QUEENSLAND URBAN UTILITIES

SP344 – SIX MILE CREEK

BRISBANE ROAD,

REDBANK

SEWAGE PUMPING STATION

CIVIL AND MECHANICAL

OPERATION AND MAINTENANCE MANUAL

Developed by:

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1. Electrical Installs

J. & P. RICHARDSON INDUSTRIES PTY LTD
SITE INSPECTION REPORT ELECTRICAL INSTALLATION (MAJOR)

JOB No: CUSTOMER: LOCATION: DRAWING No: Form F1015/6

FIELD INSPECTION BY:		DATE:	SUPERVISOR:		PAGE 1 OF 2
		REMARKS			REMARKS
CABLE LADDER	BRACKETS DE-BURRED		TERMINATION	CABLE NUMBERING	
	ADEQUATE SUPPORTS			CONNECTIONS	
	EARTH BONDING			TENSION ON TERMINALS	
	SPRING WASHER & FULL NUT THREAD				
	PAINTING				
	WELDING STANDARD		EARTHING	RESISTANCE OF EARTH GRID / STAKE	
				BONDING FENCES, EQUIPMENT, GRID AND GATES	
				CABLE SUPPORTS, WATER, PIPES, ETC,	
MOUNTING OF FIELD EQUIPMENT	WELDING STANDARD			MEN CONNECTIONS	
	BRACKETS DE-BURRED			SIZE	
	ADEQUATE STRENGTH				
	SPRING WASHER & FULL NUT THREAD				
	MOUNTING POSITION APPROVED		MAINS	SIZE	
				VOLTAGE DROP	
				ELECTRICAL PROTECTION	
RUNNING OF CABLES	GROUPING FOR DE-RATING			SUPPLY AUTHORITY METERING APPROVED	
	CLEARANCE FROM INSTRUMENTATION			POLARITY / VOLTAGE	
	DEPTH UNDERGROUND				
	ADEQUATE SUPPORT				
	PROTECTION				
	GLANDING				
	LABELLING				
	POINT TO POINT CHECKS				

J. & P. RICHARDSON INDUSTRIES PTY LTD

SITE INSPECTION REPORT ELECTRICAL INSTALLATION (MAJOR)

Form No. F1015/6

JOB No: CUSTOMER: LOCATION: DRAWING No:

FIELD INSPECTION BY: DATE: SUPERVISOR: PAGE 2 OF 2

CIRCUIT - DRIVE IDENTIFICATION	KW	F.L.C. (A)	RCD TRIP TIME (ms)	RCD TEST TRIP CURRENT (mA)	INSUL (M ohm)	CONT (ohm)	Local Stop	Local E/Stop	CB - O/L SETTINGS (A)	MAGNET SETTING (A)	WHOLE CURRENT ISOLATOR OPERATING	THERMISTOR PROTECTION OPERATING	LOCK OFF OPERATING	MOTOR No LOAD CURRENT (A)	PHASE ROTATION / POLARITY CHECK	CABLE SIZE-TYPE (mm^2)	DATE TESTED	TESTED BY	REMARKS
							Operating	Operating											

Form: F1109/0

J & P RICHARDSON INDUSTRIES PTY LTD

INSPECTION & TEST PLAN

*** Legend** **x = Perform** **w = Witness** **a = Accept** **r = Random** **H = Hold (mandatory)** **h = hold (optional)** **c = Certify**

ITP No. C54000-SP34-Electrical Install

Project: Electrical Install

Contract No: I112-024

Customer: Queensland Urban Utilities

Item No	Process Sequence	Acceptance Criteria	Activity By*		Reference Documents	Remarks/Records
			JPR	CUST		
1	**DESIGN**					
1.1	**Design Documents**					
1.1.1	Electrical Drawings - Approved for Construction	Complies with specification, drawings and schedules	a + h	x	Contract Drawings & Documents	486/5/7-0255-000 Amend 2 to 486/5/7-0255-027 Amend 2 Incl
1.1.2	Scope of Works and Project Specification	Documentation provided as IFC and sufficiently complete for JPR to proceed	a + h	x	Contract Drawings & Documents	486/5/7-0255-000 Amend 2 to 486/5/7-0255-027 Amend 2 Incl
2	**IMPLEMENTATION**					
2.1	**Site Works**					
2.1.1	Positioning of Switchboards , Pumps , Valves ,Ladder ,Traywork & Relevant Site Instrumentation	Complies with specification, drawings and schedules	x	w	Specification, drawings	QU-SP034-01-CIV-0110-0008 REV1 QU-SP034-01-CIV-0110-0010 REV1 QU-SP034-01-CIV-0110-0016 REV1 QU-SP034-01-CIV-0110-0017 REV1 QU-SP034-01-STR-0110-006 REV1 QU-SP034-01-STR-0110-007 REV1
2.1.2	Completion of Postioning of Switchboards,Pumps,Valves,Ladder,Traywork & Relevant Site Instrumentation	Complies with specification, drawings and schedules	x	w	Specification, drawings	QU-SP034-01-CIV-0110-0008 REV1 QU-SP034-01-CIV-0110-0010 REV1 QU-SP034-01-CIV-0110-0016 REV1 QU-SP034-01-CIV-0110-0017 REV1 QU-SP034-01-STR-0110-006 REV1 QU-SP034-01-STR-0110-007 REV1

Form: F1109/0

J & P RICHARDSON INDUSTRIES PTY LTD

INSPECTION & TEST PLAN

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ITP No. C54000-SP34-Electrical Install

Project: Electrical Install

Contract No: I112-024

Customer: Queensland Urban Utilities

Item No	Process Sequence	Acceptance Criteria	Activity By*		Reference Documents	Remarks/Records
			JPR	CUST		
2.1.3	Electrical Installation of Switchboards,Pumps,Valves,Relevant Site Instumentation & Cabling	Complies with specification, drawings and schedules	x	a + h	Specification, drawings, AS3000,AS3008	QU-SP034-01-CIV-0110-0008 REV1 QU-SP034-01-CIV-0110-0010 REV1 QU-SP034-01-CIV-0110-0016 REV1 QU-SP034-01-CIV-0110-0017 REV1 QU-SP034-01-STR-0110-006 REV1 QU-SP034-01-STR-0110-007 REV1
3	**HANDOVER**					
3.1	JPR - Inspecition and Checklist	Completed in accordance with contract documents,AS3000,AS3008	x		Contract documents,AS3000,AS3008, JPR Form F 1015	Customer accepted
3.2	As Installed Drawings	Complies with drawings, schedules and contract documents,AS3000,AS3008	x		Drawings and schedules, contract documents	As-Installed documentation

2. Equipment Manuals

Valveco

Heavy Duty Knifegate

General Purpose Lugged Style Knifegates

Heavy Duty General Purpose Lugged Style Knifegate Valve

Features

- Compact design for easy installation and maintenance
- Both 304SS and 316SS valves available
- Available in metal & resilient seat
- Uni & bi-directional design
- One piece integral cast body, chest and lugs
- Integral cast in gate wedges minimize flow obstructions
- High flow rates with low pressure drops
- Gate guides to support gate
- Complies with AS6401 & MSS SP-81 face to face dimensions
- Every valve pressure tested
- Gate machined over full length for optimum sealing
- 50 to 1200mm sizes available, 50 to 600mm kept in stock
- 10 bar pressure rating
- Specifically formulated PTFE impregnated packing material for increased service life and lower friction
- Specialised packing for chemical resistant or abrasive applications available on request
- Available with a variety of actuators including handwheel, chain wheel, quick acting lever, geared, electric, air or hydraulic cyliner actuator

Options

- Bonneted, non-rising stem adapter, deflection cones, positioners, limit switches, solenoids, pneumatic failsafe & shrouds.

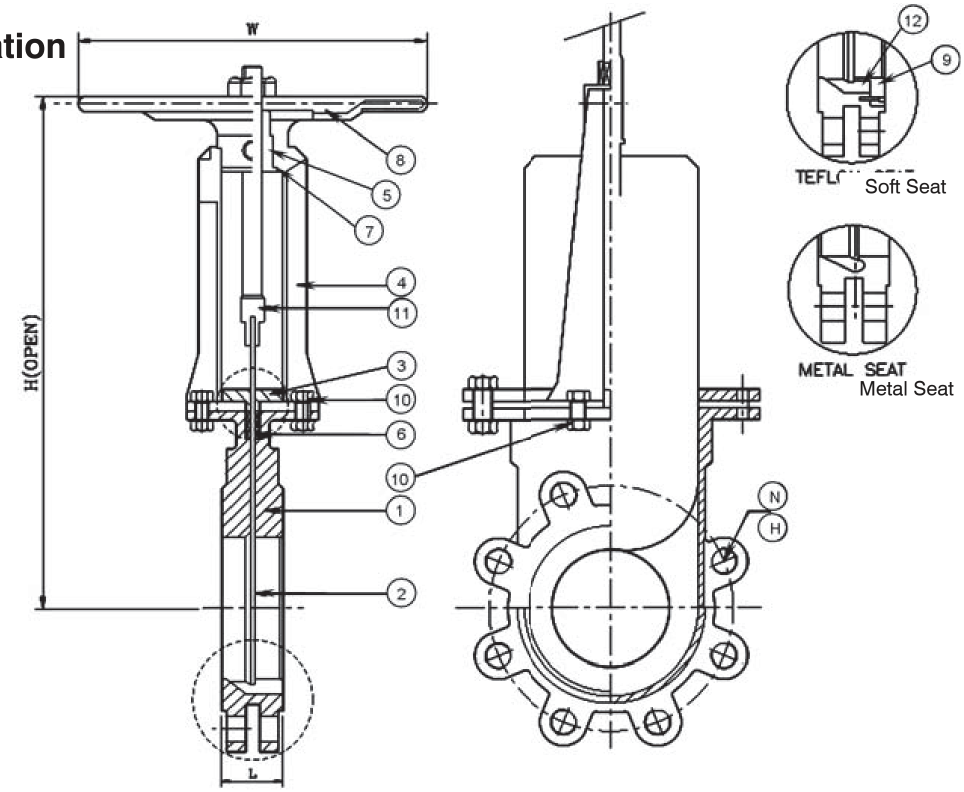
Applications

The Valveco Heavy Duty General Purpose Knifegate Valve is designed for a wide range of applications such as:

- Waste Water & Water
- Mining
- Fly Ash Handling Plants
- Bulk Conveying
- Corrosive Environments
- Pulp & Paper
- Food & Beverage
- Chemical Plants

VALVECO

Manual Actuation



Standard Materials

No.	Part Name	Material Code (ASTM)
1	Body	SS304, 316 or 316L (A351-CF8)
2	Gate	SS304, 316 or 316L (A351-CF8)
3	Packing Gland	SS304, 316 or 316L (A351-CF8)
4	Super Structure	SS304, 316 or 316L (A351-CF8)
5	Sleeve	Bronze Casting (C83600)
6	Packing	PTFE Impregnated Braided Fibre
7	Thrust Bearing	2”- 12”: Thrust Plate (Bronze) 14”- 24”: 51112
8	Hand Wheel	Cast Iron
9	Seat Ring	SS304, 316 or 316L (A351-CF8)
10	Fasteners	SS304, 316 or 316L (A351-CF8)
11	Clevis	SS304, 316 or 316L (A351-CF8)
12	Resilient Seat Replaceable Seat	Viton NBR, EPDM, PTFE, Polyamide

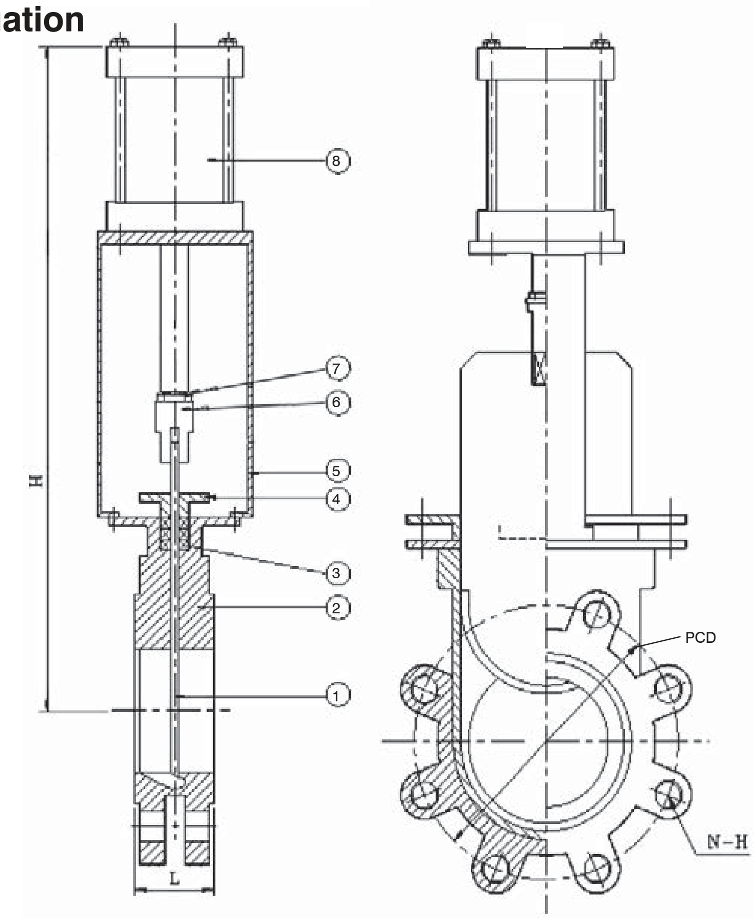
Dimensions

Class	Size															
		In	2	2½	3	4	5	6	8	10	12	14	16	18	20	24
		mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600
10 Bar & 150lb	L mm		48	51	51	51	57	57	70	70	76	76	89	89	114	114
	H mm		350	410	440	520	595	660	880	1025	1190	1355	1530	1690	1880	2200
	PCD mm		114	127	146	178	210	235	292	356	406	470	521	584	641	756
	W mm		200	200	200	225	250	250	280	350	400	400	450	450	600	600
	N-H		4-M16	4-M16	4-M16	4-M16	8-M16	8-M16	8-M16	8-M20	12-M20	12-M24	12-M24	12-M24	16-M24	16-M27
	Weight (kg)		9.5	12	13	16	19	22	34	53	65	90	145	180	227	282

*other flange drilling available

VALVECO

Pneumatic Actuation



Standard Materials

No.	Part Name	Material Code (ASTM)
1	Body	SS304, 316 or 316L (A351-CF8)
2	Gate	SS304, 316 or 316L (A351-CF8)
3	Packing	PTFE Impregnated Braided Fibre
4	Packing Gland	SS304, 316 or 316L (A351-CF8)
5	Super Structure	SS304, 316 or 316L (A351-CF8)
6	Clevis	SS304
7	Piston Rod	SS304
8	Cylinder	Aluminium or Fibreglass

Dimensions

Class	Size	In	2	2½	3	4	5	6	8	10	12	14	16	18	20	24
		mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600
10 Bar & 150lb	L mm		48	51	51	51	57	57	70	70	76	76	89	89	114	114
	H mm		500	561	574	675	750	815	966	1181	1340	1448	1648	1834	2020	2120
	PCD mm		114	127	146	178	210	235	292	356	406	470	521	584	641	756
	N-H		4-M16	4-M16	4-M16	4-M16	8-M16	8-M16	8-M16	8-M20	12-M20	12-M24	12-M24	12-M24	16-M24	16-M27
	Weight (kg)		11	13	15	21	25	31	58	103	137	158	172	202	256	494

*other flange drilling available

VALVECO

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VALVECO

visit our website: www.halmel.com.au

DEMAG
Cranes & Components

Demag DC-Pro chain hoist
Demag DCM-Pro Manulift

The new industry standard

Demag hoist units:
Perfect load handling

High productivity, efficiency and operating reliability are the most important requirements to be met by state-of-the-art material flow systems. Demag Cranes & Components develops and produces materials flow solutions for all i ndustries and companies of all sizes, from small workshops to major industrial corporations.

Contents Page

Demag DC-Pro chain hoist:
A new industrial standard – Made by Demag

All inclusive: fully featured instead of extras price list

Many features are already integrated into the Demag DC-Pro chain hoist as standard that have to be ordered and bought as extras elsewhere.
The DC-Pro chain hoist is a fully featured, highly versatile chain hoist, which can be installed and put into service in a minimum of time.

That is "Standard – Made by Demag", an investment with added value.

- 20 % longer service life and greater efficiency thanks to Demag 2m⊕
- Improved safety and reliability thanks to 24 V contactor control and operating limit switches
- Fast and ergonomic height-adjustment of the control cable without the need for any wiring
- Flexibility as standard thanks to two sizes of suspension bracket
- Simple installation and commissioning thanks to plug connections – Plug & Lift und Plug & Drive
- Gearbox, brake and slipping clutch are maintenance-free for up to 10 years
- Smooth and fast load handling of loads with two hoist speeds
- Elapsed operating time counter and diagnostics interface provide information on the operating status – maintenance breaks can be planned
- The plug-fitted chain drive can be replaced quickly and easily

Tailored solutions

Certified
DC-Pro chain hoists are tested and approved by the relevant authorities and also meet the demanding requirements of the CSA specifications. Electromagnetic compatibility is rated according to EN 61000-6-2 to 4 for interference immunity in industrial environments and for interference emissions in commercial and industrial environments.

①
Gearbox – maintenance-free for up to 10 years. With classification in FEM Group of Mechanisms Demag 2m+, the DC-Pro sets a new standard with a rated service life of 1900 hours at full load. In practical terms, this means the service life is extended by approx. 20 %. The helical gearing of all gearbox stages also reduces operating noise and provides for smooth operation.

②
Brake – maintenance-free for up to 10 years (sizes DC 10–25 up to 5 years). Thanks to minimum wear, adjustment is not necessary; short and gentle run-on path. The brake enclosure features double encapsulation and is therefore impervious to poor weather and operating conditions.

③
Slipping clutch – maintenance-free for up to 10 years. Integrated behind the brake in the power drive, it provides reliable protection against extreme overload. Damaging permanent slipping is not possible thanks to integrated speed monitoring.

④
Height adjustment of the control pendant – The length of the control cable and, therefore, the suspension height of the control pendant can be infinitely varied for a hook path range of 2–5 m and 5–8 m. The length of control cable that is not required is accommodated under the service cover. The control cable is rated for electric travel applications in 3 axes.

⑤
Control – with 24 V contactor control, operating limit switches (upper/lower) and elapsed operating time counter as standard. A geared limit switch with four contacts for fast-to-slow and limit cut-off is used as the operating limit switch for sizes DC 16 and 25.

⑥
Round steel chain – a special Demag chain of high-strength, ageing-resistant material with high surface hardness. Galvanised and additionally surface-treated to protect against hostile environments.

⑦
Suspension bracket – DC-Pro chain hoists are suspended in pendulum fashion and make optimum use of the available height thanks to their small C headroom dimension. DC-Pro units are supplied with short and long suspension brackets as standard and can always be attached to the superstructure with the optimum connection.

⑧
Housing – robust and weight-saving die-cast aluminium housing of compact and modern industrial design. UV-resistant powder-coated finish is unsusceptible to knocks and scratches.

⑨
Hoist motor – robust and enduring high-performance motor with large safety reserves even at high ambient temperatures and in prolonged operation. 2 hoist speeds with F4 ratio as standard. (Insulation class F, 360 s/h and 60 % CDF)

⑩
Chain drive – The plug-in unit facilitates quick and easy replacement of the entire chain drive without having to remove the motor or gear parts. Downtimes can therefore be cut significantly. The chain drive consists of highly wear-resistant materials for a long service life.

⑪
Chain collector box – attached in pendulum fashion, made of tough, flexible and particularly impact-resistant plastic; capacity for up to 8 m hook path. Chain collector bag for chain lengths up to 40 m as well as special lengths up to 120 m can be supplied.

⑫
Bottom block – up to 1000 kg with single chain fall for improved ergonomic handling of the hook with fittings. Chain wear is simultaneously reduced, since no chain return arrangement is required.
The new, compact and particularly ergonomic DC bottom block is used for 2/1 reeving arrangements. The cut-off springs required for the limit switches are integrated inside the bottom block and therefore save 60 mm of the valuable C dimension.

Increased performance, more speed

Increased performance, improved ergonomics, safety and reliability for greater productivity. The performance features of the new DC-Pro chain hoist provide for optimum efficiency.

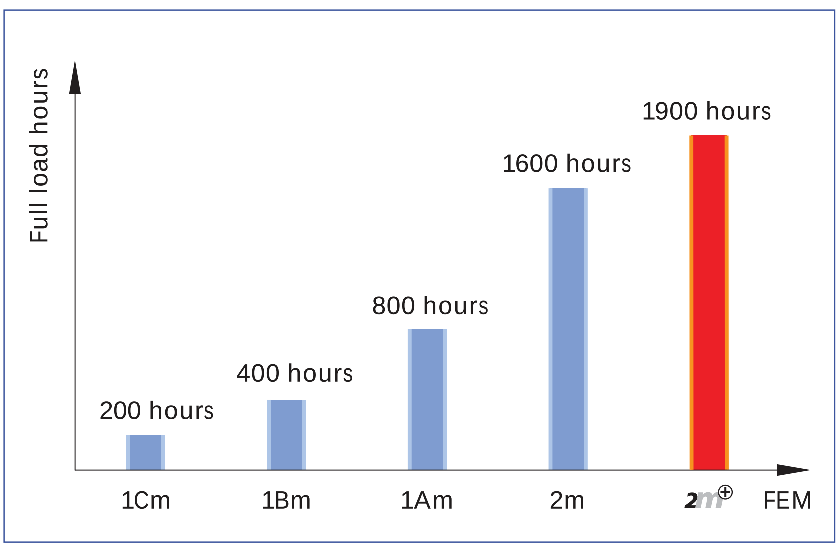
Sensitive and fast

DC-Pro units can be integrated into your work and production processes flexibly and precisely. While the main lifting speed guarantees fast and effective operation at a minimum of 6 m/min, the creep lifting speed ensures that loads are handled gently and precisely.

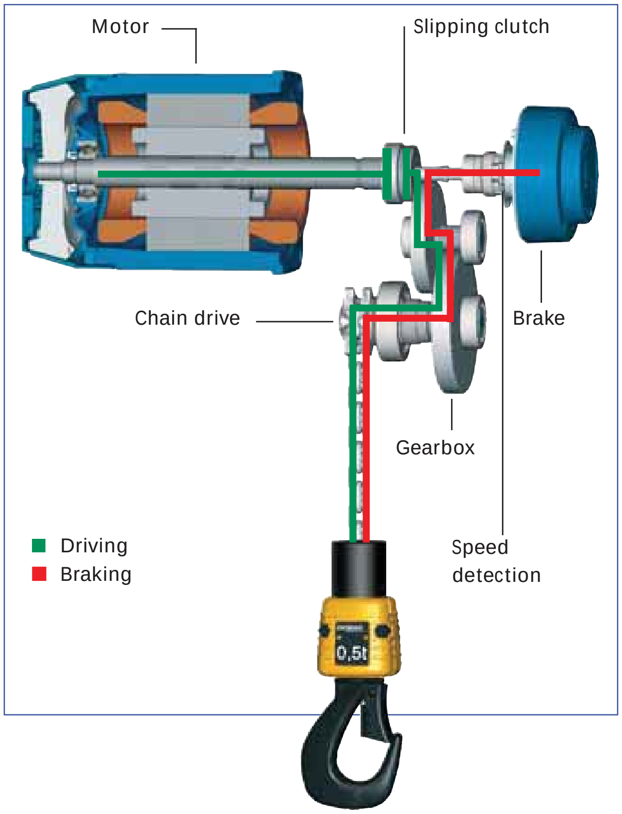
2m⊕ – an even longer service life for greater efficiency.

In practical terms, Demag 2m⊕ means the service life is extended by approx. 20 % in comparison with the conventional 2m classification for chain hoists according to the FEM Group of Mechanisms. This results in significantly extended intervals for service work and general overhauls. This extra amount of lasting efficiency is only offered by the new Demag DC-Pro chain hoist.

Duration of service in full load hours



Improved safety and reliability



Thanks to the completely new safety concept developed for the Demag DC-Pro chain hoist, the gearbox, brake and coupling operate without the need for any maintenance for up to ten years (brake for sizes DC 10 – 25 up to 5 years). The brake-coupling system ensures that the load is held securely in any operating situation. The load cannot drop. This is achieved by arrangement of the brake direct in the power drive chain (red line). Thanks to minimum wear, the brake does not need to be adjusted. Operating safety is generally improved by the single-fall design up to a load capacity of 1000 kg.

The combination of electronic control system and integrated speed sensors continuously monitor the hoist motor, clutch and brake, thus ensuring lasting safety for the operator. The compact and light 24 V contactor control system also ensures that the system is subject to only minimum wear. The run-on path is both smooth and gentle.

The standard control system includes

- 24 V contactor control
- Operating limit switches (upper/lower) to switch the hoist motion off in the highest and lowest hook positions – sizes DC 16 and 25 with geared limit switch with four contacts for for fast-to-slow and limit cut-off
- Elapsed operating time counter can be read from the outside
- Speed detection
- Infrared diagnostics interface

Control pendant:
Always at the right operating height

Height adjustment of the control cable

The most favourable operating height for the control pendant can be easily adjusted on the Demag DC-Pro chain hoist. The adjusting mechanism integrated in the chain hoist housing enables the operator to change the suspension height of the control pendant easily and without the need for any tools or wiring. The control cable is designed for an adjustment range of 3 m. The length of control cable that is not required disappears beneath the DC-Pro service cover. This innovation has been implemented for the first time in a chain hoist.

The adjusting mechanism also contains the strain relief arrangement for the control cable and can resist extreme tensile loads. The same applies to the control cable, which is made of a proven and particularly tough material. At the same time, the control cable is flexible and therefore easy to handle.

Ergonomics:
All in good hand

The DSC control pendant precisely interprets control commands in any situation. It facilitates fatigue-free operation for right and left-handed operators both with and without gloves. Furthermore, electrical interlocks prevent simultaneous initiation of motions in both directions.


39546-1

Demag control pendants feature an optimised ergonomic sloping design for convenient operation. They are made of high-quality plastic which is highly resistant to impacts and are therefore extremely robust. With bending and impact protection as well as IP 65 enclosure against dust and moisture, DSC units are ideally suited for the demanding requirements of industrial applications.
The DSC control pendant is specially developed for push-travel DC-Pro chain hoists and fitted with two-stage switching elements. The DSE 10-C control pendant is used for electric travel applications with E 11/E 22 or E 34 drives.

The control pendant can be changed quickly and easily


39031-1

Slide the protective sleeve upwards over the control cable


39031-3

Fit the plug with its bayonet connector into the control pendant and turn until it locks


39031-5

Push protective sleeve downwards

Commissioning:
Plug & Lift and Plug & Drive

A great benefit offered by the new Demag DC-Pro chain hoist is simple commissioning. The pivoting suspension bracket and infinitely adjustable flange width of the U 11, U 22 and U 34 trolleys make the mechanical parts easy to install.

The plug-in connections beneath the service cover and the power plugs that are already included in the scope of delivery also make the electrical parts simple to connect. This enables the DC-Pro to be ready for operation in a minimum of time.

Pivoting service cover

Integrated beneath the cover

You have rapid access to all important components for service and commissioning beneath the pivoting service cover

- Storage for 3 m of control cable
- Plug-in electrical connections for power cable, control cable, limit switches and trolley
- Strain relief for power supply and trolley supply cables
- Chain guide
- Chain lubrication

Maintenance:
Fast and simple

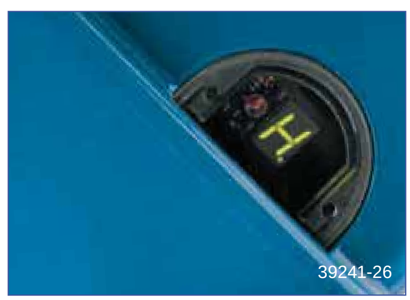
All main drive components of the Demag DC-Pro chain hoist, such as the gearbox, brake and coupling, operate without the need for any maintenance for up to ten years (maintenance-free brake for up to 5 years for sizes 10–25). The outstanding Demag quality of all components provides for a long service life even under heavy use. The few necessary maintenance measures can be carried out quickly and easily thanks to the service-friendly design of the DC-Pro.

The chain drive of the DC-Pro, for example, is designed as a compact unit which is plugged into place and can be replaced in a minimum of time without the need to disassemble motor or gearbox parts. Long downtimes as a result of maintenance work are now a thing of the past.

Chain drive

Diagnosis – wireless via display or via infrared

Service technicians can read the standard operating time counter or call up the relevant information on the operating status – from the outside via the display on the base of the chain hoist housing or by means of the diagnosis interface via infrared data transfer.



Diagnosis interface

Demag DCM-Pro Manulift:
Ergonomic single-handed load handling at the workplace

The DCM-Pro Manulift was developed for handling loads quickly and safely with only one hand. The new DCM-Pro is based on the lifting unit of the DC-Pro chain hoist and the DSM-C control unit which is connected to it by a helical cable. Thanks to the control unit which is rigidly connected to the load handling attachment for right and left-handed operation, the operator only needs one hand to operate the chain hoist and guide the load.

The quick-change coupling enables a wide variety of load handling attachments to be changed with ease. All Manulift load handling attachments are fitted with a connecting pin with a swivel lock, which snaps into the quick-change coupling. It can be easily disconnected by lifting the unlocking sleeve.

Manulift units can travel on Demag KBK profile sections and I-beams (see pages 16 – 23), which enables them to be flexibly integrated into work and production processes.

39143

39204-7

Load hook
250 kg

Slewing load hook
250 kg

Open hook
125 kg

Belt sling
125 kg

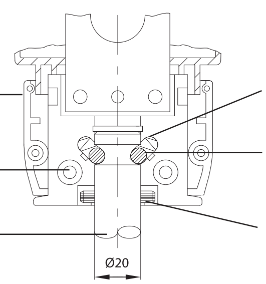
Versatile adaptability to any task

A variety of proven load handling attachments facilitate optimum and flexible adaptation of the chain hoist to meet your needs. They range from normal load hooks and various pantograph-type tongs to parallel gripper systems, e.g. for KLT containers used in the automotive industry. The DCM-Pro Manulift can be used with specially developed load handling attachments.
The universal coupling pin is used to connect customer-designed attachments.

It is provided with an M12 internal thread for connecting special load handling attachments.

Manulift load handling attachments can also be connected to the DC-Pro chain hoist load hook by means of an adapter. The versatility and flexibility of the new Demag chain hoist provide for improved load handling efficiency at the workplace.

38922



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The quick-change coupling on the DSM-C control unit

PGS-parallel gripper
125 kg

Pantograph tongs for
gripping square goods
125 kg

Pantograph tongs for
gripping round goods
125 kg

Load hook adapter
up to 250 kg

Load hook adapter
with connected
PGS shaft gripper

PGS parallel gripper system: Firm hold on loads up to 125 kg

PGS box grippers

The narrow design and short opening path of the grippers make it possible to pick up and deposit goods safely and easily, even in restricted spaces, and to place them direct into cartons. The 100 mm wide gripping range makes it possible to transport both the actual goods as well as a packed unit using the same gripper.

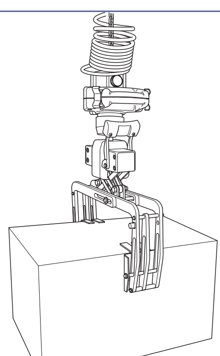
PGS shaft grippers

Various shaft grippers are available which can be adapted to different shaft types and applications by changing the gripper jaws.

When fitted with a shaft support, they can be used to pick up shafts with various diameters or an unknown centre of gravity. This significantly improves the safety of handling tasks that, until now, have always involved a certain risk.


37452-10


33229-1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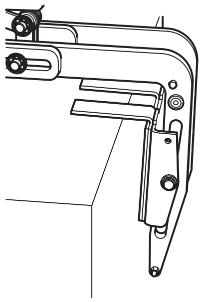
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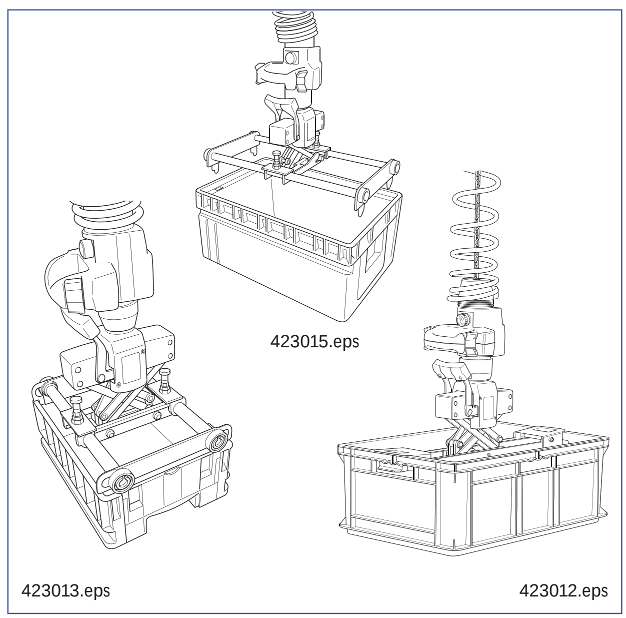
PGS container grippers

The various container grippers can be supplied for fixed or adjustable container widths. They are easily adjusted to the relevant container size by lifting and turning the locking pins, and by pushing the grippers together or pulling them apart until the stops are reached.

Container type	Container size	
	600 x 400	400 x 300
Euro container	rigid	rigid
KLT (VDMA)	rigid	rigid
	adjustable	
Various containers such as PDB, ARCA, MF, SSI Schäfer, Eurotec, Utz KLT, Bito	rigid	rigid
	adjustable	

Grippers for other container types on request



Grippers for various container types

Slewing jibs facilitate load handling at the workplace

Pillar- and wall-mounted slewing jibs with the DC-Pro chain hoist provide inexpensive support at the workplace and facilitate space-saving load handling in production, storage and shipping. When used direct on production machinery, they help to cut setting-up and idle times. Wall- and pillar-mounted slewing jibs and pillar-mounted slewing cranes are suitable for virtually any application as standard.

Wall-mounted slewing jibs

These cranes, which take up no floor space, can be used wherever load-bearing concrete walls or pillars are available. The slewing range of up to 270° and the possibility to fit them to machinery and installations makes them ideal for a wide range of applications.

Pillar-mounted slewing jibs and cranes

The locations served by these free-standing cranes are utilised to the full thanks to their slewing range of up to n x 360°. They can be used for many applications. They can be erected indoors or outside and used for handling goods at loading ramps or for serving machinery. These cranes provide maximum hook paths even where only little headroom is available. The pillar has only a small footprint and is either anchored to the foundations using anchor rods or to an existing concrete floor using anchor bolts.

KBK slewing jibs feature struts and hollow profile section rails and offer a low deadweight for load capacities up to 1000 kg. Loads can be moved quite simply by hand.

The product range of the I-beam slewing jibs covers a load range up to 10000 kg as standard.

See brochure 208 756 44 for further information on pillar and wall-mounted slewing jibs and cranes.

Efficient material flow with KBK track and crane installations

Interlinking production processes, serving machinery, moving materials – all handling and transport tasks have one thing in common: loads not only have to be lifted and lowered, horizontal motions are also required.

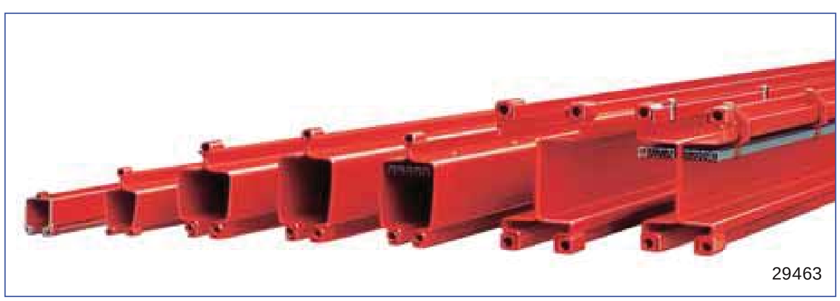
The KBK crane construction kit is the ideal horizontal transport system for the DC-Pro and DCM-Pro Manulift. KBK installations are used for both linear and area-serving load transport.

Suspension cranes

Single and double-girder suspension cranes are used for area-serving load handling. The low deadweight enables loads to be easily moved by hand. Travel drives are also available for precise positioning of larger loads.

Portal cranes

Portal cranes from the KBK system are not mounted on rails and can be easily moved. When fitted with the DC-Pro chain hoist, this makes them ideal and flexible lifting devices, above all for repair and assembly work.

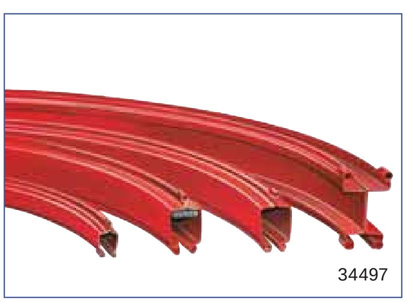


KBK sections are available in various sizes for different load capacities

Many components are available to create efficient overhead materials handling solutions to meet specific application requirements.
The KBK crane construction kit is a suspension system which uses no valuable floor space and therefore leaves production area free. It is completely modular in design, all connections are bolted or fitted. This enables installations to be modified or extended easily and cost-effectively. These are Demag system solutions for practical material flow requirements.

Suspension monorails

Suspension monorails are the preferred linear solution to connect pick-up and deposit positions. The many possible designs from simple, manually controlled straight sections to complex, semi or fully automated closed-circuit monorail systems enable a wide variety of applications to be implemented. Flexible routing by means of straight and curved sections, track switches and turntables facilitates cost-effective adaptation to the most diverse operating conditions.



Sections in various profile sizes for curved tracks

KBK Aluline – aluminium profile sections

See brochure 208 385 44 for further information on track and crane systems from the KBK crane construction kit.

Push-travel trolleys for simple horizontal movement

U trolley

The new U trolley generation is available in two sizes for load capacities up to 1100 kg (U 11), 2200 kg (U 22) and 3400 kg (U 34). The flange width can be infinitely adjusted by means of two adjusting rings and covers the ranges from 58 mm to 200 mm, and 201 mm to 310 mm. This facilitates fast and simple installation.

The travel rollers, which are made of high-strength and wear-resistant Polyamide, provide for smooth operating characteristics and low travel resistance. Optional steel rollers can also be used for special ambient conditions, e.g. high temperatures. The universal design of the travel rollers enables them to be used for operation on straight and sloping profile sections.

39032-1

39087-2

The lateral steel guide rollers support their curve-negotiating properties down to the minimum radius of 1000 mm and minimise girder wear. A drop-stop arrangement is integrated into the side cheeks, which consist of aluminium die-castings with a powder-coated finish.

Push-travel U trolleys are designed for simple addition of the E electric travel drive at a later date.

39136-1

CF 5 click-fit trolley

Simply clicked onto the girder, curve-negotiating Click-fit trolleys are ready for operation with a load capacity of up to 550 kg.

The flange widths from 58 to 91 mm, the minimum curve radius of 800 mm and easy adaptability to standard section or parallel flange girders make them suitable for universal applications. The integrated drop-stop and lift-off protection provides for safe operation.

Plug & Drive with electric trolleys

EU trolley

The E 11, E 22 and E 34 electric travel drives were specially developed for operation with the new DC-Pro chain hoist. This significantly extends the range of applications of this state-of-the-art hoist.

The travel drives can be adapted to the U 11 – U 34 trolleys. Particularly short approach dimensions can be achieved when the units are mounted in a vertical arrangement. Fast retro-fitting and commissioning offer further benefits as no changes need to be made to the push-travel trolleys.

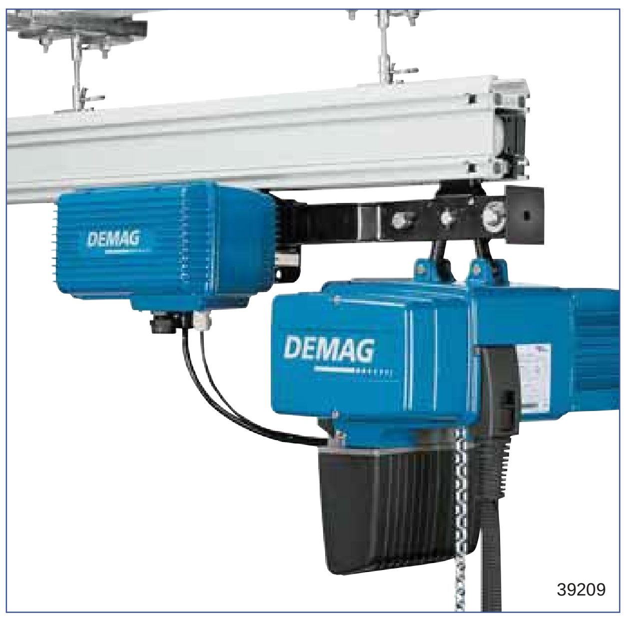
39164-3

The drive is simply connected to the DC-Pro chain hoist using plug connectors and operated by means of the newly developed DSE 10-C control pendant. The control pendant for long and cross travel is simply fitted by means of a connector. The E 22 travel drive is used as standard for the KBK rail system with the new RF 125 friction wheel travel drive.

The E electric travel drive features a state-of-the-art, compact industrial design and offers outstanding travel characteristics. The control system integrated in the travel unit provides for gentle starting and braking for low-sway load handling. A convenient load-sway damping system can be activated for the cross-travel motion. The speeds and acceleration and braking rates can also be modified by means of the DSE-10 C control pendant, if required. All electrical connections are of plug-in design.

The trolleys can also be fitted with an optional cross-type limit witch, either with fast-to-slow and limit switch cut-off or only with limit switch cut-off.

39208-1



39209

Clamp-fitted buffers to limit travel

KPA/KPT clamp-fitted buffers are the ideal solution to limit travel and are suitable for all DC-Pro trolleys. They can be fitted to sloping and parallel I-beam girders quickly and easily using screws. The travel range is shortened or extended by simply relocating the buffers.

They can be adapted to flange widths from 50 to 300 mm for universal applications.

They are suitable temperature ranges from -20°C to + 70°C as well as for operation outdoors thanks to adequate resistance to ageing, ozone and weather conditions. Furthermore, they offer good resistance to acids and lyes. The tightening torque details are cast into the buffer to ease assembly.

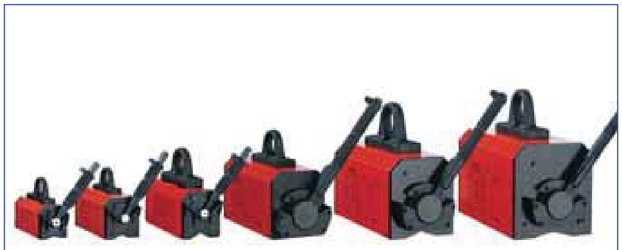
39716

Magnets as versatile load handling attachments

DPMN permanent magnets

They offer low operating costs, constant availability and versatility and are suitable for operation both inside manufacturing facilities and outdoors. They function independently of a power supply and are safe, easy and reliable to operate.

When switched to “magnetise”, a magnetic field is created between two field poles; no magnetism remains when switched to “demagnetise”. The outer surface of the magnet armature is always neutral and offers maximum protection against external influences.



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19763

DBM 34/68 battery magnets

The compact unit consists of an electromagnet, battery and control unit with an integrated charging set. Battery magnets operate independently of a mains power supply and are used in stationary and travelling applications. They offer safe, reliable and easy operation in stores or production areas. The charging operation is controlled automatically and the charge level is indicated by the battery monitoring display.

R 26 round magnets

These single magnets offer enormous strength. The solid housing is made of highly permeable steel and the coil consists of fully encapsulated enamelled copper wire. They are fitted with integrated rectifiers and switches as standard.

Service – ready to help around the clock

All over the world
We offer you service around the clock with our world-wide network of Demag expert service teams and Demag partners. This ensures the highest availability and safety in your installation.

Rapid and reliable spare part supply
Any spare parts needed can be shipped 24 hours a day, 7 days a week.

Service systems: Demag IDAPSY
We have developed a new integrated service system for the new Demag DC-Pro chain hoist: Demag IDAPSY. IDAPSY stands for Inspection Diagnosis Application System.

And these are your benefits:
- Transparency
  By recording utilisation of the installation, Demag IDAPSY facilitates predictive and plannable service. This enables a high level of availability to be ensured.
- Analysis
  Recorded data provides an excellent basis for analysis. The load spectrum recorder can be read out or error messages can be called up for maintenance or repair purposes, for example.
- Efficiency
  Maintenance work carried out in good time to ensure your installation is in optimum condition increases overall efficiency.

Demag IDAPSY enables service work to be carried out more quickly. This means that your hoist is ready for operation again even more quickly if service work has to be carried out.

Your individual service package
Demag Service and our Demag partners offer a comprehensive portfolio of services to ensure the lasting availability of your installation throughout its entire lifecycle:
- Recurring inspections according to relevant accident prevention regulations
- Inspection and maintenance
- Fault elimination both with and without on-call standby
- Service training for operators and maintenance engineers


DEMAG
39040
39040

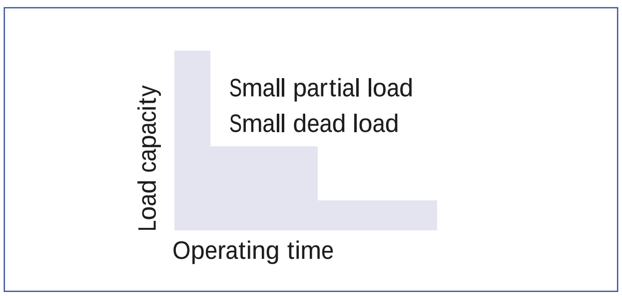
Selection criteria

The size of the hoist is determined by the load spectrum, average operating time per working day, SWL and reeving.

1. What are the operating conditions?
2. What is the specified safe working load?
3. To what height must the load be lifted?
4. What is the required lifting speed?
5. Do the loads need to be lifted and lowered with high precision?
6. Is horizontal load travel necessary?
7. How is the hoist to be controlled?

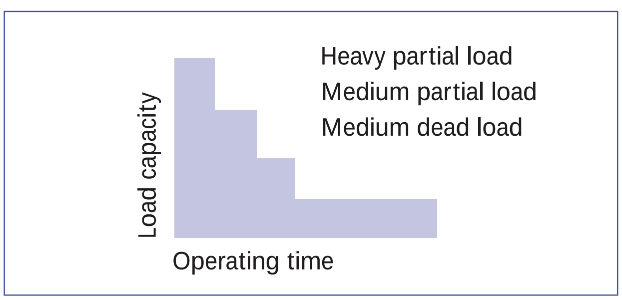
The load spectrum

(in most cases estimated) can be evaluated in accordance with the following definitions:



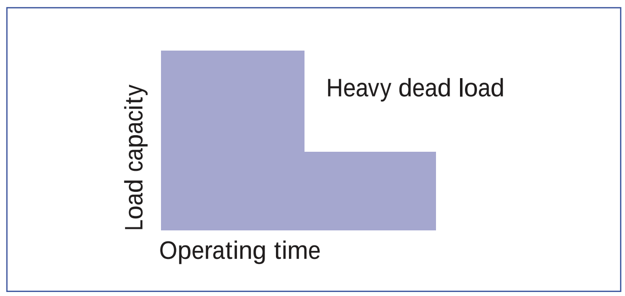
1 Light

Hoist units which are usually subject to very small loads and only in exceptional cases to maximum loads.



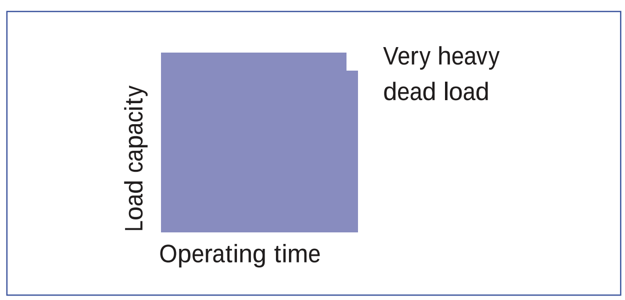
2 Medium

Hoist units which are usually subject to small loads but rather often to maximum loads.



3 Heavy

Hoist units which are usually subject to medium loads but frequently to maximum loads.



4 Very heavy

Hoist units which are usually subject to maximum and almost maximum loads.

The group is determined by the load spectrum and operating time.

Load spectrum				Average operating time per day in hours			
L1	Light			2-4	4-8	8-16	over 16
L2	Medium			1-2	2-4	4-8	8-16
L3	Heavy			0.5-1	1-2	2-4	4-8
L4	Very heavy			0.25-0.5	0.5-1	1-2	2-4
Group of mechanisms to FEM				1Am	2m+	3m	4m

Reeving		Range	Size			
SWL in kg						
1/1	2/1					
Demag DC chain hoist						
80		DC-Pro 1 / DC-Pro 2				80
100		DC-Pro 1 / DC-Pro 2				100
125		DC-Pro 1 / DC-Pro 2				125
160		DC-Pro 2				160
160		DC-Pro 5				160
200		DC-Pro 2			200	
200		DC-Pro 5				200
250		DC-Pro 2		250		
252		DC-Pro 5				250
315		DC-Pro 5				315
315		DC-Pro 10				315
400		DC-Pro 5			400	
400		DC-Pro 10				400
500		DC-Pro 5		500		
500		DC-Pro 10				500
630		DC-Pro 10				630
800		DC-Pro 10			800	
1000		DC-Pro 10		1000		
1250		DC-Pro 10	1250			
1250		DC-Pro 16			1250	
	1250	DC-Pro 10				1250
1600		DC-Pro 16		1600		
	1600	DC-Pro 10			1600	
2000		DC-Pro 25		2000		
	2000	DC-Pro 10		2000		
2500		DC-Pro 25	2500			
	2500	DC-Pro 10	2500			
	3200	DC-Pro 16		3200		
	4000	DC-Pro 25		4000		
	5000	DC-Pro 25	5000			

Example:

SWL 250 kg
Load spectrum „medium“ from table
Lifting speed 8 m/min;
1/1 reeving
average hook path 4 m;
Number of cycles/hour 20
Working time/day 8 hours

The average operating time per working day is estimated or calculated as follows:

$$\text{Operating time/day} = \frac{2 \cdot \text{average hook path} \cdot \text{no. of cycles/h} \cdot \text{working time/day}}{60 \cdot \text{speed hoist}}$$

$$= \frac{2 \cdot 4 \cdot 20 \cdot 8}{60 \cdot 8} = 2.66 \text{ hours}$$

For the medium load spectrum and an average daily operating time of 2.66 hours, the table shows group 2m+. For a load capacity of 250 kg, the diagram shows size DC-Pro 2-250.

Technical data

Model code

EU	DC-Pro	10 -	2000	2/1	H5	V6/1,5	380 - 415 /	50	24/6	100

- 100: Flange width [mm] or I beam
- 24/6: Travel speed [m/min]
- 50: Frequency [Hz]
- 380 - 415 /: Voltage range chain hoist [V]
- V6/1,5: Hoist speed [m/min]
- H5: Hook path [m]
- 2/1: Reeving
- 2000: Load capacity [kg]
- 10 -: Size
- DC: Demag chain hoist

Trolley type

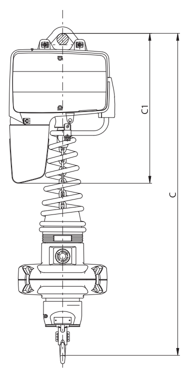
CF	Click-fit trolley	E	Electric travel drive
U	Travelling hoist	D	Articulated trolley
R	Push travel		

Demag DCM-Pro Manulift selection table

Load capacity [kg]	Manulift Typ	Hoist speed [m/min at 50 Hz]	Hoist speed [m/min at 60 Hz]	Motor size	Hook path [m]	Group of mechanisms FEM	Reeving	Max. weight for 2,8 and 4,3 hook path [kg]
80	DCM-Pro 1 - ...	8/2	9.6/2.4	ZNK 71 B 8/2	2.8 and 4.3	4m	1/1	22 / 23
	DCM-Pro 2 - ...	16/4	19.2/4.8					
125	DCM-Pro 1 - ...	8/2	9.6/2.4					
	DCM-Pro 2 - ...	16/4	19.2/4.8					
250	DCM-Pro 2 - ...	8/2	9.6/2.4			2m+ 1)		
	DCM-Pro 5 - ...	16/4	19.2/4.8	ZNK 80 B 8/2		4m		28 / 29

1) 2m+ corresponds to 1900 hours at full load

Demag DCM-Pro Manulift dimension table



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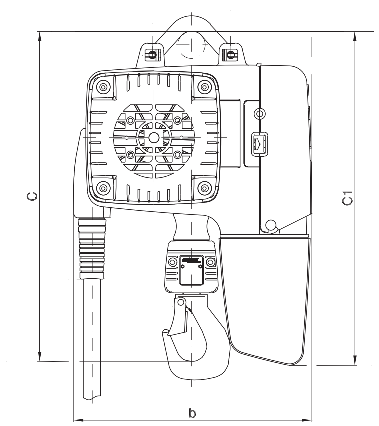
Size	Short suspension bracket C for hook path 2.8 m	Short suspension bracket C for hook path 4.3 m	Short suspension bracket C1 Chain collector box H5	Long suspension bracket C for hook path 2.8 m	Long suspension bracket C for hook path 4.3 m	Long suspension bracket C1 Chain collector box H5
DCM-Pro 1	635	705	335	673	743	373
DCM-Pro 2	635	705	335	673	743	373
DCM-Pro 5	680	750	395	718	788	435

DC-Pro chain hoist selection table

SWL	Chain hoist	Hoist speed		Motor size	Hook path [2]	Group of mechanisms	Reeving	Max. weight at H5 / H8 respect. H4
[kg]	Typ	[m/min at 50 Hz]	[m/min at 60 Hz]		[m]	FEM		[kg]
80	DC-Pro 1 -...	8/2	9.6/2.4	ZNK 71 B 8/2	5 and 8	4m	1/1	22 / 24
	DC-Pro 2 -...	16/4	19.2/4.8					
100	DC-Pro 1 -...	8/2	9.6/2.4					
	DC-Pro 2 -...	16/4	19.2/4.8					
125	DC-Pro 1 -...	8/2	9.6/2.4					
	DC-Pro 2 -...	16/4	19.2/4.8					
160	DC-Pro 2 -...	8/2	9.6/2.4					
	DC-Pro 5 -...	16/4	19.2/4.8	ZNK 80 B 8/2				28 / 30
200	DC-Pro 2 -...	8/2	9.6/2.4	ZNK 71 B 8/2		3m		22 / 24
	DC-Pro 5 -...	16/4	19.2/4.8	ZNK 80 B 8/2		4m		28 / 30
250	DC-Pro 2 -...	8/2	9.6/2.4	ZNK 71 B 8/2		2m+ [1]		22 / 24
	DC-Pro 5 -...	16/4	19.2/4.8	ZNK 80 A 8/2		4m		28 / 30
315	DC-Pro 5 -...	8/2	9.6/2.4	ZNK 80 A 8/2		4m		28 / 30
	DC-Pro 10 -...	12/3	14.4/3.6	ZNK 100 A 8/2				48 / 52
400	DC-Pro 5 -...	8/2	9.6/2.4	ZNK 80 A 8/2		3m		28 / 30
	DC-Pro 10 -...	12/3	14.4/3.6	ZNK 100 A 8/2		4m		48 / 52
500	DC-Pro 5 -...	8/2	9.6/2.4	ZNK 80 A 8/2		2m+ [1]		28 / 30
	DC-Pro 10 -...	12/3	14.4/3.6	ZNK 100 A 8/2		4m		48 / 52
630	DC-Pro 10 -...	6/1.5	7.2/1.8	ZNK 100 A 8/2		4m		48 / 52
		12/3	14.4/3.6	ZNK 100 B 8/2				56 / 60
800	DC-Pro 10 -...	6/1.5	7.2/1.8	ZNK 100 A 8/2		3m		48 / 52
		12/3	14.4/3.6	ZNK 100 B 8/2				56 / 60
1000	DC-Pro 10 -...	6/1.5	7.2/1.8	ZNK 100 A 8/2		2m+ [1]		48 / 52
		12/3	14.4/3.6	ZNK 100 B 8/2				56 / 60
1250	DC-Pro 10 -...	6/1.5	7.2/1.8	ZNK 100 B 8/2	5 and 8	4m	2/1	65 / 73
		8/2	9.6/2.4			1Am	1/1	56 / 60
	DC-Pro 16 -...	12/3	14.4/3.6	ZNK 100 C 8/2	4	3m	1/1	111
1600	DC-Pro 10 -...	6/1.5	7.2/1.8	ZNK 100 B 8/2	5 and 8	3m	2/1	65 / 73
	DC-Pro 16 -...	8/2	9.6/2.4	ZNK 100 B 8/2	4	2m+ [1]	1/1	103
		12/3	14.4/3.6	ZNK 100 C 8/2				111
2000	DC-Pro 10 -...	6/1.5	7.2/1.8	ZNK 100 B 8/2	5 and 8	2m+ [1]	2/1	65 / 73
	DC-Pro 25 -...	8/2	9.6/2.4	ZNK 100 C 8/2	4		1/1	113
2500	DC-Pro 10 -...	4/1	4.8/1.2	ZNK 100 B 8/2	5 and 8	1Am	2/1	65 / 73
	DC-Pro 25 -...	8/2	9.6/2.4	ZNK 100 C 8/2	4		1/1	113
3200	DC-Pro 16 -...	4/1	4.8/1.2	ZNK 100 B 8/2	4	2m+ [1]	2/1	110
		6/1.5	7.2/1.8	ZNK 100 C 8/2				
4000	DC-Pro 25 -...	4/1	4.8/1.2		4	2m+ [1]	2/1	125
5000						1Am		

1) 2m+ corresponds to 1900 hours at full load 2) Longer hook paths possible, please enquire

Demag DC-Pro chain hoist dimension tables



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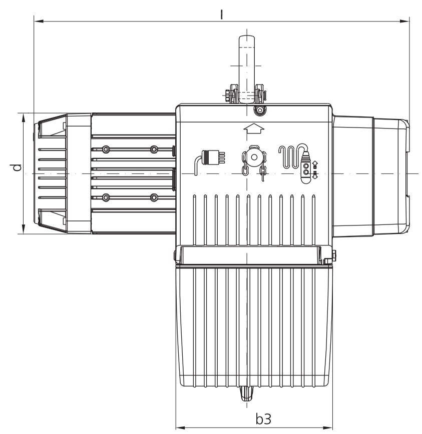

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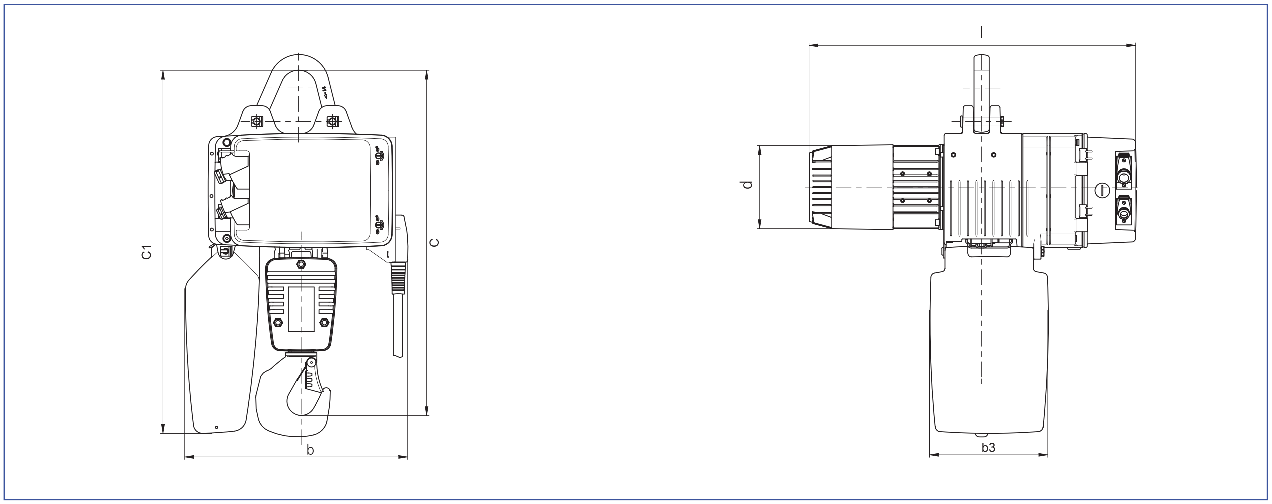
DC-Pro 1–10, up to 1000 kg
1/1 reeving

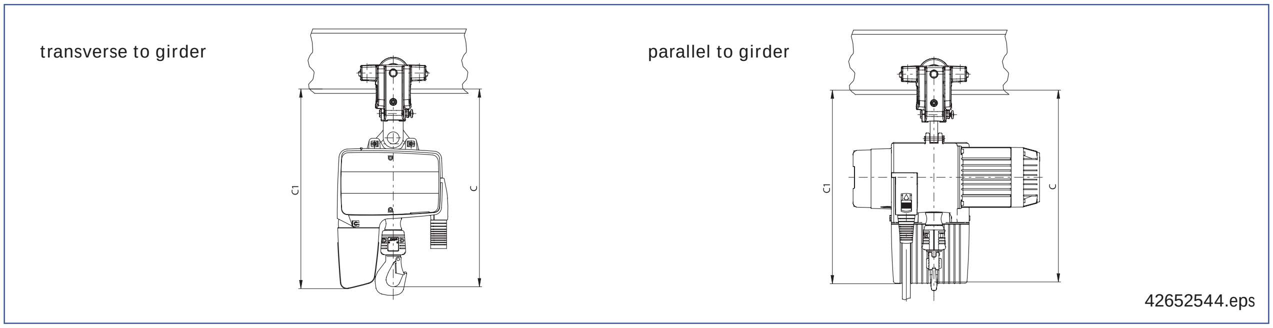
Size	Motor	Suspension bracket						b	l	b3	d
		short	long	short		long					
				Chain collector box size							
				H5	H8	H5	H8				
		C		C 1				b	l	b3	d
DC-Pro 1 DC-Pro 2	ZNK 71 B 8/2	326	364	335	365	373	403	268	422	183	124
DC-Pro 5	ZNK 80 B 8/2	378	316	395	425	435	465	280	468	195	151
DC-Pro 10	ZNK 100 A 8/2	472	505	493	582	526	615	349	528	227	187
DC-Pro 10	ZNK 100 B 8/2	472	505	582	582	615	615	349	578	227	187

DC-Pro 10, 1250 to 2500 kg
2/1 reeving

Size	Motor	Suspension bracket											
		short	long	short		long							
				Chain collector box size									
				H5	H8	H5	H8	H5	H8	H5	H8		
		C		C 1				b		b3		l	d
DC-Pro 10	ZNK 100 B 8/2	541	574	582	582	615	615	349	409	227	330	578	187

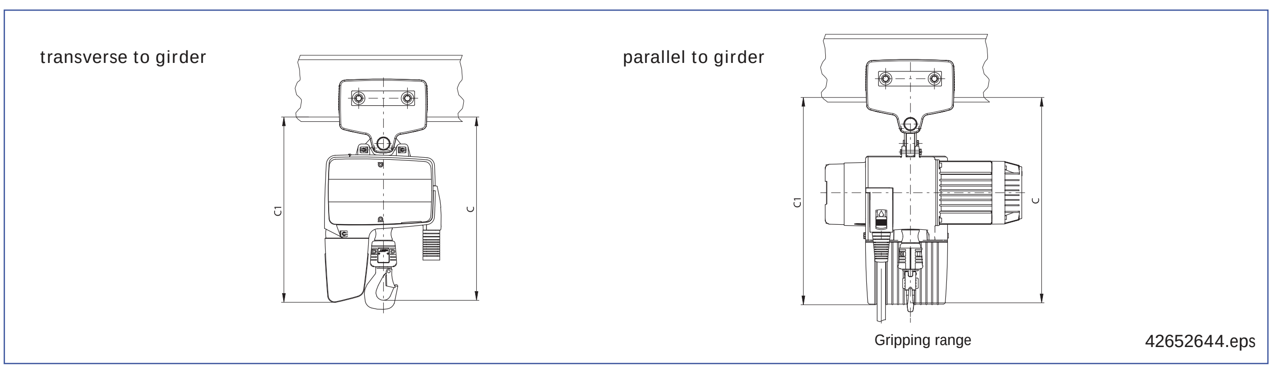

C1
c
b
l
d
b3

DC-Pro chain hoist with CF 5 trolley dimension table



Size	transverse to girder			parallel to girder		
	C	C1		C	C1	
		Chain collector box			Chain collector box	
		H5	H8		H5	H8
DC-Pro 1	385	415	445	380	410	440
DC-Pro 2	385	415	445	380	410	440
DC-Pro 5	430	477	507	425	472	502

Dimension table for DC-Pro 1–10 chain hoists with U 11, U 22 or U 34 trolleys

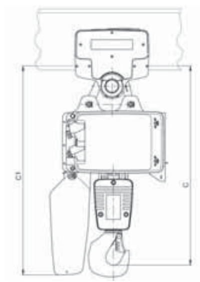


Size	Reeving	Trolley	transverse to girder			parallel to girder		
			C	C1		C	C1	
				Chain collector box			Chain collector box	
				H5	H8		H5	H8
DC-Pro 1	1/1	U 11	378	390	420	416	415	445
DC-Pro 2	1/1	U 11	378	390	420	416	415	445
DC-Pro 5	1/1	U 11	430	452	482	468	477	507
DC-Pro 10	1/1	U 11	524	578	667	557	602	691
	1/1	U 22	536	590	679	569	614	703
	2/1	U 22 / U 34	605	679	779	638	703	803

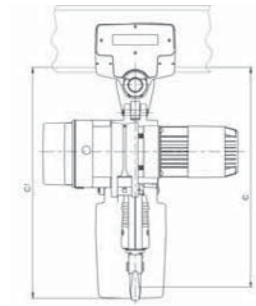
For further information, see U 11/U 22/U 34 technical data 203 570 44.

Dimension table for DC-Pro 16 and 25 chain hoists with U 22, U 34, RU 56 trolleys

transverse to girder



parallel to girder



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Size	Reeving	Trolley	transverse to girder			parallel to girder		
			C	C1		C	C1	
				Chain collector box			Chain collector box	
				Gr. 1	Gr. 2		Gr. 1	Gr. 2
DC-Pro 16	1/1	U 22	704	877	957	736	909	989
	2/1	U 34	799			831		
DC-Pro 25	1/1	U 34	704	877	957	736	909	989
	2/1	RU 56	850	893	973	882	925	1005

Trolley curve radii

Trolley size		Load capacity	Runway girder			
			Push travel		Electric travel	
			Flange width	Rmin	Flange width	Rmin
		[kg]	[mm]	[mm]	[mm]	[mm]
CF 5		550	50-91	800	-	-
U 11 DC	EU 11 DC	1100	58-310	1000	58-310	2000
U 22 DC	EU 22 DC	2200	82-310	2000	82-310	3000
U 34 DC	EU 34 DC	3400	82-310	2000	82-310	3000
RU 56 DC	EU 56 DC	5600	98-310	2000 [1)]	98-310	2500 [1)]

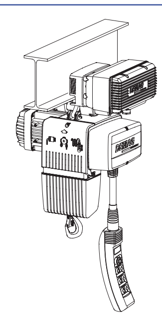
1) From flange width 106 mm

The specified curve radii apply for normal applications.
Please enquire for frequent curve travel (e.g. in automatic installations).

Travel speeds

Load capacity [kg]	Chain hoist Typ	Reeving	Possible cross-travel speeds in approx. ... m/min							
			V14/3		V12/4		V24/6		V40/10	
			Trolley	Travel drive	Trolley	Travel drive	Trolley	Travel drive	Trolley	Travel drive
80 up to 1000	DC-Pro 1 -... up to DC-Pro 10 -...	1/1	-	-	-	-	U 11 DC	E 11 DC	-	-
1250	DC-Pro 10 -...	2/1					U 22 DC	E 22 DC		
	DC-Pro 16 -...	1/1			RU 56 DC	ZBF 80 A 12/4	U 22 DC	E 22 DC	RU 56 DC	ZBF 80 A 8/2
							RU 56 DC	ZBF 71 A 8/2		
1600	DC-Pro 10 -...	2/1			-	-	U 22 DC	E 22 DC	-	-
	DC-Pro 16 -...	1/1			RU 56 DC	ZBF 80 A 12/4	U 22 DC	E 22 DC	RU 56 DC	ZBF 80 A 8/2
							RU 56 DC	ZBF 71 A 8/2		
2000	DC-Pro 10 -...	2/1	-	-	-	-	U 22 DC	E 22 DC	-	-
	DC-Pro 25 -...	1/1	U 34 DC	E 34 DC	RU 56 DC	ZBF 80 A	RU 56 DC	ZBF 71 A 8/2	RU 56 DC	ZBF 80 A 8/2
2500	DC-Pro 10 -...	2/1	U 34 DC	E 34 DC	-	-	-	-	-	-
	DC-Pro 25 -...	1/1			RU 56 DC	ZBF 80 A	RU 56 DC	ZBF 71 A 8/2	RU 56 DC	ZBF 80 A 8/2
3200	DC-Pro 16 -...	2/1	U 34 DC	E 34 DC	RU 56 DC	ZBF 80 A	RU 56 DC	ZBF 71 A 8/2	RU 56 DC	ZBF 80 A 8/2
4000	DC-Pro 25 -...		-	-	RU 56 DC	ZBF 80 A 12/4	RU 56 DC	ZBF 80 A 8/2	RU 56 DC	ZBF 90 B 8/2
5000										

E 11/E 22/E34 travel drive selection table, 220–480 V, 50/60 Hz, 3 ~



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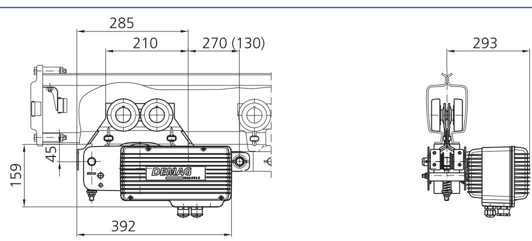
max. displaceable weight incl. dead weight 2) [kg]	Travel drive Typ	Speed at full load 3) [m/min]	Speed at partial load 1) [m/min]	Possible trolleys	Max. weight [kg]
1100	E 11	24/6	30	U 11	4
2200	E 22			U 22, RF 125	5
3400	E 34	14/3.5	–	U 34	5

1) Possible by programming other parameters 2) Max. 1% climbing ability 3) infinitely variable up to 24m/min

See operating instructions 214 810 44 for further information.

E 22 trolley on KBK RF 125 dimensions



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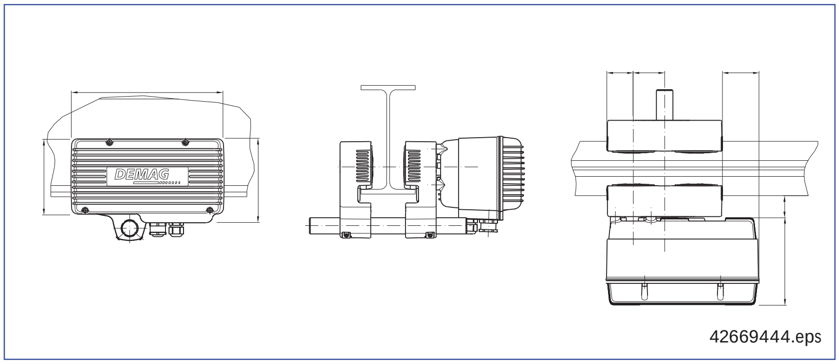
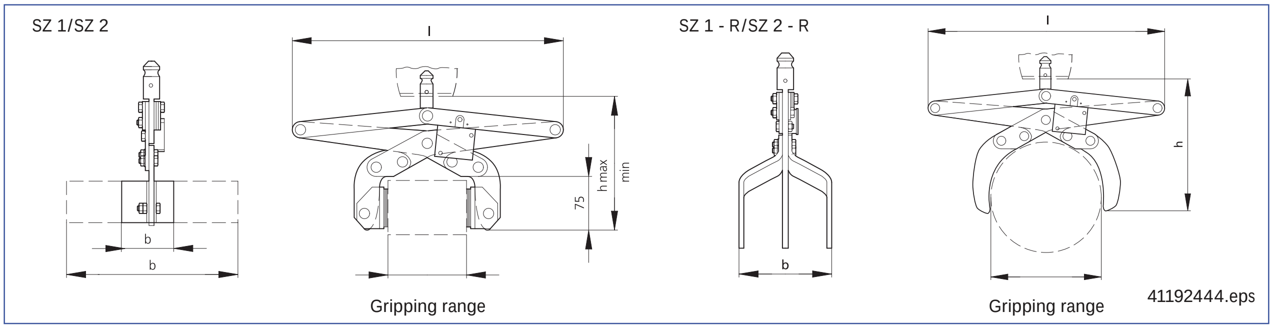
E 11 / E 22 / E 34 travel drive on U 11 / U 22 / U 34 trolley dimensions



Trolley	A1 [mm]	X1 [mm]	X2 [mm]	T1 [mm]
U 11	58	50	68	41
U 22 / U 34	60	68	44	49

Pantograph tongs for load capacity up to 125 kg dimension table



Range	Gripping range	b	l	h min	h max	Size	Part-no.:	Weight in kg
SZ 1	60 – 80	60	370	190	265	SZ 1-08-1	265 701 44	3.5
	80 – 105					SZ 1-10-1	565 601 44	
	105 – 130					SZ 1-13-1	565 702 44	
	130 – 155	60	370	190	265	SZ 1-15-1	565 602 44	3.7
	155 – 180					SZ 1-18-1	565 703 44	
	180 – 205					SZ 1-20-1	565 603 44	
	60 – 80	200	370	190	265	SZ 1-08-2	565 704 44	4.3
	80 – 105					SZ 1-10-2	565 604 44	
	105 – 130					SZ 1-13-2	565 705 44	
	130 – 155	200	370	190	265	SZ 1-15-2	565 605 44	4.5
	155 – 180					SZ 1-18-2	565 706 44	
	180 – 205					SZ 1-20-2	565 606 44	
	Ø 40 – 150	120	370	225	420	SZ 1-R-15	565 608 44	4.0
SZ 2	140 – 210	60	520	190	415	SZ 2-21-1	565 712 44	4.7
	210 – 275					SZ 2-27-1	565 612 44	
	275 – 340					SZ 2-34-1	565 613 44	
	140 – 210	200	520	190	415	SZ 2-21-2	565 715 44	5.4
	210 – 275					SZ 2-27-2	565 615 44	
	275 – 340	200	520	190	415	SZ 2-34-2	565 616 44	5.7
	Ø 100 – 300	160	520	325	620	SZ 2-R-30	565 618 44	5.3

Find your hoist

www.demag-hoistdesigner.com is the address where all important data and facts on the new Demag DC-Pro chain hoist and Manulift DCM-Pro can be found.
This information and planning platform provides you with a comprehensive product overview and contains all the data you need for project engineering. You can also download the CAD drawings of the entire Demag chain hoist range and integrate them into your design drawings.

Suitable hoists and accessories can be selected in this way. A practical and intuitive user interface ensures that you find the right solution to meet your needs quickly and easily. The Demag Internet order system at www.demag-shop.com also makes it possible to order chain hoists and components immediately.

39041

We find the right solution to meet your needs.

Demag Cranes & Components has the right hoist for every business and every load. In order to select the best product for your individual needs from the wide variety of sizes and versions, just fill in the following fax form and send it to us or your dealer. You will promptly receive a recommended solution with the corresponding offer.

Fax service +49 (0) 2335 - 922406

Demag Cranes & Components GmbH
Dept. 2902
Handling Technology Product Promotion
P.O. Box 67
58286 Wetter/Germany

Please send the quote to

____
Company
____
Attention of
____
Department
____
Road
____
Town/post code
____
Telephone
____
Telefax
____
E-mail

☐ DC-Pro chain hoist

☐ DCM-Pro Manulift

Load capacity ______________________ kg

Operating time per day ____________ approx. hours

Lifting height ______________________ approx. m

Hoist speed ______________________ m/min

Trolley ☐ Push-travel trolley

☐ Electric-travel trolley

Travel speed
(for electric trolley) ______________________ m/min

☐ Pillar/wall-mounted slewing jib

☐ KBK crane construction kit
(suspension monorail/crane installation)

Girder profile dimensions ______________________

Operating voltage ______________________

DEMAG
Cranes & Components

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www.demagcranes.com

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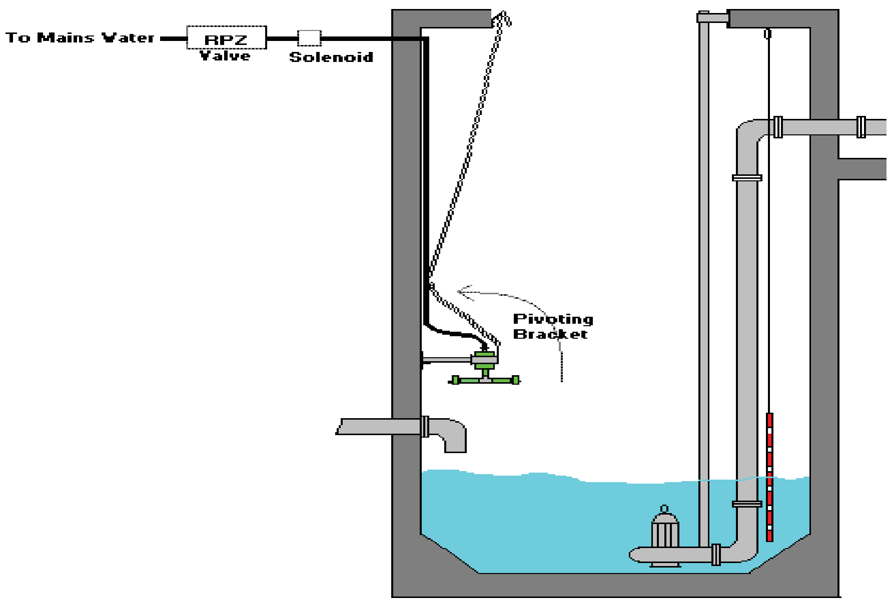
McBerns AutoWellWasher ™

(Australian Patent No. 655111)
(International Patent Appl.No.PCT/AU00/00084)

INSTALLATION INSTRUCTIONS for WALL MOUNT BRACKET

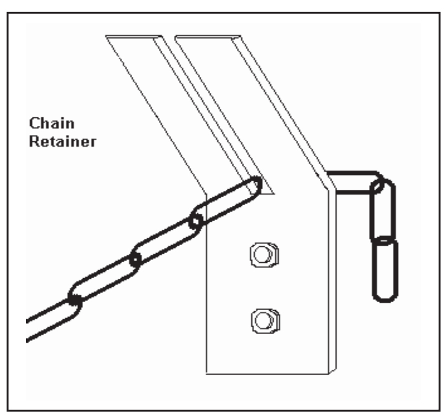
Positioning of the device in the well can be critical to the effectiveness of the wash system. Configuration of wells can differ but, in general the Washer should be positioned in the clearest available space to ensure the rotating arms do not come in contact with guide rails, chains, probes, etc.
The mounting bracket is designed to pivot back against the wall (see Figure 1) so as



not to impede access when a pump needs to be removed.

Having chosen the position, the mounting bracket is secured to the wall by means of four 12mm stainless steel Dynabolts™. The bolt holes should be drilled approximately 1 metre above the normal high water line.
If you need to use the bracket extension piece it should now be attached. The extension piece is not needed in all wells depending on diameter and internal configuration. If not used, save it for later installations when multiple extensions may be useful.
Once the bracket is secured, the Washer head is inserted in the semi-circular clamp and the two locknuts tightened.

Now attach the pivot chain to the lug near the Washer head and pass the chain through the "eye" nut which should be installed in the wall approx. 1 metre above the Washer. The chain then attaches to the chain retainer which is fixed to the lip of the well opening.



Now the water supply can be connected to the Washer head. You can use good quality 3/4" hose (not garden hose), poly, PVC, copper or whatever best suits your requirements. From our experience the hose method is easiest, as it can be simply dropped down the wall and secured out of harms way using electrical ties.

The next step is to set the rotation speed by adjusting the spray buckets. By loosening the bolt which passes through each bucket, the nozzle housing can rotate through 360 degrees (see Figure 2). The nozzles need to be pointing in opposite directions to cause the spray arms to rotate. Speed of rotation is affected by the angle at which the nozzles are set (Figure 3). Best results are obtained with slow rotation, but care must be taken to allow for drops in water pressure at times of peak water usage in the locality. A temporary drop in water pressure can cause the Washer to stop turning if the initial speed is set too low.

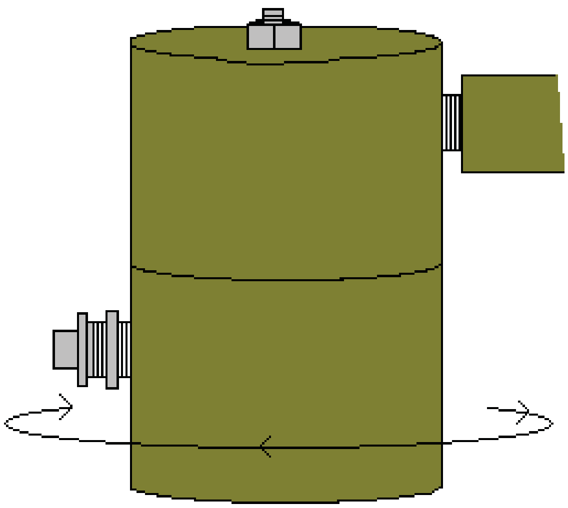


FIGURE 2

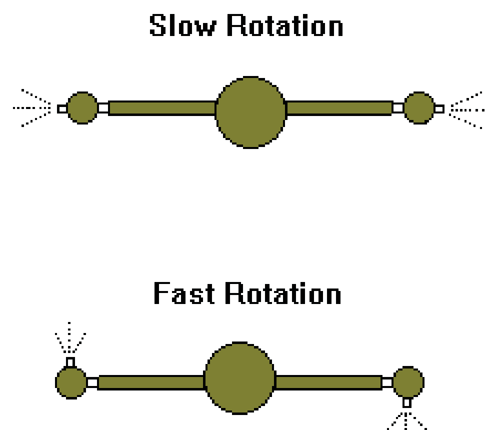


FIGURE 3

Now by twisting the nozzle buckets on the nipples which join them to the spray arms, the nozzles can be directed to wash the desired areas (Figure 4).
Each nozzle gives a wide fan of spray. Usually, one would be directed to cover the well wall from high to low water line. The other can be directed at a sharper angle to

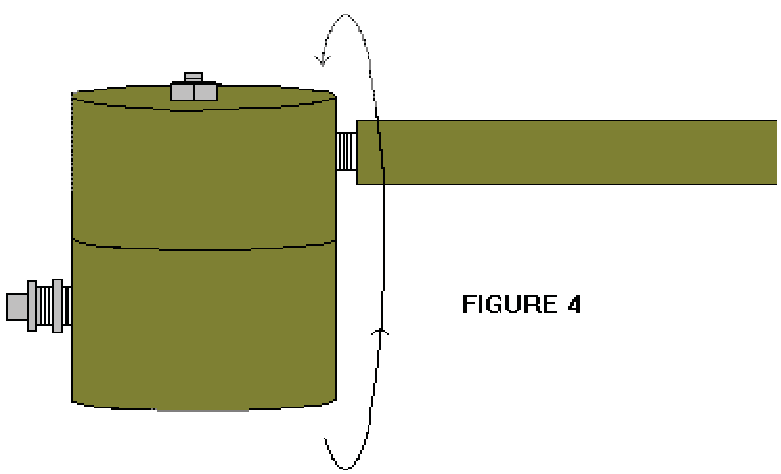


FIGURE 4

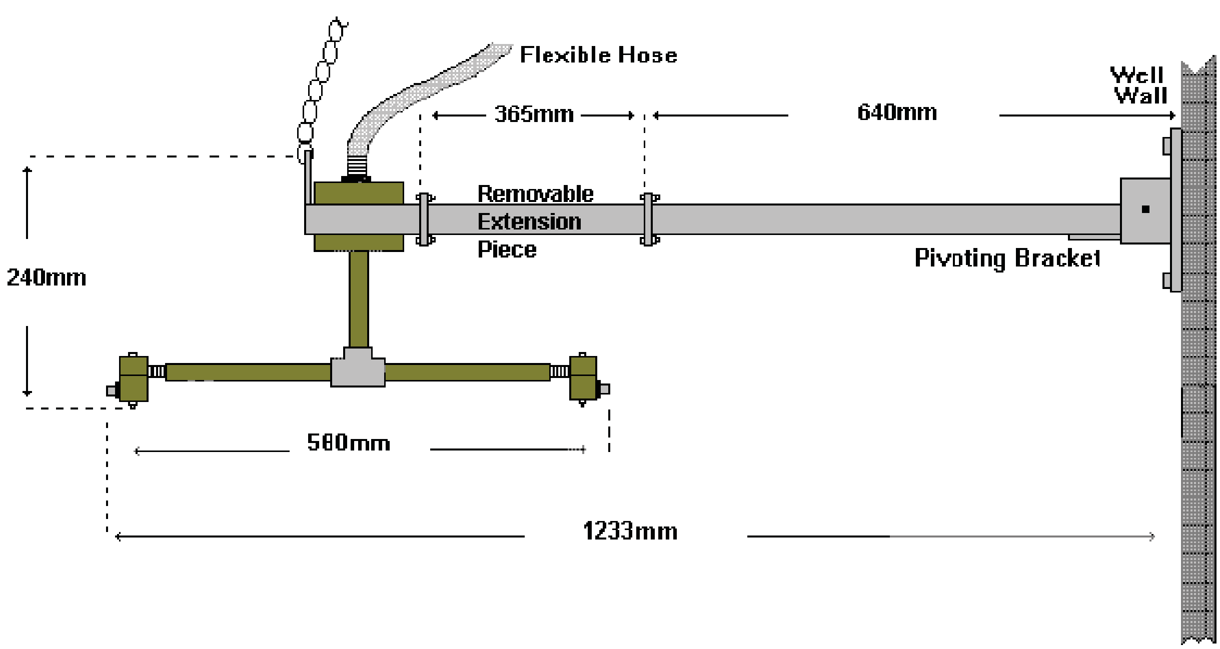
hit the top of the pumps, probe/float switches, guide rails etc.
The last task while in the well is to double check that all nuts have been tightened.
Above ground you should have already installed an approved back-flow prevention device to the water supply line. Australian Standard specifies a Reduced Pressure Zone (RPZ) valve, and we recommend a 25mm model. Between this and the Washer a solenoid valve should be fitted in the water line. This solenoid is wired to the sewage pump control board so as to open when the pump turns on, and close when the pump stops. Thus the Washer operates as the well is being emptied

THE WELL WASHER KIT CONTAINS*:*

Rotating Washer Assembly — 4 x 12mm SS Dynabolts
Pivoting Mounting Bracket — 5 metres SS Chain
Installation Instructions — "Eye" nut & SS Dynabolt
Chain Retainer with 2 SS Dynabolts

TO INSTALL YOU NEED TO PROCURE*:*

Back flow prevention device. (Brand is your choice but we recommend 25mm size.)
24volt AC Solenoid. (Brand and type is best chosen by your Electrician).
Water conduit and connectors (water inlet for Washer head is 3/4” BSP male).



Please note the dimensions above are a guide only. Slight variations may occur.

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PO Box 304
Yandina Qld 4561 Australia
www.autowellwashers.com

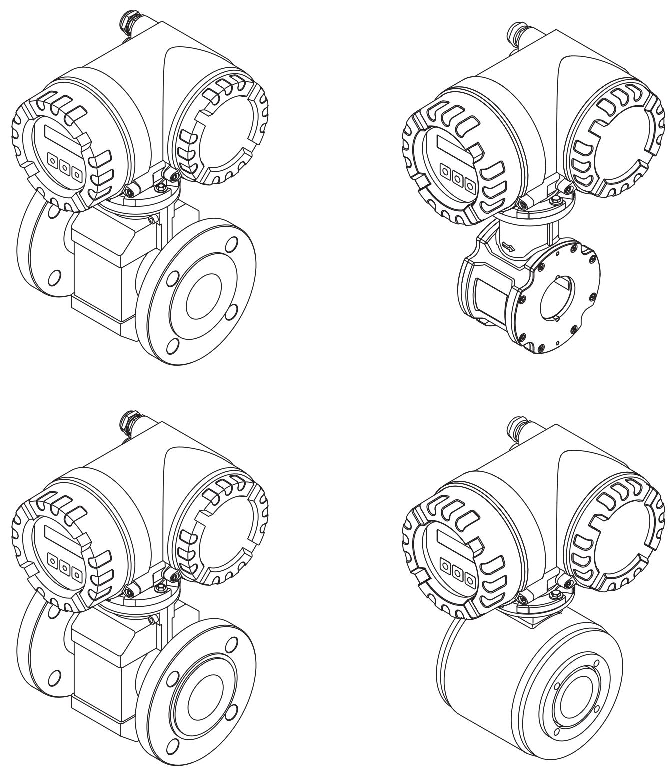
Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Operating Instructions

Proline Promag 50

Electromagnetic flow measuring system

HART®
FIELD COMMUNICATION PROTOCOL



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Valid as of version
V 2.03.XX (device software)

Endress+Hauser
People for Process Automation

Table of contents

1 Safety instructions

1.1 Designated use

The measuring device described in this Operating Manual is to be used only for measuring the flow rate of conductive fluids in closed pipes.

A minimum conductivity of 20 µS/cm is required for measuring demineralized water. Most liquids can be measured as of a minimum conductivity of 5 µS/cm.

Examples:
- Acids, alkalis,
- Drinking water, wastewater, sewage sludge,
- Milk, beer, wine, mineral water, etc.

Resulting from incorrect use or from use other than that designated the operational safety of the measuring devices can be suspended. The manufacturer accepts no liability for damages being produced from this.

1.2 Installation, commissioning and operation

Please note the following:
- Installation, connection to the electricity supply, commissioning and maintenance of the device must be carried out by trained, qualified specialists authorized to perform such work by the facility's owner-operator. The specialist must have read and understood this Operating Manual and must follow the instructions it contains.
- The device must be operated by persons authorized and trained by the facility's owner-operator. Strict compliance with the instructions in the Operating Manual is mandatory.
- With regard to special fluids, including fluids used for cleaning, Endress+Hauser will be happy to assist in clarifying the corrosion-resistant properties of wetted materials.
  However, minor changes in temperature, concentration or in the degree of contamination in the process may result in variations in corrosion resistance. For this reason, Endress+Hauser does not accept any responsibility with regard to the corrosion resistance of wetted materials in a specific application.
  The user is responsible for the choice of suitable wetted materials in the process.
- If welding work is performed on the piping system, do not ground the welding appliance through the Promag flowmeter.
- The installer must ensure that the measuring system is correctly wired in accordance with the wiring diagrams. The transmitter must be grounded apart from when special protective measures are taken (e.g. galvanically isolated SELV or PELV power supply)
- Invariably, local regulations governing the opening and repair of electrical devices apply.

1.3 Operational safety

Please note the following:
- Measuring systems for use in hazardous environments are accompanied by separate Ex documentation, which is an integral part of this Operating Manual. Strict compliance with the installation instructions and ratings as stated in this supplementary documentation is mandatory. The symbol on the front of this Ex documentation indicates the approval and the certification body (e.g. Ex Europe, FM USA, SP Canada).
- The measuring device complies with the general safety requirements in accordance with EN 61010-1, the EMC requirements of IEC/EN 61326 and NAMUR Recommendations NE 21 and NE 43.
- Depending on the application, the seals of the process connections of the Promag H sensor require periodic replacement.

- When hot fluid passes through the measuring tube, the surface temperature of the housing increases. In the case of the sensor, in particular, users should expect temperatures that can be close to the fluid temperature. If the temperature of the fluid is high, implement sufficient measures to prevent burning or scalding.
- The manufacturer reserves the right to modify technical data without prior notice. Your Endress+Hauser distributor will supply you with current information and updates to these Operating Instructions.

1.4 Return

- Do not return a measuring device if you are not absolutely certain that all traces of hazardous substances have been removed, e.g. substances which have penetrated crevices or diffused through plastic.
- Costs incurred for waste disposal and injury (burns, etc.) due to inadequate cleaning will be charged to the owner-operator.

1.5 Notes on safety conventions and icons

The devices are designed to meet state-of-the-art safety requirements, have been tested, and left the factory in a condition in which they are safe to operate. The devices comply with the applicable standards and regulations in accordance with EN 61010-1 "Safety requirements for electrical equipment for measurement, control and laboratory use".
The devices can, however, be a source of danger if used incorrectly or for anything other than the designated use. Consequently, always pay particular attention to the safety instructions indicated in this Operating Manual by the following icons:

⚠ Warning!
"Warning" indicates an action or procedure which, if not performed correctly, can result in injury or a safety hazard. Comply strictly with the instructions and proceed with care.

Caution!
"Caution" indicates an action or procedure which, if not performed correctly, can result in incorrect operation or destruction of the device. Comply strictly with the instructions.

✎ Note!
"Note" indicates an action or procedure which, if not performed correctly, can have an indirect effect on operation or trigger an unexpected response on the part of the device.

2 Identification

2.1 Device designation

The flow measuring system consists of the following components:

- Promag 50 transmitter
- Promag D, Promag L, Promag W, Promag P or Promag H sensor

In the *compact version*, the transmitter and sensor form a single mechanical unit; in the *remote version* they are installed separately.

