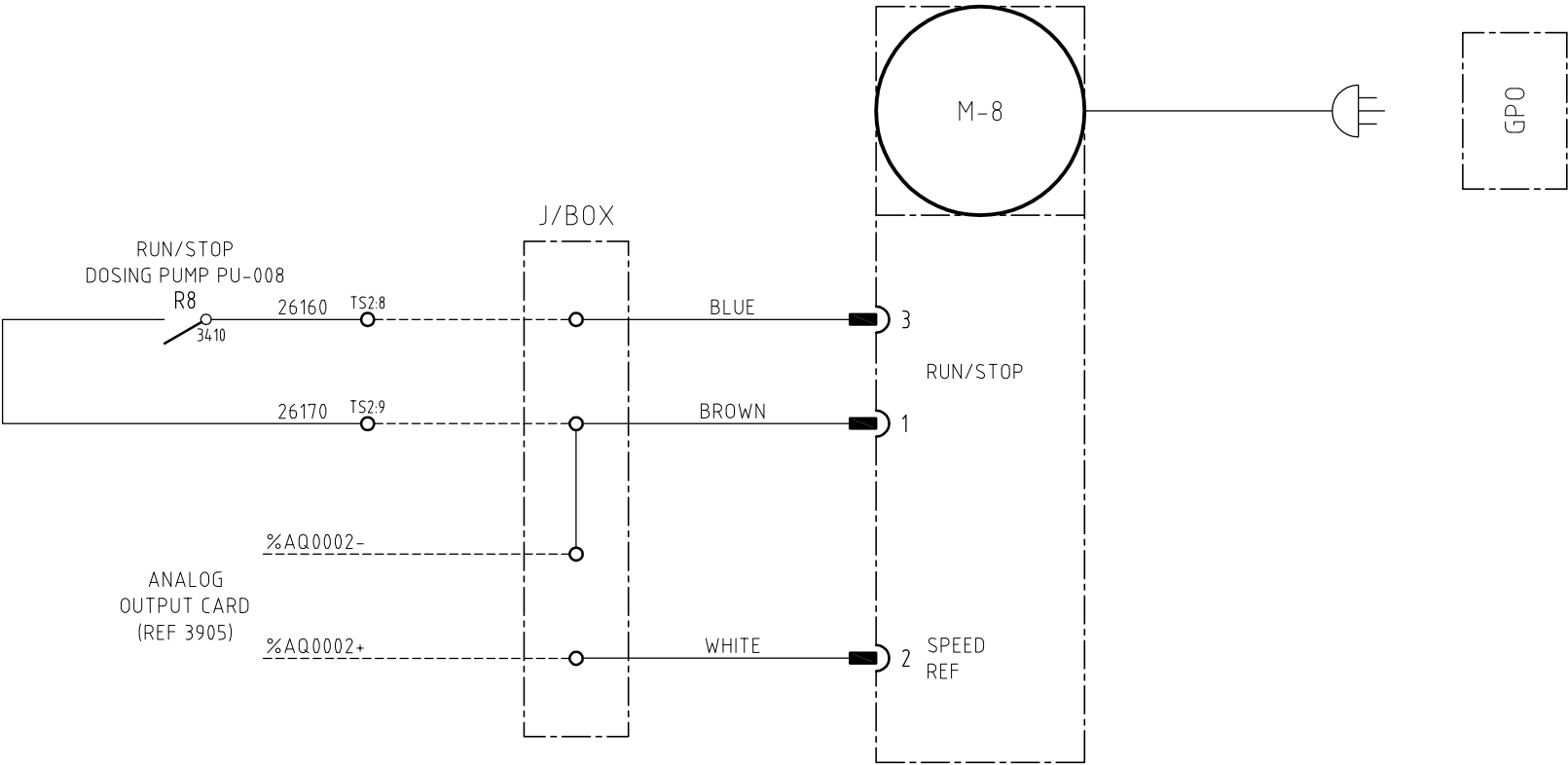
HARDWIRED CONTROLS

GRUNDFOS  
TRUEDOS 222-60  
SOCKET 4

GRUNDFOS DDI60  
LOW FLOW  
DOSING PUMP 1 (PU-007)



GRUNDFOS DDI60  
LOW FLOW  
DOSING PUMP 2 (PU-008)



REDRAWN FROM CONTROL IT DWG 02202701-026

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FAX :- 61 - 7 - 3908 3909  
<http://www.conneq.com.au>

TITLE  
QUEENSLAND URBAN UTILITIES - BUNDAMBA  
EFFLUENT DISINFECTION SYSTEM  
DOSING PUMPS  
ELECTRICAL DRAWINGS

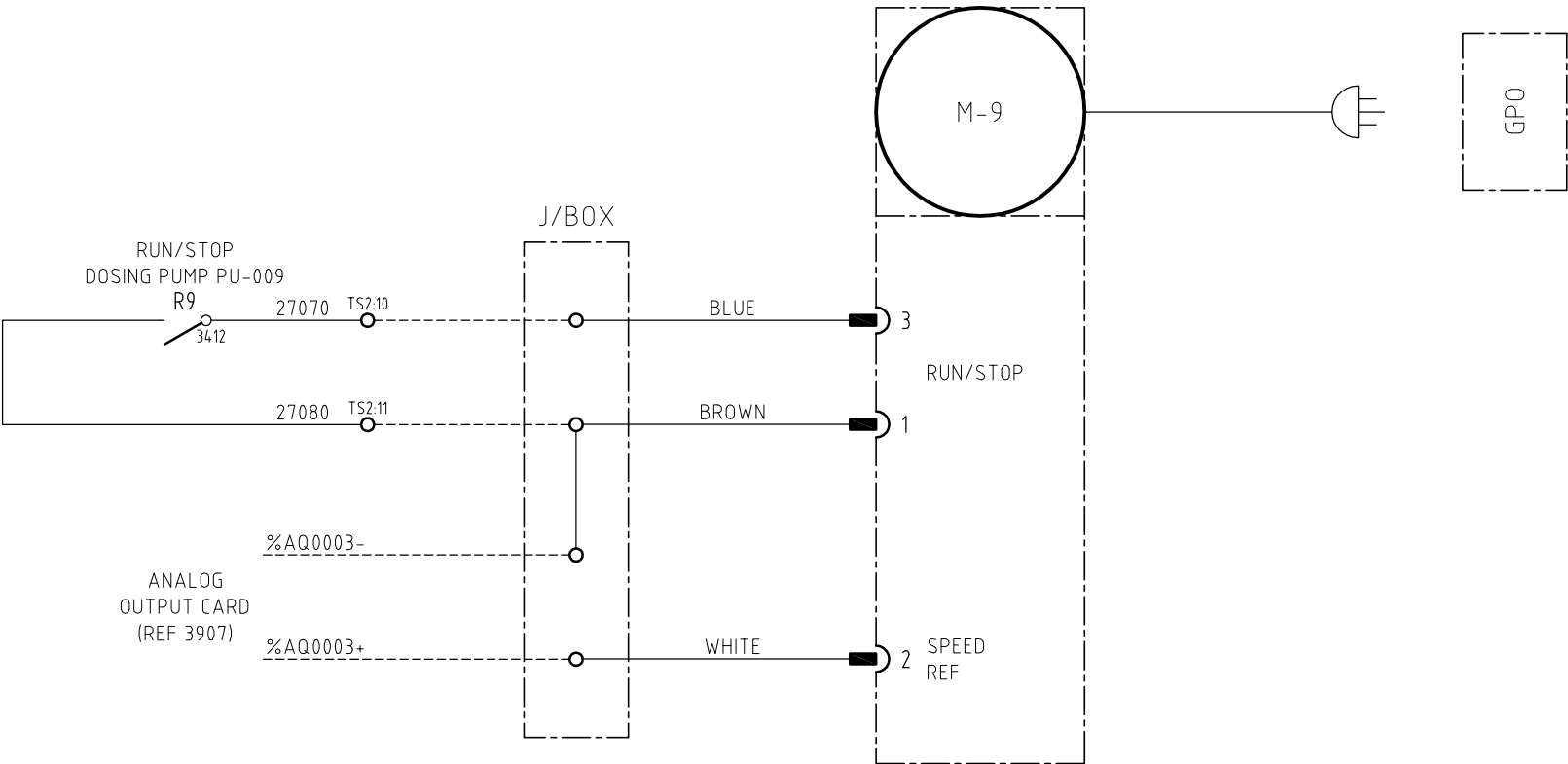
SCALE	N.T.S.	16 NOV 2011
DRAWN	R. OLOFERNES	
CHECKED	-	
DESIGNED	J. PETERS	
APPROVED	-	
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PROJECT		JOB No. 14286 BUNDAMBA E.D.S.	
CUSTOMER		QUEENSLAND URBAN UTILITIES	
DRAWING NO.	SHEET	REV	
A4 486/5/7-0157-028		A	

HARDWIRED CONTROLS


GRUNDFOS  
TRUEDOS 222-60  
SOCKET 4

GRUNDFOS DD160  
LOW FLOW  
DOSING PUMP 3 (PU-009)



- 27/01
- 27/02
- 27/03
- 27/04
- 27/05
- 27/06
- 27/07
- 27/08
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- 27/10
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- 27/12
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- 27/20
- 27/21

REDRAWN FROM CONTROL IT DWG 02202701-027

REVISIONS				 I-POWER SOLUTIONS	ABN 21 096 286 207 BRISBANE OFFICE: 185 QUEENSPORT RD NORTH, MURARRIE, QLD 4172 PHONE :- 61 - 7 - 3908 3908 FAX :- 61 - 7 - 3908 3909 http://www.conneq.com.au	TITLE		SCALE	N.T.S	16 NOV 2011	PROJECT			
NO	BY	DATE	DESCRIPTION			QUEENSLAND URBAN UTILITIES - BUNDAMBA		DRAWN	R. OLOFERNES		JOB No. 14286			
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED			EFFLUENT DISINFECTION SYSTEM		CHECKED	-		CUSTOMER			
						DOSING PUMPS		DESIGNED	J. PETERS		QUEENSLAND URBAN UTILITIES			
						ELECTRICAL DRAWINGS		APPROVED	-		DRAWING NO.		SHEET	REV
								© 2011	Conneq I.Power Solutions Pty Ltd		A4			A
											486/5/7-0157-029			