2.1.1 Nameplate of the transmitter

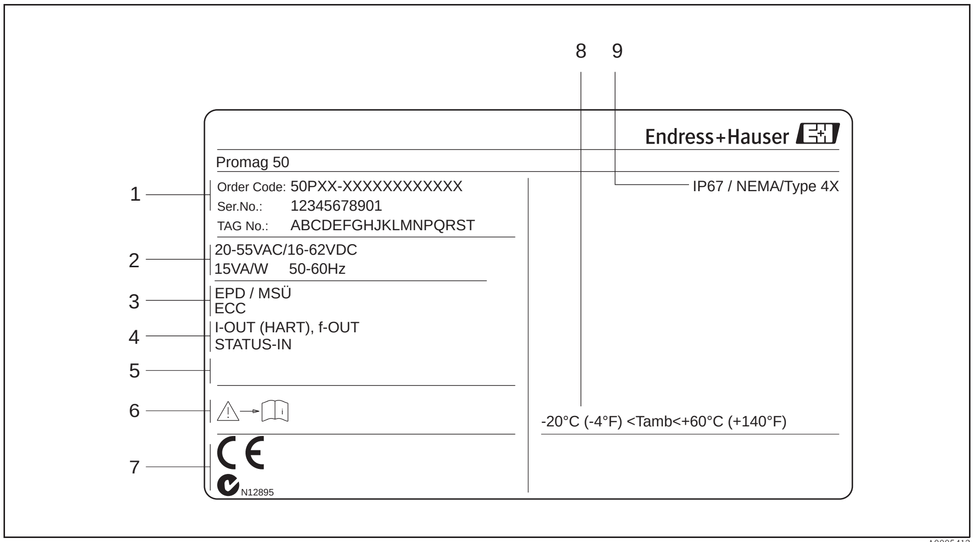


Fig. 1: Nameplate specifications for the "Promag 50" transmitter (example)

1 Ordering code/serial number: See the specifications on the order confirmation for the meanings of the individual letters and digits.
2 Power supply, frequency, power consumption
3 Additional information:
EPD/MSÜ: with Empty Pipe Detection
ECC: with electrode cleaning
4 Outputs available:
I-OUT (HART): with current output (HART)
f-OUT (HART): with frequency output
STATUS-IN: with status input (power supply)
5 Reserved for information on special products
6 Observe device documentation
7 Reserved for additional information on device version (approvals, certificates)
8 Permitted ambient temperature range
9 Degree of protection

2.1.2 Nameplate of the sensor

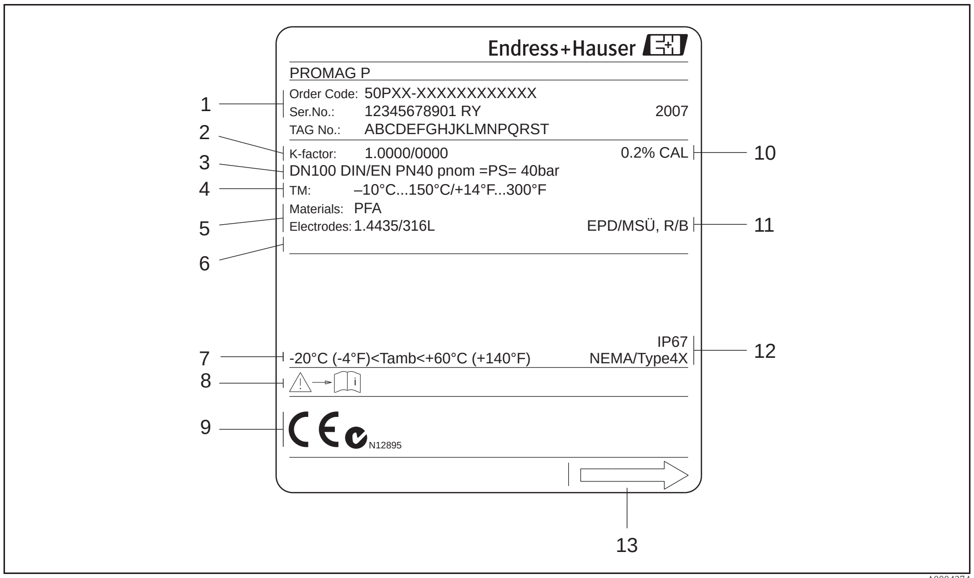


Fig. 2: Nameplate specifications for the "Promag" sensor (example)

1 *Ordering code/serial number: See the specifications on the order confirmation for the meanings of the individual letters and digits.*
2 *Calibration factor with zero point*
3 *Nominal diameter / Pressure rating*
4 *Fluid temperature range*
5 *Materials: lining/measuring electrodes*
6 *Reserved for information on special products*
7 *Permitted ambient temperature range*
8 *Observe device documentation*
9 *Reserved for additional information on device version (approvals, certificates)*
10 *Calibration tolerance*
11 *Additional information (examples):*
– *EPD/MSÜ: with Empty Pipe Detection electrode*
– *R/B: with reference electrode*
12 *Degree of protection*
13 *Flow direction*

2.1.3 Nameplate, connections

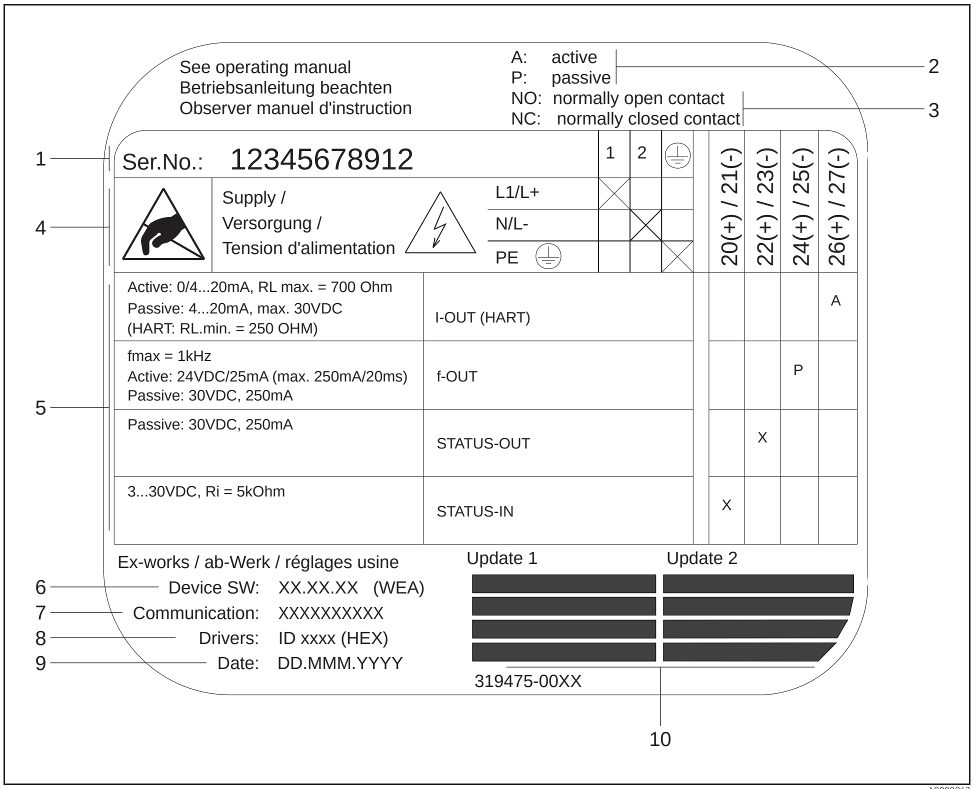


Fig. 3: Nameplate specifications for transmitter (example)

1 *Serial number*
2 *Possible configuration of current output*
3 *Possible configuration of relay contacts*
4 *Terminal assignment, cable for power supply: 85 to 260 V AC, 20 to 55 V AC, 16 to 62 V DC*
Terminal No. 1: *L1 for AC, L+ for DC*
Terminal No. 2: *N for AC, L– for DC*
5 *Signals present at inputs and outputs, possible configuration and terminal assignment (20 to 27), see also "Electrical values of inputs/outputs"*
6 *Version of device software currently installed*
7 *Installed communication type, e.g.: HART, PROFIBUS PA, etc.*
8 *Information on current communication software (Device Revision and Device Description), e.g.: Dev. 01 / DD 01 for HART*
9 *Date of installation*
10 *Current updates to data specified in points 6 to 9*

2.2 Certificates and approvals

The devices are designed to meet state-of-the-art safety requirements in accordance with sound engineering practice. They have been tested and left the factory in a condition in which they are safe to operate.

The devices comply with the applicable standards and regulations in accordance with EN 61010-1 "Safety requirements for electrical equipment for measurement, control and laboratory use" and with the EMC requirements of IEC/EN 61326/A1.

The measuring system described in this Operating Manual is therefore in conformity with the statutory requirements of the EC Directives. Endress+Hauser confirms successful testing of the device by affixing to it the CE mark.

The measuring system meets the EMC requirements of the Australian Communications and Media Authority (ACMA)

2.3 Registered trademarks

KALREZ® and VITON®
Registered trademarks of E.I. Du Pont de Nemours & Co., Wilmington, USA

TRI-CLAMP®
Registered trademark of Ladish & Co., Inc., Kenosha, USA

HART®
Registered trademark of the HART Communication Foundation, Austin, USA

HistoROM™, S-DAT®, Field Xpert™, FieldCare®, Fieldcheck®, Applicator®
Registered or registration-pending trademarks of Endress+Hauser Flowtec AG, Reinach, CH

3 Installation

3.1 Incoming acceptance, transport and storage

3.1.1 Incoming acceptance

On receipt of the goods, check the following:
- Check the packaging and the contents for damage.
- Check the shipment, make sure nothing is missing and that the scope of supply matches your order.

3.1.2 Transport

The following instructions apply to unpacking and to transporting the device to its final location:
- Transport the devices in the containers in which they are delivered.
- Do not remove the protective plates or caps on the process connections until you are ready to install the device. This is particularly important in the case of sensors with PTFE linings.

Special notes on flanged devices

Caution!
- The wooden covers mounted on the flanges from the factory protect the linings on the flanges during storage and transportation. In case of Promag L they are additionally used to hold the lap joint flanges in place. Do not remove these covers until **immediately before** the device in the pipe.
- Do not lift flanged devices by the transmitter housing, or the connection housing in the case of the remote version.

Transporting flanged devices DN ≤ 300 (≤ 12")

Use webbing slings slung round the two process connections. Do not use chains, as they could damage the housing.

Warning!
Risk of injury if the measuring device slips. The center of gravity of the assembled measuring device might be higher than the points around which the slings are slung.
At all times, therefore, make sure that the device does not unexpectedly turn around its axis or slip.

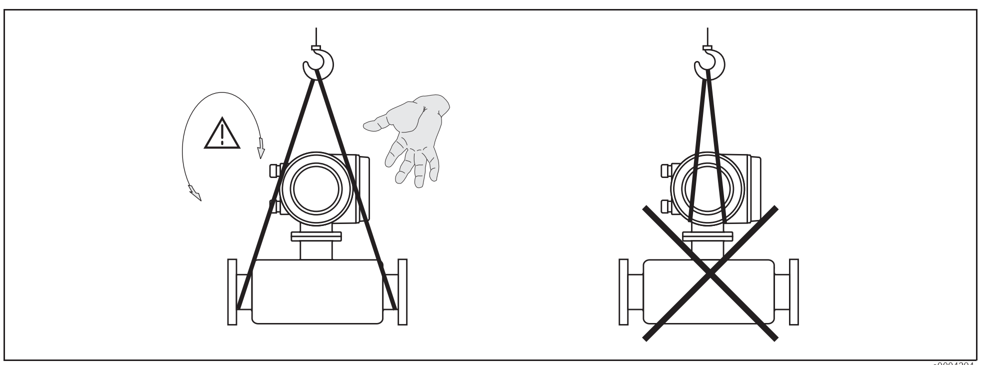
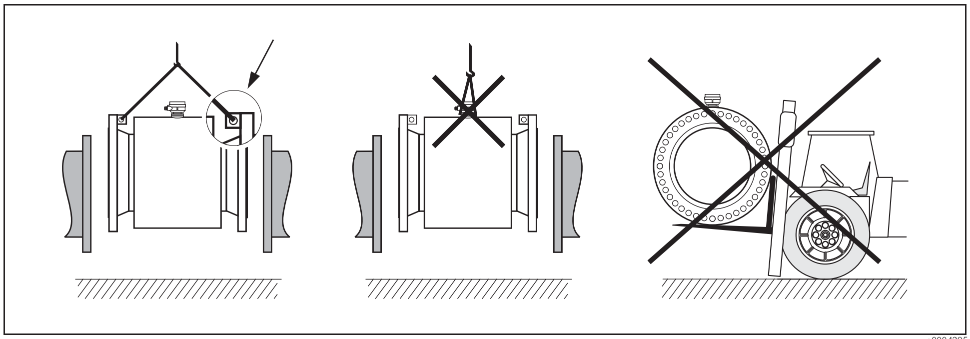


Fig. 4: Transporting sensors with DN ≤ 300 (≤ 12")

Transporting flangeddevices DN > 300 (> 12")

Use only the metal eyes on the flanges for transporting the device, lifting it and positioning the sensor in the piping.

Caution!
Do not attempt to lift the sensor with the tines of a fork-lift truck beneath the metal casing. This would buckle the casing and damage the internal magnetic coils.



a0004295

Fig. 5: Transporting sensors with DN > 300 (> 12")

3.1.3 Storage

Please note the following:
- Pack the measuring device in such a way as to protect it reliably against impact for storage (and transportation). The original packaging provides optimum protection.
- The storage temperature corresponds to the operating temperature range of the measuring transmitter and the appropriate measuring sensors → 101.
- Do not remove the protective plates or caps on the process connections until you are ready to install the device. This is particularly important in the case of sensors with PTFE linings.
- The measuring device must be protected against direct sunlight during storage in order to avoid unacceptably high surface temperatures.
- Choose a storage location where moisture does not collect in the measuring device. This will help prevent fungus and bacteria infestation which can damage the liner.

3.2 Installation conditions

3.2.1 Dimensions

The dimensions and installation lengths of the sensor and transmitter can be found in the "Technical Information" for the device in question. This document can be downloaded as a PDF file from www.endress.com. A list of the "Technical Information" documents available is provided in the "Documentation" section on → 🗎 116.

3.2.2 Mounting location

Entrained air or gas bubble formation in the measuring tube can result in an increase in measuring errors.
Avoid the following locations:
- Highest point of a pipeline. Risk of air accumulating!
- Directly upstream from a free pipe outlet in a vertical pipeline.

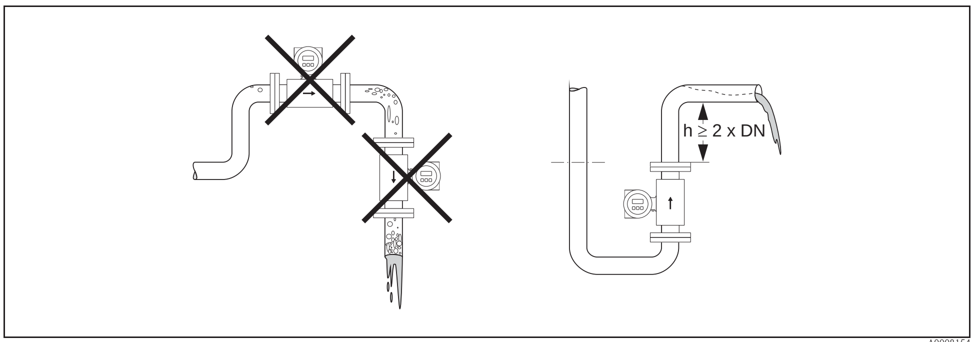


Fig. 6: Mounting location

Installation of pumps

Do **not** install the sensor on the intake side of a pump. This precaution is to avoid low pressure and the consequent risk of damage to the lining of the measuring tube. Information on the lining's resistance to partial vacuum can be found on → 🗎 105.

It might be necessary to install pulse dampers in systems incorporating reciprocating, diaphragm or peristaltic pumps. Information on the measuring system's resistance to vibration and shock can be found on → 🗎 101.

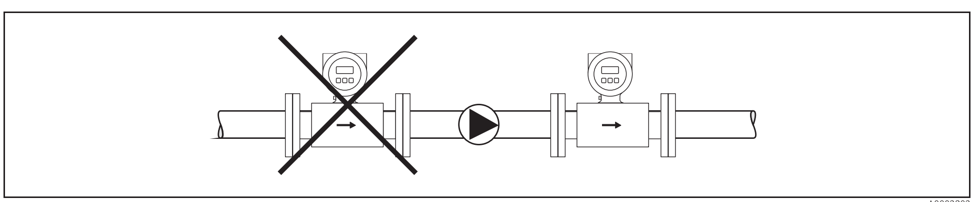


Fig. 7: Installation of pumps

Partially filled pipes

Partially filled pipes with gradients necessitate a drain-type configuration.
The Empty Pipe Detection function (EPD → 📄 74) offers additional protection by detecting empty or partially filled pipes.

Caution!
Risk of solids accumulating. Do not install the sensor at the lowest point in the drain. It is advisable to install a cleaning valve.

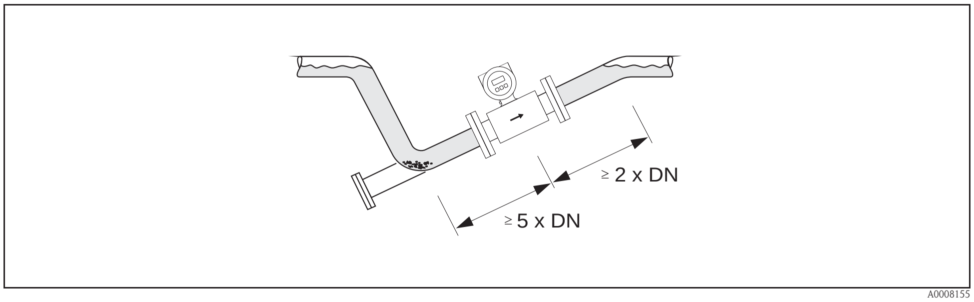


Fig. 8: Installation in a partially filled pipe

Down pipes

Install a siphon or a vent valve downstream of the sensor in down pipes whose length h ≥ 5 m (16.4 ft). This precaution is to avoid low pressure and the consequent risk of damage to the lining of the measuring tube.
This measure also prevents the system losing prime, which could cause air pockets. Information on the lining's resistance to partial vacuum can be found on → 📄 105.

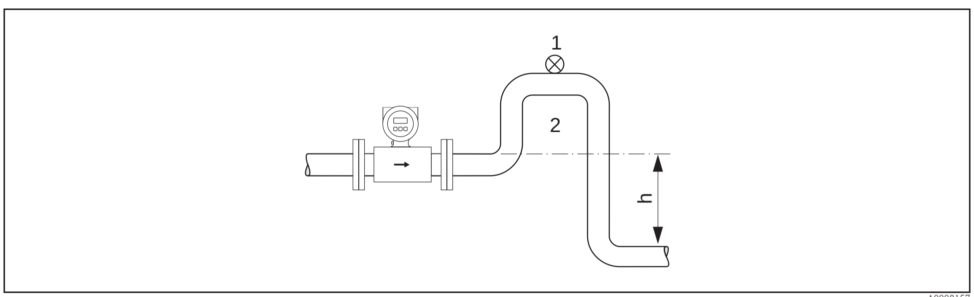


Fig. 9: Measures for installation in a down pipe

1 Vent valve
2 Pipe siphon
h Length of down pipe

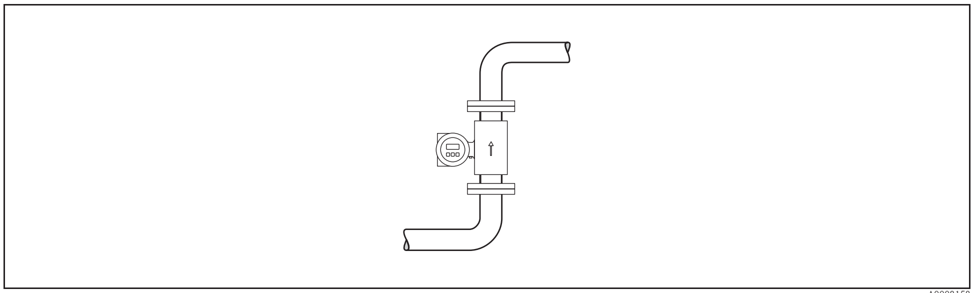
3.2.3 Orientation

An optimum orientation position helps avoid gas and air accumulations and deposits in the measuring tube. However, Promag offers the additional Empty Pipe Detection (EPD) function to ensure the detection of partially filled measuring tubes, e.g. in the case of degassing fluids or varying process pressure:

- Electrode Cleaning Circuit (ECC) for applications with accretive fluids, e.g. electrically conductive deposits (→ "Description of Device Functions" manual).
- Empty Pipe Detection (EPD) ensures the detection of partially filled measuring tubes, e.g. in the case of degassing fluids (→ 74)
- Exchangeable Measuring Electrodes for abrasive fluids (→ 93)

Vertical orientation

This is the ideal orientation for self-emptying piping systems and for use in conjunction with Empty Pipe Detection.



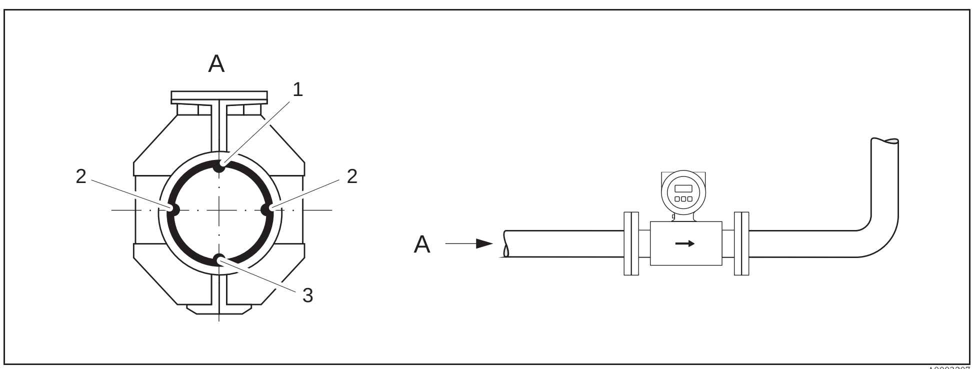
A0008158

Fig. 10: Vertical orientation

Horizontal orientation

The measuring electrode plane should be horizontal. This prevents brief insulation of the two measuring electrodes by entrained air bubbles.

Caution!
Empty Pipe Detection functions correctly only when the measuring device is installed horizontally and the transmitter housing is facing upward (→ 10). Otherwise there is no guarantee that Empty Pipe Detection will respond if the measuring tube is only partially filled or empty.



A0003207

Fig. 11: Horizontal orientation

1 *EPD electrode for the detection of empty pipes (not with Promag D and Promag H (DN 2 to 15; 1/12" to ½"))*
2 *Measuring electrodes for signal detection*
3 *Reference electrode for the potential equalization (not with Promag D and H)*

Inlet and outlet run

If possible, install the sensor upstream from fittings such as valves, T-pieces, elbows, etc. The following inlet and outlet runs must be observed in order to meet accuracy specifications:

- Inlet run: ≥ 5 × DN
- Outlet run: ≥ 2 × DN

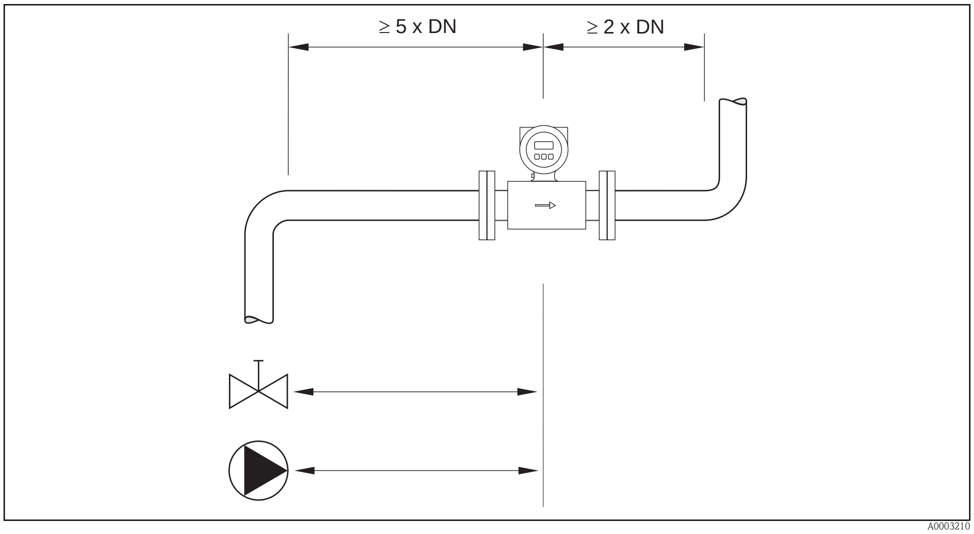


Fig. 12: Inlet and outlet runs

3.2.4 Vibrations

Secure the piping and the sensor if vibration is severe.

Caution!
If vibrations are too severe, we recommend the sensor and transmitter be mounted separately. Information on resistance to vibration and shock can be found on → 101.

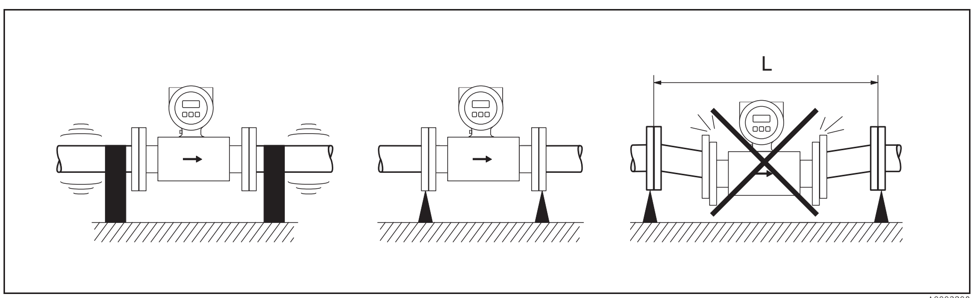


Fig. 13: Measures to prevent vibration of the device (L > 10 m (32.8 ft))

3.2.5 Foundations, supports

If the nominal diameter is DN ≥ 350, mount the sensor on a foundation of adequate load-bearing strength.

Caution!
Risk of damage.
Do not support the weight of the sensor on the metal casing: the casing would buckle and damage the internal magnetic coils.

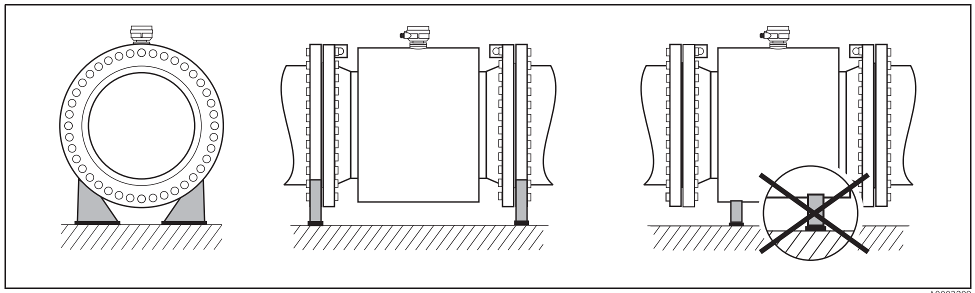


Fig. 14: Correct support for large nominal diameters (DN ≥ 350)

3.2.6 Adapters

Suitable adapters to DIN EN 545 (double-flange reducers) can be used to install the sensor in larger-diameter pipes.
The resultant increase in the rate of flow improves measuring accuracy with very slow-moving fluids. The nomogram shown here can be used to calculate the pressure loss caused by reducers and expanders.

Note!
The nomogram only applies to liquids of viscosity similar to water.

1. Calculate the ratio of the diameters d/D.
2. From the nomogram read off the pressure loss as a function of flow velocity (*downstream* from the reduction) and the d/D ratio.

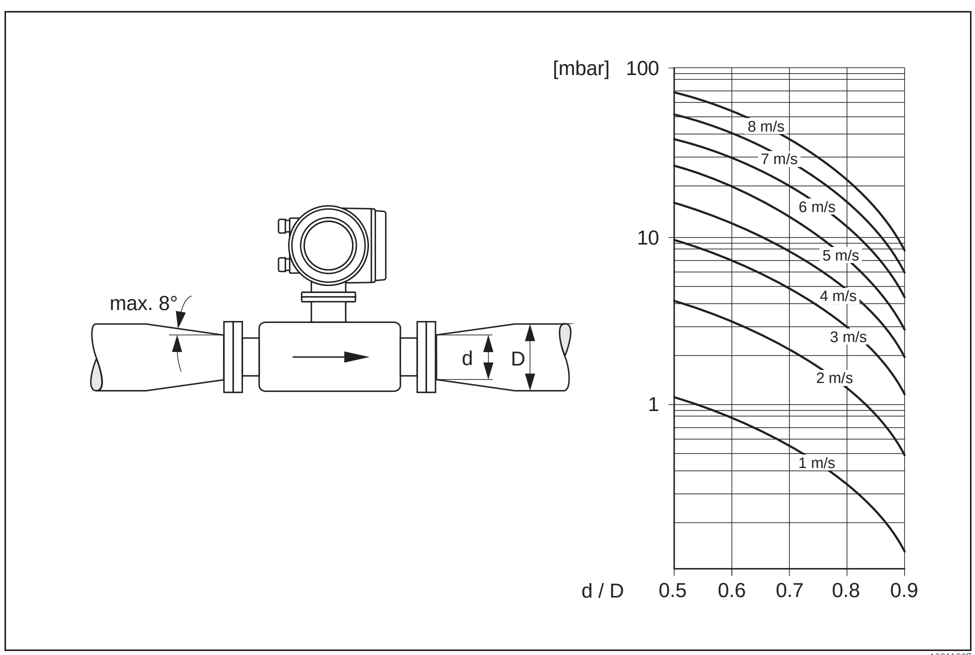


Fig. 15: Pressure loss due to adapters

3.2.7 Nominal diameter and flow rate

The diameter of the pipe and the flow rate determine the nominal diameter of the sensor. The optimum velocity of flow is between 2 and 3 m/s (6.5 to 9.8 ft/s)

The velocity of flow (v), moreover, has to be matched to the physical properties of the fluid:
- v < 2 m/s (v < 6.5 ft/s): for abrasive fluids
- v > 2 m/s (v > 6.5 ft/s): for fluids producing buildup

Note!
Flow velocity can be increased, if necessary, by reducing the nominal diameter of the sensor (→ 17).

Recommended flow (SI units)

Nominal diameter	Promag D	Promag L	Promag W	Promag P	Promag H
[mm]	Min./max. full scale value (v ≈ 0.3 or 10 m/s) in [dm³/min]				
2	–	–	–	–	0.06 to 1.8
4	–	–	–	–	0.25 to 7
8	–	–	–	–	1 to 30
15	–	–	–	4 to 100	4 to 100
25	9 to 300	–	9 to 300	9 to 300	9 to 300
32	–	–	15 to 500	15 to 500	–
40	25 to 700	–	25 to 700	25 to 700	25 to 700
50	35 to 1100	35 to 1100	35 to 1100	35 to 1100	35 to 1100
65	60 to 2000	60 to 2000	60 to 2000	60 to 2000	60 to 2000
80	90 to 3000	90 to 3000	90 to 3000	90 to 3000	90 to 3000
100	145 to 4700	145 to 4700	145 to 4700	145 to 4700	145 to 4700
125	–	220 to 7500	220 to 7500	220 to 7500	–
[mm]	Min./max. full scale value (v ≈ 0.3 or 10 m/s) in [m³/h]				
150	–	20 to 600	20 to 600	20 to 600	–
200	–	35 to 1100	35 to 1100	35 to 1100	–
250	–	55 to 1700	55 to 1700	55 to 1700	–
300	–	80 to 2400	80 to 2400	80 to 2400	–
350	–	–	110 to 3300	110 to 3300	–
375	–	–	140 to 4200	–	–
400	–	–	140 to 4200	140 to 4200	–
450	–	–	180 to 5400	180 to 5400	–
500	–	–	220 to 6600	220 to 6600	–
600	–	–	310 to 9600	310 to 9600	–
700	–	–	420 to 13500	–	–
800	–	–	550 to 18000	–	–
900	–	–	690 to 22500	–	–
1000	–	–	850 to 28000	–	–
1200	–	–	1250 to 40000	–	–
1400	–	–	1700 to 55000	–	–
1600	–	–	2200 to 70000	–	–
1800	–	–	2800 to 90000	–	–
2000	–	–	3400 to 110000	–	–

Recommended flow (US units)

Nominal diameter	Promag D	Promag L	Promag W	Promag P	Promag H
[inch]	Min./max. full scale value (v ≈ 0.3 or 10 m/s) in [gal/min]				
1 $^1/_{12}$"	–	–	–	–	0.015 to 0.5
$^5/_{32}$"	–	–	–	–	0.07 to 2
$^5/_{16}$"	–	–	–	–	0.25 to 8
$^1/_2$"	–	–	–	1.0 to 27	1.0 to 27
1"	2.5 to 80	–	2.5 to 80	2.5 to 80	2.5 to 80
1 $^1/_4$"	–	–	4 to 130	4 to 130	–
1 $^1/_2$"	7 to 190	7 to 190	7 to 190	7 to 190	7 to 190
2"	10 to 300	10 to 300	10 to 300	10 to 300	10 to 300
2 $^1/_2$"	16 to 500	16 to 500	16 to 500	16 to 500	16 to 500
3"	24 to 800	24 to 800	24 to 800	24 to 800	24 to 800
4"	40 to 1250	40 to 1250	40 to 1250	40 to 1250	40 to 1250
5"	–	60 to 1950	60 to 1950	60 to 1950	–
6"	–	90 to 2650	90 to 2650	90 to 2650	–
8"	–	155 to 4850	155 to 4850	155 to 4850	–
10"	–	250 to 7500	250 to 7500	250 to 7500	–
12"	–	350 to 10600	350 to 10600	350 to 10600	–
14"	–	–	500 to 15000	500 to 15000	–
15"	–	–	600 to 19000	–	–
16"	–	–	600 to 19000	600 to 19000	–
18"	–	–	800 to 24000	800 to 24000	–
20"	–	–	1000 to 30000	1000 to 30000	–
24"	–	–	1400 to 44000	1400 to 44000	–
28"	–	–	1900 to 60000	–	–
30"	–	–	2150 to 67000	–	–
32"	–	–	2450 to 80000	–	–
36"	–	–	3100 to 100000	–	–
40"	–	–	3800 to 125000	–	–
42"	–	–	4200 to 135000	–	–
48"	–	–	5500 to 175000	–	–
[inch]	Min./max. full scale value (v ≈ 0.3 or 10 m/s) in [Mgal/d]				
54"	–	–	9 to 300	–	–
60"	–	–	12 to 380	–	–
66"	–	–	14 to 500	–	–
72"	–	–	16 to 570	–	–
78"	–	–	18 to 650	–	–

3.2.8 Length of connecting cable

In order to ensure measuring accuracy, comply with the following instructions when installing the remote version:

- Fix cable run or lay in armored conduit. Cable movements can falsify the measuring signal especially in the case of low fluid conductivities.
- Route the cable well clear of electrical machines and switching elements.
- Ensure potential equalization between sensor and transmitter, if necessary.
- The permitted connecting cable length L_{max} is determined by the fluid conductivity (→ 16). A minimum conductivity of 20 µS/cm is required for measuring demineralized water. Most liquids can be measured as of a minimum conductivity of 5 µS/cm.
- The maximum connecting cable length is 10 m (32.8 ft) when empty pipe detection (EPD → 74) is switched on.

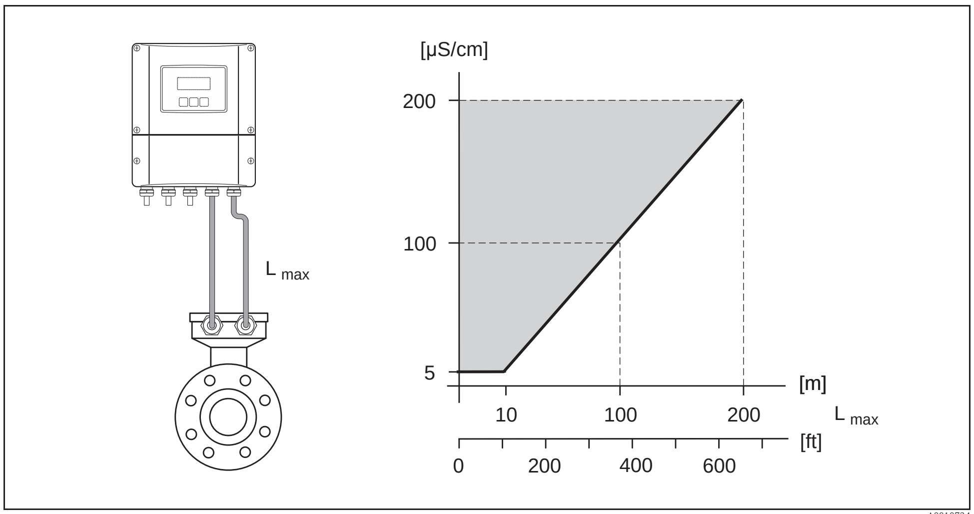


Fig. 16: Permissible cable length for the remote version

Area shaded gray = permitted range
Lmax = connecting cable length in [m]
Fluid conductivity in [µS/cm]

3.3 Installation instructions

3.3.1 Installing the Promag D sensor

The sensor is installed between the pipe flanges with a mounting kit. The device is centered using recesses on the sensor (→ 22).

Note!
A mounting kit consisting of mounting bolts, seals, nuts and washers can be ordered separately (→ 77). Centering sleeves are provided with the device if they are required for the installation.

Caution!
When installing the transmitter in the pipe, observe the necessary torques (→ 23).

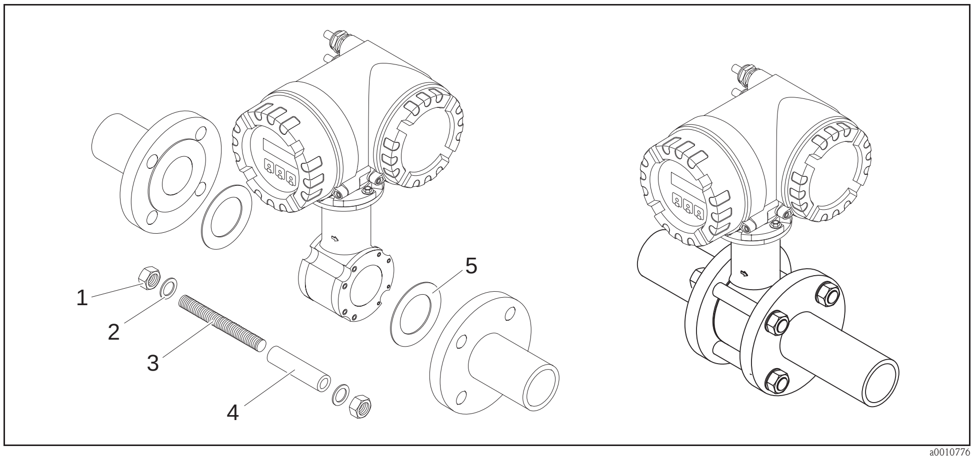


Fig. 17: Mounting the sensor

1 Nut
2 Washer
3 Mounting bolt
4 Centering sleeve
5 Seal

Seals

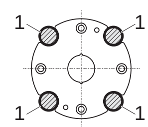
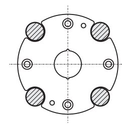
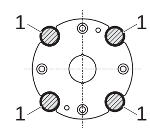
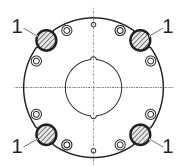
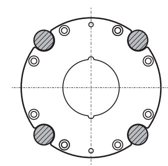
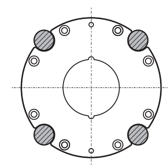
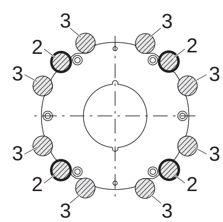
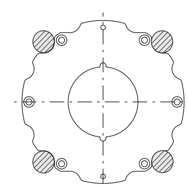
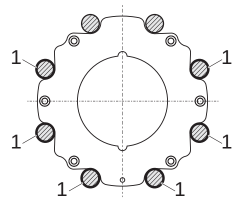
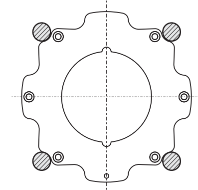
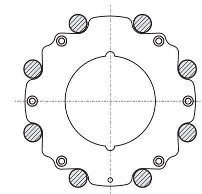
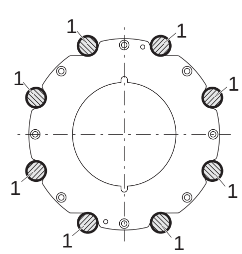
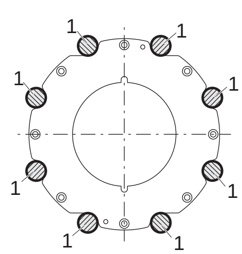
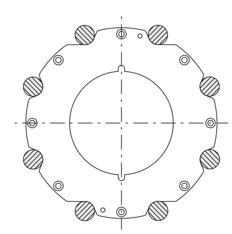
When installing the sensor, make sure that the seals used do not project into the pipe cross-section.

Caution!
Risk of short circuit! Do not use electrically conductive sealing compounds such as graphite! An electrically conductive layer could form on the inside of the measuring tube and short-circuit the measuring signal.

Note!
Use seals with a hardness rating of 70° Shore.

Arrangement of the mounting bolts and centering sleeves

The device is centered using recesses on the sensor. The arrangement of the mounting bolts and the use of the centering sleeves supplied depend on the nominal diameter, the flange standard und the pitch circle diameter.

	Process connection		
	EN (DIN)	ANSI	JIS
DN 25 to 40 (DN 1" to 1 ½")	 A0010896	 A0010824	 A0010896
DN 50 (DN 2")	 A0010897	 A0010825	 A0010825
DN 65	 A0012170	—	 A0012171
DN 80 (DN 3")	 A0010898	 A0010827	 A0010826
DN 100 (DN 4")	 A0012168	 A0012168	 A0012169

1 = Mounting bolts with centering sleeves
2 = EN (DIN) flanges: 4-hole → with centering sleeves
3 = EN (DIN) flanges: 8-hole → without centering sleeves

Screw tightening torques (Promag D)

Please note the following:
- The tightening torques listed below are for lubricated threads only.
- Always tighten the screws uniformly and in diagonally opposite sequence.
- Overtightening the screws will deform the sealing faces or damage the seals.
- The tightening torques listed below apply only to pipes not subjected to tensile stress.

The tightening torques apply to situations where an EPDM soft material flat seal (e.g. 70 Shore) is used.

Tightening torques, mounting bolts and centering sleeves for EN (DIN) PN 16

Nominal diameter	Mounting bolts	Centering sleeve length	Tightening torque [Nm] with a process flange with a	
[mm]	[mm]	[mm]	smooth seal face	raised face
25	4 × M12 × 145	54	19	19
40	4 × M16 × 170	68	33	33
50	4 × M16 × 185	82	41	41
65[1]	4 × M16 × 200	92	44	44
65[2]	8 × M16 × 200	– [3]	29	29
80	8 × M16 × 225	116	36	36
100	8 × M16 × 260	147	40	40

[1] EN (DIN) flanges: 4-hole → with centering sleeves
[2] EN (DIN) flanges: 8-hole → without centering sleeves
[3] A centering sleeve is not required. The device is centered directly via the sensor housing.

Tightening torques, mounting bolts and centering sleeves for JIS 10 K

Nominal diameter	Mounting bolts	Centering sleeve length	Tightening torque [Nm] with a process flange with a	
[mm]	[mm]	[mm]	smooth seal face	raised face
25	4 × M16 × 170	54	24	24
40	4 × M16 × 170	68	32	25
50	4 × M16 × 185	– *	38	30
65	4 × M16 × 200	– *	42	42
80	8 × M16 × 225	– *	36	28
100	8 × M16 × 260	– *	39	37

* A centering sleeve is not required. The device is centered directly via the sensor housing.

Tightening torques, mounting bolts and centering sleeves for ANSI Class 150

Nominal diameter	Mounting bolts	Centering sleeve length	Tightening torque [lbf · ft] with a process flange with a	
[inch]	[inch]	[inch]	smooth seal face	raised face
1"	4 × UNC 1/2" × 5.70"	– *	14	7
1 ½"	4 × UNC 1/2" × 6.50"	– *	21	14
2"	4 × UNC 5/8" × 7.50"	– *	30	27
3"	4 × UNC 5/8" × 9.25"	– *	31	31
4"	8 × UNC 5/8" × 10,4"	5,79	28	28

* A centering sleeve is not required. The device is centered directly via the sensor housing.

3.3.2 Installing the Promag L sensor

Caution!
- The protective covers mounted on the two sensor flanges are used to hold the lap joint flanges in place and to protect the PTFE liner during transportation. Consequently, do not remove these covers until immediately before the sensor is installed in the pipe.
- The covers must remain in place while the device is in storage.
- Make sure that the lining is not damaged or removed from the flanges.

Note!
Bolts, nuts, seals, etc. are not included in the scope of supply and must be supplied by the customer.

The sensor is designed for installation between the two piping flanges.
- Observe in any case the necessary screw tightening torques on → 25
- If grounding disks are used, follow the mounting instructions which will be enclosed with the shipment
- To comply with the device specification, a concentrical installation in the measuring section is required

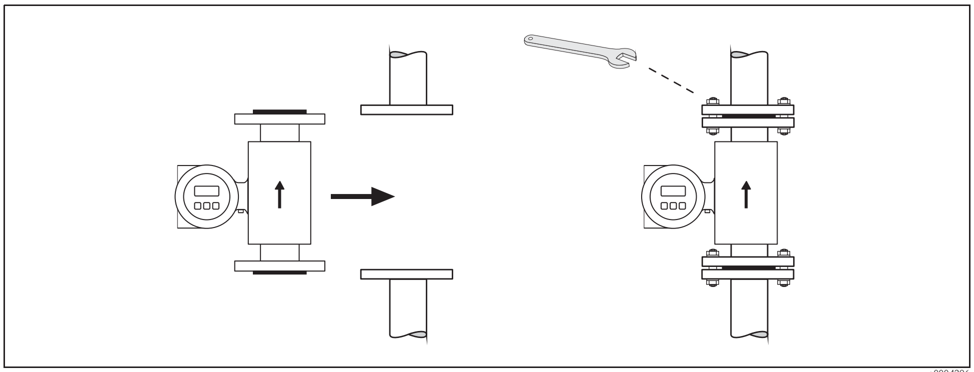


Fig. 18: Installing the Promag L sensor

Seals

Comply with the following instructions when installing seals:
- **No** seals are required.
- For DIN flanges, use only seals according to EN 1514-1.
- Make sure that the seals do not protrude into the piping cross-section.

Caution!
Risk of short circuit!
Do not use electrically conductive sealing compounds such as graphite! An electrically conductive layer could form on the inside of the measuring tube and short-circuit the measuring signal.

Ground cable

- If necessary, special ground cables for potential equalization can be ordered as an accessory (→ 77).
- Information on potential equalization and detailed mounting instructions for the use of ground cables can be found on → 55.

Screw tightening torques (Promag L)

Please note the following:
- The tightening torques listed below are for lubricated threads only.
- Always tighten the screws uniformly and in diagonally opposite sequence.
- Overtightening the screws will deform the sealing faces or damage the seals.
- The tightening torques listed below apply only to pipes not subjected to tensile stress.

Promag L tightening torques for EN (DIN)

Nominal diameter	EN (DIN)		Max. tightening torque	
			Polyurethan	PTFE
[mm]	Pressure rating [bar]	Threaded fasteners	[Nm]	[Nm]
50	PN 10/16	4 × M 16	15	40
65*	PN 10/16	8 × M 16	10	22
80	PN 10/16	8 × M 16	15	30
100	PN 10/16	8 × M 16	20	42
125	PN 10/16	8 × M 16	30	55
150	PN 10/16	8 × M 20	50	90
200	PN 10	8 × M 20	65	130
250	PN 10	12 × M 20	50	90
300	PN 10	12 × M 20	55	100
* Designed acc. to EN 1092-1 (not to DIN 2501)				

Promag L tightening torques for ANSI

Nominal diameter		ANSI		Max. tightening torque			
		Pressure rating	Threaded fasteners	Polyurethane		PTFE	
[mm]	[inch]	[lbs]		[Nm]	[lbf · ft]	[Nm]	[lbf · ft]
50	2"	Class 150	4 × 5/8"	15	11	40	29
80	3"	Class 150	4 × 5/8"	25	18	65	48
100	4"	Class 150	8 × 5/8"	20	15	44	32
150	6"	Class 150	8 × ¾"	45	33	90	66
200	8"	Class 150	8 × ¾"	65	48	125	92
250	10"	Class 150	12 × 7/8"	55	41	100	74
300	12"	Class 150	12 × 7/8"	68	56	115	85

3.3.3 Installing the Promag W sensor

Note!
Bolts, nuts, seals, etc. are not included in the scope of supply and must be supplied by the customer.

The sensor is designed for installation between the two piping flanges.
- Observe in any case the necessary screw tightening torques on → 🗎 26
- If grounding disks are used, follow the mounting instructions which will be enclosed with the shipment

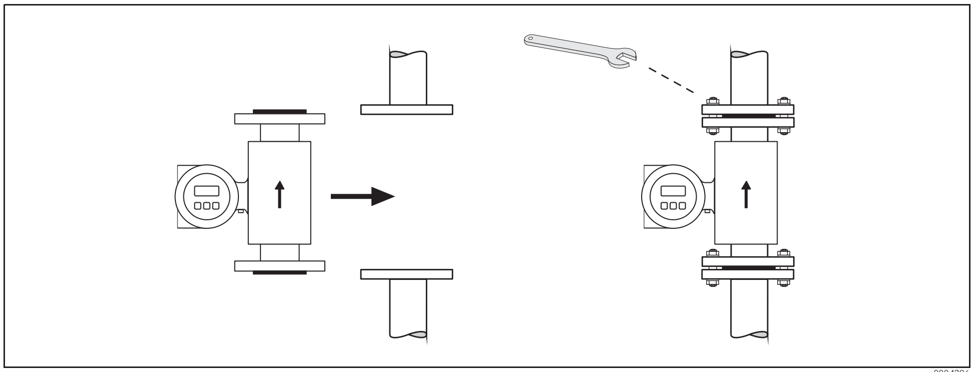


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Fig. 19: Installing the Promag W sensor

Seals

Comply with the following instructions when installing seals:
- Hard rubber lining → additional seals are **always** necessary.
- Polyurethane lining → **no** seals are required.
- For DIN flanges, use only seals according to EN 1514-1.
- Make sure that the seals do not protrude into the piping cross-section.

Caution!
Risk of short circuit!
Do not use electrically conductive sealing compounds such as graphite! An electrically conductive layer could form on the inside of the measuring tube and short-circuit the measuring signal.

Ground cable

- If necessary, special ground cables for potential equalization can be ordered as an accessory (→ 🗎 77).
- Information on potential equalization and detailed mounting instructions for the use of ground cables can be found on → 🗎 55

Screw tightening torques (Promag W)

Please note the following:
- The tightening torques listed below are for lubricated threads only.
- Always tighten the screws uniformly and in diagonally opposite sequence.
- Overtightening the screws will deform the sealing faces or damage the seals.
- The tightening torques listed below apply only to pipes not subjected to tensile stress.

Tightening torques for:
- EN (DIN)→ 🗎 27
- JIS→ 🗎 29
- ANSI→ 🗎 28
- AWWA → 🗎 29
- AS 2129 → 🗎 30
- AS 4087 → 🗎 30

Promag W tightening torques for EN (DIN)

Nominal diameter [mm]	EN (DIN) Pressure rating [bar]	Threaded fasteners	Max. tightening torque [Nm]	
			Hard rubber	Polyurethane
25	PN 40	4 × M 12	-	15
32	PN 40	4 × M 16	-	24
40	PN 40	4 × M 16	-	31
50	PN 40	4 × M 16	-	40
65*	PN 16	8 × M 16	32	27
65	PN 40	8 × M 16	32	27
80	PN 16	8 × M 16	40	34
80	PN 40	8 × M 16	40	34
100	PN 16	8 × M 16	43	36
100	PN 40	8 × M 20	59	50
125	PN 16	8 × M 16	56	48
125	PN 40	8 × M 24	83	71
150	PN 16	8 × M 20	74	63
150	PN 40	8 × M 24	104	88
200	PN 10	8 × M 20	106	91
200	PN 16	12 × M 20	70	61
200	PN 25	12 × M 24	104	92
250	PN 10	12 × M 20	82	71
250	PN 16	12 × M 24	98	85
250	PN 25	12 × M 27	150	134
300	PN 10	12 × M 20	94	81
300	PN 16	12 × M 24	134	118
300	PN 25	16 × M 27	153	138
350	PN 6	12 × M 20	111	120
350	PN 10	16 × M 20	112	118
350	PN 16	16 × M 24	152	165
350	PN 25	16 × M 30	227	252
400	PN 6	16 × M 20	90	98
400	PN 10	16 × M 24	151	167
400	PN 16	16 × M 27	193	215
400	PN 25	16 × M 33	289	326
450	PN 6	16 × M 20	112	126
450	PN 10	20 × M 24	153	133
450	PN 16	20 × M 27	198	196
450	PN 25	20 × M 33	256	253
500	PN 6	20 × M 20	119	123
500	PN 10	20 × M 24	155	171
500	PN 16	20 × M 30	275	300
500	PN 25	20 × M 33	317	360
600	PN 6	20 × M 24	139	147
600	PN 10	20 × M 27	206	219
600 *	PN 16	20 × M 33	415	443
600	PN 25	20 × M 36	431	516
700	PN 6	24 × M 24	148	139
700	PN 10	24 × M 27	246	246
700	PN 16	24 × M 33	278	318

Nominal diameter [mm]	EN (DIN) Pressure rating [bar]	Threaded fasteners	Max. tightening torque [Nm]	
			Hard rubber	Polyurethane
700	PN 25	24 × M 39	449	507
800	PN 6	24 × M 27	206	182
800	PN 10	24 × M 30	331	316
800	PN 16	24 × M 36	369	385
800	PN 25	24 × M 45	664	721
900	PN 6	24 × M 27	230	637
900	PN 10	28 × M 30	316	307
900	PN 16	28 × M 36	353	398
900	PN 25	28 × M 45	690	716
1000	PN 6	28 × M 27	218	208
1000	PN 10	28 × M 33	402	405
1000	PN 16	28 × M 39	502	518
1000	PN 25	28 × M 52	970	971
1200	PN 6	32 × M 30	319	299
1200	PN 10	32 × M 36	564	568
1200	PN 16	32 × M 45	701	753
1400	PN 6	36 × M 33	430	398
1400	PN 10	36 × M 39	654	618
1400	PN 16	36 × M 45	729	762
1600	PN 6	40 × M 33	440	417
1600	PN 10	40 × M 45	946	893
1600	PN 16	40 × M 52	1007	1100
1800	PN 6	44 × M 36	547	521
1800	PN 10	44 × M 45	961	895
1800	PN 16	44 × M 52	1108	1003
2000	PN 6	48 × M 39	629	605
2000	PN 10	48 × M 45	1047	1092
2000	PN 16	48 × M 56	1324	1261
* Designed acc. to EN 1092-1 (not to DIN 2501)				

Promag W tightening torques for ANSI

Nominal diameter		ANSI Pressure rating	Threaded fasteners	Max. tightening torque			
				Hard rubber		Polyurethane	
[mm]	[inch]	[lbs]		[Nm]	[lbf · ft]	[Nm]	[lbf · ft]
25	1"	Class 150	4 × ½"	–	–	7	5
25	1"	Class 300	4 × 5/8"	–	–	8	6
40	1 ½"	Class 150	4 × ½"	–	–	10	7
40	1 ½"	Class 300	4 × ¾"	–	–	15	11
50	2"	Class 150	4 × 5/8"	–	–	22	16
50	2"	Class 300	8 × 5/8"	–	–	11	8
80	3"	Class 150	4 × 5/8"	60	44	43	32
80	3"	Class 300	8 × ¾"	38	28	26	19
100	4"	Class 150	8 × 5/8"	42	31	31	23
100	4"	Class 300	8 × ¾"	58	43	40	30
150	6"	Class 150	8 × ¾"	79	58	59	44
150	6"	Class 300	12 × ¾"	70	52	51	38
200	8"	Class 150	8 × ¾"	107	79	80	59
250	10"	Class 150	12 × 7/8"	101	74	75	55
300	12"	Class 150	12 × 7/8"	133	98	103	76
350	14"	Class 150	12 × 1"	135	100	158	117
400	16"	Class 150	16 × 1"	128	94	150	111
450	18"	Class 150	16 × 1 1/8"	204	150	234	173
500	20"	Class 150	20 × 1 1/8"	183	135	217	160
600	24"	Class 150	20 × 1 ¼"	268	198	307	226

Promag W tightening torques for JIS

Nominal diameter [mm]	JIS Pressure rating	Threaded fasteners	Max. tightening torque [Nm] Hard rubber	Polyurethane
25	10K	4 × M 16	–	19
25	20K	4 × M 16	–	19
32	10K	4 × M 16	–	22
32	20K	4 × M 16	–	22
40	10K	4 × M 16	–	24
40	20K	4 × M 16	–	24
50	10K	4 × M 16	–	33
50	20K	8 × M 16	–	17
65	10K	4 × M 16	55	45
65	20K	8 × M 16	28	23
80	10K	8 × M 16	29	23
80	20K	8 × M 20	42	35
100	10K	8 × M 16	35	29
100	20K	8 × M 20	56	48
125	10K	8 × M 20	60	51
125	20K	8 × M 22	91	79
150	10K	8 × M 20	75	63
150	20K	12 × M 22	81	72
200	10K	12 × M 20	61	52
200	20K	12 × M 22	91	80
250	10K	12 × M 22	100	87
250	20K	12 × M 24	159	144
300	10K	16 × M 22	74	63
300	20K	16 × M 24	138	124

Promag W tightening torques for AWWA

Nominal diameter		AWWA		Max. tightening torque			
		Pressure rating	Threaded fasteners	Hard rubber		Polyurethane	
[mm]	[inch]			[Nm]	[lbf · ft]	[Nm]	[lbf · ft]
700	28"	Class D	28 × 1 ¼"	247	182	292	215
750	30"	Class D	28 × 1 ¼"	287	212	302	223
800	32"	Class D	28 × 1 ½"	394	291	422	311
900	36"	Class D	32 × 1 ½"	419	309	430	317
1000	40"	Class D	36 × 1 ½"	420	310	477	352
1050	42"	Class D	36 × 1 ½"	528	389	518	382
1200	48"	Class D	44 × 1 ½"	552	407	531	392
1350	54"	Class D	44 × 1 ¾"	730	538	633	467
1500	60"	Class D	52 × 1 ¾"	758	559	832	614
1650	66"	Class D	52 × 1 ¾"	946	698	955	704
1800	72"	Class D	60 × 1 ¾"	975	719	1087	802
2000	78"	Class D	64 × 2"	853	629	786	580

Promag W tightening torques for AS 2129

Nominal diameter [mm]	AS 2129 Pressure rating	Threaded fasteners	Max. tightening torque [Nm] Hard rubber
80	Table E	4 × M 16	49
100	Table E	8 × M 16	38
150	Table E	8 × M 20	64
200	Table E	8 × M 20	96
250	Table E	12 × M 20	98
300	Table E	12 × M 24	123
350	Table E	12 × M 24	203
400	Table E	12 × M 24	226
450	Table E	16 × M 24	226
500	Table E	16 × M 24	271
600	Table E	16 × M 30	439
700	Table E	20 × M 30	355
750	Table E	20 × M 30	559
800	Table E	20 × M 30	631
900	Table E	24 × M 30	627
1000	Table E	24 × M 30	634
1200	Table E	32 × M 30	727

Promag W tightening torques for AS 4087

Nominal diameter [mm]	AS 4087 Pressure rating	Threaded fasteners	Max. tightening torque [Nm] Hard rubber
80	PN 16	4 × M 16	49
100	PN 16	4 × M 16	76
150	PN 16	8 × M 20	52
200	PN 16	8 × M 20	77
250	PN 16	8 × M 20	147
300	PN 16	12 × M 24	103
350	PN 16	12 × M 24	203
375	PN 16	12 × M 24	137
400	PN 16	12 × M 24	226
450	PN 16	12 × M 24	301
500	PN 16	16 × M 24	271
600	PN 16	16 × M 27	393
700	PN 16	20 × M 27	330
750	PN 16	20 × M 30	529
800	PN 16	20 × M 33	631
900	PN 16	24 × M 33	627
1000	PN 16	24 × M 33	595
1200	PN 16	32 × M 33	703

3.3.4 Installing the Promag P sensor

Caution!
- The protective covers mounted on the two sensor flanges guard the PTFE, which is turned over the flanges. Consequently, do not remove these covers until **immediately before** the sensor is installed in the pipe.
- The covers must remain in place while the device is in storage.
- Make sure that the lining is not damaged or removed from the flanges.

Note!
Bolts, nuts, seals, etc. are not included in the scope of supply and must be supplied by the customer.

The sensor is designed for installation between the two piping flanges.
- Observe in any case the necessary screw tightening torques on → 🗎 32
- If grounding disks are used, follow the mounting instructions which will be enclosed with the shipment

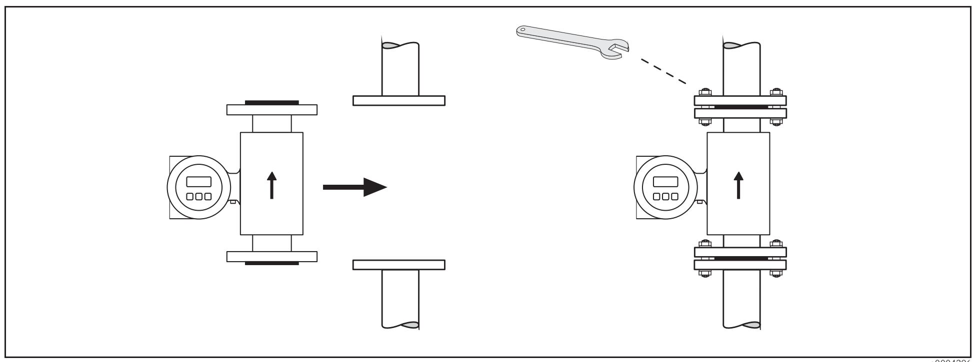


Fig. 20: Installing the Promag P sensor

Seals

Comply with the following instructions when installing seals:
- PFA or PTFE lining → **No** seals are required!
- For DIN flanges, use only seals according to EN 1514-1.
- Make sure that the seals do not protrude into the piping cross-section.

Caution!
Risk of short circuit! Do not use electrically conductive sealing compounds such as graphite! An electrically conductive layer could form on the inside of the measuring tube and short-circuit the measuring signal.

Ground cable

- If necessary, special ground cables for potential equalization can be ordered as an accessory (→ 🗎 77).
- Information on potential equalization and detailed mounting instructions for the use of ground cables can be found on → 🗎 55

Installing the high-temperature version (with PFA lining)

The high-temperature version has a housing support for the thermal separation of sensor and transmitter. The high-temperature version is always used for applications in which high ambient temperatures are encountered **in conjunction with** high fluid temperatures. The high-temperature version is obligatory if the fluid temperature exceeds +150 °C.

Note!
You will find information on permissible temperature ranges on → 102

Insulation

Pipes generally have to be insulated if they carry very hot fluids, in order to avoid energy losses and to prevent accidental contact with pipes at temperatures that could cause injury. Guidelines regulating the insulation of pipes have to be taken into account.

Caution!
Risk of measuring electronics overheating. The housing support dissipates heat and its entire surface area must remain uncovered. Make sure that the sensor insulation does not extend past the top of the two sensor shells.

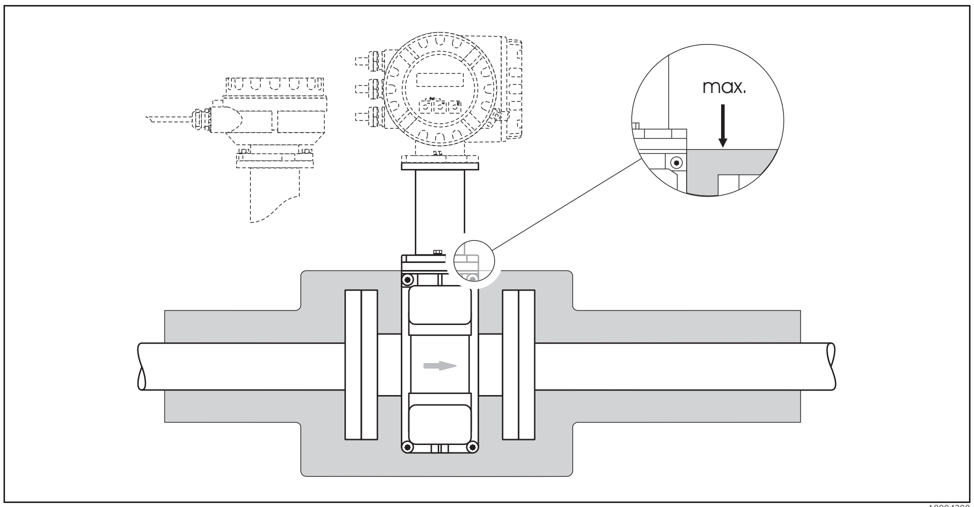


Fig. 21: Promag P (high-temperature version): Insulating the pipe

Tightening torques for threaded fasteners (Promag P)

Please note the following:
- The tightening torques listed below are for lubricated threads only.
- Always tighten the screws uniformly and in diagonally opposite sequence.
- Overtightening the screws will deform the sealing faces or damage the seals.
- The tightening torques listed below apply only to pipes not subjected to tensile stress.

Tightening torques for:
- EN (DIN) → 33
- ANSI → 34
- JIS → 34
- AS 2129 → 35
- AS 4087 → 35

Promag P tightening torques for EN (DIN)

Nominal diameter [mm]	EN (DIN) Pressure rating [bar]	Threaded fasteners	Max. tightening torque [Nm]	
			PTFE	PFA
15	PN 40	4 × M 12	11	–
25	PN 40	4 × M 12	26	20
32	PN 40	4 × M 16	41	35
40	PN 40	4 × M 16	52	47
50	PN 40	4 × M 16	65	59
65 *	PN 16	8 × M 16	43	40
65	PN 40	8 × M 16	43	40
80	PN 16	8 × M 16	53	48
80	PN 40	8 × M 16	53	48
100	PN 16	8 × M 16	57	51
100	PN 40	8 × M 20	78	70
125	PN 16	8 × M 16	75	67
125	PN 40	8 × M 24	111	99
150	PN 16	8 × M 20	99	85
150	PN 40	8 × M 24	136	120
200	PN 10	8 × M 20	141	101
200	PN 16	12 × M 20	94	67
200	PN 25	12 × M 24	138	105
250	PN 10	12 × M 20	110	–
250	PN 16	12 × M 24	131	–
250	PN 25	12 × M 27	200	–
300	PN 10	12 × M 20	125	–
300	PN 16	12 × M 24	179	–
300	PN 25	16 × M 27	204	–
350	PN 10	16 × M 20	188	–
350	PN 16	16 × M 24	254	–
350	PN 25	16 × M 30	380	–
400	PN 10	16 × M 24	260	–
400	PN 16	16 × M 27	330	–
400	PN 25	16 × M 33	488	–
450	PN 10	20 × M 24	235	–
450	PN 16	20 × M 27	300	–
450	PN 25	20 × M 33	385	–
500	PN 10	20 × M 24	265	–
500	PN 16	20 × M 30	448	–
500	PN 25	20 × M 33	533	–
600	PN 10	20 × M 27	345	–
600 *	PN 16	20 × M 33	658	–
600	PN 25	20 × M 36	731	–
* Designed acc. to EN 1092-1 (not to DIN 2501)				

Promag P tightening torques for ANSI

Nominal diameter		ANSI		Max. tightening torque			
		Pressure rating	Threaded	PTFE		PFA	
[mm]	[inch]	[lbs]	fasteners	[Nm]	[lbf · ft]	[Nm]	[lbf · ft]
15	½"	Class 150	4 × ½"	6	4	–	–
15	½"	Class 300	4 × ½"	6	4	–	–
25	1"	Class 150	4 × ½"	11	8	10	7
25	1"	Class 300	4 × 5/8"	14	10	12	9
40	1 ½"	Class 150	4 × ½"	24	18	21	15
40	1 ½"	Class 300	4 × ¾"	34	25	31	23
50	2"	Class 150	4 × 5/8"	47	35	44	32
50	2"	Class 300	8 × 5/8"	23	17	22	16
80	3"	Class 150	4 × 5/8"	79	58	67	49
80	3"	Class 300	8 × ¾"	47	35	42	31
100	4"	Class 150	8 × 5/8"	56	41	50	37
100	4"	Class 300	8 × ¾"	67	49	59	44
150	6"	Class 150	8 × ¾"	106	78	86	63
150	6"	Class 300	12 × ¾"	73	54	67	49
200	8"	Class 150	8 × ¾"	143	105	109	80
250	10"	Class 150	12 × 7/8"	135	100	–	–
300	12"	Class 150	12 × 7/8"	178	131	–	–
350	14"	Class 150	12 × 1"	260	192	–	–
400	16"	Class 150	16 × 1"	246	181	–	–
450	18"	Class 150	16 × 1 1/8"	371	274	–	–
500	20"	Class 150	20 × 1 1/8"	341	252	–	–
600	24"	Class 150	20 × 1 ¼"	477	352	–	–

Promag P tightening torques for JIS

Nominal diameter	JIS		Max. tightening torque [Nm]	
[mm]	Pressure rating	Threaded fasteners	PTFE	PFA
25	10K	4 × M 16	32	27
25	20K	4 × M 16	32	27
32	10K	4 × M 16	38	–
32	20K	4 × M 16	38	–
40	10K	4 × M 16	41	37
40	20K	4 × M 16	41	37
50	10K	4 × M 16	54	46
50	20K	8 × M 16	27	23
65	10K	4 × M 16	74	63
65	20K	8 × M 16	37	31
80	10K	8 × M 16	38	32
80	20K	8 × M 20	57	46
100	10K	8 × M 16	47	38
100	20K	8 × M 20	75	58
125	10K	8 × M 20	80	66
125	20K	8 × M 22	121	103
150	10K	8 × M 20	99	81
150	20K	12 × M 22	108	72
200	10K	12 × M 20	82	54
200	20K	12 × M 22	121	88
250	10K	12 × M 22	133	–
250	20K	12 × M 24	212	–
300	10K	16 × M 22	99	–
300	20K	16 × M 24	183	–

Promag P tightening torques for AS 2129

Nominal diameter [mm]	AS 2129 Pressure rating	Threaded fasteners	Max. tightening torque [Nm] PTFE
25	Table E	4 × M 12	21
50	Table E	4 × M 16	42

Promag P tightening torques for AS 4087

Nominal diameter [mm]	AS 4087 Pressure rating	Threaded fasteners	Max. tightening torque [Nm] PTFE
50	PN 16	4 × M 16	42

3.3.5 Installing the Promag H sensor

The sensor is supplied to order, with or without pre-installed process connections. Pre-installed process connections are secured to the sensor with 4 or 6 hex-head threaded fasteners.

Caution!
The sensor might require support or additional attachments, depending on the application and the length of the piping run. When plastic process connections are used, the sensor must be additionally supported mechanically. A wall-mounting kit can be ordered separately from Endress+Hauser as an accessory (→ 77).

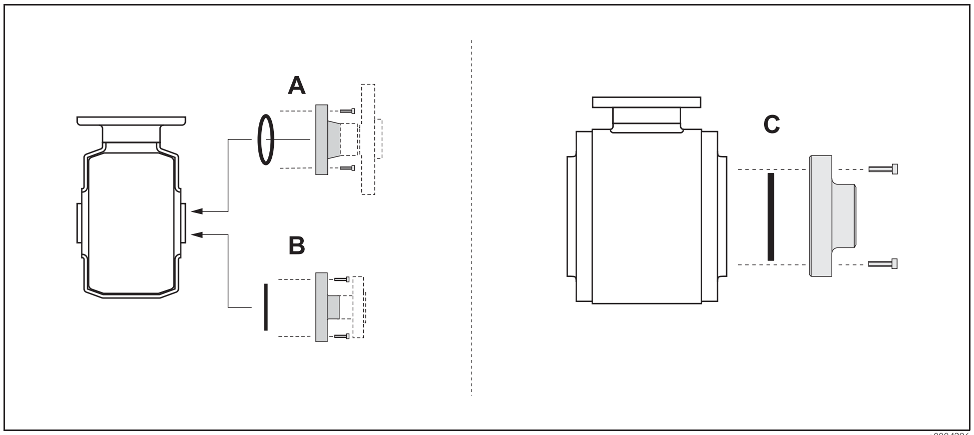


Abb. 22: Promag H process connections (DN 2…25 / DN 40…100, 1/12"…1" / DN 1½"…4")

A = DN 2…25, 1/12"…1"/ process connections with O-ring
– welding flanges (DIN EN ISO 1127, ODT / SMS),
– flange (EN (DIN), ANSI, JIS), flange PVDF (EN (DIN), ANSI, JIS)
– external and internal thread, hose connection, PVC adhesive fitting

B = DN 2…25, 1/12"…1"/ process connections with aseptic gasket vseal
– weld nipples (DIN 11850, ODT/SMS)
– Clamp (ISO 2852, DIN 32676, L14 AM7)
– coupling (DIN 11851, DIN 11864-1, SMS 1145)
– flange DIN 11864-2

C = DN 40…100, 1½…4"/ process connections with aseptic gasket seal
– weld nipples (DIN 11850, ODT/SMS)
– Clamp (ISO 2852, DIN 32676, L14 AM7)
– coupling (DIN 11851, DIN 11864-1, ISO 2853, SMS 1145)
– flange DIN 11864-2

Seals

When installing the process connections, make sure that the seals are clean and correctly centered.

Caution!
- With metal process connections, you must fully tighten the screws. The process connection forms a metallic connection with the sensor, which ensures a defined compression of the seal.
- With plastic process connections, note the max. torques for lubricated threads (7 Nm / 5.2 lbf ft). With plastic flanges, always use seals between connection and counter flange.
- The seals must be replaced periodically, depending on the application, particularly in the case of gasket seals (aseptic version)!
  The period between changes depends on the frequency of cleaning cycles, the cleaning temperature and the fluid temperature. Replacement seals can be ordered as accessories → 77.

Usage and assembly of ground rings (DN 2 to 25, 1/12" to 1")

In case the process connections are made of plastic (e.g. flanges or adhesive fittings), the potential between the sensor and the fluid must be equalized using additional ground rings.
If the ground rings are not installed this can affect the accuracy of the measurements or cause the destruction of the sensor through the electrochemical erosion of the electrodes.

Caution!

- Depending on the option ordered, plastic disks may be installed at the process connections instead of ground rings. These plastic disks serve only as spacers and have no potential equalization function. In addition, they provide a sealing function at the interface between the sensor and process connection. For this reason, with process connections without ground rings, these plastic disks/seals must not be removed, or must always be installed.
- Ground rings can be ordered separately from Endress+Hauser as accessories (→ 🗎 77). When placing the order, make certain that the ground ring is compatible with the material used for the electrodes. Otherwise, there is a risk that the electrodes may be destroyed by electrochemical corrosion! Information about the materials can be found on → 🗎 112.
- Ground rings, including the seals, are mounted within the process connections. Therefore, the fitting length is not affected.

1. Loosen the four or six hexagonal headed bolts (1) and remove the process connection from the sensor (4).
2. Remove the plastic disk (3), including the two O-ring seals (2).
3. Place one seal (2) in the groove of the process connection.
4. Place the metal ground ring (3) on the process connection.
5. Now place the second seal (2) in the groove of the ground ring.
6. Finally, mount the process connection on the sensor again.
   With plastic process connections, note the max. torques for lubricated threads
   (7 Nm / 5.2 lbf ft).

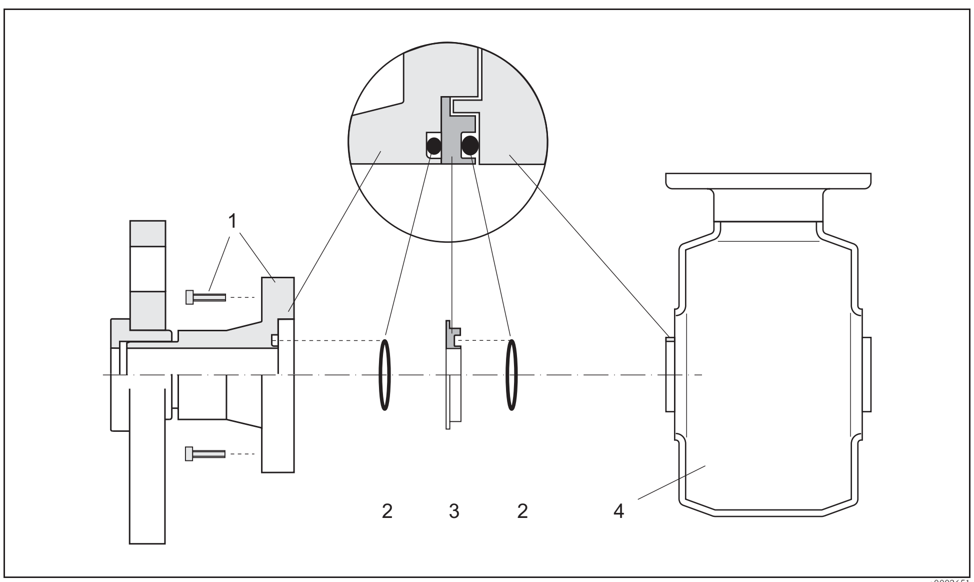


Fig. 23: Installing ground rings with Promag H (DN 2 to 25, 1/12" to 1")

1 = Hexagonal-headed bolt (process connection)
2 = O-ring seals
3 = Ground ring or plastic disk (spacer)
4 = Sensor

Welding the transmitter into the piping (weld nipples)

Caution!
Risk of destroying the measuring electronics. Make sure that the welding machine is *not* grounded via the sensor or the transmitter.

1. Tack-weld the sensor into the pipe. A suitable welding jig can be ordered separately as an accessory (→ 77).
2. Loosen the screws on the process connection flange and remove the sensor, complete with the seal, from the pipe.
3. Weld the process connection to the pipe.
4. Reinstall the sensor in the pipe. Make sure that everything is clean and that the seal is correctly seated.

Note!
- If thin-walled foodstuffs pipes are not welded correctly, the heat could damage the installed seal. It is therefore advisable to remove the sensor and the seal prior to welding.
- The pipe has to be spread approximately 8 mm to permit disassembly.

Cleaning with pigs

If pigs are used for cleaning, it is essential to take the inside diameters of the measuring tube and process connection into account. All the dimensions and lengths of the sensor and transmitter are provided in the separate documentation "Technical Documentation" → 116.

3.3.6 Turning the transmitter housing

Turning the aluminum field housing

Warning!
The turning mechanism in devices with Ex d/de or FM/CSA Cl. I Div. 1 classification is not the same as that described here. The procedure for turning these housings is described in the Ex-specific documentation.

1. Loosen the two securing screws.
2. Turn the bayonet catch as far as it will go.
3. Carefully lift the transmitter housing:
   – Promag D: approx. 10 mm (0.39 inch) above the securing screws
   – Promag L, W, P, H: to the stop
4. Turn the transmitter housing to the desired position:
   – Promag D: max. 180° clockwise or max. 180° counterclockwise
   – Promag L, W, P, H: max. 280° clockwise or max. 20° counterclockwise
5. Lower the housing into position and re-engage the bayonet catch.
6. Retighten the two securing screws.

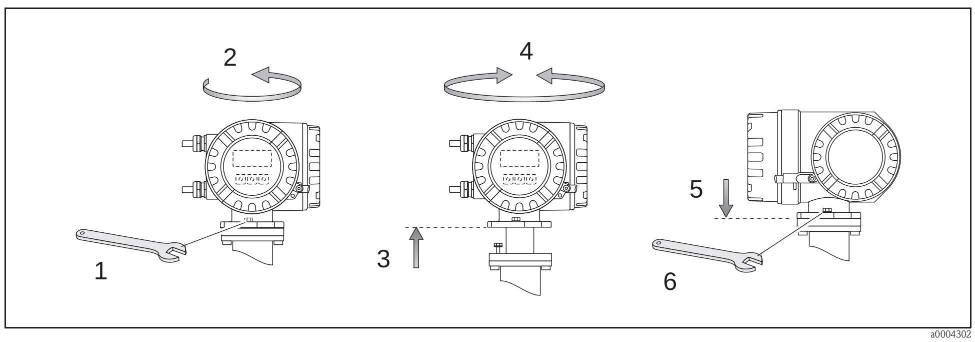


Fig. 24: Turning the transmitter housing (aluminum field housing)

Turning the stainless-steel field housing

1. Loosen the two securing screws.
2. Carefully lift the transmitter housing as far as it will go.
3. Turn the transmitter housing to the desired position (max. 2 × 90° in either direction).
4. Lower the housing into position.
5. Retighten the two securing screws.

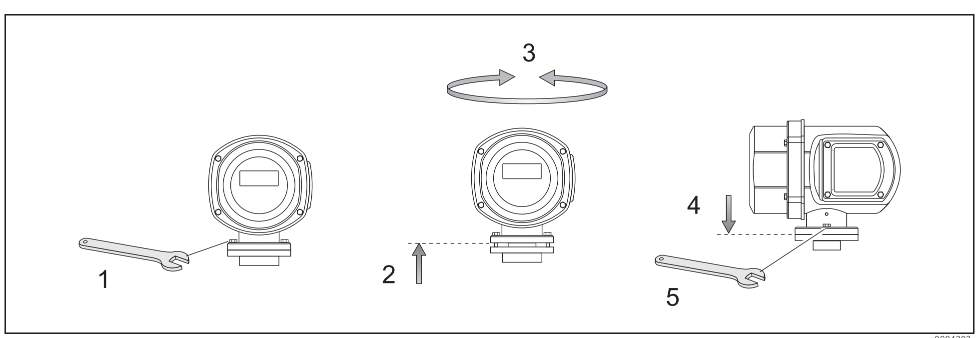


Fig. 25: Turning the transmitter housing (stainless-steel field housing)

3.3.7 Turning the onsite display

1. Unscrew the cover of the electronics compartment from the transmitter housing.
2. Press the side latches on the display module and remove it from the electronics compartment cover plate.
3. Turn the display to the desired position (max. 4 × 45° in both directions) and reset it onto the cover plate of the electronics compartment.
4. Screw the cover of the electronics compartment firmly back onto the transmitter housing.

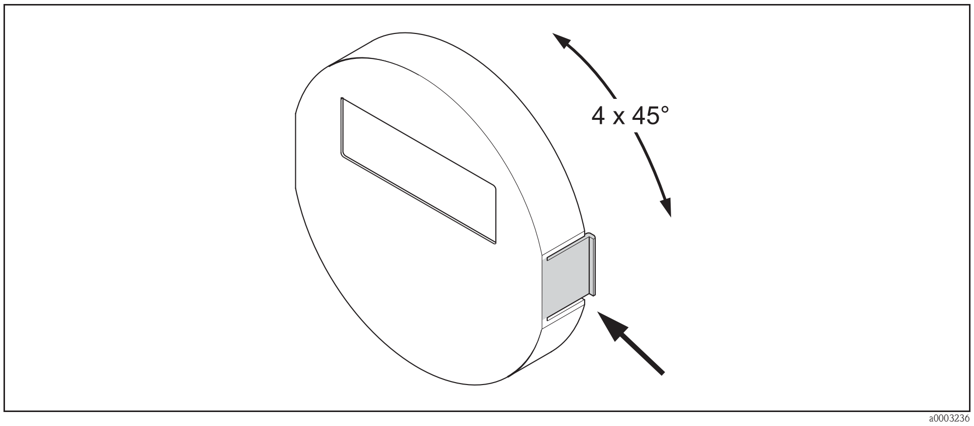


Fig. 26: Turning the local display (field housing)

3.3.8 Installing the wall-mount housing

There are various ways of installing the wall-mount transmitter housing:

- Direct wall mounting
- Installation in control panel (with separate mounting kit, accessories) → 42
- Pipe mounting (with separate mounting kit, accessories) → 42

Caution!
- Make sure that the ambient temperature does not exceed the permissible range at the mounting location, –20 to +60 °C (–4 to + °140 F), optional –40 to +60 °C (–40 to +140 °F). Install the device at a shady location. Avoid direct sunlight.
- Always install the wall-mount housing in such a way that the cable entries are pointing down.

Direct wall mounting

1. Drill the holes as illustrated in the graphic.
2. Remove the cover of the connection compartment (a).
3. Push the two securing screws (b) through the appropriate bores (c) in the housing.
   – Securing screws (M6): max. Ø 6.5 mm (0.26")
   – Screw head: max. Ø 10.5 mm (0.41")
4. Secure the transmitter housing to the wall as indicated.
5. Screw the cover of the connection compartment (a) firmly onto the housing.

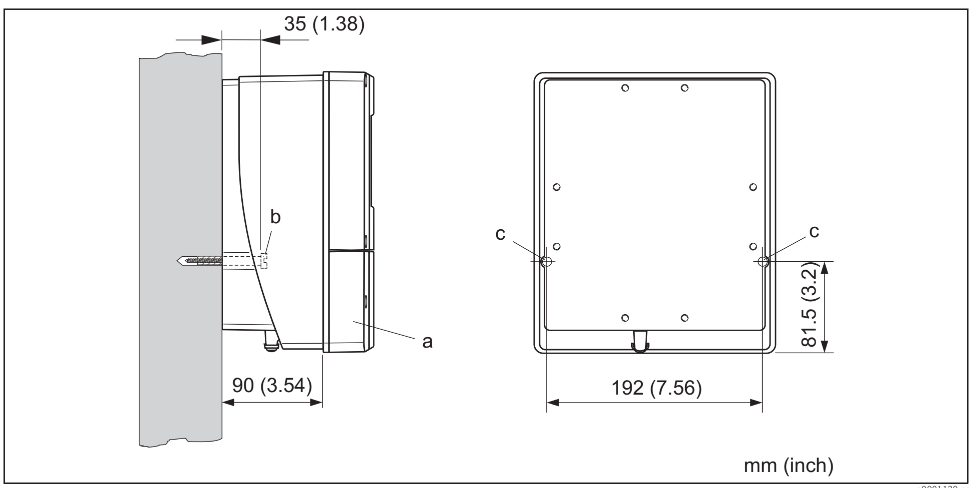


Fig. 27: Mounted directly on the wall

Panel-mounted installation

1. Prepare the opening in the panel as illustrated in the graphic.
2. Slide the housing into the opening in the panel from the front.
3. Screw the fasteners onto the wall-mount housing.
4. Place the threaded rods in the fasteners and screw them down until the housing is seated tightly against the panel. Afterwards, tighten the locking nuts. Additional support is not necessary.

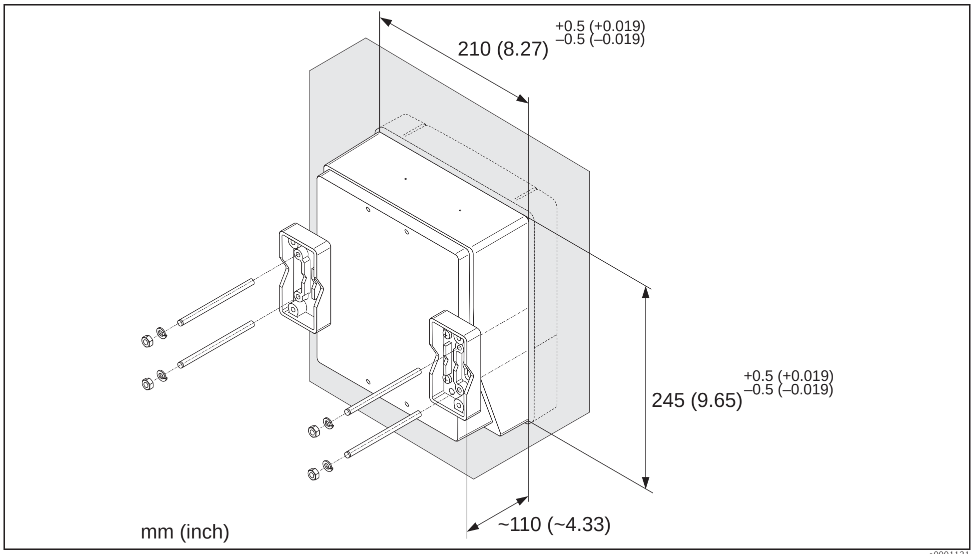


Fig. 28: Panel installation (wall-mount housing)

Pipe mounting

The assembly should be performed by following the instructions in the graphic.

Caution!
If the device is mounted to a warm pipe, make certain that the housing temperature does not exceed +60 °C (+140 °F), which is the maximum permissible temperature.

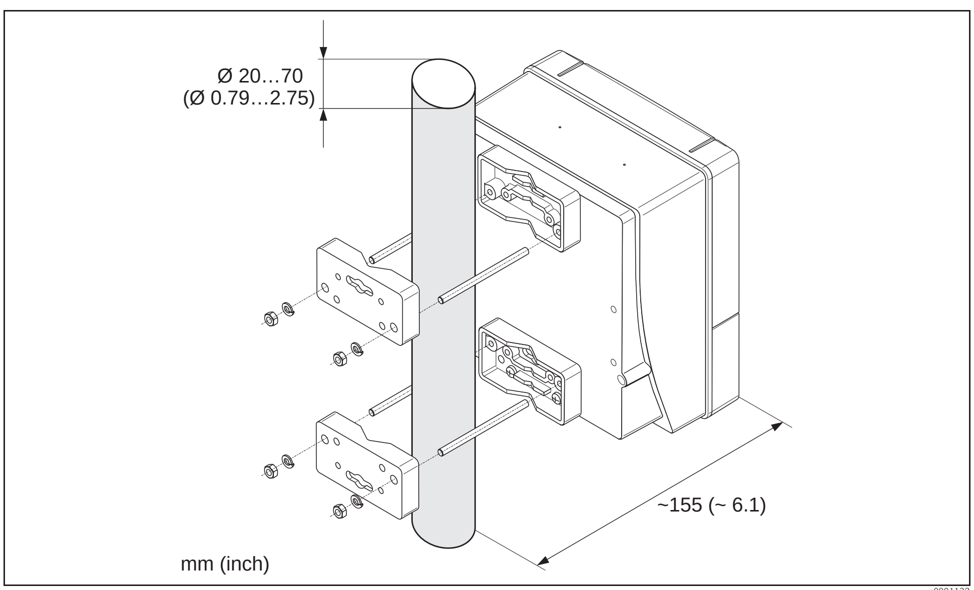


Fig. 29: Pipe mounting (wall-mount housing)

3.4 Post-installation check

Perform the following checks after installing the measuring device in the pipe:

Device condition and specifications	Notes
Is the device damaged (visual inspection)?	–
Does the device correspond to specifications at the measuring point, including process temperature and pressure, ambient temperature, minimum fluid conductivity, measuring range, etc.?	→ 🗎 100
Installation	**Notes**
Does the arrow on the sensor nameplate match the actual direction of flow through the pipe?	–
Is the position of the measuring electrode plane correct?	→ 🗎 15
Is the position of the empty pipe detection electrode correct?	→ 🗎 15
Were all screws tightened to the specified torques when the sensor was installed?	Promag D → 🗎 23 Promag L → 🗎 25 Promag W → 🗎 26 Promag P → 🗎 32
Were the correct seals used (type, material, installation)?	Promag D → 🗎 21 Promag L→ 🗎 24 Promag W → 🗎 26 Promag P → 🗎 31 Promag H → 🗎 36
Are the measuring point number and labeling correct (visual inspection)?	–
Process environment / process conditions	**Notes**
Were the inlet and outlet runs respected?	Inlet run ≥ 5 × DN Outlet run ≥ 2 × DN
Is the measuring device protected against moisture and direct sunlight?	–
Is the sensor adequately protected against vibration (attachment, support)?	Acceleration up to 2 g by analogy with IEC 600 68-2-8

4 Wiring

Warning!
When connecting Ex-certified devices, see the notes and diagrams in the Ex-specific supplement to these Operating Instructions.
Please do not hesitate to contact your Endress+Hauser representative if you have any questions.

Note!
The device does not have an internal circuit breaker. For this reason, assign the device a switch or power-breaker switch capable of disconnecting the power supply line from the mains.

4.1 Connecting the remote version

4.1.1 Connecting Promag D, L, W, P, H

Warning!
- Risk of electric shock! Switch off the power supply before opening the device. Do **not** install or wire the device while it is connected to the power supply. Failure to comply with this precaution can result in irreparable damage to the electronics.
- Risk of electric shock! Connect the protective conductor to the ground terminal on the housing before the power supply is applied.

Caution!
- Only sensors and transmitters with the same serial number can be connected to one another. Communication problems can occur if the devices are not connected in this way.
- Risk of damaging the coil driver. Always switch off the power supply before connecting or disconnecting the coil cable.

Procedure

1. Transmitter: Remove the cover from the connection compartment (a).
2. Sensor: Remove the cover from the connection housing (b).
3. Feed the signal cable (c) and the coil cable (d) through the appropriate cable entries.

   Caution!
   Route the connecting cables securely (see "Connecting cable length" → 44).
4. Terminate the signal and coil current cable as indicated in the table:
   Promag D, L, W, P → Refer to the table → 47
   Promag H → Refer to the "Cable termination" table → 48
5. Establish the wiring between the sensor and the transmitter.
   The electrical wiring diagram that applies to your device can be found:
   - In the corresponding graphic:
     → 30 (Promag D) → 31 (Promag L, W, P); → 32 (Promag H)
   - In the cover of the sensor and transmitter

   Note!
   The cable shields of the Promag H sensor are grounded by means of the strain relief terminals (see also the "Cable termination" table → 48)

   Caution!
   Insulate the shields of cables that are not connected to eliminate the risk of short-circuits with neighboring cable shields inside the connection housing.
6. Transmitter: Screw the cover on the connection compartment (a).
7. Sensor: Secure the cover on the connection housing (b).

Promag D

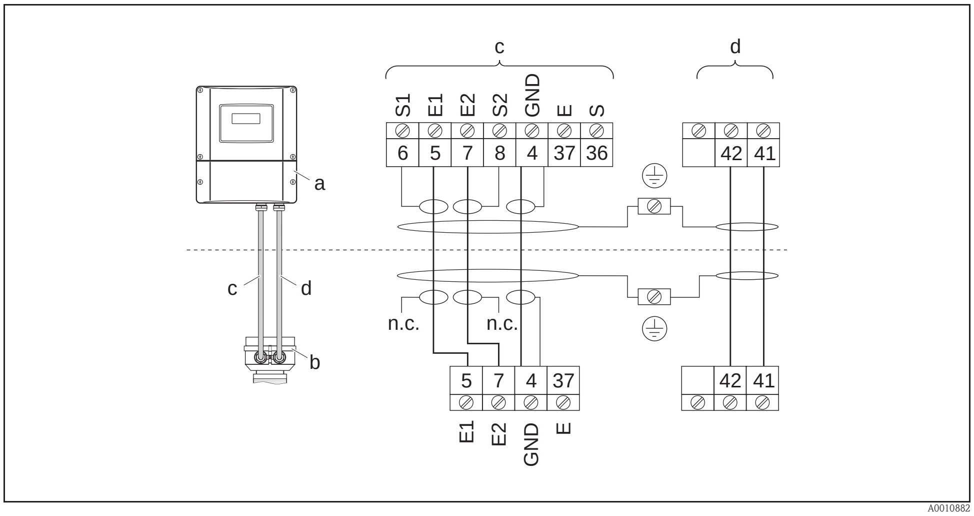


Fig. 30: Connecting the remote version of Promag D

a Wall-mount housing connection compartment
b Cover of the sensor connection housing
c Signal cable
d Coil current cable
n.c. Not connected, insulated cable shields

Wire colors/Terminal No.:
5/6 = braun, 7/8 = white, 4 = green, 37/36 = yellow

Promag L, W, P

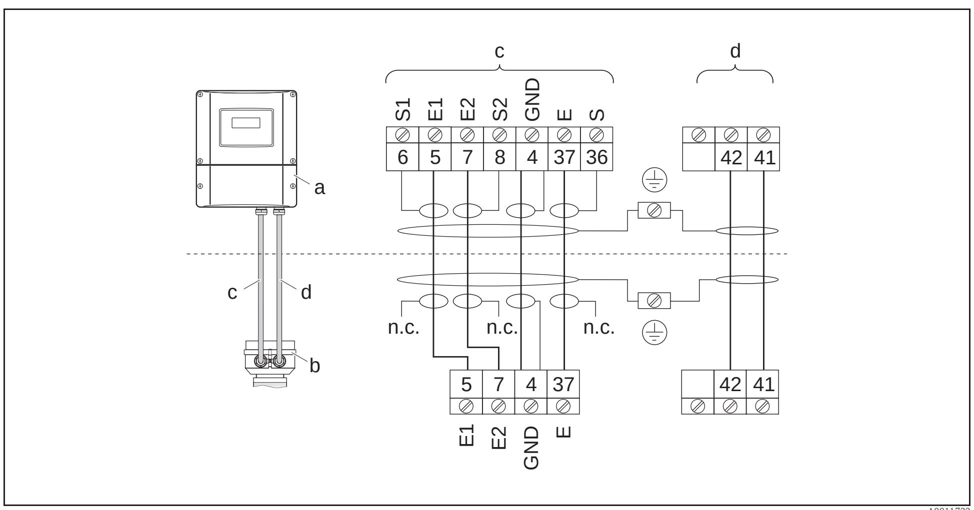


Fig. 31: Connecting the remote version of Promag L, W, P

a Wall-mount housing connection compartment
b Cover of the sensor connection housing
c Signal cable
d Coil current cable
n.c. Not connected, insulated cable shields

Wire colors/Terminal No.:
5/6 = braun, 7/8 = white, 4 = green, 37/36 = yellow

Promag H

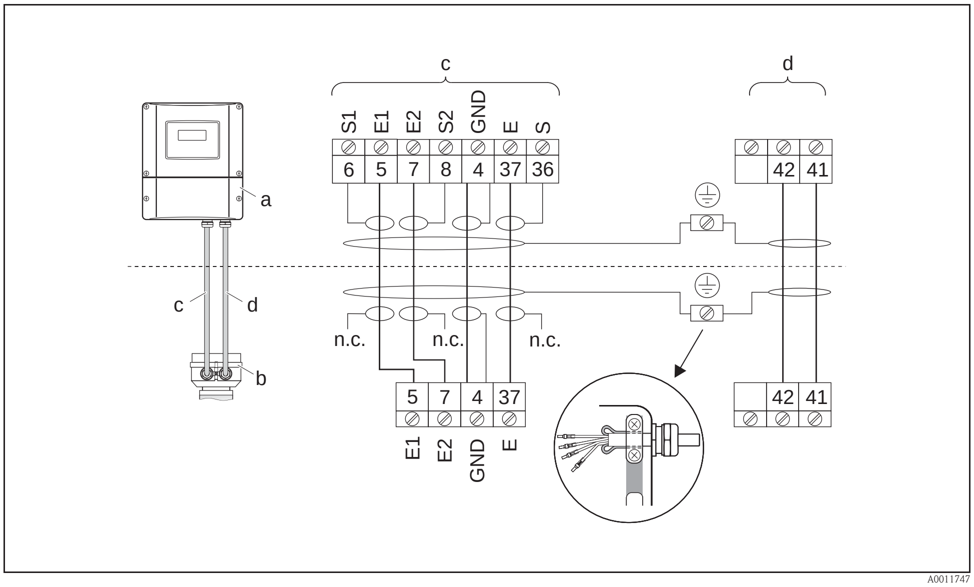


Fig. 32: Connecting the remote version of Promag H

a Wall-mount housing connection compartment
b Cover of the sensor connection housing
c Signal cable
d Coil current cable
n.c. Not connected, insulated cable shields

Wire colors/Terminal No.:
5/6 = braun, 7/8 = white, 4 = green, 37/36 = yellow

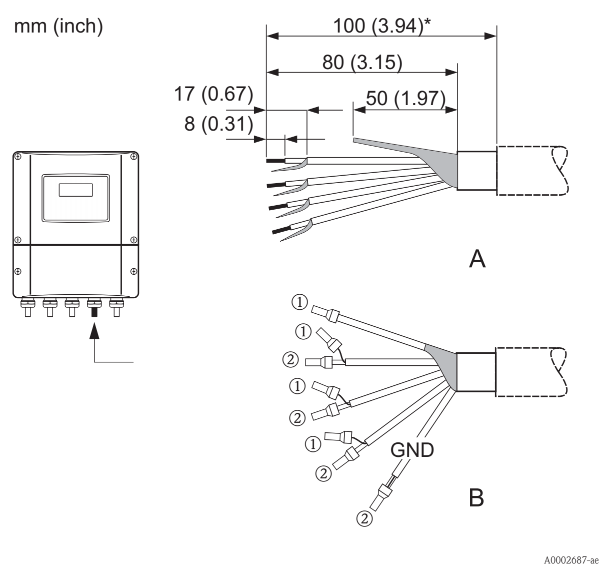
Cable termination for the remote version
Promag D / Promag L / Promag W / Promag P

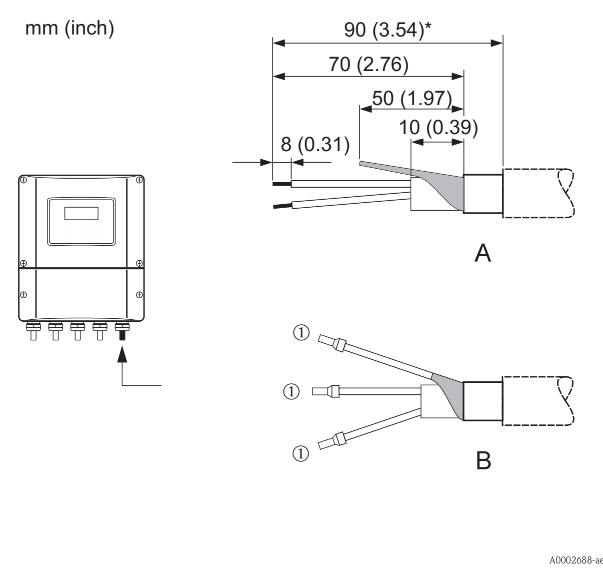
Terminate the signal and coil current cables as shown in the figure below (Detail A).
Ferrules must be provided on the fine-wire cores (Detail B: ① = red ferrules, ∅ 1.0 mm; ② = white ferrules, ∅ 0.5 mm).
* Stripping only for reinforced cables

Caution!
When fitting the connectors, pay attention to the following points:
- *Signal cable* → Make sure that the ferrules do not touch the wire shield on the sensor side.
  Minimum distance = 1 mm (exception "GND" = green cable)
- *Coil current cable* → Insulate one core of the three-core wire at the level of the core reinforcement; you only require two cores for the connection.

TRANSMITTER

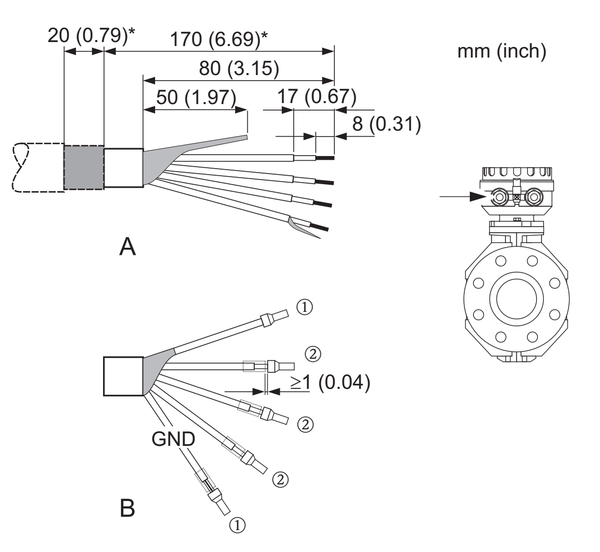
Signal cable	Coil current cable

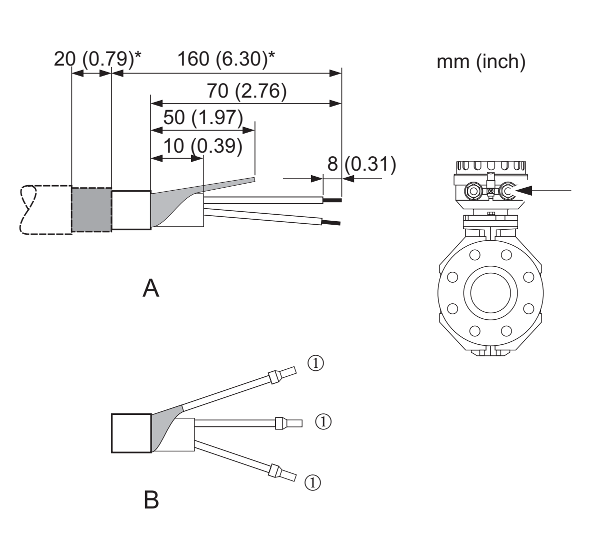




SENSOR

Signal cable	Coil current cable





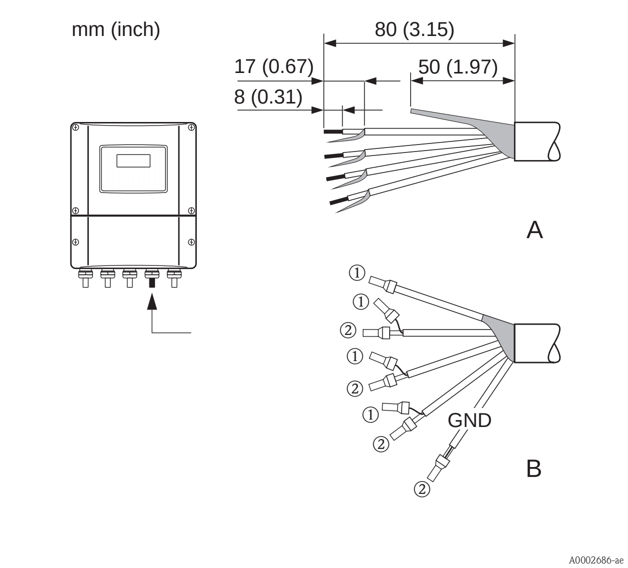
Cable termination for the remote version
Promag H

Terminate the signal and coil current cables as shown in the figure below (Detail A).
Ferrules must be provided on the fine-wire cores (Detail B: ① = red ferrules, ∅ 1.0 mm; ② = white ferrules, ∅ 0.5 mm).

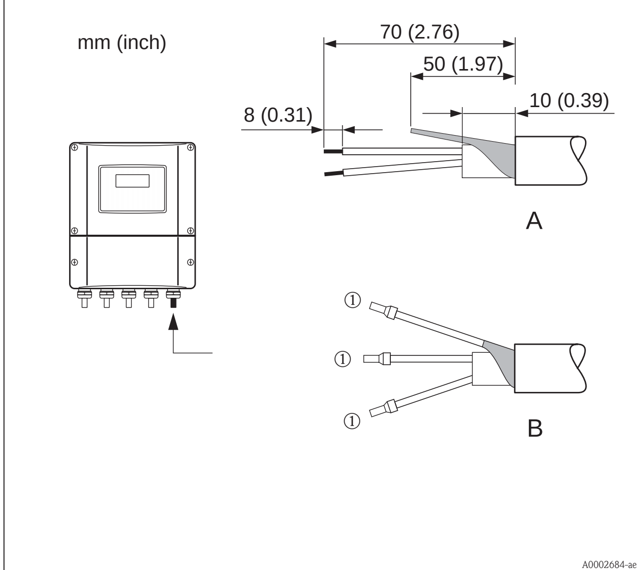
Caution!
When fitting the connectors, pay attention to the following points:
- *Signal cable* → Make sure that the ferrules do not touch the wire shield on the sensor side.
  Minimum distance = 1 mm (exception "GND" = green cable).
- *Coil current cable* → Insulate one core of the three-core wire at the level of the core reinforcement; you only require two cores for the connection.
- On the sensor side, reverse both cable shields approx. 15 mm over the outer jacket. The strain relief ensures an electrical connection with the connection housing.

TRANSMITTER

Signal cable

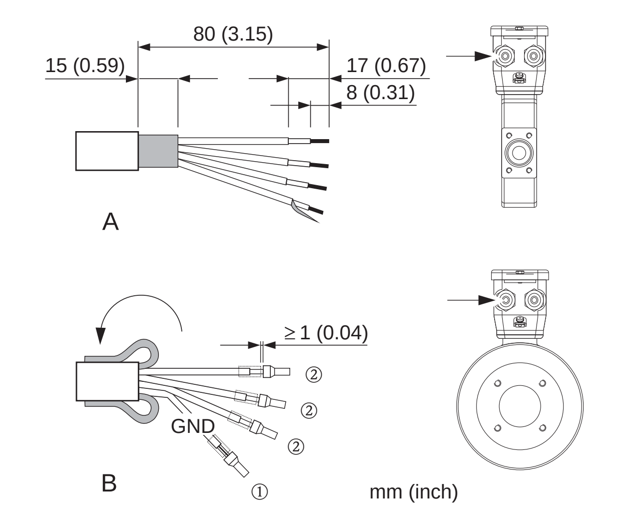


Coil current cable

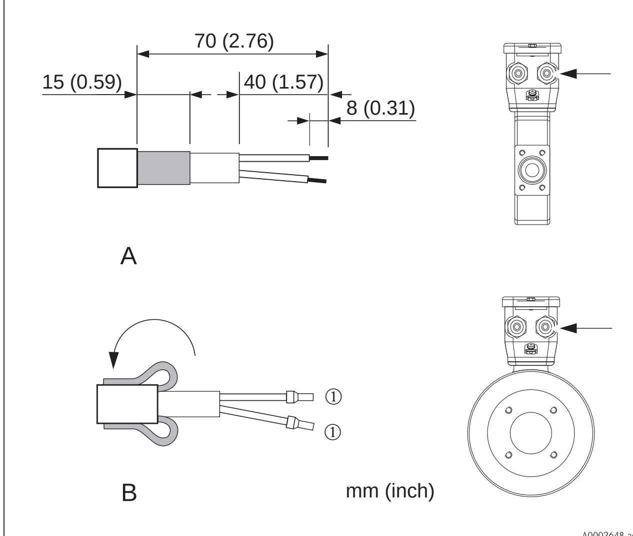


SENSOR

Signal cable



Coil current cable



4.1.2 Cable specifications

Signal cable

- 3 × 0.38 mm² PVC cable with common, braided copper shield (∅ ~7 mm) and individually shielded cores
- With Empty Pipe Detection (EPD): 4 × 0.38 mm² PVC cable with common, braided copper shield (∅ ~ 7 mm) and individually shielded cores
- Conductor resistance: ≤ 50 Ω/km
- Capacitance: core/shield: ≤ 420 pF/m
- Permanent operating temperature: –20 to +80 °C
- Cable cross-section: max. 2.5 mm²

Coil cable

- 2 × 0.75 mm² PVC cable with common, braided copper shield (∅ ~ 7 mm)
- Conductor resistance: ≤ 37 Ω/km
- Capacitance: core/core, shield grounded: ≤ 120 pF/m
- Operating temperature: –20 to +80 °C
- Cable cross-section: max. 2.5 mm²
- Test voltage for cable insulation: ≥1433 V AC r.m.s. 50/60 Hz or ≥2026 V DC

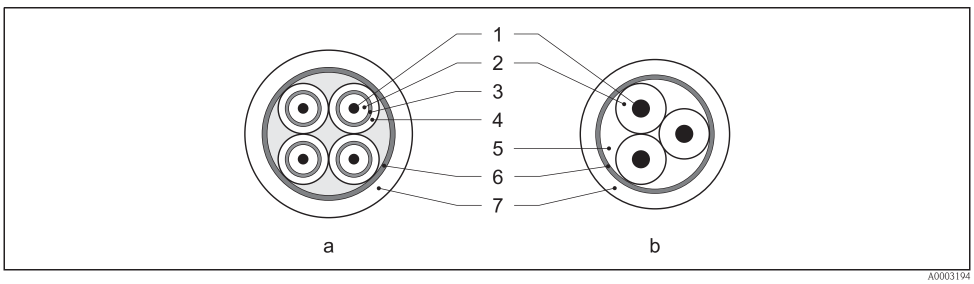


Fig. 33: Cable cross-section

a Signal cable
b Coil current cable

1 Core
2 Core insulation
3 Core shield
4 Core jacket
5 Core reinforcement
6 Cable shield
7 Outer jacket

Reinforced connecting cables

As an option, Endress+Hauser can also deliver reinforced connecting cables with an additional, reinforcing metal braid. Reinforced connecting cables should be used when laying the cable directly in the ground, if there is a risk of damage from rodents or if using the measuring device below IP 68 degree of protection.

Operation in zones of severe electrical interference:

The measuring device complies with the general safety requirements in accordance with EN 61010 and the EMC requirements of IEC/EN 61326.

Caution!
Grounding is by means of the ground terminals provided for the purpose inside the connection housing. Ensure that the stripped and twisted lengths of cable shield to the ground terminal are as short as possible.

4.2 Connecting the measuring unit

4.2.1 Connecting the transmitter

Warning!
- Risk of electric shock! Switch off the power supply before opening the device. Do not install or wire the device while it is energized. Failure to comply with this precaution can result in irreparable damage to the electronics.
- Risk of electric shock! Connect the protective conductor to the ground terminal on the housing before the power supply is applied (not necessary if the power supply is galvanically isolated).
- Compare the specifications on the nameplate with the local voltage supply and frequency. Also comply with national regulations governing the installation of electrical equipment.

1. Remove the cover of the connection compartment (f) from the transmitter housing.
2. Feed the power supply cable (a) and the signal cable (b) through the appropriate cable entries.
3. Perform the wiring:
   - Wiring diagram (aluminum housing) → 34
   - Wiring diagram (stainless steel housing) → 35
   - Wiring diagram (wall-mount housing) → 36
   - Terminal assignment → 52
4. Screw the cover of the connection compartment (f) firmly onto the transmitter housing.

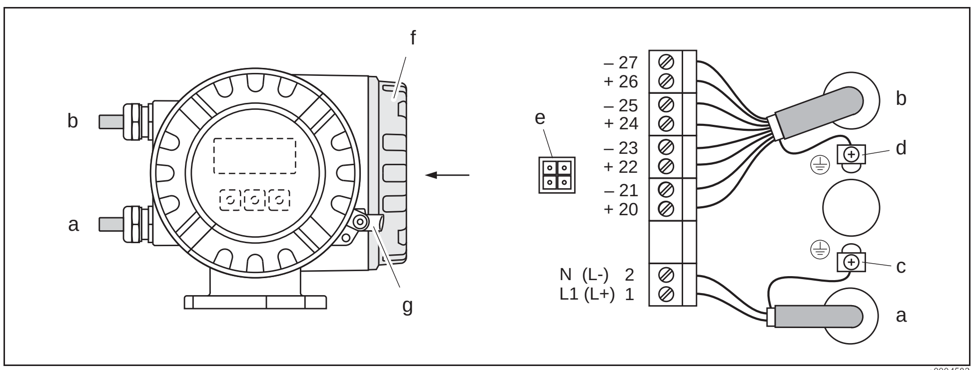


Fig. 34: Connecting the transmitter (aluminum field housing). Cable cross-section: max. 2.5 mm²

a Cable for power supply: 85 to 260 V AC, 20 to 55 V AC, 16 to 62 V DC
*Terminal **No. 1:** L1 for AC, L+ for DC*
*Terminal **No. 2:** N for AC, L- for DC*
*b Signal cable: Terminals **Nos. 20–27** → 52*
c Ground terminal for protective ground
d Ground terminal for signal cable shield
e Service connector for connecting service interface FXA193 (Fieldcheck, FieldCare)
f Cover of the connection compartment
g Securing clamp

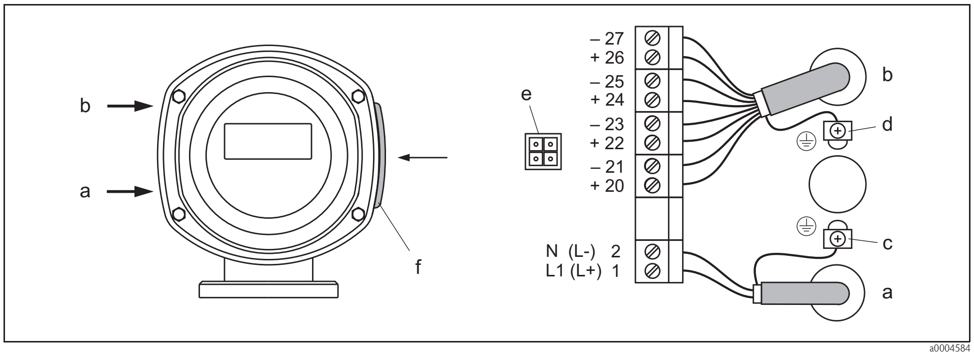


Fig. 35: Connecting the transmitter (stainless steel field housing); cable cross-section: max. 2.5 mm²

a Cable for power supply: 85 to 260 V AC, 20 to 55 V AC, 16 to 62 V DC
Terminal ***No. 1:*** *L1 for AC, L+ for DC*
Terminal ***No. 2:*** *N for AC, L- for DC*
b Signal cable: Terminals ***Nos. 20–27*** *→ 52*
c Ground terminal for protective ground
d Ground terminal for signal cable shield
e Service connector for connecting service interface FXA193 (Fieldcheck, FieldCare)
f Cover of the connection compartment

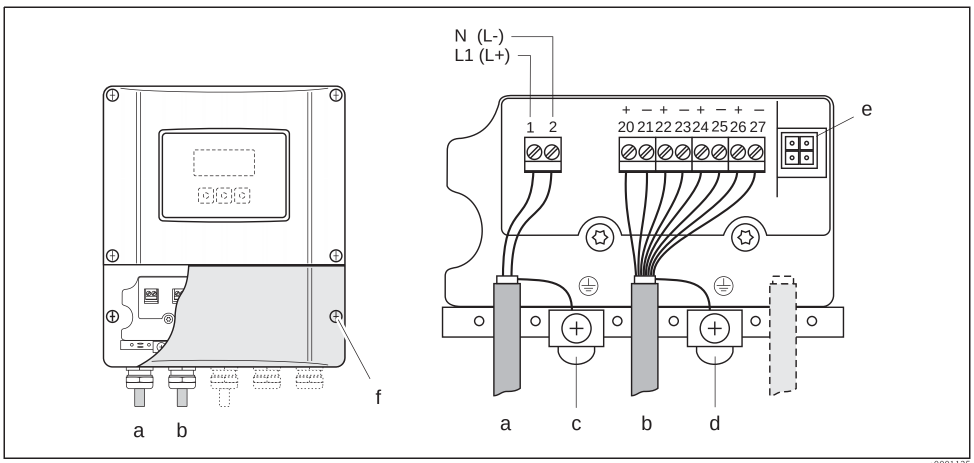


Fig. 36: Connecting the transmitter (wall-mount housing); cable cross-section: max. 2.5 mm²

a Cable for power supply: 85 to 260 V AC, 20 to 55 V AC, 16 to 62 V DC
Terminal ***No. 1:*** *L1 for AC, L+ for DC*
Terminal ***No. 2:*** *N for AC, L- for DC*
b Signal cable: Terminals ***Nos. 20–27*** *→ 52*
c Ground terminal for protective ground
d Ground terminal for signal cable shield
e Service connector for connecting service interface FXA193 (Fieldcheck, FieldCare)
f Cover of the connection compartment

4.2.2 Terminal assignment

	Terminal No. (inputs / outputs)			
Order version	**20 (+) / 21 (–)**	**22 (+) / 23 (–)**	**24 (+) / 25 (–)**	**26 (+) / 27 (–)**
50***-***********W	–	–	–	Current output HART
50***-***********A	–	–	Frequency output	Current output HART
50***-***********D	Status input	Status output	Frequency output	Current output HART
50***-***********S	–	–	Frequency output Ex i	Current output, Ex i, active, HART
50***-***********T	–	–	Frequency output Ex i	Current output, Ex i, passive, HART

Note!
Functional values of the inputs and outputs → 🗎 97

4.2.3 HART connection

Users have the following connection options at their disposal:
- Direct connection to transmitter by means of terminals 26(+) and 27 (–)
- Connection by means of the 4 to 20 mA circuit.
- The measuring loop's minimum load must be at least 250 Ω.
- After commissioning, make the following settings:
  – CURRENT SPAN function → "4–20 mA HART"
  – Switch HART write protection on or off → 64

Connection of the HART handheld communicator

See also the documentation issued by the HART Communication Foundation, and in particular HCF LIT 20: "HART, a technical summary".

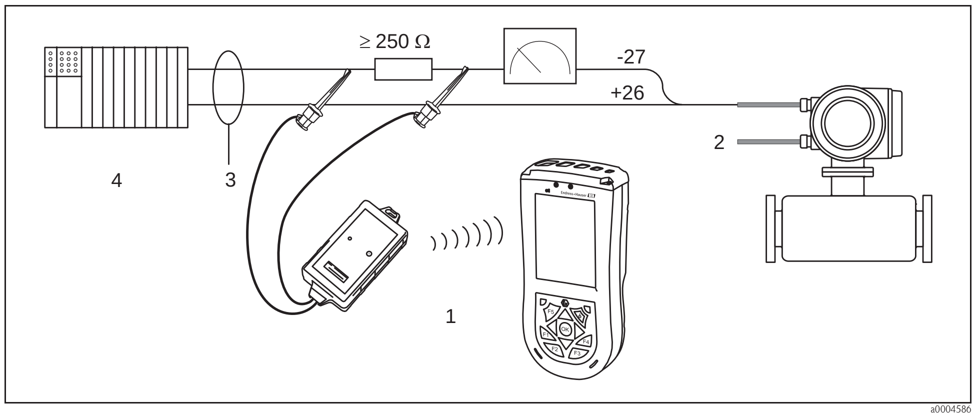


Fig. 37: Electrical connection of HART handheld Field Xpert SFX100

1 HART handheld Field Xpert SFX100
2 Auxiliary energy
3 Shielding
4 Other devices or PLC with passive input

Connection of a PC with an operating software

In order to connect a PC with operating software (e.g. "FieldCare"), a HART modem (e.g. "Commubox FXA195") is needed.

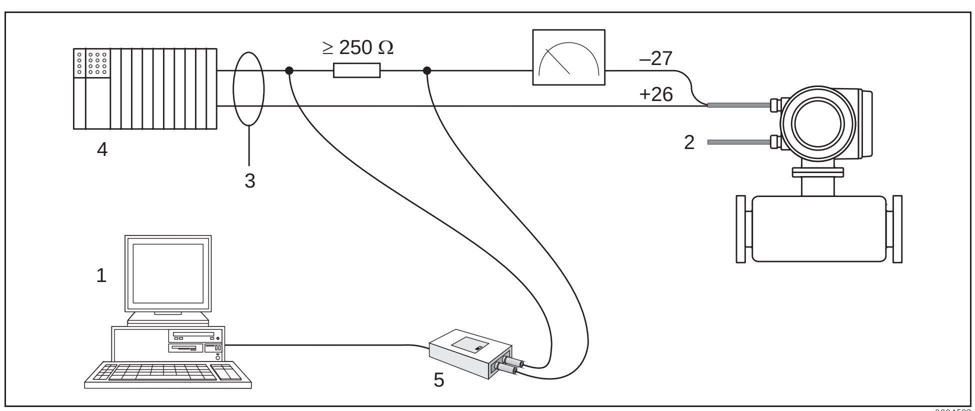


Fig. 38: Electrical connection of a PC with operating software

1 PC with operating software
2 Auxiliary energy
3 Shielding
4 Other devices or PLC with passive input
5 HART modem, e.g. Commubox FXA195

4.3 Potential equalization

Warning!
The measuring system must be included in the potential equalization.

Perfect measurement is only ensured when the fluid and the sensor have the same electrical potential. This is ensured by the reference electrode integrated in the sensor as standard.

The following should also be taken into consideration for potential equalization:
- Internal grounding concepts in the company
- Operating conditions, such as the material/grounding of the pipes (see Table)

4.3.1 Potential equalization for Promag D

- No reference electrode is integrated!
  For the two ground disks of the sensor an electrical connection to the fluid is always ensured.
- Exampels for connections → 54

4.3.2 Potential equalization for Promag W, P, L

- Reference electrode integrated in the sensor as standard
- Exampels for connections → 55

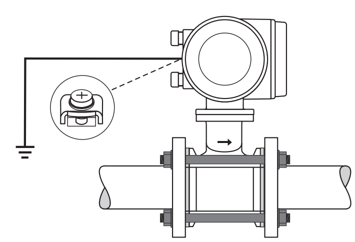
4.3.3 Potential equalization for Promag H

No reference electrode is integrated!
For the metal process connections of the sensor an electrical connection to the fluid is always ensured.

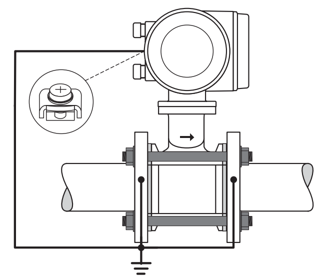
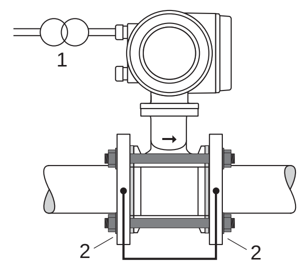
Caution!
If using process connections made of a synthetic material, ground rings have to be used to ensure that potential is equalized (→ 37). The necessary ground rings can be ordered separately from Endress+Hauser as accessories (→ 77).

4.3.4 Exampels for potential equalization connections for Promag D

Standard case

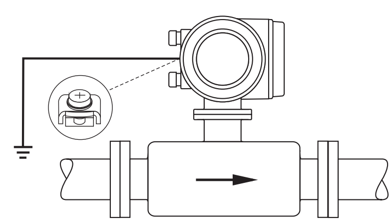
Operating conditions	Potential equalization
When using the measuring device in a: ■ Metal, grounded pipe ■ Plastic pipe ■ Pipe with insulating lining Potential equalization takes place via the ground terminal of the transmitter (standard situation). Note! When installing in metal pipes, we recommend you connect the ground terminal of the transmitter housing with the piping.	 a00012172 *Fig. 39: Via the ground terminal of the transmitter*

Special cases

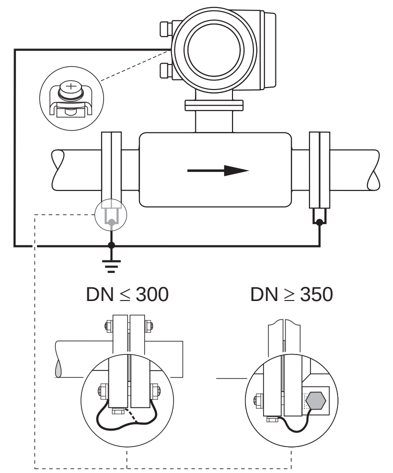
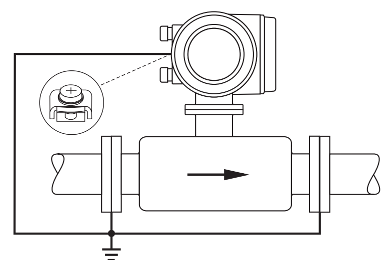
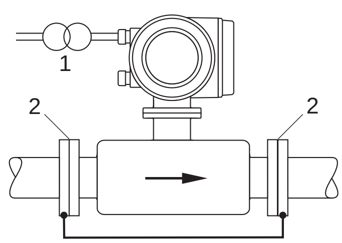
Operating conditions	Potential equalization
When using the measuring device in a: ▪ Metal pipe that is not grounded This connection method also applies in situations where: ▪ Customary potential equalization cannot be ensured ▪ Excessively high equalizing currents can be expected Potential equalization takes place via the ground terminal of the transmitter and the two pipe flanges. Here, the ground cable (copper wire, 6 mm² (0.0093 in²)) is mounted directly on the conductive flange coating with flange screws.	 a00012173 *Fig. 40: Via the ground terminal of the transmitter and the flanges of the pipe .*
When using the measuring device in a: ▪ Pipe with a cathodic protection unit The device is installed potential-free in the pipe. Only the two flanges of the pipe are connected with a ground cable (copper wire, 6 mm² (0.0093 in²)). Here, the ground cable is mounted directly on the conductive flange coating with flange screws. Note the following when installing: ▪ The applicable regulations regarding potential-free installation must be observed. ▪ There should be **no** electrically conductive connection between the pipe and the device. ▪ The mounting material must withstand the applicable torques.	 a00012174 *Fig. 41: Potential equalization and cathodic protection* *1 Power supply isolation transformer* *2 Electrically isolated*

4.3.5 Exampels for potential equalization connections for Promag L, W, P

Standard case

Operating conditions	Potential equalization
When using the measuring device in a: ▪ Metal, grounded pipe Potential equalization takes place via the ground terminal of the transmitter (standard situation). ✎ Note! When installing in metal pipes, we recommend you connect the ground terminal of the transmitter housing with the piping.	 A0011892 *Fig. 42: Via the ground terminal of the transmitter*

Special cases

Operating conditions	Potential equalization
When using the measuring device in a: ▪ Metal pipe that is not grounded This connection method also applies in situations where: ▪ Customary potential equalization cannot be ensured ▪ Excessively high equalizing currents can be expected Both sensor flanges are connected to the pipe flange by means of a ground cable (copper wire, 6 mm² (0.0093 in²)) and grounded. Connect the transmitter or sensor connection housing, as applicable, to ground potential by means of the ground terminal provided for the purpose. Ground cable installation depends on the nominal diameter: ▪ DN ≤ 300: The ground cable is mounted directly on the conductive flange coating with the flange screws. ▪ DN ≥ 350: The ground cable is mounted directly on the metal transport bracket. Note! The ground cable for flange-to-flange connections can be ordered separately as an accessory from Endress+Hauser.	 *Fig. 43: Via the ground terminal of the transmitter and the flanges of the pipe*
When using the measuring device in a: ▪ Plastic pipe ▪ Pipe with insulating lining This connection method also applies in situations where: ▪ Customary potential equalization cannot be ensured ▪ Excessively high equalizing currents can be expected Potential equalization takes place using additional ground disks, which are connected to the ground terminal via a ground cable (copper wire, min. 6 mm² (0.0093 in²)). When installing the ground disks, please comply with the enclosed Installation Instructions.	 *Fig. 44: Via the ground terminal of the transmitter*
When using the measuring device in a: ▪ Pipe with a cathodic protection unit The device is installed potential-free in the pipe. Only the two flanges of the pipe are connected with a ground cable (copper wire, 6 mm² (0.0093 in²)). Here, the ground cable is mounted directly on the conductive flange coating with flange screws. Note the following when installing: ▪ The applicable regulations regarding potential-free installation must be observed. ▪ There should be **no** electrically conductive connection between the pipe and the device. ▪ The mounting material must withstand the applicable torques.	 *Fig. 45: Potential equalization and cathodic protection* *1 Power supply isolation transformer* *2 Electrically isolated*

4.4 Degree of protection

The devices meet all the requirements of IP 67 degree of protection.

Compliance with the following points is mandatory following installation in the field or servicing in order to ensure that IP 67 protection is maintained:

- The housing seals must be clean and undamaged when inserted into their grooves. The seals must be dried, cleaned or replaced if necessary.
- All threaded fasteners and screw covers must be firmly tightened.
- The cables used for connection must be of the specified outside diameter → 📄 49.
- Firmly tighten the cable entries.
- The cables must loop down before they enter the cable entries ("water trap"). This arrangement prevents moisture penetrating the entry. Always install the measuring device in such a way that the cable entries do not point up.
- Remove all unused cable entries and insert plugs instead.
- Do not remove the grommet from the cable entry.

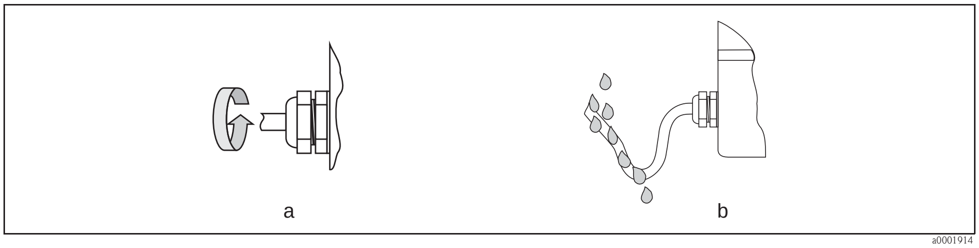


Fig. 46: Installation instructions, cable entries

Caution!
Do not loosen the threaded fasteners of the sensor housing, as otherwise the degree of protection guaranteed by Endress+Hauser no longer applies.

Note!
The Promag L, Promag W and Promag P sensors can be supplied with IP 68 rating (permanent immersion in water to a depth of 3 meters (10 ft)). In this case the transmitter must be installed remote from the sensor.
The Promag L sensors with IP 68 rating are only available with stainless steel flanges.

4.5 Post-connection check

Perform the following checks after completing electrical installation of the measuring device:

Device condition and specifications	Notes
Are cables or the device damaged (visual inspection)?	-
Electrical connection	**Notes**
Does the supply voltage match the specifications on the nameplate?	■ 85 to 250 V AC (50 to 60 Hz) ■ 20 to 28 V AC (50 to 60 Hz) 11 to 40 V DC
Do the cables used comply with the necessary specifications?	→ 🗎 49
Do the cables have adequate strain relief?	-
Is the cable type route completely isolated? Without loops and crossovers?	-
Are the power-supply and signal cables correctly connected?	See the wiring diagram inside the cover of the terminal compartment
Are all screw terminals firmly tightened?	-
Have the measures for grounding/potential equalization been correctly implemented?	→ 🗎 54
Are all cable entries installed, firmly tightened and correctly sealed? Cables looped as "water traps"?	→ 🗎 57
Are all housing covers installed and firmly tightened?	-

5 Operation

5.1 Display and operating elements

The local display enables you to read all important parameters directly at the measuring point and configure the device.
The display area consists of two lines; this is where measured values are displayed, and/or status variables (direction of flow, partially filled pipe, bar graph, etc.). You can change the assignment of display lines to variables at will in order to customize the display to suit your needs and preferences (→ "Description of Device Functions" manual).

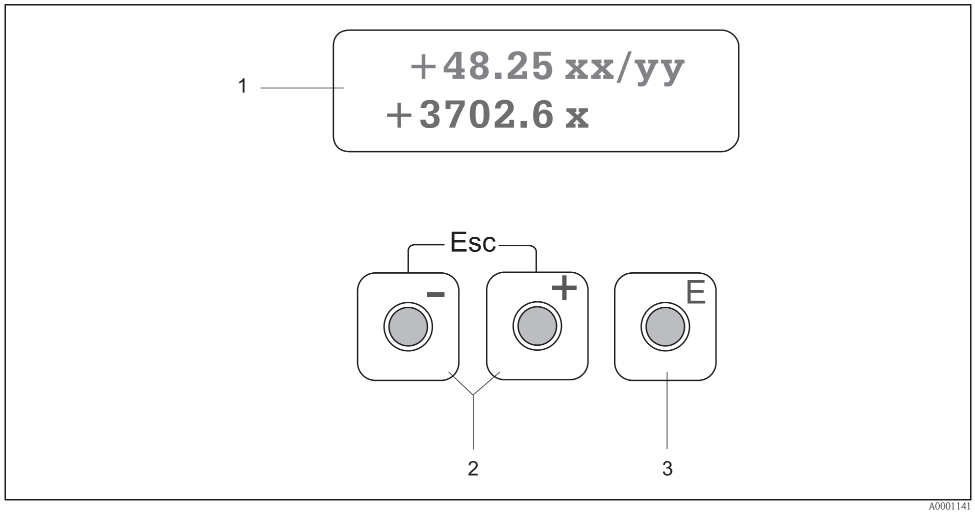


Fig. 47: Display and operating elements

1 Liquid crystal display
The two-line liquid-crystal display shows measured values, dialog texts, error messages and information messages. The display as it appears when normal measuring is in progress is known as the HOME position (operating mode).
– Upper display line: Shows primary measured values, e.g. volume flow in [ml/min] or in [%].
– Lower display line: Shows supplementary measured variables and status variables, e.g. totalizer reading in [m3], bar graph, measuring point designation

2 Plus/minus keys
– Enter numerical values, select parameters
– Select different function groups within the function matrix

Press the +/- keys simultaneously to trigger the following functions:
– Exit the function matrix step by step → HOME position
– Press and hold down +/- keys for longer than 3 seconds → Return directly to HOME position
– Cancel data entry

3 Enter key
– HOME position → Entry into the function matrix
– Save the numerical values you input or settings you change

5.2 Brief operating instructions on the function matrix

Note!
- See the general notes on → 61.
- Detailed description of all the functions → "Description of Device Functions" manual

The function matrix comprises two levels, namely the function groups and the functions of the function groups.
The groups are the highest-level grouping of the control options for the device. A number of functions is assigned to each group. You select a group in order to access the individual functions for operating and configuring the device.

1. HOME position → E → Enter the function matrix
2. Select a function group (e.g. OPERATION)
3. Select a function (e.g. LANGUAGE)
   Change parameter/enter numerical values:
   +/- → select or enter enable code, parameters, numerical values
   E → save your entries
4. Exit the function matrix:
   – Press and hold down Esc key (-/+) for longer than 3 seconds → HOME position
   – Repeatedly press Esc key (-/+) → return step by step to HOME position

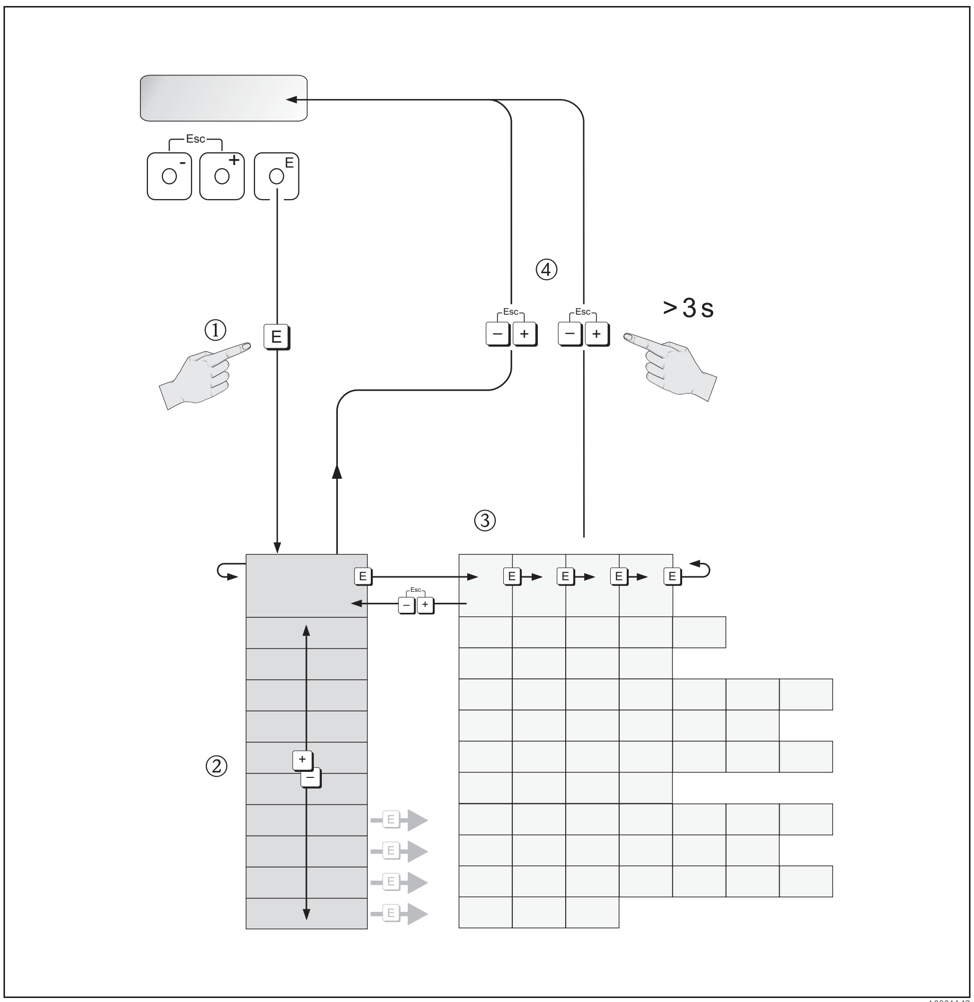


Fig. 48: Selecting functions and configuring parameters (function matrix)

5.2.1 General notes

The Quick Setup menu (→ 71) is adequate for commissioning in most instances. Complex measuring operations on the other hand necessitate additional functions that you can configure as necessary and customize to suit your process parameters. The function matrix, therefore, comprises a multiplicity of additional functions which, for the sake of clarity, are arranged in a number of function groups.

Comply with the following instructions when configuring functions:
- You select functions as described on → 60.
- You can switch off certain functions (OFF). If you do so, related functions in other function groups will no longer be displayed.
- Certain functions prompt you to confirm your data entries.
  Press to select "SURE [YES]" and press E again to confirm. This saves your setting or starts a function, as applicable.
- Return to the HOME position is automatic if no key is pressed for 5 minutes.

Note!
- The transmitter continues to measure while data entry is in progress, i.e. the current measured values are output via the signal outputs in the normal way.
- If the power supply fails, all preset and configured values remain safely stored in the EEPROM.

Caution!
All functions are described in detail, including the function matrix itself, in the "Description of Device Functions" manual, which is a separate part of these Operating Instructions.

5.2.2 Enabling the programming mode

The function matrix can be disabled. Disabling the function matrix rules out the possibility of inadvertent changes to device functions, numerical values or factory settings. A numerical code (factory setting = 50) has to be entered before settings can be changed.
If you use a code number of your choice, you exclude the possibility of unauthorized persons accessing data (→ see the "Description of Device Functions" manual).

Comply with the following instructions when entering codes:
- If programming is disabled and the operating elements are pressed in any function, a prompt for the code automatically appears on the display.
- If "0" is specified as the customer's code, programming is always enabled.
- The Endress+Hauser service organization can be of assistance if you mislay your personal code.

Caution!
Changing certain parameters such as all sensor characteristics, for example, influences numerous functions of the entire measuring system, particularly measuring accuracy.
There is no need to change these parameters under normal circumstances and consequently, they are protected by a special code known only to the Endress+Hauser service organization.
Please contact Endress+Hauser if you have any questions.

5.2.3 Disabling the programming mode

Programming is disabled if you do not press the operating elements within 60 seconds following automatic return to the HOME position.
You can also disable programming in the "ACCESS CODE" function by entering any number (other than the customer's code).

5.3 Displaying error messages

5.3.1 Type of error

Errors which occur during commissioning or measuring operation are displayed immediately. If two or more system or process errors occur, the error with the highest priority is the one shown on the display.

The measuring system distinguishes between two types of error:

- *System errors* → 🗎 81*:*
  This group comprises all device errors, e.g. communication errors, hardware faults, etc.
- *Process errors* → 🗎 83:
  This group comprises all application errors, e.g. empty pipe, etc.

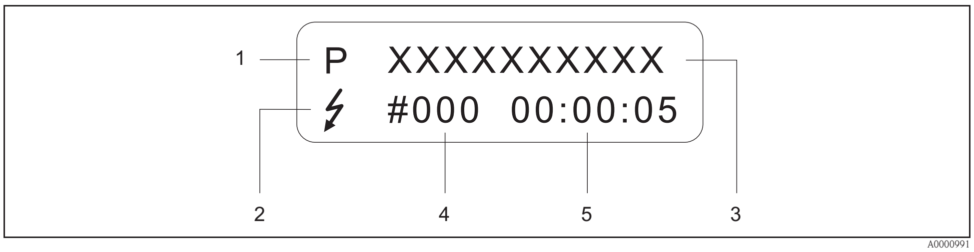


Fig. 49: Error messages on the display (example)

1 Error type:
– P = process error
– S = system error
2 Error message type:
– ϟ = fault message
– ! = notice message
3 Error designation: e.g. EMPTY PIPE = measuring tube is only partly filled or completely empty
4 Error number: e.g. #401
5 Duration of most recent error occurrence (in hours, minutes and seconds)

5.3.2 Error message types

Users have the option of weighting certain errors differently, in other words having them classed as "Fault messages" or "Notice messages". You can define messages in this way with the aid of the function matrix (→ "Description of Device Functions" manual).
Serious system errors, e.g. module defects, are always identified and classed as "fault messages" by the measuring device.

Notice message (!)

- Displayed as → Exclamation mark (!), error type (S: system error, P: process error)
- The error in question has no effect on the outputs of the measuring device.

Fault message ≈ϟ)

- Displayed as → Lightning flash (ϟ), error type (S: system error, P: process error).
- The error in question has a direct effect on the outputs.
  The response of the individual outputs (failsafe mode) can be defined in the function matrix using the "FAILSAFE MODE" function (→ "Description of Device Functions" manual).

✎ Note!
For security reasons, error messages should be output via the status output.

5.4 Communication

In addition to local operation, the measuring device can be configured and measured values can be obtained by means of the HART protocol. Digital communication takes place using the 4–20 mA current output HART → 53.

The HART protocol allows the transfer of measuring and device data between the HART master and the field devices for configuration and diagnostics purposes.
The HART master, e.g. a handheld terminal or PC-based operating programs (such as FieldCare), require device description (DD) files which are used to access all the information in a HART device. Information is exclusively transferred using so-called "commands". There are three different command classes:

- *Universal commands:*
  All HART device support and use universal commands.
  The following functionalities are linked to them:
  – Identify HART devices
  – Reading digital measured values (volume flow, totalizer, etc.)
- *Common practice commands:*
  Common practice commands offer functions which are supported and can be executed by most but not all field devices.
- *Device-specific commands:*
  These commands allow access to device-specific functions which are not HART standard. Such commands access individual field device information, amongst other things, such as empty/full pipe calibration values, low flow cutoff settings, etc.

✎ Note!
The device has access to all three command classes. A list of all the "Universal commands" and "Common practice commands" is provided on → 65.

5.4.1 Operating options

For the complete operation of the measuring device, including device-specific commands, there are DD files available to the user to provide the following operating aids and programs:

Field Xpert HART Communicator

Selecting device functions with a HART Communicator is a process involving a number of menu levels and a special HART function matrix.
The HART manual in the carrying case of the HART Communicator contains more detailed information on the device.

Operating program "FieldCare"

FieldCare is Endress+Hauser’s FDT-based plant Asset Management Tool and allows the configuration and diagnosis of intelligent field devices. By using status information, you also have a simple but effective tool for monitoring devices. The Proline flow measuring devices are accessed via a service interface or via the service interface FXA193.

Operating program "SIMATIC PDM" (Siemens)

SIMATIC PDM is a standardized, manufacturer-independent tool for the operation, configuration, maintenance and diagnosis of intelligent field devices.

Operating program "AMS" (Emerson Process Management)

AMS (Asset Management Solutions): program for operating and configuring devices.

5.4.2 Current device description files

The following table illustrates the suitable device description file for the operating tool in question and then indicates where these can be obtained.

HART protocol:

Valid for device software:	2.03.XX	→ Function DEVICE SOFTWARE
Device data HART		
Manufacturer ID:	11_{hex} (ENDRESS+HAUSER)	→ Function MANUFACTURER ID
Device ID:	41_{hex}	→ Function DEVICE ID
HART version data:	Device Revision 6/ DD Revision 1	
Software release:	07.2009	

Operating program:	Sources for obtaining device descriptions:
Handheld Field Xpert SFX100	Use update function of handheld terminal
FieldCare / DTM	▪ www.endress.com → Download ▪ CD-ROM (Endress+Hauser order number 56004088) ▪ DVD (Endress+Hauser order number 70100690)
AMS	www.endress.com → Download
SIMATIC PDM	www.endress.com → Download

Tester/simulator:	Sources for obtaining device descriptions:
Fieldcheck	Update by means of FieldCare with the flow device FXA193/291 DTM in the Fieldflash module

✎ Note!
The "Fieldcheck" tester/simulator is used for testing flowmeters in the field. When used in conjunction with the "FieldCare" software package, test results can be imported into a database, printed out and used for official certification. Contact your Endress+Hauser representative for more information.

5.4.3 Device variables

The following device variables are available using the HART protocol:

Code (decimal)	Device variable
0	OFF (not assigned)
1	Volume flow
250	Totalizer 1
251	Totalizer 2

At the factory, the process variables are assigned to the following device variables:
- Primary process variable (PV) → Volume flow
- Second process variable (SV) → Totalizer 1
- Third process variable (TV) → not assigned
- Fourth process variable (FV) → not assigned

✎ Note!
You can set or change the assignment of device variables to process variables using Command 51.

5.4.4 Switching HART write protection on/off

The HART write protection can be switched on and off using the HART WRITE PROTECT device function (→ "Description of Device Functions" manual).

5.4.5 Universal and common practice HART commands

The following table contains all the universal commands supported by the device.

Command No. HART command / Access type		Command data (numeric data in decimal form)	Response data (numeric data in decimal form)
Universal commands			
0	Read unique device identifier Access type = read	none	Device identification delivers information on the device and the manufacturer. It cannot be changed. The response consists of a 12 byte device ID: – Byte 0: fixed value 254 – Byte 1: Manufacturer ID, 17 = E+H – Byte 2: Device type ID, 65 = Promag 50 – Byte 3: Number of preambles – Byte 4: Universal commands rev. no. – Byte 5: Device-specific commands rev. no. – Byte 6: Software revision – Byte 7: Hardware revision – Byte 8: Additional device information – Bytes 9–11: Device identification
1	Read primary process variable Access type = read	none	– Byte 0: HART unit code of the primary process variable – Bytes 1–4: Primary process variable Factory setting: Primary process variable = Volume flow Note! ▪ Manufacturer-specific units are represented using the HART unit code "240". ▪ You can change the assignment of device variables to process variables using Command 51.
2	Read the primary process variable as current in mA and percentage of the set measuring range Access type = read	none	– Bytes 0–3: actual current of the primary process variable in mA – Bytes 4–7: % value of the set measuring range Factory setting: Primary process variable = Volume flow Note! You can change the assignment of device variables to process variables using Command 51.
3	Read the primary process variable as current in mA and four dynamic process variables Access type = read	none	24 bytes are sent as a response: – Bytes 0–3: primary process variable current in mA – Byte 4: HART unit code of the primary process variable – Bytes 5–8: Primary process variable – Byte 9: HART unit code of the second process variable – Bytes 10–13: Second process variable – Byte 14: HART unit code of the third process variable – Bytes 15–18: Third process variable – Byte 19: HART unit code of the fourth process variable – Bytes 20–23: Fourth process variable *Factory setting:* ▪ Primary process variable = Volume flow ▪ Second process variable = Totalizer 1 ▪ Third process variable = OFF (not assigned) ▪ Fourth process variable = OFF (not assigned) Note! ▪ Manufacturer-specific units are represented using the HART unit code "240". ▪ You can change the assignment of device variables to process variables using Command 51.

Command No. HART command / Access type		Command data (numeric data in decimal form)	Response data (numeric data in decimal form)
6	Set HART shortform address Access type = write	Byte 0: desired address (0 to 15) Factory setting: 0 Note! With an address >0 (multidrop mode), the current output of the primary process variable is set to 4 mA.	Byte 0: active address
11	Read unique device identification using the TAG (measuring point designation) Access type = read	Bytes 0-5: TAG	Device identification delivers information on the device and the manufacturer. It cannot be changed. The response consists of a 12 byte device ID if the given TAG agrees with the one saved in the device: – Byte 0: fixed value 254 – Byte 1: Manufacturer ID, 17 = E+H – Byte 2: Device type ID, 65 = Promag 50 – Byte 3: Number of preambles – Byte 4: Universal commands rev. no. – Byte 5: Device-specific commands rev. no. – Byte 6: Software revision – Byte 7: Hardware revision – Byte 8: Additional device information – Bytes 9-11: Device identification
12	Read user message Access type = read	none	Bytes 0-24: User message Note! You can write the user message using Command 17.
13	Read TAG, descriptor and date Access type = read	none	– Bytes 0-5: TAG – Bytes 6-17: descriptor – Bytes 18-20: Date Note! You can write the TAG, descriptor and date using Command 18.
14	Read sensor information on primary process variable	none	– Bytes 0-2: Sensor serial number – Byte 3: HART unit code of sensor limits and measuring range of the primary process variable – Bytes 4-7: Upper sensor limit – Bytes 8-11: Lower sensor limit – Bytes 12-15: Minimum span Note! ▪ The data relate to the primary process variable (= volume flow). ▪ Manufacturer-specific units are represented using the HART unit code "240".
15	Read output information of primary process variable Access type = read	none	– Byte 0: Alarm selection ID – Byte 1: Transfer function ID – Byte 2: HART unit code for the set measuring range of the primary process variable – Bytes 3-6: upper range, value for 20 mA – Bytes 7-10: lower range, value for 4 mA – Bytes 11-14: Damping constant in [s] – Byte 15: Write protection ID – Byte 16: OEM dealer ID, 17 = E+H Factory setting: Primary process variable = Volume flow Note! ▪ Manufacturer-specific units are represented using the HART unit code "240". ▪ You can change the assignment of device variables to process variables using Command 51.

Command No. HART command / Access type		Command data (numeric data in decimal form)	Response data (numeric data in decimal form)
16	Read the device production number Access type = read	none	Bytes 0-2: Production number
17	Write user message Access = write	You can save any 32-character long text in the device under this parameter: Bytes 0-23: Desired user message	Displays the current user message in the device: Bytes 0-23: Current user message in the device
18	Write TAG, descriptor and date Access = write	With this parameter, you can store an 8 character TAG, a 16 character descriptor and a date: – Bytes 0-5: TAG – Bytes 6-17: descriptor – Bytes 18-20: Date	Displays the current information in the device: – Bytes 0-5: TAG – Bytes 6-17: descriptor – Bytes 18-20: Date
19	Write the device production number Access = write	Bytes 0-2: Production number	Bytes 0-2: Production number

The following table contains all the common practice commands supported by the device.

Command No. HART command / Access type		Command data (numeric data in decimal form)	Response data (numeric data in decimal form)
Common practice commands			
34	Write damping value for primary process variable Access = write	Bytes 0-3: Damping value of the primary process variable "volume flow" in seconds *Factory setting:* Primary process variable = Current output damping	Displays the current damping value in the device: Bytes 0-3: Damping value in seconds
35	Write measuring range of primary process variable Access = write	Write the desired measuring range: – Byte 0: HART unit code of the primary process variable – Bytes 1-4: upper range, value for 20 mA – Bytes 5-8: lower range, value for 4 mA *Factory setting:* Primary process variable = Volume flow Note! ▪ The start of the measuring range (4 mA) must correspond to the zero flow. ▪ If the HART unit code is not the correct one for the process variable, the device will continue with the last valid unit.	The currently set measuring range is displayed as a response: – Byte 0: HART unit code for the set measuring range of the primary process variable – Bytes 1-4: upper range, value for 20 mA – Bytes 5-8: lower range, value for 4 mA Note! ▪ Manufacturer-specific units are represented using the HART unit code "240". ▪ You can change the assignment of device variables to process variables using Command 51.
38	Device status reset (configuration changed) Access = write	none	none Note! It is also possible to execute this HART command when write protection is activated (= ON)!
40	Simulate input current of primary process variable Access = write	Simulation of the desired output current of the primary process variable. An entry value of 0 exits the simulation mode: Bytes 0-3: Output current in mA *Factory setting:* Primary process variable = Volume flow Note! You can set the assignment of device variables to process variables using Command 51.	The momentary output current of the primary process variable is displayed as a response: Bytes 0-3: Output current in mA
42	Perform master reset Access = write	none	none

Command No.	HART command / Access type	Command data (numeric data in decimal form)	Response data (numeric data in decimal form)
44	Write unit of primary process variable Access = write	Set unit of primary process variable. Only units which are suitable for the process variable are transferred to the device: Byte 0: HART unit code *Factory setting:* Primary process variable = Volume flow Note! ■ If the written HART unit code is not the correct one for the process variable, the device will continue with the last valid unit. ■ If you change the unit of the primary process variable, this has a direct impact on the system units.	The current unit code of the primary process variable is displayed as a response: Byte 0: HART unit code Note! Manufacturer-specific units are represented using the HART unit code "240".
48	Read additional device status Access = read	none	The device status is displayed in extended form as the response: Coding: see table → 69
50	Read assignment of the device variables to the four process variables Access = read	none	Display of the current variable assignment of the process variables: – Byte 0: Device variable code to the primary process variable – Byte 1: Device variable code to the second process variable – Byte 2: Device variable code to the third process variable – Byte 3: Device variable code to the fourth process variable *Factory setting:* ■ Primary process variable: Code 1 for volume flow ■ Second process variable: Code 250 for totalizer ■ Third process variable: Code 0 for OFF (not assigned) ■ Fourth process variable: Code 0 for OFF (not assigned)
51	Write assignment of the device variables to the four process variables Access = write	Setting of the device variables to the four process variables: – Byte 0: Device variable code to the primary process variable – Byte 1: Device variable code to the second process variable – Byte 2: Device variable code to the third process variable – Byte 3: Device variable code to the fourth process variable *Factory setting:* ■ Primary process variable: Volume flow ■ Second process variable: Totalizer 1 ■ Third process variable: OFF (not assigned) ■ Fourth process variable: OFF (not assigned)	The variable assignment of the process variables is displayed as a response: – Byte 0: Device variable code to the primary process variable – Byte 1: Device variable code to the second process variable – Byte 2: Device variable code to the third process variable – Byte 3: Device variable code to the fourth process variable
53	Write device variable unit Access = write	This command sets the unit of the given device variables. Only those units which suit the device variable are transferred: – Byte 0: Device variable code – Byte 1: HART unit code Code of the supported device variables: See information → 64 Note! ■ If the written unit is not the correct one for the device variable, the device will continue with the last valid unit. ■ If you change the unit of the device variable, this has a direct impact on the system units.	The current unit of the device variables is displayed in the device as a response: – Byte 0: Device variable code – Byte 1: HART unit code Note! Manufacturer-specific units are represented using the HART unit code "240".
59	Write number of preambles in response message Access = write	This parameter sets the number of preambles which are inserted in the response messages: Byte 0: Number of preambles (4 to 20)	The current number of preambles is displayed in the response telegram: Byte 0: Number of preambles

5.4.6 Device status and error messages

You can read the extended device status, in this case, current error messages, via Command "48". The command delivers information which is partly coded in bits (see table below).

Note!

- You can find a detailed explanation of the device status and error messages and their elimination on → 69
- Bits and bytes not listed are not assigned.

Byte	Bit	Error No.	Short error description
0	0	001	Serious device error
	1	011	Measuring amplifier has faulty EEPROM
	2	012	Error when accessing data of the measuring amplifier EEPROM
1	1	031	S-DAT: defective or missing
	2	032	S-DAT: Error accessing saved values
	5	051	I/O and the amplifier are not compatible.
3	3	111	Totalizer checksum error
	4	121	I/O board and amplifier not compatible.
4	3	251	Internal communication fault on the amplifier board.
	4	261	No data reception between amplifier and I/O board
5	0	321	Coil current of the sensor is outside the tolerance.
	7	339	Flow buffer: The temporarily buffered flow portions (measuring mode for pulsating flow) could not be cleared or output within 60 seconds.
6	0	340	
	1	341	
	2	342	
	3	343	Frequency buffer: The temporarily buffered flow portions (measuring mode for pulsating flow) could not be cleared or output within 60 seconds.
	4	344	
	5	345	
	6	346	
	7	347	Pulse buffer: The temporarily buffered flow portions (measuring mode for pulsating flow) could not be cleared or output within 60 seconds.
7	0	348	
	1	349	
	2	350	
	3	351	Current output: Flow is out of range.
	4	352	
	5	353	
	6	354	
	7	355	Frequency output: Flow is out of range.
8	0	356	
	1	357	
	2	358	

Byte	Bit	Error No.	Short error description
8	3	359	Pulse output: Flow is out of range.
	4	360	
	5	361	
	6	362	
10	7	401	Measuring tube partially filled or empty
11	2	461	EPD calibration not possible because the fluid's conductivity is either too low or too high.
	4	463	The EPD calibration values for empty pipe and full pipe are identical, and therefore incorrect.
12	1	474	Maximum flow value entered is overshot
	7	501	Amplifier software version is loaded. Currently no other commands are possible.
13	0	502	Upload/download of device files. Currently no other commands are possible.
14	3	601	Positive zero return active
	7	611	Simulation current output active
15	0	612	
	1	613	
	2	614	
	3	621	Simulation frequency output active
	4	622	
	5	623	
	6	624	
	7	631	Simulation pulse output active
16	0	632	
	1	633	
	2	634	
	3	641	Simulation status output active
	4	642	
	5	643	
	6	644	
17	7	671	Simulation of the status input active
18	0	672	
	1	673	
	2	674	
	3	691	Simulation of response to error (outputs) active
	4	692	Simulation of volume flow active

6 Commissioning

6.1 Function check

Make sure that all final checks have been completed before you start up your measuring point:

- Checklist for "Post-installation check" → 43
- Checklist for "Post-connection check" → 58

6.2 Switching on the measuring device

Once the connection checks have been successfully completed, it is time to switch on the power supply. The device is now operational. The measuring device performs a number of post switch-on self-tests. As this procedure progresses the following sequence of messages appears on the local display:

PROMAG 50 **STARTUP. . .**	Start-up message
▼	
DEVICE SOFTWARE **V XX.XX.XX**	Current software version
▼	
SYSTEM OK **→OPERATION**	Beginning of normal measuring mode
▼	

Normal measuring mode commences as soon as start-up completes.
Various measured-value and/or status variables (HOME position) appear on the display.

Note!
If start-up fails, an error message indicating the cause is displayed.

6.3 Quick Setup

In the case of measuring devices without a local display, the individual parameters and functions must be configured via the operating program, e.g. FieldCare.
If the measuring device is equipped with a local display, all the important device parameters for standard operation, as well as additional functions, can be configured quickly and easily by means of the following Quick Setup menu.

6.3.1 "Commissioning" Quick Setup menu

This Quick Setup menu guides you systematically through the setup procedure for all the major device functions that have to be configured for standard measuring operation.

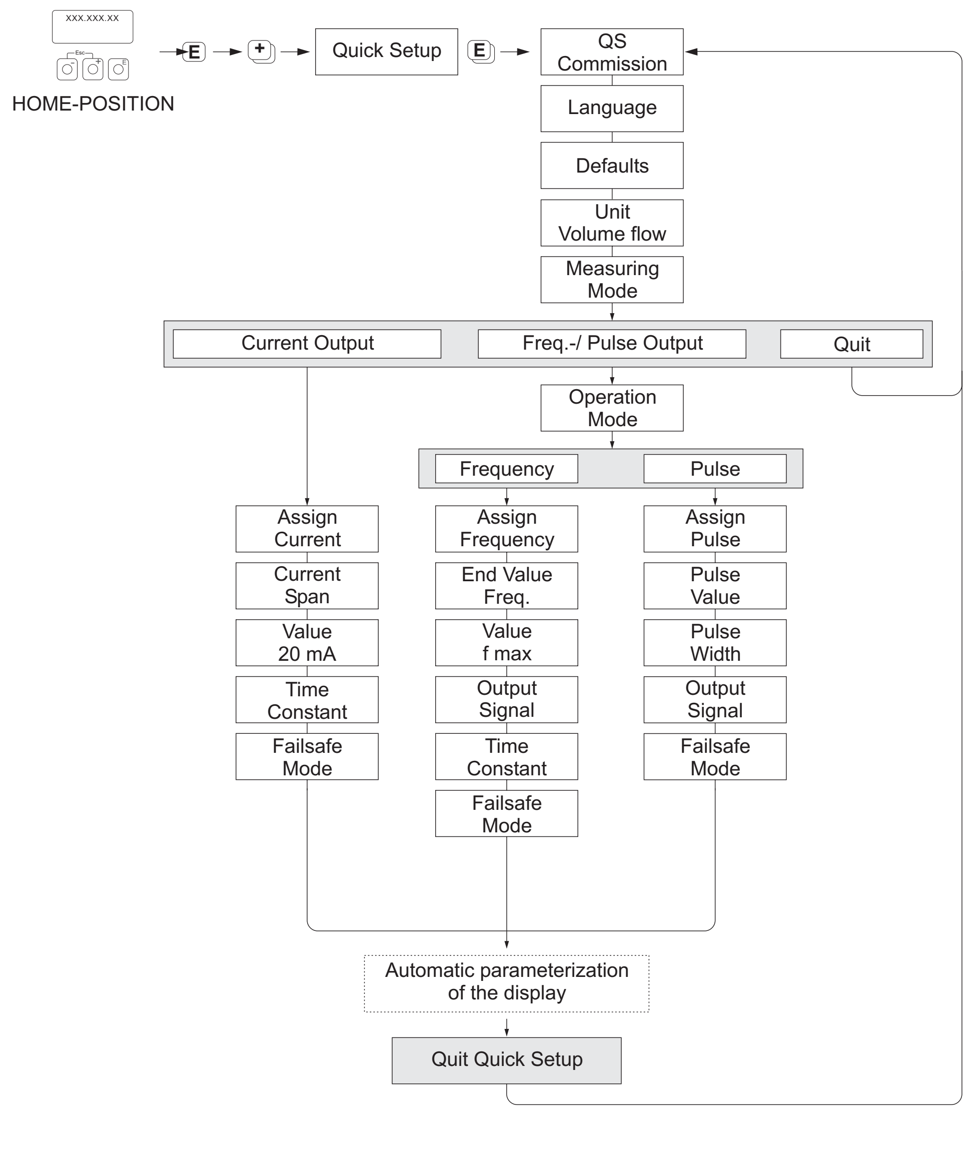


Fig. 50: "QUICK SETUP COMMISSIONING" menu for the rapid configuration of important device functions

6.4 Configuration

6.4.1 Current output: active/passive

The current output is configured as "active" or "passive" by means of various jumpers on the I/O board.

Warning!
Risk of electric shock! Exposed components carry dangerous voltages. Make sure that the power supply is switched off before you remove the cover of the electronics compartment.

1. Switch off power supply.
2. Remove the I/O board → 88
3. Position the jumper → 51

   Caution!
   Risk of destroying the measuring device. Set the jumpers exactly as shown in the graphic. Pay strict attention to the position of the jumpers as indicated in the graphic.
4. Installation of the I/O board is the reverse of the removal procedure.

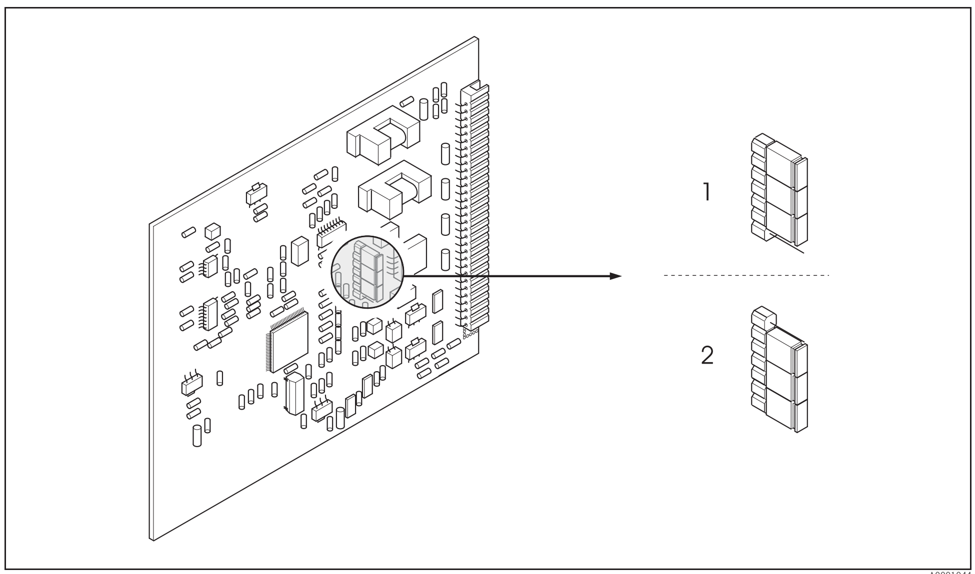


Fig. 51: Configuring current outputs using jumpers (I/O board)

1 Active current output (factory setting)
2 Passive current output

6.5 Adjustment

6.5.1 Empty-pipe/full-pipe adjustment

Flow cannot be measured correctly unless the measuring tube is completely full.
This status can be permanently monitored using the Empty Pipe Detection:

- EPD = Empty Pipe Detection (with the help of an EPD electrode)
- OED = Open Electrode Detection (Empty Pipe Detection with the help of the measuring electrodes, if the sensor is not equipped with an EPD electrode or the orientation is not suitable for using EPD).

Caution!
Detailed information on the empty-pipe/full-pipe adjustment procedure can be found in the "Description of Device Functions" manual:
- EPD/OED ADJUSTMENT (carrying out the adjustment).
- EPD (switching on and off EPD/OED).
- EPD RESPONSE TIME (input of the response time for EPD/OED).

Note!
- The EPD function is not available unless the sensor is fitted with an EPD electrode.
- The devices are already calibrated at the factory with water (approx. 500 µS/cm). If the fluid conductivity differs from this reference, empty-pipe/full-pipe adjustment has to be performed again on site.
- The default setting for EPD when the devices are delivered is OFF; the function has to be activated if required.
- The EPD process error can be output by means of the configurable relay output.

Performing empty-pipe and full-pipe adjustment (EPD)

1. Select the appropriate function in the function matrix:
   HOME → E → +⇊ → PROCESS PARAMETER → E → +⇊ → EPD ADJUSTMENT
2. Empty the piping:
   – The wall of the measuring tube should still be wet with fluid during EPD empty pipe adjustment
   – The wall of the measuring tube/the measuring electrodes should **no longer** be wet with fluid during OED empty pipe adjustment
3. Start empty-pipe adjustment: Select "EMPTY PIPE ADJUST" or "OED EMPTY ADJUST" and press E to confirm.
4. After empty-pipe adjustment, fill the piping with fluid.
5. Start full-pipe adjustment: Select "FULL PIPE ADJUST" or "OED FULL ADJUST" and press E to confirm.
6. Having completed the adjustment, select the setting "OFF" and exit the function by pressing E.
7. Switch on empty pipe detection in the EPD function:
   – EPD empty pipe adjustment: Select ON STANDARD or ON SPECIAL and press E to confirm
   – OED empty pipe adjustment: Select OED and confirm with E.

   Caution!
   The adjustment coefficients must be valid before you can activate the EPD function. If adjustment is incorrect the following messages might appear on the display:
   – FULL = EMPTY
   The adjustment values for empty pipe and full pipe are identical. In cases of this nature you must repeat empty-pipe or full-pipe adjustment!
   – ADJUSTMENT NOT OK
   Adjustment is not possible because the fluid’s conductivity is out of range.

6.6 Data storage device (HistoROM)

At Endress+Hauser, the term HistoROM refers to various types of data storage modules on which process and measuring device data are stored. It is possible to plug these modules into other devices to copy device configurations from one device to another, for example.

6.6.1 HistoROM/S-DAT (sensor-DAT)

The S-DAT is an exchangeable data storage device in which all sensor relevant parameters are stored, i.e., diameter, serial number, calibration factor, zero point.

7 Maintenance

No special maintenance work is required.

7.1 Exterior cleaning

When cleaning the exterior of measuring devices, always use cleaning agents that do not attack the surface of the housing and the seals.

7.2 Seals

The seals of the Promag H sensor must be replaced periodically, particularly in the case of gasket seals (aseptic version).
The period between changes depends on the frequency of cleaning cycles, the cleaning temperature and the fluid temperature.

Replacement seals (accessories) → 77.

8 Accessories

Various accessories, which can be ordered separately from Endress+Hauser, are available for the transmitter and the sensor. Your Endress+Hauser service organization can provide detailed information on the specific order codes on request.

8.1 Device-specific accessories

Accessory	Description	Order code
Proline Promag 50 transmitter	Transmitter for replacement or storage. Use the order code to define the following specifications: ■ Approvals ■ Degree of protection/version ■ Cable for remote version ■ Cable entry ■ Display/power supply/operation ■ Software ■ Outputs/inputs	50XXX – XXXXX******

8.2 Measuring principle-specific accessories

Accessory	Description	Order code
Mounting set for Promag 50 transmitter	Mounting set for the transmitter (remote version). Suitable for: ■ Wall mounting ■ Pipe mounting ■ Panel-mounted installation Mounting set for aluminum field housing. Suitable for: ■ Pipe mounting	DK5WM – *
Wall-mounting kit for Promag H	Wall-mounting kit for the Promag H sensor.	DK5HM – **
Cable for remote version	Coil and signal cables, various lengths.	DK5CA – **
Mounting kit for Promag D, wafer version	Mounting kit consisting of: ■ Mounting bolts ■ Nuts incl. washers ■ Flange seals ■ Centering sleeves (if required for the flange)	DKD** – **
Set of seals for Promag D	Set of seals consisting of two flange seals.	DK5DD – ***
Mounting kit for Promag H	Mounting kit consisting of: ■ 2 process connections ■ Threaded fasteners ■ Seals	DKH** – ****
Set of seals for Promag H	For regular replacement of the seals of the Promag H sensor.	DK5HS – ***
Welding jig for Promag H	Weld nipple as process connection: welding jig for installation in pipe.	DK5HW – ***
Adapter connection for Promag A, H	Adapter connections for installing a Promag 10 H instead of a Promag 30/33 A or Promag 30/33 H DN 25.	DK5HA – *****
Ground rings for Promag H	Ground rings for potential equalization.	DK5HR – ***
Ground cable for Promag L, W, P	Ground cable for potential equalization.	DK5GC – ***
Ground disk for Promag L, W, P	Ground disk for potential equalization.	DK5GD – * * ***

Accessory	Description	Order code
Process display RIA45	Multifunctional 1-channel display unit: ▪ Universal input ▪ Transmitter power supply ▪ Limit relay ▪ Analog output	RIA45 – ******
Process display RIA251	Digital display device for looping into the 4 to 20 mA current loop.	RIA251 – **
Field display unit RIA16	Digital field display device for looping into the 4 to 20 mA current loop.	RIA16 – ***
Application Manager RMM621	Electronic recording, display, balancing, control, saving and event and alarm monitoring of analog and digital input signals. Values and conditions determined are output by means of analog and digital output signals. Remote transmission of alarms, input values and calculated values using a PSTN or GSM modem.	RMM621 – **********

8.3 Communication-specific accessories

Accessory	Description	Order code
HART Communicator Field Xpert SFX 100	Handheld terminal for remote configuration and for obtaining measured values via the HART current output (4 to 20 mA) and FOUNDATION Fieldbus. Contact your Endress+Hauser representative for more information.	SFX100 – *******
Fieldgate FXA320	Gateway for remote interrogation of HART sensors and actuators via Web browser: ▪ 2-channel analog input (4 to 20 mA) ▪ 4 binary inputs with event counter function and frequency measurement ▪ Communication via modem, Ethernet or GSM ▪ Visualization via Internet/Intranet in Web browser and/or WAP cellular phone ▪ Limit value monitoring with alarm by e-mail or SMS ▪ Synchronized time stamping of all measured values.	FXA320 – *****
Fieldgate FXA520	Gateway for remote interrogation of HART sensors and actuators via Web browser: ▪ Web server for remote monitoring of up to 30 measuring points ▪ Intrinsically safe version [EEx ia]IIC for applications in hazardous areas ▪ Communication via modem, Ethernet or GSM ▪ Visualization via Internet/Intranet in Web browser and/or WAP cellular phone ▪ Limit value monitoring with alarm by e-mail or SMS ▪ Synchronized time stamping of all measured values ▪ Remote diagnosis and remote configuration of connected HART devices	FXA520 – ****
FXA195	The Commubox FXA195 connects intrinsically safe Smart transmitters with HART protocol to the USB port of a personal computer. This makes the remote operation of the transmitters possible with the aid of configuration programs (e.g. FieldCare). Power is supplied to the Commubox by means of the USB port	FXA195 – *

8.4 Service-specific accessories

Accessory	Description	Order code
Applicator	Software for selecting and planning flowmeters. The Applicator software can be downloaded from the Internet or ordered on CD-ROM for installation on a local PC. Contact your Endress+Hauser representative for more information.	DXA80 – *
Fieldcheck	Tester/simulator for testing flowmeters in the field. When used in conjunction with the "FieldCare" software package, test results can be imported into a database, printed out and used for official certification. Contact your Endress+Hauser representative for more information.	50098801
FieldCare	FieldCare is Endress+Hauser's FDT-based asset management tool. It can configure all intelligent field units in your system and helps you manage them. By using status information, it is also a simple but effective way of checking their status and condition.	See the product page on the Endress+Hauser Web site: www.endress.com
Memograph M graphic display recorder	The Memograph M graphic display recorder provides information on all the relevant process variables. Measured values are recorded correctly, limit values are monitored and measuring points analyzed. The data are stored in the 256 MB internal memory and also on a DSD card or USB stick. Memograph M boasts a modular design, intuitive operation and a comprehensive security concept. The ReadWin® 2000 PC software is part of the standard package and is used for configuring, visualizing and archiving the data captured. The mathematics channels which are optionally available enable continuous monitoring of specific power consumption, boiler efficiency and other parameters which are important for efficient energy management.	RSG40 – ************
FXA193	Service interface from the device to the PC for operation via FieldCare.	FXA193 – *

9 Troubleshooting

9.1 Troubleshooting instructions

Always start troubleshooting with the checklist below if faults occur after start-up or during operation. The routine takes you directly to the cause of the problem and the appropriate remedial measures.

Check the display	
No display visible and no output signals present.	1. Check the supply voltage → terminals 1, 2 2. Check the power line fuse → 🗎 92 85 to 260 V AC: 0.8 A slow-blow / 250 V 20 to 55 V AC / 16 to 62 V DC: 2 A slow-blow / 250 V 3. Measuring electronics defective → order spare parts → 🗎 77
No display visible, but output signals are present.	1. Check whether the ribbon-cable connector of the display module is correctly plugged into the amplifier board → 🗎 88 2. Display module defective → order spare parts → 🗎 77 3. Measuring electronics defective → order spare parts → 🗎 77
Display texts are in a foreign language.	Switch off power supply. Press and hold down both the +- buttons and switch on the measuring device. The display text will appear in English (default) and is displayed at maximum contrast.
Measured value indicated, but no signal at the current or pulse output.	Electronics board defective → order spare parts → 🗎 77
↓	
Error messages on display	
Errors which occur during commissioning or measuring operation are displayed immediately. Error messages consist of a variety of icons: the meanings of these icons are as follows (example): – Error type: **S** = system error, **P** = process error – Error message type: ϟ = fault message, **!** = notice message – **EMPTY PIPE** = Type of error, e.g. measuring tube is only partly filled or completely empty – **03:00:05** = duration of error occurrence (in hours, minutes and seconds) – **#**401 = error number Caution! ▪ See the information on → 🗎 62! ▪ The measuring system interprets simulations and positive zero return as system errors, but displays them as notice message only.	
Error number: No. 001 – 399 No. 501 – 699	System error (device error) has occurred → 🗎 81
Error number: No. 401 - 499	Process error (application error) has occurred → 🗎 83
↓	
Other error (without error message)	
Some other error has occurred.	Diagnosis and rectification → 🗎 84

9.2 System error messages

Serious system errors are **always** recognized by the device as "Fault message", and are shown as a lightning flash (ϟ) on the display. Fault messages immediately affect the outputs.

Caution!
In the event of a serious fault, a flowmeter might have to be returned to the manufacturer for repair. The necessary procedures on → 🗎 6 must be carried out before you return a flowmeter to Endress+Hauser. Always enclose a duly completed "Declaration of Contamination" form. You will find a master copy of this form at the back of this manual.

Note!
Also observe the information on → 🗎 62.

No.	Error message / Type	Cause	Remedy (spare part → 🗎 87)
S = System error ϟ = Fault message (with an effect on the outputs) ! = Notice message (without an effect on the outputs)			
No. # 0xx → Hardware error			
001	S: CRITICAL FAILURE ϟ: # 001	Serious device error	Replace the amplifier board.
011	S: AMP HW EEPROM ϟ: # 011	Amplifier: Defective EEPROM	Replace the amplifier board.
012	S: AMP SW EEPROM ϟ: # 012	Amplifier: Error accessing EEPROM data	The EEPROM data blocks in which an error has occurred are displayed in the TROUBLESHOOTING function. Press Enter to acknowledge the errors in question; default values are automatically inserted instead of the errored parameter values. Note! The measuring device has to be restarted if an error has occurred in a totalizer block (see error No. 111 / CHECKSUM TOTAL).
031	S: SENSOR HW DAT ϟ: # 031	1. S-DAT is not plugged into the amplifier board correctly (or is missing). 2. S-DAT is defective.	1. Check whether the S-DAT is correctly plugged into the amplifier board. 2. Replace the S-DAT if it is defective. Check that the new replacement DAT is compatible with the measuring electronics. Check the: - Spare part set number - Hardware revision code 3. Replace measuring electronics boards if necessary. 4. Plug the S-DAT into the amplifier board.
032	S: SENSOR SW DAT ϟ: # 032		
No. # 1xx → Software error			
101	S: GAIN ERROR AMP ϟ: # 101	Gain deviation compared to reference gain > 25%.	Replace the amplifier board.
111	S: CHECKSUM TOTAL ϟ: # 111	Totalizer checksum error.	1. Restart the measuring device. 2. Replace the amplifier board if necessary.
121	S: A / C COMPATIB. !: # 121	Due to different software versions, I/O board and amplifier board are only partially compatible (possibly restricted functionality). Note! – This message is only listed in the error history. – Nothing is shown on the display.	Module with lower software version has either to be updated by FieldCare with the required software version or the module has to be replaced.
No. # 2xx → Error in DAT / no communication			
251	S: COMMUNICATION I/O ϟ: # 251	Internal communication fault on the amplifier board.	Replace the amplifier board.
261	S: COMMUNICATION I/O ϟ: # 261	No data reception between amplifier and I/O board or faulty internal data transfer.	Check the BUS contacts.

No.	Error message / Type	Cause	Remedy (spare part → 🗎 87)
No. # 3xx → System limits exceeded			
321	S: TOL. COIL CURR. ϟ: # 321	Sensor: Coil current is out of tolerance.	⚠ Warning! Switch off power supply before manipulating the coil current cable, coil current cable connector or measuring electronics boards! Remote version: 1. Check wiring of terminals 41/42 → 🗎 44 2. Check coil current cable connector. Compact and remote version: Replace measuring electronics boards if necessary
339 to 342	S: STACK CUR OUT n !: # 339 to 342	The temporarily buffered flow portions (measuring mode for pulsating flow) could not be cleared or output within 60 seconds.	1. Change the upper or lower limit setting, as applicable. 2. Increase or reduce flow, as applicable. Recommendations in the event of fault category = FAULT MESSAGE (ϟ) ■ Configure the fault response of the output to "ACTUAL VALUE" so that the temporary buffer can be cleared. ■ Clear the temporary buffer by the measures described under Item 1.
343 to 346	S: STACK FREQ. OUT n !: # 343 to 346		
347 to 350	S: STACK PULSE OUT n !: # 343 to 346	The temporarily buffered flow portions (measuring mode for pulsating flow) could not be cleared or output within 60 seconds.	1. Increase the setting for pulse weighting 2. Increase the max. pulse frequency if the totalizer can handle a higher number of pulses. 3. Increase or reduce flow, as applicable. Recommendations in the event of fault category = FAULT MESSAGE (ϟ) ■ Configure the fault response of the output to "ACTUAL VALUE" so that the temporary buffer can be cleared. ■ Clear the temporary buffer by the measures described under Item 1.
351 to 354	S: CURRENT RANGE n !: # 351 to 354	Current output: flow is out of range.	1. Change the upper or lower limit setting, as applicable. 2. Increase or reduce flow, as applicable.
355 to 358	S: FREQ. RANGE n !: # 355 to 358	Frequency output: flow is out of range.	1. Change the upper or lower limit setting, as applicable. 2. Increase or reduce flow, as applicable.
359 to 362	S: PULSE RANGE !: # 359 to 362	Pulse output: the pulse output frequency is out of range.	1. Increase the setting for pulse weighting 2. When selecting the pulse width, choose a value that can still be processed by a connected counter (e.g. mechanical counter, PLC etc.). *Determine the pulse width:* – Variant 1: Enter the minimum duration that a pulse must be present at the connected counter to ensure its registration. – Variant 2: Enter the maximum (pulse) frequency as the half "reciprocal value" that a pulse must be present at the connected counter to ensure its registration. Example: The maximum input frequency of the connected counter is 10 Hz. The pulse width to be entered is: $\frac{1}{2 \cdot 10\ Hz} = 50\ ms$ a0004437 3. Reduce flow.

No.	Error message / Type	Cause	Remedy (spare part → 🗎 87)
No. # 5xx → Application error			
501	S: SW.-UPDATE ACT. !: # 501	New amplifier or communication (I/O module) software version is loaded. Currently no other functions are possible.	Wait until the procedure is finished. The device will restart automatically.
502	S: UP-/DOWNLOAD ACT !: # 502	Uploading or downloading the device data via operating program. Currently no other functions are possible.	Wait until the procedure is finished.
No. # 6xx → Simulation mode active			
601	S: POS. ZERO-RETURN !: # 601	Positive zero return active Caution! This message has the highest display priority!	Switch off positive zero return
611 to 614	S: SIM. CURR. OUT. n !: # 611 to 614	Simulation current output active	
621 to 624	S: SIM. FREQ. OUT. n !: # 621 to 624	Simulation frequency output active	Switch off simulation
631 to 634	S: SIM. PULSE n !: # 631 to 634	Simulation pulse output active	Switch off simulation
641 to 644	S: SIM. STAT. OUT n !: # 641 to 644	Simulation status output active	Switch off simulation
671 to 674	S: SIM. STATUS IN n !: # 671 to 674	Simulation status input active	Switch off simulation
691	S: SIM. FAILSAFE !: # 691	Simulation of response to error (outputs) active	Switch off simulation
692	S: SIM. MEASURAND !: # 692	Simulation of a measured variable active (e.g. mass flow).	Switch off simulation
698	S: DEV. TEST ACT. !: # 698	The measuring device is being checked on site via the test and simulation device.	–

9.3 Process error messages

Note!
Also observe the information on → 🗎 62.

No.	Error message / Type	Cause	Remedy (spare part → 🗎 87)
P = Process error ϟ = Fault message (with an effect on the outputs) ! = Notice message (without an effect on the outputs)			
401	EMPTY PIPE ϟ: # 401	Measuring tube partially filled or empty	1. Check the process conditions of the plant 2. Fill the measuring tube
461	ADJ. NOT OK !: # 461	EPD calibration not possible because the fluid's conductivity is either too low or too high.	The EPD function cannot be used with fluids of this nature.
463	FULL = EMPTY ϟ: # 463	The EPD calibration values for empty pipe and full pipe are identical, therefore incorrect.	Repeat calibration, making sure procedure is correct → 🗎 74.

9.4 Process errors without messages

Symptoms	Rectification
Remark: You may have to change or correct certain settings in functions in the function matrix in order to rectify the fault.	
Flow values are negative, even though the fluid is flowing forwards through the pipe.	1. Remote version: – Switch off the power supply and check the wiring → 44 – If necessary, reverse the connections at terminals 41 and 42 2. Change the setting in the "INSTALLATION DIRECTION SENSOR" function accordingly
Measured-value reading fluctuates even though flow is steady.	1. Check grounding and potential equalization → 54 2. Check the fluid for presence of gas bubbles. 3. In the "SYSTEM DAMPING" function → increase the value
Measured-value reading shown on display, even though the fluid is at a standstill and the measuring tube is full.	1. Check grounding and potential equalization → 54 2. Check the fluid for presence of gas bubbles. 3. Activate the "LOW FLOW CUTOFF" function, i.e. enter or increase the value for the switching point.
Measured-value reading on display, even though measuring tube is empty.	1. Perform empty-pipe/full-pipe adjustment and then switch on Empty Pipe detection → 74 2. Remote version: Check the terminals of the EPD cable → 44 3. Fill the measuring tube.
The current output signal is always 4 mA, irrespective of the flow signal at any given time.	1. Select the "BUS ADDRESS" function and change the setting to "0". 2. Value for creepage too high. Reduce the value in the "LOW FLOW CUTOFF" function.
The fault cannot be rectified or some other fault not described above has arisen. In these instances, please contact your Endress+Hauser service organization.	The following options are available for tackling problems of this nature: **Request the services of an Endress+Hauser service technician** If you contact our service organization to have a service technician sent out, please be ready to quote the following information: – Brief description of the fault – Nameplate specifications (→ 7): order code, serial number **Returning devices to Endress+Hauser** The necessary procedures (→ 6) must be carried out before you return a flowmeter requiring repair or calibration to Endress+Hauser. Always enclose a duly completed "Declaration of Conformity" form with the flowmeter. You will find a master copy of this form at the back of this manual. **Replace transmitter electronics** Components in the measuring electronics defective → order spare parts → 77

9.5 Response of outputs to errors

Note!
The failsafe mode of totalizers, current, pulse and frequency outputs can be customized by means of various functions in the function matrix. You will find detailed information on these procedures in the "Description of Device Functions" manual.

You can use positive zero return to set the signals of the current, pulse and status outputs to their fallback value, for example when measuring has to be interrupted while a pipe is being cleaned. This function takes priority over all other device functions: simulations, for example, are suppressed.

Failsafe mode of outputs and totalizers		
	Process/system error is current	Positive zero return is activated
Caution! System or process errors defined as "Notice messages" have no effect whatsoever on the inputs and outputs. See the information on → 65		
Current output	MINIMUM VALUE 0–20 mA → 0 mA 4–20 mA → 2 mA 4–20 mA HART → 2 mA 4–20 mA NAMUR →3.5 mA 4–20 mA HART NAMUR →3.5 mA 4–20 mA US → 3.75 mA 4–20 mA HART US → 3,75 mA 0–20 mA (25 mA) → 0 mA 4–20 mA (25 mA) → 2 mA 4–20 mA (25 mA) HART → 2 mA MAXIMUM VALUE 0–20 mA → 22 mA 4–20 mA → 22 mA 4–20 mA HART → 22 mA 4–20 mA NAMUR → 22.6 mA 4–20 mA HART NAMUR → 22.6 mA 4–20 mA US → 22.6 mA 4–20 mA HART US → 22.6 mA 0–20 mA (25 mA) → 25 mA 4–20 mA (25 mA) → 25 mA 4–20 mA (25 mA) HART → 25 mA HOLD VALUE Last valid value (preceding occurrence of the fault) is output. ACTUAL VALUE Measured value display on the basis of the current flow measurement. The fault is ignored.	Output signal corresponds to "zero flow"
Pulse output	MIN/MAX VALUE → FALLBACK VALUE Signal output → no pulses HOLD VALUE Last valid value (preceding occurrence of the fault) is output. ACTUAL VALUE Fault is ignored, i.e. normal measured-value output on the basis of ongoing flow measurement.	Output signal corresponds to "zero flow"

Failsafe mode of outputs and totalizers		
	Process/system error is current	Positive zero return is activated
Frequency output	*FALLBACK VALUE* Signal output → 0 Hz *FAILSAFE LEVEL* Output of the frequency specified in the FALÌLSAFE VALUE function. *HOLD VALUE* Measured value display on the basis of the last saved value preceding occurrence of the fault. *ACTUAL VALUE* Measured value display on the basis of the current flow measurement. The fault is ignored.	Output signal corresponds to "zero flow"
Totalizer	*STOP* The totalizers are paused until the error is rectified. *ACTUAL VALUE* The fault is ignored. The totalizer continues to count in accordance with the current flow value. *HOLD VALUE* The totalizer continues to count the flow in accordance with the last valid flow value (before the error occurred).	Totalizer stops
Status output	In the event of a fault or power supply failure: Status output → non-conductive	No effect on status output

9.6 Spare parts

Detailed troubleshooting instructions are provided in the previous sections → 80
The measuring device, moreover, provides additional support in the form of continuous self-diagnosis and error messages.
Fault rectification can entail replacing defective components with tested spare parts. The illustration below shows the available scope of spare parts.