HARDWIRED CONTROLS

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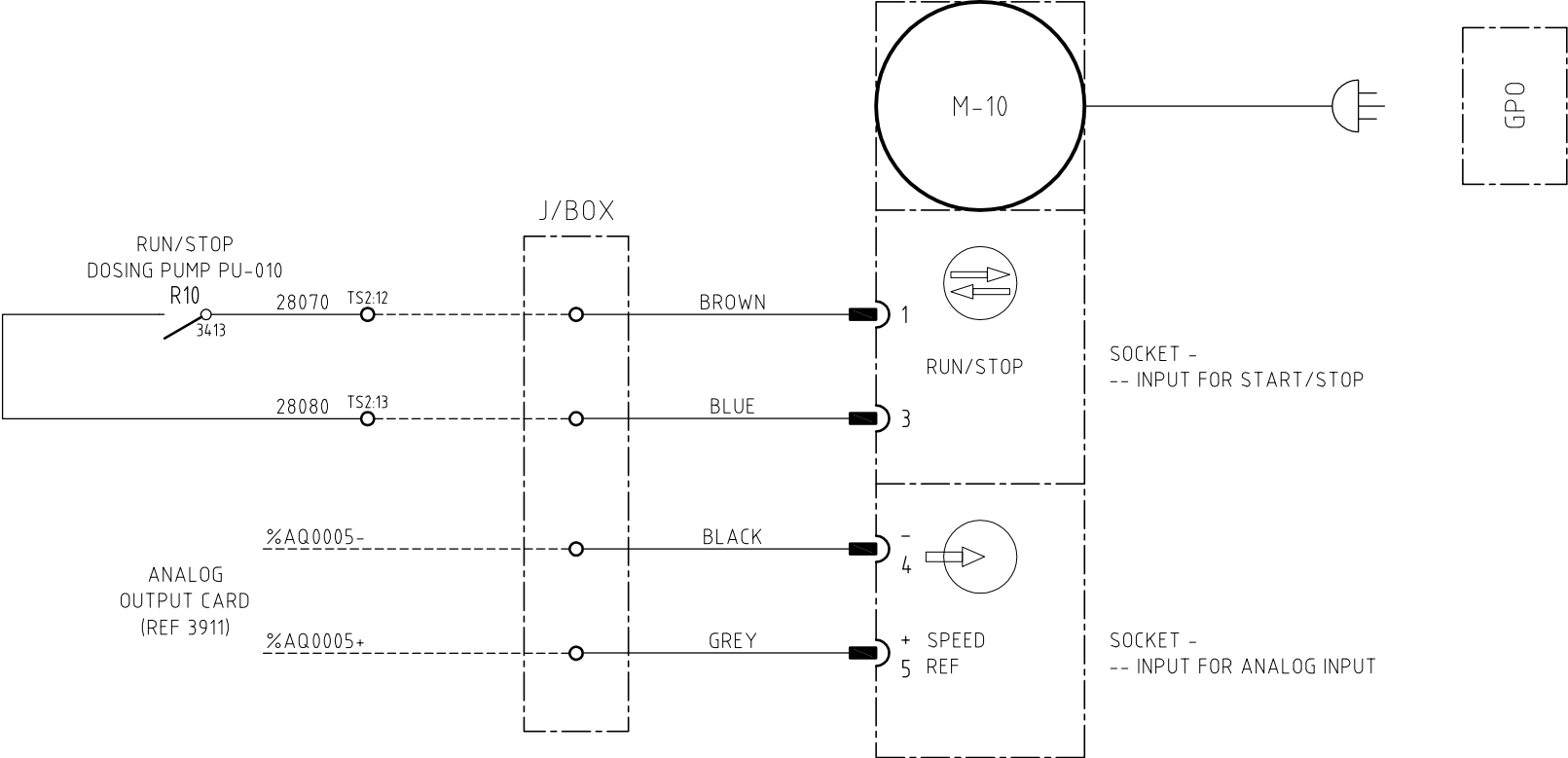
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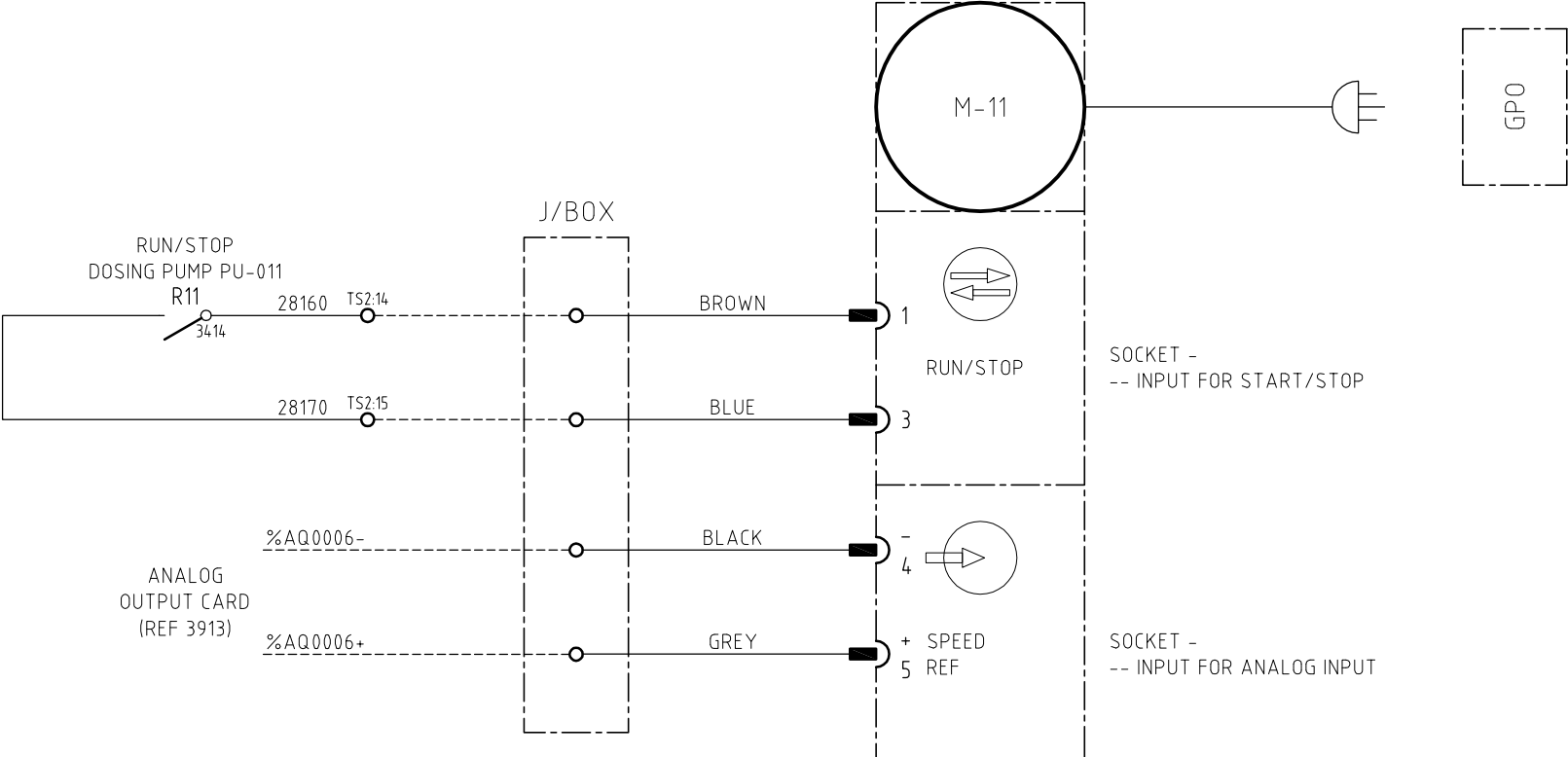
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GRUNDFOS  
DME  
SOCKET 1  
(CABLE 1)

GRUNDFOS DME375  
HIGH FLOW  
DOSING PUMP 1 (PU-010)



GRUNDFOS DME375  
HIGH FLOW  
DOSING PUMP 2 (PU-011)



REDRAWN FROM CONTROL IT DWG 02202701-028

REVISIONS			
NO	BY	DATE	DESCRIPTION
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED



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TITLE
QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM DOSING PUMPS ELECTRICAL DRAWINGS

SCALE	N.T.S	16 NOV 2011
DRAWN	R. OLOFERNES	
CHECKED	-	
DESIGNED	J. PETERS	
APPROVED	-	
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PROJECT		JOB No. 14286 BUNDAMBA E.D.S.	
CUSTOMER		QUEENSLAND URBAN UTILITIES	
DRAWING NO.	SHEET	REV	
A4 486/5/7-0157-030		A	



HARDWIRED CONTROLS

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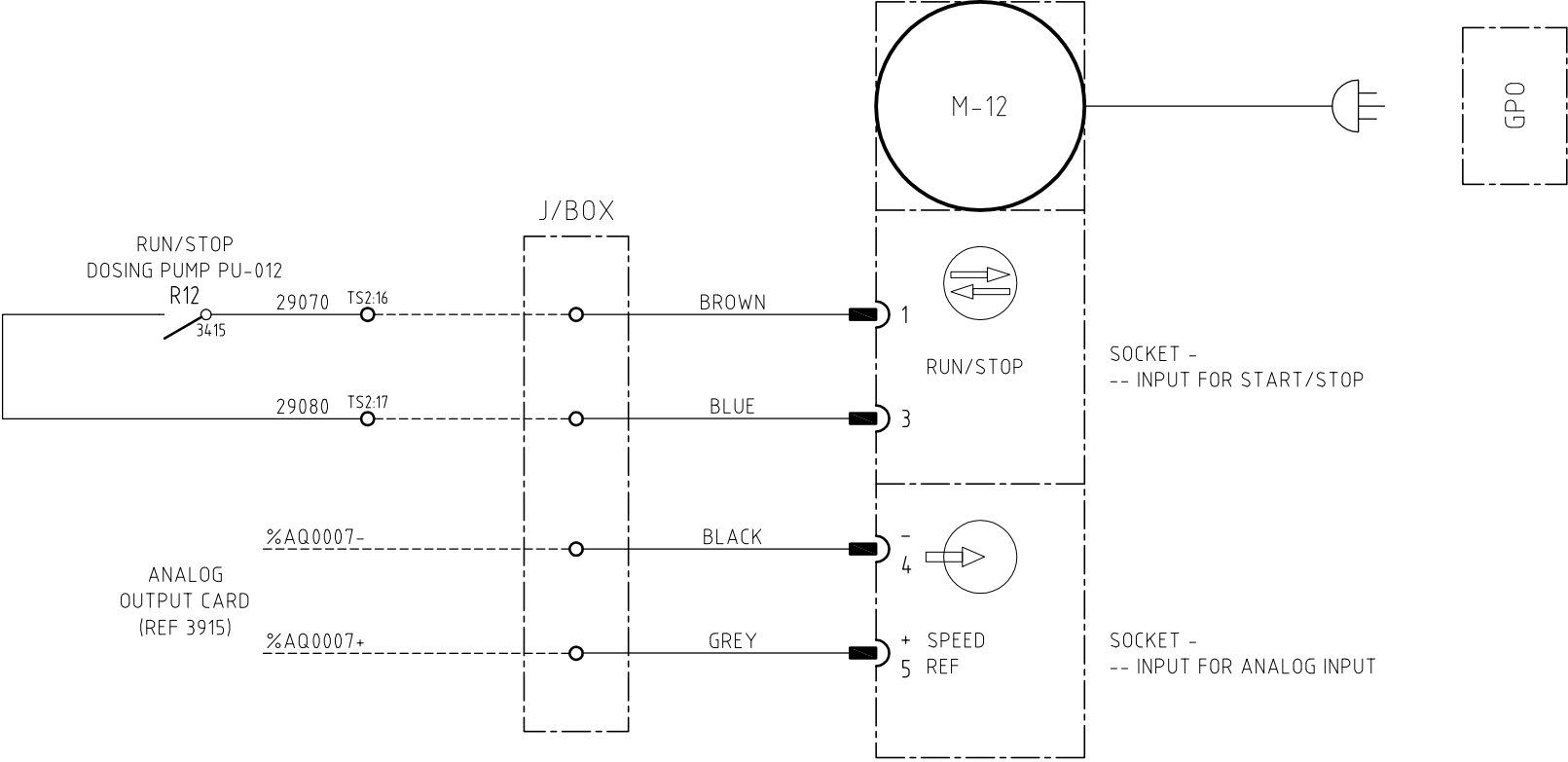
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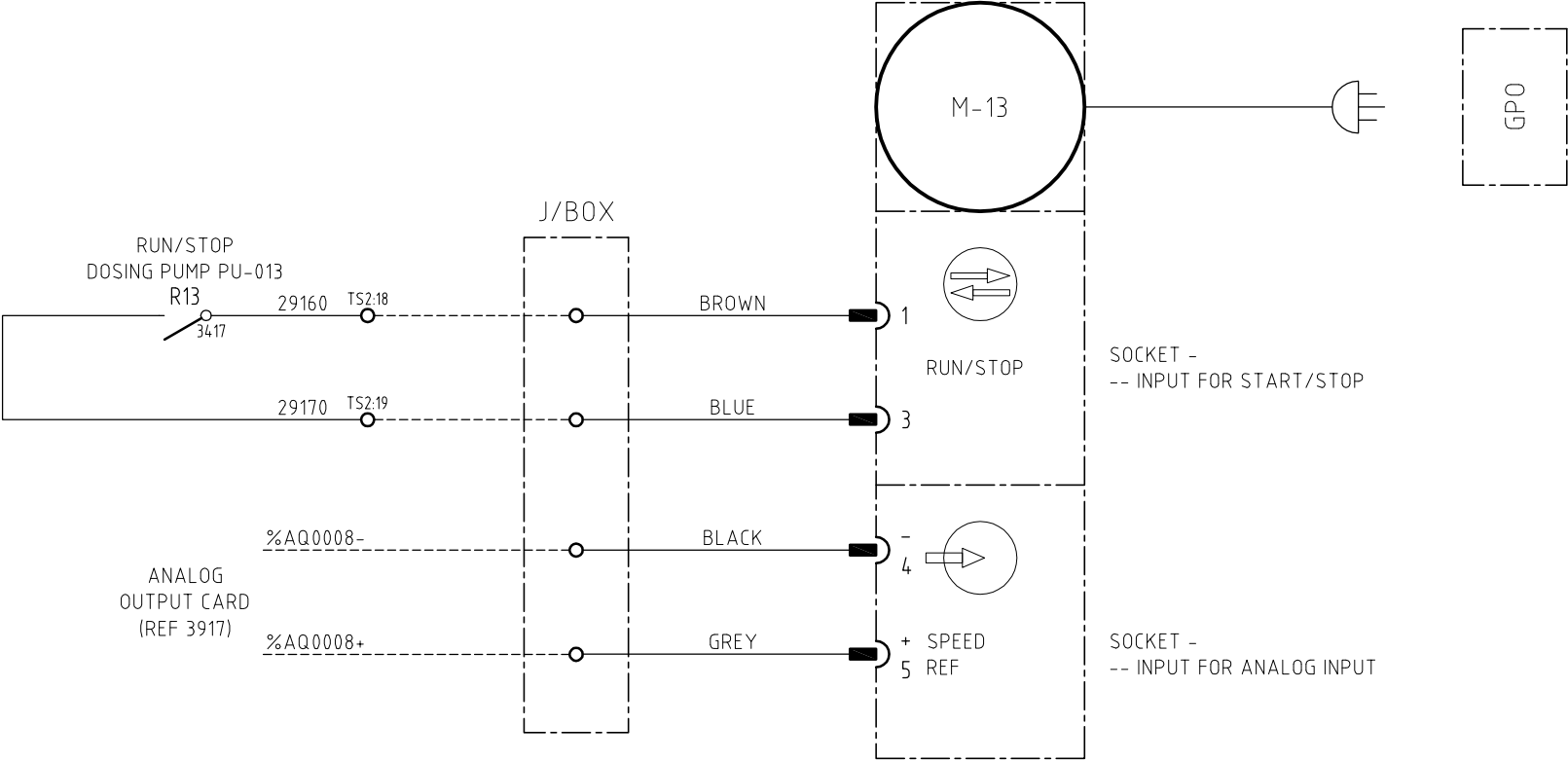
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GRUNDFOS  
DME  
SOCKET 1  
(CABLE 1)

GRUNDFOS DME375  
HIGH FLOW  
DOSING PUMP 3 (PU-012)



GRUNDFOS DME375  
HIGH FLOW  
DOSING PUMP 4 (PU-013)



REDRAWN FROM CONTROL IT DWG 02202701-029

REVISIONS			
NO	BY	DATE	DESCRIPTION
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED



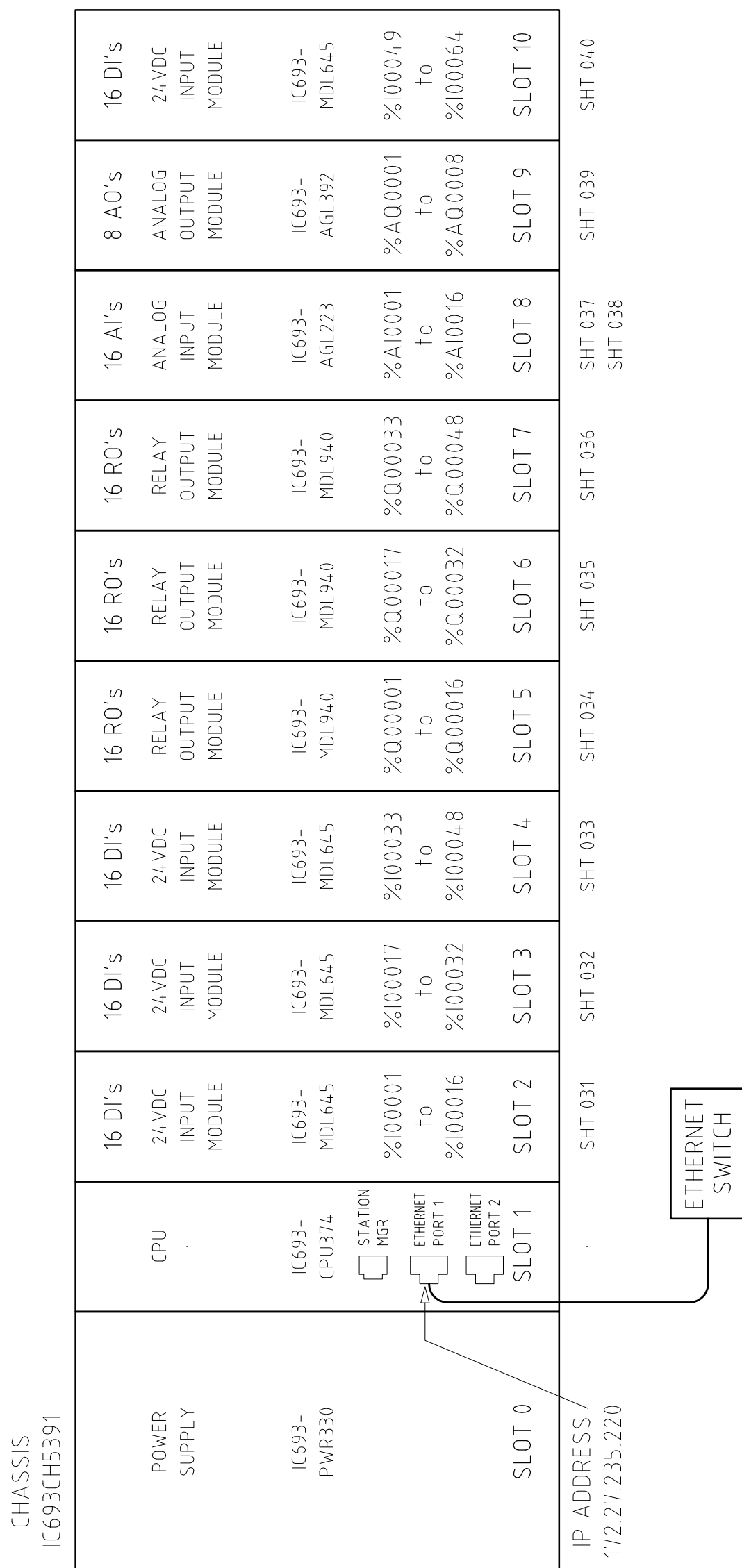
ABN 21 096 286 207  
BRISBANE OFFICE:  
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MURARRIE, QLD 4172  
PHONE :- 61 - 7 - 3908 3908  
FAX :- 61 - 7 - 3908 3909  
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TITLE
QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM DOSING PUMPS ELECTRICAL DRAWINGS