Note!
You can order spare parts directly from your Endress+Hauser service organization by providing the serial number printed on the transmitter's nameplate → 7

Spare parts are shipped as sets comprising the following parts:
- Spare part
- Additional parts, small items (threaded fasteners, etc.)
- Mounting instructions
- Packaging

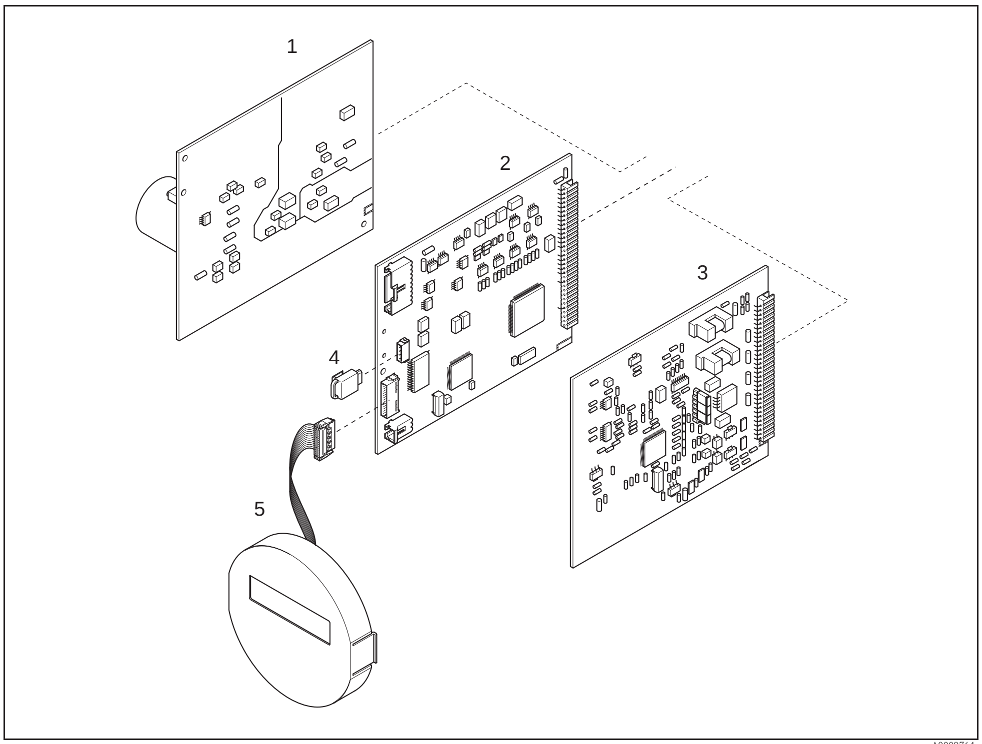


Fig. 52: Spare parts for Promag 50 transmitter (field and wall-mounted housings)

1 Power unit board (85 to 260 V AC, 20 to 55 V AC, 16 to 62 V DC)
2 Amplifier board
3 I/O board (COM module)
4 HistoROM / S-DAT (sensor data memory)
5 Display module

9.6.1 Removing and installing printed circuit boards

Field housing: removing and installing printed circuit boards → 53

Warning!
- Risk of electric shock!
  Exposed components carry dangerous voltages. Make sure that the power supply is switched off before you remove the cover of the electronics compartment.
- Risk of damaging electronic components (ESD protection). Static electricity can damage electronic components or impair their operability. Use a workplace with a grounded working surface purpose-built for electrostatically sensitive devices!
- If you cannot guarantee that the dielectric strength of the device is maintained in the following steps, then an appropriate inspection must be carried out in accordance with the manufacturer's specifications.
- When connecting Ex-certified devices, see the notes and diagrams in the Ex-specific supplement to these Operating Instructions.

Caution!
Use only original Endress+Hauser parts.

1. Switch off power supply.
2. Unscrew cover of the electronics compartment from the transmitter housing.
3. Remove the local display (1) as follows:
   – Press in the latches (1.1) at the side and remove the display module.
   – Disconnect the ribbon cable (1.2) of the display module from the amplifier board.
4. Remove the screws and remove the cover (2) from the electronics compartment.
5. Remove the boards (4, 6): Insert a suitable tool into the hole (3) provided for the purpose and pull the board clear of its holder.
6. Remove amplifier board (5):
   – Disconnect the plug of the electrode signal cable (5.1) including S-DAT (5.3) from the board.
   – Loosen the plug locking of the coil current cable (5.2) and gently disconnect the plug from the board, i.e. without moving it to and fro.
   – Insert a thin pin into the hole (3) provided for the purpose and pull the board clear of its holder.
7. Installation is the reverse of the removal procedure.

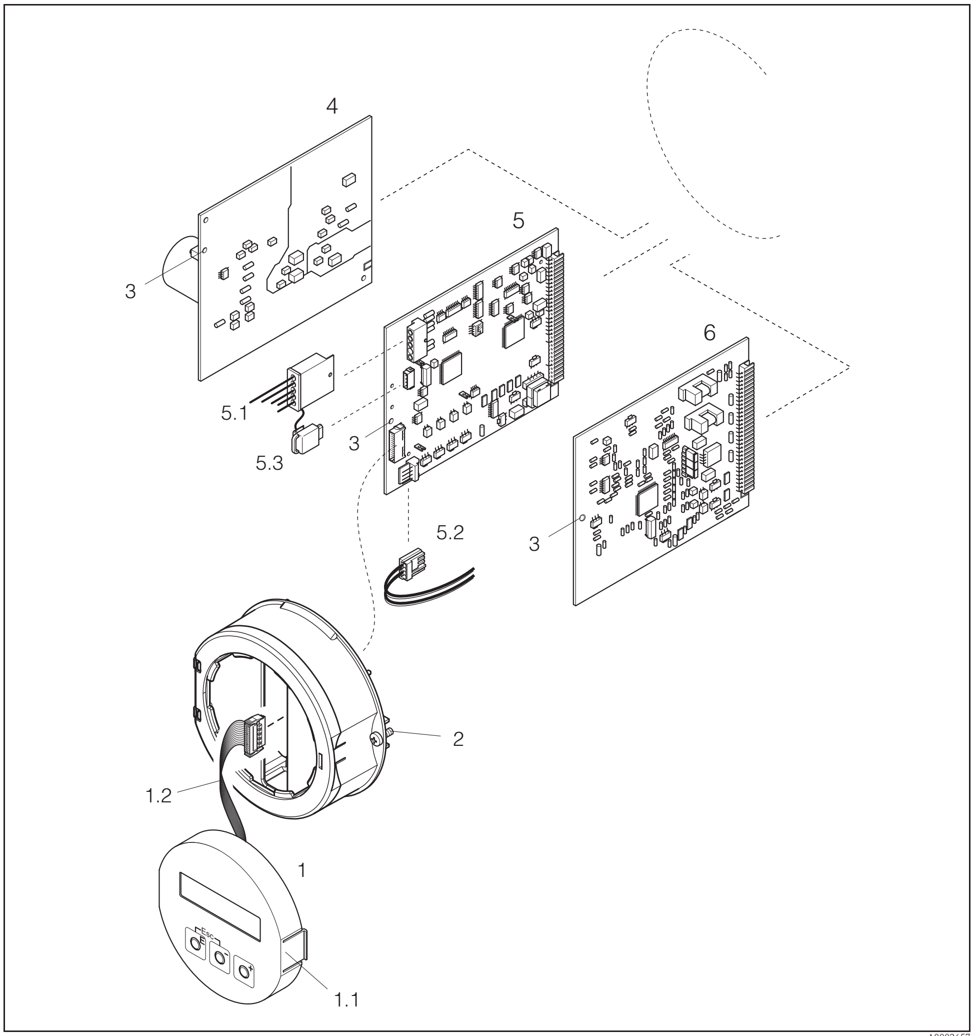


Fig. 53: Field housing: removing and installing printed circuit boards

1 Local display
1.1 Latch
1.2 Ribbon cable (display module)
2 Screws of electronics compartment cover
3 Aperture for installing/removing boards
4 Power supply board
5 Amplifier board
5.1 Electrode signal cable (sensor)
5.2 Coil current cable (sensor)
5.3 Histo-ROM / S-DAT (sensor data memory)
6 I/O board

Wall-mount housing: removing and installing printed circuit boards → 🖹 91

Warning!
- Risk of electric shock!
  Exposed components carry dangerous voltages. Make sure that the power supply is switched off before you remove the cover of the electronics compartment.
- Risk of damaging electronic components (ESD protection). Static electricity can damage electronic components or impair their operability. Use a workplace with a grounded working surface purpose-built for electrostatically sensitive devices!
- If you cannot guarantee that the dielectric strength of the device is maintained in the following steps, then an appropriate inspection must be carried out in accordance with the manufacturer's specifications.
- When connecting Ex-certified devices, see the notes and diagrams in the Ex-specific supplement to these Operating Instructions.

Caution!
Use only original Endress+Hauser parts.

1. Switch off power supply.
2. Remove the screws and open the hinged cover (1) of the housing. Remove screws of the electronics module (2).
3. Then push up electronics module and pull it as far as possible out of the wall-mounted housing.
4. Disconnect the following cable plugs from amplifier board (7):
   – Electrode signal cable plug (7.1) including S-DAT (7.3).
   – Plug of coil current cable (7.2). To do so, loosen the plug locking of the coil current cable and gently disconnect the plug from the board, i.e. without moving it to and fro.
   – Ribbon cable plug (3) of the display module.
5. Remove the screws and remove the cover (4) from the electronics compartment.
6. Remove the boards (6, 7, 8): Insert a suitable tool into the hole (5) provided for the purpose and pull the board clear of its holder.
7. Installation is the reverse of the removal procedure.

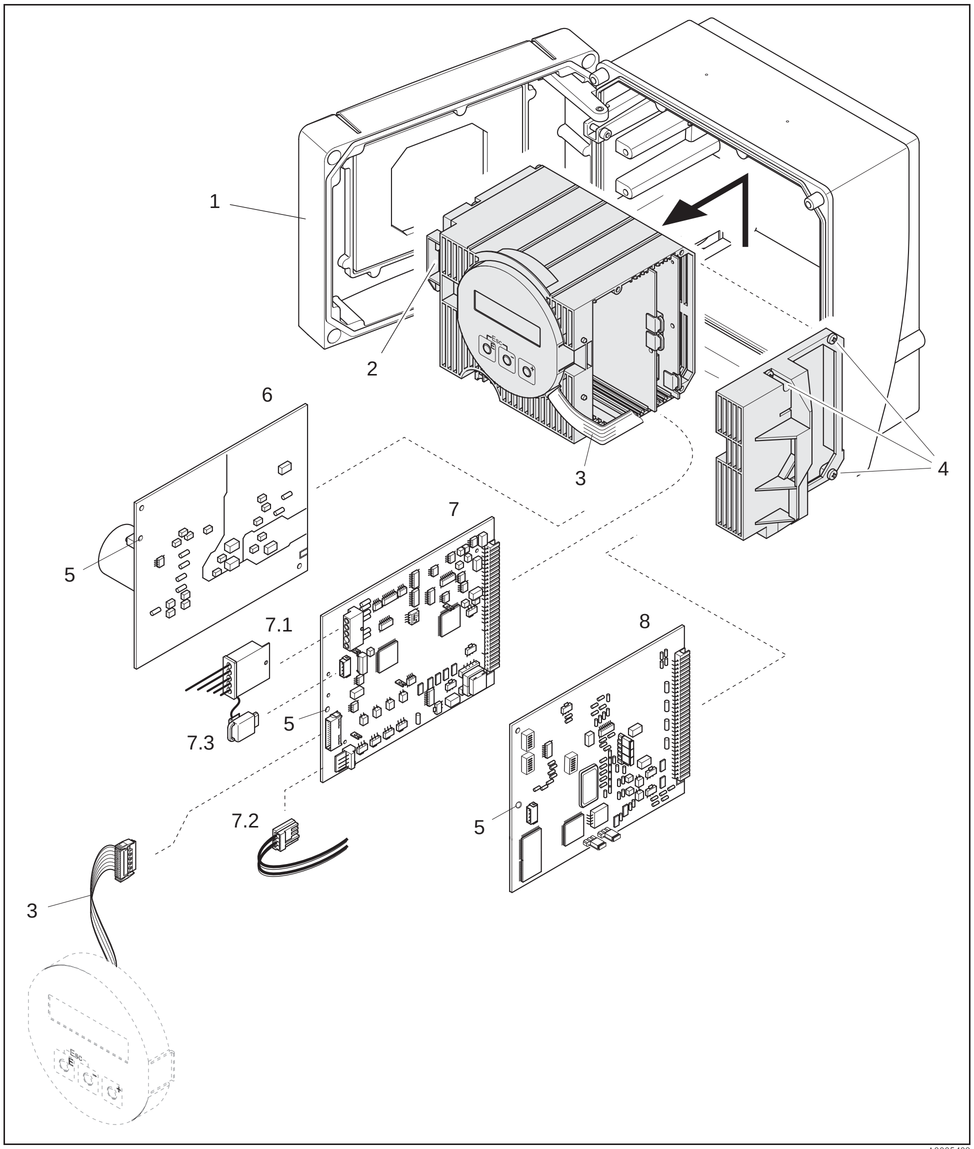


Fig. 54: Wall-mount housing: removing and installing printed circuit boards

1 Housing cover
2 Electronics module
3 Ribbon cable (display module)
4 Cover of electronics compartment (3 screws)
5 Aperture for installing/removing boards
6 Power supply board
7 Amplifier board
7.1 Electrode signal cable (sensor)
7.2 Coil current cable (sensor)
7.3 Histo-ROM / S-DAT (sensor data memory)
8 I/O board

9.6.2 Replacing the device fuse

Warning!
Risk of electric shock! Exposed components carry dangerous voltages. Make sure that the power supply is switched off before you remove the cover of the electronics compartment.

The main fuse is on the power supply board (→ 92).
The procedure for replacing the fuse is as follows:

1. Switch off power supply.
2. Remove the power supply board: field housing → 88, wall-mount housing → 90
3. Remove cap (1) and replace the device fuse (2).
   Use only fuses of the following type:
   – Power supply 20 to 55 V AC / 16 to 62 V DC → 2.0 A slow-blow / 250 V; 5.2 × 20 mm
   – Power supply 85 to 260 V AC → 0.8 A slow-blow / 250 V; 5.2 × 20 mm
   – Ex-rated devices → see the Ex documentation.
4. Installation is the reverse of the removal procedure.

Caution!
Use only original Endress+Hauser parts.

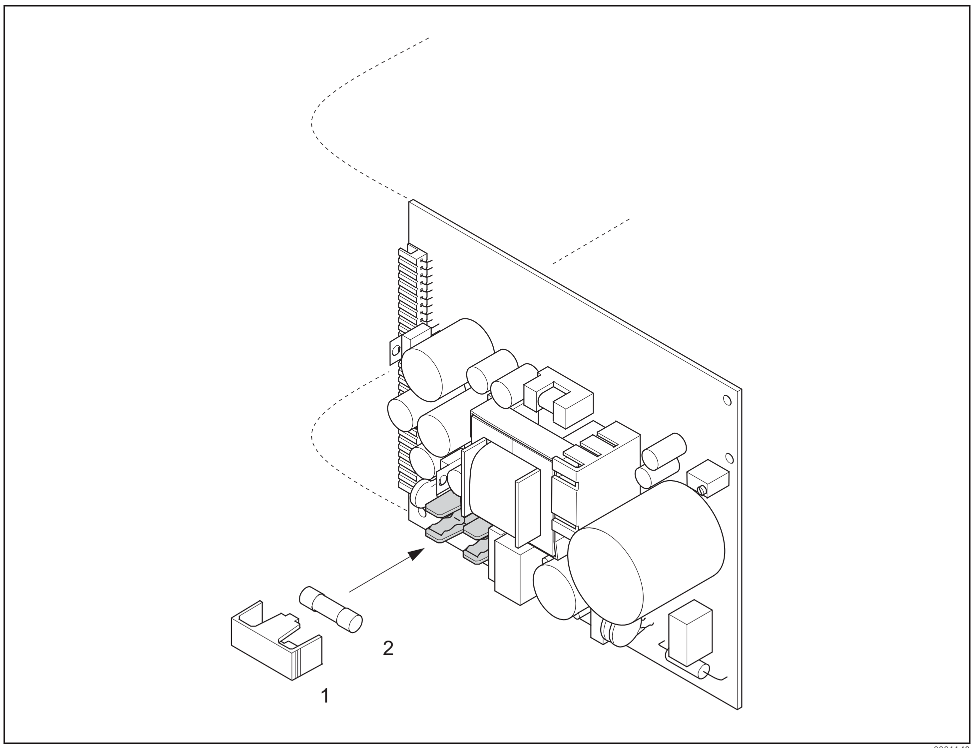


Fig. 55: Replacing the device fuse on the power supply board

1 Protective cap
2 Device fuse

9.6.3 Replacing the exchangeable electrode

The Promag W sensor (DN 350 to 2000; 14" to 78") is available with exchangeable measuring electrodes as an option. This design permits the measuring electrodes to be replaced or cleaned under process conditions.

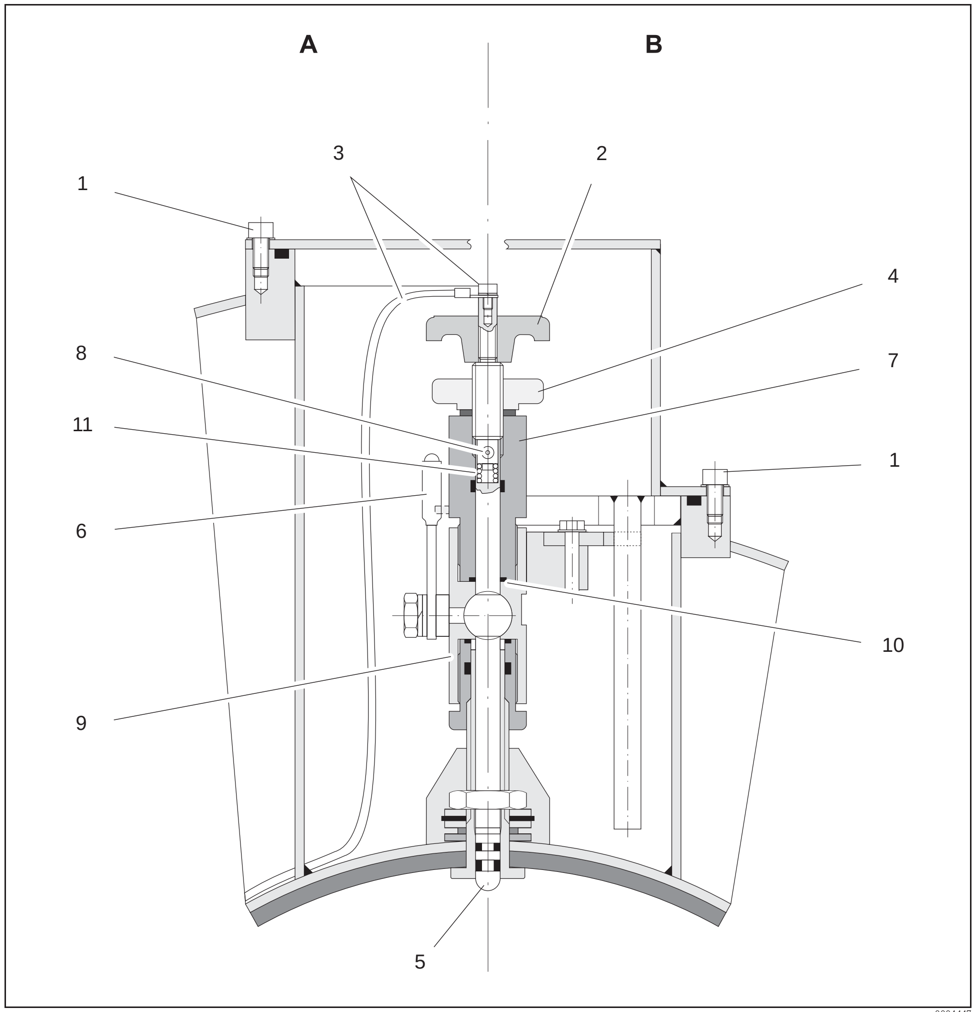


Fig. 56: Apparatus for replacing exchangeable measuring electrodes

View A = DN 1200 to 2000 (48" to 78")

View B = DN 350 to 1050 (14" to 42")

1 Allen screw
2 Handle
3 Electrode cable
4 Knurled nut (locknut)
5 Measuring electrode
6 Stop cock (ball valve)
7 Retaining cylinder
8 Locking pin (for handle)
9 Ball-valve housing
10 Seal (retaining cylinder)
11 Coil spring

Removing the electrode	Installing the electrode
1 Loosen Allen screw (1) and remove the cover.	1 Insert new electrode (5) into retaining cylinder (7) from below. Make sure that the seals at the tip of the electrode are clean.
2 Remove electrode cable (3) secured to handle (2).	2 Mount handle (2) on the electrode and insert locking pin (8) to secure it in position. Caution! Make sure that coil spring (11) is inserted. This is essential to ensure correct electrical contact and correct measuring signals.
3 Loosen knurled nut (4) by hand. This knurled nut acts as a locknut.	3 Pull the electrode back until the tip of the electrode no longer protrudes from retaining cylinder (7).
4 Remove electrode (5) by turning handle (2). The electrode can now be pulled out of retaining cylinder (7) as far as a defined stop. Warning! Risk of injury. Under process conditions (pressure in the piping system) the electrode can recoil suddenly against its stop. Apply counter-pressure while releasing the electrode.	4 Screw the retaining cylinder (7) onto ball-valve housing (9) and tighten it by hand. Seal (10) on the cylinder must be correctly seated and clean. Note! Make sure that the rubber hoses on retaining cylinder (7) and stop cock (6) are of the same color (red or blue).
5 Close stop cock (6) after pulling out the electrode as far as it will go. Warning! Do not subsequently open the stop cock, in order to prevent fluid escaping.	5 Open stop cock (6) and turn handle (2) to screw the electrode all the way into the retaining cylinder.
6 Remove the electrode complete with retaining cylinder (7).	6 Screw knurled nut (4) onto the retaining cylinder. This firmly locates the electrode in position.
7 Remove handle (2) from electrode (5) by pressing out locking pin (8). Take care not to lose coil spring (11).	7 Use the Allen screw to secure electrode cable (3) to handle (2). Caution! Make sure that the machine screw securing the electrode cable is firmly tightened. This is essential to ensure correct electrical contact and correct measuring signals.
8 Remove the old electrode and insert the new electrode. Replacement electrodes can be ordered separately from Endress+Hauser.	8 Reinstall the cover and tighten Allen screw (a).

9.7 Return

Caution!
Do not return a measuring device if you are not absolutely certain that all traces of hazardous substances have been removed, e.g. substances which have penetrated crevices or diffused through plastic.
Costs incurred for waste disposal and injury (burns, etc.) due to inadequate cleaning will be charged to the owner-operator.

The following steps must be taken before returning a flow measuring device to Endress+Hauser, e.g. for repair or calibration:

- Always enclose a duly completed "Declaration of contamination" form. Only then can Endress+Hauser transport, examine and repair a returned device.
- Enclose special handling instructions if necessary, for example a safety data sheet as per EC REACH Regulation No. 1907/2006.
- Remove all residues. Pay special attention to the grooves for seals and crevices which could contain residues. This is particularly important if the substance is hazardous to health, e.g. flammable, toxic, caustic, carcinogenic, etc.

Note!
You will find a preprinted "Declaration of contamination" form at the back of these Operating Instructions.

9.8 Disposal

Observe the regulations applicable in your country!

9.9 Software history

Date	Software version	Changes to software	Operating Instructions
11.2009	Amplifier: V 2.03.XX	Introduction of Calf history	71106181 / 12.09 71105332 / 11.09
06.2009	Amplifier: V 2.02.XX	Introduction of Promag L	71095684 / 06.09
03.2009	Amplifier: V 2.02.XX	Introduction of Promag D Introduction of new nominal diameter	71088677 / 03.09
11.2004	Amplifier: 1.06.01 Communication module: 1.04.00	Software update relevant only for production	50097089 / 10.03
10.2003	Amplifier: 1.06.00 Communication module: 1.03.00	Software expansion: ▪ Language groups ▪ Flow direction pulse output selectable New functionalities: ▪ Second Totalizer ▪ Adjustable backlight (display) ▪ Operation hours counter ▪ Simulation function for pulse output ▪ Counter for access code ▪ Reset function (fault history) ▪ Up-/download with FieldTool	50097089 / 10.03

Date	Software version	Changes to software	Operating Instructions
08.2003	Communication module: 1.02.01	Software expansion: ▪ New / revised functionalities New functionalities: ▪ Current span NAMUR NE 43 ▪ Failsafe mode function ▪ Troubleshooting function ▪ System and process error messages ▪ Response of status output	50097089 / 08.03
08.2002	Amplifier: 1.04.00	Software expansion: ▪ New / revised functionalities New functionalities: ▪ Current span NAMUR NE 43 ▪ EPD (new mode) ▪ Failsafe mode function ▪ Acknowledge fault function ▪ Troubleshooting function ▪ System and process error messages ▪ Response of status output	50097089 / 08.02
03.2002	Amplifier: 1.03.00	Software expansion: ▪ Suitability for custody transfer measurement Promag 50/51	none
06.2001	Amplifier: 1.02.00 Communication module: 1.02.00	Software expansion: ▪ New functionalities: New functionalities: ▪ General device functions ▪ "OED" software function ▪ "Pulse width" software function	50097089 / 06.01
09.2000	Amplifier: 1.01.01 Communication module: 1.01.00	Software expansion: ▪ Functional adaptations	none
08.2000	Amplifier: 1.01.00	Software expansion: ▪ Functional adaptations	none
04.2000	Amplifier: 1.00.00 Communication module: 1.00.00	Original software Compatible with: ▪ FieldTool ▪ Commuwin II (version 2.05.03 and higher) ▪ HART Communicator DXR 275 (from OS 4.6) with Rev. 1, DD1	50097089 / 04.00

✎ Note!
Uploads or downloads between the individual software versions are only possible with a special service software.

10 Technical data

10.1 Technical data at a glance

10.1.1 Application

→ 5

10.1.2 Function and system design

Measuring principle	Electromagnetic flow measurement on the basis of Faraday's Law.
Measuring system	→ 7

10.1.3 Input

Measured variable	Flow velocity (proportional to induced voltage)
Measuring range	Typically v = 0.01 to 10 m/s (0.033 to 33 ft/s) with the specified accuracy
Operable flow range	Over 1000 : 1

Input signal

Status input (auxiliary input)

- Galvanically isolated
- U = 3 to 30 V DC
- Ri = 5 kΩ
- Can be configured for: totalizer reset, positive zero return, error message reset.

10.1.4 Output

Output signal

Current output

- Galvanically isolated
- Active/passive can be selected:
  – Active: 0/4 to 20 mA, R_L < 700 Ω (HART: R_L ≥ 250 Ω)
  – Passive: 4 to 20 mA, supply voltage V_S 18 to 30 V DC, R_i ≥150 Ω)
- Time constant can be selected (0.01 to 100s)
- Full scale value adjustable
- Temperature coefficient: typ. 0.005% o.f.s./°C, resolution: 0.5 µA

o.f.s. = of full scale value

Pulse/frequency output

- Galvanically isolated
- Passive: 30 V DC / 250 mA
- Open collector
- Can be configured as:
  – Pulse output
    Pulse value and pulse polarity can be selected, max. pulse width adjustable (0.5 to 2000 ms)
  – Frequency output
    Full scale frequency 2 to 1000 Hz (f_{max} = 1.25 Hz), on/off ratio 1:1, pulse width max. 10 s.

Signal on alarm	*Current output* Failsafe mode can be selected (e.g. in accordance with NAMUR Recommendation NE 43) *Pulse/frequency output* Failsafe mode can be selected *Status output* "Not conductive" in the event of fault or power supply failure
Load	See "Output signal"
Switching output	*Status output* ■ Galvanically isolated ■ Max. 30 V DC/250 mA ■ Open collector ■ Can be configured for: error messages, empty pipe detection (EPD), flow direction, limit values
Low flow cut off	Low flow cut off, switch-on point can be selected as required
Galvanic isolation	All circuits for inputs, outputs, and power supply are galvanically isolated from each other.

10.1.5 Power supply

Electrical connections	→ 🗎 44
Supply voltage (power supply)	▪ 85 to 260 V AC, 45 to 65 Hz ▪ 20 to 55 V AC, 45 to 65 Hz ▪ 16 to 62 V DC
Cable entry	*Power supply and signal cables (inputs/outputs):* ▪ Cable entry M20 × 1.5 (8 to 12 mm/0.31 to 0.47 inch) ▪ Sensor cable entry for armored cables M20 × 1.5 (9.5 to 16 mm / 0.37 to 0.63 inch) ▪ Threads for cable entries ½" NPT, G ½" *Connecting cable for remote version:* ▪ Cable entry M20 × 1.5 (8 to 12 mm/0.31 to 0.47 inch) ▪ Sensor cable entry for armored cables M20 × 1.5 (9.5 to 16 mm / 0.37 to 0.63 inch) ▪ Threads for cable entries ½" NPT, G ½"
Cable specifications	→ 🗎 50
Power consumption	*Power consumption* ▪ AC: <15 VA (incl. sensor) ▪ DC: <15 W (incl. sensor) *Switch-on current* ▪ Max 3 A (<5 ms) for 260 V AC ▪ Max. 13.5 A (<5 ms) for 24 V DC
Power supply failure	▪ Lasting min. 1 cycle frequency: ▪ EEPROM saves measuring system data ▪ S-DAT: exchangeable data storage chip which stores the data of the sensor (nominal diameter, serial number, calibration factor, zero point etc.)
Potential equalization	→ 🗎 54

10.1.6 Performance characteristics

Reference operating conditions	*To DIN EN 29104 and VDI/VDE 2641:* ■ Fluid temperature: +28 °C ± 2 K ■ Ambient temperature: +22 °C ± 2 K ■ Warm-up period: 30 minutes *Installation:* ■ Inlet run >10 × DN ■ Outlet run > 5 × DN ■ Sensor and transmitter grounded. ■ The sensor is centered in the pipe.
Maximum measured error	■ Current output: plus typically ± 5 µA ■ Pulse output: ± 0.5% o.r. ± 1 mm/s Option: ± 0.2% o.r. ± 2 mm/s (o.r. = of reading) (o.r. = of reading) Fluctuations in the supply voltage do not have any effect within the specified range.

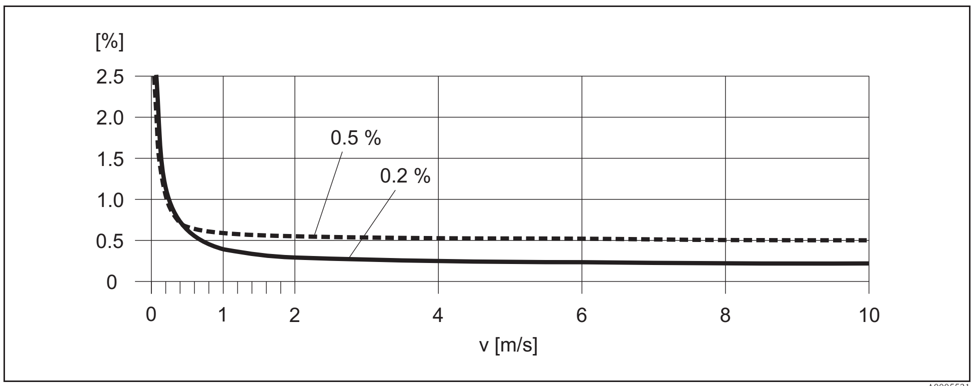


Fig. 57: Max. measured error in % of reading

Repeatability	Max. ± 0.1% o.r. ± 0.5 mm/s (o.r. = of reading)

10.1.7 Operating conditions: Installation

Installation instructions	Any orientation (vertical, horizontal), restrictions and installation instructions → 13
Inlet and outlet run	If possible, install the sensor upstream from fittings such as valves, T-pieces, elbows, etc. The following inlet and outlet runs must be observed in order to meet accuracy specifications (→ 16, → 12): ■ Inlet run: ≥ 5 × DN ■ Outlet run: ≥ 2 × DN
Adapters	→ 17
Length of connecting cable	→ 20

10.1.8 Operating conditions: Environment

Ambient temperature range	■ Transmitter: – Standard: –20 to +60 °C (–4 to +140 °F) – Optional: –40 to +60 °C (–40 to +140 °F) Note! At ambient temperatures below –20 (–4 °F) the readability of the display may be impaired. ■ Sensor: – Flange material carbon steel: –10 to +60 °C (+14 to +140 °F) – Flange material stainless steel: –40 to +60 °C (–40 to +140 °F) Caution! ■ The permitted temperature range of the measuring tube lining may not be undershot or overshot (→ "Operating conditions: Process" → "Medium temperature range"). ■ Install the device in a shady location. Avoid direct sunlight, particularly in warm climatic regions. ■ The transmitter must be mounted separate from the sensor if both the ambient and fluid temperatures are high.
Storage temperature	The storage temperature corresponds to the operating temperature range of the measuring transmitter and the appropriate measuring sensors. Caution! ■ The measuring device must be protected against direct sunlight during storage in order to avoid unacceptably high surface temperatures. ■ A storage location must be selected where moisture does not collect in the measuring device. This will help prevent fungus and bacteria infestation which can damage the liner.
Degree of protection	■ Standard: IP 67 (NEMA 4X) for transmitter and sensor ■ Optional: IP 68 (NEMA 6P) for remote version of Promag L, W and P sensor. Promag L only with stainless steel flanges.
Shock and vibration resistance	Acceleration up to 2 g following IEC 60068-2-6 (high-temperature version: no data available)
CIP cleaning	Caution! The maximum fluid temperature permitted for the device may not be exceeded. *CIP cleaning is possible:* Promag P, Promag H *CIP cleaning is not possible:* Promag D, Promag L, Promag W
SIP cleaning	Caution! The maximum fluid temperature permitted for the device may not be exceeded. *SIP cleaning is possible:* Promag H *SIP cleaning is not possible:* Promag D, Promag L, Promag W, Promag P
Electromagnetic compatibility (EMC)	■ As per IEC/EN 61326 and NAMUR Recommendation NE 21 ■ Emission: to limit value for industry EN 55011

10.1.9 Operating conditions: Process

Medium temperature range

The permissible temperature depends on the lining of the measuring tube

Promag D

0 to +60 °C (+32 to +140 °F) for polyamide

Promag L

- –20 to +50 °C (–4 to +122 °F) for polyurethane (DN 50 to 300)
- –20 to +90 °C (–4 to +194 °F) for PTFE (DN 50 to 300)

Promag W

- 0 to +80 °C (+32 to +176 °F) for hard rubber (DN 65 to 2000)
- –20 to +50 °C (–4 to +122 °F) for polyurethane (DN 25 to 1200)

Promag P

Standard
- –40 to +130 °C (–40 to +266 °F) for PTFE (DN 15 to 600 / 1/2" to 24"), Restrictions → see the following diagrams
- –20 to +130 °C (–4 to +266 °F) for PFA/HE (DN 25 to 200 / 1" to 8"), Restrictions → see the following diagrams
- –20 to +150 °C (–4 to +302 °F) for PFA (DN 25 to 200 / 1" to 8"), Restrictions → see the following diagrams

Optional
High-temperature version (HT): –20 to +180 °C (–4 to +356 °F) for PFA (DN 25 to 200 / 1" to 8")

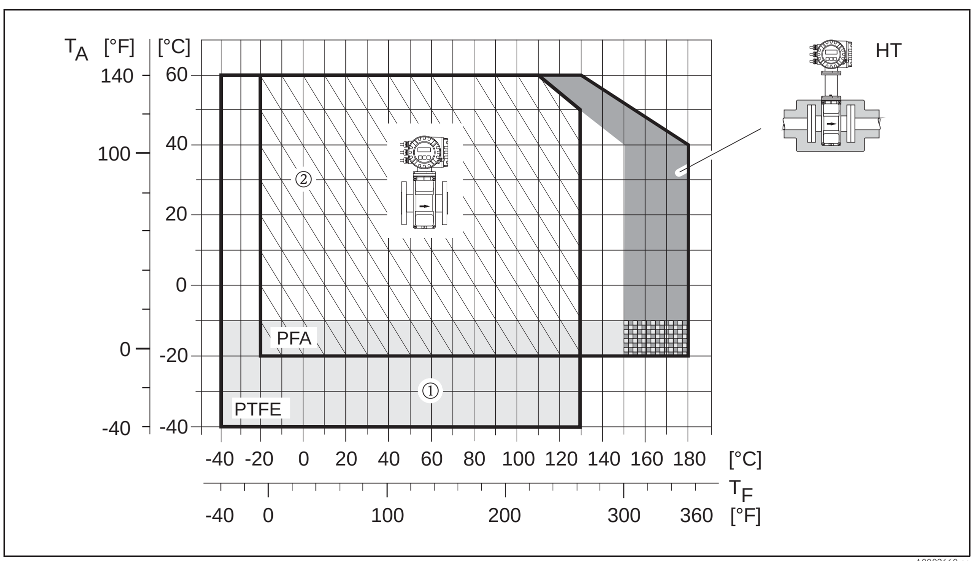


Abb. 58: Compact version Promag P (with PFA- or PTFE-lining)

T_A = ambient temperature; T_F = fluid temperature; HT = high-temperature version with insulation
① = light gray area → temperature range from –10 to –40 °C (–14 to –40 °F) is valid for stainless steel version only
② = diagonal hatched area → foam lining (HE) and degree of protection IP 68 = fluid temperature max. 130°C / 266 °F

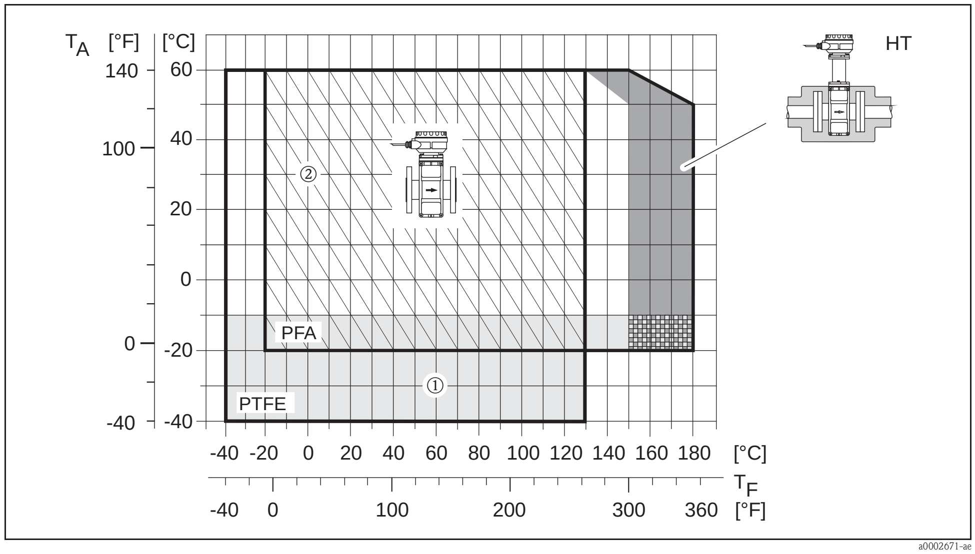


Abb. 59: Remote version Promag P (with PFA- or PTFE-lining)

T_A = ambient temperature; T_F = fluid temperature; HT = high-temperature version with insulation
① = light gray area → temperature range from –10 to –40 °C (–14 to –40 °F) is valid for stainless steel version only
② = diagonal hatched area → foam lining (HE) and degree of protection IP68 = fluid temperature max. 130°C / 266 °F

Promag H

Sensor:
- DN 2 to 25: –20 to +150 °C (–4 to +302 °F)
- DN 40 to 100: –20 to +150 °C (–4 to +302 °F)

Seals:
- EPDM: –20 to +150 °C (–4 to +302 °F)
- Silicone: –20 to +150 °C (–4 to +302 °F)
- Viton: –20 to +150 °C (–4 to +302 °F)
- Kalrez: –20 to +150 °C (–4 to +302 °F)

Conductivity

The minimum conductivity is ≥ 5 μS/cm (≥ 20 μS/cm for demineralized water)

Note!
Note that in the case of the remote version, the requisite minimum conductivity is also influenced by the length of the connecting cable → 20

Medium pressure range (nominal pressure)

Promag D

- EN 1092-1 (DIN 2501)
  – PN 16
- ANSI B 16.5
  – Class 150
- JIS B2220
  – 10 K

Promag L

- EN 1092-1 (DIN 2501)
  – PN 10 (DN 50 to 300)
  – PN 16 (DN 50 to 150)
- EN 1092-1, lap joint flange, stampel plate
  – PN 10 (DN 50 to 300)
- ANSI B 16.5
  – Class 150 (2" to 12")

Promag W

- EN 1092-1 (DIN 2501)
  - PN 6 (DN 350 to 2000)
  - PN 10 (DN 200 to 2000)
  - PN 16 (DN 65 to 2000)
  - PN 25 (DN 200 to 1000)
  - PN 40 (DN 25 to 150)
- ANSI B 16.5
  - Class 150 (1" to 24")
  - Class 300 (1" to 6")
- AWWA
  - Class D (28" to 78")
- JIS B2220
  - 10 K (DN 50 to 300)
  - 20 K (DN 25 to 300)
- AS 2129
  - Table E (DN 80, 100, 150 to 1200)
- AS 4087
  - PN 16 (DN 80, 100, 150 to 1200)

Promag P

- EN 1092-1 (DIN 2501)
  - PN 10 (DN 200 to 600)
  - PN 16 (DN 65 to 600)
  - PN 25 (DN 200 to 600)
  - PN 40 (DN 15 to 150)
- ANSI B 16.5
  - Class 150 (½" to 24")
  - Class 300 (½" to 6")
- JIS B2220
  - 10 K (DN 50 to 300)
  - 20 K (DN 15 to 300)
- AS 2129
  - Table E (DN 25, 50)
- AS 4087
  - PN 16 (DN 50)

Promag H

The permissible nominal pressure depends on the process connection and the seal:
- 40 bar → flange, weld nipple (with O-ring seal)
- 16 bar → all other process connections

Pressure tightness

Promag D

Measuring tube: 0 mbar abs (0 psi abs) with a fluid temperature of ≤ 60 °C (≤ 140 °F)

Promag L (Measuring tube lining: Polyurethane)

Promag L Nominal diameter		Resistance of measuring tube lining to partial vacuum Limit values for abs. pressure [mbar] ([psi]) at various fluid temperatures		
		25 °C	**50 °C**	**80° C**
[mm]	**[inch]**	**77 °F**	**122 °F**	**176° F**
50 to 300	2 to 12"	0	0	–

Promag L
Measuring tube lining: PTFE

Promag L Nominal diameter		Resistance of measuring tube lining to partial vacuum Limit values for abs. pressure [mbar] ([psi]) at various fluid temperatures			
		25 °C		**90 °C**	
		77 °F		**194 °F**	
[mm]	**[inch]**	**[mbar]**	**[psi]**	**[mbar]**	**[psi]**
50	2"	0	0	0	0
65	–	0	0	40	0.58
80	3"	0	0	40	0.58
100	4"	0	0	135	1.96
125	–	135	1.96	240	3.48
150	6"	135	1.96	240	3.48
200	8"	200	2.90	290	4.21
250	10"	330	4.79	400	5.80
300	12"	400	5.80	500	7.25

Promag W

Promag W Nominal diameter		Measuring tube lining	Resistance of measuring tube lining to partial vacuum Limit values for abs. pressure [mbar] ([psi]) at various fluid temperatures						
			25 °C	**50 °C**	**80° C**	**100 °C**	**130 °C**	**150 °C**	**180 °C**
[mm]	**[inch]**		**77 °F**	**122 °F**	**176° F**	**212 °F**	**266 °F**	**302 °F**	**356 °F**
25 to 1200	1 to 48"	Polyurethane	0	0	–	–	–	–	–
65 to 2000	3 to 78"	Hard rubber	0	0	0	–	–	–	–

Promag P
Measuring tube lining: PFA

Promag P Nominal diameter		Resistance of measuring tube lining to partial vacuum Limit values for abs. pressure [mbar] ([psi]) at various fluid temperatures					
		25 °C	**80° C**	**100 °C**	**130 °C**	**150 °C**	**180 °C**
[mm]	**[inch]**	**77 °F**	**176° F**	**212 °F**	**266 °F**	**302 °F**	**356 °F**
25	1"	0	0	0	0	0	0
32	–	0	0	0	0	0	0
40	1 ½"	0	0	0	0	0	0
50	2"	0	0	0	0	0	0
65	–	0	*	0	0	0	0
80	3"	0	*	0	0	0	0
100	4"	0	*	0	0	0	0

Promag P Nominal diameter		Resistance of measuring tube lining to partial vacuum Limit values for abs. pressure [mbar] ([psi]) at various fluid temperatures					
		25 °C	80° C	100 °C	130 °C	150 °C	180 °C
[mm]	[inch]	77 °F	176° F	212 °F	266 °F	302 °F	356 °F
125	-	0	*	0	0	0	0
150	6"	0	*	0	0	0	0
200	8"	0	*	0	0	0	0
* No value can be quoted.							

Promag P
Measuring tube lining: PTFE

Promag P Nominal diameter		Resistance of measuring tube lining to partial vacuum Limit values for abs. pressure [mbar] ([psi]) at various fluid temperatures								
		25 °C		80° C	100 °C		130 °C		150 °C	180 °C
		77 °F		176° F	212 °F		266 °F		302 °F	356 °F
[mm]	[inch]	[mbar]	[psi]		[mbar]	[psi]	[mbar]	[psi]		
15	½"	0	0	0	0	0	100	1.45	–	–
25	1"	0	0	0	0	0	100	1.45	–	–
32	-	0	0	0	0	0	100	1.45	–	–
40	1 ½"	0	0	0	0	0	100	1.45	–	–
50	2"	0	0	0	0	0	100	1.45	–	–
65	-	0	0	*	40	0.58	130	1.89	–	–
80	3"	0	0	*	40	0.58	130	1.89	–	–
100	4"	0	0	*	135	1.96	170	2.47	–	–
125	-	135	1.96	*	240	3.48	385	5.58	–	–
150	6"	135	1.96	*	240	3.48	385	5.58	–	–
200	8"	200	2.90	*	290	4.21	410	5.95	–	–
250	10"	330	4.79	*	400	5.80	530	7.69	–	–
300	12"	400	5.80	*	500	7.25	630	9.14	–	–
350	14"	470	6.82	*	600	8.70	730	10.59	–	–
400	16"	540	7.83	*	670	9.72	800	11.60	–	–
450	18"	Partial vacuum is impermissible!								
500	20"									
600	24"									
* No value can be quoted.										

Promag H (Measuring tube lining: PFA)

Promag H Nominal diameter		Resistance of measuring tube lining to partial vacuum Limit values for abs. pressure [mbar] ([psi]) at various fluid temperatures					
		25 °C	80° C	100 °C	130 °C	150 °C	180 °C
[mm]	[inch]	77 °F	176° F	212 °F	266 °F	302 °F	356 °F
2 to 100	1/12 to 4"	0	0	0	0	0	0

Limiting flow

→ 🗎 18

Pressure loss

- No pressure loss if the sensor is installed in a pipe of the same nominal diameter (Promag H: only DN 8 and larger).
- Pressure losses for configurations incorporating adapters according to DIN EN 545 (see "Adapters" → 🗎 17)

10.1.10 Mechanical construction

Design, dimensions

The dimensions and installation lengths of the sensor and transmitter can be found in the "Technical Information" for the device in question. This document can be downloaded as a PDF file from www.endress.com. A list of the "Technical Information" documents available is provided in the "Documentation" section on → 116.

Weight (SI units)

Promag D

Weight data of Promag D in kg				
Nominal diameter		Compact version	Remote version (without cable)	
[mm]	[inch]		Sensor	Transmitter
25	1"	4.5	2.5	6.0
40	1 ½"	5.1	3.1	6.0
50	2"	5.9	3.9	6.0
65	2 ½"	6.7	4.7	6.0
80	3"	7.7	5.7	6.0
100	4"	10.4	8.4	6.0
Transmitter Promag (compact version): 3.4 kg (Weight data valid without packaging material)				

Promag L (lap joint flanges)

Weight data of Promag L in kg										
Nominal diameter		Compact version				Remote version (without cable)				
						Sensor				Transmitter
[mm]	[inch]	EN (DIN)		ANSI		EN (DIN)		ANSI		
50	2"	PN 16	10.6	Class 150	10.6	PN 16	8.6	Class 150	8.6	6.0
65	2 ½"		12.0		–		10.0		–	6.0
80	3"		14.0		14.0		12.0		12.0	6.0
100	4"		16.0		16.0		14.0		14.0	6.0
125	5"		21.5		–		19.5		–	6.0
150	6"		25.5		25.5		23.5		23.5	6.0
200	8"	PN 10	45		45	PN 10	43		43	6.0
250	10"		65		65		63		73	6.0
300	12"		70		–		68		–	6.0
Transmitter Promag (compact version): 3.4 kg (Weight data valid for standard pressure ratings and without packaging material)										

Promag L (lap joint flanges, stamped plate)

Weight data of Promag L in kg						
Nominal diameter		Compact version		Remote version (without cable)		
[mm]	[inch]	EN (DIN)		Sensor EN (DIN)		Transmitter
50	2"	PN 10	7.2	PN 10	5.2	6.0
65	2 ½"		8.0		6.0	6.0
80	3"		9.0		7.0	6.0
100	4"		11.5		9.5	6.0
125	5"		15.0		13.0	6.0
150	6"		19.0		17.0	6.0
200	8"		37.5		35.5	6.0
250	10"		56.0		54.0	6.0
300	12"		57.0		55.0	6.0
Transmitter Promag (compact version): 3.4 kg (Weight data valid for standard pressure ratings and without packaging material)						

Promag W

Weight data of Promag W in kg														
Nominal diameter		Compact version						Remote version (without cable)						
								Sensor						Trans-mitter
[mm]	[inch]	EN (DIN) / AS*		JIS		ANSI/ AWWA		EN (DIN) / AS*		JIS		ANSI/ AWWA		
25	1"	PN 40	7.3	10K	7.3	Class 150	7.3	PN 40	5.3	10K	5.3	Class 150	5.3	6.0
32	1 ¼"		8.0		7.3		–		6.0		5.3		–	6.0
40	1 ½"		9.4		8.3		9.4		7.4		6.3		7.4	6.0
50	2"		10.6		9.3		10.6		8.6		7.3		8.6	6.0
65	2 ½"	PN 16	12.0		11.1		–	PN 16	10.0		9.1		–	6.0
80	3"		14.0		12.5		14.0		12.0		10.5		12.0	6.0
100	4"		16.0		14.7		16.0		14.0		12.7		14.0	6.0
125	5"		21.5		21.0		–		19.5		19.0		–	6.0
150	6"		25.5		24.5		25.5		23.5		22.5		23.5	6.0
200	8"	PN 10	45		41.9		45	PN 10	43		39.9		43	6.0
250	10"		65		69.4		65		63		67.4		73	6.0
300	12"		70		72.3		110		68		70.3		108	6.0
350	14"		115				175		113				173	6.0
400	16"		135				205		133				203	6.0
450	18"		175				255		173				253	6.0
500	20"		175				285		173				283	6.0
600	24"		235				405		233				403	6.0
700	28"		355			Class D	400		353			Class D	398	6.0
–	30"		–				460		–				458	6.0
800	32"		435				550		433				548	6.0
900	36"		575				800		573				798	6.0
1000	40"		700				900		698				898	6.0
–	42"	PN 6	–				1100	PN 6	–				1098	6.0
1200	48"		850				1400		848				1398	6.0
–	54"		–				2200		–				2198	6.0
1400	–		1300				–		1298				–	6.0
–	60"		–				2700		–				2698	6.0
1600	–		1700				–		1698				–	6.0
–	66"		–				3700		–				3698	6.0
1800	72"		2200				4100		2198				4098	6.0
–	78"		–				4600		–				4598	6.0
2000	–		2800				–		2798				–	6.0

Transmitter Promag (compact version): 3.4 kg
(Weight data valid for standard pressure ratings and without packaging material)
*Flanges according to AS are only available for DN 80, 100, 150 to 400, 500 and 600

Promag P

Weight data of Promag P in kg														
Nominal diameter		Compact version						Remote version (without cable)						
								Sensor						Trans-mitter
[mm]	[inch]	EN (DIN) / AS*		JIS		ANSI/ AWWA		EN (DIN) / AS*		JIS		ANSI/ AWWA		
15	½"	PN 40	6.5	10K	6.5	Class 150	6.5	PN 40	4.5	10K	4.5	Class 150	4.5	6.0
25	1"		7.3		7.3		7.3		5.3		5.3		5.3	6.0
32	1 ¼"		8.0		7.3		–		6.0		5.3		–	6.0
40	1 ½"		9.4		8.3		9.4		7.4		6.3		7.4	6.0
50	2"		10.6		9.3		10.6		8.6		7.3		8.6	6.0
65	2 ½"	PN 16	12.0		11.1		–	PN 16	10.0		9.1		–	6.0
80	3"		14.0		12.5		14.0		12.0		10.5		12.0	6.0
100	4"		14.4		14.7		16.0		14.0		12.7		14.0	6.0
125	5"		16.0		21.0		–		19.5		19.0		–	6.0
150	6"		21.5		24.5		25.5		23.5		22.5		23.5	6.0
200	8"	PN 10	45		41.9		45	PN 10	43		39.9		43	6.0
250	10"		65		69.4		75		63		67.4		73	6.0
300	12"		70		72.3		110		68		70.3		108	6.0
350	14"		115				175		113				173	6.0
400	16"		135				205		133				203	6.0
450	18"		175				255		173				253	6.0
500	20"		175				285		173				283	6.0
600	24"		235				405		233				403	6.0

Transmitter Promag (compact version): 3.4 kg
High-temperature version: + 1.5 kg
(Weight data valid for standard pressure ratings and without packaging material)
* Flanges according to AS are only available for DN 25 and 50.

Promag H

Weight data of Promag H in kg				
Nominal diameter		Compact version	Remote version (without cable)	
[mm]	[inch]	DIN	Sensor	Transmitter
2	1/12"	5.2	2	6.0
4	5/32"	5.2	2	6.0
8	5/16"	5.3	2	6.0
15	½"	5.4	1.9	6.0
25	1"	5.5	2.8	6.0
40	1 ½"	6.5	4.5	6.0
50	2"	9.0	7.0	6.0
65	2 ½"	9.5	7.5	6.0
80	3"	19.0	17.0	6.0
100	4"	18.5	16.5	6.0

Transmitter Promag (compact version): 3.4 kg
(Weight data valid for standard pressure ratings and without packaging material)

Weight (US units)

Promag D

Weight data of Promag D in lbs				
Nominal diameter		Compact version	Remote version (without cable)	
[mm]	[inch]		Sensor	Transmitter
25	1"	10	6	13
40	1 ½"	11	7	13
50	2"	13	9	13
80	3"	17	13	13
100	4"	23	19	13
Transmitter Promag (compact version): 7.5 lbs (Weight data valid without packaging material)				

Promag L (ANSI)

Weight data of Promag L in lbs						
Nominal diameter		Compact version		Remote version (without cable)		
[mm]	[inch]			Sensor		Transmitter
50	2"	Class 150	23	Class 150	19	13
80	3"		31		26	13
100	4"		35		31	13
150	6"		56		52	13
200	8"		99		95	13
250	10"		143		161	13
Transmitter Promag (compact version): 7.5 lbs (Weight data valid for standard pressure ratings and without packaging material)						

Promag P (ANSI/AWWA)

Weight data of Promag P in lbs						
Nominal diameter		Compact version		Remote version (without cable)		
[mm]	[inch]			Sensor		Transmitter
15	½"	Class 150	14	Class 150	10	13
25	1"		16		12	13
40	1 ½"		21		16	13
50	2"		23		19	13
80	3"		31		26	13
100	4"		35		31	13
150	6"		56		52	13
200	8"		99		95	13
250	10"		165		161	13
300	12"		243		238	13
350	14"		386		381	13
400	16"		452		448	13
450	18"		562		558	13
500	20"		628		624	13
600	24"		893		889	13
Transmitter Promag (compact version): 7.5 lbs High-temperature version: 3.3 lbs (Weight data valid for standard pressure ratings and without packaging material)						

Promag W (ANSI/AWWA)

Weight data of Promag W in lbs						
Nominal diameter		Compact version		Remote version (without cable)		
[mm]	[inch]				Sensor	Transmitter
25	1"	Class 150	16	Class 150	12	13
40	1 ½"		21		16	13
50	2"		23		19	13
80	3"		31		26	13
100	4"		35		31	13
150	6"		56		52	13
200	8"		99		95	13
250	10"		143		161	13
300	12"		243		238	13
350	14"		386		381	13
400	16"		452		448	13
450	18"		562		558	13
500	20"		628		624	13
600	24"		893		889	13
700	28"	Class D	882	Class D	878	13
–	30"		1014		1010	13
800	32"		1213		1208	13
900	36"		1764		1760	13
1000	40"		1985		1980	13
–	42"		2426		2421	13
1200	48"		3087		3083	13
–	54"		4851		4847	13
–	60"		5954		5949	13
–	66"		8159		8154	13
1800	72"		9041		9036	13
–	78"		10143		10139	13
Transmitter Promag (compact version): 7.5 lbs (Weight data valid for standard pressure ratings and without packaging material)						

Promag H

Weight data of Promag H in lbs				
Nominal diameter		Compact version	Remote version (without cable)	
[mm]	[inch]		Sensor	Transmitter
2	1/12"	11	4	13
4	5/32"	11	4	13
8	5/16"	12	4	13
15	½"	12	4	13
25	1"	12	6	13
40	1 ½"	14	10	13
50	2"	20	15	13
65	2 ½"	21	17	13
80	3"	42	37	13
100	4"	41	36	13
Transmitter Promag (compact version): 7.5 lbs (Weight data valid for standard pressure ratings and without packaging material)				

Material

Promag D

- Transmitter housing: powder-coated die-cast aluminum
- Sensor housing: powder-coated die-cast aluminum
- Measuring tube: polyamide, O-rings EPDM
  (Drinking water approvals: WRAS BS 6920, ACS, NSF 61, KTW/W270)
- Electrodes: 1.4435/316L
- Ground disks: 1.4301/304

Promag L

- Transmitter housing:
  – Compact housing: powder-coated die-cast aluminum
  – Wall-mounted housing: powder-coated die-cast aluminum
- Sensor housing: powder-coated die-cast aluminum
- Measuring tube: stainless steel 1.4301 or 1.4306/304L
- Electrodes: 1.4435, Alloy C-22
- Flange
  – EN 1092-1 (DIN 2501): 1.4306; 1.4307; 1.4301; RSt37-2 (S235JRG2)
  – ANSI: A105; F316L
- Seals: to DIN EN 1514-1
- Ground disks: 1.4435/316L or Alloy C-22

Promag W

- Transmitter housing:
  – Compact housing: powder-coated die-cast aluminum
  – Wall-mounted housing: powder-coated die-cast aluminum
- Sensor housing
  – DN 25 to 300: powder-coated die-cast aluminum
  – DN 350 to 2000: with protective lacquering
- Measuring tube
  – DN ≤ 300: stainless steel 1.4301 or 1.4306/304L
  (for flanges made of carbon steel with Al/Zn protective coating)
  – DN ≥ 350: stainless steel 1.4301 or 1.4306/304
  (for flanges made of carbon steel with protective lacquering)
- Electrodes: 1.4435 or Alloy C-22, Tantalum
- Flange
  – EN 1092-1 (DIN2501): 1.4571/316L; RSt37-2 (S235JRG2); C22; FE 410W B
  (DN ≤ 300 with Al/Zn protective coating; DN ≥ 350 with protective lacquering)
  – ANSI: A105; F316L
  (DN ≤ 300 with Al/Zn protective coating; DN ≥ 350 with protective lacquering)
  – AWWA: 1.0425
  – JIS: RSt37-2 (S235JRG2); HII; 1.0425/316L
  (DN ≤ 300 with Al/Zn protective coating; DN ≥ 350 with protective lacquering)
  – AS 2129
    – (DN 150, 200, 250, 300, 600) A105 or RSt37-2 (S235JRG2)
    – (DN 80, 100, 350, 400, 500) A105 or St44-2 (S275JR)
  – AS 4087: A105 or St44-2 (S275JR)
- Seals: to DIN EN 1514-1
- Ground disks: 1.4435/316L, Alloy C-22, Titanium, Tantalum

Promag P

- Transmitter housing:
  - Compact housing: powder-coated die-cast aluminum
  - Wall-mounted housing: powder-coated die-cast aluminum
- Sensor housing
  - DN 15 to 300: powder-coated die-cast aluminum
  - DN 350 to 2000: with protective lacquering
- Measuring tube
  - DN ≤ 300: stainless steel 1.4301 or 1.4306/304L; for flanges made of carbon steel with Al/Zn protective coating
  - DN ≥ 350.: stainless steel 1.4301 or 1.4306/304L; for flanges made of carbon steel with Al/Zn protective coating
- Electrodes: 1.4435, Platinum, Alloy C-22, Tantalum, Titanium
- Flange
  - EN 1092-1 (DIN2501): 1.4571/316L; RSt37-2 (S235JRG2); C22; FE 410W B (DN ≤ 300: with Al/Zn protective coating; DN ≥ 350 with protective lacquering)
  - ANSI: A105; F316L (DN ≤ 300 with Al/Zn protective coating; DN ≥ 350 with protective lacquering)
  - AWWA: 1.0425
  - JIS: RSt37-2 (S235JRG2); HII; 1.0425/316L (DN ≤ 300 with Al/Zn protective coating; DN ≥ 350 with protective lacquering)
  - AS 2129
    - (DN 25) A105 or RSt37-2 (S235JRG2)
    - (DN 40) A105 or St44-2 (S275JR)
  - AS 4087: A105 or St44-2 (S275JR)
- Seals: to DIN EN 1514-1
- Ground disks: 1.4435/316L or Alloy C-22

Promag H

- Transmitter housing:
  - Compact housing: powder-coated die-cast aluminum or stainless steel field housing (1.4301/316L)
  - Wall-mounted housing: powder-coated die-cast aluminum
  - Window material: glas or polycarbonate
- Sensor housing: stainless steel 1.4301
- Wall mounting kit: stainless steel 1.4301
- Measuring tube: stainless steel 1.4301
- Electrodes:
  - Standard: 1.4435
  - Option: Alloy C-22, Tantalum, Platinum
- Flange:
  - All connections stainless-steel 1.4404/316L
  - EN (DIN), ANSI, JIS made of PVDF
  - Adhesive fitting made of PVC
- Seals
  - DN 2 to 25: O-ring (EPDM, Viton, Kalrez), gasket seal (EPDM, Viton, silicone)
  - DN 40 to 100: gasket seal (EPDM, Viton, silicone)
- Ground rings: 1.4435/316L (optional: Tantalum, Alloy C-22)

Material load diagram

The material load diagrams (pressure-temperature graphs) for the process connections are to be found in the "Technical Information" documents of the device in question:
List of supplementary documentation → 116.

Fitted electrodes

Promag D

- 2 measuring electrodes for signal detection

Promag L, W and P

- 2 measuring electrodes for signal detection
- 1 EPD electrode for empty pipe detection
- 1 reference electrode for potential equalization

Promag H

- 2 measuring electrodes for signal detection
- 1 EPD electrode for empty pipe detection (apart from DN 2 to 15)

Process connections

Promag D

Wafer version → without process connections

Promag L

Flange connections:
- EN 1092-1 (DIN 2501)
- ANSI

Promag W and P

Flange connections:
- EN 1092-1 (DIN 2501)
  - DN ≤ 300 = form A
  - DN ≥ 350 = flat face
  - DN 65 PN 16 and DN 600 PN 16 only as per EN 1092-1
- ANSI
- AWWA (only Promag W)
- JIS
- AS

Promag H

With O-ring:
- Weld nipple DIN (EN), ISO 1127, ODT/SMS
- Flange EN (DIN), ANSI, JIS
- Flange made of PVDF EN (DIN), ANSI, JIS
- External thread
- Internal thread
- Hose connection
- PVC adhesive fitting

With gasket seal:
- Weld nipple DIN 11850, ODT/SMS
- Clamp ISO 2852, DIN 32676, L14 AM7
- Threaded joint DIN 11851, DIN 11864-1, ISO 2853, SMS 1145
- Flange DIN 11864-2

Surface roughness

All data relate to parts in contact with fluid.

- Liner → PFA: ≤ 0.4 µm (15 µin)
- Electrodes: 0.3 to 0.5 µm (12 to 20 µin)
- Process connection made of stainless-steel (Promag H): ≤ 0.8 µm (31 µin)

10.1.11 Human interface

Display elements	▪ Liquid crystal display: illuminated, two-line, 16 characters per line ▪ Custom configurations for presenting different measured-value and status variables ▪ 2 totalizers Note! At ambient temperatures below –20 (–4 °F) the readability of the display may be impaired.
Operating elements	▪ Local operation with three keys (−, +, E) ▪ "Quick Setup" menus for straightforward commissioning
Language groups	Language groups available for operation in different countries: ▪ Western Europe and America (WEA): English, German, Spanish, Italian, French, Dutch and Portuguese ▪ Eastern Europe/Scandinavia (EES): English, Russian, Polish, Norwegian, Finnish, Swedish and Czech ▪ Southeast Asia (SEA): English, Japanese, Indonesian Note! You can change the language group via the operating program "FieldCare".
Remote operation	Operation via HART protocol and Fieldtool

10.1.12 Certificates and approvals

CE mark	The measuring system is in conformity with the statutory requirements of the EC Directives. Endress+Hauser confirms successful testing of the device by affixing to it the CE mark.
C-tick mark	The measuring system meets the EMC requirements of the Australian Communications and Media Authority (ACMA)
Ex approval	Information about currently available Ex versions (ATEX, FM, CSA, IECEx, NEPSI etc.) can be supplied by your Endress+Hauser Sales Center on request. All explosion protection data are given in a separate documentation which is available upon request.
Sanitary compatibility	*Promag D, L, W and P* No applicable approvals or certification *Promag H* ▪ 3A authorization and EHEDG-tested ▪ Seals: in conformity with FDA (except Kalrez seals)
Drinking water approval	*Promag D, L and W* ▪ WRAS BS 6920 ▪ ACS ▪ NSF 61 ▪ KTW/W270 *Promag P and H* No drinking water approval

Pressure Equipment Directive	*Promag D and L* No pressure measuring device approval *Promag W, P and H* Measuring devices with a nominal diameter smaller than or equal to DN 25 correspond to Article 3 (3) of the EC Directive 97/23/EC (Pressure Equipment Directive) and have been designed and manufactured according to good engineering practice. Where necessary (depending on the fluid and process pressure), there are additional optional approvals to Category II/III for larger nominal diameters.
Other standards and guidelines	▪ EN 60529 Degrees of protection by housing (IP code). ▪ EN 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use ▪ IEC/EN 61326 Electromagnetic compatibility (EMC requirements) ▪ ANSI/ISA-S82.01 Safety Standard for Electrical and Electronic Test, Measuring, Controlling and related Equipment - General Requirements. Pollution degree 2, Installation Category II. ▪ CAN/CSA-C22.2 (No. 1010.1-92) Safety requirements for Electrical Equipment for Measurement and Control and Laboratory Use. Pollution degree 2, Installation Category I. ▪ NAMUR NE 21 Electromagnetic compatibility (EMC) of industrial process and laboratory control equipment. ▪ NAMUR NE 43 Standardization of the signal level for the breakdown information of digital transmitters with analog output signal.

10.1.13 Ordering information

Your Endress+Hauser service organization can provide detailed ordering information and information on the order codes on request.

10.1.14 Accessories

Various accessories, which can be ordered separately from Endress+Hauser, are available for the transmitter and the sensor → 📄 77.
Your Endress+Hauser service organization can provide detailed information on the specific order codes on request.

10.1.15 Documentation

- Flow measuring technology (FA005D/06)
- Technical Information Promag 50D (TI082D/06)
- Technical Information Promag 50L (TI097D/06)
- Technical Information Promag 50W, 53W (TI046D/06)
- Technical Information Promag 50P, 53P (TI047D/06)
- Technical Information Promag 50H, 53H (TI048D/06)
- Description of Device Functions Promag 50 HART (BA049D/06)
- Supplementary documentation on Ex-ratings: ATEX, FM, CSA, etc.

Index

Endress+Hauser
People for Process Automation

Declaration of Hazardous Material and De-Contamination
Erklärung zur Kontamination und Reinigung

RA No. ☐☐☐☐☐☐☐☐

Please reference the Return Authorization Number (RA#), obtained from Endress+Hauser, on all paperwork and mark the RA# clearly on the outside of the box. If this procedure is not followed, it may result in the refusal of the package at our facility.
Bitte geben Sie die von E+H mitgeteilte Rücklieferungsnummer (RA#) auf allen Lieferpapieren an und vermerken Sie diese auch außen auf der Verpackung. Nichtbeachtung dieser Anweisung führt zur Ablehnung ihrer Lieferung.

Because of legal regulations and for the safety of our employees and operating equipment, we need the "Declaration of Hazardous Material and De-Contamination", with your signature, before your order can be handled. Please make absolutely sure to attach it to the outside of the packaging.
Aufgrund der gesetzlichen Vorschriften und zum Schutz unserer Mitarbeiter und Betriebseinrichtungen, benötigen wir die unterschriebene "Erklärung zur Kontamination und Reinigung", bevor Ihr Auftrag bearbeitet werden kann. Bringen Sie diese unbedingt außen an der Verpackung an.

Type of instrument / sensor
Geräte-/Sensortyp ____

Serial number
Seriennummer ________________________

☐ **Used as SIL device in a Safety Instrumented System /** *Einsatz als SIL Gerät in Schutzeinrichtungen*

Process data/ *Prozessdaten*

Temperature / *Temperatur* _____ [°F] _____ [°C]
Pressure / *Druck* _____ [psi] _____ [Pa]
Conductivity / *Leitfähigkeit* ________ [µS/cm]
Viscosity / *Viskosität* _____ [cp] _____ [mm²/s]

Medium and warnings
Warnhinweise zum Medium

	Medium /concentration *Medium /Konzentration*	Identification CAS No.	flammable *entzündlich*	toxic *giftig*	corrosive *ätzend*	harmful/ irritant *gesundheits-schädlich/ reizend*	other * *sonstiges**	harmless *unbedenklich*
Process medium *Medium im Prozess*								
Medium for process cleaning *Medium zur Prozessreinigung*								
Returned part cleaned with *Medium zur Endreinigung*								

* explosive; oxidising; dangerous for the environment; biological risk; radioactive
* *explosiv; brandfördernd; umweltgefährlich; biogefährlich; radioaktiv*

Please tick should one of the above be applicable, include safety data sheet and, if necessary, special handling instructions.
Zutreffendes ankreuzen; trifft einer der Warnhinweise zu, Sicherheitsdatenblatt und ggf. spezielle Handhabungsvorschriften beilegen.

Description of failure / *Fehlerbeschreibung* ____
____
____

Company data / *Angaben zum Absender*

Company / *Firma* ______________________________
____
Address / *Adresse*
____
____

Phone number of contact person / *Telefon-Nr. Ansprechpartner:*
____
Fax / E-Mail ______________________________
Your order No. / *Ihre Auftragsnr.* ______________________

"We hereby certify that this declaration is filled out truthfully and completely to the best of our knowledge.We further certify that the returned parts have been carefully cleaned. To the best of our knowledge they are free of any residues in dangerous quantities."
"Wir bestätigen, die vorliegende Erklärung nach unserem besten Wissen wahrheitsgetreu und vollständig ausgefüllt zu haben. Wir bestätigen weiter, dass die zurückgesandten Teile sorgfältig gereinigt wurden und nach unserem besten Wissen frei von Rückständen in gefahrbringender Menge sind."

P/SF/Konta XIV

______________________ ______________________ ______________________
(place, date / *Ort, Datum*) Name, dept./*Abt.* (please print / *bitte Druckschrift*) Signature / *Unterschrift*

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Endress+Hauser

People for Process Automation

BA046D/06/en/12.09
71106181
FM+SGML6.0 ProMoDo

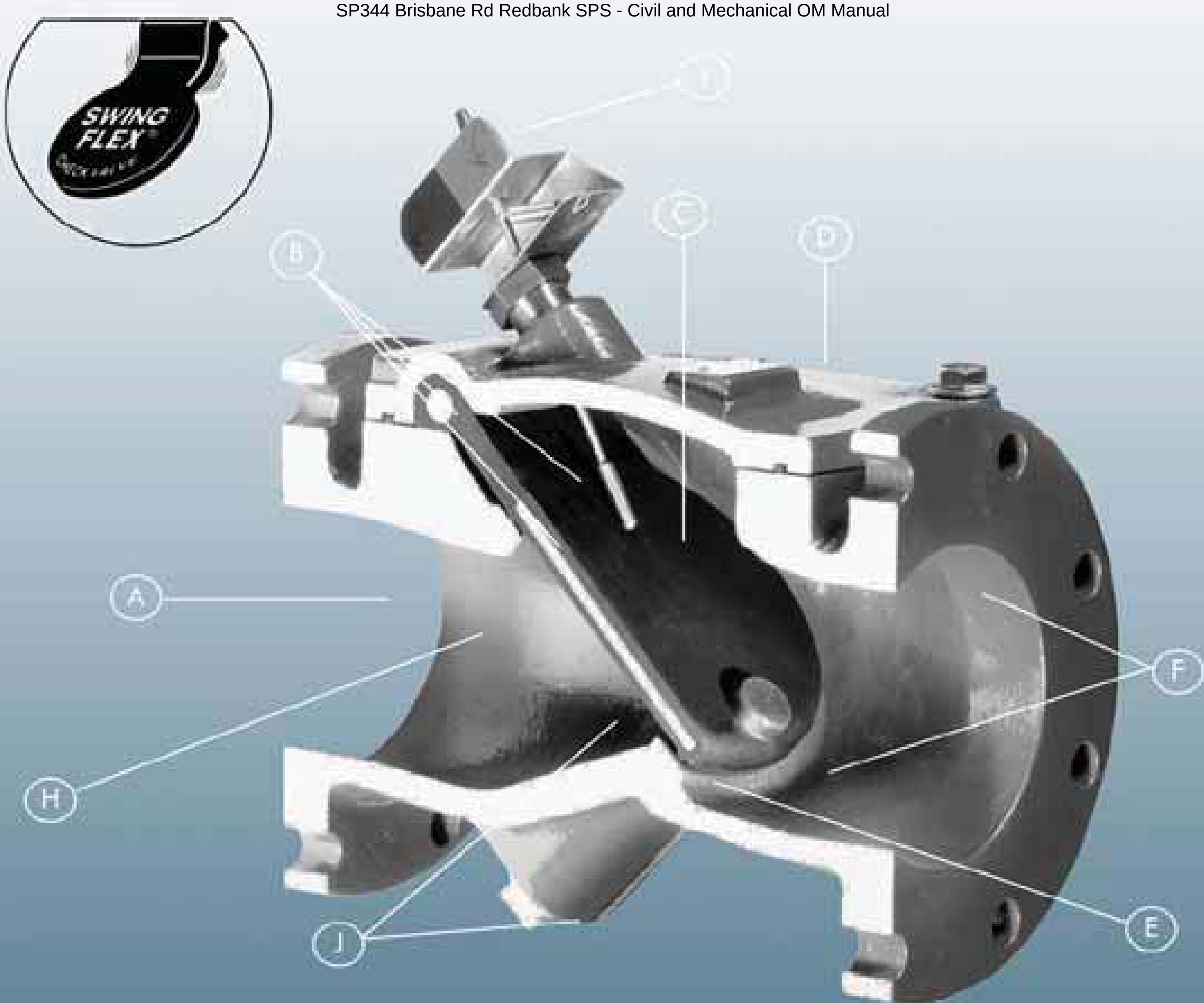
BULLETIN 500

VAL-MATIC®

SWING FLEX® CHECK VALVE

EFFICIENCY & RELIABILITY THROUGH SIMPLICITY OF DESIGN

Swing-Flex® Check Valve



A. 100% FLOW AREA

For improved flow characteristics and lower head loss, the Val-Matic Swing-Flex® Check Valve provides 100% unrestricted flow area.

B. REINFORCED DISC

The one piece precision molded disc is steel and nylon reinforced to provide years of trouble free performance. It is backed by a 25 year warranty for the flex portion of the disc. (Tested for proof of design - see page 5.)

C. ONE MOVING PART

The Memory-Flex™ disc, the only moving part, assures long life with minimal maintenance. No packing or O-rings, mechanical hinges, pivot pins or bearings to wear out.

D. DOMED ACCESS PORT

Full size top access port allows removal of disc without removing valve from line. Access cover includes a drilled and tapped port for installation of optional Disc Position Indicator.

E. DROP TIGHT SEATING

The synthetic reinforced disc, with its integral O-ring type seal design assures positive seating at high and low pressures.

F. NON-SLAM CLOSURE

"Short Disc Stroke" combined with Memory-Flex™ Disc Action reduces potentially destructive water hammer.

G. BACKFLOW ACTUATOR (Not Shown)

Body is drilled and tapped for installation of optional backflow actuator (see options).

H. NON-CLOG DESIGN

The unrestricted full flow area combined with smooth streamlined contouring allows passage of large solids minimizing the potential for clogging.

I. MECHANICAL DISC POSITION INDICATOR* (Optional)

Provides clear indication or the valve's disc position. Can also be provided with a SCADA compatible limit switch for off site monitoring (see options).

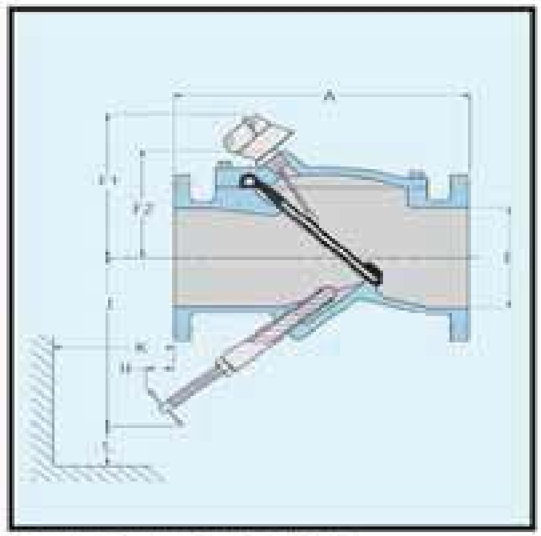
J. FUSION BONDED EPOXY

Fusion Bonded Epoxy (FBE) is provided standard on the interior and exterior of the valve. The FBE is ANSI/NSF 61 certified. Other coatings are available on request.

INSTALLATION DIMENSIONS AND CONSTRUCTION

VALVE SIZE	MODEL #	A	E	F1	F2	H	J	K	L
2	502A	8	2	N/A	3 3/8	-1/2	6 3/4	7/8	1 1/2
2 1/2	525A	8 1/2	2 1/2	N/A	3 3/8	-1/2	7	5/8	1 1/2
3	503A	9 1/2	3	7 5/8	5 1/8	-3/8	7 1/2	3/4	1 3/4
4	504A	11 1/2	4	8 1/4	5 3/4	1 1/2	7 1/4	2 3/8	2 3/8
6	506A	15	6	9 3/8	6 7/8	2	12	6 1/4	3 1/4
8	508A	19 1/2	8	11	8 3/8	2	15 3/4	7 1/2	4 1/4
10	510A	24 1/2	10	13 3/8	10 3/4	4	20 3/8	8	5 1/4
12	512A	27 1/2	12	15	12 1/2	3 1/2	22 1/2	10	6 1/2
14	514A	31	14	17 3/8	13	4	26 1/4	11 5/8	7 1/2
16	516A	32	16	18 7/8	14 1/4	4 5/8	30	13 1/4	8 3/8
18	518A	36	18	20	15 1/4	5 1/4	33 3/4	15	9 3/4
20	520A	40	20	21 3/8	16 7/8	5 7/8	37 1/2	16 5/8	10 7/8
24	524A	48	24	23 7/8	19 1/4	7	45	20	13
30	530	56	30	27 5/8	23	-5/8	41 1/4	12	6
36	536	63	36	31	27 3/8	-6 1/8	43 1/2	8	6

Dimensions "L" and "K" represent the clearance required to remove backflow actuator.



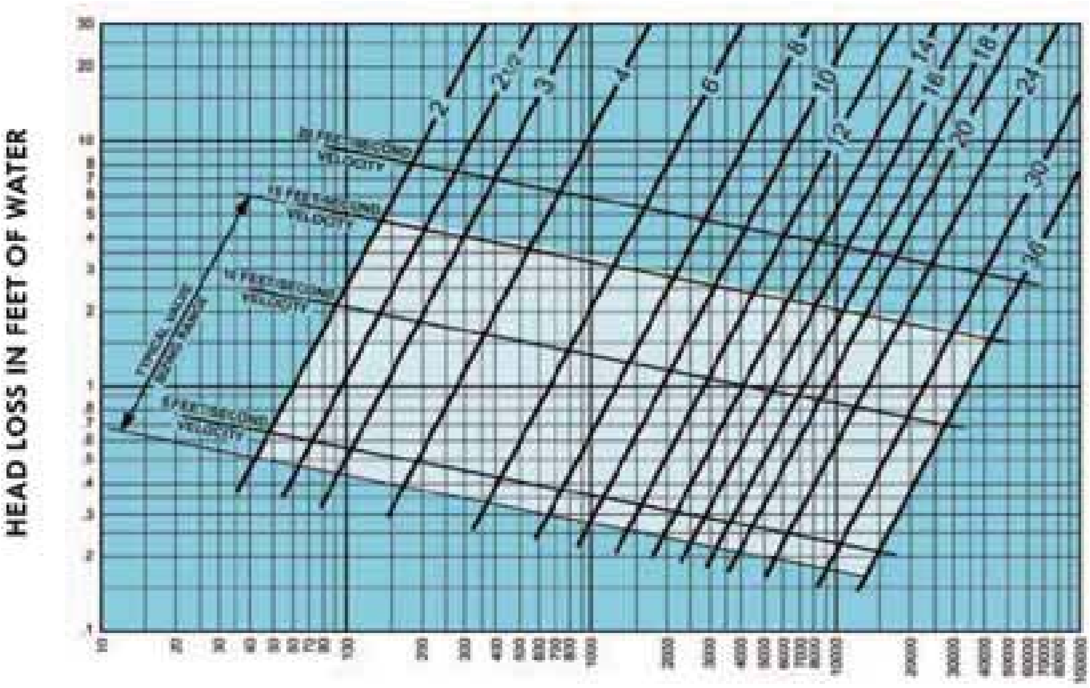
*Dimension "E" represents nominal valve size.
Note: Flanged ends conform to ANSI B16.1 Class 125.

MATERIALS OF CONSTRUCTION			
Component		Standard	Optional
Body and Cover		Ductile Iron ASTM A536 Grade 65-45-12	Stainless Steel, Bronze
Disc		Buna-N (NBR), ASTM D2000-BG	Viton (FKM), ASTM D2000-HK
Coatings	Interior	Fusion Bonded Epoxy*	Rubber Lining
	Exterior	Fusion Bonded Epoxy*	Consult Factory

Consult factory for additional material and coating options.
*ANSI/NSF 61 Certifications

ANSI MAXIMUM PRESSURE-TEMPERATURE RATING		
Maximum Non-Shock Working Pressure (P.S.I.) ANSI Class 125		
Temperature °F	2" - 24"	30" - 36"
100°	250	150
150°		
200°	235	135
Hydrostatic Test Pressures	375	230

HEAD LOSS CHART



FLOW OF WATER IN GALLONS PER MINUTE

Consult factory for Digester Gas Service

Flow Tests performed by the Utah Water Research Laboratory of Utah State University.

4

SAMPLE SPECIFICATIONS

The check valve shall be of the ***Swing-Flex***® full body flanged type, with a domed access cover and only one moving part - the valve disc.

The valve body shall have full flow equal to nominal pipe diameter at any point through the valve. The seating surface shall be on a 45° angle to minimize disc travel. The top access port shall be full size, allowing removal of the disc without removal of the valve from the pipeline and shall include a port for installation of an optional mechanical position indicator.

The disc shall be of one piece construction, precision molded with an integral O-ring type sealing surface and contain steel and nylon reinforcements in both the ***Memory Flex***™ and central disc areas. The flex portion of the disc shall be warranted for 25 years. Non-slam closing characteristic shall be provided through a short 35° disc stroke and a ***Memory-Flex***™ disc return action.

A mechanical indicator shall be provided when specified to provide disc position indication on valves 3" and larger. The indicator shall have continuous contact with the disc under all operating conditions to assure accurate disc position indication.

A limit switch will be provided when specified to indicate open/closed position to a remote location. The mechanical type limit switch shall be activated by the external position indicator. The switch shall be rated for NEMA 4, 6, or 6P and shall have U.L. rated 5 amp, 125, or 250 VAC contacts.

Backflow capabilities shall be available by means of an optional screw type backflow actuator. Both the disc position indicator and backflow actuator shall be capable of installation without special tools.

The valve body and cover shall be ASTM A536 Grade 65-45-12, Class B Ductile Iron. The disc shall be Buna-N (NBR), ASTM D2000-BG.

The interior and exterior of the valve shall be coated with an ANSI/NSF 61 approved Fusion Bonded Epoxy.

The valve shall be proof of design cycle tested 1,000,000 times with no signs of wear or distortion to the valve disc or seat and shall remain drop tight at both high and low pressures. The test results shall be independently certified.

The manufacturer shall have a minimum of five years experience in the manufacture of flexible disc type check valves.

The valve shall be Val-Matic ***Swing-Flex***® series 500 and shall be designed, manufactured and tested in accordance with ANSI/AWWA Standard C508.

INDEPENDENT PROOF OF DESIGN TEST

In the case of the Val-Matic ***Swing-Flex***® Check Valve, we have taken quality assurance one step further by having the valve cycle tested. Utilizing an eight-inch ***Swing-Flex***® with optional signal switch, the valve was cycled over 1,000,000 (one million) times.

To place one million cycles in perspective, it would take an average of 100 cycles per day for more than 27 years to equal the 1,000,000 cycles. Upon conclusion, PSI/Pittsburgh Testing Laboratory Division reported the following results:

1. After 1,000,000 cycles the valve's disc showed no signs of fatigue or stress cracks.

2. After 1,000,000 cycles the valve seating areas showed no signs of wear or distortion. The valve seating remained drop tight during the low and high pressure hydrostatic tests.

3. After 1,000,000 cycles the signal switch continued to function as designed.

Copies of the PSI/Pittsburgh Testing Laboratory Division report are available upon request.

QUALITY ASSURANCE

Val-Matic's Quality Assurance is the sum of imaginative design, solid engineering, careful manufacturing and dedicated people.

These all combine to ensure total customer satisfaction. We recognize the need for, and encourage, individual pride and the self-satisfaction, which is gained in producing reliable and quality valves.

This quality attitude permeates through the corporation from the president to our newest employee.

Testing (right) is the backbone of our quality assurance. Every Swing-Flex® Check Valve is 100% tested including a seat test to assure drop tight sealing and hydrostatic testing to assure the integrity of the casting.

Swing-Flex® Valve at test.

EFFICIENCY..... RELIABILITY ......BY DESIGN!

Efficiency and reliability through simplicity of design is the key to the superior performance and long life of the Val-Matic **Swing-Flex®** Check Valve.

ENERGY EFFICIENT BY DESIGN

The streamlined contour of the **Swing-Flex®** body provides 100% flow area with no restrictions at any point through the valve (Figure 1.) Flow tests performed by an independent laboratory have shown that this unique body design produces minimal head loss through the valve. Flow and head loss charts, developed from the test data, are shown on Page 4.

DISC STABILIZATION BY DESIGN

In the full open position, the disc is stabilized by using body contouring to ease the direction of flow towards the disc assuring long disc life (Figure 1).

NON-CLOGGING BY DESIGN

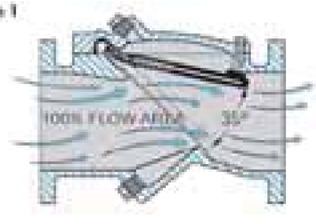
Clog resistant performance is achieved by maintaining an unobstructed 100% flow area, smooth streamlined body contouring and the simplicity of one moving part. The entrapment or hang-up of solids and stringy materials is minimized by the elimination of mechanical devices in the valve design. The standard 4" Swing-Flex is designed to pass a 3" solid.

NON-SLAM CLOSING BY DESIGN

The non-slam closing characteristic of the **Swing-Flex®** Check Valve is achieved by utilizing a "Short Disc Stroke" in conjunction with the unique ***"Memory-Flex™*** action" of the valve's disc. The 35° stroke, a result of the angled seat, is less than half the typical 80° to 90° stroke of a conventional swing check valve. (Figures 1 & 2) The feature is similar to that found in high performance tilted disc check valves.

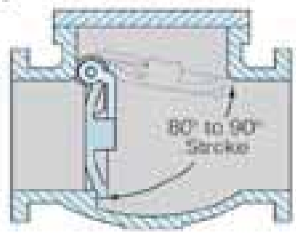
VAL-MATIC SWING-FLEX® VALVE

Figure 1



CONVENTIONAL SWING CHECK VALVE

Figure 2



The short disc stroke and ***"Memory-Flex™*** action" (Figure 1) serve to reduce the closing time of the valve. This reduced closing time minimizes flow reversal and the resultant water hammer normally associated with the sudden stoppage of reverse flow.

RELIABILITY BY DESIGN

Operational reliability is achieved by utilizing just one moving part, the ***Memory-Flex™*** disc. Extended life is -- designed into the disc by the inclusion of steel and nylon reinforcements. The steel and nylon are precision molded into the disc, providing a tough, durable disc with a 25-year warranty*. (Figure 3)

Unlike a conventional horizontal swing check valve, the **Swing-Flex®** has no packing or O-rings, mechanical hinges, shafts, pivot pins, or bearings to wear out (Figure 3.) Upon conclusion of a 1,000,000 (one million) cycle test, an independent testing laboratory reported that the valve had no visible signs of wear and remained drop tight. (See Page 5.)

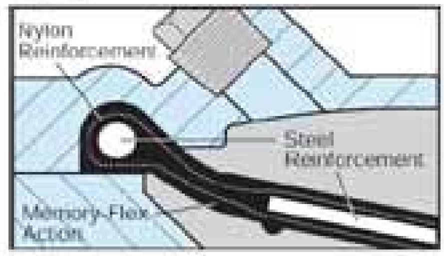


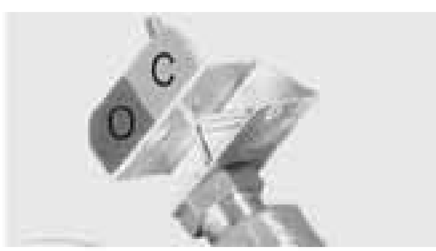
Figure 3

POSITIVE SHUT OFF BY DESIGN

The ***Memory-Flex™*** disc with its integral O-ring type seal design assures drop tight seating at both high and low working pressures. Each and every valve is tested to this standard. A certified report is available upon request.

OPTIONAL ACCESSORIES

RUBBER LINING -- Unlike conventional swing check valves, the **Swing-Flex®** Check Valve is designed to accept synthetic or natural rubber lining. Body lining coupled with synthetic ***Memory-Flex™*** discs makes the **Swing-Flex®** ideally suited for systems containing abrasive or corrosive fluids.



DISC POSITION INDICATOR -- The cover mounted disc position indicator provides clear indication of the valve's disc position. A SCADA compatible limit switch can also be provided. Both can be provided at the time of valve purchase or for field installation at a later date.

BACKFLOW ACTUATOR -- Available for use when manual backflow operation is required. Most commonly used for priming pumps, back flushing, draining lines, and system testing. The Val-Matic Backflow Actuator can be provided at the time of valve purchase or for field installation at a later date.

* The Val-Matic warranty and its remedies are available for 25 years covering the flex portion of the disc.

Make the change to QUALITY!
Specify VAL-MATIC®

Val-Matic's quality of design and meticulous workmanship has set the standards by which all others are measured. Quality design features such as Type 316 stainless steel trim as standard on Air Release, Air/Vacuum and Combination Air Valves...combined resilient/metal to metal seating for Silent Check® Valves...stabilized components that provide extended life of the Dual Disc® Check Valves...high strength and wear resistant aluminum bronze trim as standard for Tilted Disc® Check valves...unrestricted full flow area through Swing-Flex® Check Valves...heavy duty stainless steel screened inlet on Sure Seal® Foot Valves...a Cam-Centric® Plug Valve with more requested features than any other eccentric plug valve, and the American-BFV® Butterfly Valve that provides a field replaceable seat without the need for special tools. These features coupled with our attention to detail put Val-Matic valves in a class by themselves.

Val-Matic is totally committed to providing the highest quality valves and outstanding service to our customers. Complete customer satisfaction is our goal.

VAL-MATIC®

VAL-MATIC VALVE AND MANUFACTURING CORP.

905 RIVERSIDE DRIVE • ELMHURST, IL 60126
630/941-7600 • FAX: 630/941-8042
www.valmatic.com valves@valmatic.com

3. Odour Control & Generator Slab

BORAL **Boral Testing Services**

Whinstanes Laboratory
Boral Resources (Qld) Pty Limited
ACN: 009 671 809
Cullen Ave West, Whinstanes, Qld, 4007

Phone: (07) 3861 8500
Fax: (07) 3861 8599

Concrete Test Report

Report No: WWH-12/04542
Issue No: 1
This report replaces all previous issues of report no 'WWH-12/04542'.