SCALE	N.T.S	16 NOV 2011
DRAWN	R. OLOFERNES	
CHECKED	-	
DESIGNED	J. PETERS	
APPROVED	-	
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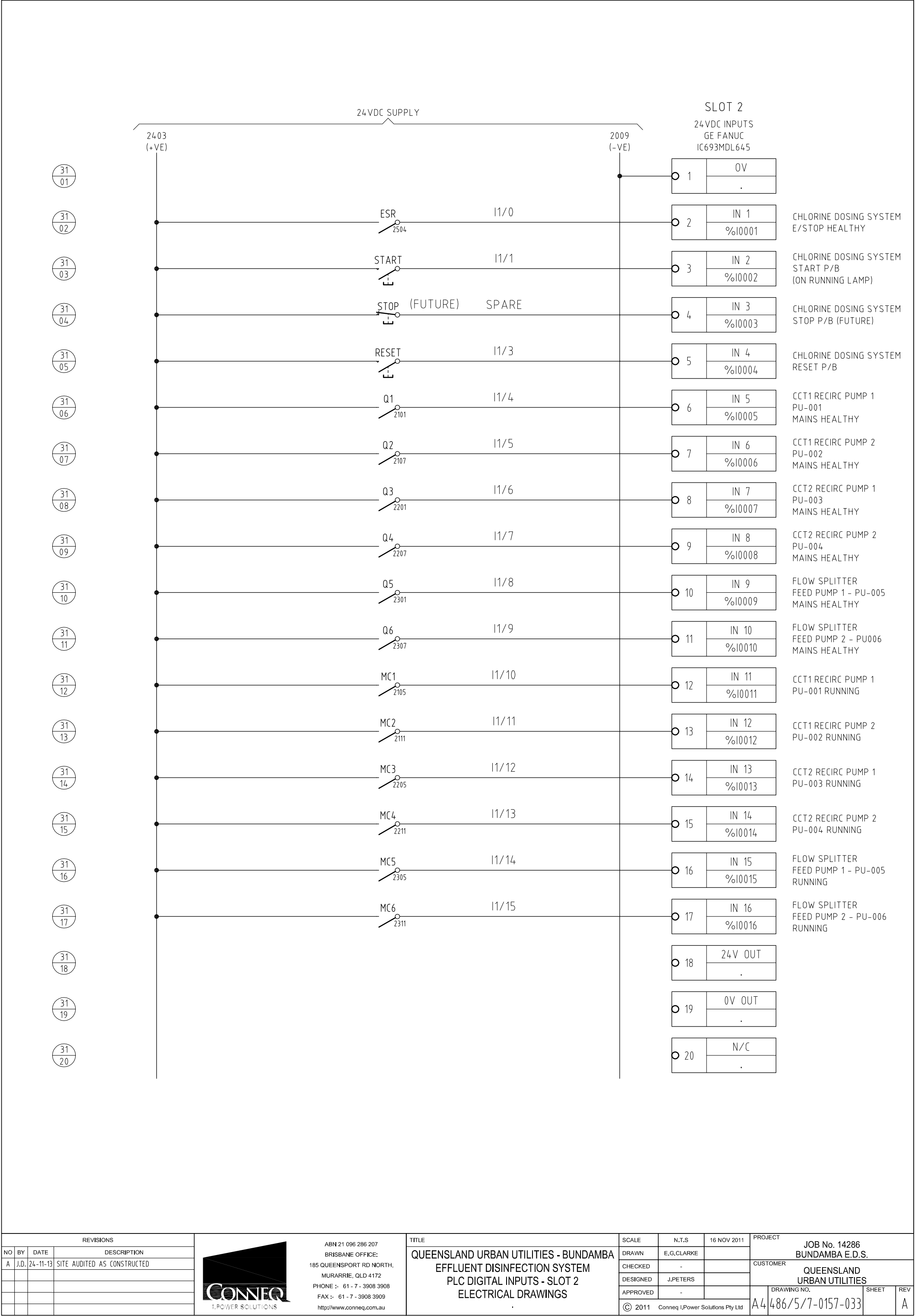
PROJECT		JOB No. 14286 BUNDAMBA E.D.S.	
CUSTOMER		QUEENSLAND URBAN UTILITIES	
DRAWING NO.	SHEET	REV	
A4 486/5/7-0157-031		A	

## PLC I/O RACK LAYOUT



☐ FOR QUOTATION PURPOSES ONLY  
☐ FOR INFORMATION ONLY  
☐ PRELIMINARY - NOT FOR CONSTRUCTION  
☐ FOR REVIEW  
☐ FOR CONSTRUCTION  
☒ AS BUILT

REVISIONS				 <p>ABN 21 096 286 207 BRISBANE OFFICE: 185 QUEENSPORT RD NORTH, MURARRIE, QLD 4172 PHONE :- 61 - 7 - 3908 3908 FAX :- 61 - 7 - 3908 3909 <a href="http://www.conneq.com.au">http://www.conneq.com.au</a></p>	TITLE		SCALE	N.T.S.	16 NOV 2011	PROJECT		
NO	BY	DATE	DESCRIPTION		QUEENSLAND URBAN UTILITIES - BUNDAMBA		DRAWN	E.G.CLARKE		JOB No. 14286 BUNDAMBA E.D.S.		
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED		EFFLUENT DISINFECTION SYSTEM		CHECKED	-		CUSTOMER		
					PLC RACK LAYOUT		DESIGNED	J.PETERS		QUEENSLAND URBAN UTILITIES		
					ELECTRICAL DRAWINGS		APPROVED	-		DRAWING NO.		
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										A4		
										486/5/7-0157-032		A



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TITLE

QUEENSLAND URBAN UTILITIES - BUNDAMBA

EFFLUENT DISINFECTION SYSTEM

PLC DIGITAL INPUTS - SLOT 2

ELECTRICAL DRAWINGS

SCALE	N.T.S	16 NOV 2011	PROJECT
DRAWN	E.G.CLARKE		JOB No. 14286
CHECKED	-		BUNDAMBA E.D.S.
DESIGNED	J.PETERS		CUSTOMER
APPROVED	-		QUEENSLAND
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A4	486/5/7-0157-033	A

NOTE 1  
RELAYS R30-R35 ARE PART OF  
HARD WIRED LOCAL CONTROL  
CIRCUIT - SEE DWG 036

SLOT 3

24VDC INPUTS  
GE FANUC  
IC693MDL645

24VDC SUPPLY

NOTE 2  
AUTO = REMOTE  
OFF = LOCAL OFF  
ON = LOCAL RUN

2405  
(+VE)

2009  
(-VE)

32  
01

32  
02

32  
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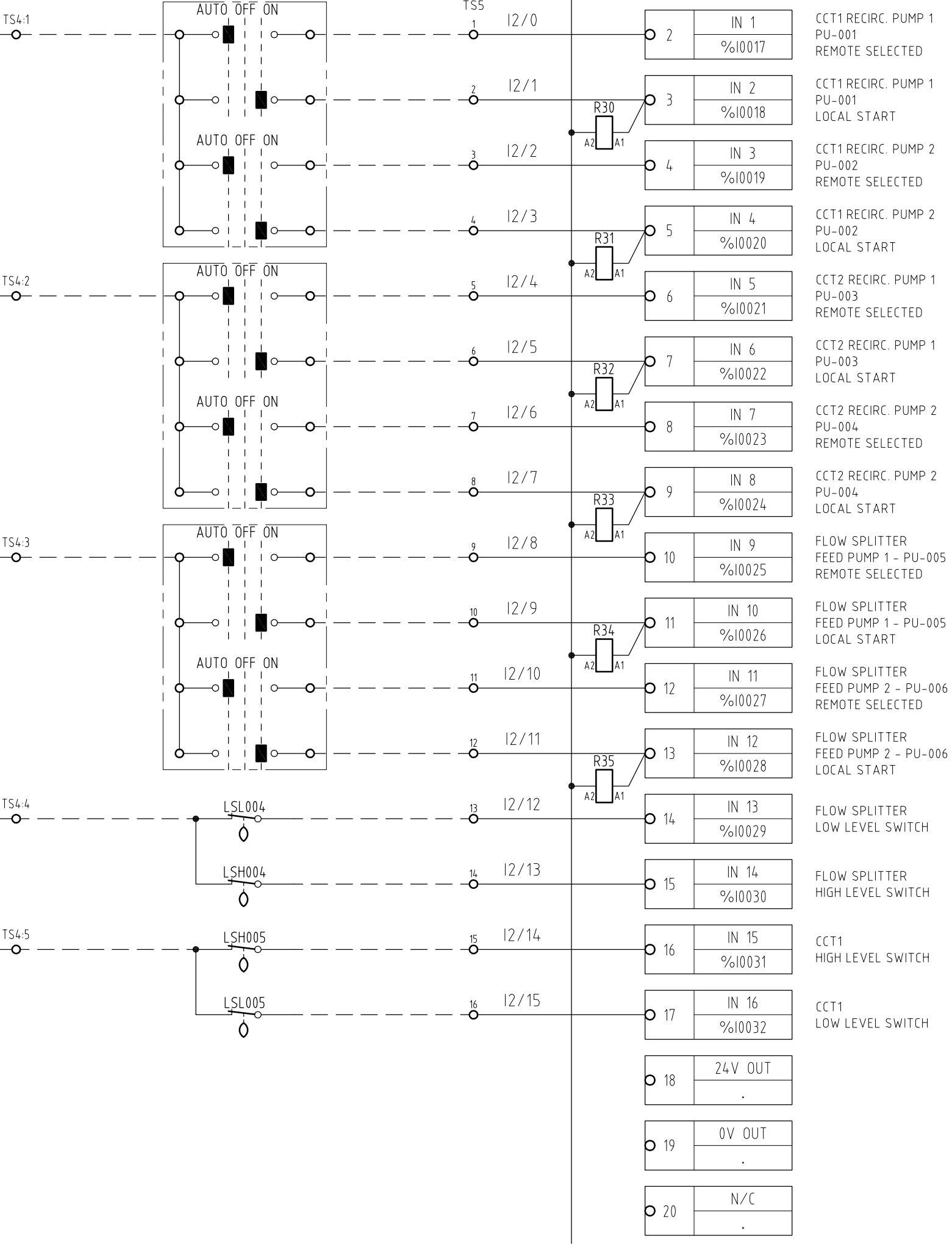
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NO	BY	DATE	DESCRIPTION
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED

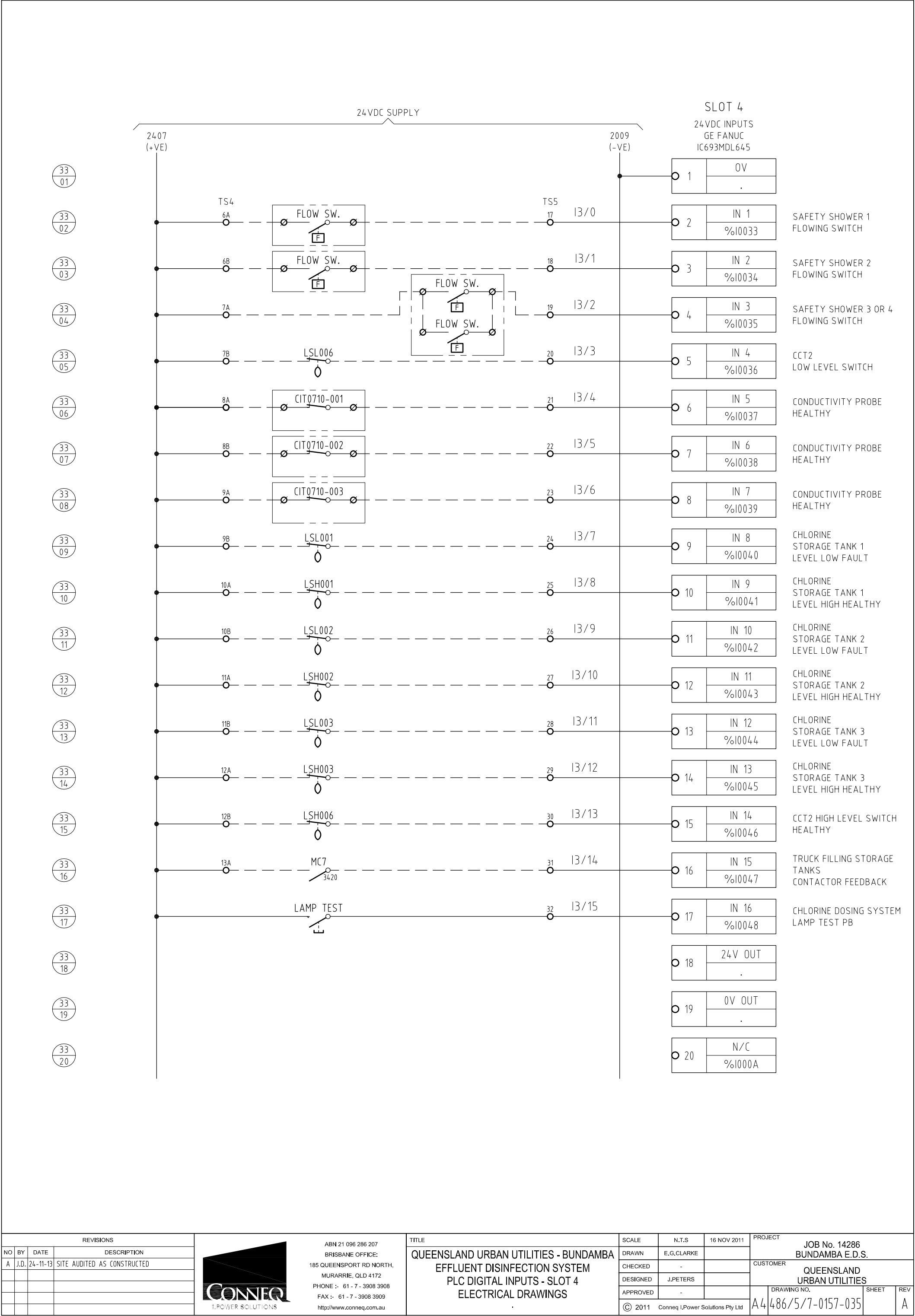


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TITLE
QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM PLC DIGITAL INPUTS - SLOT 3 ELECTRICAL DRAWINGS