Client: MORGAN BROS
51 WOODEND CT
PARK RIDGE QLD 4125

Project: BRISBANE RD, REDBANK

NATA

The document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025

NATA Accredited Laboratory Number: 489

Approved Signatory: Mark Hasler

Date of Issue: 9/05/2012

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL

COMPRESSIVE STRENGTH OF CONCRETE CYLINDERS

Details of Sampled Concrete / Concrete Specimens and Results

Date & Time Batched Load / Prog. Load	Truck No Time Sampled	Plant Code Docket No Product Code	Grade(MPa) Agg(mm) Slump/Super(mm) Design	Air (%) Compact Measured	Specimen Ident.	Dimensions (mm) Avg. Diameter	Height	Density (kg/m³)	Curing Initial (hrs)	Std (days)	Type of Cap	Date of Test	Age (days)	Strength (MPa)	Marks	Fail Mode	Location & Remarks
03/04/12	40205	QWA	N32	N/A	1733A	100.1	196	2420	23	6	N	10/04/12	7	24.0		N	Sampling AS 1012.1 Cl 6b
11:10	11:44	44858853	20	XV	1733B	99.9	196	2420		27	N	01/05/12	28	31.5		N	Concrete Temp. (°C): 28
6		PU32-20-BS	80/N/A	80/N/A	1733C	99.9	196	2420		27	N	01/05/12	28	28.5	E	S	FOUNDATION FOR GENERATOR SLAB

Notes

1. Sampling in accordance with AS 1012.1
2. Slump Test in accordance with AS 1012.3.1
3. Compaction by vibration, in accordance with AS 1012.8.1 Clause 7.4
4. Initial Curing in accordance with AS 1012.8.1 Clause 9.2.2
5. Standard Curing in accordance with AS 1012.8.1 Clause 9.3(a)
6. Capping R - Rubber, S - Sulphur, N - Nil, T - Timber, G - Ground
7. Compressive Strength in accordance with AS 1012.9
8. Density in accordance with AS 1012.12.1
9. Moisture Condition SSD in accordance with AS 1012.12.1, unless otherwise stated

Remarks

Marks: E = Excluded from AS1379
FailureMode: N = Normal, S = Shear
Compaction: XV = External Vibrator
NATA endorsement applies only to work carried out by this laboratory. Our staff did not perform field work. This was performed by Jamie Burns Nata Cert Tester No 730

Form No: 18969, Report No: WWH-12/04542

BORAL
Building something great™

CONCRETE FIELD TEST INFORMATION SHEET - AS1012.1,3.1,8.1,8.2

BORAL TESTING SERVICES - ACN 009 671 809 - PO BOX 162, HAMILTON QLD 4007 - TEL: 3861 8500 FAX: 3861 8599

DATE CAST: 4 . 5 . 12 **REPORT No.** -

CUSTOMER: MORGAN BROS.

PROJECT: BRISBANE RD. REDBANK

TESTER No. 14

NATA Accreditation No. 489

Job No.	42093		
Mix Code:	Q1S322SA		
Mix Description:	32/20/80		
Truck Number:	148		
Sample Number:	75439	75440	75441
Docket Number:	44859884		
Plant:	60		
Strength Grade:	32/20		
Load Size m^3:	5.6		
Time Batched:	12.57		
Time Tested:	13.20		
Ordered Slump:	80		
Measured Slump:	80		
Ambient Temp:	23		
Concrete Temp:	27		
W.A.B.T / W.A.A.T.	W.A.B.T / W.A.A.T. = NIL	W.A.B.T / W.A.A.T. =	W.A.B.T / W.A.A.T. =
Weather F / O / R	O		
Pour Location	ODOR SLAB PIERS - SP344		

Specified Slump	Slump Range	Cyl. Ref	Mould Number	Age	Test Date	Paid / QC	Cyl. Ref	Mould Number	Age	Test Date	Paid / QC	Cyl. Ref	Mould Number	Age	Test Date	Paid / QC
<60	+/- 10.....1	A	5	7	11.5	PAID QC	A				PAID QC	A				PAID QC
≥60 ≤80	+/- 15.....2	B	266	28	1.6	PAID QC	B				PAID QC	B				PAID QC
≥80 ≤110	+/- 20.....3	C	267	28	1.6	PAID QC	C				PAID QC	C				PAID QC
≥110 ≤150	+/- 30.....4	D				PAID QC	D				PAID QC	D				PAID QC
≥150	+/- 40.....5	E				PAID QC	E				PAID QC	E				PAID QC
Spread	+/- 75.....6	F				PAID QC	F				PAID QC	F				PAID QC
		G				PAID QC	G				PAID QC	G				PAID QC

Compaction Method AS1012.8
1.7.3 - Rodding.........1
1.7.4 - Vibration (Ext / Int).........2
1.7.5 - Ramming.........3
Method Unknown.........4

Comments: RAIN

Comments:

Comments:

Sampling Method AS1012.1
7.2.1 - Uninterrupted Discharge.........1
7.2.2 - Consistence Test Only.........2
7.2.3 - Slow Discharge.........3
7.2.4 - Terminated Discharge.........4
7.2.5 - Interrupted Discharge.........5
7.4 - After Discharge.........6
Method Unknown

FIELD TEST OFFICER

Commencement STD Moist Curing
5 / 5 / 12 @ 1020 Hrs
Curing Zone: Tropic/
if ≥36 hrs Field Temp:
MAX: MIN:

TESTING SERVICES
C.O.D. Charge: ✓ $
CUSTOMER SIGNATURE
PRINT NAME

BORAL
Building something great™

CONCRETE FIELD TEST INFORMATION SHEET - AS1012.1,3.1,8.1,8.2

BORAL TESTING SERVICES - ACN 009 671 809 - PO BOX 162, HAMILTON QLD 4007 - TEL: 3861 8500 FAX: 3861 8599

DATE CAST:	24-4-12	REPORT No.	
CUSTOMER:	Morgan Bros	TESTER No.	33
PROJECT:	Urban utilities upgrade		NATA Accreditation No. 489

Job No.	42094		
Mix Code:	QR322SM		
Mix Description:	32-20-80		
Truck Number:	237		
Sample Number:	64822	64823	64824
Docket Number:	61261644		
Plant:	56		
Strength Grade:	32		
Load Size m^3:	5.8		
Time Batched:	1250		
Time Tested:	1315		
Ordered Slump:	80		
Measured Slump:	90		
Ambient Temp:	24°		
Concrete Temp:	26°		
W.A.B.T / W.A.A.T.	W.A.B.T / W.A.A.T. =	W.A.B.T / W.A.A.T. =	W.A.B.T / W.A.A.T. =
Weather F / O / R	overcast		
Pour Location	odour slab piers		

Specified Slump	Slump Range
<60	+/- 10.....1
≥60 ≤80	+/- 15.....2
≥80 ≤110	+/- 20.....3
≥110 ≤150	+/- 30.....4
≥150	+/- 40.....5
Spread	+/- 75.....6

Cyl. Ref	Mould Number	Age	Test Date	Paid / QC	Cyl. Ref	Mould Number	Age	Test Date	Paid / QC	Cyl. Ref	Mould Number	Age	Test Date	Paid / QC
A	1510	7	1.5	PAID QC	A				PAID QC	A				PAID QC
B	15415	28	22.5	PAID QC	B				PAID QC	B				PAID QC
C	1798	28	22.5	PAID QC	C				PAID QC	C				PAID QC
D				PAID QC	D				PAID QC	D				PAID QC
E				PAID QC	E				PAID QC	E				PAID QC
F				PAID QC	F				PAID QC	F				PAID QC
G				PAID QC	G				PAID QC	G				PAID QC

Compaction Method AS1012.8
- 1.7.3 - Rodding.....1
- 1.7.4 - Vibration (Ext / Int).....2
- 1.7.5 - Ramming.....3
- Method Unknown.....4

Comments:

Comments:

Comments:

Sampling Method AS1012.1
- 7.2.1 - Uninterrupted Discharge.....1
- 7.2.2 - Consistence Test Only.....2
- 7.2.3 - Slow Discharge.....3
- 7.2.4 - Terminated Discharge.....4
- 7.2.5 - Interrupted Discharge.....5
- 7.4 - After Discharge.....6
- Method Unknown.....7

FIELD TEST OFFICER
Kyle McNeilly

Commencement STD Moist Curing
/ / @ Hrs
Curing Zone: Tropic/ if ≥36 hrs Field Temp:
MAX: MIN:

TESTING SERVICES
C.O.D. Charge: $

CUSTOMER SIGNATURE

PRINT NAME

B No. 9292

SHEEHY & PARTNERS
PTY LIMITED
CONSULTING ENGINEERS
STRUCTURAL AND CIVIL
A.C.N. 009 899 905
ABN 52 009 899 905

TRANSMITTAL/SITE MEMORANDUM

To: DARREN WEDLEY
THRU: MERV
J & P RICHARDSON

date:- 4/MAY/12
job no:- 7789
from:- ALLAN YANGO

Attention:

Projects: ODOUR CONTROL UNIT SLAB

Description of Work:

INSPECTION OF BORED PIERS - SP34
- 14 BORED PIER HOLES INSPECTED
- SIZE AND SOCKET DEPTH IS
IN ACCORDANCE TO DRAWING 7789-S03
- BORED PIERS ADJACENT TO
SLOPING GROUND 2/OFF ARE
DEEPER - 2500
- ENSURE REQUIRED COVER TO
ALL REINFORCEMENTS ARE MAINTAINED

MERV MORGAN
0412727621

No of Copies	Dwg No	Description

Comments

sent to you for your
☐ information
☐ comment
☐ approval
☐ action

☐ enclosed herewith
☐ under separate cover
☐ our messenger
☐ your messenger
☐ by post

Copies to:

Sheehy & Partners Pty. Ltd.
per

DIRECTORS:
P. Jones, B.Eng., M.I.E.Aust., L.G.E.
P. Cockerill, Cert.Eng.
S. Thomas, B.Eng.(Hons), M.I.E.Aust.

3 Gregory Terrace
SPRING HILL QLD 4000
Phone (07) 3839 3644
Facsimile: (07) 3839 3655
RPECQ No. 25

BURNS' TESTING SERVICES

CONCRETE FIELD TESTING INFORMATION SHEET - AS1012.1,3.1,8.1

ABN 96 950 405 386 42 Moores Pocket Road, Tivoli Qld 4305
Wray: 0401 075 054 Ph: 07 3281 9131 Fax: 07 3282 7224

DATE CAST: 11/5/12		REPORT No.	
CUSTOMER: [illegible]		TESTER No.	NATA Accreditation No 18494
PROJECT: Brisbane Rd Redbank		20	

Job No.	42959		
Mix Code:	[illegible]		
Mix Description:	[illegible]		
Truck Number:	407		
Sample Number:	1007	1008	1009
Docket Number:	[illegible]242		
Plant:	60		
Strength Grade:	32		
Load Size m^3:	5.6		
Time Batched:	7.37		
Time Tested:	[illegible]		
Ordered Slump:	80		
Measured Slump:	[illegible]		
Ambient Temp:			
Concrete Temp:	[illegible]		
W.A.B.T / W.A.A.T.	W.A.B.T / W.A.A.T. =	W.A.B.T / W.A.A.T. =	W.A.B.T / W.A.A.T. =
Weather F / O / R	F		
Pour Location	[illegible]		

Specified Slump	Slump Range	Cyl. Ref	Mould Number	Age	Test Date	Paid / QC	Cyl. Ref	Mould Number	Age	Test Date	Paid / QC	Cyl. Ref	Mould Number	Age	Test Date	Paid / QC
<60	+/- 10.....1	A	3	7	21/5	PAID QC	A				PAID QC	A				PAID QC
≥60 ≤80	+/- 15.....2	B	41	28	11/6	PAID QC	B				PAID QC	B				PAID QC
≥80 ≤110	+/- 20.....3	C	47	28	11/6	PAID QC	C				PAID QC	C				PAID QC
≥110 ≤150	+/- 30.....4	D				PAID QC	D				PAID QC	D				PAID QC
≥150	+/- 40.....5	E				PAID QC	E				PAID QC	E				PAID QC
Spread	+/- 75.....6	F				PAID QC	F				PAID QC	F				PAID QC
Compaction Method AS1012.8		G				PAID QC	G				PAID QC	G				PAID QC

Compaction Method AS1012.8
1.7.3 - Rodding....1
1.7.4 - Vibration (Ext / Int)....2
1.7.5 - Ramming....3
Method Unknown....4

Comments:

Comments:

Comments:

Sampling Method AS1012.1
7.2.1 - Uninterrupted Discharge....1
7.2.2 - Consistence Test Only....2
7.2.3 - Slow Discharge....3
7.2.4 - Terminated Discharge....4
7.2.5 - Interrupted Discharge....5
7.4 - After Discharge....6
Method Unknown....7

FIELD TEST OFFICER

Commencement STD Moist Curing

11 / 5 / 12 @ [illegible] Hrs

Curing Zone: Tropic/ if ≥36 hrs Field Temp:

MAX: MIN:

TESTING SERVICES

C.O.D. [ ] Charge: [ ] $........

CUSTOMER SIGNATURE

PRINT NAME

BURNS' TESTING SERVICES

CONCRETE FIELD TESTING INFORMATION SHEET - AS1012.1,3.1,8.1
ABN 96 950 405 386 42 Moores Pocket Road, Tivoli Qld 4305
Wray: 0401 075 054 Ph: 07 3281 9131 Fax: 07 3282 7224

DATE CAST:	[illegible]	**REPORT No.**	
CUSTOMER:	Morgan [illegible]	**TESTER No.**	NATA Accreditation No 18494
PROJECT:	Brisbane Rd Redbank	20	

Job No.	42959		
Mix Code:	[illegible]		
Mix Description:	[illegible]		
Truck Number:	[illegible]		
Sample Number:	1733	1734	1735
Docket Number:	[illegible]		
Plant:	[illegible]		
Strength Grade:	32		
Load Size m^3:	6.0		
Time Batched:	11.10		
Time Tested:	11.44		
Ordered Slump:	80		
Measured Slump:	~~78~~ 80		
Ambient Temp:	28		
Concrete Temp:	28		
W.A.B.T / W.A.A.T.	W.A.B.T / W.A.A.T. =	W.A.B.T / W.A.A.T. =	W.A.B.T / W.A.A.T. =
Weather F / O / R	F		
Pour Location	[illegible]		

Specified Slump	*Slump Range*	Cyl. Ref	Mould Number	Age	Test Date	Paid / QC	Cyl. Ref	Mould Number	Age	Test Date	Paid / QC	Cyl. Ref	Mould Number	Age	Test Date	Paid / QC
<60	+/- 10.....1	A	[illegible]	[illegible]	[illegible]	PAID QC	A				PAID QC	A				PAID QC
≥60 ≤80	+/- 15.....2	B	[illegible]	[illegible]	[illegible]	PAID QC	B				PAID QC	B				PAID QC
≥80 ≤110	+/- 20.....3	C	[illegible]	[illegible]	[illegible]	PAID QC	C				PAID QC	C				PAID QC
≥110 ≤150	+/- 30.....4	D				PAID QC	D				PAID QC	D				PAID QC
≥150	+/- 40.....5	E				PAID QC	E				PAID QC	E				PAID QC
Spread	+/- 75.....6	F				PAID QC	F				PAID QC	F				PAID QC
Compaction Method AS1012.8		G				PAID QC	G				PAID QC	G				PAID QC

Compaction Method AS1012.8
1.7.3 - Rodding.....1
1.7.4 - Vibration (Ext / Int) 2
1.7.5 - Ramming.....3
Method Unknown.....4

Comments: | *Comments:* | *Comments:*

Sampling Method AS1012.1
7.2.1 - Uninterrupted Discharge.....1
7.2.2 - Consistence Test Only.....2
7.2.3 - Slow Discharge.....3
7.2.4 - Terminated Discharge.....4
7.2.5 - Interrupted Discharge.....5
7.4 - After Discharge.....6
Method Unknown.....7

FIELD TEST OFFICER

Commencement STD Moist Curing

/ / @ Hrs

Curing Zone: Tropic/ if ≥36 hrs Field Temp:

MAX: MIN:

TESTING SERVICES

C.O.D. Charge: $

CUSTOMER SIGNATURE

PRINT NAME

WHITE - OFFICE YELLOW - CYLINDERS PINK - CUSTOMER

Boral Concrete & Quarries

BORAL

BORAL RESOURCES (QLD) PTY LIMITED
ABN 46 009 671 809
Level 6, 88 Musk Ave, Kelvin Grove QLD 4059
PO Box 125 Kelvin Grove QLD 4059
Telephone (07) 3867 7600
Facsimile (07) 3867 7699

42007 60

Customer: Q15322SM
MORGAN BROS
528909 -42959

No: 44860148

Date:

Order No:

Time Batched: 14/05/2012 08:42 010

CON: PH#

Deliver to: BRISBANE RD
REDBANK

Job	Dist.	Truck	Map Ref
	8	40281	BR215R9

WACOL QLD MC
3726 IPSWICH ROAD
1300 30 59 24

LOT/BLOCK

Product: PUMP 32MPA 20MM

Spec:

STRENGTH	AGG SIZE	SLUMP
32	20MM	80

WARNING:
Freshly mixed cement, mortar, concrete or grout may cause skin injury. Avoid contact with the eyes and wash exposed skin areas thoroughly with water. If any cement mixture gets into eyes rinse with water continuously for 10 minutes and get prompt medical treatment. Wear suitable protective clothing and gloves.
Dust generated by drilling, sawing or chasing hardened concrete or quarry products may contain crystalline silica, which can cause lung disease. Avoid breathing concrete dust. Use adequate dust prevention and extraction methods. Wear suitable protective clothing, gloves, safety goggles and a dust mask that conforms to Australian Standards. If dust gets into the eyes, rinse with water continuously for 10 minutes. If dust is inhaled, move immediately to fresh air. Seek prompt medical advice.
Contact Boral for more information and a Material Safety Data Sheet.

Quantity:

Ordered	Progress: Job	Progress: Today	This Load
10.0		13.2	7.6

Additives/Extras:
PUMP 32MPA 20MM 7.6 M3

On Site:

Time on Site	830	Time off Site	835	Waiting Time	
Waiting Time Accepted	CUSTOMER SIGNATURE X				
Water Added	Litres	Tests			
Additives		Return	Metres		

TOTAL CASH/CHEQUE RECEIVED $

Received Carter
Received Plant
10

Customer Signature: X

Customer accepts the receipt and/or the return of the product and the on-site adjustments as documented on this docket, subject to the conditions of sale overleaf.

Prev. Docket: RR #100142

Driver Instructions: TREV 0412 777021
AT SEWAGE PUMPING STATION ON BRISBANE RD NEXT TO
SIX MILE CREEK

A Credit card surcharge may apply on the GST inclusive value of the transaction.

WHITE PART - Office Copy **YELLOW** - Carters Copy **PINK** - Customer Copy **GREEN** - Plant Copy

Boral Concrete & Quarries BORAL

BORAL RESOURCES (QLD) PTY LIMITED
ABN 46 009 671 809

Level 6, 88 Musk Ave, Kelvin Grove QLD 4059
PO Box 125 Kelvin Grove QLD 4059
Telephone (07) 3867 7600
Facsimile (07) 3867 7699

42007 60

Customer: Q153225M
MORGAN BROS
528909 -42959

No: 44860152

Date: 14/05/2012

Order No: JN:

Time Batched: 08:30 OLD

Deliver to: BRISBANE RD
REDBANK

WACOL QLD MC
3726 IPSWICH ROAD
1300 30 59 73

LOT/BLOCK

Job	Dist.	Truck	Map Ref
	6.5	40147	8H215R9

Product: PUMP 32MPA 20MM

STRENGTH	AGG SIZE	SLUMP
32	20MM	80

Spec: [redacted]

Quantity:

Ordered	Progress: Job	Progress: Today	This Load
18.0		18.8	5.6

WARNING:
Freshly mixed cement, mortar, concrete or grout may cause skin injury. Avoid contact with the eyes and wash exposed skin areas thoroughly with water. If any cement mixture gets into eyes rinse with water continuously for 10 minutes and get prompt medical treatment. Wear suitable protective clothing and gloves.
Dust generated by drilling, sawing or chasing hardened concrete or quarry products may contain crystalline silica, which can cause lung disease. Avoid breathing concrete dust. Use adequate dust prevention and extraction methods. Wear suitable protective clothing, gloves, safety goggles and a dust mask that conforms to Australian Standards. If dust gets into the eyes, rinse with water continuously for 10 minutes. If dust is inhaled, move immediately to fresh air. Seek prompt medical advice.
Contact Boral for more information and a Material Safety Data Sheet.

Additives/Extras: PUMP 32MPA 20MM 5.6 M3

On Site:

Time on Site	9.57	Time off Site		Waiting Time	
Waiting Time Accepted	CUSTOMER SIGNATURE X				
Water Added	Litres	Tests			
Additives		Return	Metres		

Customer Signature: X

TOTAL CASH/CHEQUE RECEIVED $

Received Carter

Received Plant

TRK #:40201

Customer accepts the receipt and/or the return of the product and the on-site adjustments as documented on this docket, subject to the conditions of sale overleaf.

Prev. Docket:

Driver Instructions: MERV 0412 227 621
AT SEWAGE PUMPING STATION ON BRISBANE RD NEXT TO
SIX-MILE CREEK

A credit card surcharge may apply on the GST inclusive value of the transaction.

WHITE PART - Office Copy **YELLOW** - Carters Copy **PINK** - Customer Copy **GREEN** - Plant Copy

Boral Concrete & Quarries

BORAL

BORAL RESOURCES (QLD) PTY LIMITED
ABN 46 009 671 809

Level 6, 88 Musk Ave, Kelvin Grove QLD 4059
PO Box 125 Kelvin Grove QLD 4059
Telephone (07) 3867 7600
Facsimile (07) 3867 7699

42007 60

Customer: MORGAN BROS
528909 -42959
Q133229M

No: 44860142

Date: 14/05/2012

Time Batched: 07:37 QLD

Order No: CJN: PH#

Deliver to: BRISBANE RD
REDBANK

WACOL QLD MC
3726 IPSWICH ROAD
1300 30 59 73

Job	Dist.	Truck	Map Ref
	8	40147	BR215R9

LOT/BLOCK

Product: PUMP 32MPA 20MM

Spec:

STRENGTH	AGG SIZE	SLUMP
32	20MM	80

[redacted]

Quantity:

Ordered	Progress: Job	Progress: Today	This Load
18.0		5.6	5.6

WARNING:
Freshly mixed cement, mortar, concrete or grout may cause skin injury. Avoid contact with the eyes and wash exposed skin areas thoroughly with water. If any cement mixture gets into eyes rinse with water continuously for 10 minutes and get prompt medical treatment. Wear suitable protective clothing and gloves.
Dust generated by drilling, sawing or chasing hardened concrete or quarry products may contain crystalline silica, which can cause lung disease. Avoid breathing concrete dust. Use adequate dust prevention and extraction methods. Wear suitable protective clothing, gloves, safety goggles and a dust mask that conforms to Australian Standards. If dust gets into the eyes, rinse with water continuously for 10 minutes. If dust is inhaled, move immediately to fresh air. Seek prompt medical advice.
Contact Boral for more information and a Material Safety Data Sheet.

Additives/Extras: PUMP 32MPA 20MM 5.6 M3

On Site:

Time on Site: 55 | Time off Site: | Waiting Time:

Waiting Time Accepted: CUSTOMER SIGNATURE X

Water Added: Litres | Tests:

Additives: | Return: Metres

Customer Signature: X

TOTAL CASH/CHEQUE RECEIVED $

Received Carter
Received Plant

Customer accepts the receipt and/or the return of the product and the on-site adjustments as documented on this docket, subject to the conditions of sale overleaf.

Prev. Docket: TRK #1

Driver Instructions: MERV 0412 727 621
AT SEWAGE PUMPING STATION ON BRISBANE RD NEXT TO
SIX-MILE CREEK

A Credit Card surcharge may apply on the GST inclusive value of the transaction.

CERTIFIED QUALITY

WHITE PART - Office Copy **YELLOW** - Carters Copy **PINK** - Customer Copy **GREEN** - Plant Copy

Boral Concrete & Quarries

BORAL

BORAL RESOURCES (QLD) PTY LIMITED
ABN 46 009 671 809

Level 6, 88 Musk Ave, Kelvin Grove QLD 4059
PO Box 125 Kelvin Grove QLD 4059
Telephone (07) 3867 7600
Facsimile (07) 3867 7699

42093 60

Customer: Q1S322SA
MORGAN BROS
528909 -42959

No: 44859884

Date:

Order No: MERV
CJN: PH#

Time Batched: 04/05/2012 12:57 OLD

Deliver to: BRISBANE RD
REDBANK

Job | Dist. 8 | Truck 40148 | Map Ref BR215R9

WACOL OLD MC
3726 IPSWICH ROAD
1300 30 59 73

LOT/BLOCK

Product: PUMP 32MPA 20MM

Spec:

STRENGTH	AGG SIZE	SLUMP
32	20MM	80

[redacted]

Quantity:

Ordered	Progress: Job	Progress: Today	This Load
80		5.6	5.6

WARNING:
Freshly mixed cement, mortar, concrete or grout may cause skin injury. Avoid contact with the eyes and wash exposed skin areas thoroughly with water. If any cement mixture gets into eyes rinse with water continuously for 10 minutes and get prompt medical treatment. Wear suitable protective clothing and gloves.
Dust generated by drilling, sawing or chasing hardened concrete or quarry products may contain crystalline silica, which can cause lung disease. Avoid breathing concrete dust. Use adequate dust prevention and extraction methods. Wear suitable protective clothing, gloves, safety goggles and a dust mask that conforms to Australian Standards. If dust gets into the eyes, rinse with water continuously for 10 minutes. If dust is inhaled, move immediately to fresh air. Seek prompt medical advice.
Contact Boral for more information and a Material Safety Data Sheet.

Additives/Extras:
PUMP 32MPA 20MM 5.6 M3

On Site:

Time on Site | Time off Site | Waiting Time

Waiting Time Accepted: CUSTOMER SIGNATURE X

Water Added: Litres | Tests:

Additives: | Return: Metres

Customer Signature: X

TOTAL CASH/CHEQUE RECEIVED: $

Received Carter
Received Plant

Customer accepts the receipt and/or the return of the product and the on-site adjustments as documented on this docket, subject to the conditions of sale overleaf.

Prev. Docket: TRK #:

Driver Instructions: AT SEWAGE PUMPING STATION ON BRISBANE RD NEXT TO ONE MILE CREEK - MERV 0412 727 621

A Credit Card surcharge may apply on the GST inclusive value of the transaction.

WHITE PART - Office Copy YELLOW - Carters Copy PINK - Customer Copy GREEN - Plant Copy

Boral Concrete & Quarries

BORAL

BORAL RESOURCES (QLD) PTY LIMITED
ABN 46 009 671 809
Level 6, 88 Musk Ave, Kelvin Grove QLD 4059
PO Box 125 Kelvin Grove QLD 4059
Telephone (07) 3867 7600
Facsimile (07) 3867 7699

42081 60

Customer: BLS322SM
MORGAN BROS
528909 -42959

No: 44858853

Date: 03/04/2012

Order No: MCORLAF ST
CJN: PH#

Time Batched: 11:10 OLD

Deliver to: BRISBANE RD
REDBANK

WACOL QLD MC
3726 IPSWICH ROAD
1300 30 59 73

Job	Dist.	Truck	Map Ref
	8	40205	BR215R9

LOT/BLOCK:

Product: PUMP 32MPA 20MM

Spec:

STRENGTH	AGG SIZE	SLUMP
32	20MM	80

WARNING:
Freshly mixed cement, mortar, concrete or grout may cause skin injury. Avoid contact with the eyes and wash exposed skin areas thoroughly with water. If any cement mixture gets into eyes rinse with water continuously for 10 minutes and get prompt medical treatment. Wear suitable protective clothing and gloves.
Dust generated by drilling, sawing or chasing hardened concrete or quarry products may contain crystalline silica, which can cause lung disease. Avoid breathing concrete dust. Use adequate dust prevention and extraction methods. Wear suitable protective clothing, gloves, safety goggles and a dust mask that conforms to Australian Standards. If dust gets into the eyes, rinse with water continuously for 10 minutes. If dust is inhaled, move immediately to fresh air. Seek prompt medical advice.
Contact Boral for more information and a Material Safety Data Sheet.

Quantity:

Ordered	Progress: Job	Progress: Today	This Load
6.0		6.0	6.0

Additives/Extras: PUMP 32MPA 20MM 6.0 M3

On Site:

Time on Site: | Time off Site: | Waiting Time:

Waiting Time Accepted: CUSTOMER SIGNATURE X

Water Added: Litres | Tests:

Additives: | Return: Metres

TOTAL CASH/CHEQUE RECEIVED: $

Received Carter

Received Plant

Customer Signature: X

Customer accepts the receipt and/or the return of the product and the on-site adjustments as documented on this docket, subject to the conditions of sale overleaf.

Prev. Docket: TRK #:

Driver Instructions: 04127 27521 CNR OF MCORLAF ST
OPPOSITE PAN PACIFIC GARDENS

A Credit Card surcharge may apply on the GST inclusive value of the transaction.

WHITE PART - Office Copy **YELLOW** - Carters Copy **PINK** - Customer Copy **GREEN** - Plant Copy

HALLCO ENGINEERING PTY. LTD.

ABN: 29 052 126 619 – ACN: 052 126 619

Pump Station, Concrete Construction, Steel and Aluminium Fabrication

PO Box 12
Moffat Beach Qld. 4551
Fax: (07) 5491 9818

Office: (07) 5491 6811
Mobile: 0418 741 536

Inspection & Checklist - STRUCTURAL CONCRETE PLACEMENT

Job/Contract Name SP34 **No** 1708

Lot No________ Pour Time ___ : ___ Pour Date 4/5 2012

Structure ① ABOVE SLAB PIERS ONLY

If test results are applicable the result/s are to be reported. For multiple results, report the range (maximum & minimum).
If test results are not applicable (ie. No test performed, visual inspection only) indicate conformance with a tick.

MPA 32 AGG 20 SLUMP 80

Delivery Docket No: 44859884 Test Docket No: 75439

ITEM	CHECKED
FOUNDATION WORK (If Applicable)	
1. Bearing Capacity / compaction	NA
2. Blinding Concrete	NA
FORMWORK	
1. Formwork adequately fixed / braced / held down	NA
2. Clean out	NA
3. Sealing of joints & corners	NA
4. Construction joint preparation	NA
5. Fillets	NA
6. Embedments / Blockouts (if applicable)	NA
REINFORCEMENT	
1. Correct size, shape & spacing	✓
2. Cover	✓
3. Starter Bars & Dowels	✓
4. Chairs	✓
PLACING	
1. Notice of Inspection given	✓
2. Survey	NA
3. Pump / Truck access	✓
READY TO POUR: Signed (Concrete Foreman)	Date 4/5/12
IS THE LOT ACCEPTED: Signed (Concrete Foreman)	Date __/__/__

Comments:

HALLCO ENGINEERING PTY. LTD.
ABN: 29 052 126 619 – ACN: 052 126 619
Pump Station, Concrete Construction, Steel and Aluminium Fabrication
PO Box 12
Moffat Beach Qld. 4551
Fax: (07) 5491 9818
Office: (07) 5491 6811
Mobile: 0418 741 536

Inspection & Checklist - STRUCTURAL CONCRETE PLACEMENT

Job/Contract Name SP34 **No** 1709

Lot No ______ Pour Time ___ : ___ Pour Date 14/05/2012

Structure ODOUR SLAB + FOUNDATIONS

If test results are applicable the result/s are to be reported. For multiple results, report the range (maximum & minimum).
If test results are not applicable (ie. No test performed, visual inspection only) indicate conformance with a tick.

MPA 32 AGG 20 SLUMP 80

Delivery Docket No: 44860142 Test Docket No: 1007

ITEM	CHECKED
FOUNDATION WORK (If Applicable)	
1. Bearing Capacity / compaction	NA
2. Blinding Concrete	NA
FORMWORK	
1. Formwork adequately fixed / braced / held down	NA
2. Clean out	NA
3. Sealing of joints & corners	NA
4. Construction joint preparation	NA
5. Fillets	NA
6. Embedments / Blockouts (if applicable)	NA
REINFORCEMENT	
1. Correct size, shape & spacing	✓
2. Cover	✓
3. Starter Bars & Dowels	✓
4. Chairs	✓
PLACING	
1. Notice of Inspection given	✓
2. Survey	NA
3. Pump / Truck access	✓
READY TO POUR: Signed (Concrete Foreman) [signature]	Date 14/5/12
IS THE LOT ACCEPTED: Signed (Concrete Foreman)	Date / /
Comments:	

Compliance Certificate for building Design or Specification

15

NOTE Sheehy & Partners Pty Ltd Job No.7789	**This is to be used for the purposes of section 10 of the *Building Act 1975* and/or section 46 of the *Building Regulation 2006*.** **RESTRICTION: A building certifier (class B) can only give a compliance certificate about whether building work complies with the BCA or a provision of the QDC. A building certifier (Class B) can not give a certificate regarding QDC boundary clearance and site cover provisions.**
1. Property description **This section need only be completed if details of street address and property description are applicable.** **EG. In the case of (standard/generic) pool design/shell manufacture and/or patio and carport systems this section may not be applicable.** The description must identify all land the subject of the application. The lot & plan details (eg. SP / RP) are shown on title documents or a rates notice. If the plan is not registered by title, provide previous lot and plan details.	Street address *(include no., street, suburb / locality & postcode)* Sewage Pump Stations SP01, SP33 and SP34 Located on Drawing 7789-S00 Postcode Lot & plan details *(attach list if necessary)* In which local government area is the land situated? Ipswich
2. Description of component/s certified Clearly describe the extent of work covered by this certificate, e.g. all structural aspects of the steel roof beams.	All structural aspects of the foundations and slabs on ground as indicated on Sheehy & Partners Drawings numbered 7789-S00, 7789-S01, 7789-S02 and 7789-S03 in their most up to date revision.
3. Basis of certification Detail the basis for giving the certificate and the extent to which tests, specifications, rules, standards, codes of practice and other publications, were relied upon.	Documents relied upon include the project arrangement drawings, equipment vendor drawings and geotechnical investigation report for the project and the following current Australian Standard Codes: Structural Design Actions Code AS/NZS 1170 Residential Slabs and Footings Code AS2870 Concrete Structures Code AS3600 Piling Code AS2159 Design Criteria are as indicated on the project structural drawings. Limitations on the certification: 1. The issue of this certificate in no way reduces the responsibility of the Builder to undertake all building works consistent with the relevant plans, Building Act and Regulations and good building practice. 2. Proprietary items (eg deformed reinforcement bar, welded mesh etc) are deemed to be covered by the manufacturer's certification.
4. Reference documentation Clearly identify any relevant documentation, e.g. numbered structural engineering plans.	Sheehy & Partners Structural Engineering Drawings numbered 7789-S00, 7789-S01, 7789-S02 and 7789-S03. Civiltech Engineering Geotechnical Investigation Report number 12015 dated 16 February 2012. Kellog Brown & Root project arrangement drawings dated 29.07.2011. Siemens Water Technologies equipment arrangement drawings for project number 20338 dated 12.01.2012.

LOCAL GOVERNMENT USE ONLY

Date received		Reference Number/s		Approved form 15 Version 2 02/0?

Form 15 continued

5. Building certifier reference number	Building certifier reference number
6. Competent person details A competent person for building work, means a person who is assessed by the building certifier for the work as competent to practise in an aspect of the building and specification design, of the building work because of the individual's skill, experience and qualifications in the aspect. The competent person must also be registered or licensed under a law applying in the State to practice the aspect. If no relevant law requires the individual to be licensed or registered to be able to give the help, the certifier must assess the individual as having appropriate experience, qualifications or skills to be able to give the help. If the chief executive issues any guidelines for assessing a competent person, the building certifier must use the guidelines when assessing the person.	Name (*in full*) Scott McDonald Company name (*if applicable*): Sheehy & Partners Pty Ltd Contact person: Scott McDonald Phone no. *business hours*: (07) 3839 3644 Mobile no.: 0413 262 546 Fax no.: (07) 3839 3655 Email address scottmc@sheehy.com.au Postal address 3 Gregory Terrace Spring Hill QLD Postcode 4000 Licence or registration number (*if applicable*) RPEQ No. 8023
7. Signature of competent person This certificate must be signed by the individual assessed by the building certifier as competent.	Signature [signature] Date: 15/03/2012

Inspection Certificate / Aspect Certificate / QBSA Licensee Aspect Certificate 16

NOTE Sheehy & Partners Pty Ltd Job No. 7789	This is to be used for the purposes of section 10(c) of the *Building Act 1975* and/or section 47 of the *Building Regulation 2006*.
1. Indicate the type of certificate	☒ **Inspection Certificate** for ☐ Stage of building work (for single detached class 1a or class 10 building or structure) (indicate the stage) ______ ☒ Aspect of building work (indicate the aspect) Completed concrete slabs and foundations ☐ **QBSA Licensee Aspect Certificate** **Scope of the work** Scope of the work covered by the licence class under the *Queensland Building Services Authority Regulation 2003* for the aspect being certified, eg scope of work for a waterproofing licence is "installing waterproofing materials or systems for preventing moisture penetration". An aspect being certified may include "wet area sealing to showers".
2. Property description The description must identify all land the subject of the application. The lot & plan details (eg. SP / RP) are shown on title documents or a rates notice. If the plan is not registered by title, provide previous lot and plan details.	Street address *(include no., street, suburb / locality & postcode)* Queensland Urban Utilities Sewage Pump Stations SP01, SP33 and SP34 Located on Drawing 7789-S00 Postcode Lot & plan details *(Attach list if necessary)* In which local government area is the land situated? Ipswich
3. Building description	Building description: Foundation slabs for pump station odour control units Class of building / structure: 10b
4. Description of component/s certified Clearly describe the extent of work covered by this certificate, e.g. all structural aspects of the steel roof beams.	All structural aspects of the foundations and slabs on ground as indicated on Sheehy & Partners Drawings numbered 7789-S00, 7789-S01, 7789-S02 and 7789-S03 in their most up to date revision.

LOCAL GOVERNMENT USE ONLY

DATE RECEIVED	REFERENCE NUMBER/S	Approved form 16 Version 2. 02/08

Form 16 continued

5. Basis of certification

Detail the basis for giving the certificate and the extent to which tests, specifications, rules, standards, codes of practice and other publications, were relied upon.

Documents relied upon include the project arrangement drawings, equipment vendor drawings and geotechnical investigation report for the project and the following current Australian Standard Codes:

Structural Design Actions Code AS/NZS 1170
Residential Slabs and Footings Code AS2870
Concrete Structures Code AS3600
Piling Code AS2159

Design Criteria are as indicated on the project structural drawings.

Limitations on the certification:

1. The issue of this certificate in no way reduces the responsibility of the Builder to undertake all building works consistent with the relevant plans, Building Act and Regulations and good building practice.
2. The certificate has been based on periodic inspections normally conducted prior to the final completed construction by the Builder of the elements concerned (ie the actual completed structure was not inspected)
3. The certificate does not cover issues such as the Builder's activities after the inspection, plumbing, waterproofing, termite protection, equipment installation and other matters that are the Builder's responsibility.
4. Proprietary items (eg welded wire reinforcement mesh etc) are deemed to be covered by the manufacturer's certification.
5. Obtaining local government approvals for changes in the approved materials or detail variations remain the responsibility of the Builder.

6. Reference documentation

Clearly identify any relevant documentation, e.g. numbered structural engineering plans.

- Sheehy & Partners Structural Engineering Drawings numbered 7789-S00, 7789-S01, 7789-S02 and 7789-S03.
- Civiltech Engineering Geotechnical Investigation Report number 12015 dated 16 February 2012.
- Kellog Brown & Root project arrangement drawings dated 29.07.2011.
- Siemens Water Technologies equipment arrangement drawings for project number 20338 dated 12.01.2012.

7. Building certifier reference number and development approval number

Building certifier reference number	Development approval number

8. Building Certifier or competent person details

A **competent person** must be assessed as competent before carrying out the inspection.

The builder for the work cannot give a stage certificate of inspection.

A competent person is assessed by the building certifier for the work as competent to practice in an aspect of the building and specification design, because of the individual's skill, experience and qualifications. The competent person must be registered or licensed under a law applying in the State to practice the aspect.

If no relevant law requires the individual to be licensed or registered, the certifier must assess the individual as having appropriate experience, qualifications or skills to be able to give the help.

If the chief executive issues any guidelines for assessing a competent person, the building certifier must use the guidelines when assessing the person.

Name (*in full*): Scott McDonald

Company name *if applicable*: Sheehy & Partners

Contact person: Scott McDonald

Phone no. *business hours*: (07) 3839 3644

Mobile no.: 0413 262 546

Fax no.: (07) 3839 3655

Email address: scottmc@sheehy.com.au

Postal address:
3 Gregory Terrace
Spring Hill QLD Postcode 4000

Licence class: RPEQ

Licence number: 8023

Date approval to inspect received from building certifier:

Form 16 continued

9. Signature of building certifier, competent person or QBSA licensee	☒ **Inspection Certificate for stage or aspect** ☐ **QBSA Licensee Aspect Certificate** ☐ A person who may under s43 give a QBSA licensee certificate for the aspect if it complies with the requirements for self assessable building work under the *Building Regulation 2006* s44. Signature: [signature] Date: 4/07/2012

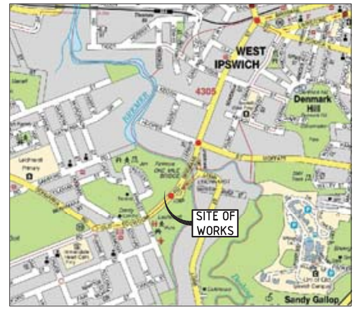
The Building Act 1975 is administered by the Department of Infrastructure and Planning

Queensland Government
Department of Infrastructure and Planning

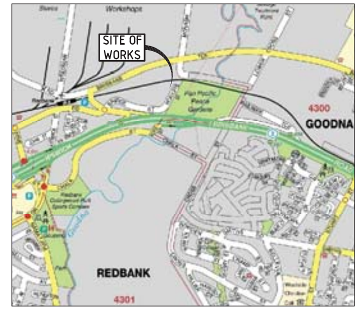
SEWAGE PUMP STATIONS REFURBISHMENTS
SEWAGE PUMP STATIONS SP01, SP33 & SP34

DRAWING SCHEDULE

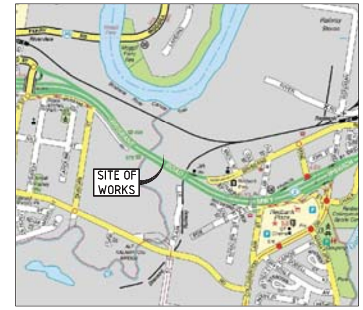
DWG. NO.	DRAWING TITLE
7789-S00	DRAWING SCHEDULE & NOTES SHEET
7789-S01	SEWAGE PUMP STATION SP01, SLAB LAYOUT PLAN & SECTIONS
7789-S02	SEWAGE PUMP STATION SP33, SLAB LAYOUT PLAN & SECTIONS
7789-S03	SEWAGE PUMP STATION SP34, SLAB LAYOUT PLAN & SECTIONS



SP01 LOCALITY PLAN
UBD MAP No. 212 (GRID R,20)
NTS



SP33 LOCALITY PLAN
UBD MAP No. 216 (GRID D,8)
NTS



SP34 LOCALITY PLAN
UBD MAP No. 215 (GRID N,10)
NTS

CONCRETE NOTES

1. ALL CONCRETE WORK SHALL BE EXECUTED IN ACCORDANCE WITH THE FOLLOWING CODES, UNLESS SPECIFICALLY VARIED BY THE CONTRACT DOCUMENTS:
   AS3600 CONCRETE STRUCTURES
   AS3610 FORMWORK FOR CONCRETE
   AS2870 RESIDENTIAL SLABS AND FOOTINGS (IF APPLICABLE)
2. THE CHARACTERISTIC COMPRESSIVE STRENGTH OF CONCRETE TEST CYLINDERS (f'c) SHALL BE AS FOLLOWS:

LOCATION	f'c AT 28 DAYS (MPa)	SLUMP (mm)	MAXIMUM AGGREGATE SIZE (mm)
FOOTING	32	80	20
GROUND SLABS	32	80	20

3. EXPOSURE CLASSIFICATION:

LOCATION	EXPOSURE CLASSIFICATION
FOOTINGS	A2
EXTERNAL CONCRETE SURFACES	B1

4. CURING REQUIREMENTS:

EXPOSURE CLASSIFICATION	MINIMUM f'c (MPa)	MINIMUM INITIAL CONTINUAL CURING DURATION (SEE AS 3600 CLAUSE 17.1.5.1)
A1	20	3 DAYS
A2	25	3 DAYS
B1	32	7 DAYS

5. COVER:

LOCATION	COVER (mm)
FOOTINGS	50
SLABS:	
- EXTERNAL	40

6. ALL CONCRETE SHALL BE VIBRATED IN ACCORDANCE WITH AS3600.
7. STEEL CHAIRS (PLASTIC TIPPED), PLASTIC CHAIRS OR CONCRETE BLOCKS SHALL BE USED TO SUPPORT REINFORCEMENT AND GIVE CORRECT COVER. SPACING OF CHAIRS TO MESH REINFORCEMENT TO BE MAXIMUM 800mm CENTERS.
8. SIZES SHOWN ARE STRUCTURAL SIZES AND DO NOT INCLUDE APPLIED FINISHES.
9. REINFORCEMENT IS SHOWN DIAGRAMMATICALLY AND NOT IN TRUE PROJECTION.
10. NO CHASES OR HOLES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS WILL BE PERMITTED IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL OF THE ENGINEER.
11. ALL PENETRATIONS THROUGH SLABS (eg. PIPES FOR SERVICES) SHALL BE FULLY WRAPPED WITH ABLEFLEX.
12. FORMWORK FINISHES TO CLASS 2.
13. WELDING OF REINFORCEMENT WILL NOT BE PERMITTED.
14. STRIPPING OF FORMWORK:

MINIMUM f'c (MPa)	MINIMUM AVERAGE COMPRESSIVE STRENGTH (MPa) AT THE TIME OF STRIPPING OF FORMS OR REMOVAL FROM MOULDS
20 & 25	15
32	20
40	25
50	32

15. SPLICES IN REINFORCEMENT SHALL BE MADE IN PLACES SHOWN OR APPROVED IN ALL CASES. GENERALLY AT MIDSPAN FOR TOP STEEL AND NEAR SUPPORTS FOR BOTTOM STEEL. IN ALL CASES THE LAP LENGTH SHALL BE AS PER NOTE 22 BELOW.
16. BAR NOMENCLATURE:
    R. INDICATES PLAIN ROUND BAR, TO AS/NZS4671
       fsy= 250 MPa, DIAMETER IN (mm)
    W. INDICATES STEEL WIRE, TO AS/NZS4671
       fsy= 550 MPa, DIAMETER IN (mm)
    N. INDICATES DEFORMED BARS, TO AS/NZS4671
       fsy= 500 MPa, DIAMETER IN (mm)
17. UNLESS SHOWN OTHERWISE, DISTRIBUTION STEEL SHALL BE N12 AT 400mm CENTRES.
18. SL72etc. INDICATES REINFORCING FABRIC CONFORMING TO AS/NZS4671, LAP LENGTHS SHALL BE:

FABRIC	END LAP (mm)	SIDE LAP (mm)
RL918, RL718	425	125
SL102, SL92, SL82, SL81, SL72, SL62	425	225
L8, L11, & L12 TRENCH MESH	350	-

19. TOP STEEL HAS MAIN BARS OR WIRES ON TOP, BOTTOM STEEL HAS MAIN WIRES OR BARS ON BOTTOM.
20. UNLESS OTHERWISE SHOWN BAR LAPS SHALL BE:

DIAMETER (mm)	TENSION LAP (mm)	TENSION ANCHORAGE (mm)
12	600	500
16	900	800
20	1200	1000
24	1600	1300
28	2000	1600
32	2400	1900
36	2800	2300

21. INDICATES REINFORCING BARS AT 90 DEGREES TO PLANE OF PAPER: ● ● ● ● ● ●
22. CURING SHALL BE EFFECTED BY USE OF AN APPROVED CURING OIL WHICH SHALL BE APPLIED TO ALL CONCRETE SURFACES WHERE VISIBLE IMMEDIATELY CONCRETE IS HARD, AND TO ALL FORMED SURFACES IMMEDIATELY AFTER FORMS ARE REMOVED EXCEPT WHERE AN APPLIED FINISH IS TO BE USED. CURING OIL SHALL THEN BE TAKEN OUT BY MAINTAINING THE SURFACE IN A MOIST CONDITION. OTHER CURING METHODS SHALL BE APPROVED IN WRITING BY THE ENGINEER PRIOR TO USE. NO CONSTRUCTION/ EXPANSION JOINTS PERMITTED UNLESS SHOWN ON DRAWINGS.
23. CONCRETE TESTING RESULTS TO BE PROVIDED AT 1 TEST PER 50m3.

BORED PIER NOTES

1. BORED PIERS SHALL BE FOUNDED 300mm MINIMUM INTO VERY STIFF NATURAL CLAY WITH AN ALLOWABLE END BEARING CAPACITY OF AT LEAST 250kPa AND ALLOWABLE SHAFT SKIN FRICTION IN SAME MATERIAL OF AT LEAST 15kPa, UNLESS OTHERWISE NOTED. REFER TO GEOTECHNICAL REPORT NUMBER 12015 PREPARED BY CIVILTECH ENGINEERING, DATED 16 FEBRUARY 2012. ALL FOUNDING MATERIAL & DEPTHS SHALL BE DETERMINED & APPROVED BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER AT BUILDERS COST.
2. ALL MATERIALS, WORKMANSHIP AND PRACTICE SHALL COMPLY WITH THE REQUIREMENTS OF AS 2159: PILING - DESIGN AND INSTALLATION.
3. THE MAXIMUM DEVIATION OF THE PILE CENTRE POINT AS NOTED ON THE SETTING OUT DRAWINGS SHALL NOT EXCEED 75mm IN PLAN. THE ALIGNMENT OF EACH PILE SHALL BE WITHIN 4% OF THE SPECIFIED INCLINATIONS FOR PILES RAKED UP TO 1 IN 5, AND 7% FOR PILES RAKED MORE THAN 1 IN 5. WHERE PILES DEVIATE TO SUCH AN EXTENT THAT ADDITIONAL PILES, RE-DESIGN OR ENLARGEMENT OF THE PILE-CAP, ARE NECESSARY TO COMPENSATE FOR SUCH DEVIATIONS, THE CONTRACTOR SHALL BE LIABLE FOR ALL ADDITIONAL COSTS INCURRED IN SUCH MODIFICATIONS.
4. THE PILING OPERATION SHALL BE SUPERVISED BY A COMPETENT PERSON, PROPERLY QUALIFIED AND EXPERIENCED IN PILING OPERATIONS. THIS SUPERVISOR SHALL BE IN ATTENDANCE AT ALL TIME WHEN PILING IS BEING CARRIED OUT.
5. ALL MATERIALS RELATING TO THE PILES SUCH AS CEMENT, AGGREGATES, WATER, REINFORCEMENT, ADMIXTURES ETC SHALL CONFORM TO THE STANDARD SPECIFICATION FOR CONCRETE AND CONCRETE SUPPLY. SIMILARLY, CONCRETE QUANTITIES AND TESTING OF SAME SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION.
6. THE PILING CONTRACTOR SHALL PROVIDE FOR CHECKING SETTING OUT POSITIONS AS PROVIDED, AND HE SHALL BRING ANY DISCREPANCIES TO THE NOTICE OF THE ENGINEER. SHOULD ANY PILES BE FOUND TO BE OUTSIDE THE REQUIRED TOLERANCE, THESE SHALL BE REPLACED BY A NEW PILE AT THE CONTRACTORS EXPENSE.
7. CARE SHALL BE TAKEN DURING TRIMMING TO PREVENT CRACKING OR OTHERWISE DAMAGING THE STEEL REINFORCEMENT. ANY DAMAGED CONCRETE SHALL BE REMOVED AND THE DAMAGED SECTION ADEQUATELY REPAIRED.
8. UNLESS OTHERWISE STATED, ALL PILES SHALL BE CONSTRUCTED AS BORED IN-SITU NON-DISPLACEMENT PILES. SHOULD THE CONTRACTOR WISH TO USE AN ALTERNATIVE PILING TECHNIQUE, DETAILS SHALL BE SUBMITTED FOR APPROVAL, PRIOR TO WORKS COMMENCING ON SITE AND SHALL DEMONSTRATE COMPLIANCE WITH AS 2159.
9. THE TOLERANCE ON STRAIGHTNESS OF ANY PORTION, AND OF THE COMPLETED LENGTH OF PILE, SHALL BE 1/100 OF THE LENGTH OF THE PILE.
10. BORING SHALL BE CARRIED OUT WITH THE APPROVED PLANT AND THE HOLE SHALL BE ADVANCED BY APPROVED PROCEDURES. PILES SHALL NOT BE BORED ADJACENT TO PILES ALREADY CAST AND WHICH CONTAIN WORKABLE OR UNSET CONCRETE.
11. TEMPORARY LINERS OF APPROVED QUALITY SHALL BE USED TO MAINTAIN THE STABILITY OF PILE EXCAVATION WHICH MIGHT OTHERWISE COLLAPSE, IN ACCORDANCE WITH AS 2159. TEMPORARY LINERS SHALL BE FREE FROM SIGNIFICANT DISTORTION, AND SHALL BE OF UNIFORM TUBULAR CROSS-SECTION THROUGHOUT EACH CONTINUOUS LENGTH. DURING CONCRETING, THEY SHALL BE FREE FROM INTERNAL PROJECTIONS AND CRUSTED CONCRETE WHICH MIGHT INHIBIT THE PROPER FORMATION OF PILES.
12. REINFORCEMENT FOR BORED PILES SHALL BE HIGH YIELD STEEL TO AS 4671. REINFORCEMENT SHALL BE PROPERLY POSITION AND HELD AGAINST DISPLACEMENT DURING THE FORMATION OF THE PILE. REINFORCEMENT SHALL PROJECT ABOVE THE PILE CUT-OFF LEVEL TO PROVIDE THE REQUIRED ANCHORAGE AND LAP LENGTHS AS SPECIFIED IN THE CONTRACT DRAWINGS.
13. CONCRETE PRODUCTION, PLACEMENT, COMPACTION AND CURING SHALL COMPLY WITH AS 3600 & AS 2154 STANDARD SPECIFICATIONS FOR CONCRETE AND CONCRETE SUPPLY. CONCRETE SHALL BE PLACED IN SUCH A MANNER THAT SEGREGATION OF THE CONCRETE DOES NOT OCCUR AND THAT THE POSITION OF THE REINFORCEMENT IS MAINTAINED, IF LINERS ARE TO BE REMOVED THE CONCRETE MUST BE PLACED IN SUFFICIENT QUANTITY & FLUIDITY SO THAT THE CONCRETE IS NOT LIFTED WITH THE LINER.

GENERAL NOTES

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE KELLOGG BROWN & ROOT Pty Ltd. DRAWINGS AND THE PROJECT SPECIFICATION. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER IN WRITING.
2. THE FLOORS HAVE BEEN DESIGNED TO CARRY THE FOLLOWING LIVE LOADS:
   SLAB ON GROUND = 5 (kPa)
   EQUIPMENT LOADS AS INDICATED ON THE SITE SPECIFIC DRAWINGS
3. ALL SETOUT, SLAB SIZES, SURFACE FINISHES, SURFACE FALL'S, EQUIPMENT HOLD DOWN AND OTHER DETAILS NOT SHOWN ON SHEEHY & PARTNERS DRAWINGS, ARE TO BE IN ACCORDANCE WITH SIEMENS AND KBR DRAWINGS PROVIDED IN THE CONTRACT.
4. ALL DIMENSIONS SHALL BE CHECKED ON SITE BEFORE WORK COMMENCES.
5. DIMENSIONS SHALL NOT BE OBTAINED BY SCALING STRUCTURAL DRAWINGS.
6. DURING CONSTRUCTION, THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION.
7. ALL PROPRIETARY PRODUCTS SHALL BE FIXED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS TO WITHSTAND THE APPLICABLE DESIGN LOADS UNLESS SPECIFICALLY VARIED BY THE DOCUMENTS.
8. IF AT ANY TIME PRIOR TO PRACTICAL COMPLETION, THE CONTRACTOR SHOULD BECOME AWARE OF ANY SIGNS OF DISTRESS, EXCESSIVE SETTLEMENT OR DEFLECTION, CONFLICT OF COMPONENTS OR ANY OTHER INDICATIONS WHATSOEVER OF ACTUAL OR POTENTIAL DAMAGE TO THE CONTRACTOR WORK OR ANY PART THEREOF, HE SHALL FORTHWITH NOTIFY THE ENGINEER AND CONFIRM SUCH NOTICE IN WRITING AS SOON AS IS PRACTICABLE.

FOUNDATION NOTES

1. ALL SLAB EDGE BEAMS AND STRIP FOOTINGS SHALL BE FOUNDED 200mm MINIMUM INTO NATURAL MATERIAL WITH AN ALLOWABLE BEARING CAPACITY OF AT LEAST 150kPa. ALL BORED PIERS SHALL BE FOUNDED 300mm MINIMUM INTO APPROVED FOUNDING MATERIAL WITH AN ALLOWABLE BEARING CAPACITY OF AT LEAST 250kPa, UNLESS NOTED OTHERWISE. APPROVED FOUNDING MATERIAL SHALL BE VERY STIFF NATURAL CLAY. REFER TO GEOTECHNICAL REPORT NUMBER 12015 PREPARED BY CIVILTECH ENGINEERING, DATED 16 FEBRUARY 2012. ALL FOUNDING MATERIAL AND DEPTHS SHALL BE DETERMINED & APPROVED ON SITE BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER.
2. SLAB & FOOTING DESIGN IS BASED ON ASSUMED CLASS "H1" SITE CLASSIFICATION.
3. FOR SLABS ON GROUND, ALL TOPSOIL AND UPPER STRATA CONTAINING ORGANIC MATTER SHALL BE REMOVED AND REPLACED BY AN APPROVED CONSOLIDATED FILLING MATERIAL PLACED AND COMPACTED IN ACCORDANCE WITH AS 2870 - RESIDENTIAL SLABS & FOOTINGS, COMPACTED TO 95% MODIFIED DRY DENSITY, TO AS1289 - e2.1, UNLESS OTHERWISE SPECIFIED.
4. IMPORTED MATERIAL TO BE USED FOR FILLING, IF REQUIRED, SHALL BE SELECTED, GRADED GRANULAR MATERIAL WITH A MAXIMUM SIZE OF 75mm, FREE FROM ORGANIC MATTER AND LUMPS OF CLAY AND NOT MORE THAN 50% BY WEIGHT PASSING A 425µm MESH SIEVE AND NOT MORE THAN 25% WEIGHT PASSING 75um SIEVE. THE MATERIAL PASSING THE 425µm MESH SIEVE SHALL HAVE PROPERTIES CONFORMING WITH THE FOLLOWING:
   MAXIMUM LIQUID LIMIT.......40
   MAXIMUM PLASTICITY INDEX.......15
   MAXIMUM (PI x % OF WHOLE SAMPLE PASSING 425µm SIEVE)....450
5. THE CONTRACTOR SHALL ENSURE THAT ADEQUATE DRAINAGE IS PROVIDED FOR THE SITE.
6. IF THE FILL IS NOT PLACED AND THE SOILS ARE NOT TREATED IN ACCORDANCE WITH THE ABOVE, THE SLAB DESIGN MAY BE INVALID AND THIS OFFICE SHOULD BE CONTACTED FOR FURTHER ADVISE.

SHEEHY & PARTNERS
SIGNED ________ DATE 15-3-12
NAME OF SIGNATORY (PRINT) SCOTT McDONALD
RPEQ NO. 8023

FOR CONSTRUCTION

CLIENT: J.P. RICHARDSON INDUSTRIES
PRINCIPAL: QUEENSLAND URBAN UTILITIES
PROJECT: SEWAGE PUMP STATION REFURBISHMENTS

	Amendments	Date	Initials
A	CONSTRUCTION ISSUE	15.03.12	G.H.

Scales: As Shown
Designed: S.McD.
Checked: S.McD.
Drawn: G.H.
Checked: S.McD.
Date: MARCH '12

CONSULT AUSTRALIA Member Firm

SHEEHY & PARTNERS PTY LIMITED
CONSULTING ENGINEERS STRUCTURAL AND CIVIL
PH(07)3839 3644 FAX(07)3839 3655
A.C.N.009 899 905

OUTDOOR TREATMENT EQUIPMENT SLAB
DRAWING SCHEDULE & NOTES SHEET

Drawing Number: 7789-S00
FULL SIZE A1
A
No. of Drawings:

PLOT DATE:- 15 Mar, 2012-4:35pm CAD FILE:-x:\7700s\7789\STRUCT\7789-S00.dwg XREFS:-XR-7789-TB

SEWAGE PUMP STATIONS REFURBISHMENTS
SEWAGE PUMP STATIONS SP01, SP33 & SP34

DRAWING SCHEDULE

DWG. NO.	DRAWING TITLE
7789-S00	DRAWING SCHEDULE & NOTES SHEET
7789-S01	SEWAGE PUMP STATION SP01, SLAB LAYOUT PLAN & SECTIONS
7789-S02	SEWAGE PUMP STATION SP33, SLAB LAYOUT PLAN & SECTIONS
7789-S03	SEWAGE PUMP STATION SP34, SLAB LAYOUT PLAN & SECTIONS

CONCRETE NOTES

1. ALL CONCRETE WORK SHALL BE EXECUTED IN ACCORDANCE WITH THE FOLLOWING CODES, UNLESS SPECIFICALLY VARIED BY THE CONTRACT DOCUMENTS:
   AS3600 CONCRETE STRUCTURES
   AS3610 FORMWORK FOR CONCRETE
   AS2870 RESIDENTIAL SLABS AND FOOTINGS (IF APPLICABLE)
2. THE CHARACTERISTIC COMPRESSIVE STRENGTH OF CONCRETE TEST CYLINDERS (f'c) SHALL BE AS FOLLOWS:

LOCATION	f'c AT 28 DAYS (MPa)	SLUMP (mm)	MAXIMUM AGGREGATE SIZE (mm)
FOOTING	32	80	20
GROUND SLABS	32	80	20

3. EXPOSURE CLASSIFICATION:

LOCATION	EXPOSURE CLASSIFICATION
FOOTINGS	A2
EXTERNAL CONCRETE SURFACES	B1

4. CURING REQUIREMENTS:

EXPOSURE CLASSIFICATION	MINIMUM f'c (MPa)	MINIMUM INITIAL CONTINUAL CURING DURATION (SEE AS 3600 CLAUSE 17.1.5.1)
A1	20	3 DAYS
A2	25	3 DAYS
B1	32	7 DAYS

5. COVER:

LOCATION	COVER (mm)
FOOTINGS	50
SLABS:	
- EXTERNAL	40

6. ALL CONCRETE SHALL BE VIBRATED IN ACCORDANCE WITH AS3600.
7. STEEL CHAIRS (PLASTIC TIPPED), PLASTIC CHAIRS OR CONCRETE BLOCKS SHALL BE USED TO SUPPORT REINFORCEMENT AND GIVE CORRECT COVER. SPACING OF CHAIRS TO MESH REINFORCEMENT TO BE MAXIMUM 800mm CENTERS.
8. SIZES SHOWN ARE STRUCTURAL SIZES AND DO NOT INCLUDE APPLIED FINISHES.
9. REINFORCEMENT IS SHOWN DIAGRAMMATICALLY AND NOT IN TRUE PROJECTION.
10. NO CHASES OR HOLES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS WILL BE PERMITTED IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL OF THE ENGINEER.
11. ALL PENETRATIONS THROUGH SLABS (eg. PIPES FOR SERVICES) SHALL BE FULLY WRAPPED WITH ABLEFLEX.
12. FORMWORK FINISHES TO CLASS 2.
13. WELDING OF REINFORCEMENT WILL NOT BE PERMITTED.
14. STRIPPING OF FORMWORK:

MINIMUM f'c (MPa)	MINIMUM AVERAGE COMPRESSIVE STRENGTH (MPa) AT THE TIME OF STRIPPING OF FORMS OR REMOVAL FROM MOULDS
20 & 25	15
32	20
40	25
50	32

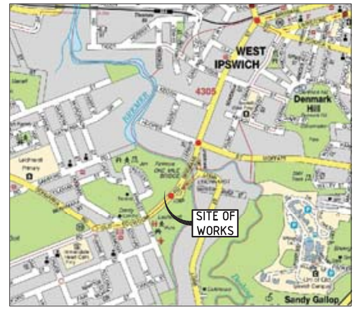
15. SPLICES IN REINFORCEMENT SHALL BE MADE IN PLACES SHOWN OR APPROVED IN ALL CASES. GENERALLY AT MIDSPAN FOR TOP STEEL AND NEAR SUPPORTS FOR BOTTOM STEEL. IN ALL CASES THE LAP LENGTH SHALL BE AS PER NOTE 22 BELOW.
16. BAR NOMENCLATURE:
    R. INDICATES PLAIN ROUND BAR, TO AS/NZS4671
    fsy= 250 MPa, DIAMETER IN (mm)
    W. INDICATES STEEL WIRE, TO AS/NZS4671
    fsy= 550 MPa, DIAMETER IN (mm)
    N. INDICATES DEFORMED BARS, TO AS/NZS4671
    fsy= 500 MPa, DIAMETER IN (mm)
17. UNLESS SHOWN OTHERWISE, DISTRIBUTION STEEL SHALL BE N12 AT 400mm CENTRES.
18. SL72etc. INDICATES REINFORCING FABRIC CONFORMING TO AS/NZS4671, LAP LENGTHS SHALL BE:

FABRIC	END LAP (mm)	SIDE LAP (mm)
RL918, RL718	425	125
SL102, SL92, SL82, SL81, SL72, SL62	425	225
L8, L11, & L12 TRENCH MESH	350	-

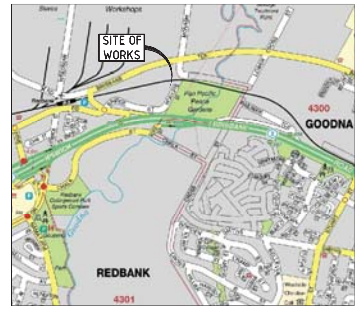
19. TOP STEEL HAS MAIN BARS OR WIRES ON TOP, BOTTOM STEEL HAS MAIN WIRES OR BARS ON BOTTOM.
20. UNLESS OTHERWISE SHOWN BAR LAPS SHALL BE:

DIAMETER (mm)	TENSION LAP (mm)	TENSION ANCHORAGE (mm)
12	600	500
16	900	800
20	1200	1000
24	1600	1300
28	2000	1600
32	2400	1900
36	2800	2300

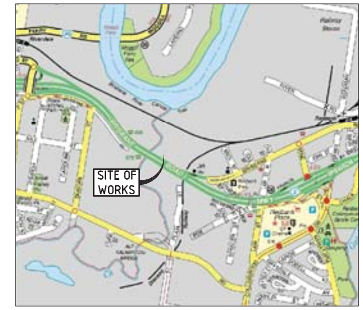
21. INDICATES REINFORCING BARS AT 90 DEGREES TO PLANE OF PAPER: ● ● ● ● ● ●
22. CURING SHALL BE EFFECTED BY USE OF AN APPROVED CURING OIL WHICH SHALL BE APPLIED TO ALL CONCRETE SURFACES WHERE VISIBLE IMMEDIATELY CONCRETE IS HARD, AND TO ALL FORMED SURFACES IMMEDIATELY AFTER FORMS ARE REMOVED EXCEPT WHERE AN APPLIED FINISH IS TO BE USED. CURING OIL SHALL THEN BE TAKEN OUT BY MAINTAINING THE SURFACE IN A MOIST CONDITION. OTHER CURING METHODS SHALL BE APPROVED IN WRITING BY THE ENGINEER PRIOR TO USE. NO CONSTRUCTION/ EXPANSION JOINTS PERMITTED UNLESS SHOWN ON DRAWINGS.
23. CONCRETE TESTING RESULTS TO BE PROVIDED AT 1 TEST PER 50m3.



SP01 LOCALITY PLAN
UBD MAP No. 212 (GRID R,20)
NTS



SP33 LOCALITY PLAN
UBD MAP No. 216 (GRID D,8)
NTS



SP34 LOCALITY PLAN
UBD MAP No. 215 (GRID N,10)
NTS

BORED PIER NOTES

1. BORED PIERS SHALL BE FOUNDED 300mm MINIMUM INTO VERY STIFF NATURAL CLAY WITH AN ALLOWABLE END BEARING CAPACITY OF AT LEAST 250kPa AND ALLOWABLE SHAFT SKIN FRICTION IN SAME MATERIAL OF AT LEAST 15kPa, UNLESS OTHERWISE NOTED. REFER TO GEOTECHNICAL REPORT NUMBER 12015 PREPARED BY CIVILTECH ENGINEERING, DATED 16 FEBRUARY 2012. ALL FOUNDING MATERIAL & DEPTHS SHALL BE DETERMINED & APPROVED BY A SUITABLY QUALIFIED GEOTHECHNICAL ENGINEER AT BUILDERS COST.
2. ALL MATERIALS, WORKMANSHIP AND PRACTICE SHALL COMPLY WITH THE REQUIREMENTS OF AS 2159: PILING - DESIGN AND INSTALLATION.
3. THE MAXIMUM DEVIATION OF THE PILE CENTRE POINT AS NOTED ON THE SETTING OUT DRAWINGS SHALL NOT EXCEED 75mm IN PLAN. THE ALIGNMENT OF EACH PILE SHALL BE WITHIN 4% OF THE SPECIFIED INCLINATIONS FOR PILES RAKED UP TO 1 IN 5, AND 7% FOR PILES RAKED MORE THAN 1 IN 5. WHERE PILES DEVIATE TO SUCH AN EXTENT THAT ADDITIONAL PILES, RE-DESIGN OR ENLARGEMENT OF THE PILE-CAP, ARE NECESSARY TO COMPENSATE FOR SUCH DEVIATIONS, THE CONTRACTOR SHALL BE LIABLE FOR ALL ADDITIONAL COSTS INCURRED IN SUCH MODIFICATIONS.
4. THE PILING OPERATION SHALL BE SUPERVISED BY A COMPETENT PERSON, PROPERLY QUALIFIED AND EXPERIENCED IN PILING OPERATIONS. THIS SUPERVISOR SHALL BE IN ATTENDANCE AT ALL TIME WHEN PILING IS BEING CARRIED OUT.
5. ALL MATERIALS RELATING TO THE PILES SUCH AS CEMENT, AGGREGATES, WATER, REINFORCEMENT, ADMIXTURES ETC SHALL CONFORM TO THE STANDARD SPECIFICATION FOR CONCRETE AND CONCRETE SUPPLY. SIMILARLY, CONCRETE QUANTITIES AND TESTING OF SAME SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION.
6. THE PILING CONTRACTOR SHALL PROVIDE FOR CHECKING SETTING OUT POSITIONS AS PROVIDED, AND HE SHALL BRING ANY DISCREPANCIES TO THE NOTICE OF THE ENGINEER. SHOULD ANY PILES BE FOUND TO BE OUTSIDE THE REQUIRED TOLERANCE, THESE SHALL BE REPLACED BY A NEW PILE AT THE CONTRACTORS EXPENSE.
7. CARE SHALL BE TAKEN DURING TRIMMING TO PREVENT CRACKING OR OTHERWISE DAMAGING THE STEEL REINFORCEMENT. ANY DAMAGED CONCRETE SHALL BE REMOVED AND THE DAMAGED SECTION ADEQUATELY REPAIRED.
8. UNLESS OTHERWISE STATED, ALL PILES SHALL BE CONSTRUCTED AS BORED IN-SITU NON-DISPLACEMENT PILES. SHOULD THE CONTRACTOR WISH TO USE AN ALTERNATIVE PILING TECHNIQUE, DETAILS SHALL BE SUBMITTED FOR APPROVAL, PRIOR TO WORKS COMMENCING ON SITE AND SHALL DEMONSTRATE COMPLIANCE WITH AS 2159.
9. THE TOLERANCE ON STRAIGHTNESS OF ANY PORTION, AND OF THE COMPLETED LENGTH OF PILE, SHALL BE 1/100 OF THE LENGTH OF THE PILE.
10. BORING SHALL BE CARRIED OUT WITH THE APPROVED PLANT AND THE HOLE SHALL BE ADVANCED BY APPROVED PROCEDURES. PILES SHALL NOT BE BORED ADJACENT TO PILES ALREADY CAST AND WHICH CONTAIN WORKABLE OR UNSET CONCRETE
11. TEMPORARY LINERS OF APPROVED QUALITY SHALL BE USED TO MAINTAIN THE STABILITY OF PILE EXCAVATION WHICH MIGHT OTHERWISE COLLAPSE, IN ACCORDANCE WITH AS 2159. TEMPORARY LINERS SHALL BE FREE FROM SIGNIFICANT DISTORTION, AND SHALL BE OF UNIFORM TUBULAR CROSS-SECTION THROUGHOUT EACH CONTINUOUS LENGTH. DURING CONCRETING, THEY SHALL BE FREE FROM INTERNAL PROJECTIONS AND CRUSTED CONCRETE WHICH MIGHT INHIBIT THE PROPER FORMATION OF PILES.
12. REINFORCEMENT FOR BORED PILES SHALL BE HIGH YIELD STEEL TO AS 4671. REINFORCEMENT SHALL BE PROPERLY POSITION AND HELD AGAINST DISPLACEMENT DURING THE FORMATION OF THE PILE. REINFORCEMENT SHALL PROJECT ABOVE THE PILE CUT-OFF LEVEL TO PROVIDE THE REQUIRED ANCHORAGE AND LAP LENGTHS AS SPECIFIED IN THE CONTRACT DRAWINGS.
13. CONCRETE PRODUCTION, PLACEMENT, COMPACTION AND CURING SHALL COMPLY WITH AS 3600 & AS 2154 STANDARD SPECIFICATIONS FOR CONCRETE AND CONCRETE SUPPLY. CONCRETE SHALL BE PLACED IN SUCH A MANNER THAT SEGREGATION OF THE CONCRETE DOES NOT OCCUR AND THAT THE POSITION OF THE REINFORCEMENT IS MAINTAINED, IF LINERS ARE TO BE REMOVED THE CONCRETE MUST BE PLACED IN SUFFICIENT QUANTITY & FLUIDITY SO THAT THE CONCRETE IS NOT LIFTED WITH THE LINER.

GENERAL NOTES

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE KELLOGG BROWN & ROOT Pty Ltd. DRAWINGS AND THE PROJECT SPECIFICATION. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER IN WRITING.
2. THE FLOORS HAVE BEEN DESIGNED TO CARRY THE FOLLOWING LIVE LOADS:
   SLAB ON GROUND = 5 (kPa)
   EQUIPMENT LOADS AS INDICATED ON THE SITE SPECIFIC DRAWINGS
3. ALL SETOUT, SLAB SIZES, SURFACE FINISHES, SURFACE FALL'S, EQUIPMENT HOLD DOWN AND OTHER DETAILS NOT SHOWN ON SHEEHY & PARTNERS DRAWINGS, ARE TO BE IN ACCORDANCE WITH SIEMENS AND KBR DRAWINGS PROVIDED IN THE CONTRACT.
4. ALL DIMENSIONS SHALL BE CHECKED ON SITE BEFORE WORK COMMENCES.
5. DIMENSIONS SHALL NOT BE OBTAINED BY SCALING STRUCTURAL DRAWINGS.
6. DURING CONSTRUCTION, THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION.
7. ALL PROPRIETARY PRODUCTS SHALL BE FIXED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS TO WITHSTAND THE APPLICABLE DESIGN LOADS UNLESS SPECIFICALLY VARIED BY THE DOCUMENTS.
8. IF AT ANY TIME PRIOR TO PRACTICAL COMPLETION, THE CONTRACTOR SHOULD BECOME AWARE OF ANY SIGNS OF DISTRESS, EXCESSIVE SETTLEMENT OR DEFLECTION, CONFLICT OF COMPONENTS OR ANY OTHER INDICATIONS WHATSOEVER OF ACTUAL OR POTENTIAL DAMAGE TO THE CONTRACTOR WORK OR ANY PART THEREOF, HE SHALL FORTHWITH NOTIFY THE ENGINEER AND CONFIRM SUCH NOTICE IN WRITING AS SOON AS IS PRACTICABLE.

FOUNDATION NOTES

1. ALL SLAB EDGE BEAMS AND STRIP FOOTINGS SHALL BE FOUNDED 200mm MINIMUM INTO NATURAL MATERIAL WITH AN ALLOWABLE BEARING CAPACITY OF AT LEAST 150kPa. ALL BORED PIERS SHALL BE FOUNDED 300mm MINIMUM INTO APPROVED FOUNDING MATERIAL WITH AN ALLOWABLE BEARING CAPACITY OF AT LEAST 250kPa, UNLESS NOTED OTHERWISE. APPROVED FOUNDING MATERIAL SHALL BE VERY STIFF NATURAL CLAY. REFER TO GEOTECHNICAL REPORT NUMBER 12015 PREPARED BY CIVILTECH ENGINEERING, DATED 16 FEBRUARY 2012. ALL FOUNDING MATERIAL AND DEPTHS SHALL BE DETERMINED & APPROVED ON SITE BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER.
2. SLAB & FOOTING DESIGN IS BASED ON ASSUMED CLASS "H1" SITE CLASSIFICATION.
3. FOR SLABS ON GROUND, ALL TOPSOIL AND UPPER STRATA CONTAINING ORGANIC MATTER SHALL BE REMOVED AND REPLACED BY AN APPROVED CONSOLIDATED FILLING MATERIAL PLACED AND COMPACTED IN ACCORDANCE WITH AS 2870 - RESIDENTIAL SLABS & FOOTINGS, COMPACTED TO 95% MODIFIED DRY DENSITY, TO AS1289 - e2.1, UNLESS OTHERWISE SPECIFIED.
4. IMPORTED MATERIAL TO BE USED FOR FILLING, IF REQUIRED, SHALL BE SELECTED, GRADED GRANULAR MATERIAL WITH A MAXIMUM SIZE OF 75mm, FREE FROM ORGANIC MATTER AND LUMPS OF CLAY AND NOT MORE THAN 50% BY WEIGHT PASSING A 425μm MESH SIEVE AND NOT MORE THAN 25% WEIGHT PASSING 75um SIEVE. THE MATERIAL PASSING THE 425μm MESH SIEVE SHALL HAVE PROPERTIES CONFORMING WITH THE FOLLOWING:
   MAXIMUM LIQUID LIMIT.......................................40
   MAXIMUM PLASTICITY INDEX.................................15
   MAXIMUM (PI x % OF WHOLE SAMPLE PASSING 425μm SIEVE)....450
5. THE CONTRACTOR SHALL ENSURE THAT ADEQUATE DRAINAGE IS PROVIDED FOR THE SITE.
6. IF THE FILL IS NOT PLACED AND THE SOILS ARE NOT TREATED IN ACCORDANCE WITH THE ABOVE, THE SLAB DESIGN MAY BE INVALID AND THIS OFFICE SHOULD BE CONTACTED FOR FURTHER ADVISE.

SHEEHY & PARTNERS
SIGNED _________ DATE 9·7·12
NAME OF SIGNATORY (PRINT) SCOTT McDONALD
RPEQ NO. 8023

AS CONSTRUCTED

CLIENT: J.P. RICHARDSON INDUSTRIES

PRINCIPAL: QUEENSLAND URBAN UTILITIES

PROJECT: SEWAGE PUMP STATION REFURBISHMENTS

	Amendments	Date	Initials
B	AS CONSTRUCTED	09.07.12	G.H.
A	CONSTRUCTION ISSUE	15.03.12	G.H.

Scales: As Shown
Designed: S.McD.
Checked: S.McD.
Drawn: G.H.
Checked: S.McD.
Date: MARCH '12

CONSULT AUSTRALIA Member Firm

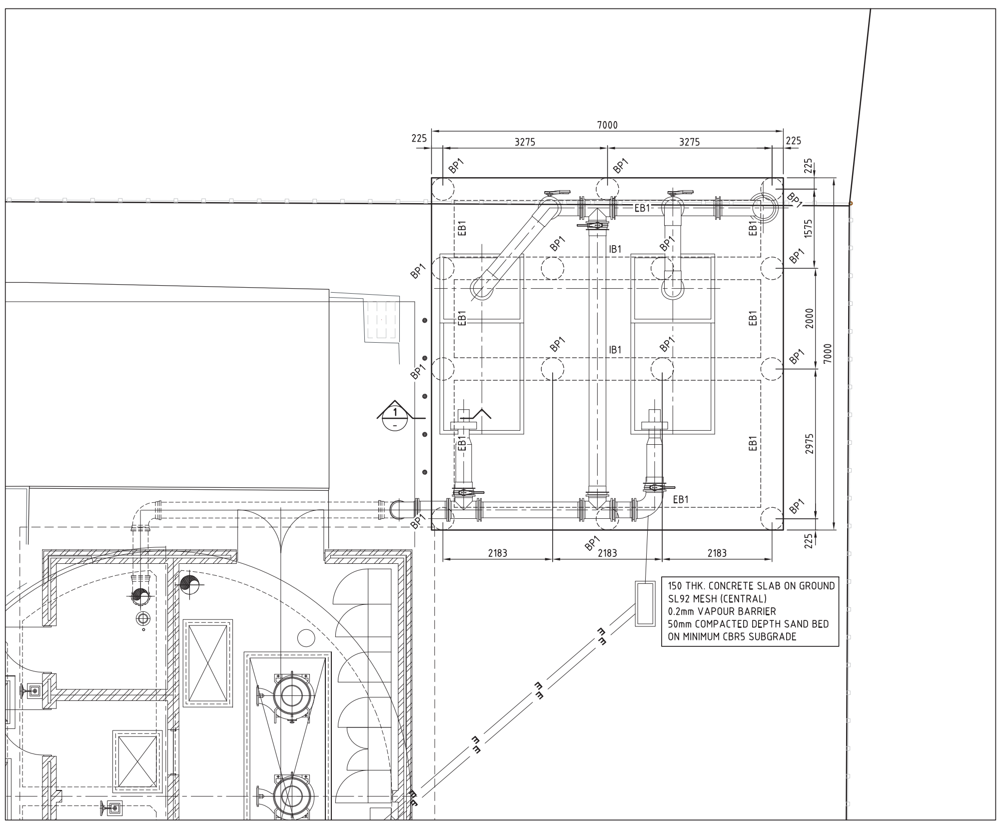
SHEEHY & PARTNERS PTY LIMITED
CONSULTING ENGINEERS STRUCTURAL AND CIVIL
PH(07)3839 3644 FAX(07)3839 3655
A.C.N.009 899 905

OUTDOOR TREATMENT EQUIPMENT SLAB
DRAWING SCHEDULE & NOTES SHEET

Drawing Number: 7789-S00
FULL SIZE A1
A B
No. of Drawings:

PLOT DATE-> 09 Jul, 2012-9:07am CAD FILE->I:\7700dir\7789\STRUCT\7789-S00.dwg XREFS->XR-7789-TB

NOTES
1. REFER TO DRAWING 7789-S00 FOR GENERAL, FOUNDATION, BORED PIER & CONCRETE NOTES.
2. ZABOC VESSEL WEIGHT (OPERATING, INCLUDING MEDIA) = 2722kg EACH



LAYOUT PLAN

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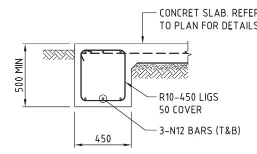

TYP. EB1 DETAIL
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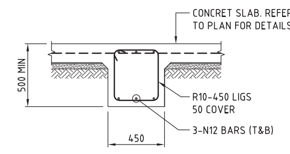

TYP. IB1 DETAIL
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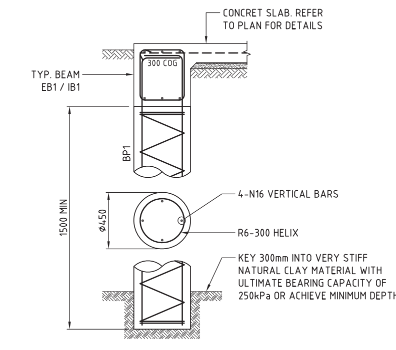

TYP. BP1 DETAIL
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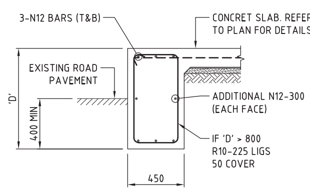


SECTION 1
SCALE 1:20

SHEEHY & PARTNERS
SIGNED DATE 15-3-12
NAME OF SIGNATORY (PRINT) SCOTT McDONALD
RPEQ NO. 8023

FOR CONSTRUCTION

CLIENT:	PRINCIPAL:	PROJECT:
J.P. RICHARDSON INDUSTRIES	QUEENSLAND URBAN UTILITIES	SEWAGE PUMP STATION REFURBISHMENTS

	Amendments	Date	Initials
A	CONSTRUCTION ISSUE	15.03.12	G.H.

Scales:	As Shown
Designed:	S.McD.
Checked:	S.McD.
Drawn:	G.H.
Checked:	S.McD.
Date:	MARCH '12

CONSULT AUSTRALIA Member Firm

SHEEHY & PARTNERS PTY LIMITED
CONSULTING ENGINEERS
STRUCTURAL AND CIVIL
PH(07)3839 3644 FAX(07)3839 3655
A.C.N.009 899 905

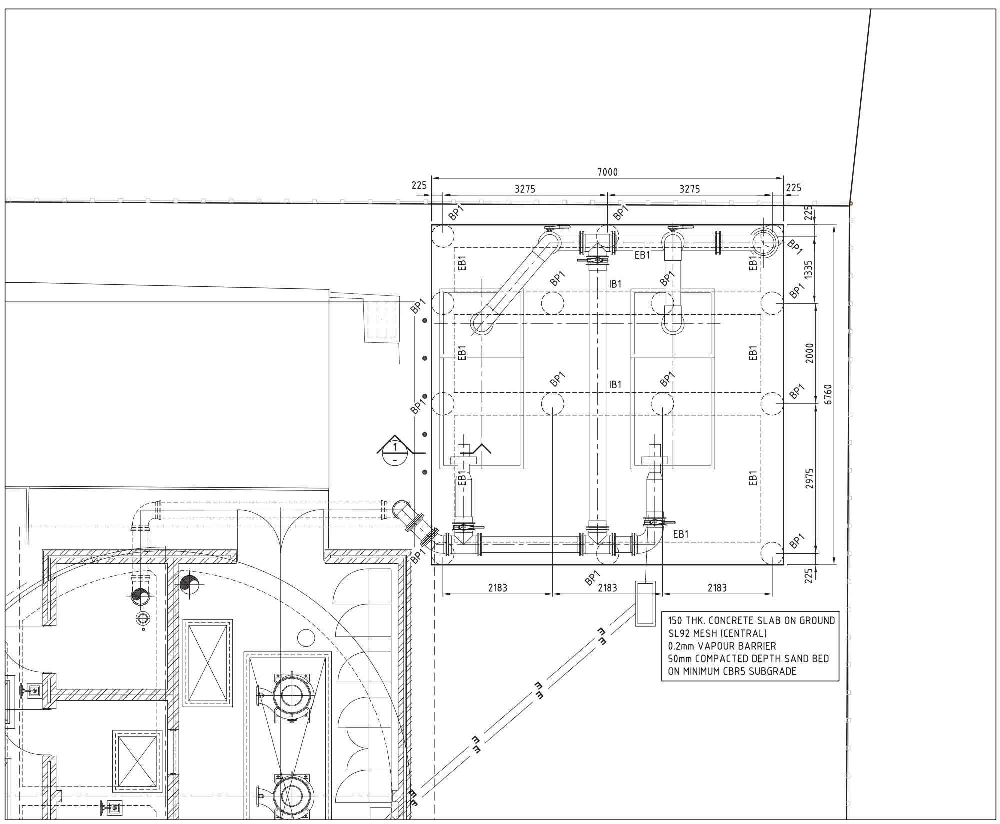
OUTDOOR TREATMENT EQUIPMENT SLAB
SEWAGE PUMP STATION SP34
ODOUR CONTROL FACILITY
SLAB LAYOUT PLAN & SECTIONS

Drawing Number: 7789-S03
FULL SIZE A1
A
No. of Drawings:

PLOT DATE-> 15 Mar, 2012-4:37pm CAD FILE->\7700s\7789\STRUCT\7789-S03.dwg XREFS->XR-7789-TB/XR-7789-SP34-SITE/XR-7789-SP34 SURVEY

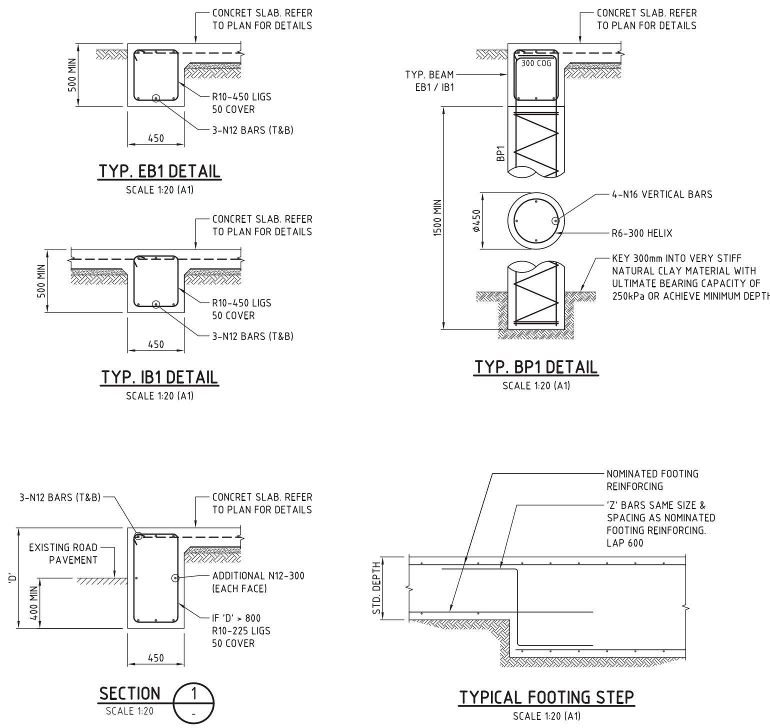
NOTES

1. REFER TO DRAWING 7789-S00 FOR GENERAL, FOUNDATION, BORED PIER & CONCRETE NOTES.
2. ZABOC VESSEL WEIGHT (OPERATING, INCLUDING MEDIA) = 2722kg EACH



LAYOUT PLAN

SCALE 0 500 1000 1500 2000 2500mm 1:50 (A1)



SHEEHY & PARTNERS
SIGNED ________ DATE 9·7·12
NAME OF SIGNATORY (PRINT) SCOTT McDONALD
RPEQ NO. 8023

AS CONSTRUCTED

CLIENT:	PRINCIPAL:	PROJECT:
J.P. RICHARDSON INDUSTRIES	QUEENSLAND URBAN UTILITIES	SEWAGE PUMP STATION REFURBISHMENTS

	Amendments	Date	Initials
B	AS CONSTRUCTED	09.07.12	G.H.
A	CONSTRUCTION ISSUE	15.03.12	G.H.

Scales:	As Shown
Designed:	S.McD.
Checked:	S.McD.
Drawn:	G.H.
Checked:	S.McD.
Date:	MARCH '12

CONSULT AUSTRALIA Member Firm

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CONSULTING ENGINEERS
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PH(07)3839 3644 FAX(07)3839 3655
A.C.N.009 899 905

OUTDOOR TREATMENT EQUIPMENT SLAB

SEWAGE PUMP STATION SP34
ODOUR CONTROL FACILITY
SLAB LAYOUT PLAN & SECTIONS

Drawing Number: 7789-S03
FULL SIZE A1
A B
No. of Drawings:

PLOT DATE:> 09 JUL 2012-9:39am CAD FILE:>\7700s\7789\STRUCT\7789-S03.dwg XREFS:>XR-7789-TB/XR-7789-SP34-SITE/XR-7789-SP34 SURVEY

THE MOSS FAMILY TRUST T/AS

CIVILTECH ENGINEERING

40 Illoura Grove
Karana Downs Q. 4306
ABN: 53 668 795 825

PH: 0418 733 168
Fax: (07) 3201 2426
Email: davidmoss6@bigpond.com

16 February, 2012

Our Job No. 12017

Sheehy & Partners Pty. Ltd.
3 Gregory Terrace,
Spring Hill, Qld, 4000

RE: GEOTECHNICAL INVESTIGATION
SP34; Ipswich Motorway, Redbank

1.0 Introduction

The work in this investigation was carried out to determine general geotechnical information regarding the proposed building area.

A single test bore with an adjacent scala cone penetrometer probe was undertaken on the 14 February 2012 at the location shown on the attached sketch.

Test locations have been located as per client instructions or as reasonably determined on site by the field officer. Any recommendations made in this report pertain to the area investigated, as defined by the Site Plan attached.

2.0 Investigation Results

The proposed building area is sparsely grassed with several significant trees in close proximity. There is a slight slope across the building site with the drainage characteristics considered moderate at the time of the investigation.

The soil profile, as established by the test bore, generally consists of partially controlled high plasticity clay fill to a depth of approximately 0.8m, very stiff high plasticity natural clays.

Local knowledge of these insitu clays defines them as potentially highly reactive.

No groundwater was encountered in the test bore at the time of the investigation.

A more detailed description of the soil profile and test results can be found in Appendix `1'.

3.0 Engineering Assessment

Based on the results of the field and laboratory investigation, and taking into account the existing environmental conditions, the site would be classified as a `P' – Problem Site, as defined by AS2870, due to the presence of filled ground greater than 0.4m in depth.

The filled ground is considered partially controlled, and with proof rolling could be suitable for the support of conventional light (less than 40kPa) uniform loads, provided some differential settlement can be tolerated. An accurate estimate of settlement is impossible as the compaction history of the fill is unknown, but it is anticipated that differential settlements could be in the order of 5 to 10mm per 10kPa of load.

If the above settlements cannot be tolerated, then all footings should be founded into the underlying very stiff natural clays.

A summary of allowable bearing pressures for footings is presented below.

	Allowable Bearing Pressure (kPa)	
Material type \ footing element	**Shaft**	**End**
Very stiff Natural clay – strip (200mm penetration)	-	200
Very stiff Natural clay - bored piers (300mm penetration)	20	300

Shaft adhesion should only be applied over that portion of the pile founded below the depth of influence and / or filled ground.

No problems are anticipated with bulk, trench or bored pier excavations using small to medium sized equipment, e.g., Cat D4 or backhoe.

4.0 Limits of Investigation

Recommendations given in this report are based on the information supplied by the client in conjunction with the findings of the investigation. Any change in the type or form of construction may make the recommendations invalid.

If soil conditions differing from those shown on the borelogs are encountered during construction, Civiltech Engineering should be advised immediately.