SCALE	N.T.S.	16 NOV 2011
DRAWN	E.G.CLARKE	
CHECKED	-	
DESIGNED	J.PETERS	
APPROVED	-	
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PROJECT		JOB No. 14286 BUNDAMBA E.D.S.	
CUSTOMER		QUEENSLAND URBAN UTILITIES	
DRAWING NO.	SHEET	REV	
A4/486/5/7-0157-034		A	



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TITLE	
QUEENSLAND URBAN UTILITIES - BUNDAMBA	
EFFLUENT DISINFECTION SYSTEM	
PLC DIGITAL INPUTS - SLOT 4	
ELECTRICAL DRAWINGS	

SCALE	N.T.S	16 NOV 2011	PROJECT	
DRAWN	E.G.CLARKE		JOB No. 14286	
CHECKED	-		BUNDAMBA E.D.S.	
DESIGNED	J.PETERS		CUSTOMER	
APPROVED	-		QUEENSLAND	
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			486/5/7-0157-035	REV
				A

Q-Pulse Id: TMS795

Active: 25/03/2014

Page 98 of 110

DWG FILE: G:\WATER\JOBS\12012\320026- BUNDAMBA WWTP CCT UPGRADE\21.0 ENGINEERING (FOR SITE USE ONLY)\21.01 DRAWINGS\ILLUS REVISED DRAWINGS\AUTOCAD DWG\486-5-7-0157-035.DWG

NOTE 1  
RELAYS R30-R35 ARE PART OF  
HARD WIRED LOCAL CONTROL  
CIRCUIT - SEE DWG 034

SLOT 5

24VDC RELAY OUTPUTS  
GE FANUC  
IC693MDL940

24VDC SUPPLY

2409  
(+VE)

2405  
(+VE)

2009  
(-VE)

34  
01

V 1 - 4	1
.	

34  
02

OUT 1	2
%Q0001	

34  
03

OUT 2	3
%Q0002	

34  
04

OUT 3	4
%Q0003	

34  
05

OUT 4	5
%Q0004	

34  
06

V 5 - 8	6
.	

34  
07

OUT 5	7
%Q0005	

34  
08

OUT 6	8
%Q0006	

34  
09

OUT 7	9
%Q0007	

34  
10

OUT 8	10
%Q0008	

34  
11

V 9 - 12	11
.	

34  
12

OUT 9	12
%Q0009	

34  
13

OUT 10	13
%Q0010	

34  
14

OUT 11	14
%Q0011	

34  
15

OUT 12	15
%Q0012	

34  
16

V 13 - 16	16
.	

34  
17

OUT 13	17
%Q0013	

34  
18

OUT 14	18
%Q0014	

34  
19

OUT 15	19
%Q0015	

34  
20

OUT 16	20
%Q0016	

04/0

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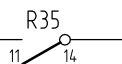
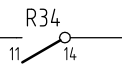
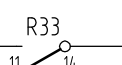
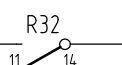
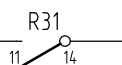
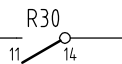
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04/14

04/15



R1

2510

R2

2511

R3

2512

R4

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R5

2514

R6

2515

R7

2607

R8

2616

R9

2707

R10

2807

R11

2816

R12

2907

R13

2916

R28

4122, 4123

R29

4124, 4125

MC7

2011, 2011, 3316

CCT1 RECIRC. PUMP 1  
PU-001  
RUN RELAY

CCT1 RECIRC. PUMP 2  
PU-002  
RUN RELAY

CCT2 RECIRC. PUMP 1  
PU-003  
RUN RELAY

CCT2 RECIRC. PUMP 2  
PU-004  
RUN RELAY

FLOW SPLITTER  
FEED PUMP 1 - PU-005  
RUN RELAY

FLOW SPLITTER  
FEED PUMP 2 - PU-006  
RUN RELAY

LOW FLOW CHLORINE  
DOSING PUMP 1 TO CCT1  
PU-007 RUN RELAY

LOW FLOW CHLORINE  
DOSING PUMP 2  
TO CCT 1 OR CCT2  
PU-008 RUN RELAY

LOW FLOW CHLORINE  
DOSING PUMP 3 TO CCT2  
PU-009 RUN RELAY

HIGH FLOW CHLORINE  
DOSING PUMP 1 TO CCT1  
PU-010 RUN RELAY

HIGH FLOW CHLORINE  
DOSING PUMP 2 TO CCT1  
PU-011 RUN RELAY

HIGH FLOW CHLORINE  
DOSING PUMP 3 TO CCT2  
PU-012 RUN RELAY

HIGH FLOW CHLORINE  
DOSING PUMP 4 TO CCT2  
PU-013 RUN RELAY

LOW FLOW DOSING VALVE  
TO CCT1  
SV3700-412

LOW FLOW DOSING VALVE  
TO CCT2  
SV3700-423

TRUCK FILL POWER  
CONTACTOR

REVISIONS			
NO	BY	DATE	DESCRIPTION
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED



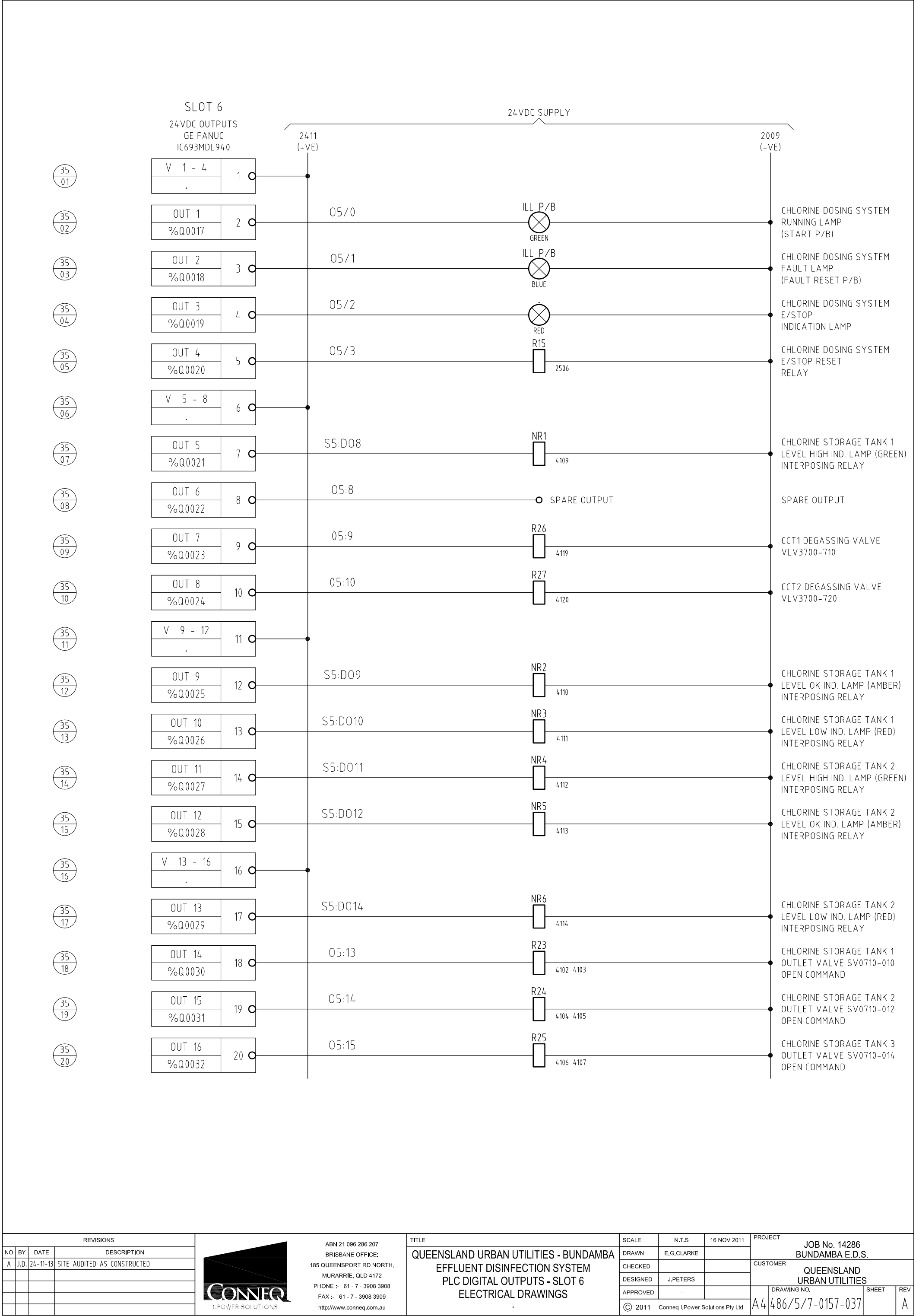
ABN 21 096 286 207  
BRISBANE OFFICE:  
185 QUEENSPORT RD NORTH,  
MURARRIE, QLD 4172  
PHONE :- 61 - 7 - 3908 3908  
FAX :- 61 - 7 - 3908 3909  
http://www.conneq.com.au

TITLE  
QUEENSLAND URBAN UTILITIES - BUNDAMBA  
EFFLUENT DISINFECTION SYSTEM  
PLC DIGITAL OUTPUTS - SLOT 5  
ELECTRICAL DRAWINGS

SCALE	N.T.S	16 NOV 2011
DRAWN	E.G.CLARKE	
CHECKED	-	
DESIGNED	J.PETERS	
APPROVED	-	
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PROJECT		JOB No. 14286 BUNDAMBA E.D.S.	
CUSTOMER		QUEENSLAND URBAN UTILITIES	
DRAWING NO.	A4	486/5/7-0157-036	SHEET
REV	A		





REVISIONS			
NO	BY	DATE	DESCRIPTION
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED



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BRISBANE OFFICE:

185 QUEENSPORT RD NORTH,

MURARRIE, QLD 4172

PHONE :- 61 - 7 - 3908 3908

FAX :- 61 - 7 - 3908 3909

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TITLE

QUEENSLAND URBAN UTILITIES - BUNDAMBA

EFFLUENT DISINFECTION SYSTEM

PLC DIGITAL OUTPUTS - SLOT 6

ELECTRICAL DRAWINGS

SCALE	N.T.S	16 NOV 2011	PROJECT	
DRAWN	E.G.CLARKE		JOB No. 14286	
CHECKED	-		BUNDAMBA E.D.S.	
DESIGNED	J.PETERS		CUSTOMER	
APPROVED	-		QUEENSLAND	
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			DRAWING NO.	SHEET
			486/5/7-0157-037	REV
				A

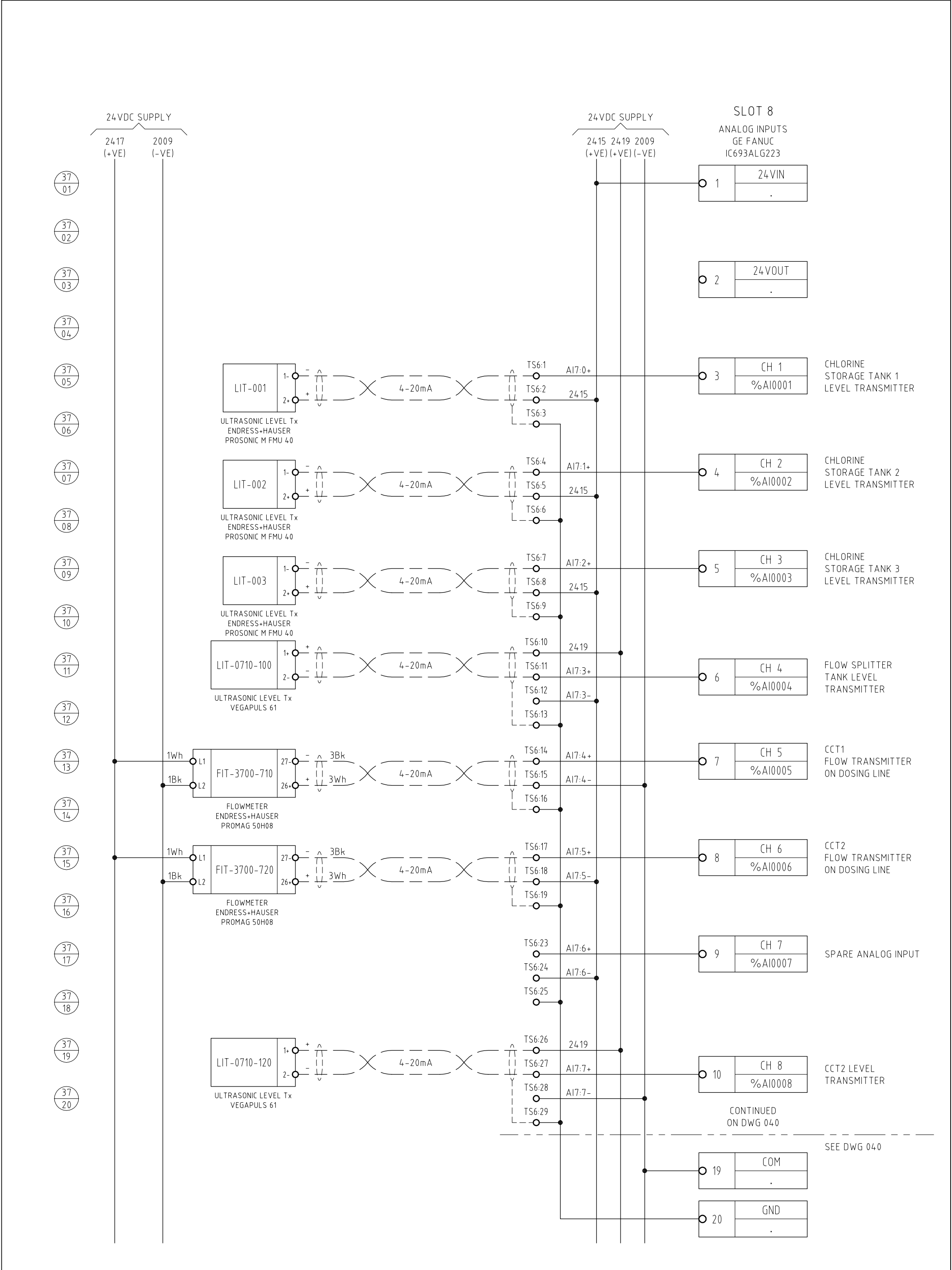
Q-Pulse Id: TMS795

Active: 25/03/2014

Page 100 of 110

DWG FILE: G:\WATER\JOBS\12012320026- BUNDAMBA WWTP CCT UPGRADE\21.0 ENGINEERING (FOR SITE USE ONLY)\21.01 DRAWINGS\ILLUS REVISED DRAWINGS\AUTOCAD DWG\486-5-7-0157-037.DWG





REVISIONS			
NO	BY	DATE	DESCRIPTION
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED

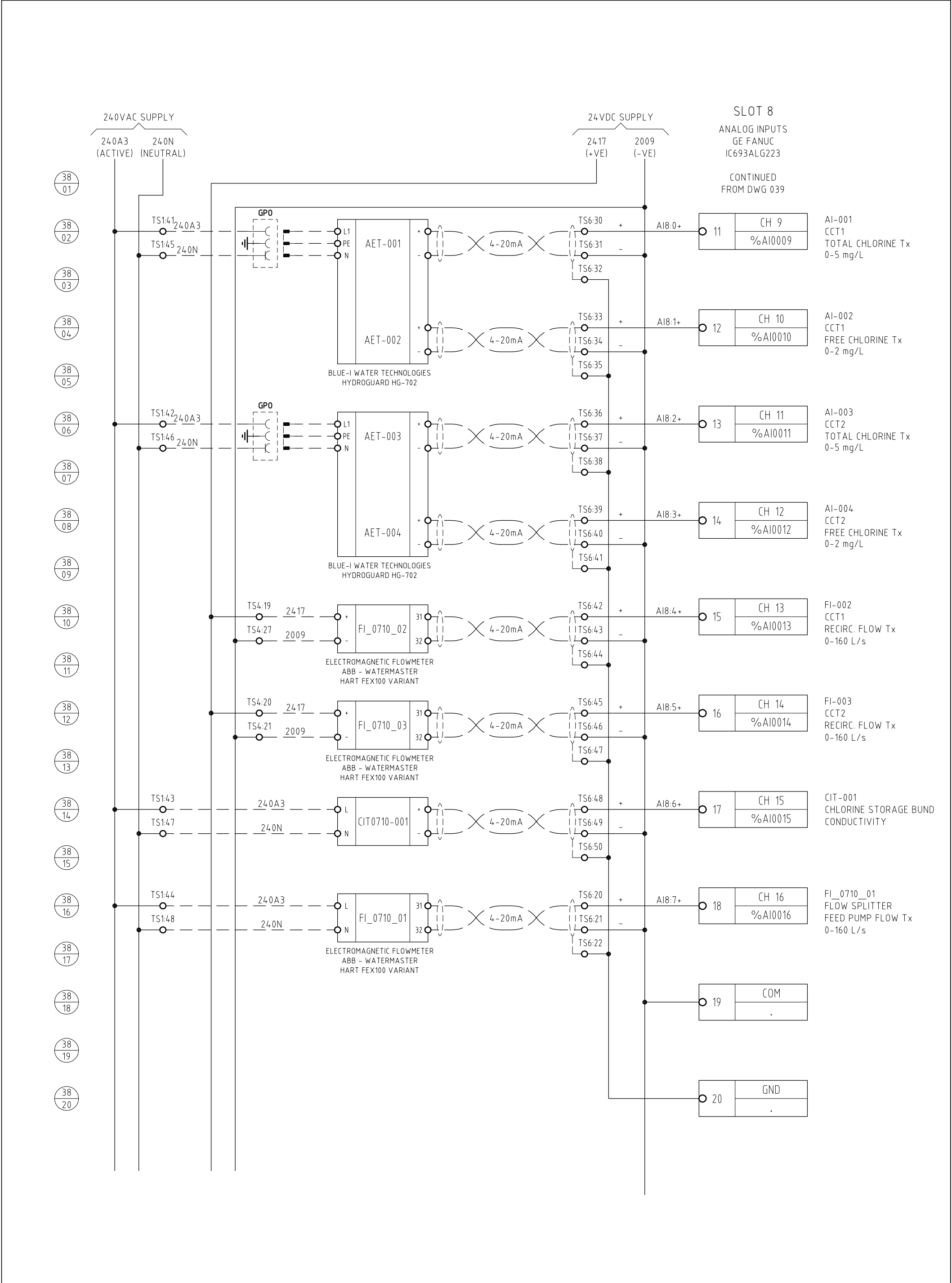



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FAX :- 61 - 7 - 3908 3909  
http://www.conneq.com.au

TITLE
QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM PLC ANALOG INPUTS - SLOT 8 ELECTRICAL DRAWINGS

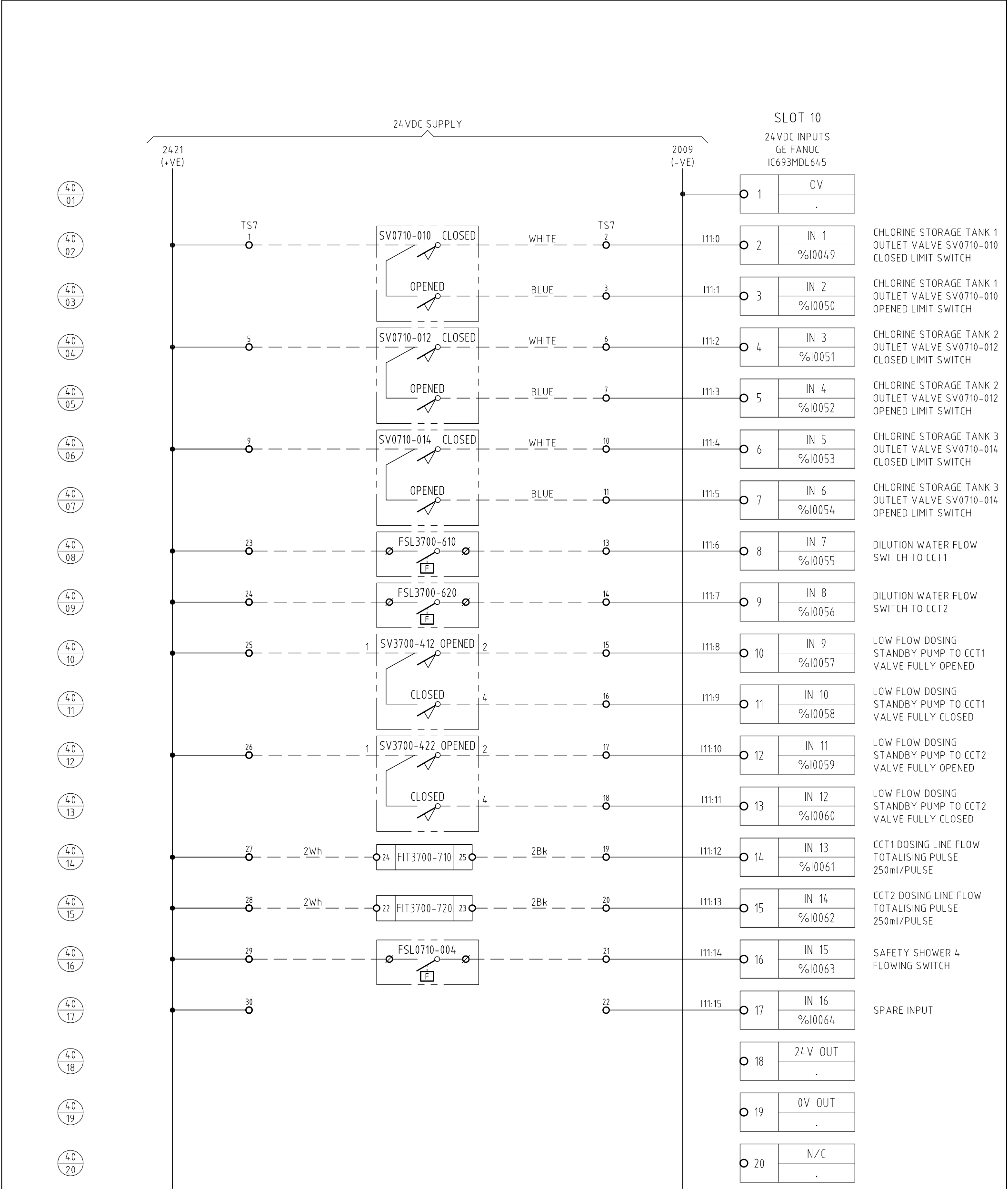
SCALE	N.T.S	16 NOV 2011
DRAWN	E.G.CLARKE	
CHECKED	-	
DESIGNED	J.PETERS	
APPROVED	-	
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PROJECT		JOB No. 14286 BUNDAMBA E.D.S.	
CUSTOMER		QUEENSLAND URBAN UTILITIES	
DRAWING NO.	SHEET	REV	
A4 486/5/7-0157-039		A	



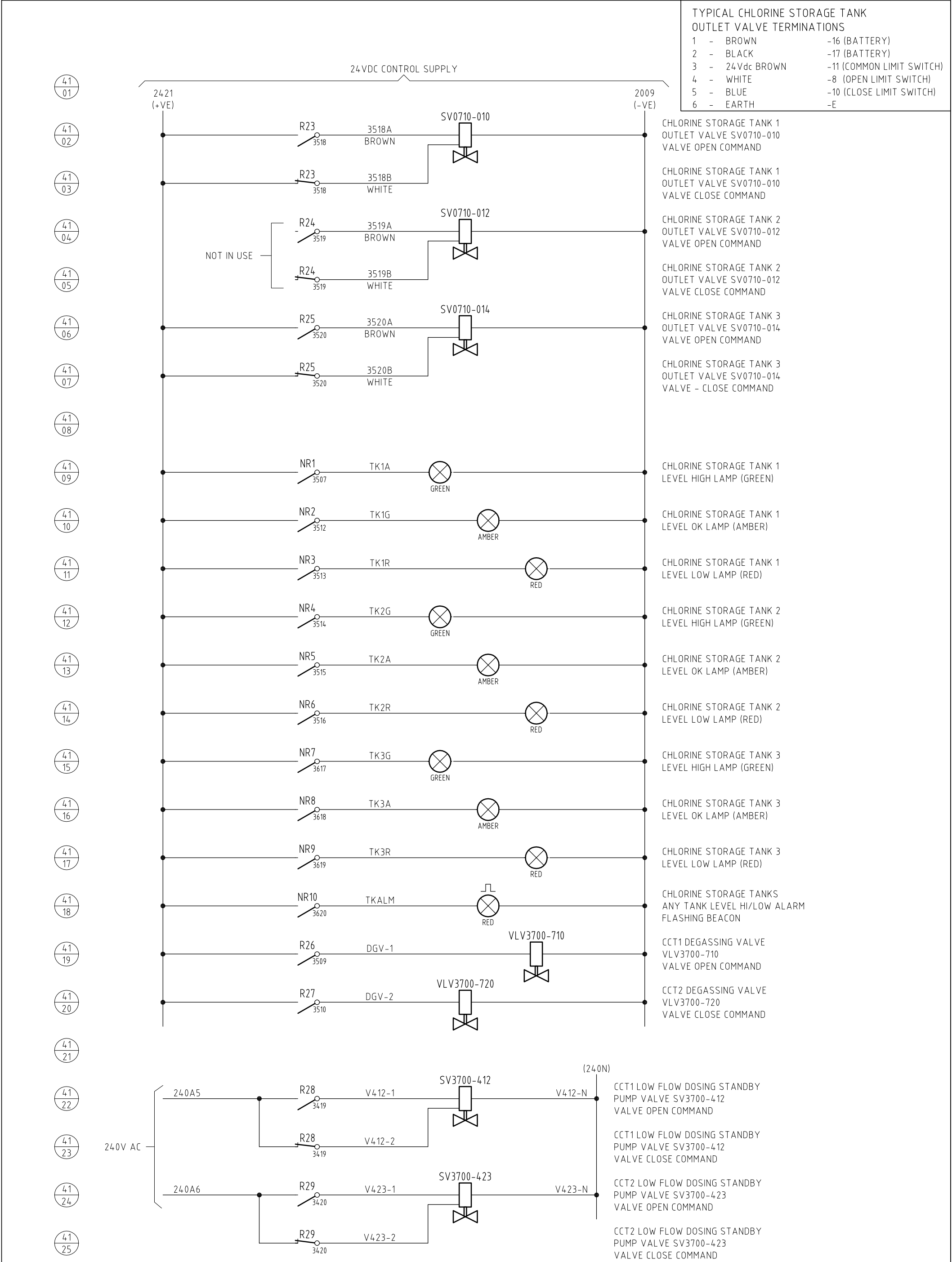
REVISIONS					ABN 21 096 286 207 BRISBANE OFFICE: 185 QUEENSPORT RD NORTH, MURARRIE, QLD 4172 PHONE :- 61 - 7 - 3908 3908 FAX :- 61 - 7 - 3908 3909 http://www.conneq.com.au	TITLE QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM PLC ANALOG INPUTS - SLOT 8 ELECTRICAL DRAWINGS	SCALE	N.T.S	16 NOV 2011	PROJECT JOB No. 14286 BUNDAMBA E.D.S.	CUSTOMER QUEENSLAND URBAN UTILITIES	DRAWING NO. A4 486/5/7-0157-040	SHEET	REV A
NO	BY	DATE	DESCRIPTION											
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED											

Q-Pulse Id: TMS795 Active: 25/03/2014 Page 104 of 110



REVISIONS				 <div>ABN 21 096 286 207 BRISBANE OFFICE: 185 QUEENSPORT RD NORTH, MURARRIE, QLD 4172 PHONE :- 61 - 7 - 3908 3908 FAX :- 61 - 7 - 3908 3909 http://www.conneq.com.au</div>	TITLE QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM PLC DIGITAL INPUTS - SLOT 10 ELECTRICAL DRAWINGS	SCALE	N.T.S	16 NOV 2011	PROJECT JOB No. 14286 BUNDAMBA E.D.S.			
NO	BY	DATE	DESCRIPTION			DRAWN	E.G.CLARKE		CUSTOMER QUEENSLAND URBAN UTILITIES			
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED			CHECKED	-					
						DESIGNED	J.PETERS					
						APPROVED	-					
						© 2011 Conneq I.Power Solutions Pty Ltd						
									DRAWING NO.	SHEET	REV	
							A4 486/5/7-0157-042		A			





TYPICAL CHLORINE STORAGE TANK OUTLET VALVE TERMINATIONS		
1	- BROWN	-16 (BATTERY)
2	- BLACK	-17 (BATTERY)
3	- 24Vdc BROWN	-11 (COMMON LIMIT SWITCH)
4	- WHITE	-8 (OPEN LIMIT SWITCH)
5	- BLUE	-10 (CLOSE LIMIT SWITCH)
6	- EARTH	-E

REVISIONS			
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http://www.conneq.com.au

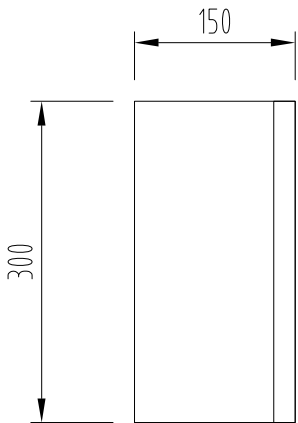
TITLE
QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM HARDWIRED CONTROL SCHEMATIC ELECTRICAL DRAWINGS

SCALE	N.T.S	16 NOV 2011
DRAWN	R. OLOFERNES	
CHECKED	-	
DESIGNED	J. PETERS	
APPROVED	-	
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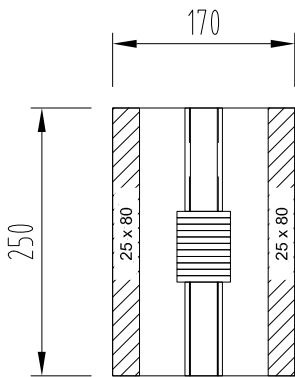
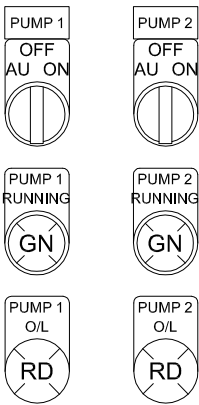
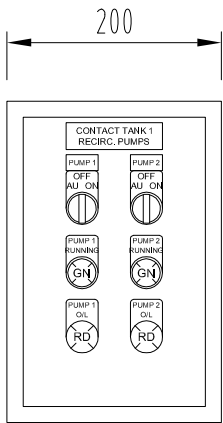
PROJECT		JOB No. 14286 BUNDAMBA E.D.S.	
CUSTOMER		QUEENSLAND URBAN UTILITIES	
	DRAWING NO.	SHEET	REV
A4	486/5/7-0157-043		A