Yours Faithfully
Civiltech Engineering

David Moss
B.E., M.I.E.Aust. R.P.E.Q. (No. 2951)

Appendix 1: Test Bore and Laboratory Test Results

DEPTH	CLASSIFICATION	SAMPLE	Scala Cone
	Bore 1		Blows/100mm
			4
0.00	Fill Topsoil		6
0.10	Fill Silty Sandy Gravel (GP) Medium dense, fine to medium		5
	gravel, light brown, dry to moist		3
0.25	Fill Clay (CH) Very stiff, high plasticity, dark grey brown, moist		2
0.80	Probable Natural Clay (CH) Very stiff, high plasticity, grey		2
	brown, moist		2
1.20	Natural Silty Clay (CH) Very stiff, high plasticity, dark grey /	0.9 : U50	4
	grey brown, moist		4
3.00	Borehole Discontinued		9
			8
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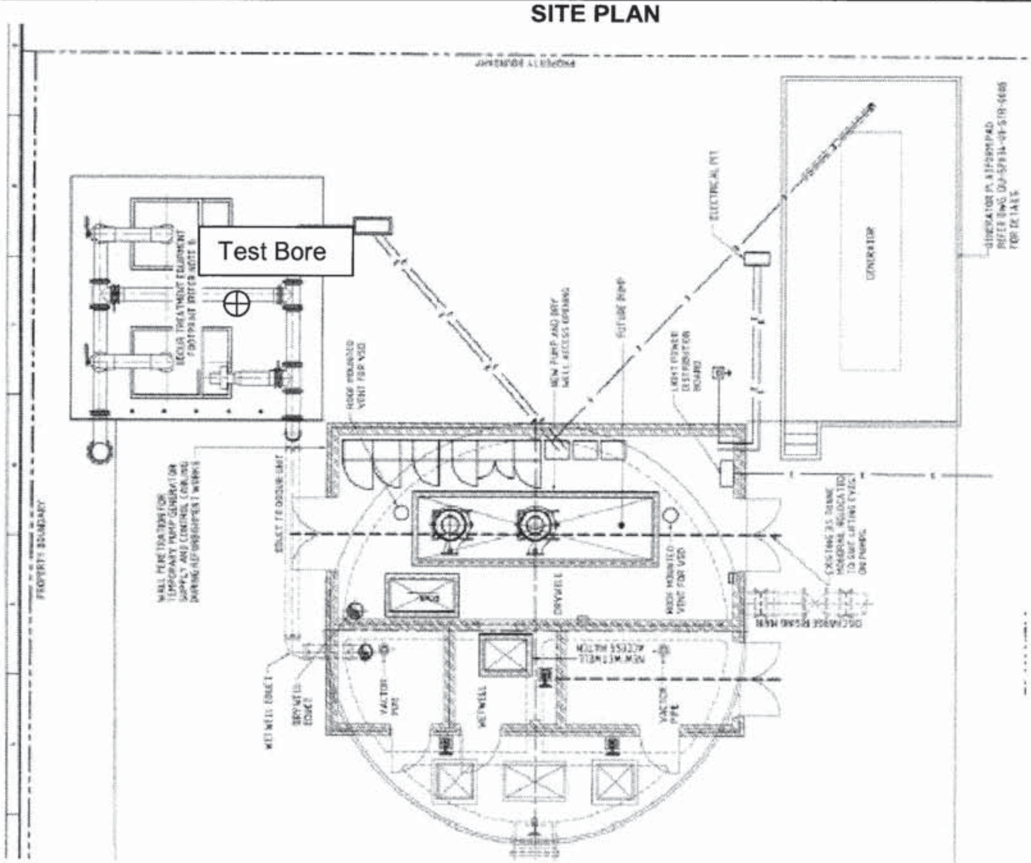
			10

SITE PLAN



Form: F1109/0

J & P RICHARDSON INDUSTRIES PTY LTD

INSPECTION & TEST PLAN

ITP No. C54000-SP34-Odour Slab

* Legend		
	x = Perform	**H = Hold (mandatory)**
	w = Witness	**h = hold (optional)**
	a = Accept	**c = Certify**
	r = Random	

Project: CONCRETE SLAB FOR ODOUR CONTROL SYSTEM AT SP34

Contract No: I112-024

Customer: Queensland Urban Utilities

Item No	Process Sequence	Acceptance Criteria	Activity By*		Reference Documents	Remarks/Records
			JPR	CUST		
1	**DESIGN**					
1.1	**Design Documents**					
1.1.1	Civil Drawings - Approved for Construction	Complies with specification, drawings and schedules	a + h	x	Contract Drawings	SHEEHY & PARTNERS DRAWINGS 7789-S00 REV A, 7789-S03 REV A
1.1.2	Scope of Works and Project Specification	Documentation provided as IFC and sufficiently complete for JPR to proceed	a + h	x	Contract Documents	JPR notice to customer that construction will proceed on the basis of the information provided
2	**IMPLEMENTATION**					
2.1	**Site Works**					
2.1.1	Mark out positioning, completion of excavation and base preperation	Complies with specification, drawings and schedules	x	w	Specification, drawings	SHEEHY & PARTNERS DRAWINGS 7789-S00 REV A, 7789-S03 REV A, QU-SP034-01-CIV-0110-0008 Rev.1
2.1.2	Completion of formwork placement	Complies with specification, drawings and schedules	x	w	Specification, drawings	SHEEHY & PARTNERS DRAWINGS 7789-S00 REV A, 7789-S03 REV A
2.1.3	Fixing of all reinforcement before placing concrete	Complies with specification, drawings and schedules	x	a + h	Specification, drawings	SHEEHY & PARTNERS DRAWINGS 7789-S00 REV A, 7789-S03 REV A
2.1.4	Commencement of concrete placement	Complies with specification, drawings and schedules	x		Specification, drawings	SHEEHY & PARTNERS DRAWINGS 7789-S00 REV A, 7789-S03 REV A
3	**HANDOVER**					

Form: F1109/0

J & P RICHARDSON INDUSTRIES PTY LTD

INSPECTION & TEST PLAN

ITP No. C54000-SP34-Odour Slab

*** Legend**	**x = Perform**	**H = Hold (mandatory)**
	w = Witness	**h = hold (optional)**
	a = Accept	**c = Certify**
	r = Random	

Project: CONCRETE SLAB FOR ODOUR CONTROL SYSTEM AT SP34

Contract No: I112-024

Customer: Queensland Urban Utilities

Item No	**Process Sequence**	**Acceptance Criteria**	**Activity By***		**Reference Documents**	**Remarks/Records**
			JPR	**CUST**		
3.1	Vendor Data (Hallco - Inspecition and Checklist - STRUCTURAL CONCRETE PLACEMENT, Concrete Delivery Dockets & Test Rreports)	Completed in accordance with contract documents	x		Supplier's documentation, contract documents	Customer accepted Vendor Data
3.2	As Constructed Drawings	Complies with drawings, schedules and contract documents	x		Drawings and schedules, contract documents	As-built documentation

4. Overhead Crane

DEMAG

Cranes & Components

Demag hoist units: Perfect load handling

High productivity, efficiency and operating reliability are the most important requirements to be met by state-of-the-art material flow systems. Demag Cranes & Components develops and produces materials flow solutions for all i ndustries and companies of all sizes, from small workshops to major industrial corporations.

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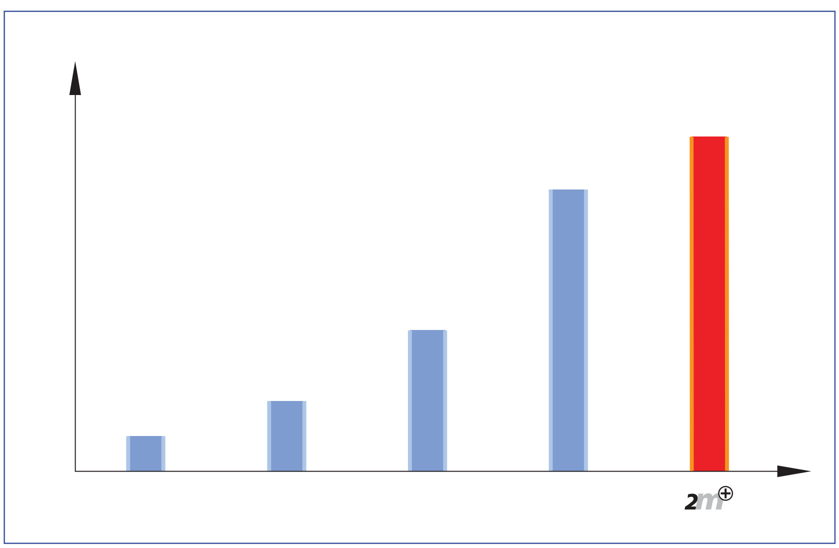

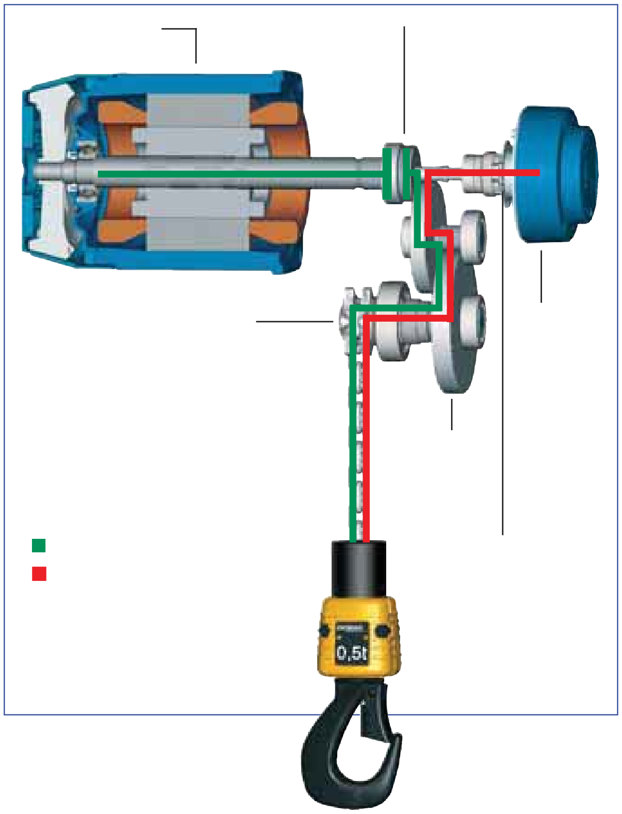
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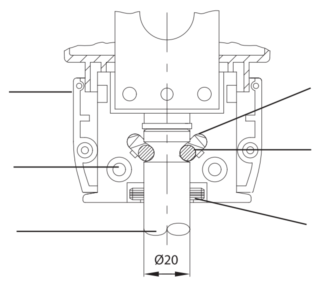

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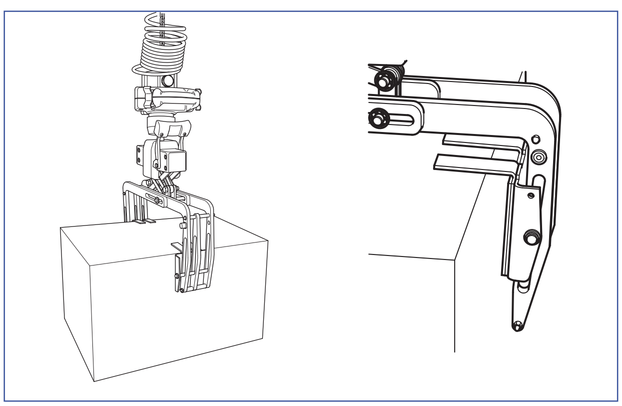

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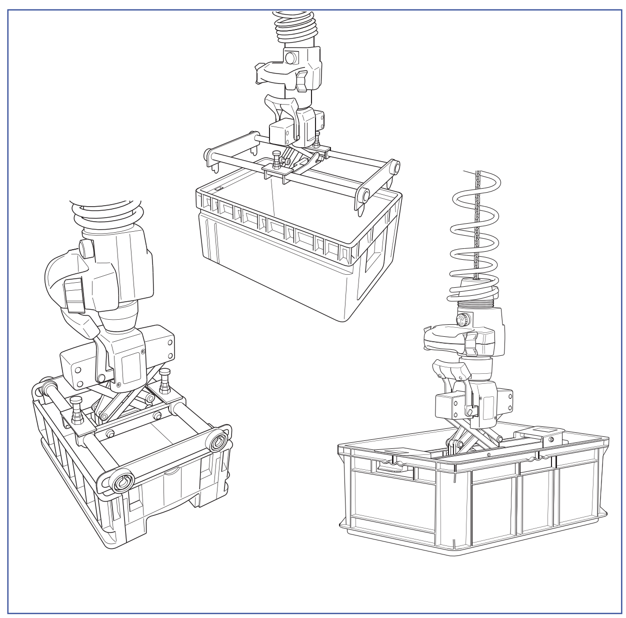

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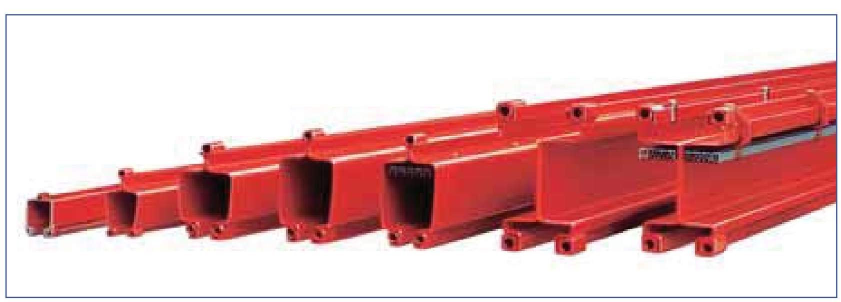

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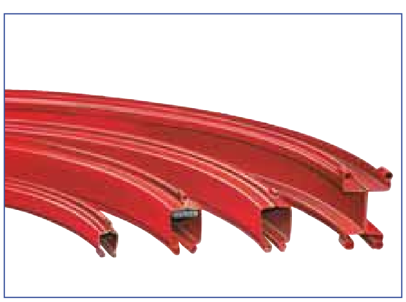

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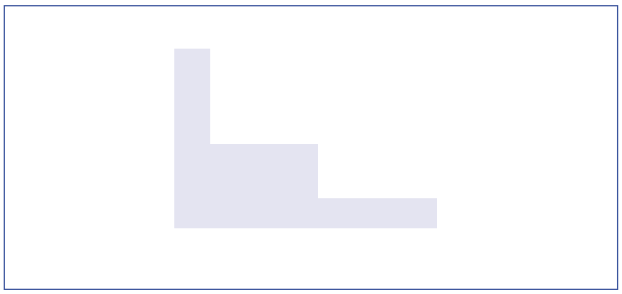

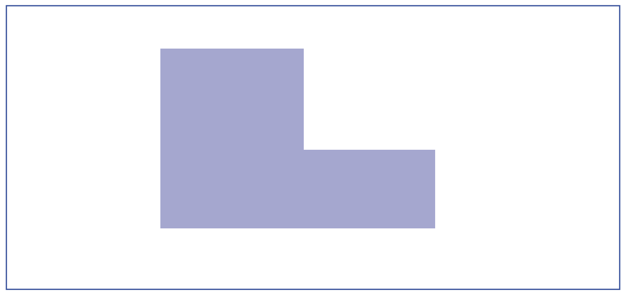

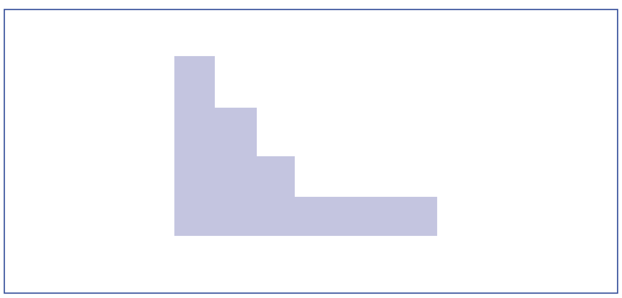

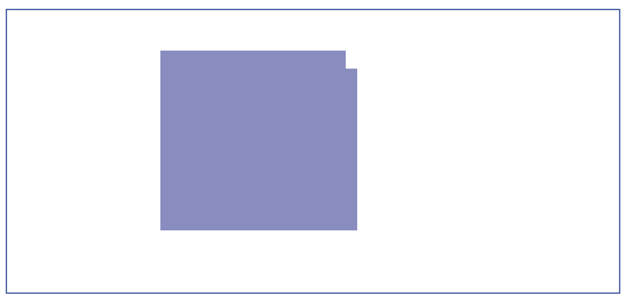

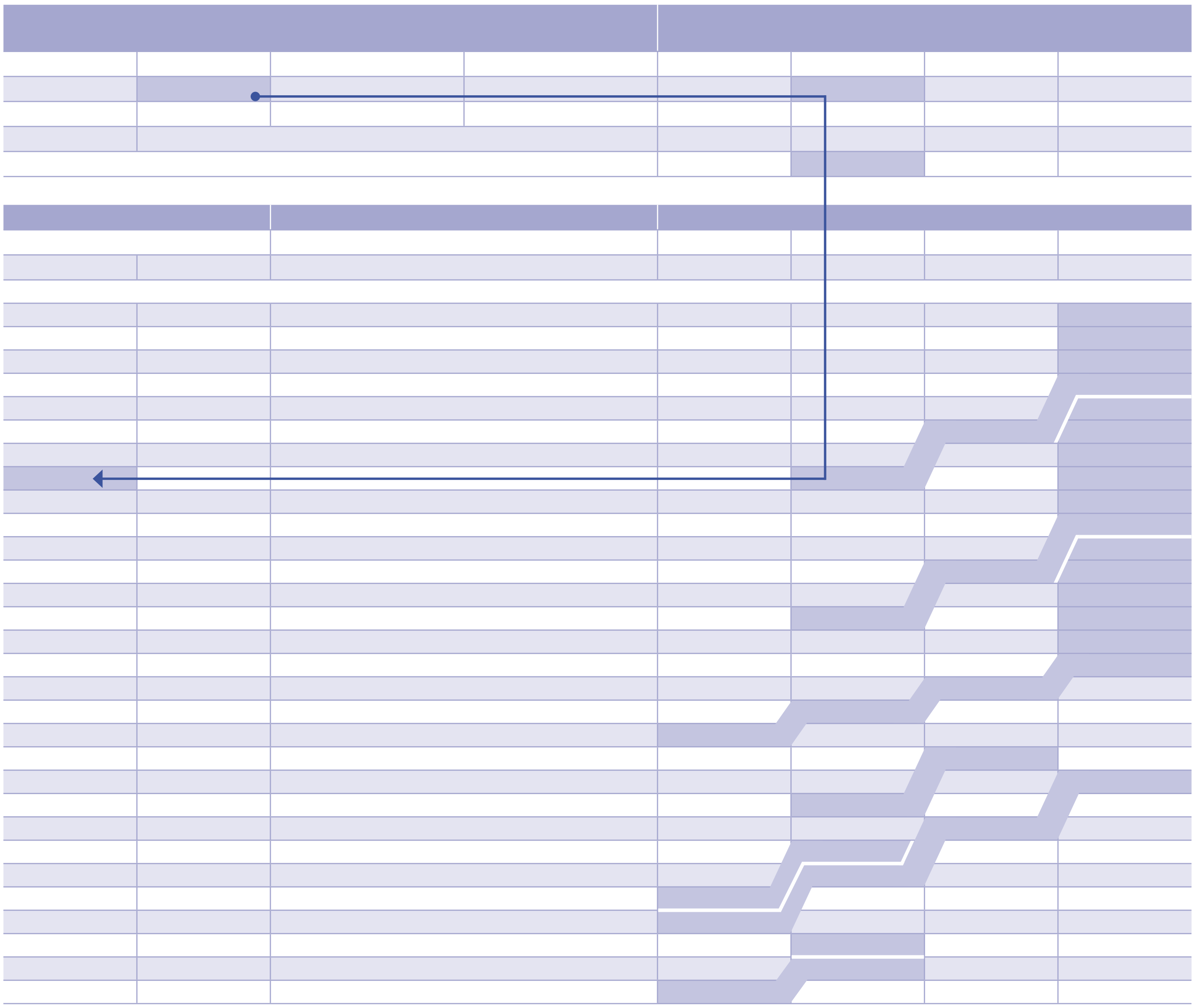

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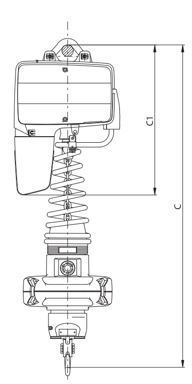

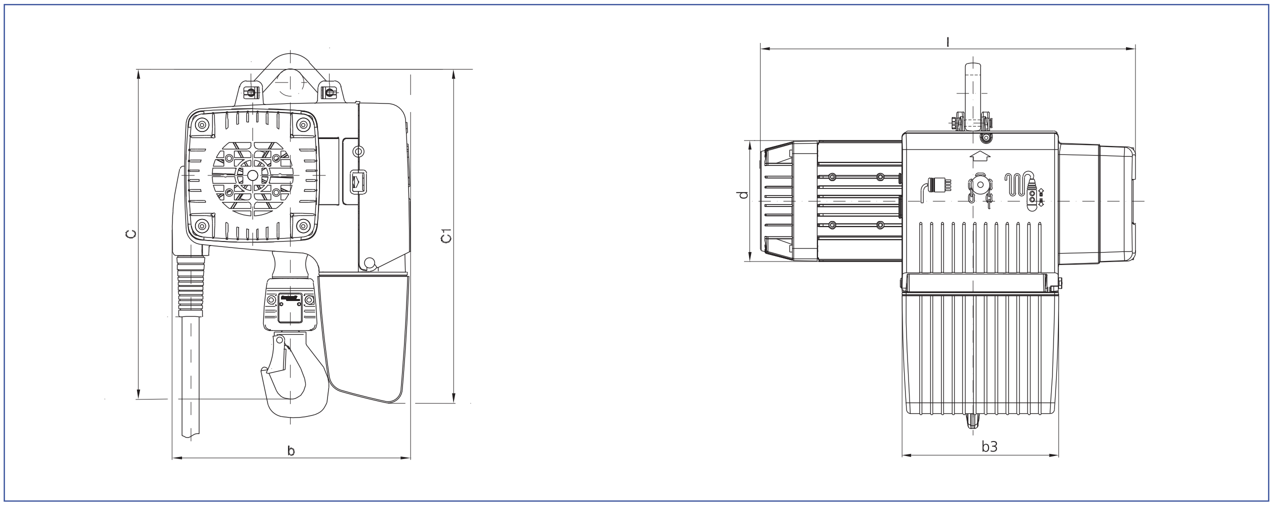
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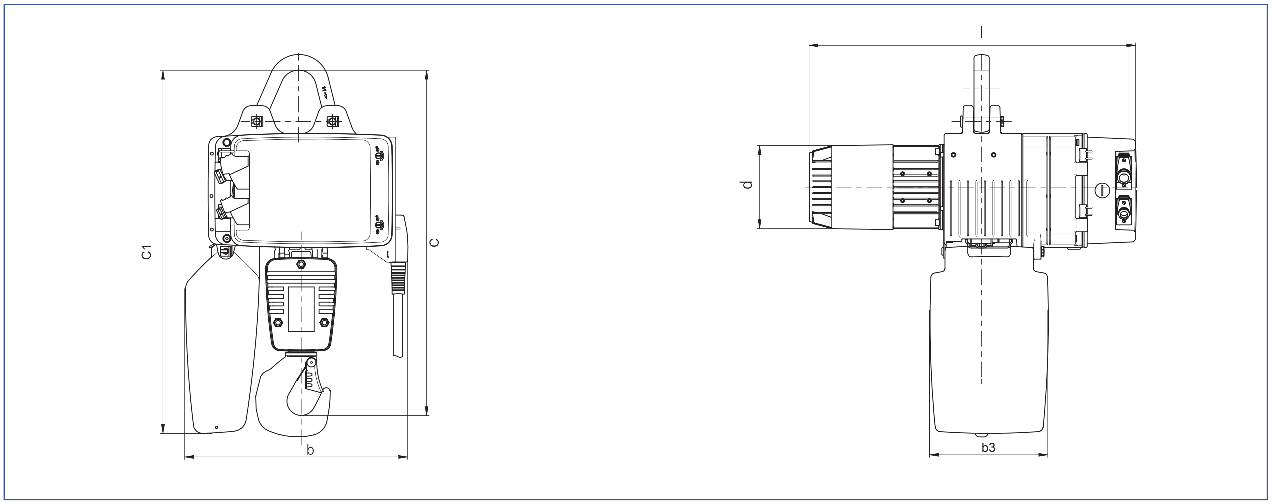
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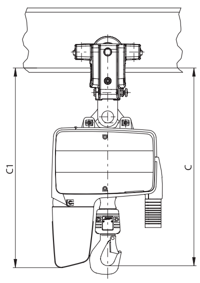
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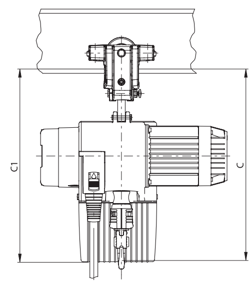
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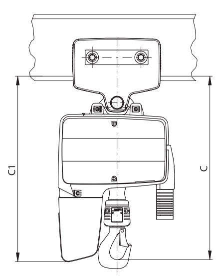
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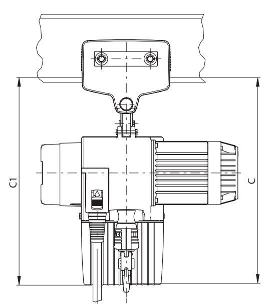
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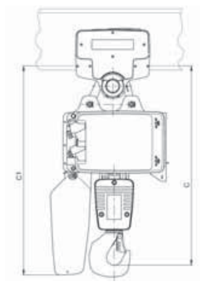

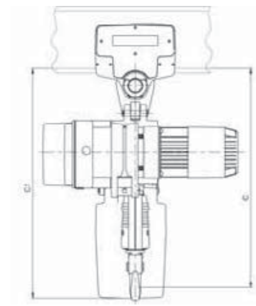

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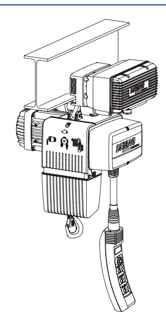

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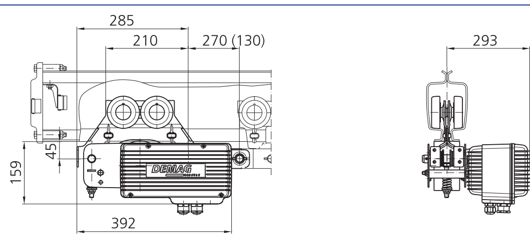

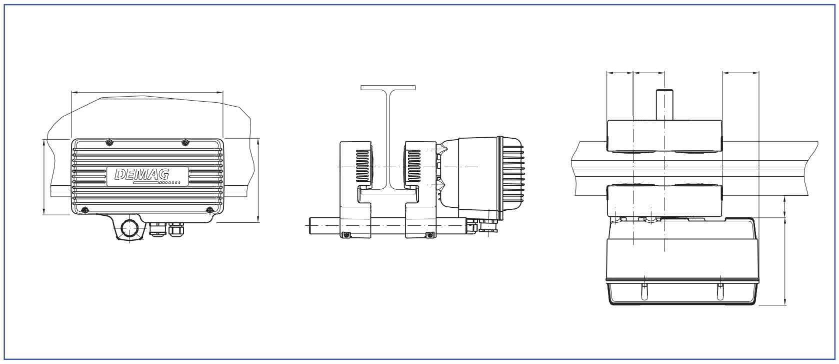
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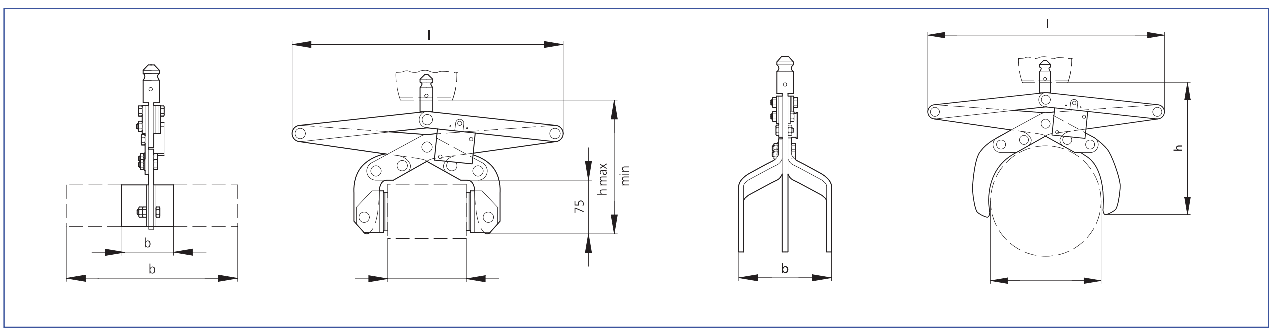
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DEMAG
Cranes & Components

Form: F1109/0

J & P RICHARDSON INDUSTRIES PTY LTD

INSPECTION & TEST PLAN

*** Legend** **x = Perform** **H = Hold (mandatory)**
w = Witness **h = hold (optional)**
a = Accept **c = Certify**
r = Random

ITP No. C54000-SP34-Overhead Crane Install

Project: Overhead Crane Install

Contract No: I112-024

Customer: Queensland Urban Utilities

Item No	Process Sequence	Acceptance Criteria	Activity By* JPR	Activity By* CUST	Reference Documents	Remarks/Records
1	**DESIGN**					
1.1	**Design Documents**					
1.1.1	Civil Drawings - Approved for Construction	Complies with specification, drawings and schedules	a + h	x	Contract Drawings & Documents	
1.1.2	Scope of Works and Project Specification	Documentation provided as IFC and sufficiently complete for JPR to proceed	a + h	x	Contract Drawings & Documents	
2	**IMPLEMENTATION**					
2.1	**Site Works**					
2.1.1	Positioning of Overhead Beam	Complies with specification, drawings and schedules	x	w	Specification, drawings	
2.1.2	Completion of Postioning of Overhead Beam	Complies with specification, drawings and schedules	x	w	Specification, drawings	
2.1.3	Installation of Overhead Crane	Complies with specification, drawings and schedules	x	a + h	Specification, drawings	
3	**HANDOVER**					
3.1	JPR - Inspecition and Checklist	Completed in accordance with contract documents	x		Contract documents	Customer accepted
3.2	As Installed Drawings	Complies with drawings, schedules and contract documents	x		Drawings and schedules, contract documents	As-Installed documentation

DEMAG Cranes & Components

SERVICE JOB SHEET

OFFICE COPY

CUSTOMER J P RICHARDSONS	CONTACT DARREN WEDLEY	TEL
STREET	SUBURB	

ORDER DATE	PROD. GRP.	SERVICE JOB NUMBER	CUSTOMER No.	CRANE No.	CUSTOMER ORDER/REF. NUMBER
		3422154			

EMPLOYEES NAME K BARBER	SIGNATURE	No. 84225
RISK ASSESSED BY (EMPLOYEE)	SIGNATURE	

RISK ASSESSMENT

ACCESS:	Yes	PPE TO BE WORN:	Yes
FIXED ACCESS (eg PLATFORM)	☐	SAFETY HELMET	☐
		EYE/FACE PROTECTION	☐
BOOMLIFT	☐	BREATHING PROTECTION	☐
SCISSOR LIFT	☑	HEARING PROTECTION	☐
SCAFFOLDING	☐	GLOVES	☐
OTHER	☐	SAFETY VEST	☐
		PROTECTIVE CLOTHING	☐

Type of Hazard	Potential Hazard (tick) Yes	Assessment of Risk Low/Med/High	Control Measure Required Yes	No	Current or Proposed Control This Section must be completed for each hazard identified
ASBESTOS/GLASS FIBRES	☐		☐	☑	
LIQUIDS	☐		☐	☑	
GASES	☐		☐	☑	
DUST	☐		☐	☑	
FUMES	☐		☐	☑	
FUMES/VAPOURS	☐		☐	☑	
CHEMICALS	☐		☐	☑	
BIOLOGICAL HAZARDS	☐		☐	☑	
MANUAL HANDLING	☐		☐	☑	
CONFINED SPACES	☐		☐	☑	

Type of Hazard	Potential Hazard (tick) Yes	Assessment of Risk Low/Med/High	Control Measure Required Yes	No	Current or Proposed Control This Section must be completed for each hazard identified
TRIP HAZARDS	☐		☐	☑	
OPENINGS	☐		☐	☑	
SLIPPERY SURFACES	☐		☐	☑	
FALLING OBJECTS	☐		☐	☑	
GUARDING & PINCH POINTS	☐		☐	☑	
MOVING MACHINERY	☐		☐	☑	
OBSTRUCTIONS	☐		☐	☑	
TRAFFIC /PERSONNEL	☐		☐	☑	
ELECTRICITY	☑		☐	☐	ISOLATE IF NECESSARY
NOISE	☐		☐	☑	
HEAT	☐		☐	☑	
COLD	☐		☐	☑	
FIRE	☐		☐	☑	
OTHERS	☐		☐	☐	
CUSTOMER JSA COMPLETED	☐		☐	☐	

LABOUR

DATE D	M	NORM TR.	WORK	O.T.1.5 TR.	WORK	O.T.2.0 TR.	WORK	SERVICE TECHNICIAN
27	3		3					KB

MATERIAL

DESCRIPTION	PART No.	QTY
SICCON LIFT	DEMAG	1

WORK COMPLETED ☑ WORK IN PROGRESS ☐ CALL OUT ☐

REPORT

COMPLAINT/INSTRUCTION TO SERVICEMAN: RETENSION CLUTCH ON BOTH HOISTS TO OBTAIN MAX LIFT OF 3.5 TON. CHANGE BOTTOM BLOCK LABLES TO 3.5 T SWL.

COMMENTS/WORK CARRIED OUT:

AS ABOVE

J P RICHARDSON REP ONSITE JAMES COYNE

EQUIPMENT TESTED AND LEFT IN SAFE CONDITION ☑ YES ☐ NO (Refer to comments above)

Customer's Signature: Print Name: Date: 27/3/13

MD 017-142C

Demag Cranes & Components Pty. Ltd. A.B.N. 86 000 406 717

Head Office: 92 Long Street Smithfield NSW 2164 Phone: (02) 9609 9500 Fax: (02) 9609 7168

Newcastle Branch: Unit5/5 Pavilion Place Cardiff NSW 2285 Phone: (02) 4979 1500 Fax: (02) 4979 1599

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South Australia Branch: 262 Grange Road Flinders Park SA 5025 Phone: (08) 8352 4466 Fax: (08) 8352 1216

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Nth QLD - Mackay 2/18 Central Park Drive Paget QLD 4740 Phone: (07) 4963 9400 Fax: (07) 4963 9499

DEMAG Cranes & Components	INSTALLATION & COMMISSIONING REPORT/CHECK NEW & REFURBISHED EQUIPMENT	DOC. No. DCC-IT-6/5 ISSUE 13 – 28/11//2008 Page 1 of 2
CUSTOMER/PROJECT: J & P Richardson		JOB/PROJECT No. 5401103
INSTALLATION DESCRIPTION (e.g. Crane, KBK System, Hoist etc.): 4000kg Chain Hoist ED DC-Pro 25-4000 2/1 H14		COMMISSIONED BY: TITLE: DATE: GWatts 14/12

NOTE: 1/ - COMPLETE DEMAG JSA BEFORE COMMENCEMENT OF WORK
2/ - WHERE INFORMATION IS REQUIRED (IN BRACKETS) IT MUST BE SUPPLIED.
3/ - ALL ITEMS TO BE CHECKED OFF, EVEN IF N/A.
4/ - DEMAG AND CLIENT SAFETY REQUIREMENTS ARE TO BE OBSERVED AT ALL TIMES.
5/ - IF REQUIRED BY CONTRACT OR STATUARY AUTHORITY CUSTOMERS SIGNATURE IS TO BE OBTAINED.

RESPONSIBILITY: - INSTALLATION FITTER / ELECTRICIAN

ITEM NO.	DESCRIPTION	ACCEPT. (✓)	UN-ACCEPT. (✓)	N/A (✓)	REMARKS
1	CHECK CRANE WITH G.A. - IDENT. No.............. REV..........	☑	☐	☐	
2	CHECK ALL BOLTS HAVE BEEN TIGHTENED TO CORRECT TORQUE. E.G. GIRDER CONNECTION BOLTS (M20 = 544 Nm) - (TORQUE WRENCH No/s..................)	☑	☐	☐	
3	CHECK L/T & C/T WHEELS SIT CORRECTLY ON RAIL/CRANE BEAM/MONORAIL I.E. FLANGE & RAIL TOLERANCES ARE CORRECT.	☑	☐	☐	
4	CHECK L/T & C/T END STOPS - POSITION - FUNCTION	☑	☐	☐	
5	CHECK BREATHER PLUGS FITTED (IF APPLICABLE)	☑	☐	☐	
6	CHECK CORRECT SIGNS FITTED - CRANE/SERIAL No. - CLASSIFICATION - WLL. - BEAM - WLL. - BOTTOM BLOCK	☑	☐	☐	
7	CHECK DIRECTION SIGN CORRESPONDS WITH ACTUAL RUNWAY DIRECTIONS	☑	☐	☐	
8	CHECK CORRECT CONTROL STATION FITTED: - PENDANT ☑ - REMOTE CONTROL ☐ - RADIO ☐	☑	☐	☐	
9	CHECK BACKUP PENDANT SUPPLIED AND GIVEN TO CUSTOMER – IF APPLICABLE	☐	☐	☑	
10	CHECK THAT, IF REMOTE CONTROL IS SUPPLIED THE FOLLOWING IS GIVEN TO CUSTOMER: - BATTERY CHARGER - SPARE BATTERY - HOLSTER & STRAP	☐	☐	☑	
11	CHECK C/T & L/T PICK-UP ARMS ARE SECURELY &/OR CORRECTLY FASTENED	☐	☐	☑	
12	CHECK ALL ELECTRICS - COMPONENTS NOT LOOSE IN CUBICLE - RANDOM CHECK OF CONNECTIONS	☑	☐	☐	
13	MEGGER EARTH – CRANE/HOIST - (.............. Ohms) DOWNSHOP SUPPLY - (.............. Ohms) *NOTE: NEW INSTALLATIONS ONLY	☑	☐	☐	By others
14	CHECK EARTHING/GROUNDING	☑	☐	☐	
15	CHECK SHIELDING	☐	☐	☐	
16	INSULATION TEST BETWEEN PHASES – CRANE/HOIST (0.01 Megohm) (1 Megohm) - DOWNSHOP SUPPLY (0.6 Megohm)	☑	☐	☐	
17	CHECK LIMIT SWITCH SET CORRECTLY - HOIST UP - HOIST OVER TRAVEL - HOIST DOWN - L/T - C/T	☑	☐	☐	
18	CHECK ALL MECHANICAL AND ELECTRICAL OPERATING FUNCTIONS	☑	☐	☐	
19	CHECK EMERGENCY STOP FUNCTION	☑	☐	☐	
20	CHECK DOWNSHOP AND THAT COLLECTORS RUN SMOOTHLY	☑	☐	☐	
21	CHECK FLAT CABLES IF MECHANICAL DAMAGE CAN OCCUR WHEN RUNNING - DOWNSHOP - C/T - PENDANT	☑	☐	☐	
22	CHECK WARNING DEVICES OPERATE; (if applicable) e.g. - HOOTER - FLASHING LIGHT	☑	☐	☐	
23	CHECK (IF APPLICABLE) - LIGHTS OPERATE - STORM CLAMPS - ANTI-COLLISION DEVICES - MOTION LIMITS	☐	☐	☑	
24	CHECK VENTILATION FANS & FILTERS - FUNCTION - NO OBSTRUCTIONS	☑	☐	☐	Platform
25	KBK - BOLTED CONNECTIONS ON SUPPORTING STRUCTURE (e.g. clamps)	☐	☐	☑	
26	KBK - FITTING OF SPRING CLIPS.	☐	☐	☑	
27	KBK - BOLTED CONNECTIONS OF TRACK CLAMPING FIXTURES	☐	☐	☑	
28	KBK - WIDTH OF TRACK SECTION GAP	☐	☐	☑	
29	KBK - ALIGNMENT OF BUTT JOINTS	☐	☐	☑	
30	KBK - END CAPS FITTED	☐	☐	☑	

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DEMAG
Cranes & Components

SERVICE JOB SHEET

OFFICE COPY

CUSTOMER J&P Richardson	CONTACT Doreen / Mark.	TEL	
STREET	SUBURB		

ORDER DATE	PROD. GRP.	SERVICE JOB NUMBER	CUSTOMER No.	CRANE No.	CUSTOMER ORDER/REF. NUMBER
		5401103			

EMPLOYEES NAME	SIGNATURE	No.
RISK ASSESSED BY (EMPLOYEE)	SIGNATURE	

RISK ASSESSMENT

ACCESS:	Yes	PPE TO BE WORN:	Yes
FIXED ACCESS (eg PLATFORM)	☐	SAFETY HELMET	☐
		EYE/FACE PROTECTION	☐
BOOMLIFT	☐	BREATHING PROTECTION	☐
SCISSOR LIFT	☐	HEARING PROTECTION	☐
SCAFFOLDING	☐	GLOVES	☐
OTHER	☐	SAFETY VEST	☐
		PROTECTIVE CLOTHING	☐

Type of Hazard	Potential Hazard (tick) Yes	Assessment of Risk Low/Med/High	Control Measure Required Yes	No	Current or Proposed Control This Section must be completed for each hazard identified
ASBESTOS/GLASS FIBRES	☐		☐	☐	
LIQUIDS	☐		☐	☐	
GASES	☐		☐	☐	
DUST	☐		☐	☐	
FUMES	☐		☐	☐	
FUMES/VAPOURS	☐		☐	☐	
CHEMICALS	☐		☐	☐	
BIOLOGICAL HAZARDS	☐		☐	☐	
MANUAL HANDLING	☐		☐	☐	
CONFINED SPACES	☐		☐	☐	

Type of Hazard	Potential Hazard (tick) Yes	Assessment of Risk Low/Med/High	Control Measure Required Yes	No	Current or Proposed Control This Section must be completed for each hazard identified
TRIP HAZARDS	☐		☐	☐	
OPENINGS	☐		☐	☐	
SLIPPERY SURFACES	☐		☐	☐	
FALLING OBJECTS	☐		☐	☐	
GUARDING & PINCH POINTS	☐		☐	☐	
MOVING MACHINERY	☐		☐	☐	
OBSTRUCTIONS	☐		☐	☐	
TRAFFIC /PERSONNEL	☐		☐	☐	
ELECTRICITY	☐		☐	☐	
NOISE	☐		☐	☐	
HEAT	☐		☐	☐	
COLD	☐		☐	☐	
FIRE	☐		☐	☐	
OTHERS	☐		☐	☐	
CUSTOMER JSA COMPLETED	☐		☐	☐	

LABOUR

DATE D	M	NORM TR.	NORM WORK	O.T.1.5 TR.	O.T.1.5 WORK	O.T.2.0 TR.	O.T.2.0 WORK	SERVICE TECHNICIAN

MATERIAL

DESCRIPTION	PART No.	QTY

WORK COMPLETED ☐ WORK IN PROGRESS ☐ CALL OUT ☐

REPORT

COMPLAINT/INSTRUCTION TO SERVICEMAN: Supply and Install and Commission new hoist at SP344 six mile creek. Removal of existing

COMMENTS/WORK CARRIED OUT:

Deflection on beam 4430kg @ deflection 7mm

End ≏ 3mm
Middle ≏ 1mm
Centre of bay ≏ 7mm

EQUIPMENT TESTED AND LEFT IN SAFE CONDITION ☐ YES ☐ NO (Refer to comments above)

Customer's Signature: [signature] Print Name: D. WEOLLEY Date: 14/12/12

MD 017-142C

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DEMAG Cranes & Components	INSTALLATION & COMMISSIONING REPORT/CHECK NEW & REFURBISHED EQUIPMENT	DOC. No. DCC-IT-6/5 ISSUE 13 – 28/11/2008 Page 2 of 2

RESPONSIBILITY: - INSTALLATION FITTER / ELECTRICIAN

ITEM NO.	DESCRIPTION	ACCEPT. (✓)	UN-ACCEPT. (✓)	N/A (✓)	REMARKS
31	KBK - COLLECTOR TROLLEY: COUPLING AND ALIGNMENT	☐	☐	☑	
32	KBK LOAD TROLLEY: SMOOTH RUNNING	☐	☐	☑	
33	KBK - SMOOTH RUNNING AND WEAR OF SUPPORT ROLLERS	☐	☐	☑	
34	KBK - SECURE FIT OF SPLIT SLEEVES	☐	☐	☑	
35	KBK - FRICTION WHEEL CONTACT PRESSURE	☐	☐	☑	
36	JIB ARM - ROTATES EASILY - BRAKES OPERATE - NO OBSTRUCTIONS - SMOOTH RUNNING OF HOIST TROLLEY	☐	☐	☐	
37		☐	☐	☐	
38		☐	☐	☐	
39		☐	☐	☐	
40		☐	☐	☐	
41		☐	☐	☐	
42		☐	☐	☐	
43		☐	☐	☐	
44		☐	☐	☐	
45		☐	☐	☐	
46		☐	☐	☐	
47		☐	☐	☐	
48		☐	☐	☐	
49		☐	☐	☐	
50		☐	☐	☐	
51		☐	☐	☐	
52	CHECK DEFLECTION OF BEAM (if req'd by Stat. Auth. or Spec.) Use DOC. No. DCC-IT-410/29 to record test results (if required).	☑	☐	☐	7 mm
53	CHECK EQUIPMENT APPEARANCE.	☑	☐	☐	
54	CHECK OPERATING ENVIRONMENT FOR POTENTIAL HAZARDS/INTERFERENCE e.g. LIGHTS, HEATERS, CABLES, DUCTS, OTHER MACHINERY	☑	☐	☐	
55	CHECK EQUIPMENT IS LEFT IN A SAFE CONDITION	☑	☐	☐	

FURTHER REMARKS:

CUSTOMER SIGNATURE: [signature]
PRINT NAME: D. WADLEY
TITLE: PROJECT MANAGER
DATE: 14/12/12

RESPONSIBILITY: INSTALLATION SUPERVISOR / MANAGER

REVIEWED BY: Gary Watts TITLE: Installation DATE: 14/12/2012

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DEMAG Cranes & Components	DEFLECTION & LOAD TEST REPORT FOR BRIDGE, GANTRY, PORTAL, MONORAIL & JIB CRANES	DOC. No. DCC-IT-410/29 ISSUE 6 – 10/11/2009

CUSTOMER: J & P Richardson		JOB No. 5401103
LOCATION (Address): , SP 34 Site Six Mile, Redbank		
DESCRIPTION (Crane/Installation Type): 4000kg Chain Hoist		CRANE S/N:
MAKE & MODEL OF HOIST: ED DC-Pro 25-4000 2/1 H14	CLASS:	HOIST S/N:

NOTE: 1/ load testing is to be carried out in accordance with AS1418.3, Section 12 - Inspection & Commissioning.
2/ All hoists are pretested at 25% overload (Test certificates available, if required).
3/ Commissioning checks are to be carried out in accordance with Doc. No. DCC-IT-6/5 "Installation & Commissioning Checklist"

WORK INSTRUCTION:
1. Ensure crane deflection is measured with crane over a runway/building column.
2. Ensure load & crab/s is mid span of the crane.
3. Ensure load is measured in a static state.
4. Ensure there are no unauthorised personnel in work area and area is barricaded/sign posted against unauthorised entry.
5. Ensure there is no machinery or other obstacles in way of crane path during testing.
6. Ensure that chains/slings used are in good condition and have been inspected and tagged.
7. Ensure that the load is slung correctly to prevent load slipping and/or falling.

1.0 DEFLECTION TESTING

1.1 MEASUREMENT BEFORE LOAD TEST: 0 mm

1.2 ACTUAL WEIGHT OF TEST WEIGHT/S, SLINGS & ANY ASSOCIATED LIFTING EQUIP. e.g. LIFTING: 4430 kg

3989
3982

1.3 WITH MAXIMUM RATED CAPACITY CHECK AT POINT OF MAXIMUM DEFLECTION: *Calculated ____ mm Actual: - 7 mm

*SPAN DIVIDED BY 500 AS PER AS1418.1.

1.4 CHECK DEFLECTION AFTER REMOVAL OF LOAD: 0 mm

1.5 CHECK CRANE TRAVEL AND TRAVERSE AT FULL SPEED WITH MAXIMUM RATED CAPACITY: 4430 kg

2.0 LOAD TEST

2.1. WITH MAXIMUM RATED CAPACITY PLUS 10% CHECK THAT OVERLOAD PROTECTION ACTIVATES e.g. MGS & ZMS, & NOTE WEIGHT LIFTED: NIL kg

2.2 CHECK OPERATION OF LOAD DISPLAY, WHERE FITTED/ACTIVATED: NIL kg

*NOTE: BEFORE CONDUCTING NEXT TEST ENSURE THAT OVERLOAD PROTECTION IS DEACTIVATED. E.g. FOR DR HOIST SWITCH DIP S/W No. 6 FROM POSITION "0" TO POSITION "1", THE OVERLOAD PROTECTION IS DEACTIVATED FOR 15 MINUTES.

2.3 WITH MAXIMUM RATED CAPACITY PLUS 10% CHECK BRAKE OPERATION. ☑ √ PASS ☐ √ FAIL

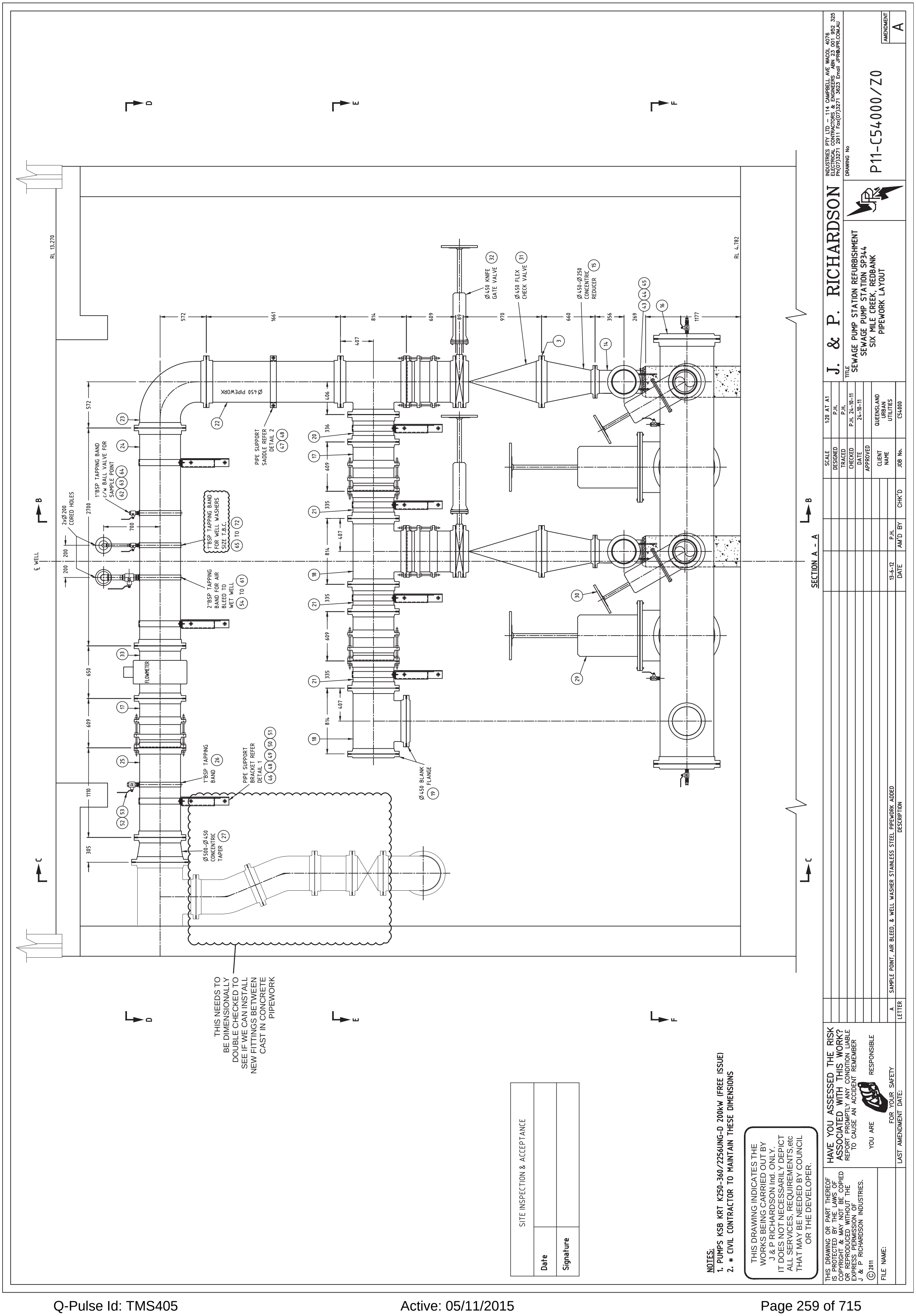
*NOTE: ONCE ALL TESTING IS COMPLETED ENSURE OVERLOAD PROTECTION IS REACTIVATED. E.g. FOR DR HOIST SWITCH DIP S/W No. 6 FROM POSITION No. "1" TO POSITION "0".

OVERLOAD PROTECTION IS REACTIVATED ☐ √

REMARKS: Cantilever 3mm deflection
Centre of bay 7mm ''
Middle beam 1mm ''

TEST CARRIED OUT BY:	WITNESSED By (Crane Owner, Customer, Authorised Officer)
Name: Gary Watts (print)	Name: D. Wesley (print)
Sign:	Sign: [signature]
Title:	Title: Project Manager
Date: 13/12/2012	Date: 14/12/12

5. Pipe Work, Valves, Pumps Install



SECTION A - A
Ø450 PIPEWORK
Ø450 KNIFE GATE VALVE
Ø450 FLEX CHECK VALVE
Ø450-Ø250 CONCENTRIC REDUCER
PIPE SUPPORT SADDLE REFER DETAIL 2
1"BSP TAPPING BAND c/w BALL VALVE FOR SAMPLE POINT
2xØ200 CORED HOLES
1"BSP TAPPING BAND FOR WELL WASHERS SIZE T.B.C.
2"BSP TAPPING BAND FOR AIR BLEED TO WET WELL
FLOWMETER
1"BSP TAPPING BAND
PIPE SUPPORT BRACKET REFER DETAIL 1
Ø450 BLANK FLANGE
Ø500-Ø450 CONCENTRIC TAPER
THIS NEEDS TO BE DIMENSIONALLY DOUBLE CHECKED TO SEE IF WE CAN INSTALL NEW FITTINGS BETWEEN CAST IN CONCRETE PIPEWORK
RL 13.270
RL 4.782
NOTES:
1. PUMPS KSB KRT K250-360/2256UNG-D 200kW (FREE ISSUE)
2. * CIVIL CONTRACTOR TO MAINTAIN THESE DIMENSIONS
THIS DRAWING INDICATES THE WORKS BEING CARRIED OUT BY J & P RICHARDSON Ind. ONLY. IT DOES NOT NECESSARILY DEPICT ALL SERVICES, REQUIREMENTS,etc THAT MAY BE NEEDED BY COUNCIL OR THE DEVELOPER.
SITE INSPECTION & ACCEPTANCE
Date
Signature
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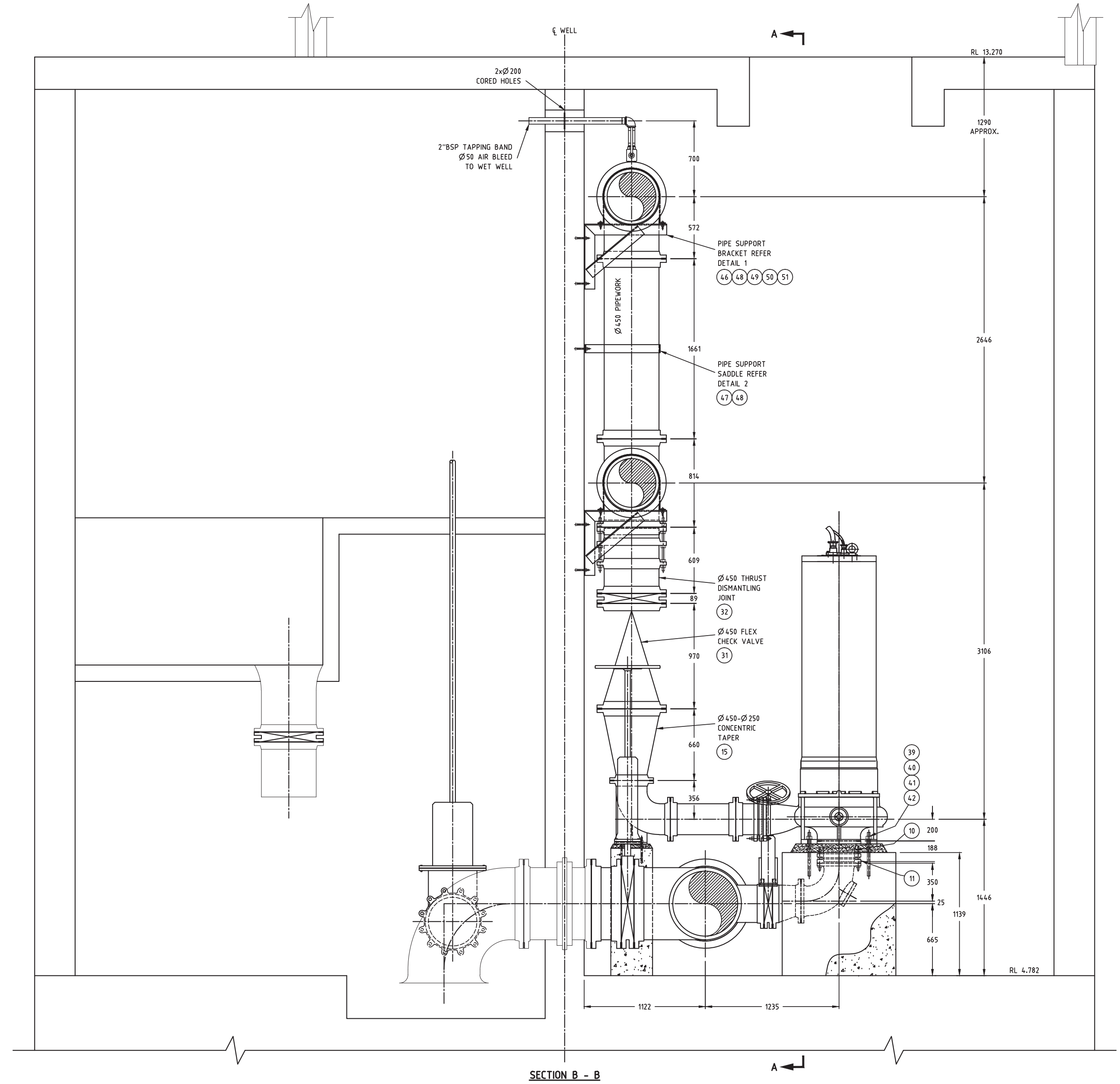
©2011
FILE NAME:
HAVE YOU ASSESSED THE RISK ASSOCIATED WITH THIS WORK?
REPORT PROMPTLY ANY CONDITION LIABLE TO CAUSE AN ACCIDENT REMEMBER
YOU ARE RESPONSIBLE FOR YOUR SAFETY
LAST AMENDMENT DATE:
A SAMPLE POINT, AIR BLEED, & WELL WASHER STAINLESS STEEL PIPEWORK ADDED 13-6-12 P.H.
LETTER DESCRIPTION DATE AM'D BY CHK'D
SCALE 1:20 AT A1
DESIGNED P.H.
TRACED P.H.
CHECKED P.H. 24-10-11
DATE 24-10-11
APPROVED
CLIENT NAME QUEENSLAND URBAN UTILITIES
JOB No. C54000
J. & P. RICHARDSON
INDUSTRIES PTY LTD - 114 CAMPBELL AVE WACOL 4076
ELECTRICAL CONTRACTORS & ENGINEERS ABN 23 001 952 325
Ph(07)3271 2911 Fax(07)3271 3623 Email JPR@JPR.COM.AU
TITLE SEWAGE PUMP STATION REFURBISHMENT SEWAGE PUMP STATION SP344 SIX MILE CREEK, REDBANK PIPEWORK LAYOUT
DRAWING No P11-C54000/Z0
AMENDMENT A



NOTES:
1. PUMPS KSB KRT K250-360/2256UNG-D 200kW (FREE ISSUE)
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SITE INSPECTION & ACCEPTANCE	
Date	
Signature	

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LAST AMENDMENT DATE:

LETTER	DESCRIPTION	DATE	AM'D BY	CHK'D
A	SAMPLE POINT, AIR BLEED, & WELL WASHER STAINLESS STEEL PIPEWORK ADDED	13-6-12	P.H.	

SCALE	1:20 AT A1
DESIGNED	P.H.
TRACED	P.H.
CHECKED	P.H. 24-10-11
DATE	24-10-11
APPROVED	
CLIENT NAME	QUEENSLAND URBAN UTILITIES
JOB No.	C54000

J. & P. RICHARDSON

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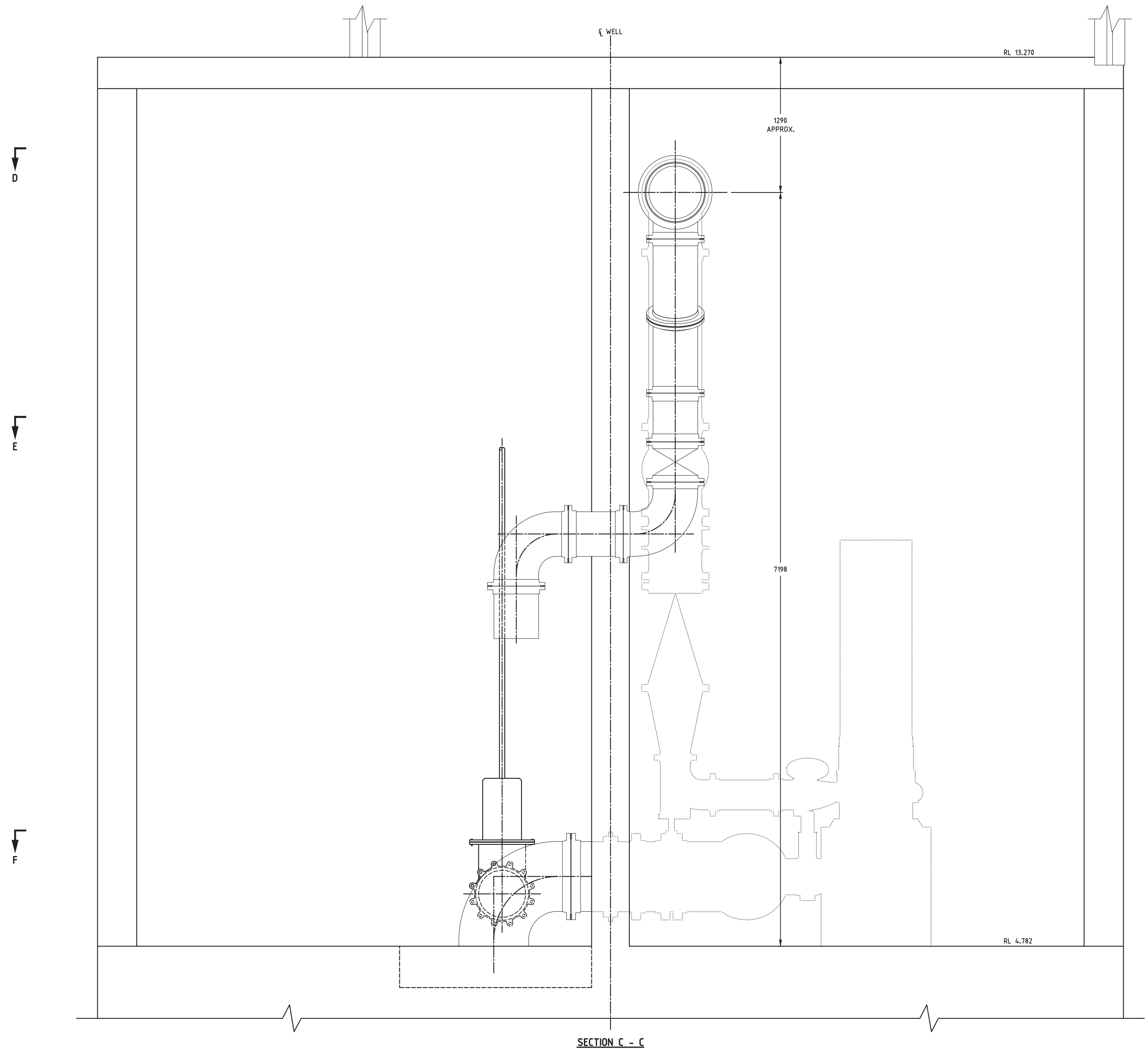
ELECTRICAL CONTRACTORS & ENGINEERS ABN 23 001 952 325
Ph(07)3271 2911 Fax(07)3271 3623 Email JPR@JPR.COM.AU

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
SIX MILE CREEK, REDBANK
PIPEWORK LAYOUT

DRAWING No
P11-C54000/Z1

AMENDMENT
A



SITE INSPECTION & ACCEPTANCE	
Date	
Signature	

NOTES:
1. PUMPS KSB KRT K250-360/2256UNG-D 200kW (FREE ISSUE)
2. * CIVIL CONTRACTOR TO MAINTAIN THESE DIMENSIONS

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REPORT PROMPTLY ANY CONDITION LIABLE TO CAUSE AN ACCIDENT REMEMBER
YOU ARE RESPONSIBLE
FOR YOUR SAFETY

LAST AMENDMENT DATE:

LETTER	DESCRIPTION	DATE	AM'D BY	CHK'D

SCALE	1:20 AT A1
DESIGNED	P.H.
TRACED	P.H.
CHECKED	
DATE	24-10-11
APPROVED	
CLIENT NAME	QUEENSLAND URBAN UTILITIES
JOB No.	C54000

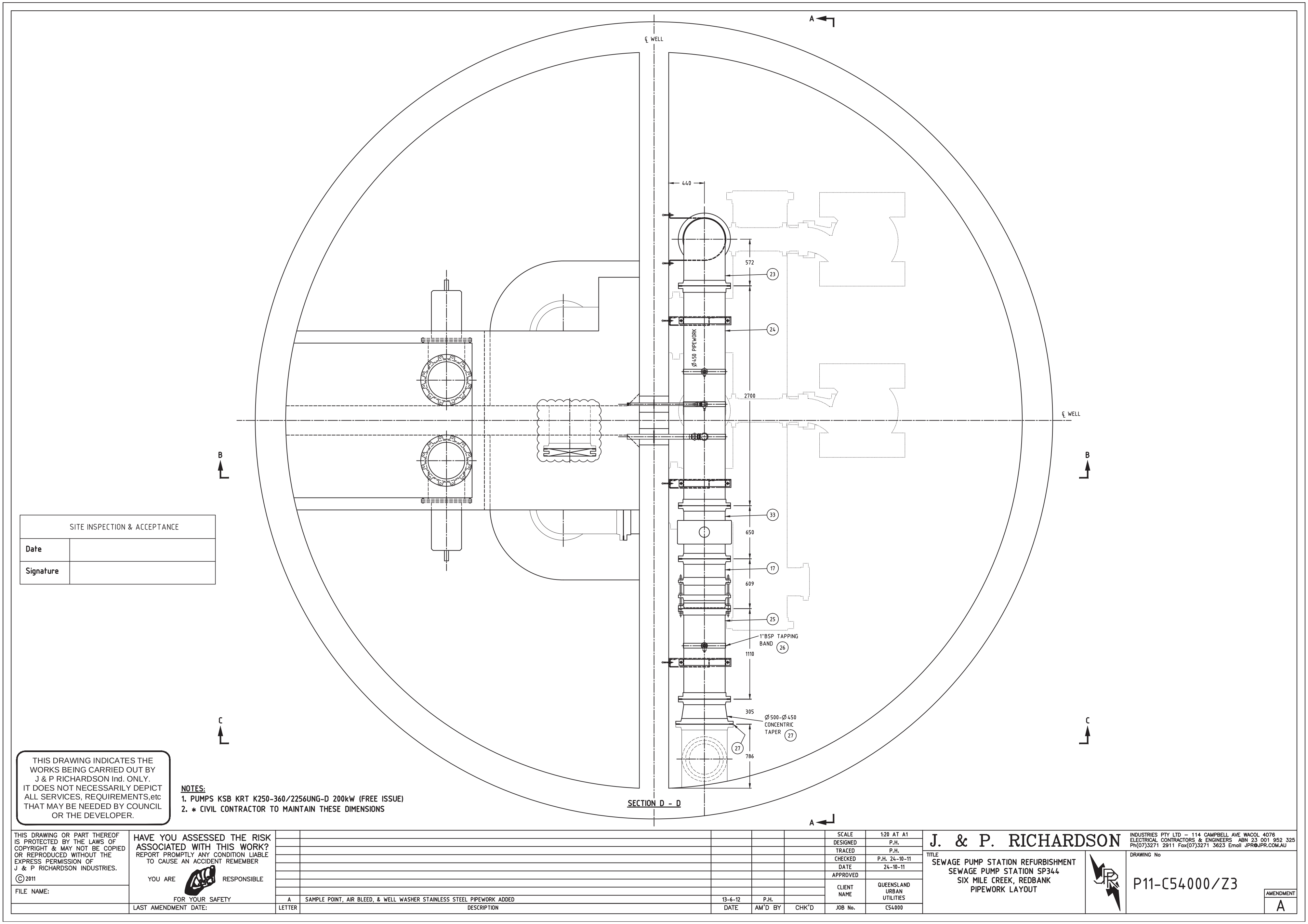
J. & P. RICHARDSON

INDUSTRIES PTY LTD – 114 CAMPBELL AVE WACOL 4076
ELECTRICAL CONTRACTORS & ENGINEERS ABN 23 001 952 325
Ph(07)3271 2911 Fax(07)3271 3623 Email JPR@JPR.COM.AU

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
SIX MILE CREEK, REDBANK
PIPEWORK LAYOUT

DRAWING No
P11-C54000/Z2

AMENDMENT



€ WELL
A
B
C
440
572
2700
650
609
1110
305
786
23
24
33
17
25
1"BSP TAPPING BAND 26
Ø500-Ø450 CONCENTRIC TAPER 27
27
Ø450 PIPEWORK
SECTION D - D
SITE INSPECTION & ACCEPTANCE
Date
Signature
THIS DRAWING INDICATES THE WORKS BEING CARRIED OUT BY J & P RICHARDSON Ind. ONLY. IT DOES NOT NECESSARILY DEPICT ALL SERVICES, REQUIREMENTS,etc THAT MAY BE NEEDED BY COUNCIL OR THE DEVELOPER.
NOTES:
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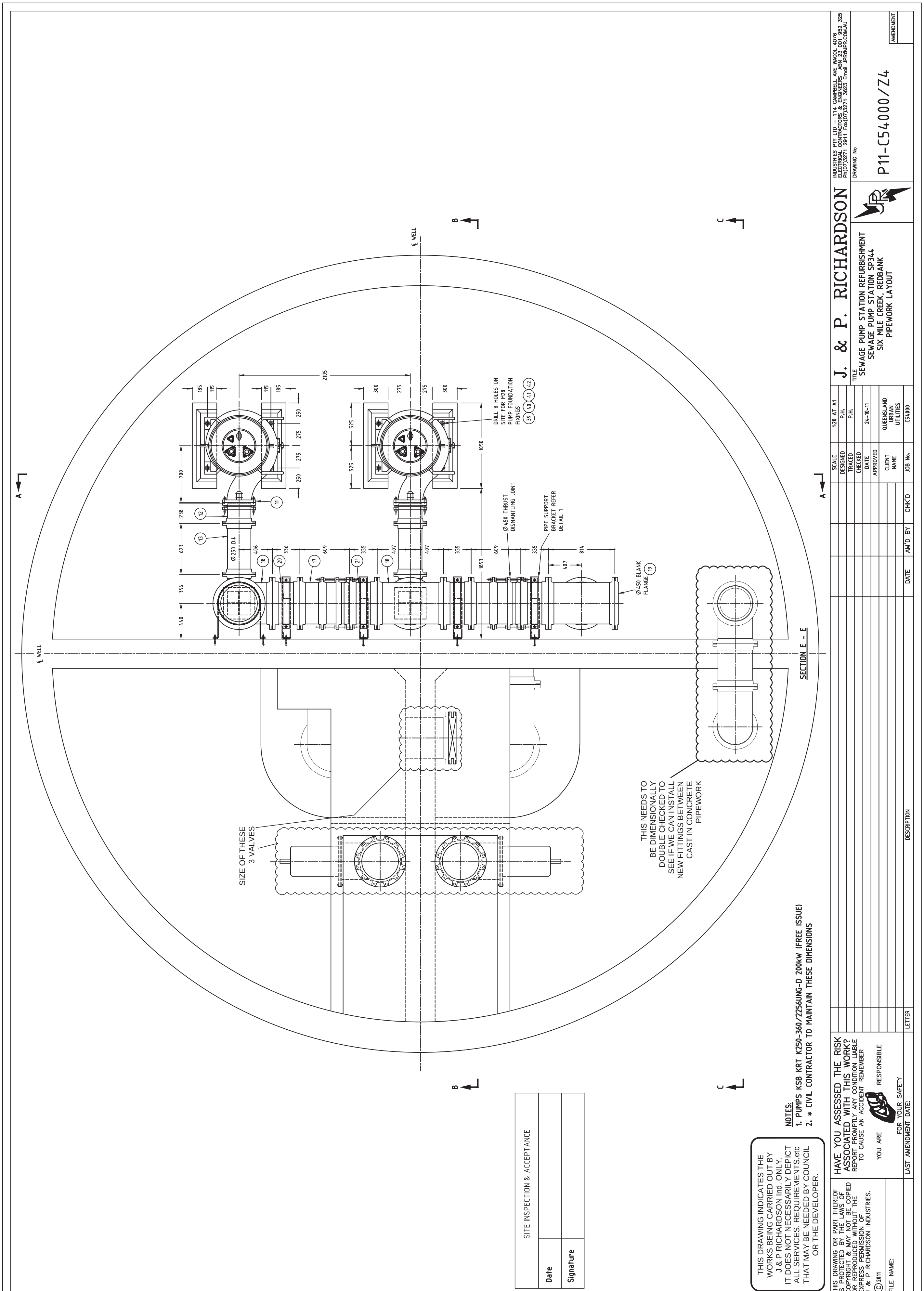
REPORT PROMPTLY ANY CONDITION LIABLE TO CAUSE AN ACCIDENT REMEMBER
YOU ARE RESPONSIBLE FOR YOUR SAFETY
LAST AMENDMENT DATE:
A
SAMPLE POINT, AIR BLEED, & WELL WASHER STAINLESS STEEL PIPEWORK ADDED
13-6-12
P.H.
LETTER
DESCRIPTION
DATE
AM'D BY
CHK'D
SCALE 1:20 AT A1
DESIGNED P.H.
TRACED P.H.
CHECKED P.H. 24-10-11
DATE 24-10-11
APPROVED
CLIENT NAME QUEENSLAND URBAN UTILITIES
JOB No. C54000
J. & P. RICHARDSON
INDUSTRIES PTY LTD - 114 CAMPBELL AVE WACOL 4076
ELECTRICAL CONTRACTORS & ENGINEERS ABN 23 001 952 325
Ph(07)3271 2911 Fax(07)3271 3623 Email JPR@JPR.COM.AU
TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
SIX MILE CREEK, REDBANK
PIPEWORK LAYOUT
DRAWING No
P11-C54000/Z3
AMENDMENT
A



SECTION E - E
SIZE OF THESE 3 VALVES
THIS NEEDS TO BE DIMENSIONALLY DOUBLE CHECKED TO SEE IF WE CAN INSTALL NEW FITTINGS BETWEEN CAST IN CONCRETE PIPEWORK
NOTES:
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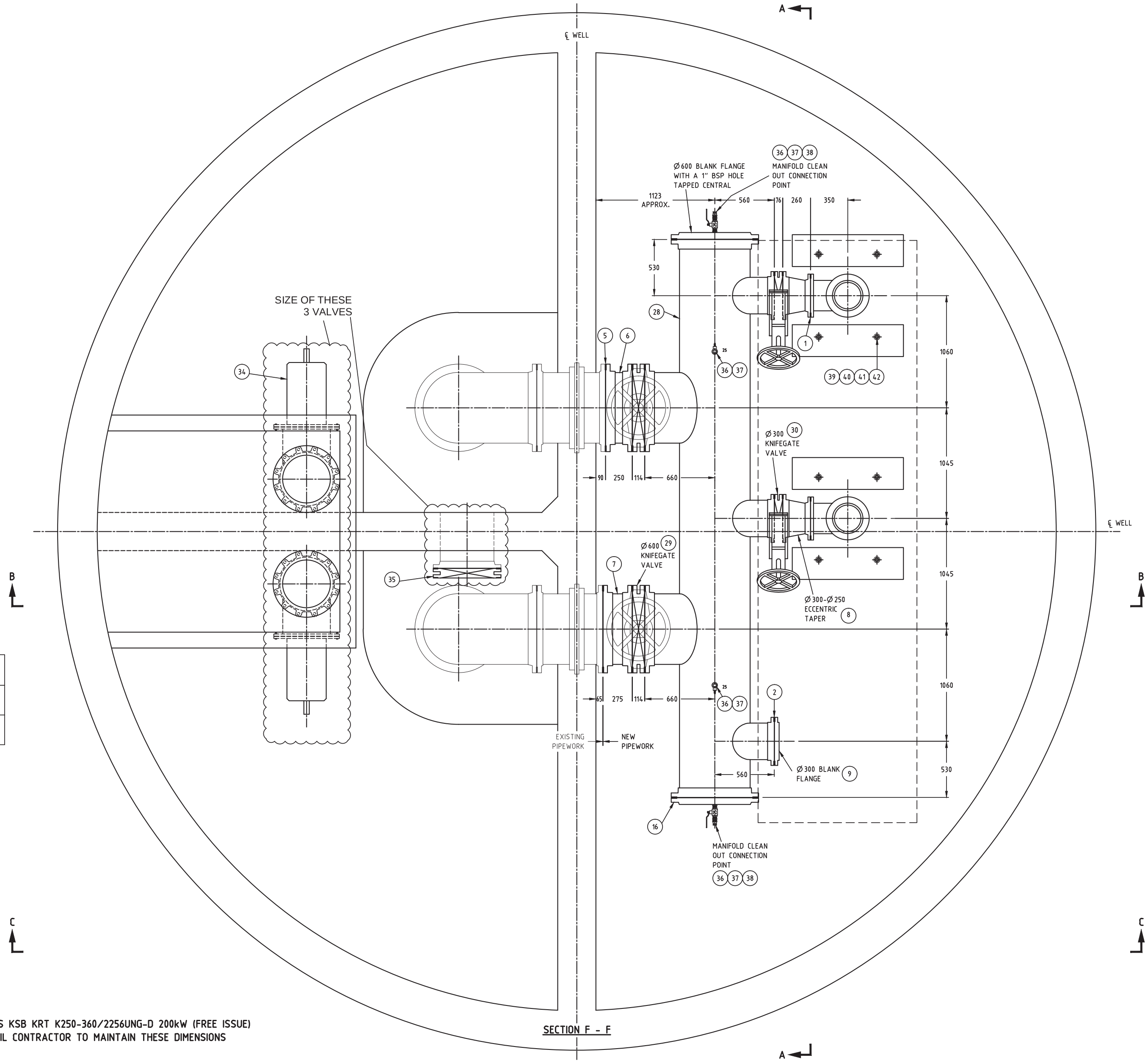
SITE INSPECTION & ACCEPTANCE
Date
Signature
J. & P. RICHARDSON
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
SIX MILE CREEK, REDBANK
PIPEWORK LAYOUT
P11-C54000/Z4



SITE INSPECTION & ACCEPTANCE	
Date	
Signature	

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FILE NAME:

HAVE YOU ASSESSED THE RISK ASSOCIATED WITH THIS WORK? REPORT PROMPTLY ANY CONDITION LIABLE TO CAUSE AN ACCIDENT REMEMBER YOU ARE RESPONSIBLE FOR YOUR SAFETY

LAST AMENDMENT DATE:

LETTER	DESCRIPTION	DATE	AM'D BY	CHK'D

SCALE	1:20 AT A1
DESIGNED	P.H.
TRACED	P.H.
CHECKED	
DATE	24-10-11
APPROVED	
CLIENT NAME	QUEENSLAND URBAN UTILITIES
JOB No.	C54000

J. & P. RICHARDSON

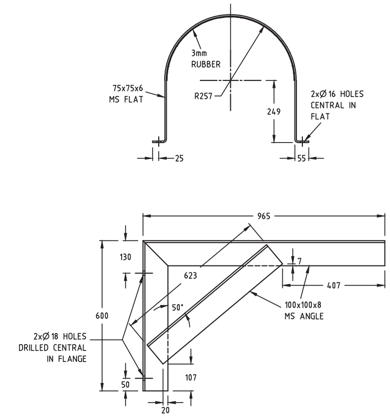
INDUSTRIES PTY LTD – 114 CAMPBELL AVE WACOL 4076
ELECTRICAL CONTRACTORS & ENGINEERS ABN 23 001 952 325
Ph(07)3271 2911 Fax(07)3271 3623 Email JPR@JPR.COM.AU

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
SIX MILE CREEK, REDBANK
PIPEWORK LAYOUT

DRAWING No
P11-C54000/Z5

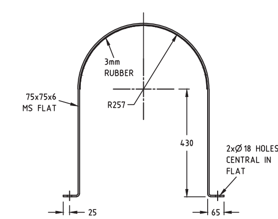
AMENDMENT

Item	Qty	Make & Number	Req. No.
1	12	250dia. B.N.W.G. SET 316SS TC	P7328
2	5	300dia. B.N.W.G. SET 316SS TC	P7328
3	26	450dia. B.N.W.G. SET 316SS TC	P7328
4	1	500dia. B.N.W.G. SET 316SS TC	P7328
5	8	600dia. B.N.W.G. SET 316SS TC	P7328
6	1	600dia. DF PIPE 250Lg	P7328
7	1	600dia. DF PIPE 275Lg	P7328
8	2	300dia. - 250dia. DF ECCENTRIC TAPER	P7328
9	1	300dia. BLANK FLANGE	P7328
10	2	250dia. FL/SP PIPE 188Lg	P7328
11	4	250dia. NON THRUST DISMANTLING JOINT	P7328
12	2	250dia. FL/SP PIPE 238Lg	P7328
13	2	250dia. DF PIPE 623Lg	P7328
14	2	250dia. DF 90deg. DUCKFOOT BEND	P7328
15	2	450dia. - 250dia. DF CONCENTRIC TAPER	P7328
16	2	600dia. BLANK FLANGE c/w 1" BSP HOLE TAPPED CENTRAL	P7328
17	5	450dia. THRUST DISMANTLING JOINT	P7329
18	3	450dia. ALL FL TEE	P7329
19	2	450dia. BLANK FLANGES	P7329
20	1	450dia. DF PIPE 336Lg	P7329
21	3	450dia. DF PIPE 335Lg	P7329
22	1	450dia. DF PIPE 1661Lg	P7329
23	1	450dia. DF 90deg. BEND	P7329
24	1	450dia. DF PIPE 2700Lg	P7329
25	1	450dia. DF PIPE 1110Lg	P7329
26	1	450dia. 1" BSP TAPPING BAND	P7329
27	1	500dia. - 450dia. DF CONCENTRIC TAPER	P7329
28	1	600dia. - 300dia. PIPEWORK HEADER	P7309
29	2	600dia. LUGGED KNIFEGATE VALVE	P7327
30	2	300dia. LUGGED KNIFEGATE VALVE	P7327
31	2	450dia. DF VALMATIC FLEX CHECK VALVE	P7327
32	2	450dia. LUGGED KNIFEGATE VALVE	P7327
33	1	450dia. ENDRESS & HAUSER FLOWMETER	P7307
34	2	***??dia. KNIFEGATE VALVE - 450? (INLET VALVES)***	
35	1	***??dia. KNIFEGATE VALVE - 450? (IN WALL BETWEEN WET WELLS***	
36	6	25mm BSP HEX. NIPPLE	
37	4	25mm BSP FULL PORT 2 PIECE BALL VALVE	
38	2	25mm BSP x MALE CAMLOCK PURPLE PIR PART No.300210430	
39	4m	M28-316SS BROOKER ROD	
40	24	M28-316SS NUTS	
41	8	28mm-316SS FLAT WASHERS	
42	16	28mm GALV. SQUARE WASHERS	
43	8	M16x220 SS STUD ANCHORS	
44	16	16mm GALV. SQUARE WASHERS	
45	16	M16-316SS NUTS	
46	3	450dia. PIPE SUPPORT BRACKET TO DETAIL 1	
47	1	450dia. PIPE SUPPORT SADDLE TO DETAIL 2	
48	8	M16x100 SS STUD ANCHORS	
49	6	M14x50-316SS SET SCREWS	
50	6	M14-316SS NUTS	
51	6	M14-316SS FLAT WASHERS	
52	1	32 - 25mm 316SS HEX. REDUCING NIPPLE	
53	1	32mm 316SS FULL PORT 2 PIECE BALL VALVE	
	AIR BLEED		
54	2	50mm 316SS HEX. NIPPLE	
55	1	50mm 316SS FULL PORT 2 PIECE BALL VALVE	
56	1	50mm 316SS F/F UNION	
57	3	50mm 316SS TOE NIPPLES	
58	1.5m	50mm 316SS SCH.10 PIPE	
59	1	50mm 316SS F/F 90deg. ELBOWS	
60	1	50mm 316SS TABLE D SOW FLANGE	
61	1	450dia. 2" BSP TAPPING BAND	
	SAMPLE POINT		
	1	450dia. 1" BSP TAPPING BAND	
62	1	25mm 316SS HEX. NIPPLE	
63	1	25mm 316SS FULL PORT 2 PIECE BALL VALVE	
64	***WELL WASHER - SIZE TBA***		
65	***1***	***450dia. 1" BSP TAPPING BAND***	
66	***1***	***25mm 316SS HEX. NIPPLE***	
67	***1***	***25mm 316SS FULL PORT 2 PIECE BALL VALVE***	
68	***1***	***25mm 316SS F/F UNION***	
69	***4***	***25mm 316SS TOE NIPPLES***	
70	***1***	***25mm 316SS F/F 90deg. ELBOWS***	
71	***2m***	***25mm 316SS SCH.10 PIPE***	
72	***1***	***25mm 316SS TABLE D SOW FLANGE***	



DETAIL 1 - PIPE SUPPORT BRACKET

SCALE: 1:10
MATERIAL: 100x100x8 MS ANGLE & 75x6 MS FLAT
FINISH: HOT DIP GALV.
No. REQUIRED: 3



DETAIL 2 - PIPE SUPPORT SADDLE

SCALE: 1:10
MATERIAL: 75x6 MS FLAT
FINISH: HOT DIP GALV.
No. REQUIRED: 1

47 48

SITE INSPECTION & ACCEPTANCE	
Date	
Signature	

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FILE NAME:

HAVE YOU ASSESSED THE RISK ASSOCIATED WITH THIS WORK? REPORT PROMPTLY ANY CONDITION LIABLE TO CAUSE AN ACCIDENT REMEMBER YOU ARE RESPONSIBLE FOR YOUR SAFETY

LAST AMENDMENT DATE:

LETTER	DESCRIPTION	DATE	AM'D BY	CHK'D
A	SAMPLE POINT, AIR BLEED, & WELL WASHER STAINLESS STEEL PIPEWORK ADDED	13-6-12	P.H.	

SCALE	1:10 AT A1
DESIGNED	P.H.
TRACED	P.H.
CHECKED	P.H. 24-10-11
DATE	24-10-11
APPROVED	
CLIENT NAME	QUEENSLAND URBAN UTILITIES
JOB No.	C54000

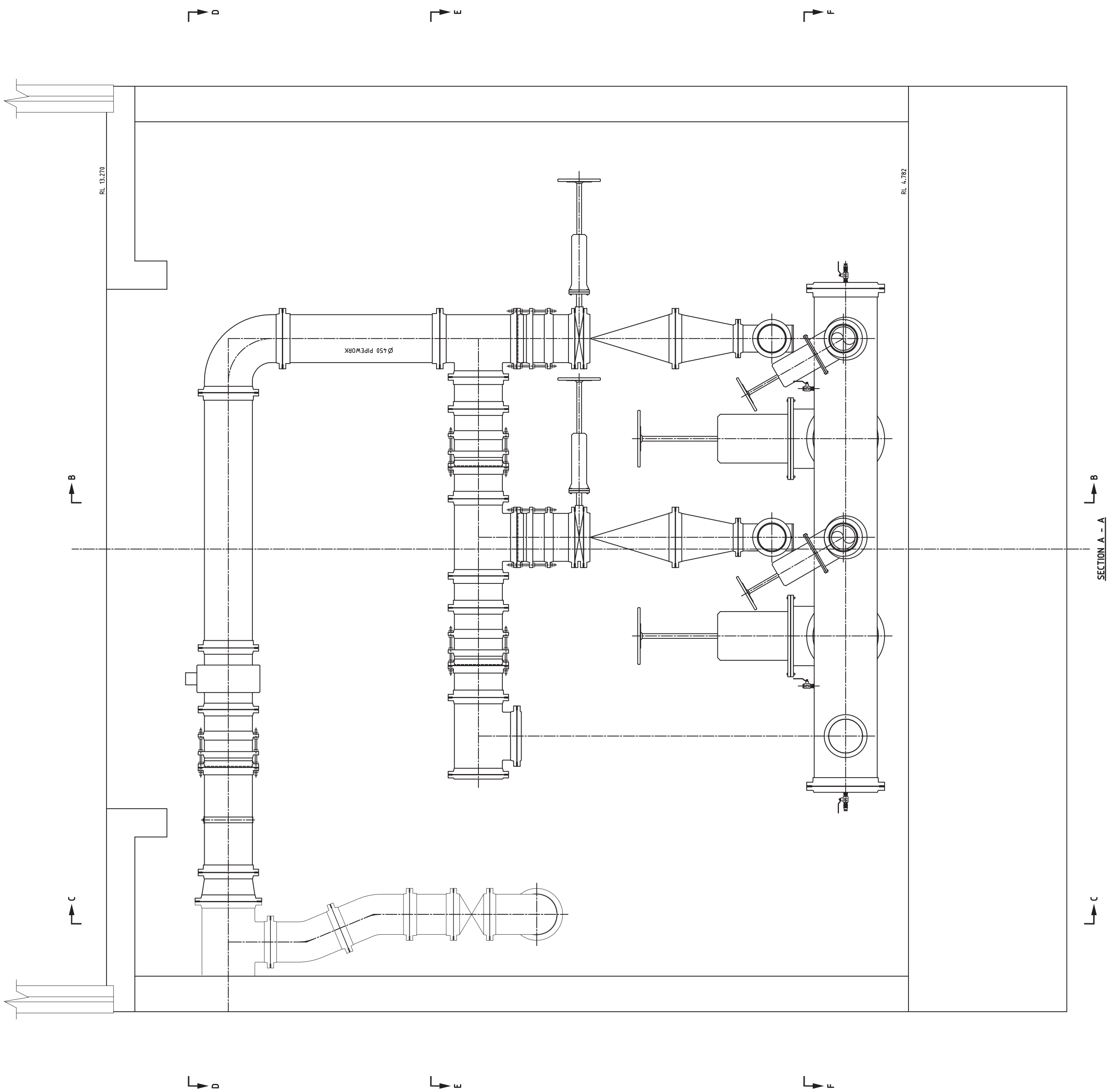
J. & P. RICHARDSON

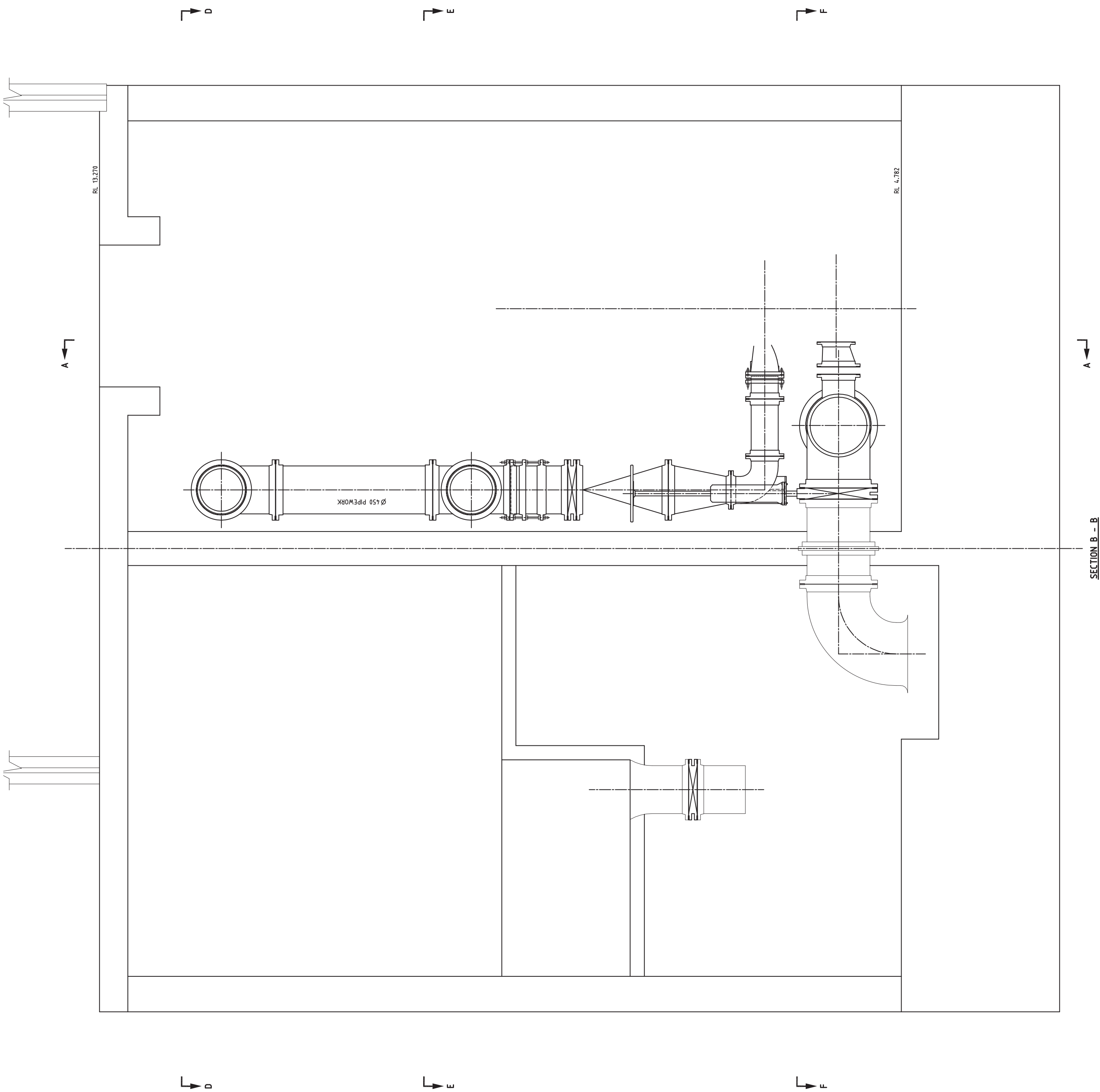
INDUSTRIES PTY LTD – 114 CAMPBELL AVE WACOL 4076 ELECTRICAL CONTRACTORS & ENGINEERS ABN 23 001 952 325 Ph(07)3271 2911 Fax(07)3271 3623 Email JPR@JPR.COM.AU

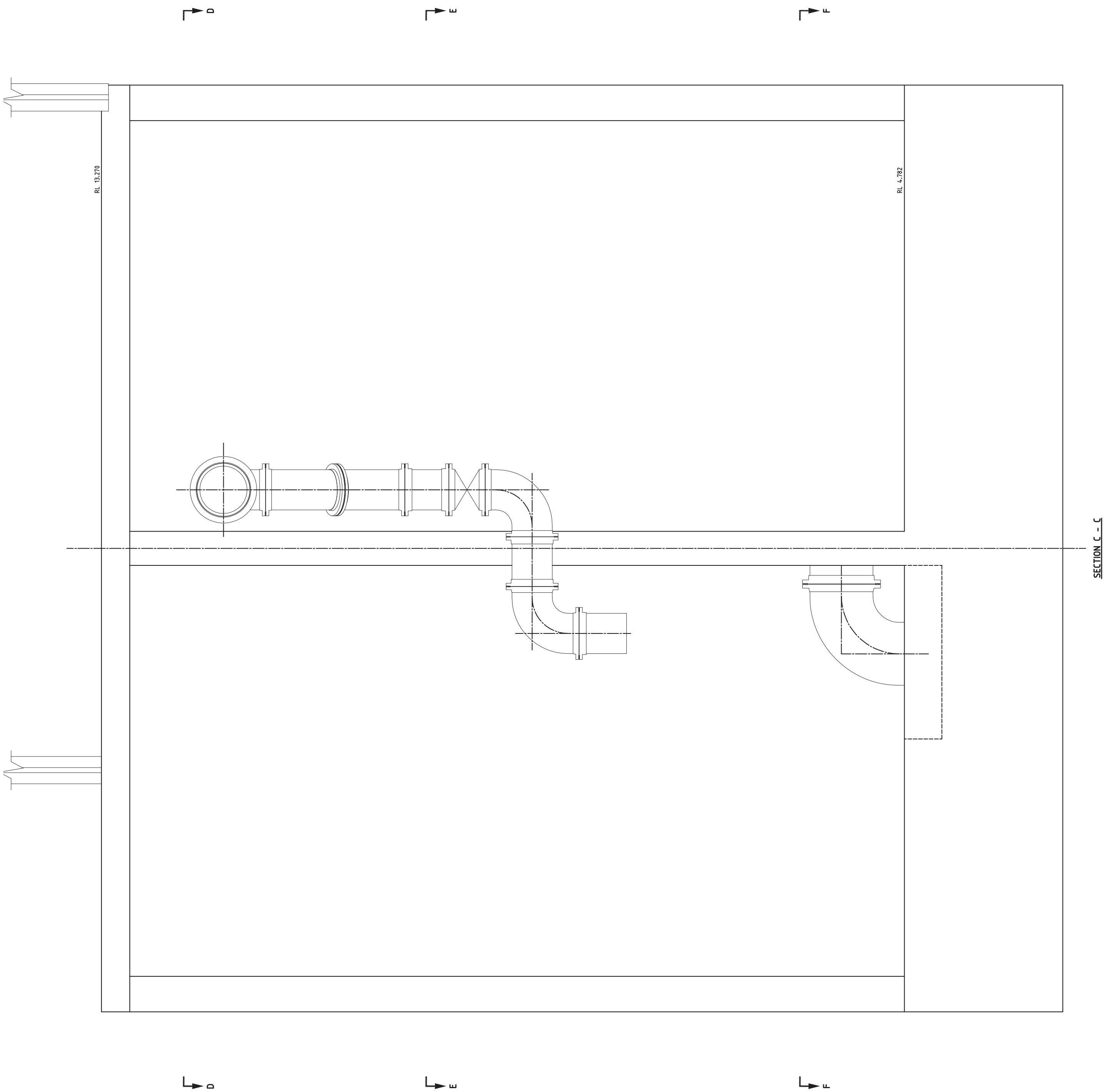
TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
SIX MILE CREEK, REDBANK
MISCELLANEOUS DETAILS

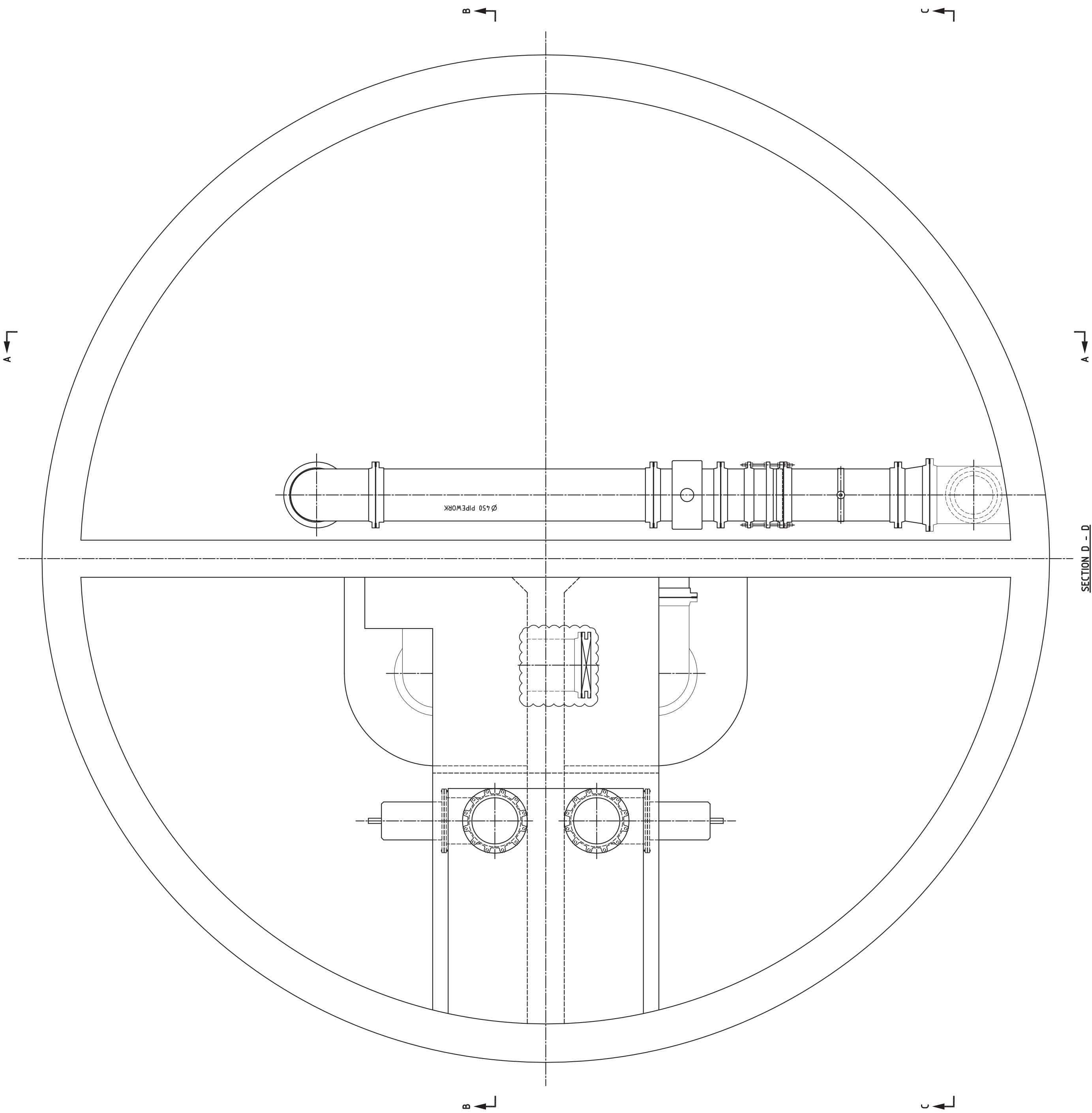
DRAWING No
P11-C54000/Z6

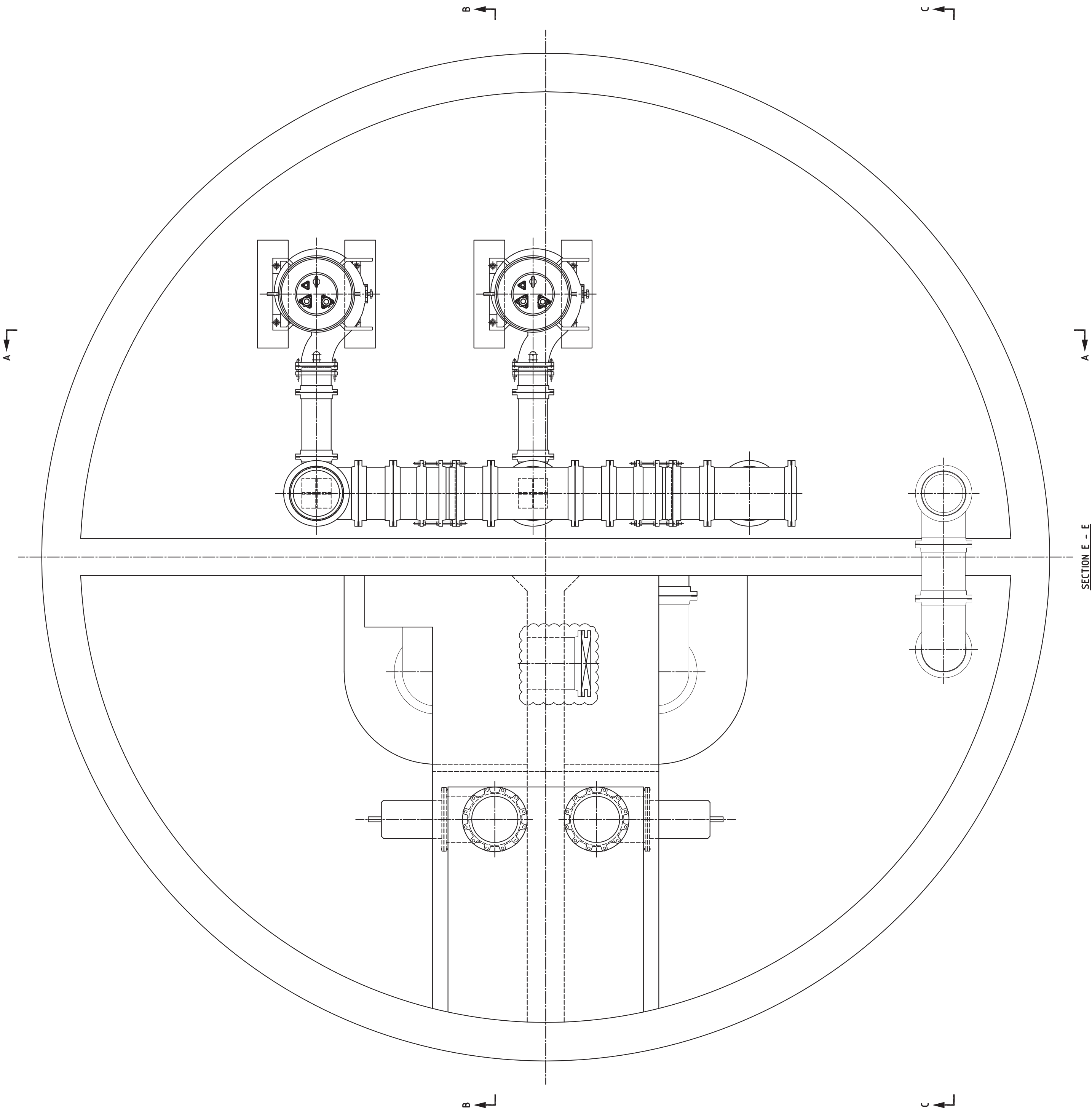
AMENDMENT
A

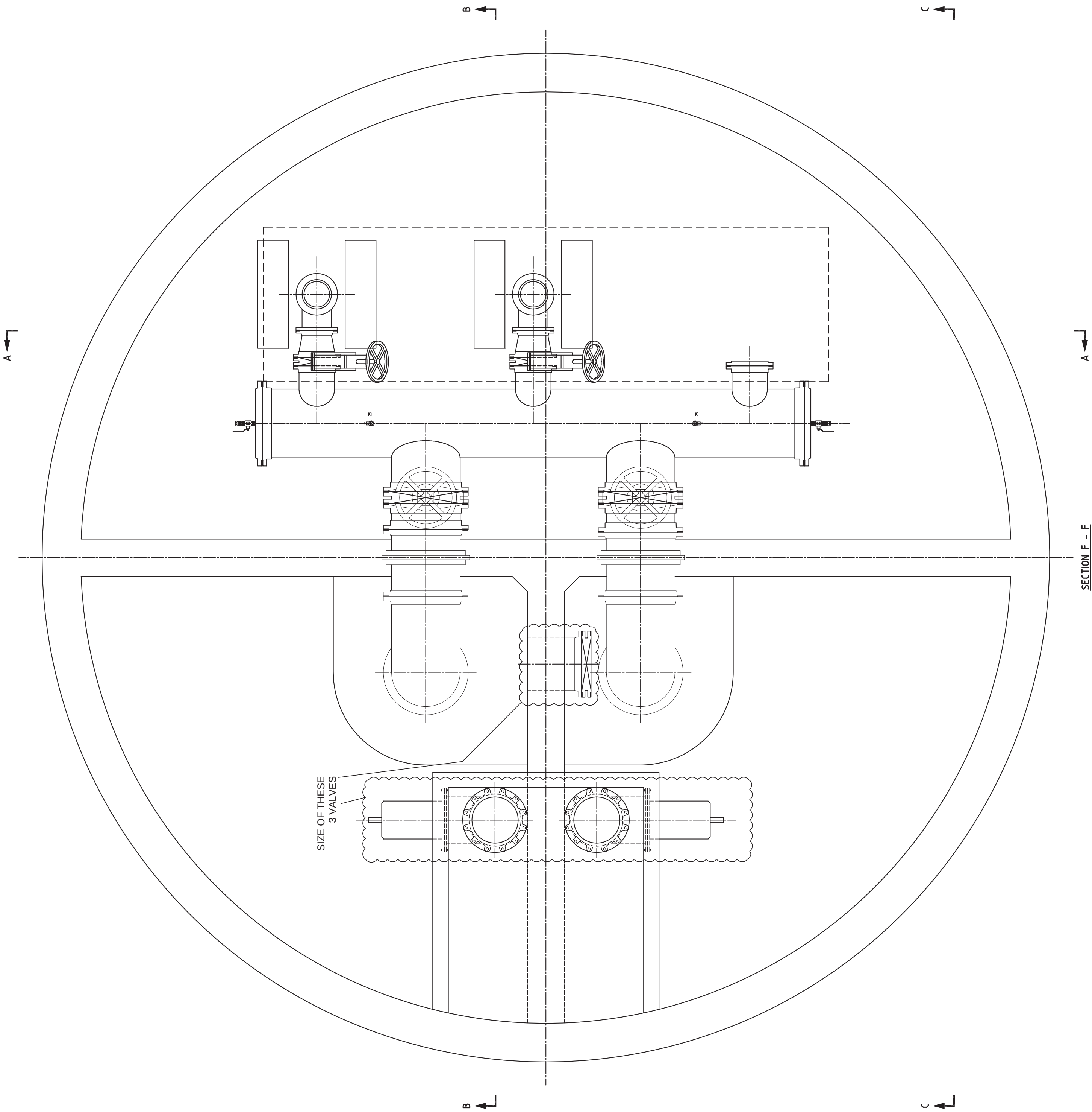

D
E
F
RL 13.270
RL 4.782
Ø450 PIPEWORK
B
B
SECTION A - A
C
C
D
E
F


SECTION B – B
Ø450 PIPEWORK
RL 13.270
RL 4.782


D
E
F
RL 13.270
RL 4.782
SECTION C – C
D
E
F


B
C
A
A
Ø450 PIPEWORK
SECTION D - D
B
C


B
C
A
A
SECTION E - E
B
C


B
C
A
A
SECTION F - F
SIZE OF THESE
3 VALVES
B
C

NOTES

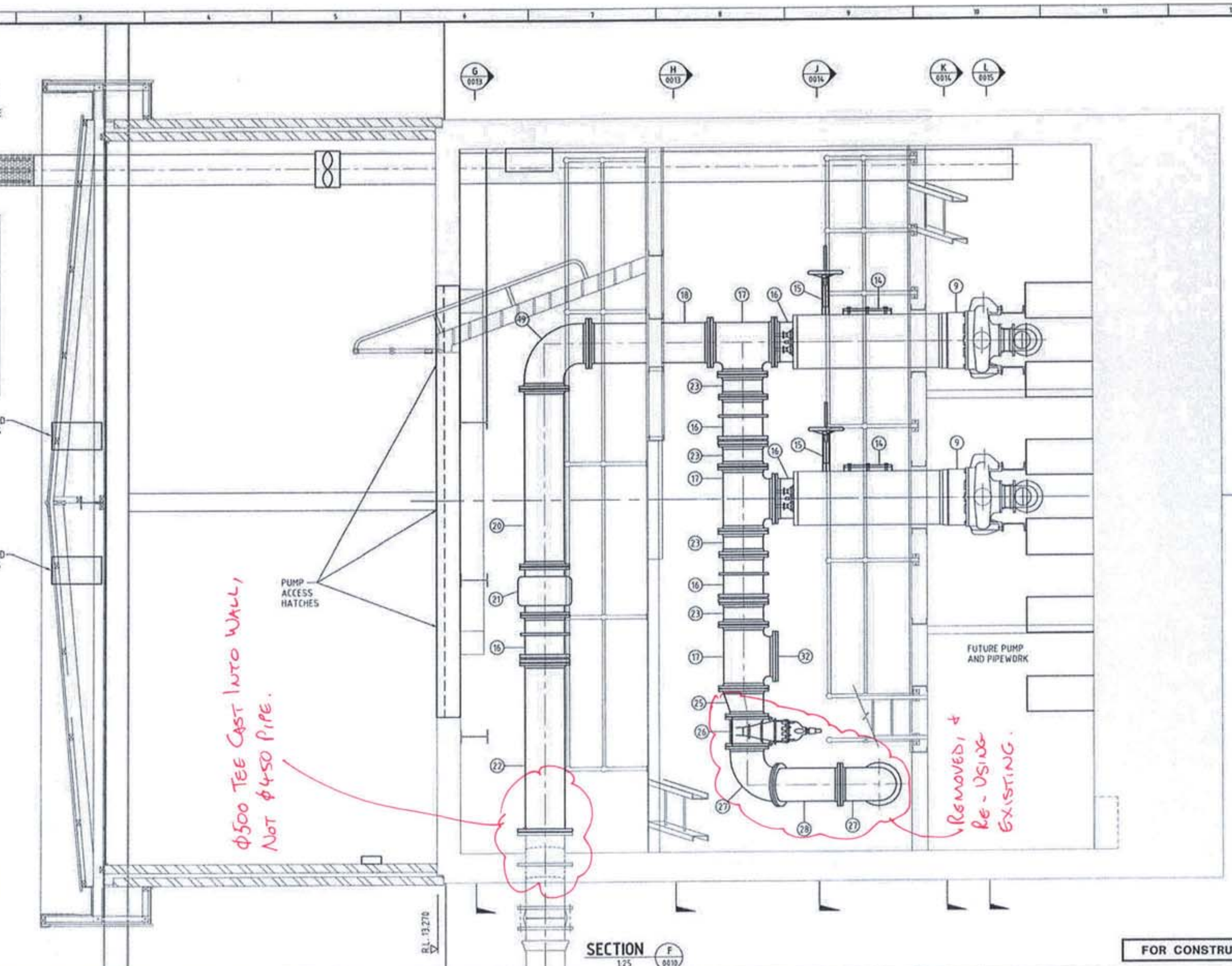
1. DRAWING TO BE READ IN CONJUNCTION WITH QU-SP043-01-CIV-0110-0009.
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.

WARNING

CONTRACTOR TO CONFIRM ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORKS.

CONTRACTOR TO CONFIRM DIAMETER OF EXISTING ASSETS PRIOR TO COMMENCEMENT OF WORKS THE DESIGN IS BASED ON INFORMATION SUPPLIED BY SERVICES AUTHORITIES AND SELECTIVE SERVICE IDENTIFICATION.

THE CONTRACTOR SHALL VERIFY THE POSITION OF EACH UNDERGROUND SERVICE BEFORE COMMENCING EXCAVATIONS.



SECTION 1:25 F 0010

Richard Mulligan Date 02/08/2011 RPEQ No. 7850

SCALE 1:25 — 500 0 500 1000 1500 2000 SCALE IN mm

FOR CONSTRUCTION

REV	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	01/08/2011
0	ISSUED FOR CONSTRUCTION	22/07/11

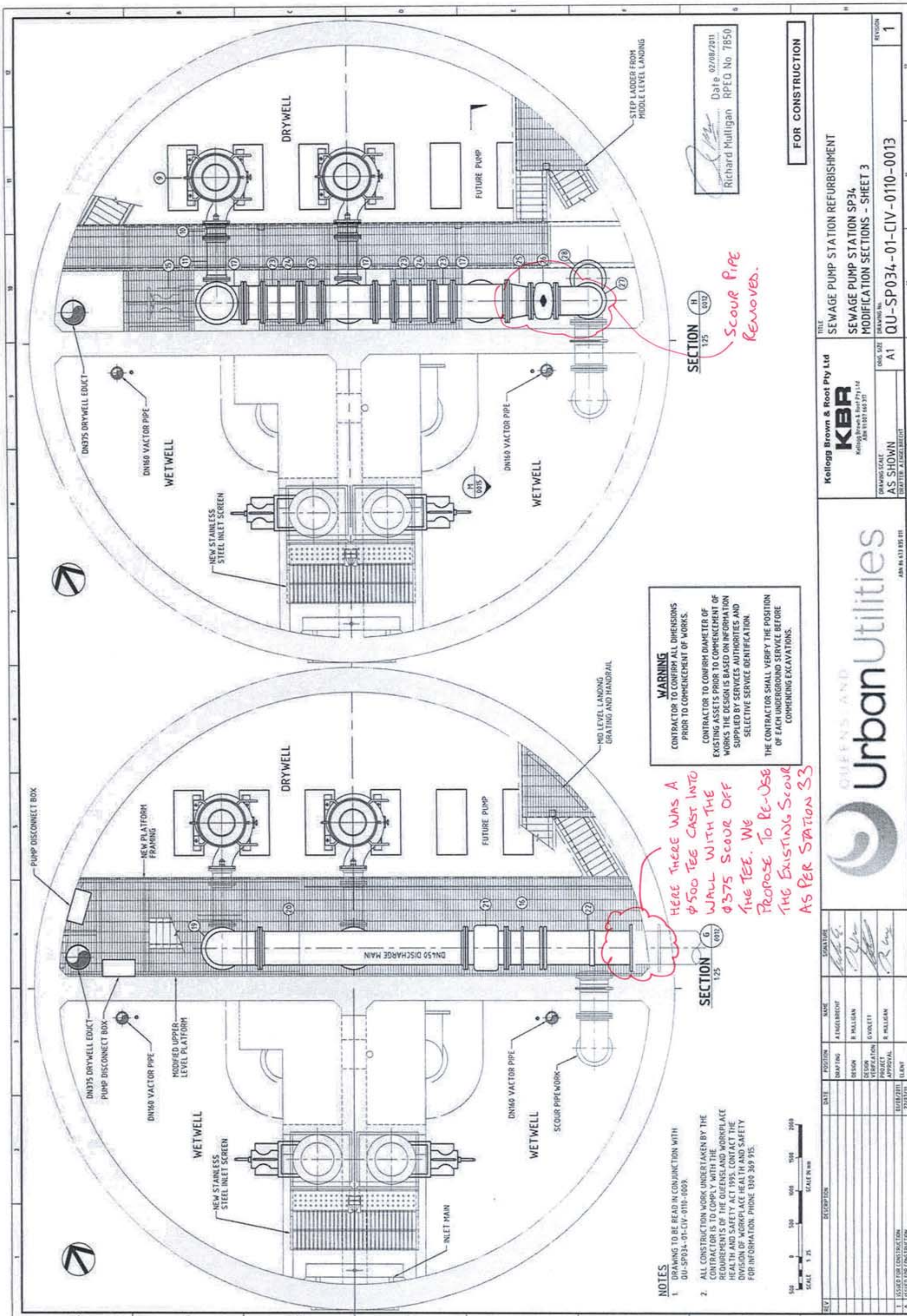
POSITION	NAME	SIGNATURE
DRAFTING	A.ENGELBRECHT	
DESIGN	R. MULLIGAN	
DESIGN VERIFICATION	G.VIOLETT	
PROJECT APPROVAL	R. MULLIGAN	
CLIENT		

QUEENSLAND Urban Utilities ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd KBR Kellogg Brown & Root Pty Ltd ABN 91 007 660 317

TITLE: SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP34
MODIFICATION SECTIONS - SHEET 2

DRAWING SCALE: AS SHOWN
DRAFTER: A.ENGELBRECHT
DRG. SIZE: A1
DRAWING No.: QU-SP034-01-CIV-0110-0012
REVISION: 1



DRYWELL
WETWELL
FUTURE PUMP
STEP LADDER FROM MIDDLE LEVEL LANDING
DN375 DRYWELL EDUCT
DN160 VACTOR PIPE
NEW STAINLESS STEEL INLET SCREEN
SECTION H 0012 1:25
SCOUR PIPE REMOVED.
Richard Mulligan Date 02/08/2011 RPEQ No 7850
FOR CONSTRUCTION
WARNING
CONTRACTOR TO CONFIRM ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORKS.
CONTRACTOR TO CONFIRM DIAMETER OF EXISTING ASSETS PRIOR TO COMMENCEMENT OF WORKS THE DESIGN IS BASED ON INFORMATION SUPPLIED BY SERVICES AUTHORITIES AND SELECTIVE SERVICE IDENTIFICATION.
THE CONTRACTOR SHALL VERIFY THE POSITION OF EACH UNDERGROUND SERVICE BEFORE COMMENCING EXCAVATIONS.
PUMP DISCONNECT BOX
NEW PLATFORM FRAMING
MID LEVEL LANDING GRATING AND HANDRAIL
MODIFIED UPPER LEVEL PLATFORM
SCOUR PIPEWORK
INLET MAIN
DN450 DISCHARGE MAIN
SECTION G 0012 1:25
HERE THERE WAS A Ø500 TEE CAST INTO WALL WITH THE Ø375 SCOUR OFF THE TEE. WE PROPOSE TO RE-USE THE EXISTING SCOUR AS PER STATION 33
NOTES
1. DRAWING TO BE READ IN CONJUNCTION WITH QU-SP034-01-CIV-0110-0009.
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.
Kellogg Brown & Root Pty Ltd
KBR
Urban Utilities
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP34
MODIFICATION SECTIONS - SHEET 3
AS SHOWN
A1
QU-SP034-01-CIV-0110-0013
1

SITE INSPECTION PUMPS (EXCLUDES ELECTRICAL INSTALLATION)

FORM No. F1013/0

JOB NO. CUSTOMER: LOCATION: DRAWING NO.

FIELD INSPECTION BY:	DATE: / / SUPERVISOR: DATE / /	PAGE OF PAGES
	STATION No.	REMARKS
BEFORE COMMENCING WORK	WELL MEASUREMENTS	
	ACCESS HOLE LOCATIONS	
	MEGGER TEST ALL PUMP MOTORS AND RECORD	
	CHECK FOR CORRECTNESS AGAINST DRAWINGS	
AFTER INSTALLATION BEFORE PUMPING	TIGHTNESS OF ALL BOLTS & FULL NUT THREAD	
	GROUTING PUMPS, PIPEWORK, S/BOARD, POLE	
	POWER AVAILABLE - ELECTRICS TESTED	
	ROTATION OF ALL MOTORS	
	(DO NOT RUN SEALS DRY)	
	COMMON PHASE ROTATION ALL PLUG OUTLETS	
	MANUAL OPERATION OF SWITCHBOARD	
WATER AVAILABLE RUN PUMPS	ELECTRODE/F.S HEIGHT TO PREVENT DRY RUN	
	AUTO OPERATION OF SWITCHBOARD	
	CHECK GLAND SEAL WATER	
	RECORD RUNNING CURRENT	
	SET OVER-LOADS	
	CHECK PIPEWORK FOR LEAKS	
	CHECK ALARM OPERATIONS	
BEFORE LEAVING SITE	MARK-UP DRAWING FOR SITE CHANGES	
	CLEAN SWITCHBOARD	
	CLEAN AND REMOVE OUR RUBBISH	
	RECORD ANY MATERIAL FOR RETURN	
	VISIT IF REQUIRED	
	ARRANGE AND FIT STATION LOCKS	
	LEAVE STATION ON AUTO (CONFIRM CLIENT)	
	LOCK SWITCHBOARD	
	STORE SPARES AND OBTAIN RECEIPT FOR SAME	
DRAWING NOS.		

Form: F1109/0

J & P RICHARDSON INDUSTRIES PTY LTD

INSPECTION & TEST PLAN

ITP No. C54000-SP34-Pipe Work , Valves, Pumps Install

* Legend		
	x = Perform	**H = Hold (mandatory)**
	w = Witness	**h = hold (optional)**
	a = Accept	**c = Certify**
	r = Random	

Project: Pipe Work , Valves, Pumps Install

Contract No: I112-024

Customer: Queensland Urban Utilities

Item No	Process Sequence	Acceptance Criteria	Activity By*		Reference Documents	Remarks/Records
			JPR	CUST		
1	**DESIGN**					
1.1	**Design Documents**					
1.1.1	Civil Drawings - Approved for Construction	Complies with specification, drawings and schedules	a + h	x	Contract Drawings & Documents	QU-SP034-01-CIV-0110-0008 REV1 QU-SP034-01-CIV-0110-0009 REV1 QU-SP034-01-CIV-0110-0010 REV1 QU-SP034-01-CIV-0110-0011 REV1 QU-SP034-01-CIV-0110-0012 REV1 QU-SP034-01-CIV-0110-0013 REV1 QU-SP034-01-CIV-0110-0014 REV1 QU-SP034-01-CIV-0110-0015 REV1
1.1.2	Scope of Works and Project Specification	Documentation provided as IFC and sufficiently complete for JPR to proceed	a + h	x	Contract Drawings & Documents	QU-SP034-01-CIV-0110-0008 REV1 QU-SP034-01-CIV-0110-0009 REV1 QU-SP034-01-CIV-0110-0010 REV1 QU-SP034-01-CIV-0110-0011 REV1 QU-SP034-01-CIV-0110-0012 REV1 QU-SP034-01-CIV-0110-0013 REV1 QU-SP034-01-CIV-0110-0014 REV1 QU-SP034-01-CIV-0110-0015 REV1
2	**IMPLEMENTATION**					
2.1	**Site Works**					

Form: F1109/0

J & P RICHARDSON INDUSTRIES PTY LTD

INSPECTION & TEST PLAN

*** Legend** **x = Perform** **w = Witness** **a = Accept** **r = Random** **H = Hold (mandatory)** **h = hold (optional)** **c = Certify**

ITP No. C54000-SP34-Pipe Work , Valves, Pumps Install

Project: Pipe Work , Valves, Pumps Install

Contract No: I112-024

Customer: Queensland Urban Utilities

Item No	Process Sequence	Acceptance Criteria	Activity By* JPR	Activity By* CUST	Reference Documents	Remarks/Records
2.1.1	Positioning of Pipe Work, Valves & Pumps	Complies with specification, drawings and schedules	x	w	Specification, drawings	QU-SP034-01-CIV-0110-0008 REV1 QU-SP034-01-CIV-0110-0009 REV1 QU-SP034-01-CIV-0110-0010 REV1 QU-SP034-01-CIV-0110-0011 REV1 QU-SP034-01-CIV-0110-0012 REV1 QU-SP034-01-CIV-0110-0013 REV1 QU-SP034-01-CIV-0110-0014 REV1 QU-SP034-01-CIV-0110-0015 REV1 C54000Z0A ,C54000Z1A ,C54000Z2 C54000Z3A ,C54000Z4 ,C54000Z5 C54000Z6
2.1.2	Completion of Postioning of Pipe Work, Valves & Pumps	Complies with specification, drawings and schedules	x	w	Specification, drawings	QU-SP034-01-CIV-0110-0008 REV1 QU-SP034-01-CIV-0110-0009 REV1 QU-SP034-01-CIV-0110-0010 REV1 QU-SP034-01-CIV-0110-0011 REV1 QU-SP034-01-CIV-0110-0012 REV1 QU-SP034-01-CIV-0110-0013 REV1 QU-SP034-01-CIV-0110-0014 REV1 QU-SP034-01-CIV-0110-0015 REV1 C54000Z0A ,C54000Z1A ,C54000Z2 C54000Z3A ,C54000Z4 ,C54000Z5 C54000Z6

Form: F1109/0

J & P RICHARDSON INDUSTRIES PTY LTD

INSPECTION & TEST PLAN

ITP No. C54000-SP34-Pipe Work , Valves, Pumps Install

*** Legend**
x = Perform **H = Hold (mandatory)**
w = Witness **h = hold (optional)**
a = Accept **c = Certify**
r = Random

Project: Pipe Work , Valves, Pumps Install

Contract No: I112-024

Customer: Queensland Urban Utilities

Item No	Process Sequence	Acceptance Criteria	Activity By*		Reference Documents	Remarks/Records
			JPR	CUST		
2.1.3	Installation of Pipe Work , Valves & Pumps	Complies with specification, drawings and schedules	x	a + h	Specification, drawings	QU-SP034-01-CIV-0110-0008 REV1 QU-SP034-01-CIV-0110-0009 REV1 QU-SP034-01-CIV-0110-0010 REV1 QU-SP034-01-CIV-0110-0011 REV1 QU-SP034-01-CIV-0110-0012 REV1 QU-SP034-01-CIV-0110-0013 REV1 QU-SP034-01-CIV-0110-0014 REV1 QU-SP034-01-CIV-0110-0015 REV1 C54000Z0A ,C54000Z1A ,C54000Z2 C54000Z3A ,C54000Z4 ,C54000Z5 C54000Z6
3	**HANDOVER**					
3.1	JPR - Inspecition and Checklist	Completed in accordance with contract documents	x		Contract documents , JPR Form 1013	Customer accepted
3.2	As Installed Drawings	Complies with drawings, schedules and contract documents	x		Drawings and schedules, contract documents	As-Installed documentation

6. Platform

Form: F1109/0

J & P RICHARDSON INDUSTRIES PTY LTD

INSPECTION & TEST PLAN

ITP No. C54000-SP34-Platform

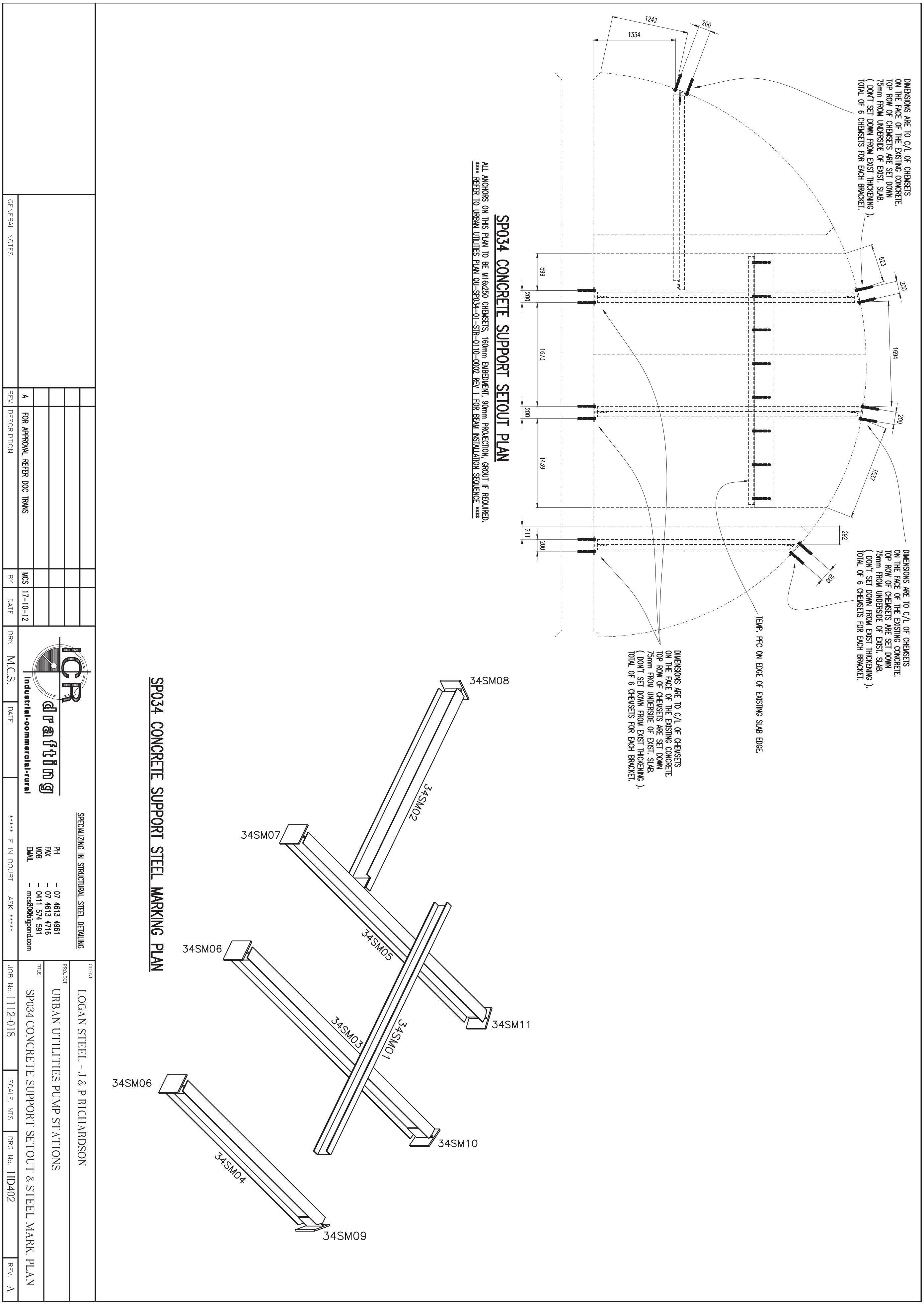
*** Legend**		
	x = Perform	**H = Hold (mandatory)**
	w = Witness	**h = hold (optional)**
	a = Accept	**c = Certify**
	r = Random	

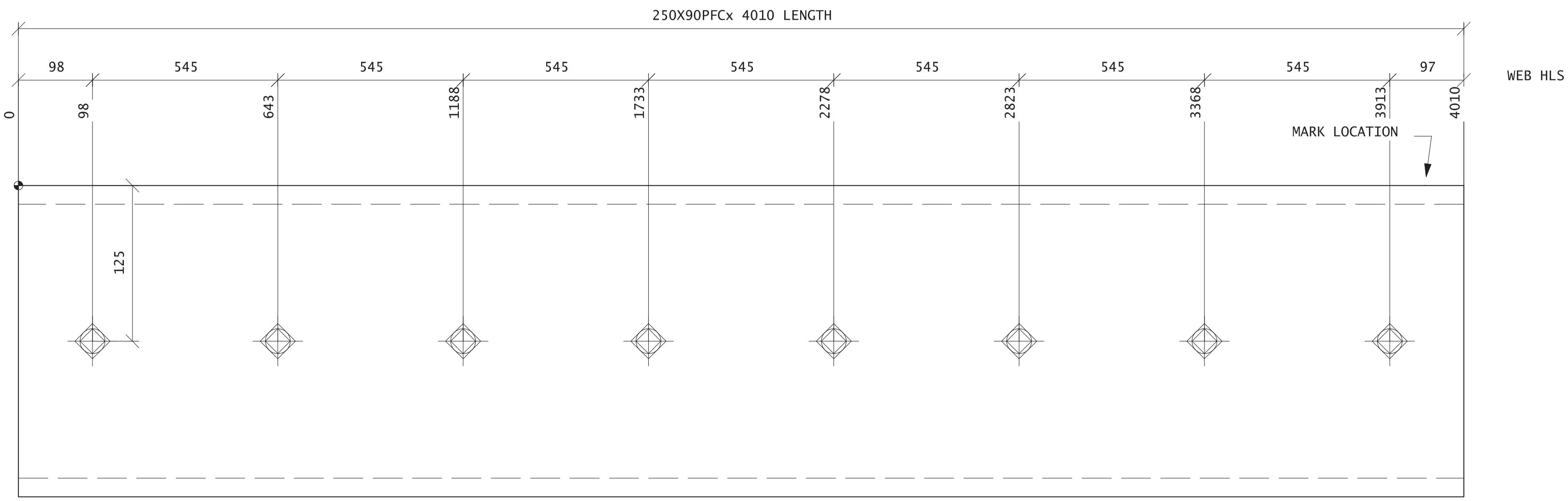
Project: Platform

Contract No: I112-024

Customer: Queensland Urban Utilities

Item No	**Process Sequence**	**Acceptance Criteria**	**Activity By***		**Reference Documents**	**Remarks/Records**
			JPR	**CUST**		
1	**DESIGN**					
1.1	**Design Documents**					
1.1.1	Civil Drawings - Approved for Construction	Complies with specification, drawings and schedules	a + h	x	Contract Drawings & Documents	
1.1.2	Scope of Works and Project Specification	Documentation provided as IFC and sufficiently complete for JPR to proceed	a + h	x	Contract Drawings & Documents	
2	**IMPLEMENTATION**					
2.1	**Site Works**					
2.1.1	Positioning of Platform	Complies with specification, drawings and schedules	x	w	Specification, drawings	
2.1.2	Completion of Postioning of Platform	Complies with specification, drawings and schedules	x	w	Specification, drawings	
2.1.3	Installation of Platform	Complies with specification, drawings and schedules	x	a + h	Specification, drawings	
3	**HANDOVER**					
3.1	JPR - Inspecition and Checklist	Completed in accordance with contract documents	x		Contract documents	Customer accepted
3.2	As Installed Drawings	Complies with drawings, schedules and contract documents	x		Drawings and schedules, contract documents	As-Installed documentation


SP034 CONCRETE SUPPORT SETOUT PLAN
ALL ANCHORS ON THIS PLAN TO BE M16x250 CHEMSETS, 160mm EMBEDMENT, 90mm PROJECTION, GROUT IF REQUIRED.
*** REFER TO URBAN UTILITIES PLAN QU-SP034-01-STR-0110-0002 REV 1 FOR BEAM INSTALLATION SEQUENCE ***
DIMENSIONS ARE TO C/L OF CHEMSETS ON THE FACE OF THE EXISTING CONCRETE. TOP ROW OF CHEMSETS ARE SET DOWN 75mm FROM UNDERSIDE OF EXIST. SLAB. (DON'T SET DOWN FROM EXIST THICKENING). TOTAL OF 6 CHEMSETS FOR EACH BRACKET.
DIMENSIONS ARE TO C/L OF CHEMSETS ON THE FACE OF THE EXISTING CONCRETE. TOP ROW OF CHEMSETS ARE SET DOWN 75mm FROM UNDERSIDE OF EXIST. SLAB. (DON'T SET DOWN FROM EXIST THICKENING). TOTAL OF 6 CHEMSETS FOR EACH BRACKET.
DIMENSIONS ARE TO C/L OF CHEMSETS ON THE FACE OF THE EXISTING CONCRETE. TOP ROW OF CHEMSETS ARE SET DOWN 75mm FROM UNDERSIDE OF EXIST. SLAB. (DON'T SET DOWN FROM EXIST THICKENING). TOTAL OF 6 CHEMSETS FOR EACH BRACKET.
TEMP. PFC ON EDGE OF EXISTING SLAB EDGE.
1242
200
1334
623
200
1694
200
1537
292
200
599
200
1673
200
1439
211
200
SP034 CONCRETE SUPPORT STEEL MARKING PLAN
34SM08
34SM02
34SM07
34SM05
34SM11
34SM06
34SM03
34SM01
34SM06
34SM10
34SM04
34SM09
GENERAL NOTES
REV
DESCRIPTION
BY
DATE
A
FOR APPROVAL REFER DOC TRANS
MCS
17-10-12
DRN.
M.C.S.
DATE.
ICR
drafting
Industrial-commercial-rural
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com
***** IF IN DOUBT - ASK *****
CLIENT
LOGAN STEEL - J & P RICHARDSON
PROJECT
URBAN UTILITIES PUMP STATIONS
TITLE
SP034 CONCRETE SUPPORT SETOUT & STEEL MARK. PLAN
JOB No. 1112-018
SCALE. NTS
DRG No. HD402
REV. A



SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34SM01	250X90PFC	300+	4010	1	142.3
				TOTAL	142.3

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

1 REQ'D AS DRN MARKED 34SM01

PHASE SP034SUPPORT
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 142.3 kg.

REV	DESCRIPTION	BY	DATE
		MCS	17/10/12

ICR drafting
industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS
DATE. 17/10/12
***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 MEMBER DETAIL

JOB No. 1112-018
SCALE. NTS
DRG No. 34SM01
REV.

STRUCAD

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34SM02	360UB45	300+	3150	1	139.5
				TOTAL	139.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQ'D AS DRN MARKED 34SM02
PHASE SP034SUPPORT
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 139.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	17/10/12

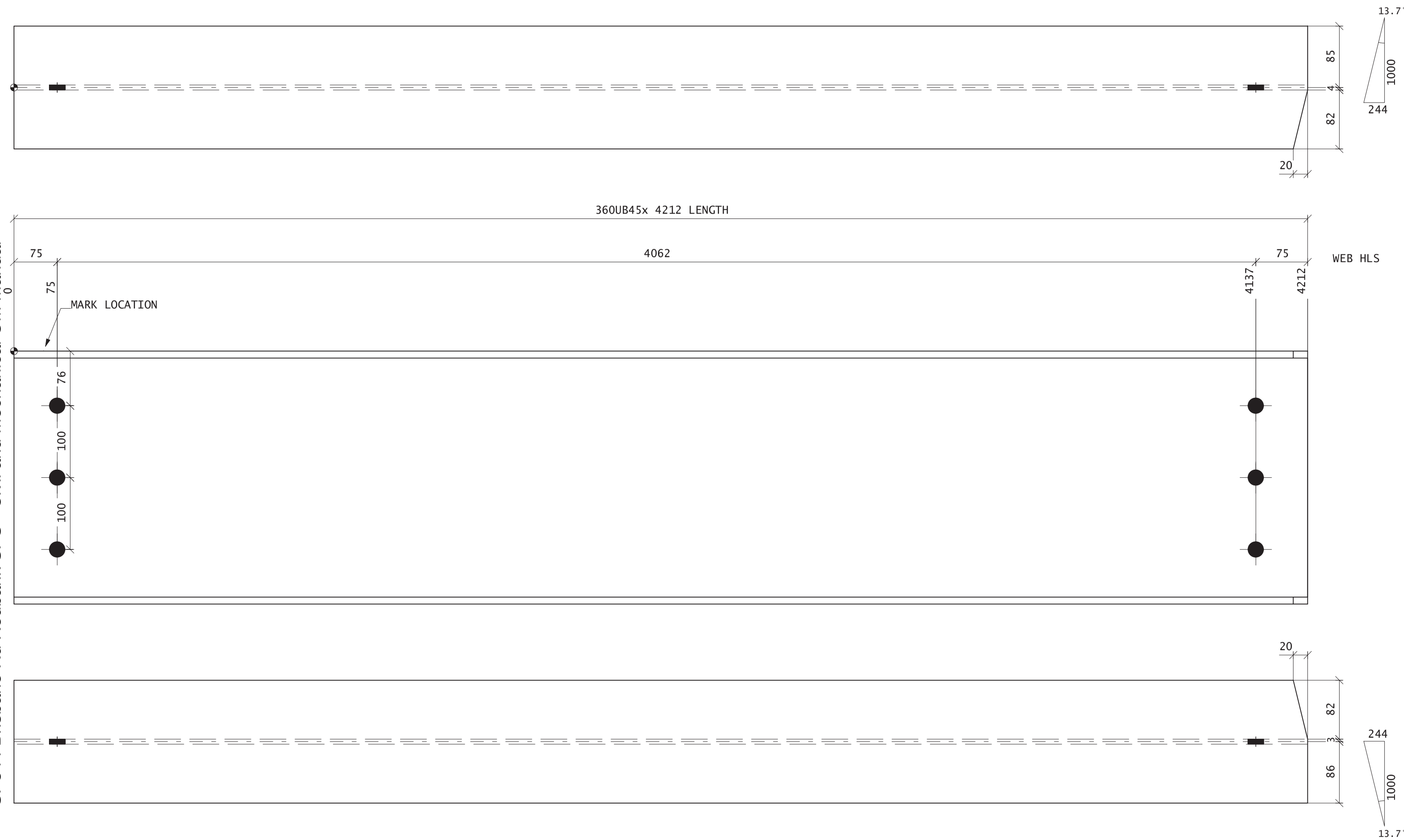
ICR drafting
industrial-commercial-rural
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 17/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34SM02 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34SM03	360UB45	300+	4212	1	189.2
				TOTAL	189.2



THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

1 REQ'D AS DRN MARKED 34SM03

PHASE SP034SUPPORT
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 189.2 kg.

REV	DESCRIPTION	BY	DATE
		MCS	17/10/12

ICR drafting
industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 17/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34SM03 | REV.

STRUCAD

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34SM04	360UB45	300+	3177	1	142.3
				TOTAL	142.3

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQ'D AS DRN MARKED 34SM04
PHASE SP034SUPPORT
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 142.3 kg.

REV	DESCRIPTION	BY	DATE
		MCS	17/10/12

ICR drafting
industrial-commercial-rural

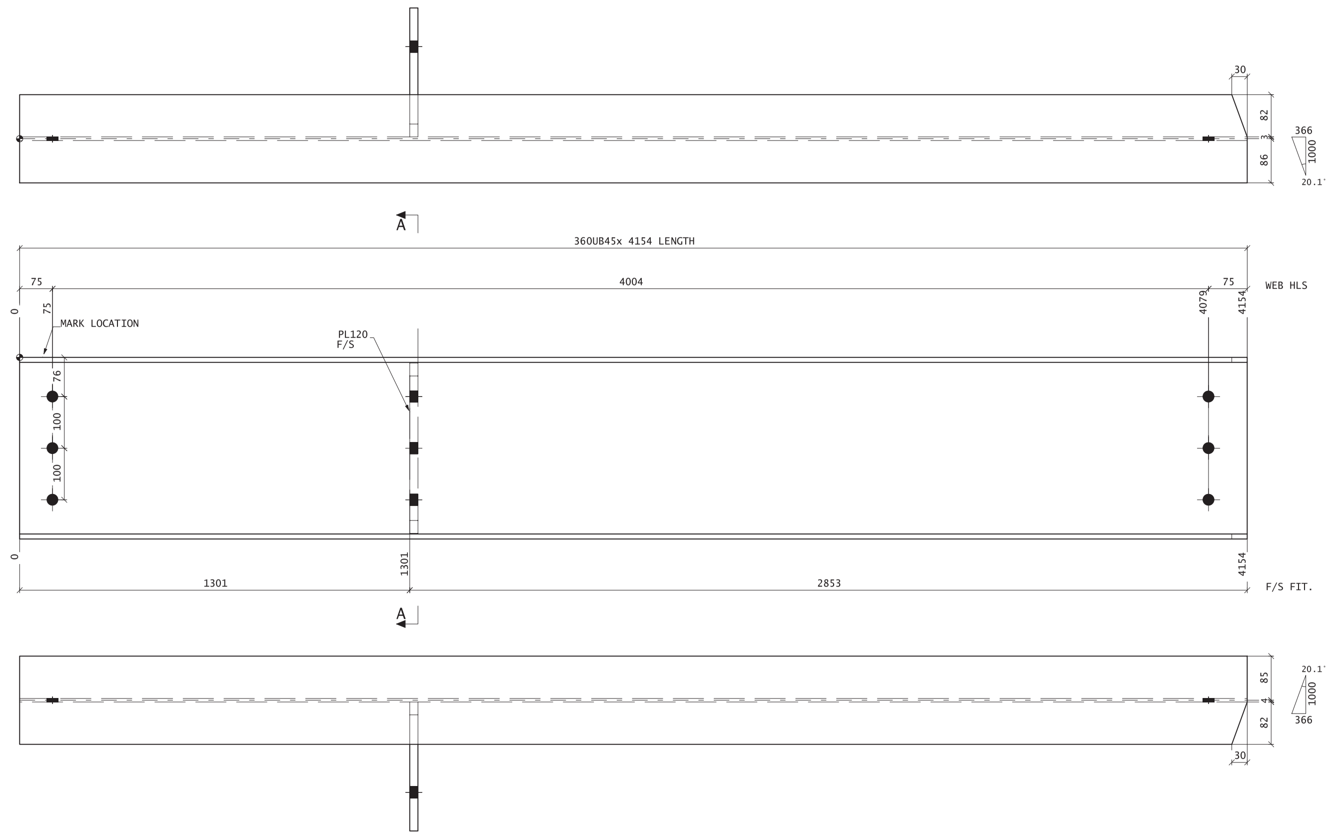
SPECIALIZING IN STRUCTURAL STEEL DETAILING

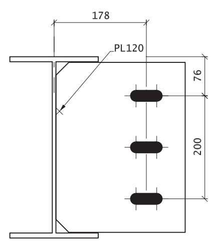
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 17/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34SM04 | REV.





SECTION A - A

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34SM05	360UB45	300+	4154	1	186.5
PL120	250X16PL	300+	330	1	10.3
				TOTAL	196.8

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

1 REQ'D AS DRN MARKED 34SM05

PHASE SP034SUPPORT
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 196.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	17/10/12

ICR drafting
industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

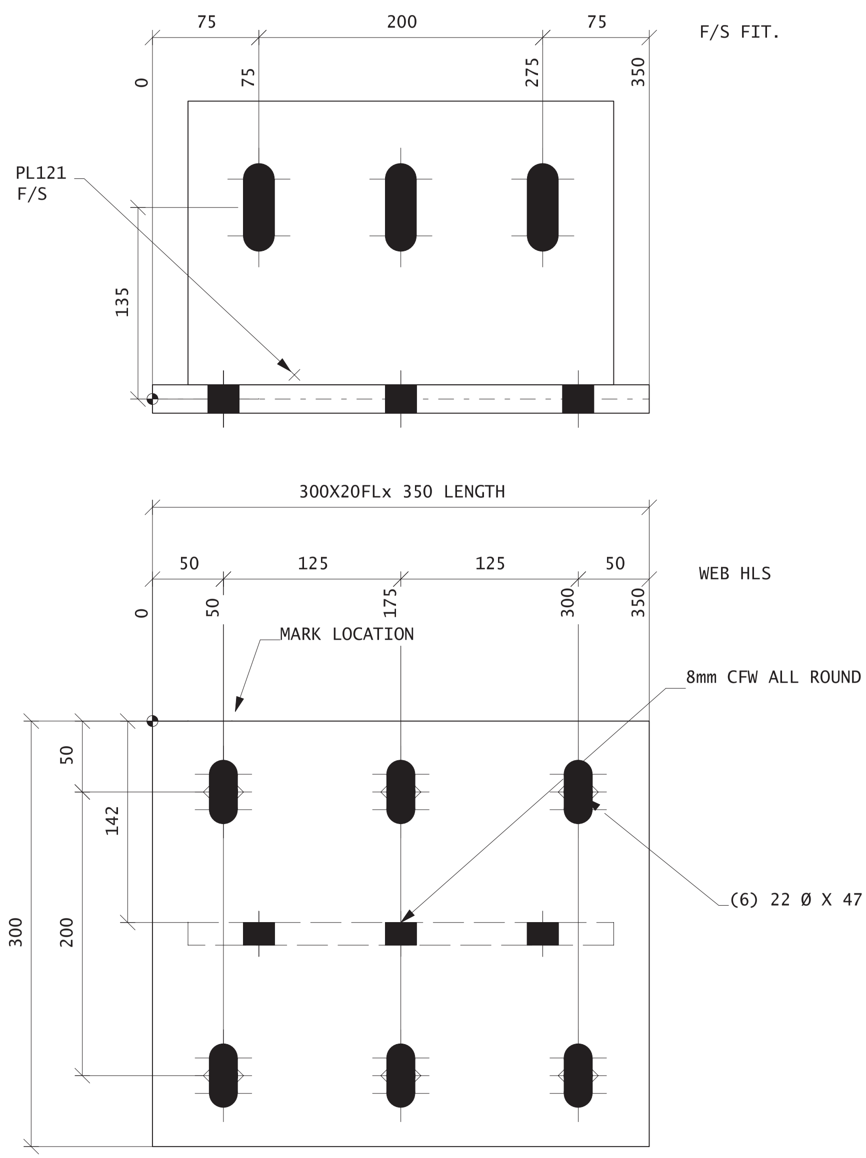
DRN. MCS | DATE. 17/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34SM05 | REV.



2 REQ'D AS DRN MARKED 34SM06

PHASE SP034SUPPORT(2)
FINISH SP034HDG(2)

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34SM06	300X20FL	300+	350	1	16.5
PL121	200X16FL	300+	300	1	7.5
				TOTAL	24.0

SHOP MATERIAL LIST FOR 2 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34SM06	300X20FL	300+	350	2	33.0
PL121	200X16FL	300+	300	2	15.1
				TOTAL	48.0

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 24.0 kg.

REV	DESCRIPTION	BY	DATE
		MCS	17/10/12

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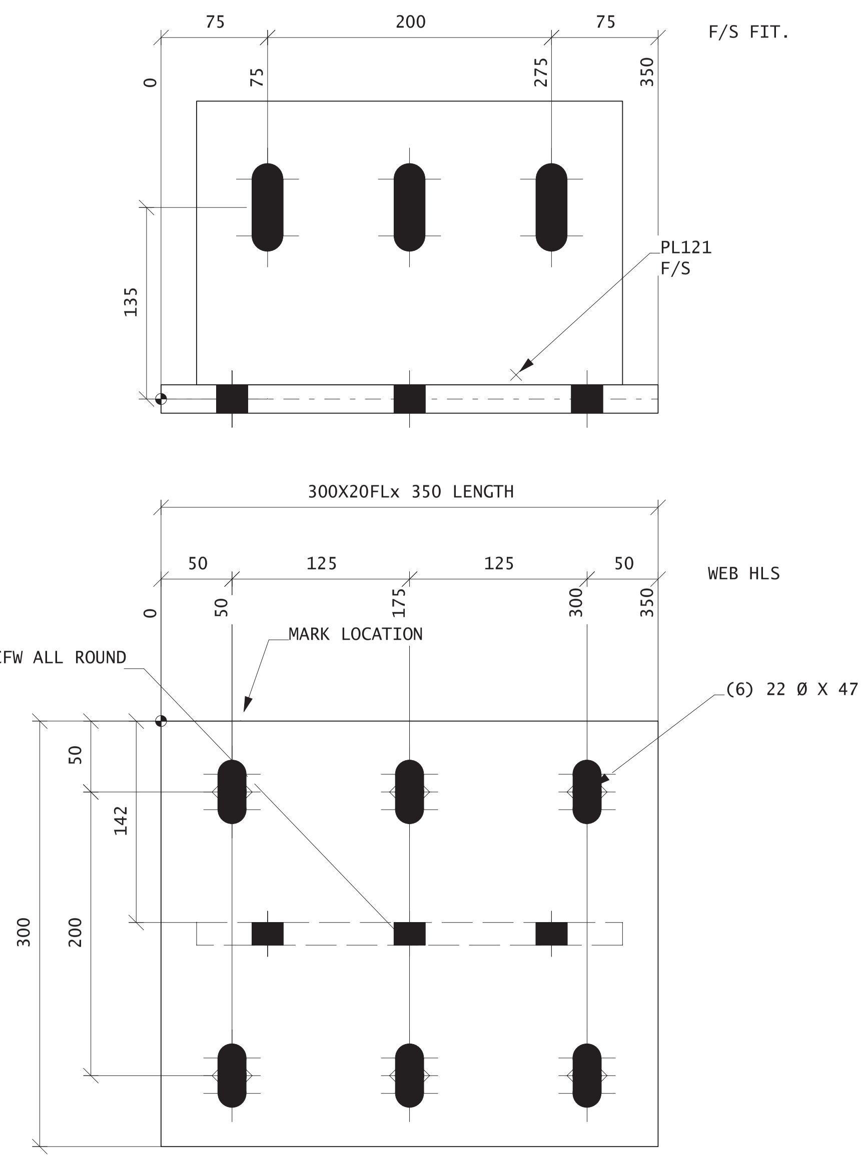
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 17/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34SM06 | REV.



1 REQ'D AS DRN MARKED 34SM07
PHASE SP034SUPPORT
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34SM07	300X20FL	300+	350	1	16.5
PL121	200X16FL	300+	300	1	7.5
				TOTAL	24.0

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 24.0 kg.

REV	DESCRIPTION	BY	DATE
		MCS	17/10/12

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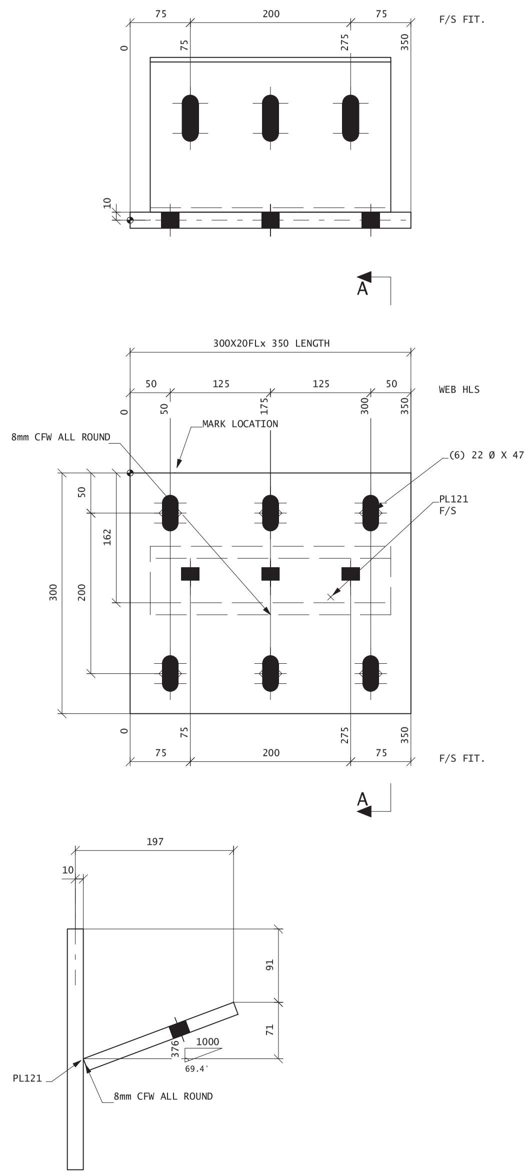
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 17/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARDSON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34SM07 | REV.



SECTION A - A

1 REQ'D AS DRN MARKED 34SM08

PHASE SP034SUPPORT
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34SM08	300X20FL	300+	350	1	16.5
PL121	200X16FL	300+	300	1	7.5
				TOTAL	24.0

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 24.0 kg.

REV	DESCRIPTION	BY	DATE
		MCS	17/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

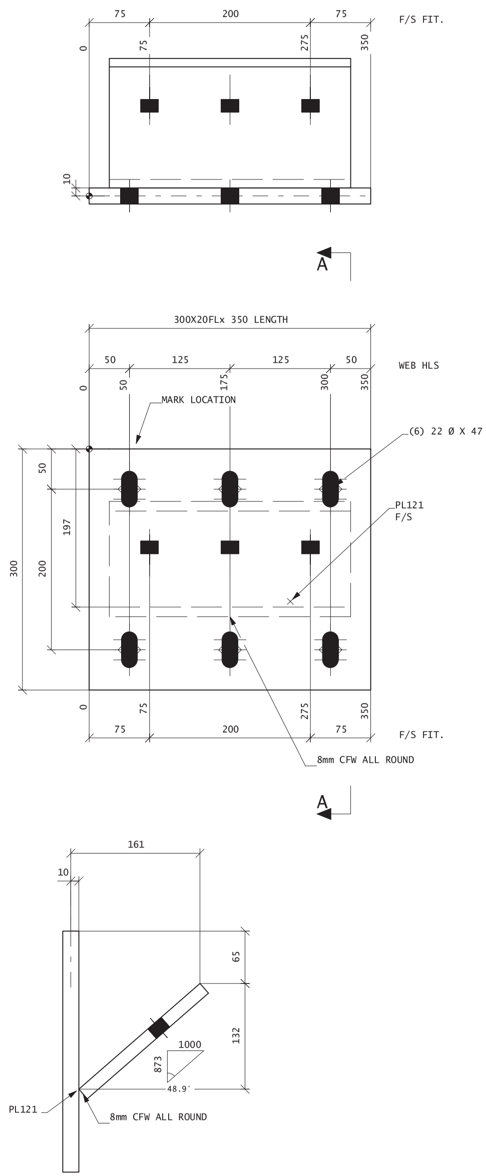
DRN. MCS | DATE. 17/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34SM08 | REV.



SECTION A - A

1 REQ'D AS DRN MARKED 34SM09

PHASE SP034SUPPORT
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34SM09	300X20FL	300+	350	1	16.5
PL121	200X16FL	300+	300	1	7.5
				TOTAL	24.0

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 24.0 kg.

REV	DESCRIPTION	BY	DATE
		MCS	17/10/12

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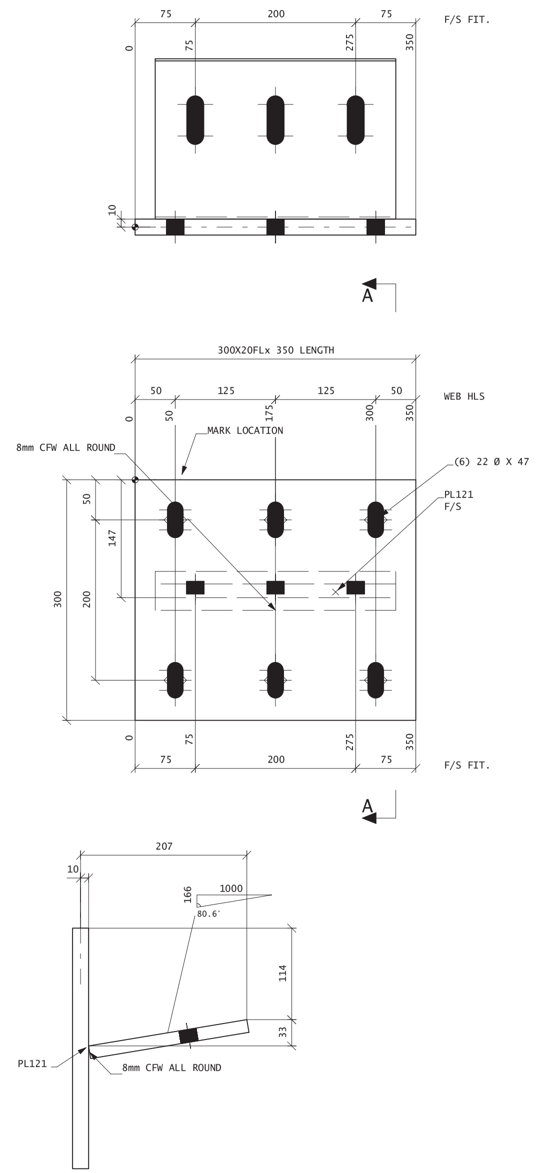
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 17/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34SM09 | REV.



SECTION A - A

1 REQ'D AS DRN MARKED 34SM10

PHASE SP034SUPPORT
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34SM10	300X20FL	300+	350	1	16.5
PL121	200X16FL	300+	300	1	7.5
				TOTAL	24.0

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 24.0 kg.

REV	DESCRIPTION	BY	DATE
		MCS	17/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

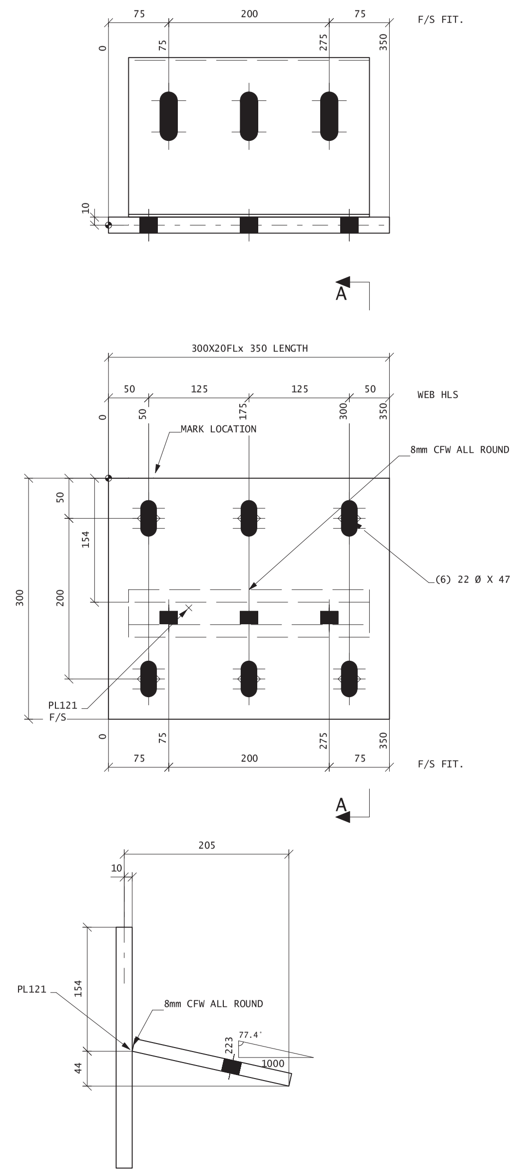
DRN. MCS | DATE. 17/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34SM10 | REV.



SECTION A - A

1 REQ'D AS DRN MARKED 34SM11

PHASE SP034SUPPORT
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34SM11	300X20FL	300+	350	1	16.5
PL121	200X16FL	300+	300	1	7.5
				TOTAL	24.0

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENETRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 24.0 kg.

REV	DESCRIPTION	BY	DATE
		MCS	17/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

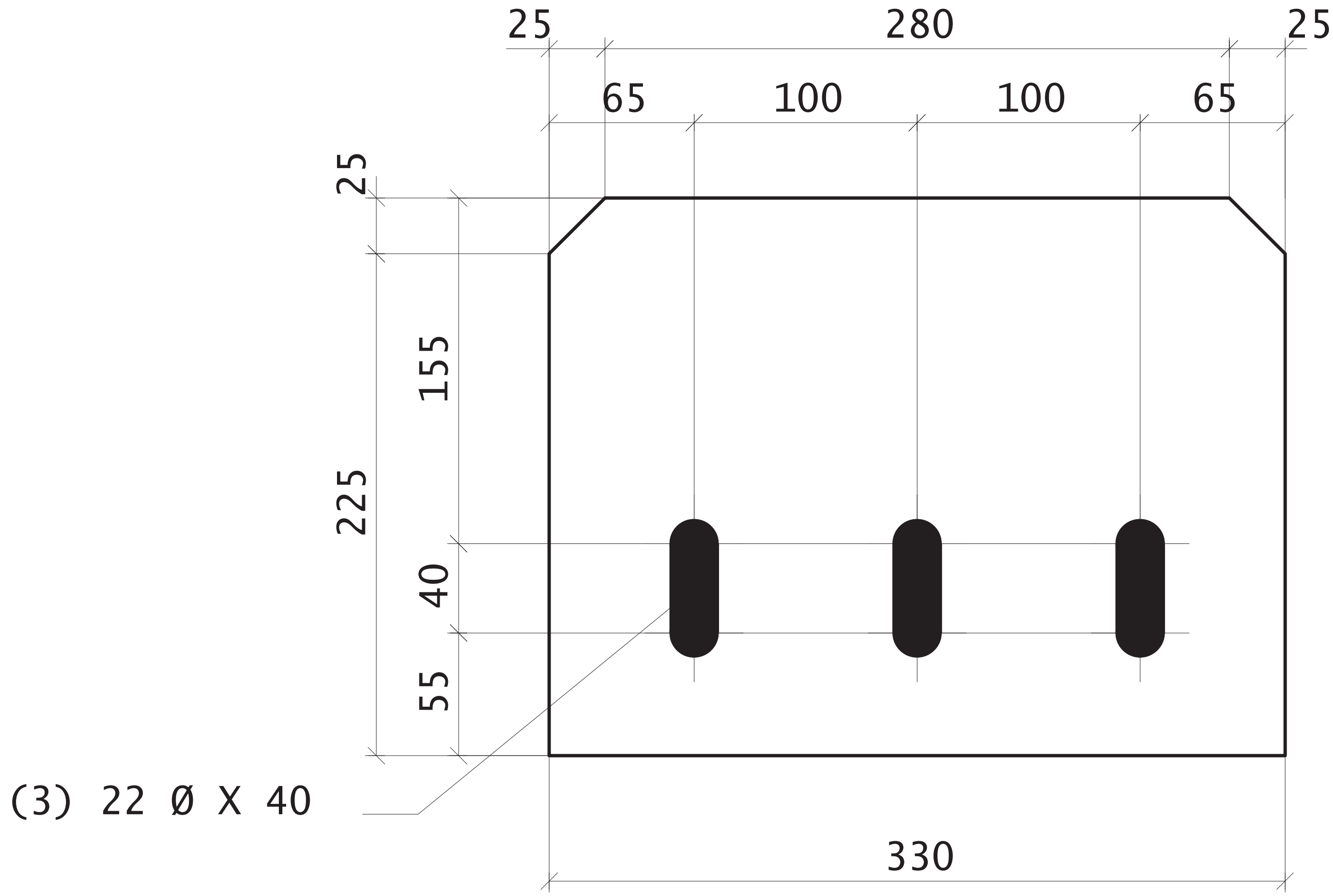
DRN. MCS | DATE. 17/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON

PROJECT URBAN UTILITIES PUMP STATIONS

TITLE SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34SM11 | REV.



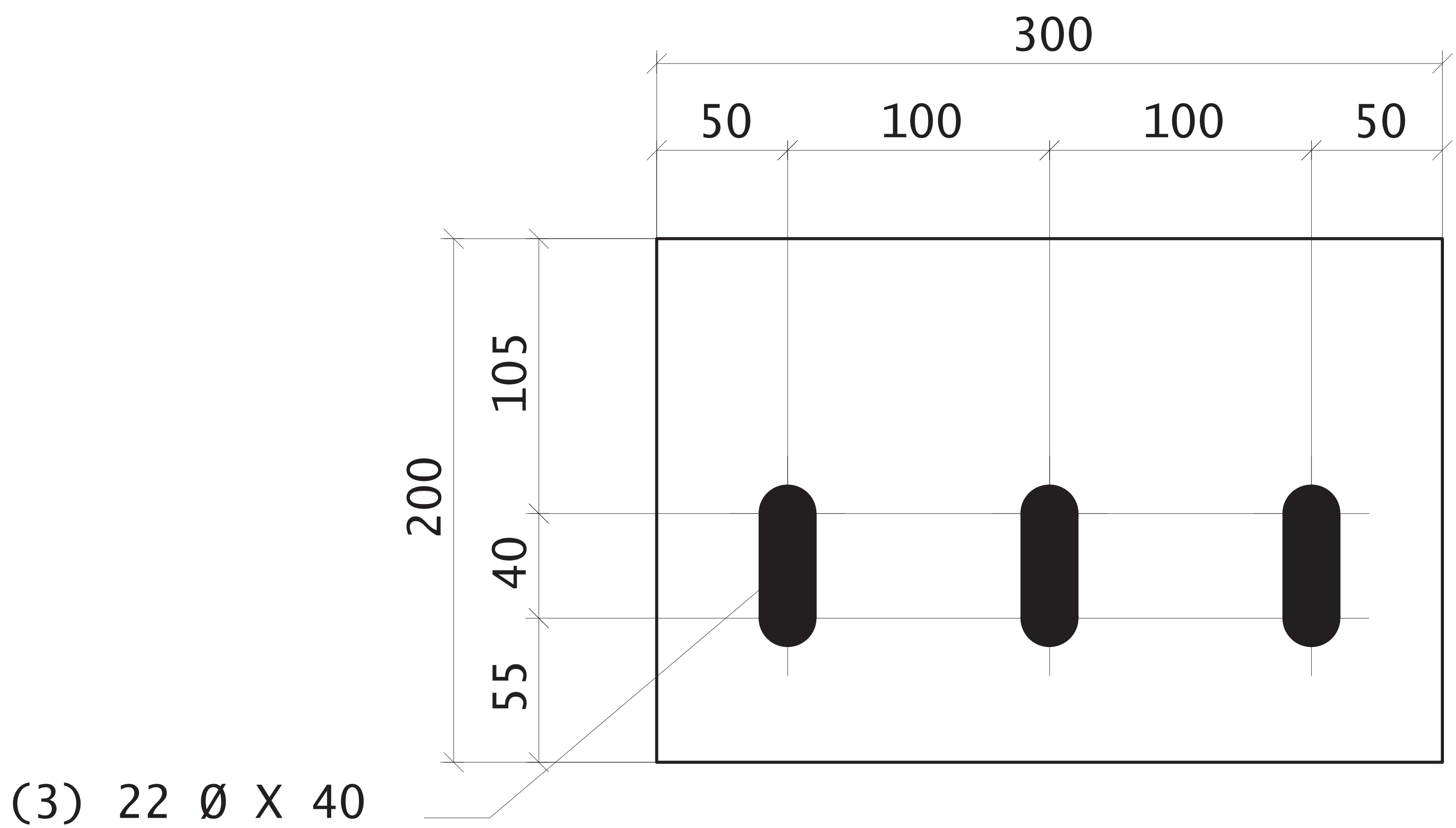
250X16PL X 330

1 REQUIRED AS DRAWN MARKED PL120

PHASE SP034SUPPORT
FINISH SP034HDG

STRUCAD

GENERAL NOTES.			
GENERAL NOTES. TOTAL WEIGHT 10.3 kg. Kg. STEEL GRADE 300+ ALL HOLES 22 mm DIA UNO.	ICR drafting industrial-commercial-rural SPECIALIZING IN STRUCTURAL STEEL DETAILING PH - 07 4613 4961 FAX - 07 4613 4716 MOB - 0411 574 591 EMAIL - mcs80@bigpond.com	CLIENT LOGAN STEL - J & P RICHARSDON PROJECT URBAN UTILITIES PUMP STATIONS TITLE FITTING DETAILS	
GENERAL NOTES.	DRN. MCS · DATE. 17/10/12 · ***** IF IN DOUBT - ASK *****	JOB No. 1112-018 · SCALE. NTS · DRG No. PL120	REV.



200X16FL X 300

7 REQUIRED AS DRAWN MARKED PL121

PHASE SP034SUPPORT(7)
FINISH SP034HDG(7)

STRUCAD

GENERAL NOTES.
TOTAL WEIGHT 7.5 kg. Kg.
STEEL GRADE 300+
ALL HOLES 22 mm DIA UNO.

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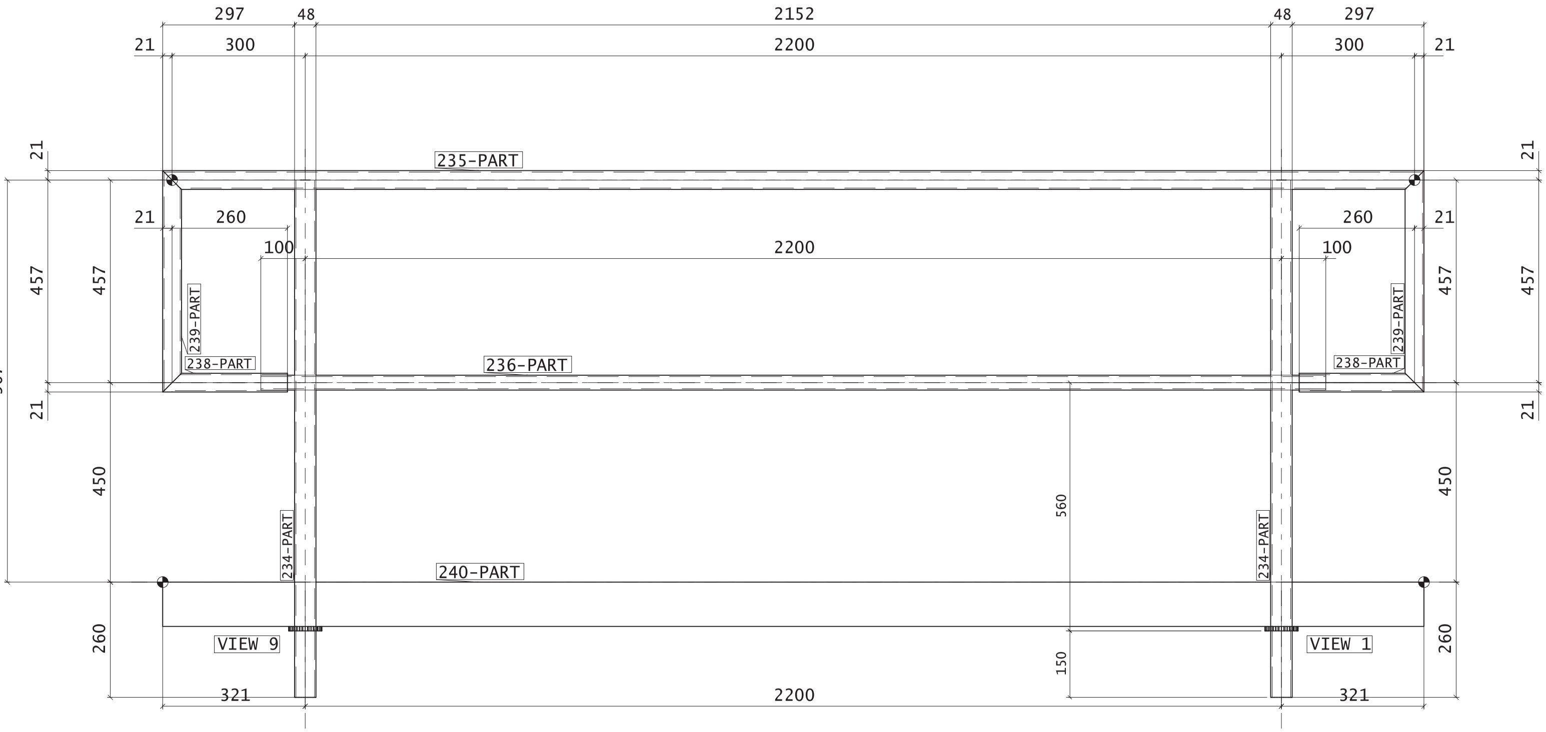
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

CLIENT	LOGAN STEL - J & P RICHARSDON				
PROJECT	URBAN UTILITIES PUMP STATIONS				
TITLE	FITTING DETAILS				
GENERAL NOTES.	DRN. MCS	DATE. 17/10/12	***** IF IN DOUBT - ASK *****	JOB No. 1112-018	SCALE. NTS
DRG No. PL121	REV.				



SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
CL29	STAUNCOLLAR	300+	10	2	0.01	0.3
234-PART	48.3CSTAUNCHION	300+	1167	2	0.34	8.3
235-PART	42.4CHSTOPRAIL	300+	2842	1	0.35	8.6
236-PART	33.7CHSMIDRAIL	300+	2400	1	0.24	5.7
238-PART	42.4CHSTOPRAIL	300+	281	2	0.07	1.6
239-PART	42.4CHSTOPRAIL	300+	499	2	0.12	2.8
240-PART	100X6KICKPLATE	300+	2842	1	0.60	13.4
				TOTAL	1.73	40.8

SHOP MATERIAL LIST FOR 2 ASSEMBLIES						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
CL29	STAUNCOLLAR	300+	10	4	0.02	0.6
234-PART	48.3CSTAUNCHION	300+	1167	4	0.68	16.5
235-PART	42.4CHSTOPRAIL	300+	2842	2	0.71	17.2
236-PART	33.7CHSMIDRAIL	300+	2400	2	0.48	11.5
238-PART	42.4CHSTOPRAIL	300+	281	4	0.13	3.2
239-PART	42.4CHSTOPRAIL	300+	499	4	0.23	5.6
240-PART	100X6KICKPLATE	300+	2842	2	1.21	26.8
				TOTAL	3.45	81.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

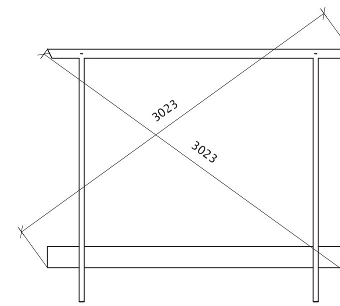
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



CHECK DIMENSIONS

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	STRUC

2 REQ'D AS DRN MARKED AS-51

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 40.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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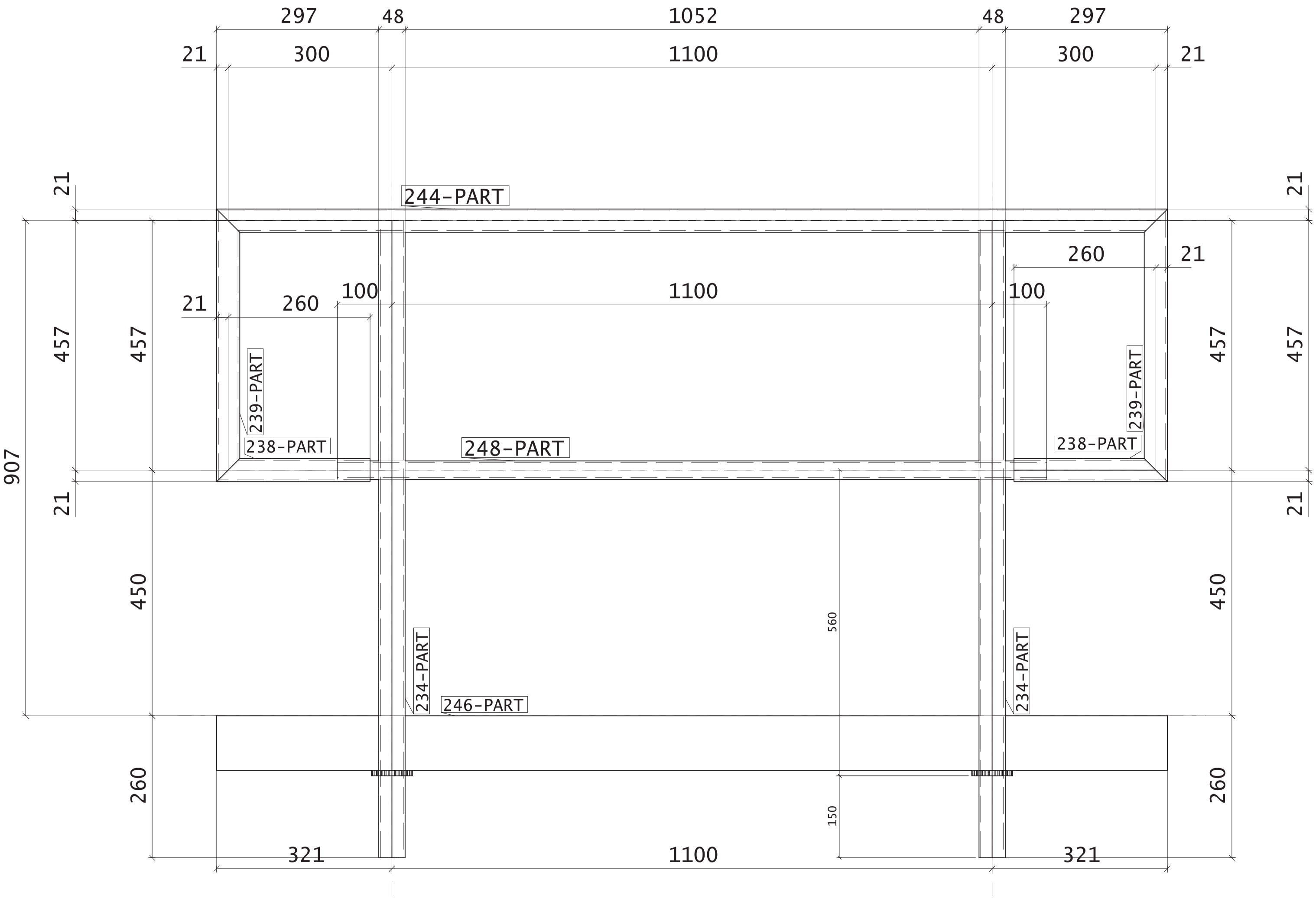
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. AS-51 | REV.



1 REQ'D AS DRN MARKED AS-52

PHASE SP034UPPER
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
CL29	STAUNCOLLAR	300+	10	2	0.01	0.3
234-PART	48.3CSTAUNCHION	300+	1167	2	0.34	8.3
238-PART	42.4CHSTOPRAIL	300+	281	2	0.07	1.6
239-PART	42.4CHSTOPRAIL	300+	499	2	0.12	2.8
244-PART	42.4CHSTOPRAIL	300+	1742	1	0.22	5.2
246-PART	100X6KICKPLATE	300+	1742	1	0.37	8.2
248-PART	33.7CHSMIDRAIL	300+	1300	1	0.13	3.1
				TOTAL	1.24	29.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

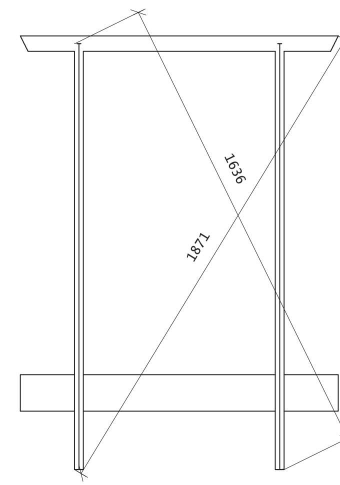
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



CHECK DIMENSIONS

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	STRUC

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 29.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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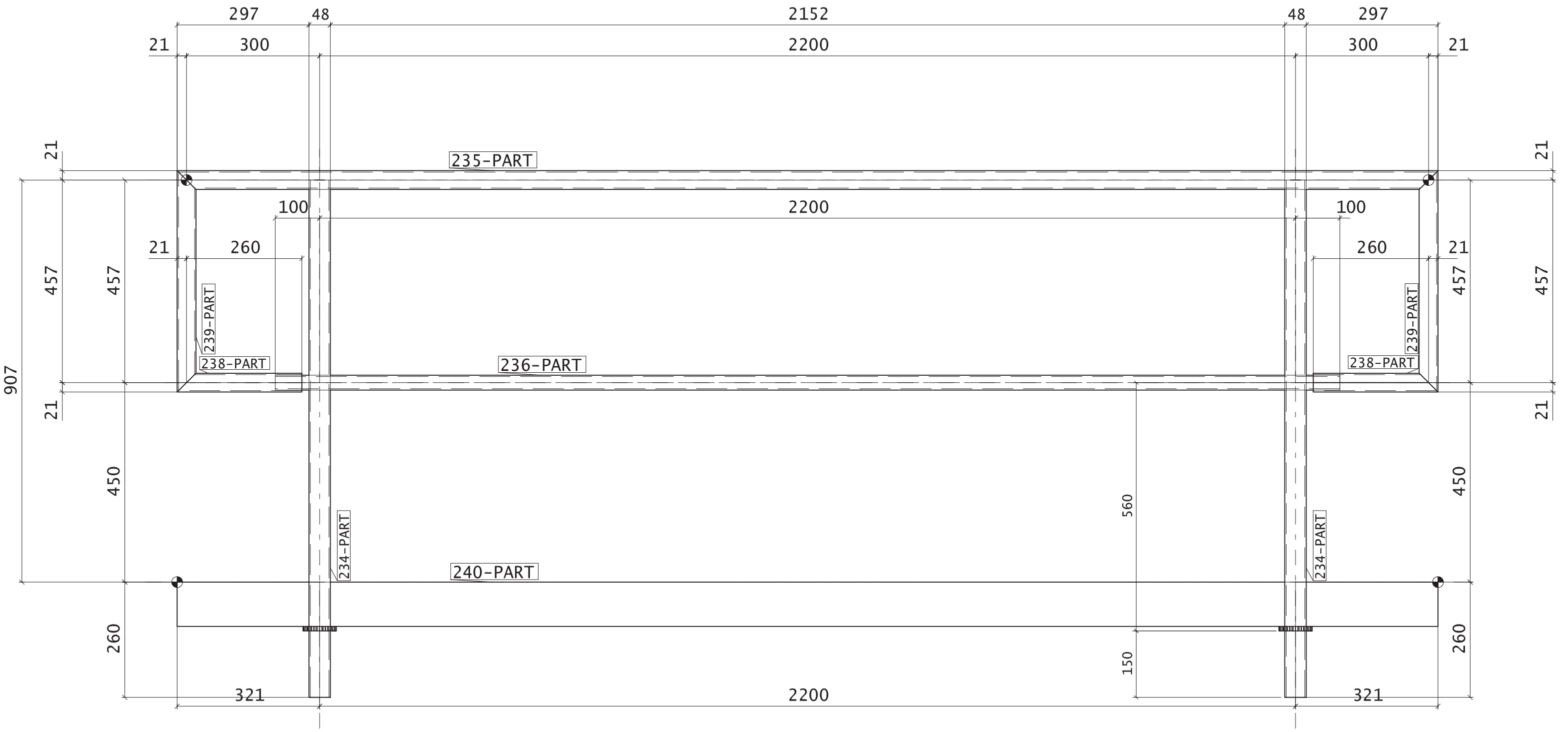
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. AS-52 | REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
CL29	STAUNCOLLAR	300+	10	2	0.01	0.3
234-PART	48.3CSTAUNCHION	300+	1167	2	0.34	8.3
235-PART	42.4CHSTOPRAIL	300+	2842	1	0.35	8.6
236-PART	33.7CHSMIDRAIL	300+	2400	1	0.24	5.7
238-PART	42.4CHSTOPRAIL	300+	281	2	0.07	1.6
239-PART	42.4CHSTOPRAIL	300+	499	2	0.12	2.8
240-PART	100X6KICKPLATE	300+	2842	1	0.60	13.4
				TOTAL	1.73	40.8

SHOP MATERIAL LIST FOR 2 ASSEMBLIES						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
CL29	STAUNCOLLAR	300+	10	4	0.02	0.6
234-PART	48.3CSTAUNCHION	300+	1167	4	0.68	16.5
235-PART	42.4CHSTOPRAIL	300+	2842	2	0.71	17.2
236-PART	33.7CHSMIDRAIL	300+	2400	2	0.48	11.5
238-PART	42.4CHSTOPRAIL	300+	281	4	0.13	3.2
239-PART	42.4CHSTOPRAIL	300+	499	4	0.23	5.6
240-PART	100X6KICKPLATE	300+	2842	2	1.21	26.8
				TOTAL	3.45	81.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

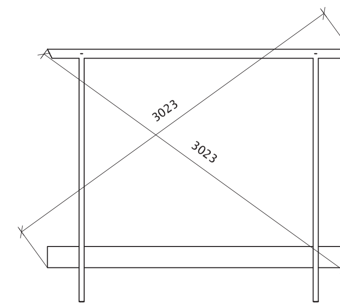
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



CHECK DIMENSIONS

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	STRUC

2 REQ'D AS DRN MARKED AS-53

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 40.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. AS-53 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
CL29	STAUNCOLLAR	300+	10	2	0.01	0.3
234-PART	48.3CSTAUNCHION	300+	1167	2	0.34	8.3
238-PART	42.4CHSTOPRAIL	300+	281	2	0.07	1.6
239-PART	42.4CHSTOPRAIL	300+	499	2	0.12	2.8
244-PART	42.4CHSTOPRAIL	300+	1742	1	0.22	5.2
246-PART	100X6KICKPLATE	300+	1742	1	0.37	8.2
248-PART	33.7CHSMIDRAIL	300+	1300	1	0.13	3.1
				TOTAL	1.24	29.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

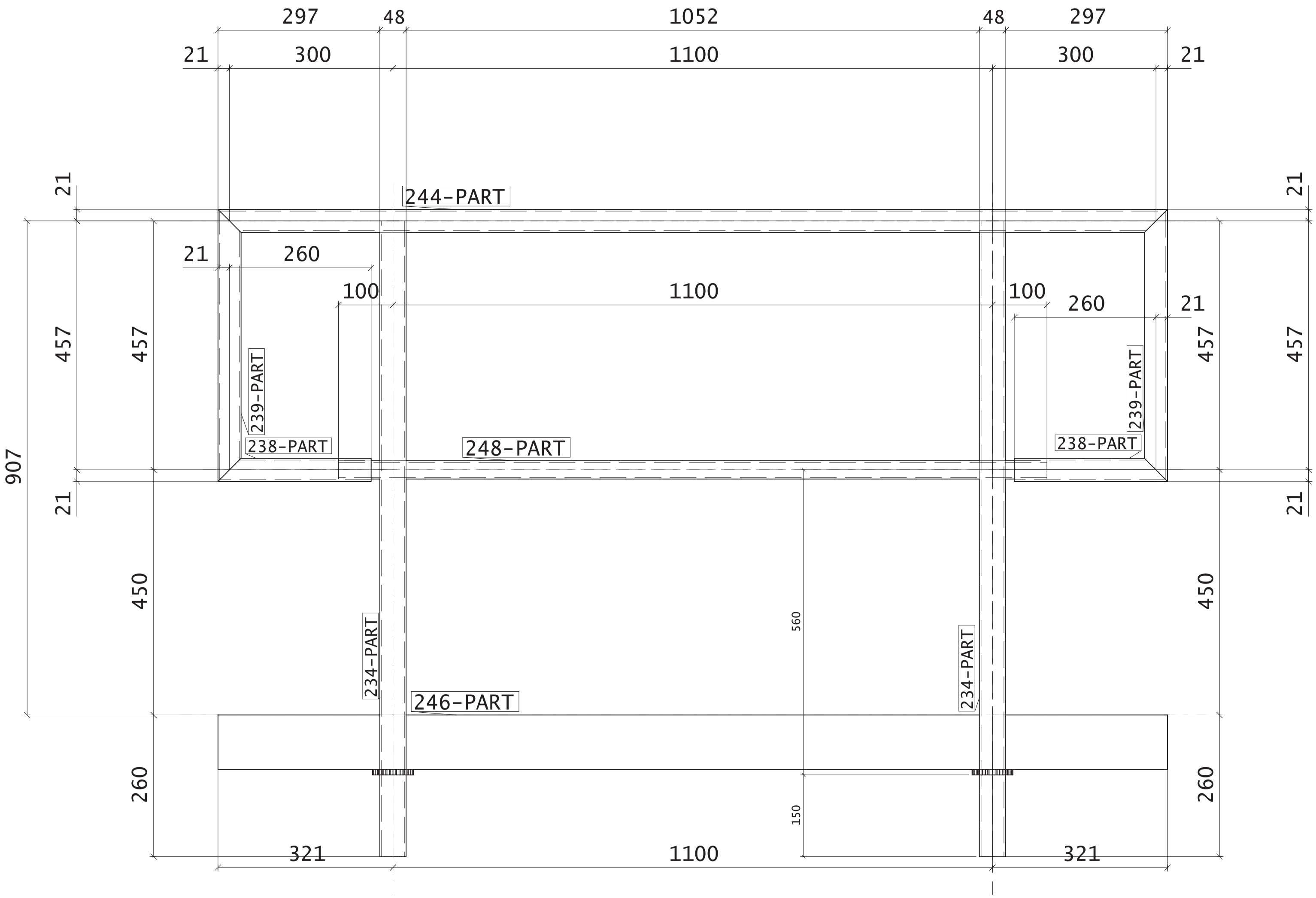
PROVIDE VENT HOLES FOR DRAINAGE.