LOCAL CONTROL PANEL

SIDE VIEW




FRONT VIEW



2405
I2/0
I2/1
I2/2
I2/3
O6/0
O6/1
O6/2
O6/3
2009
EARTH

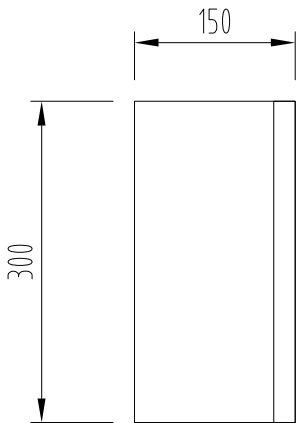
NOTE:  
PANEL CONSTRUCTION:  
316 STAINLESS STEEL, IP66 PROTECTION

REDRAWN FROM CONTROL IT DWG 02202701-045

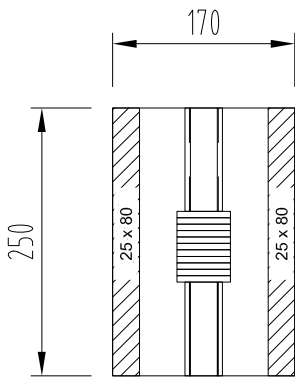
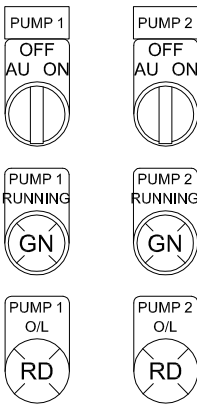
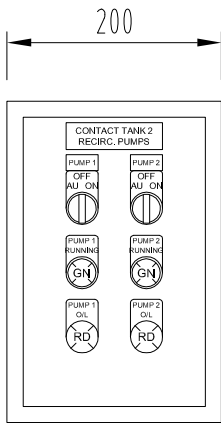
REVISIONS					ABN 21 096 286 207 BRISBANE OFFICE: 185 QUEENSPORT RD NORTH, MURARRIE, QLD 4172 PHONE :- 61 - 7 - 3908 3908 FAX :- 61 - 7 - 3908 3909 http://www.conneq.com.au	TITLE QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM CHLORINE CONTACT TANK 1 - LCP ELECTRICAL DRAWINGS	SCALE	N.T.S	08 MAY 2013	PROJECT JOB No. 14286 BUNDAMBA E.D.S.			
NO	BY	DATE	DESCRIPTION				DRAWN	J.DALZIEL		CUSTOMER QUEENSLAND URBAN UTILITIES			
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED				CHECKED	-		DRAWING NO. A4 486/5/7-0157-044			
							DESIGNED	-		SHEET A			
							APPROVED	-					
								© 2011	Conneq i.Power Solutions Pty Ltd				

LOCAL CONTROL PANEL

SIDE VIEW




FRONT VIEW



2405
I2/4
I2/5
I2/6
I2/7
O6/4
O6/5
O6/6
O6/7
2009
EARTH

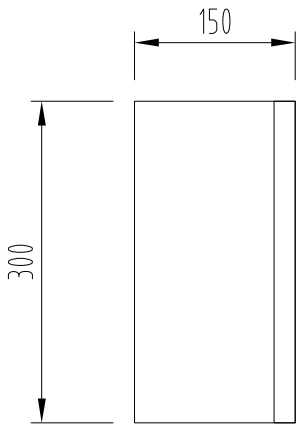
NOTE:  
PANEL CONSTRUCTION:  
316 STAINLESS STEEL, IP66 PROTECTION

REDRAWN FROM CONTROL IT DWG 02202701-046

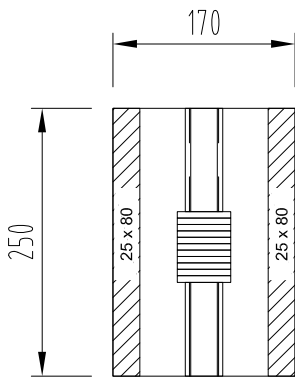
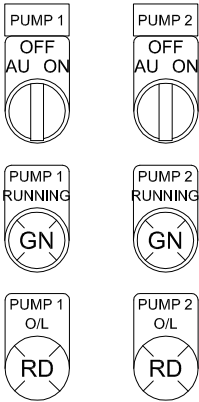
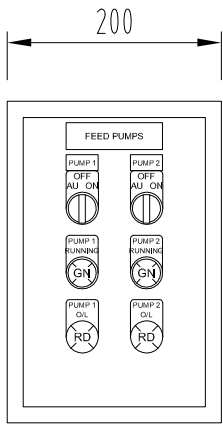
REVISIONS				<div><div>ABN 21 096 286 207 BRISBANE OFFICE: 185 QUEENSPORT RD NORTH, MURARRIE, QLD 4172 PHONE :- 61 - 7 - 3908 3908 FAX :- 61 - 7 - 3908 3909 <a href="http://www.conneq.com.au">http://www.conneq.com.au</a></div></div>	TITLE			SCALE	N.T.S	08 MAY 2013	PROJECT			
NO	BY	DATE	DESCRIPTION		QUEENSLAND URBAN UTILITIES - BUNDAMBA			DRAWN	J.DALZIEL		JOB No. 14286			
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED		EFFLUENT DISINFECTION SYSTEM			CHECKED	-		CUSTOMER			
					CHLORINE CONTACT TANK 2 - LCP			DESIGNED	-		QUEENSLAND			
					ELECTRICAL DRAWINGS			APPROVED	-		URBAN UTILITIES			
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											A4		486/5/7-0157-045	A

LOCAL CONTROL PANEL

SIDE VIEW




FRONT VIEW



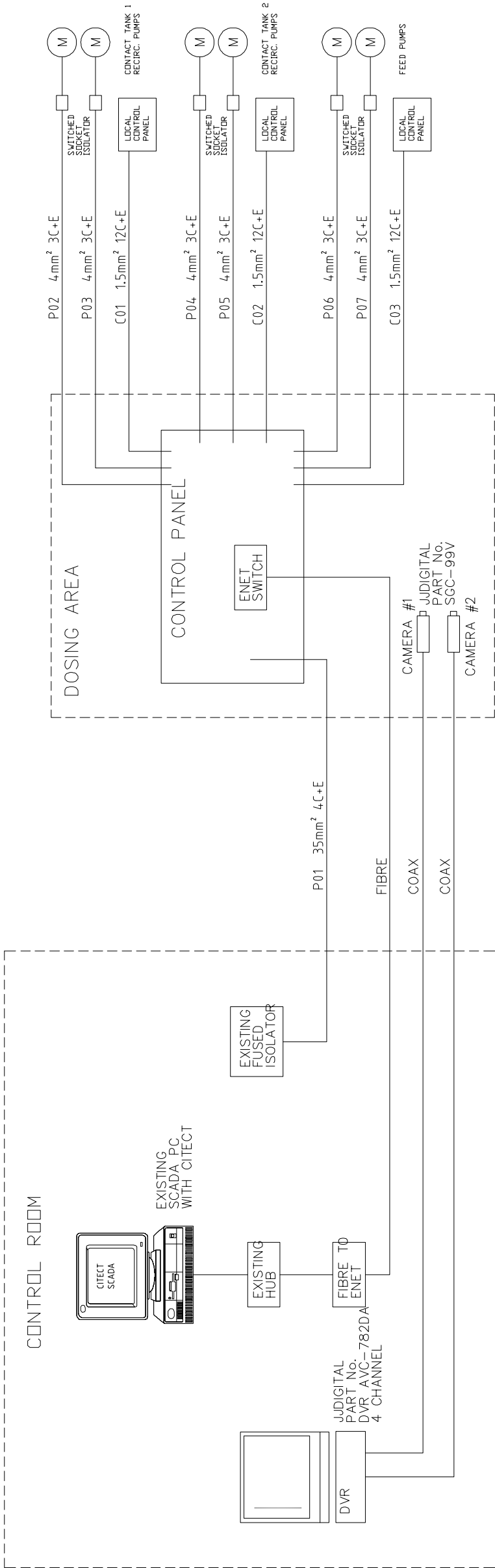
2405
I2/8
I2/9
I2/10
I2/11
O6/8
O6/9
O6/10
O6/11
2009
EARTH

NOTE:  
PANEL CONSTRUCTION:  
316 STAINLESS STEEL, IP66 PROTECTION

REDRAWN FROM CONTROL IT DWG 02202701-047

REVISIONS				<div><div>ABN 21 096 286 207 BRISBANE OFFICE: 185 QUEENSPORT RD NORTH, MURARRIE, QLD 4172 PHONE :- 61 - 7 - 3908 3908 FAX :- 61 - 7 - 3908 3909 <a href="http://www.conneq.com.au">http://www.conneq.com.au</a></div></div>	TITLE			SCALE	N.T.S	08 MAY 2013	PROJECT			
NO	BY	DATE	DESCRIPTION		QUEENSLAND URBAN UTILITIES - BUNDAMBA			DRAWN	J.DALZIEL		JOB No. 14286			
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED		EFFLUENT DISINFECTION SYSTEM			CHECKED	-		CUSTOMER			
					FEED PUMPS - LCP			DESIGNED	-		QUEENSLAND			
					ELECTRICAL DRAWINGS			APPROVED	-		URBAN UTILITIES			
								© 2011 Conneq i.Power Solutions Pty Ltd			DRAWING NO.		SHEET	REV
											A4	486/5/7-0157-046		A

BUNDAMBA



REDRAWN FROM CONTROL IT DWG 02202701-050

Cable Schedule				
Brand	Model	Location	Cable Type	Length (m)
Vega	VegaSON 61	Common	1.5mm sq. 2 Pair Dekoron	90
Vega	VegaSON 61	CCT No.2	1.5mm sq. 2 Pair Dekoron	170
Delta Ohm	SPTKI-12	Conductivity	1.5mm sq. 2 Core + E O/Circ	30
Delta Ohm	SPTKI-12	Conductivity	0.5mm sq. 2 Pair Dekoron	30
Delta Ohm	SPTKI-12	Conductivity	1.5mm sq. 2 Core + E O/Circ	100
Delta Ohm	SPTKI-12	Conductivity	1.5mm sq. 2 Pair Dekoron	100
Georg Fischer	107 PVC-U 100-230V	Dosing (Low Flow Pump 1)	1.5mm sq. 3 Core + E Control Cable	15
Georg Fischer	107 PVC-U 100-230V	Dosing (Low Flow Pump 1)	0.5mm sq. 6 Core + E Control Cable	15
Georg Fischer	107 PVC-U 100-230V	Dosing (Low Flow Pump 2)	1.5mm sq. 3 Core + E Control Cable	15
Georg Fischer	107 PVC-U 100-230V	Dosing (Low Flow Pump 2)	0.5mm sq. 6 Core + E Control Cable	15
Burkert	Type 0142	Dosing	1.5mm sq. 2 Core + E O/Circ	15
Burkert	Type 0142	Dosing	1.5mm sq. 2 Core + E O/Circ	15
E&H	Promag 50H08	Dosing	0.5mm sq. 2 Pair Dekoron	10
E&H	Promag 50H08	Dosing	0.5mm sq. 2 Pair Dekoron	10

REVISIONS			
NO	BY	DATE	DESCRIPTION
A	J.D.	24-11-13	SITE AUDITED AS CONSTRUCTED



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FAX :- 61 - 7 - 3908 3909  
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TITLE
QUEENSLAND URBAN UTILITIES - BUNDAMBA EFFLUENT DISINFECTION SYSTEM BLOCK DIAGRAM ELECTRICAL DRAWINGS

SCALE	N.T.S.	08 MAY 2013	PROJECT	
DRAWN	J.DALZIEL		JOB No. 14286 BUNDAMBA E.D.S.	
CHECKED	-		CUSTOMER	
DESIGNED	-		QUEENSLAND URBAN UTILITIES	
APPROVED	-		DRAWING NO.	
© 2011 Conneq i.Power Solutions Pty Ltd			A4	486/5/7-0157-047
			SHEET	REV
				A