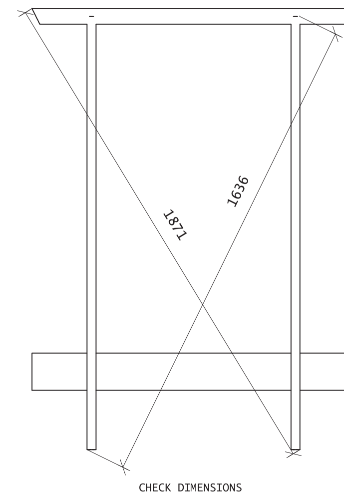
GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.





1 REQ'D AS DRN MARKED AS-54

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	STRUC

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 29.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. AS-54 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
PL116	75X12FL	300+	170	1	0.03	1.2
PL119	75X12FL	300+	250	1	0.05	1.8
224-PART	180X75PFC	300+	338	1	0.19	6.1
226-PART	42X3.2CHS	300+	1038	1	0.13	3.1
227-PART	42X3.2CHS	300+	276	1	0.03	0.8
230-PART	42X3.2CHS	300+	164	1	0.02	0.4
233-PART	150X75PFC	300+	2334	1	1.32	39.6
241-PART	42X3.2CHS	300+	162	1	0.02	0.5
254-PART	42X3.2CHS	300+	192	1	0.02	0.5
255-PART	42X3.2CHS	300+	2581	1	0.32	7.8
				TOTAL	2.13	61.8

THIS MEMBER TO BE HOT DIPPED GALVANISED.

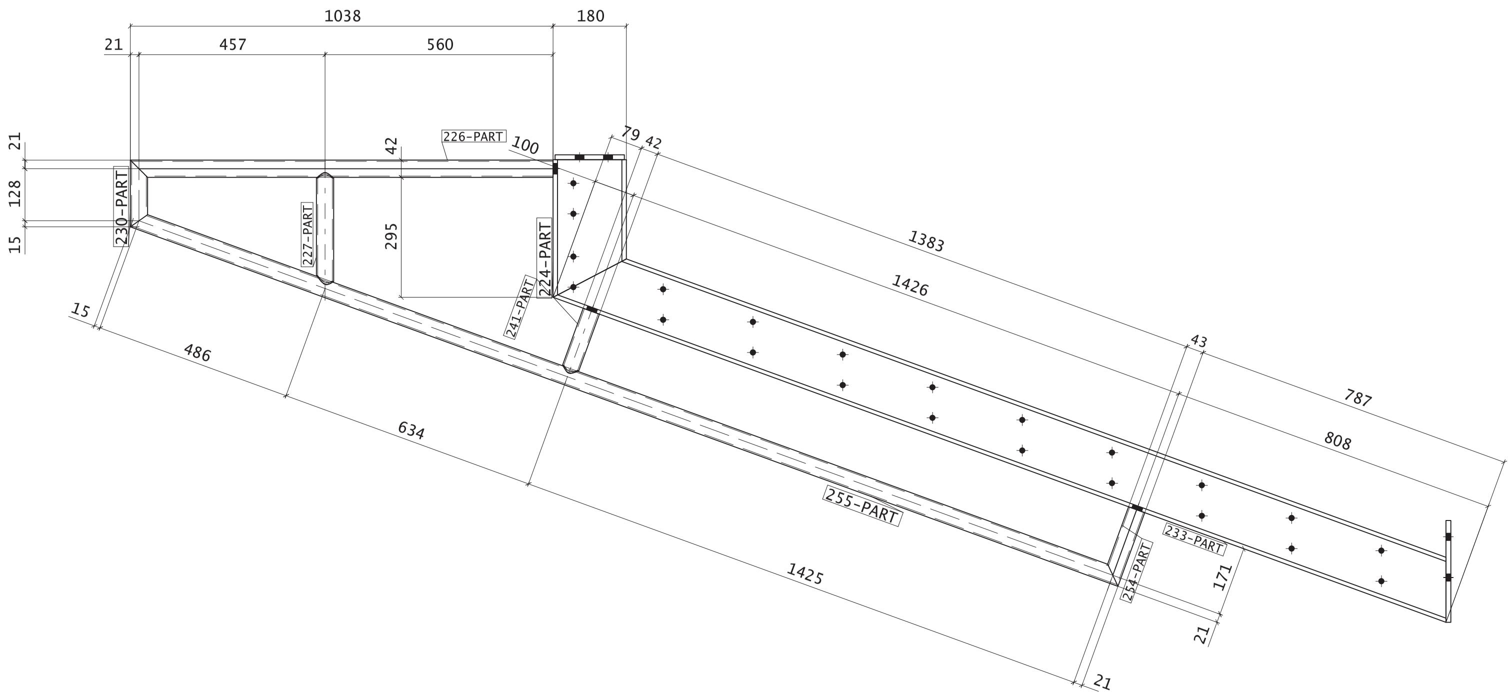
PROVIDE VENT HOLES FOR DRAINAGE.

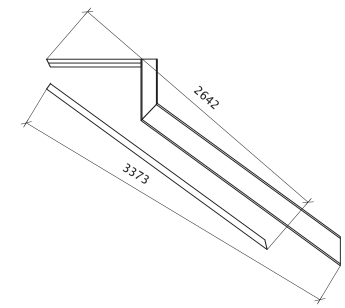
GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.





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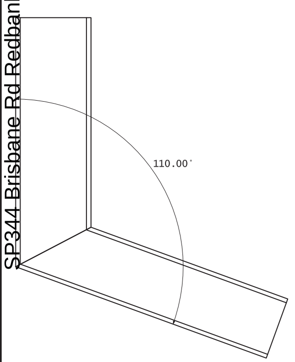

VIEW 1

1 REQ'D AS DRN MARKED AS-55

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 61.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
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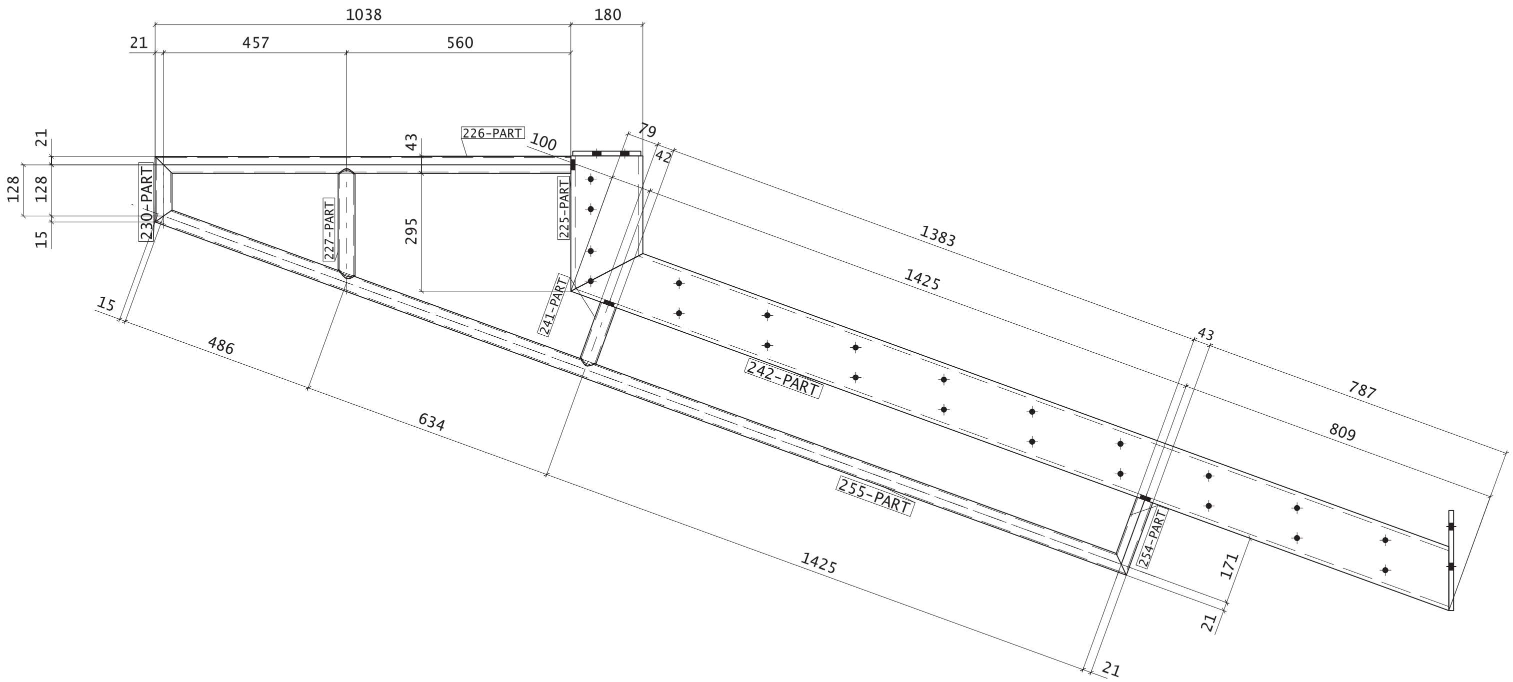
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. AS-55 | REV. B



SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
PL116	75X12FL	300+	170	1	0.03	1.2
PL119	75X12FL	300+	250	1	0.05	1.8
225-PART	180X75PFC	300+	338	1	0.19	6.1
226-PART	42X3.2CHS	300+	1038	1	0.13	3.1
227-PART	42X3.2CHS	300+	276	1	0.03	0.8
230-PART	42X3.2CHS	300+	164	1	0.02	0.4
241-PART	42X3.2CHS	300+	162	1	0.02	0.5
242-PART	150X75PFC	300+	2334	1	1.32	39.6
254-PART	42X3.2CHS	300+	192	1	0.02	0.5
255-PART	42X3.2CHS	300+	2581	1	0.32	7.8
				TOTAL	2.13	61.8

THIS MEMBER TO BE HOT DIPPED GALVANISED.

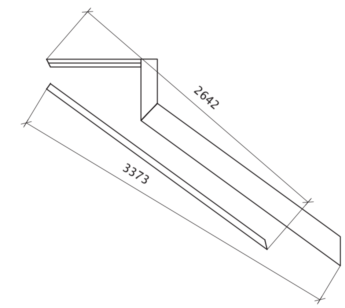
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

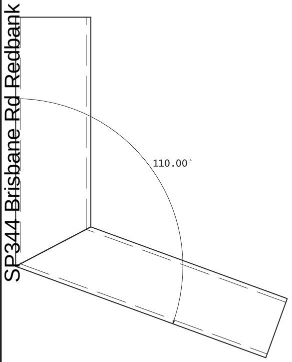
ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



CHECK DIMENSIONS



VIEW 1

1 REQ'D AS DRN MARKED AS-56

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUC

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 61.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. AS-56 | REV. B

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
PL105	150X10FL	300+	156	2	0.10	3.6
PL110	50X10FL	300+	100	1	0.01	0.4
200-PART	180X75PFC	300+	4470	1	2.88	92.3
201-PART	180X75PFC	300+	1754	1	1.13	36.1
222-PART	180X75PFC	300+	654	1	0.42	13.1
				TOTAL	4.54	145.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

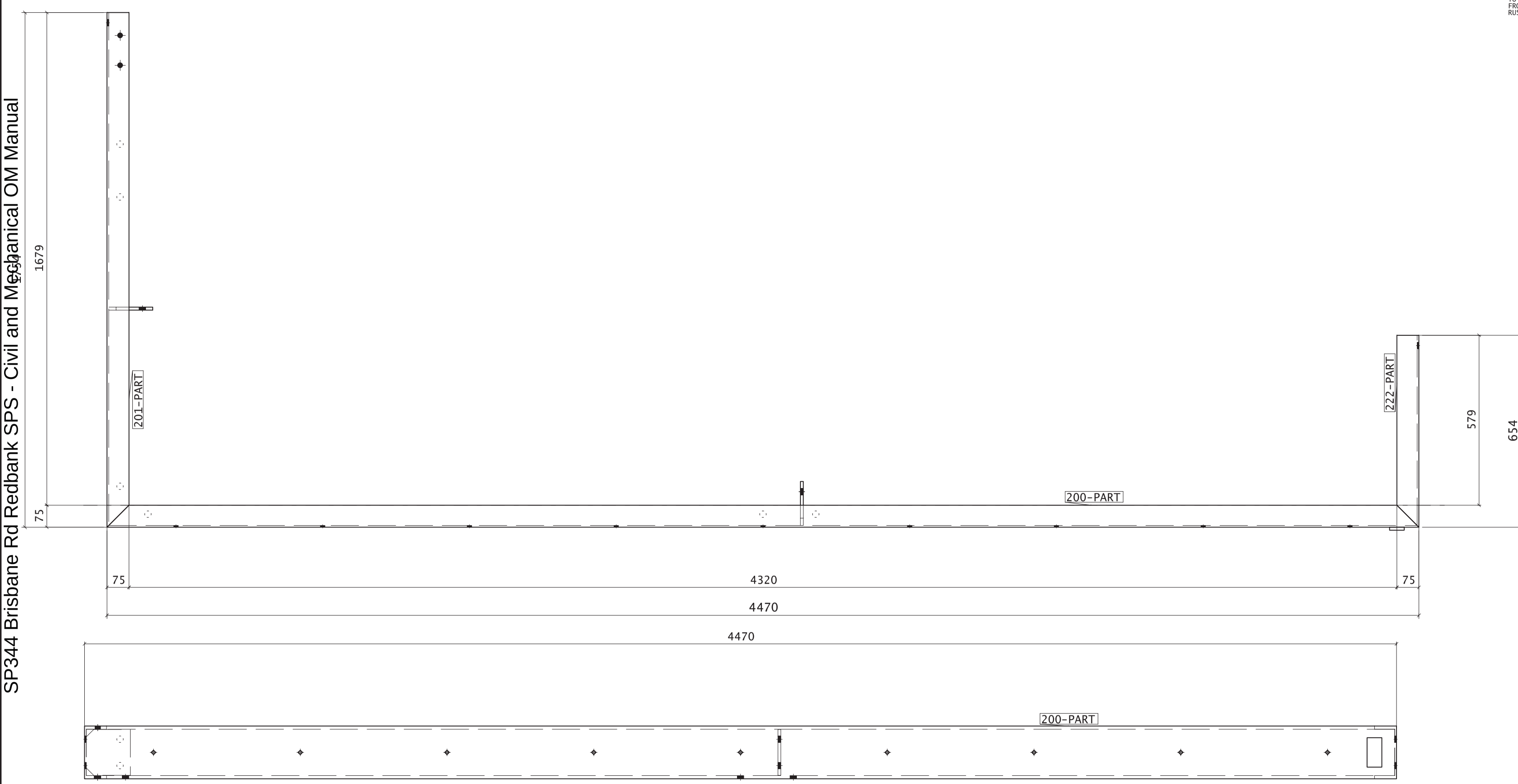
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	STRUC

1 REQ'D AS DRN MARKED AS-57

PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 145.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS DATE. 13/10/12 ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE DETAIL

JOB No. 1112-018 SCALE. NTS DRG No. AS-57 REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
PL105	150X10FL	300+	156	2	0.10	3.6
PL110	50X10FL	300+	100	1	0.01	0.4
196-PART	180X75PFC	300+	1544	1	0.99	31.7
197-PART	180X75PFC	300+	4520	1	2.91	93.4
206-PART	180X75PFC	300+	404	1	0.25	7.9
				TOTAL	4.27	137.0

THIS MEMBER TO BE HOT DIPPED GALVANISED.

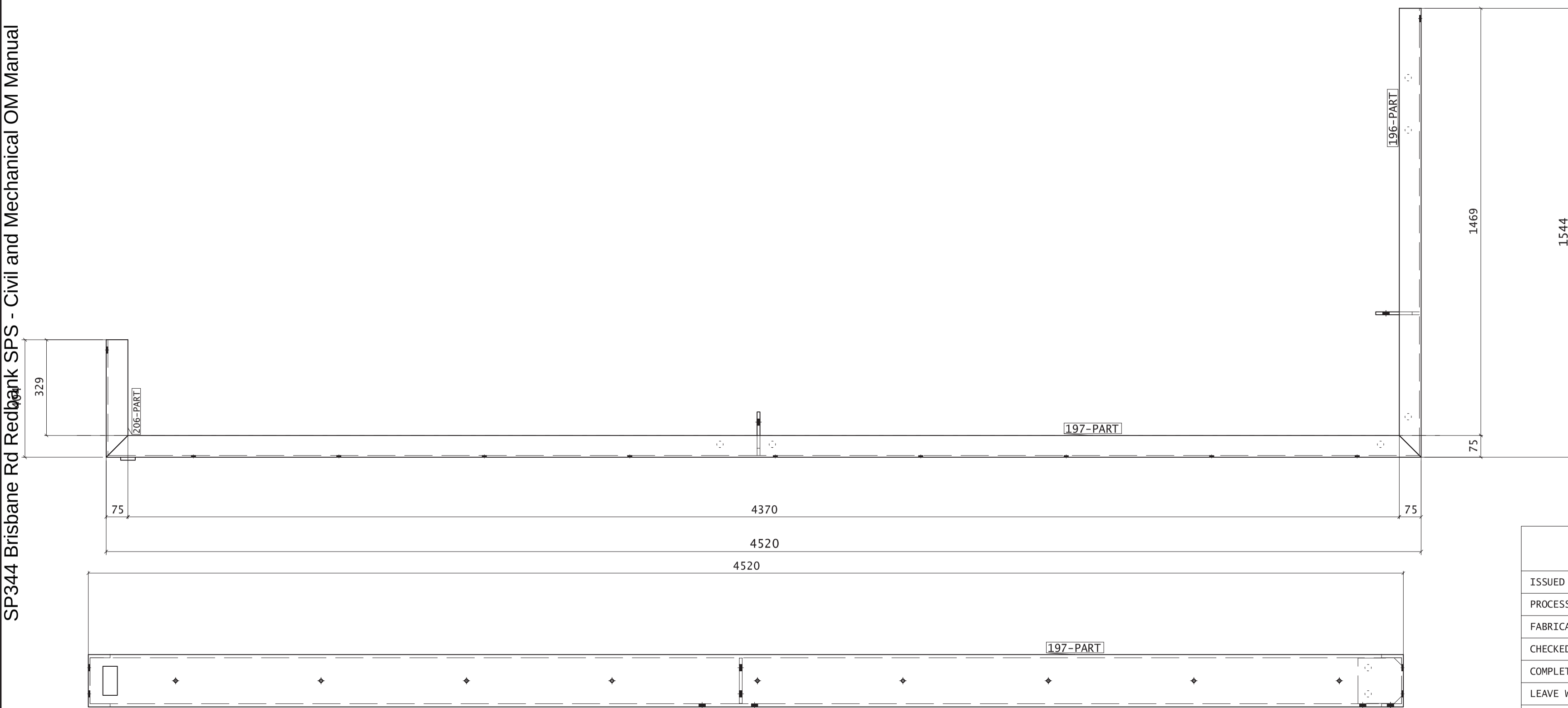
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED AS-58

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	STRUC

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 137.0 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
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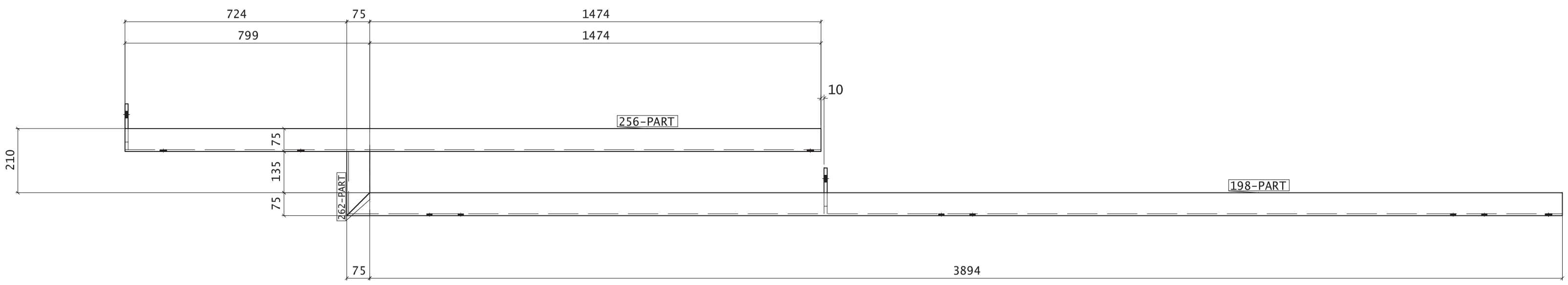
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. AS-58 | REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
PL105	150X10FL	300+	156	2	0.10	3.6
198-PART	180X75PFC	300+	3969	1	2.56	82.4
256-PART	180X75PFC	300+	2272	1	1.48	47.4
262-PART	180X75PFC	300+	210	1	0.13	3.9
				TOTAL	4.27	137.3

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	STRUC

1 REQ'D AS DRN MARKED AS-59

PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 137.3 kg.

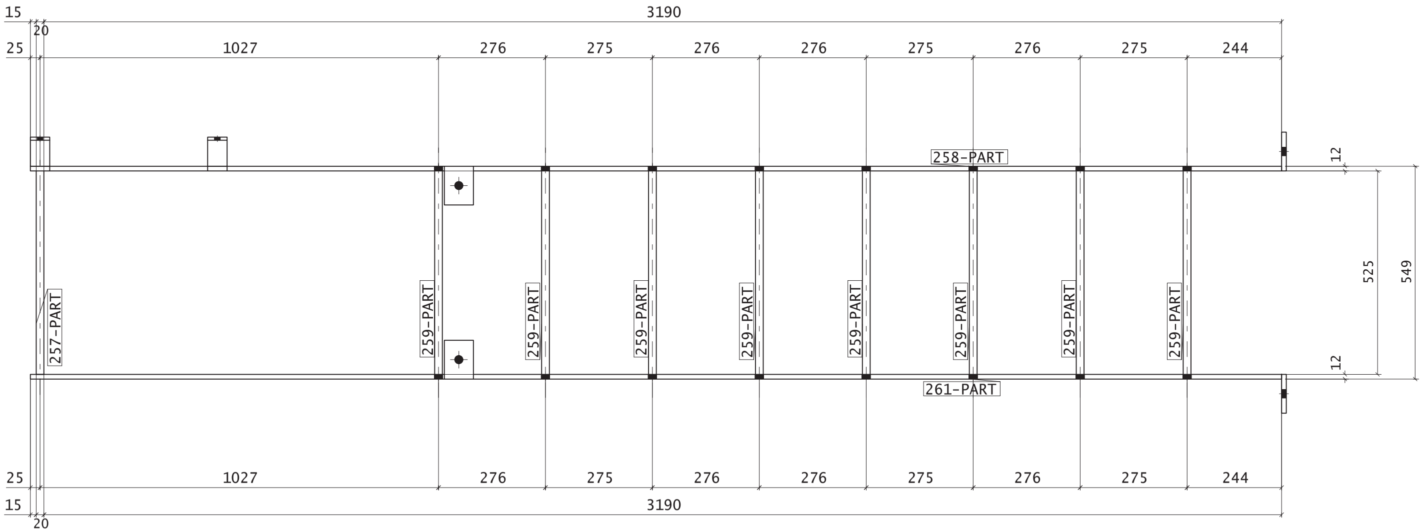
REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
industrial-commercial-rural
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. AS-59 | REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
CL161	75X12FL	300+	209	2	0.08	3.0
CL162	75X12FL	300+	100	2	0.04	1.4
CL163	75X8EA	300+	50	2	0.03	0.9
PL117	65X12FL	300+	100	2	0.03	1.2
PL118	50X12FL	300+	500	2	0.13	4.7
257-PART	DROPBAR	300+	525	1	0.03	1.3
258-PART	65X12FL	300+	3225	1	0.50	19.7
259-PART	N20REO	300+	537	8	0.27	10.5
261-PART	65X12FL	300+	3225	1	0.50	19.7
				TOTAL	1.61	62.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

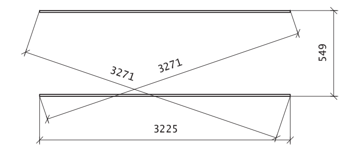
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



CHECK DIMENSIONS

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	STRUC

1 REQ'D AS DRN MARKED AS-60

PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 62.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
industrial-commercial-rural

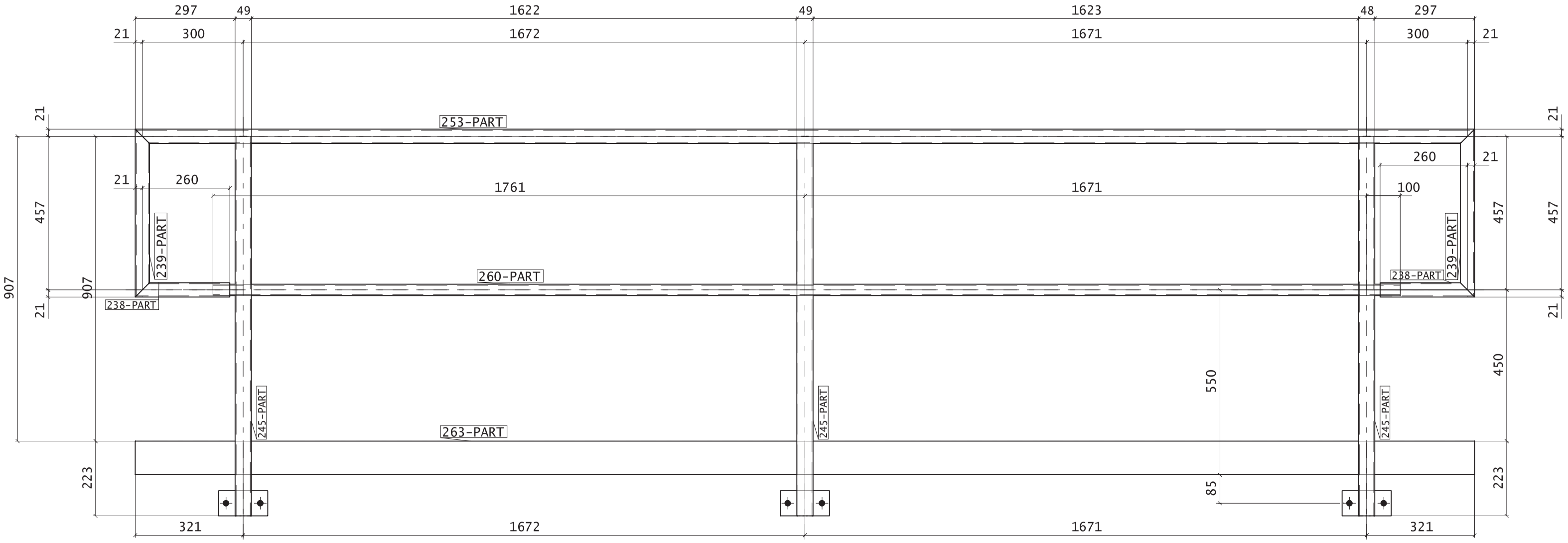
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. AS-60 | REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
CL23	STANDARBP	300+	146	3	0.08	2.6
238-PART	42.4CHSTOPRAIL	300+	281	2	0.07	1.6
239-PART	42.4CHSTOPRAIL	300+	499	2	0.12	2.8
245-PART	48.3SSTAUNCHION	300+	1130	3	0.49	12.0
253-PART	42.4CHSTOPRAIL	300+	3985	1	0.50	12.1
260-PART	33.7CHSMIDRAIL	300+	3532	1	0.35	8.5
263-PART	100X6KICKPLATE	300+	3985	1	0.85	18.8
				TOTAL	2.45	58.4

THIS MEMBER TO BE HOT DIPPED GALVANISED.

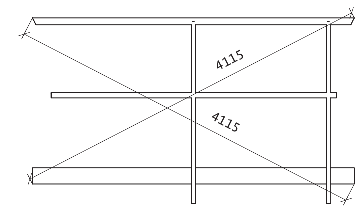
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



CHECK DIMENSIONS

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	STRUC

VIEW 4

1 REQ'D AS DRN MARKED AS-61

PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 58.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
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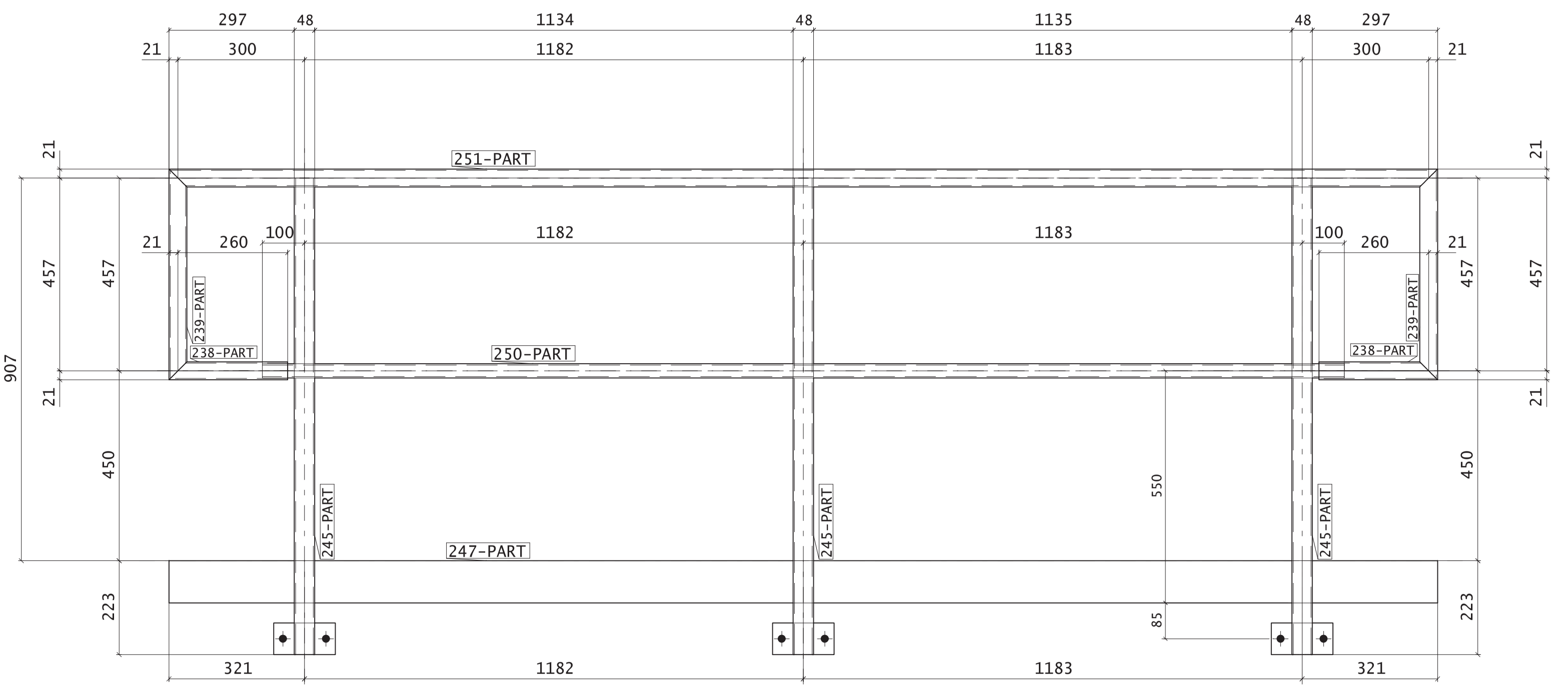
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. AS-61 | REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
CL23	STANDARBP	300+	146	3	0.08	2.6
238-PART	42.4CHSTOPRAIL	300+	281	2	0.07	1.6
239-PART	42.4CHSTOPRAIL	300+	499	2	0.12	2.8
245-PART	48.3SSTAUNCHION	300+	1130	3	0.49	12.0
247-PART	100X6KICKPLATE	300+	3007	1	0.64	14.2
250-PART	33.7CHSMIDRAIL	300+	2565	1	0.25	6.1
251-PART	42.4CHSTOPRAIL	300+	3007	1	0.37	9.1
				TOTAL	2.02	48.4

THIS MEMBER TO BE HOT DIPPED GALVANISED.

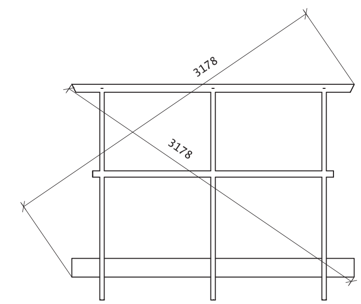
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



CHECK DIMENSIONS

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	STRUC

1 REQ'D AS DRN MARKED AS-62

PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 48.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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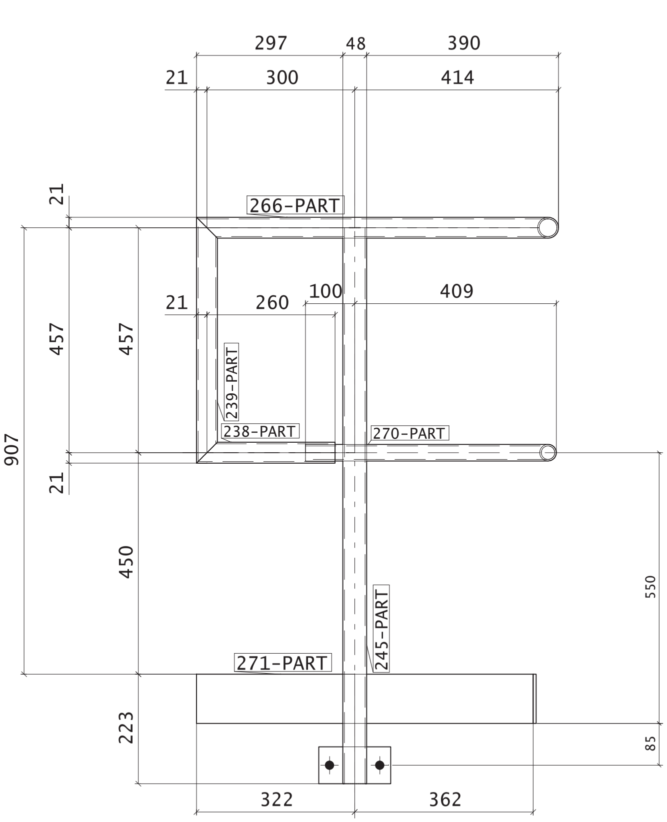
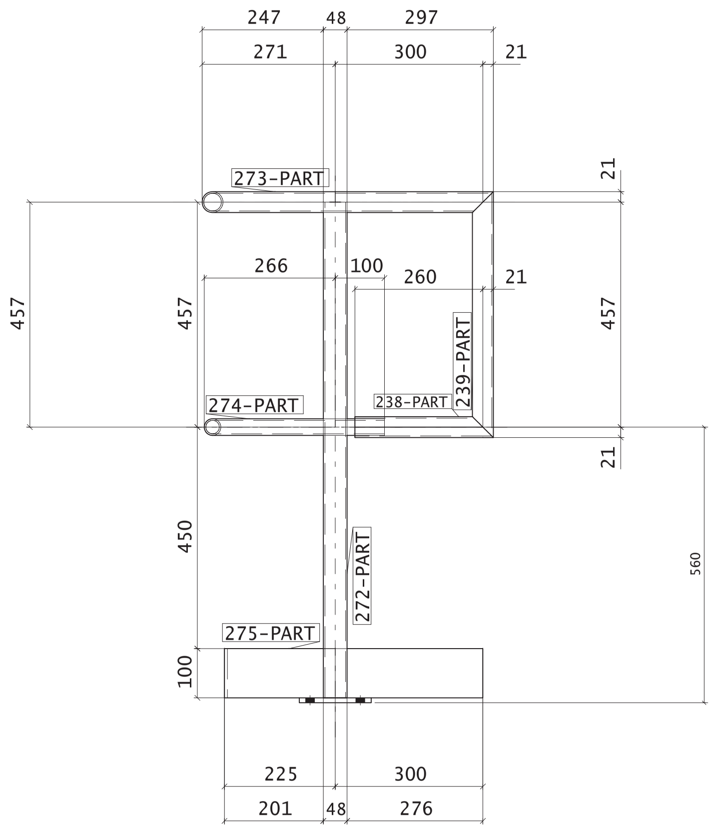
DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. AS-62 | REV. A





SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	SURFACE M2	WEIGHT KG
CL23	STANDARBP	300+	146	2	0.05	1.7
238-PART	42.4CHSTOPRAIL	300+	281	2	0.07	1.6
239-PART	42.4CHSTOPRAIL	300+	499	2	0.12	2.8
245-PART	48.3SSTAUNCHION	300+	1130	1	0.16	4.0
266-PART	42.4CHSTOPRAIL	300+	735	1	0.09	2.1
270-PART	33.7CHSMIDRAIL	300+	509	1	0.05	1.2
271-PART	100X6KICKPLATE	300+	684	1	0.15	3.2
272-PART	48.3CHSSTAUNCHION	300+	1007	1	0.15	3.6
273-PART	42.4CHSTOPRAIL	300+	592	1	0.07	1.7
274-PART	33.7CHSMIDRAIL	300+	366	1	0.03	0.8
275-PART	100X6KICKPLATE	300+	525	1	0.11	2.5
				TOTAL	1.05	25.2

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	STRUCA

1 REQ'D AS DRN MARKED AS-69

PHASE SP034UPPER
FINISH SP034HDG

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 25.2 kg.

GENERAL NOTES

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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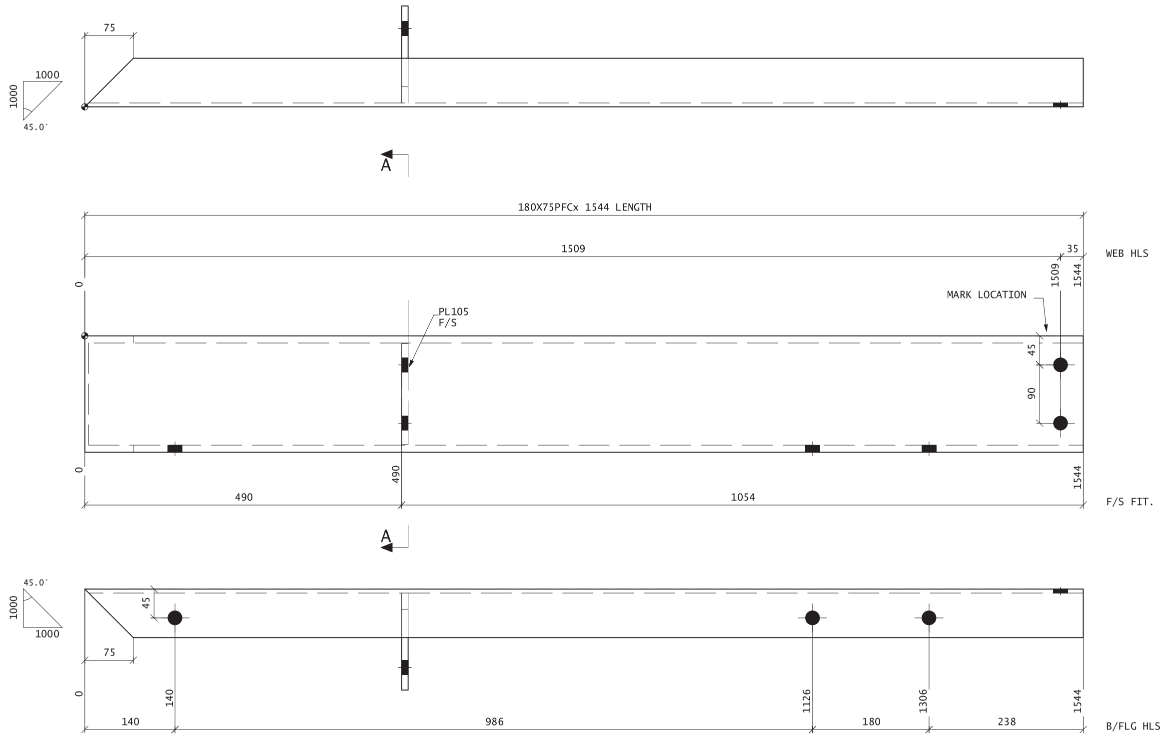
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. AS-69 | REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
196-PART	180X75PFC	300+	1544	1	31.7
PL105	150X10FL	300+	156	1	1.8
				TOTAL	33.5

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

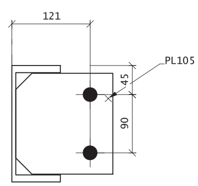
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



SECTION A - A

1 REQ'D AS DRN MARKED 196-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 33.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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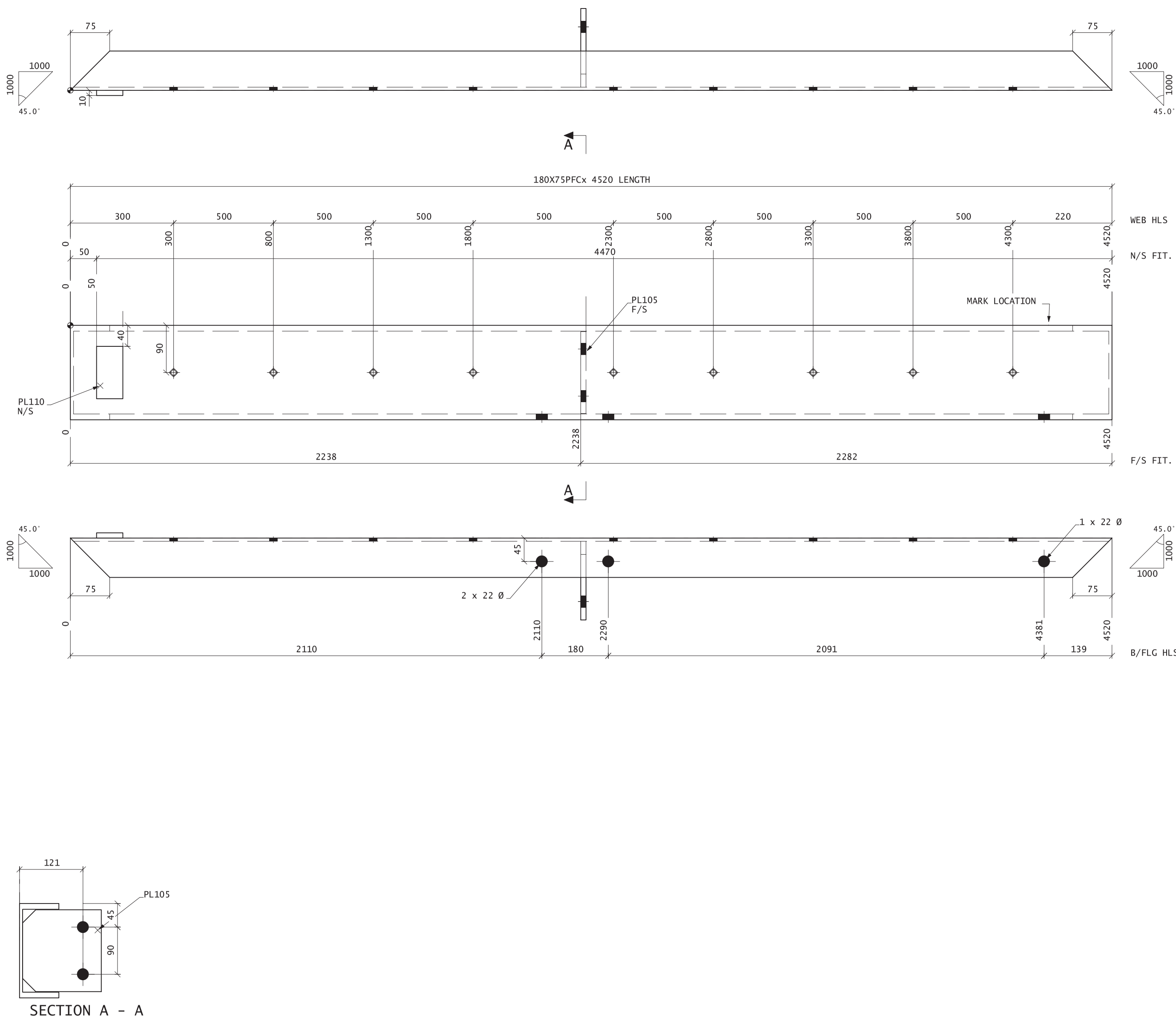
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 196-PART | REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
197-PART	180X75PFC	300+	4520	1	93.4
PL105	150X10FL	300+	156	1	1.8
PL110	50X10FL	300+	100	1	0.4
				TOTAL	95.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

1 REQ'D AS DRN MARKED 197-PART
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES
BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 15 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 95.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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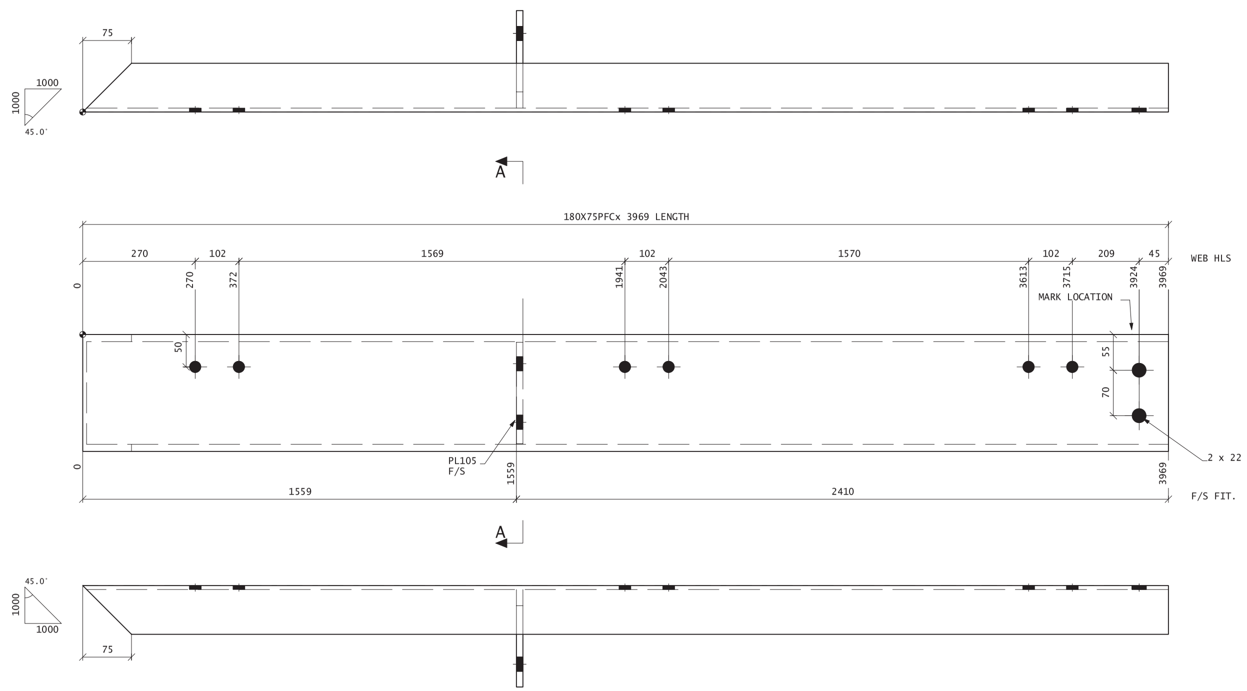
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 197-PART | REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
198-PART	180X75PFC	300+	3969	1	82.4
PL105	150X10FL	300+	156	1	1.8
				TOTAL	84.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

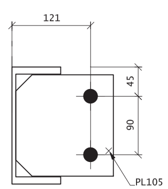
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



SECTION A - A

1 REQ'D AS DRN MARKED 198-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCA

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 18 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 84.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
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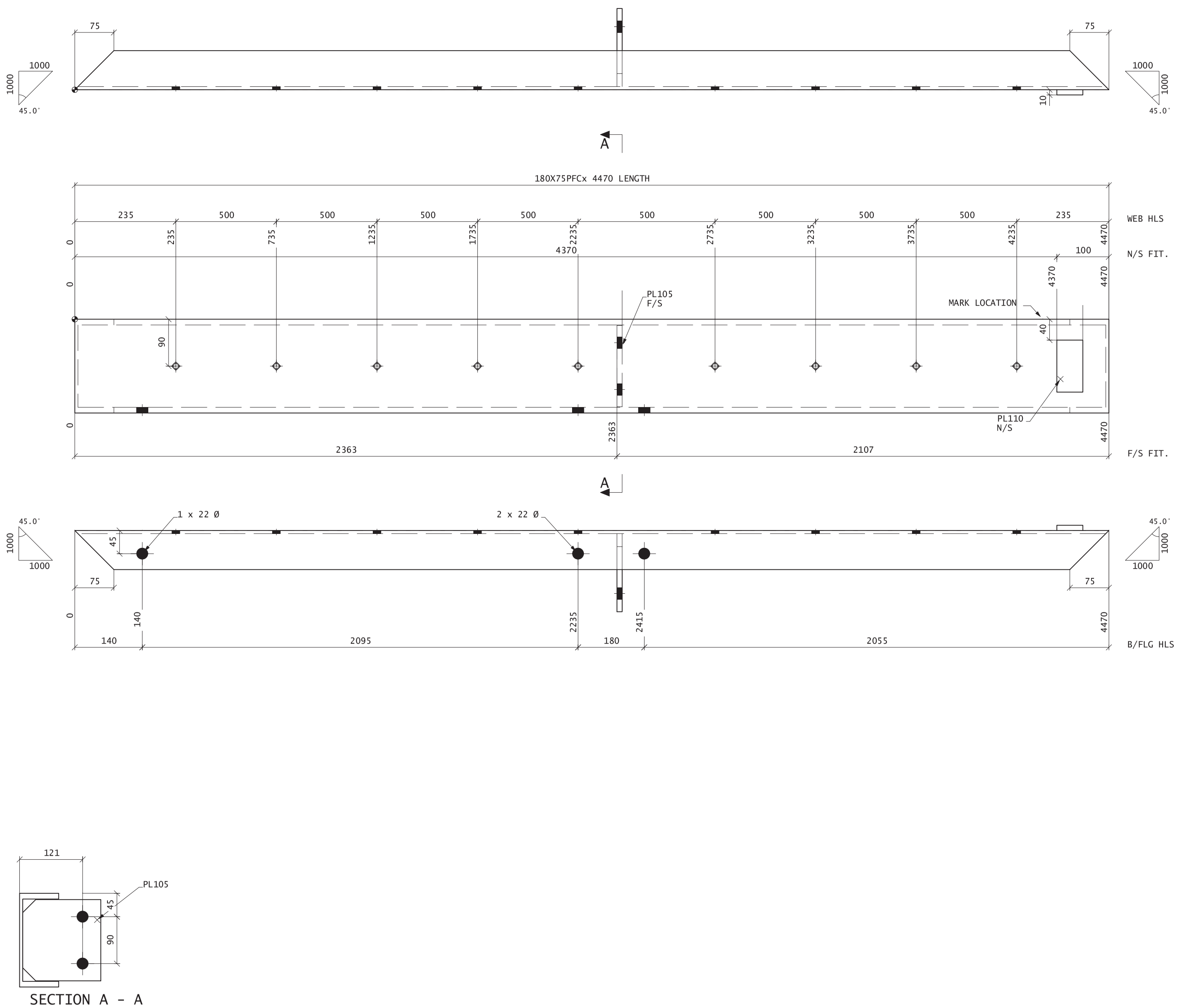
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 198-PART | REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
200-PART	180X75PFC	300+	4470	1	92.3
PL105	150X10FL	300+	156	1	1.8
PL110	50X10FL	300+	100	1	0.4
				TOTAL	94.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

1 REQ'D AS DRN MARKED 200-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 15 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 94.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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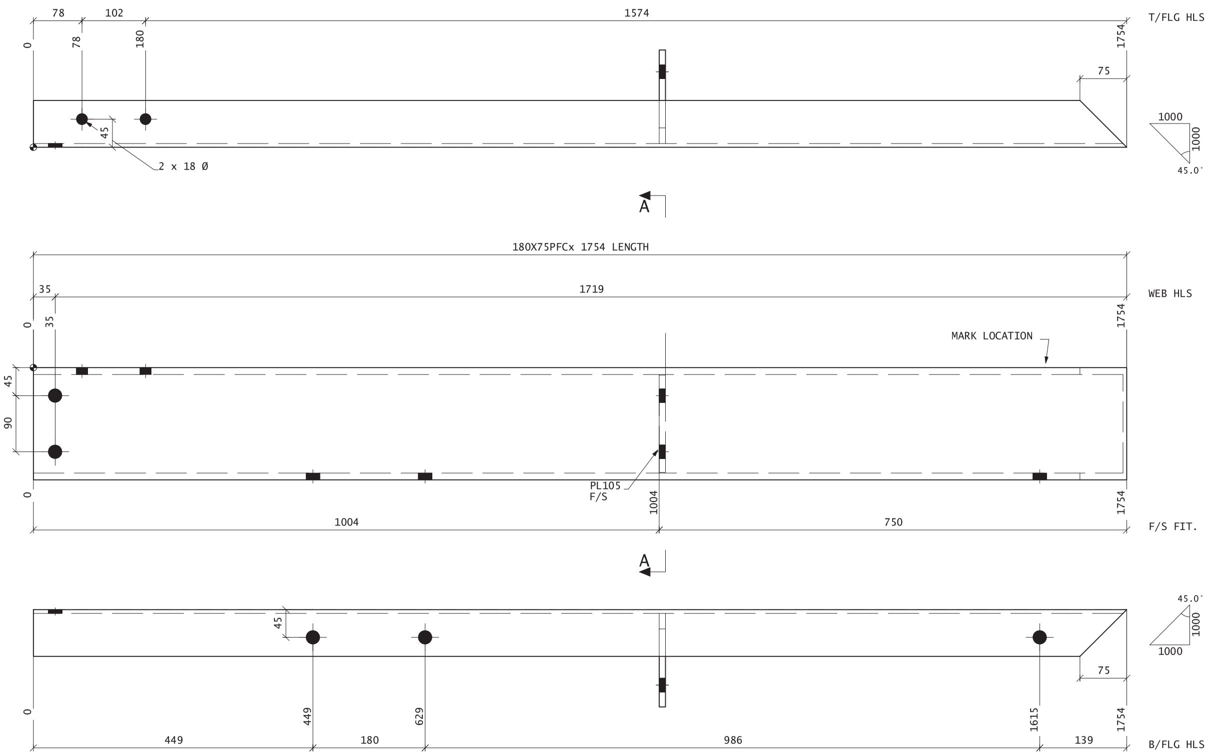
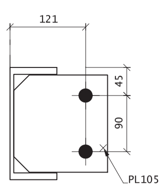
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 200-PART | REV.





SECTION A - A

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
201-PART	180X75PFC	300+	1754	1	36.1
PL105	150X10FL	300+	156	1	1.8
				TOTAL	37.9

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

1 REQ'D AS DRN MARKED 201-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 37.9 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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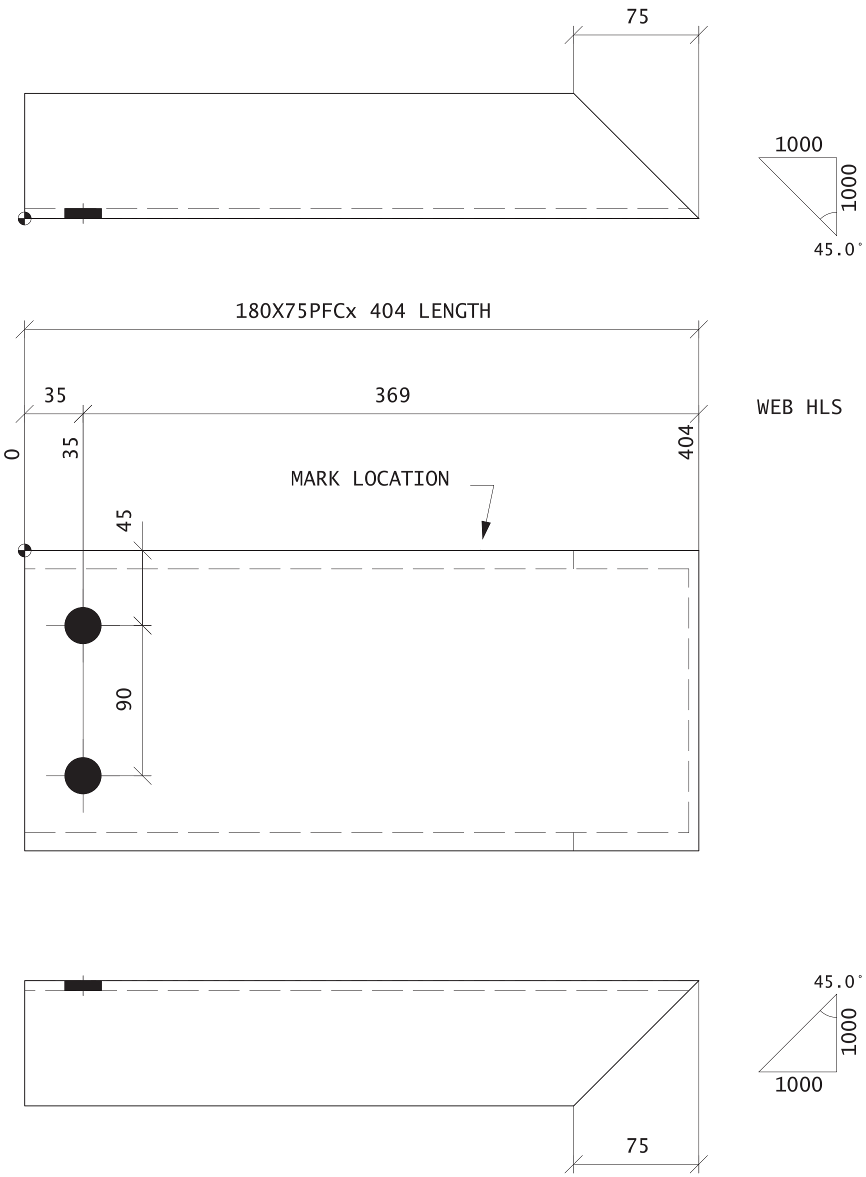
EMAIL - mcs80@bigpond.com

DRN. MCS DATE. 13/10/12 ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 201-PART | REV. A



1 REQ'D AS DRN MARKED 206-PART

PHASE SP034UPPER
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
206-PART	180X75PFC	300+	404	1	7.9
				TOTAL	7.9

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 7.9 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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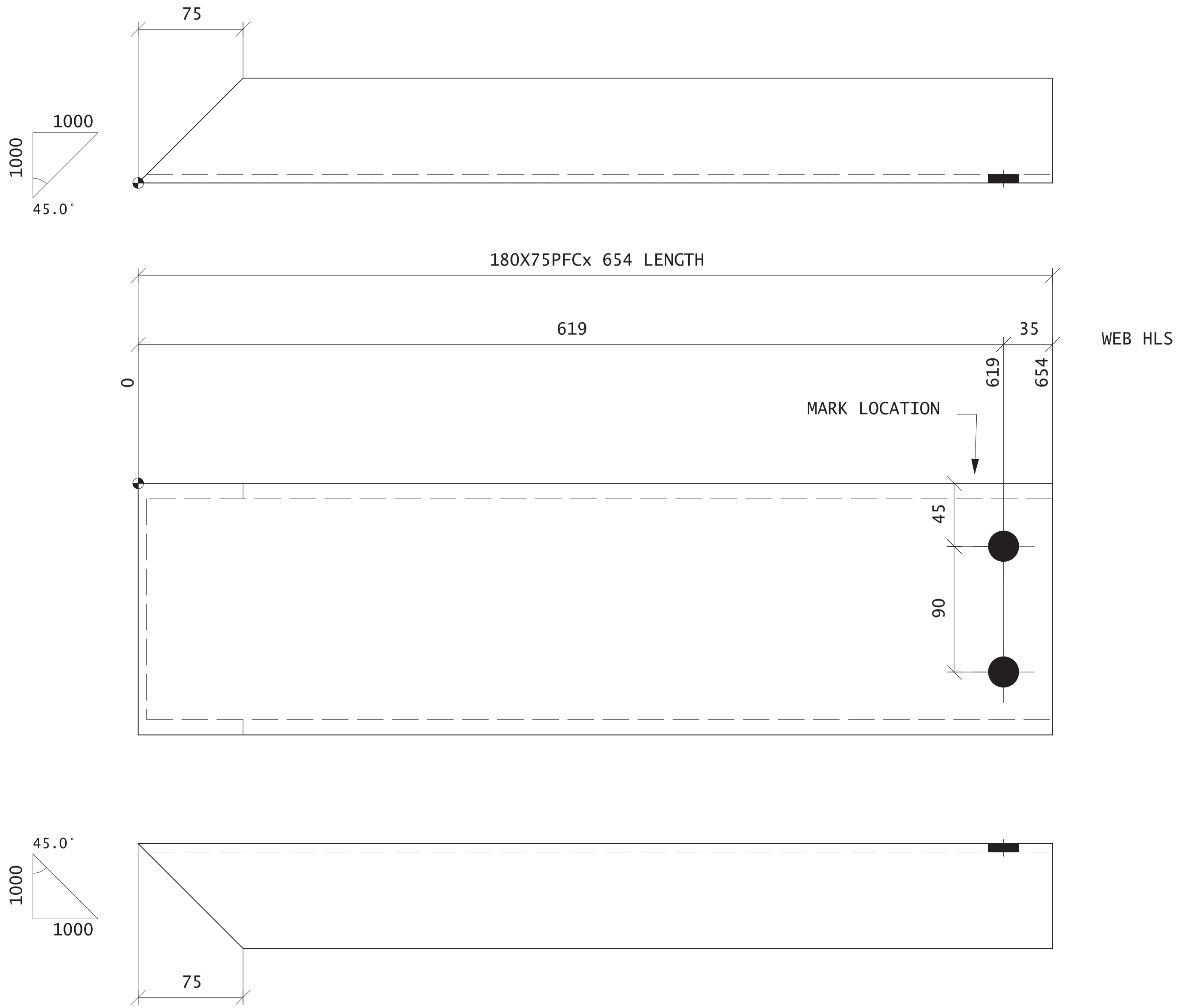
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 206-PART | REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
222-PART	180X75PFC	300+	654	1	13.1
				TOTAL	13.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

1 REQ'D AS DRN MARKED 222-PART
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES
BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 13.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting industrial-commercial-rural
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
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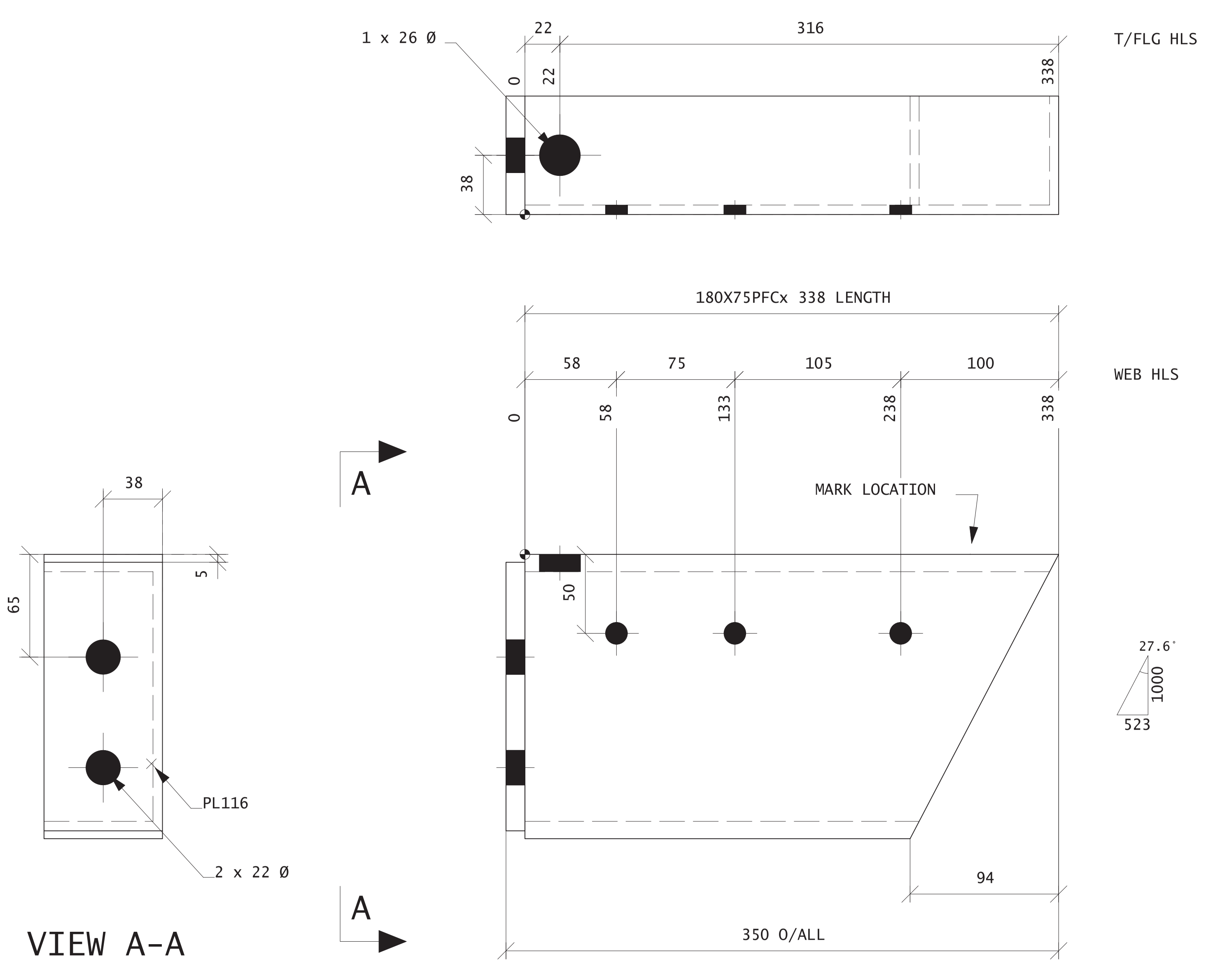
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL
JOB No. 1112-018 | SCALE. NTS | DRG No. 222-PART | REV.



1 REQ'D AS DRN MARKED 224-PART

PHASE SP034UPPER
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
224-PART	180X75PFC	300+	338	1	6.1
PL116	75X12FL	300+	170	1	1.2
				TOTAL	7.3

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCA

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 14 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 7.3 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

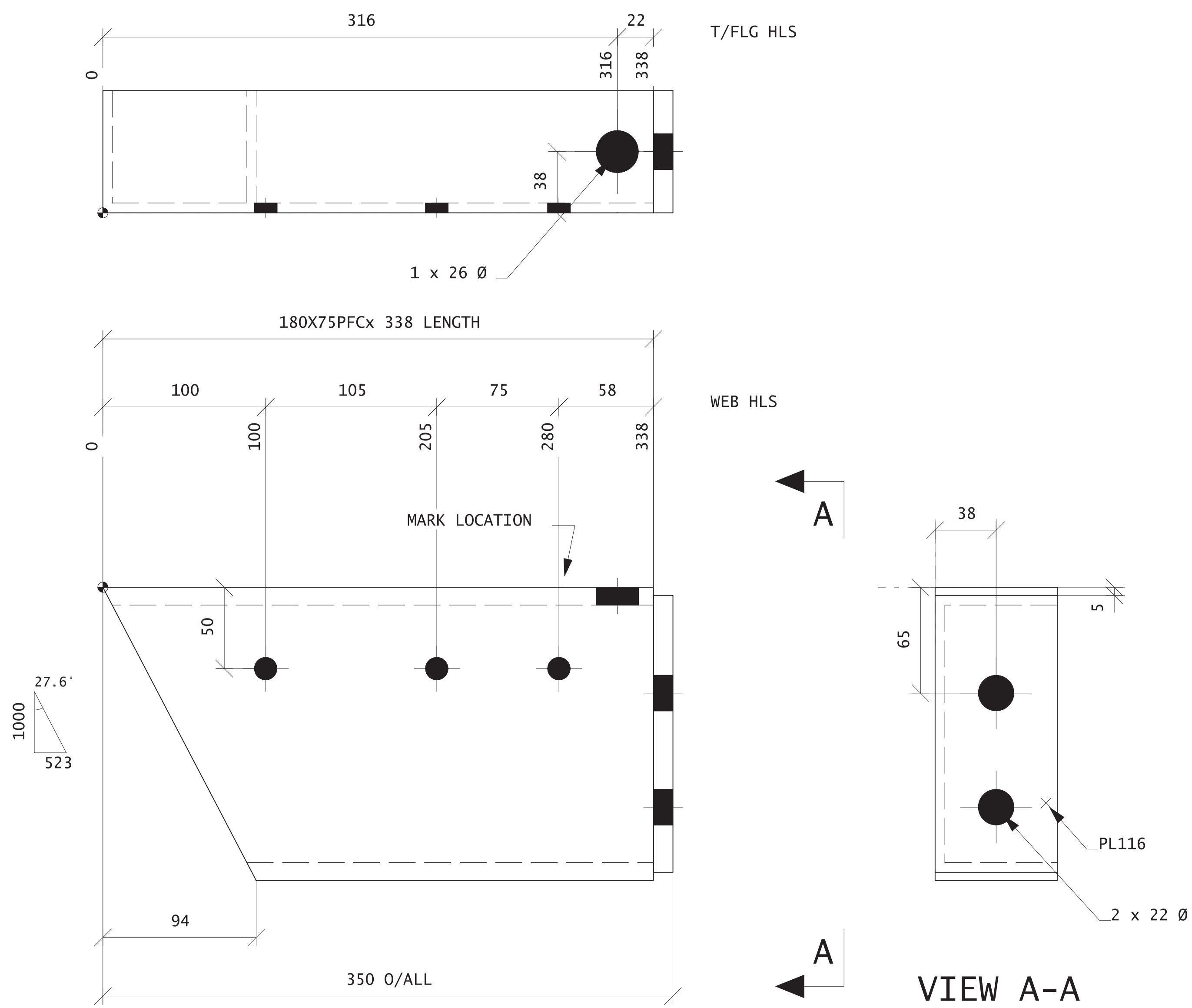
DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 224-PART | REV. A



1 REQ'D AS DRN MARKED 225-PART

PHASE SP034UPPER
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
225-PART	180X75PFC	300+	338	1	6.1
PL116	75X12FL	300+	170	1	1.2
				TOTAL	7.3

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 14 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 7.3 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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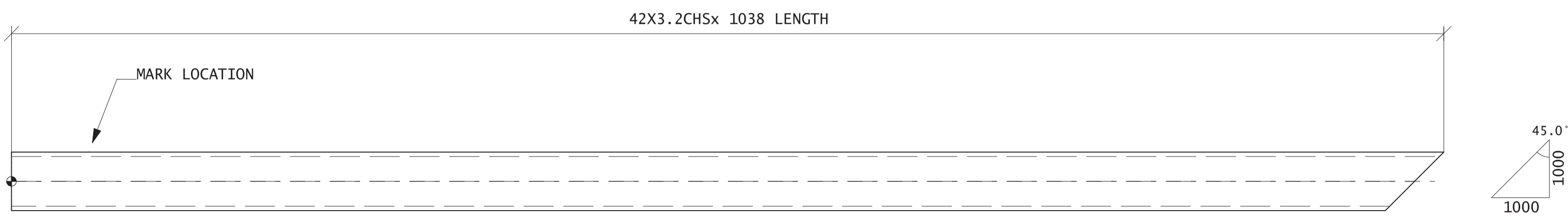
DRN. MCS DATE. 13/10/12 ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 SCALE. NTS DRG No. 225-PART REV. A



SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
226-PART	42X3.2CHS	300+	1038	1	3.1
				TOTAL	3.1

SHOP MATERIAL LIST FOR 2 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
226-PART	42X3.2CHS	300+	1038	2	6.3
				TOTAL	6.3

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

2 REQ'D AS DRN MARKED 226-PART
PHASE SP034UPPER(2)
FINISH SP034HDG(2)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 3.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 226-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
227-PART	42X3.2CHS	300+	276	1	0.8
				TOTAL	0.8

SHOP MATERIAL LIST FOR 2 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
227-PART	42X3.2CHS	300+	276	2	1.6
				TOTAL	1.6

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

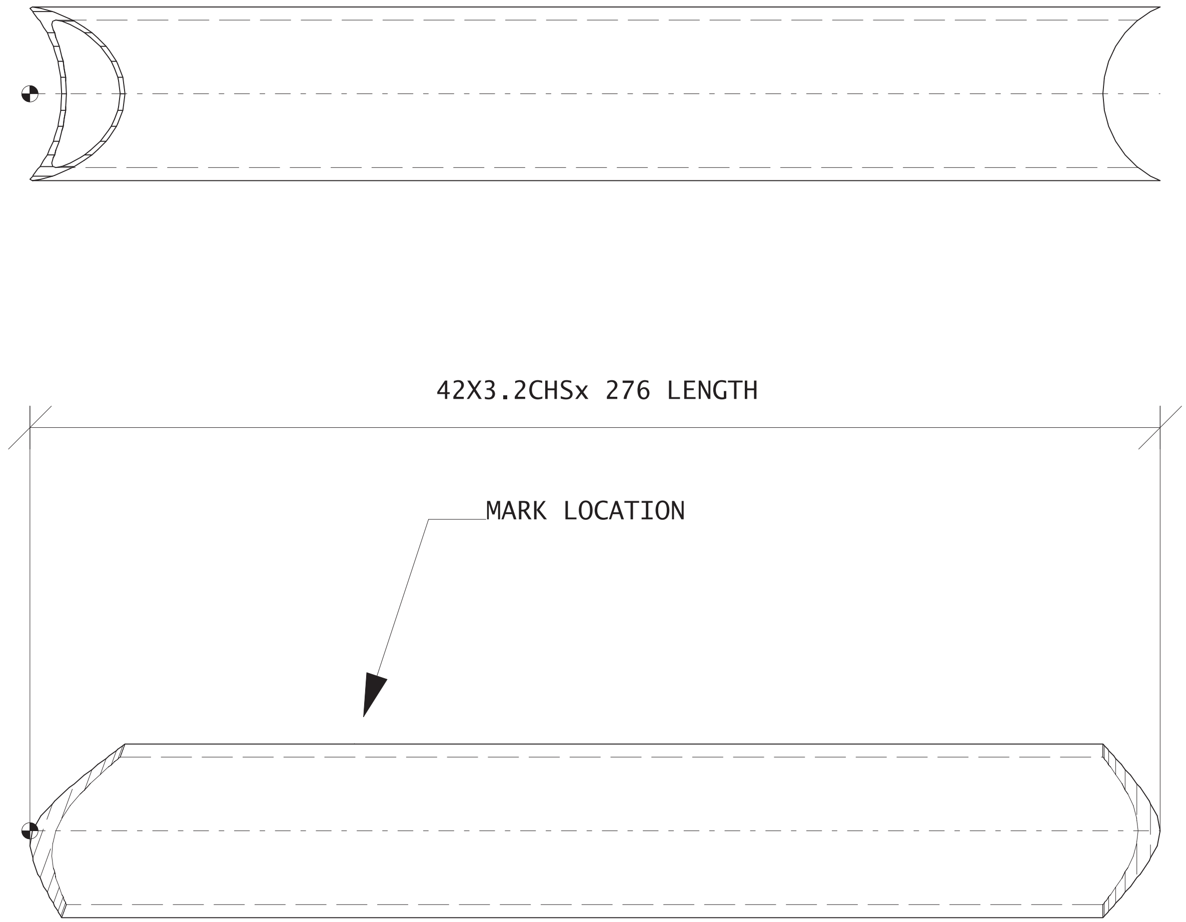
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



2 REQ'D AS DRN MARKED 227-PART
PHASE SP034UPPER(2)
FINISH SP034HDG(2)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 0.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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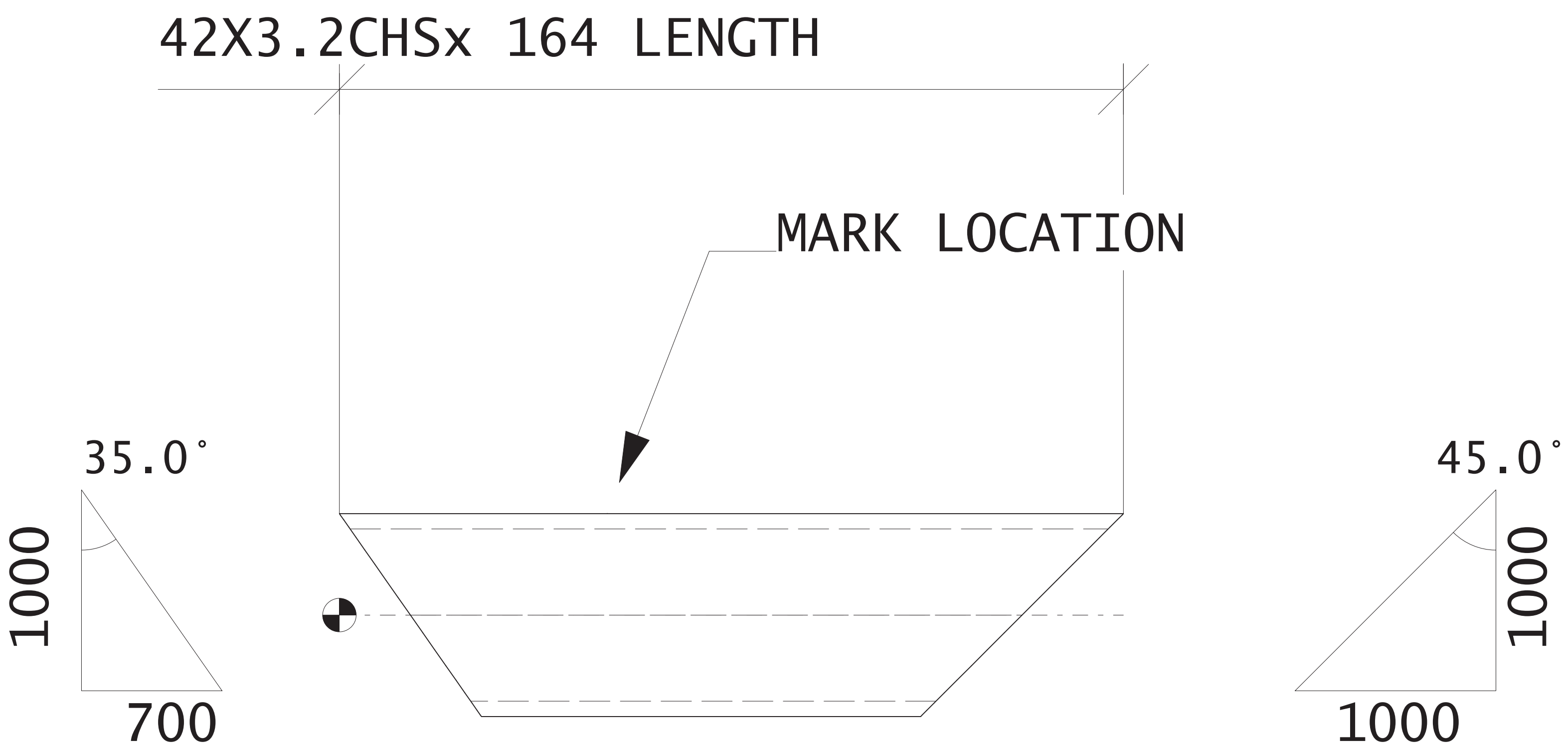
DRN. MCS — DATE. 13/10/12 — ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 — SCALE. NTS — DRG No. 227-PART — REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
230-PART	42X3.2CHS	300+	164	1	0.4
				TOTAL	0.4

SHOP MATERIAL LIST FOR 2 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
230-PART	42X3.2CHS	300+	164	2	0.8
				TOTAL	0.8



THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

2 REQ'D AS DRN MARKED 230-PART
PHASE SP034UPPER(2)
FINISH SP034HDG(2)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 0.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 230-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
233-PART	150X75PFC	300+	2334	1	39.6
PL119	75X12FL	300+	250	1	1.8
				TOTAL	41.4

THIS MEMBER TO BE HOT DIPPED GALVANISED.

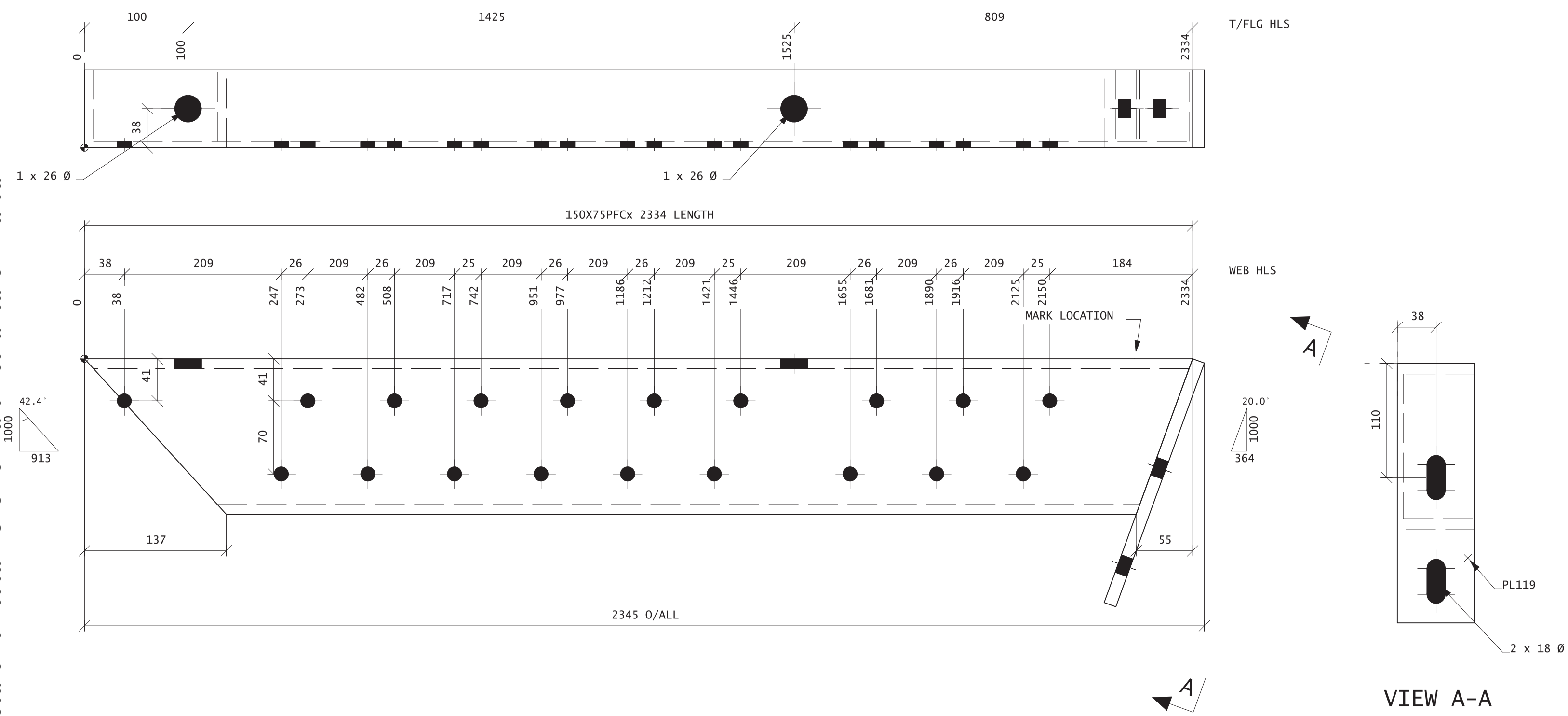
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



VIEW A-A

1 REQ'D AS DRN MARKED 233-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 14 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 41.4 kg.

GENERAL NOTES

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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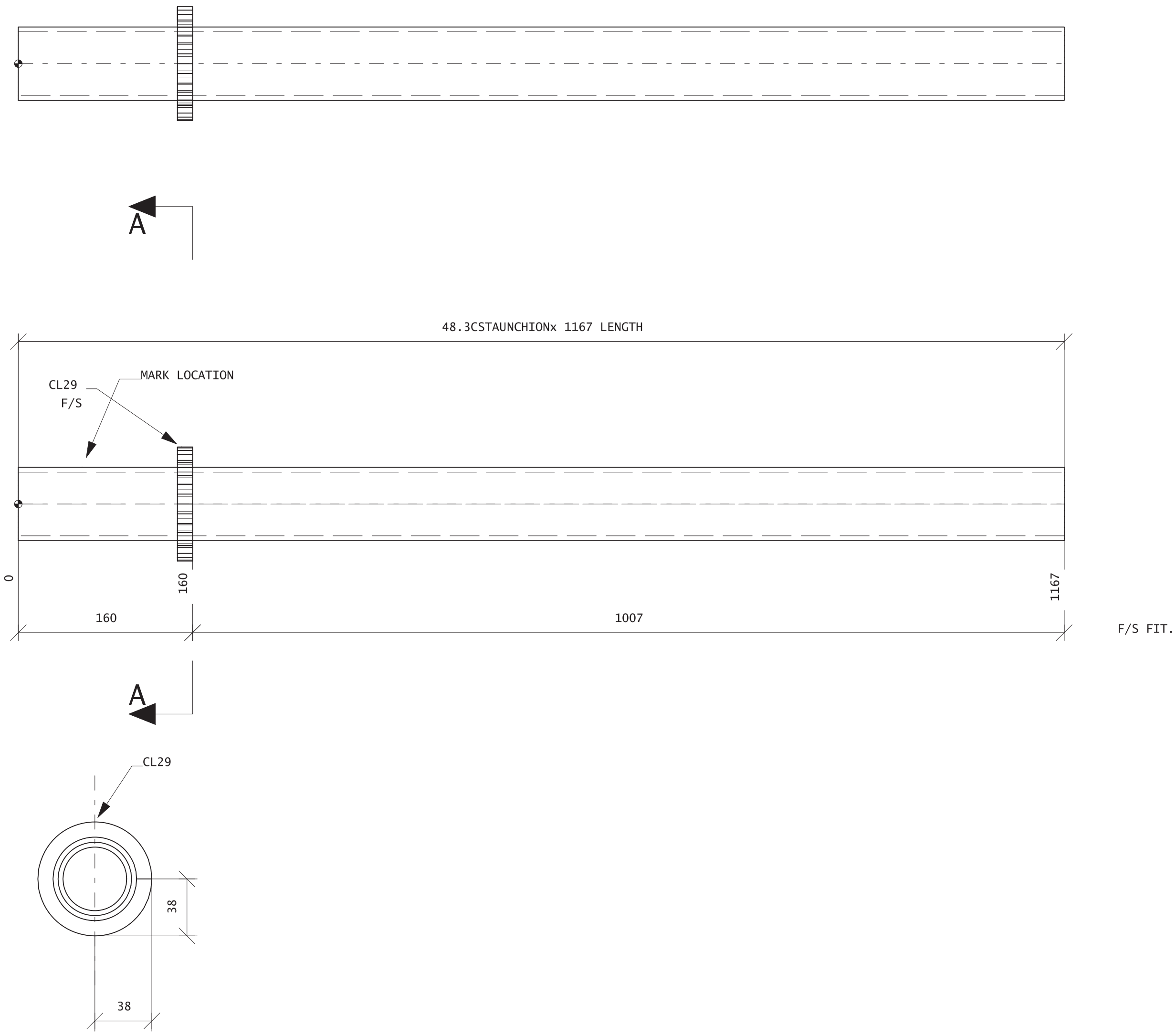
DRN. MCS DATE. 13/10/12 ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARDSON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 SCALE. NTS DRG No. 233-PART REV.



SECTION A - A

12 REQ'D AS DRN MARKED 234-PART
PHASE SP034UPPER(12)
FINISH SP034HDG(12)

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
234-PART	48.3CSTAUNCHION	300+	1167	1	4.1
CL29	STAUNCOLLAR	300+	10	1	0.2
				TOTAL	4.3

SHOP MATERIAL LIST FOR 12 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
234-PART	48.3CSTAUNCHION	300+	1167	12	49.6
CL29	STAUNCOLLAR	300+	10	12	1.9
				TOTAL	51.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES
BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
STEEL GRADE 300+
TOTAL WEIGHT 4.3 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL
JOB No. 1112-018 | SCALE. NTS | DRG No. 234-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
235-PART	42.4CHSTOPRAIL	300+	2842	1	8.6
				TOTAL	8.6

SHOP MATERIAL LIST FOR 4 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
235-PART	42.4CHSTOPRAIL	300+	2842	4	34.5
				TOTAL	34.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

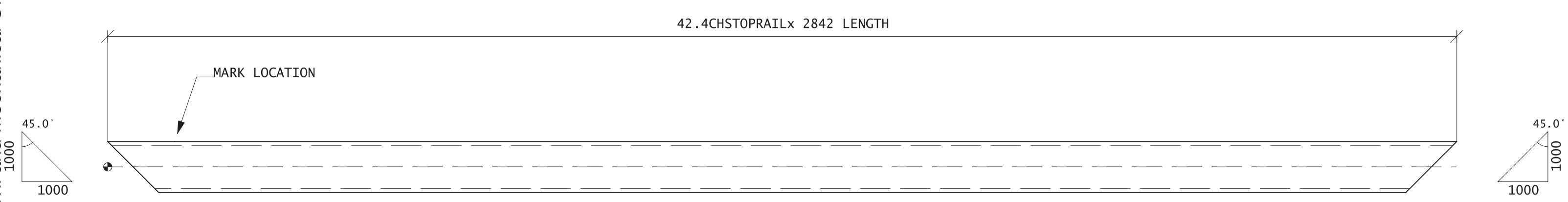
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



4 REQ'D AS DRN MARKED 235-PART

PHASE SP034UPPER(4)
FINISH SP034HDG(4)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 8.6 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 235-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
236-PART	33.7CHSMIDRAIL	300+	2400	1	5.7
				TOTAL	5.7

SHOP MATERIAL LIST FOR 4 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
236-PART	33.7CHSMIDRAIL	300+	2400	4	23.0
				TOTAL	23.0

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

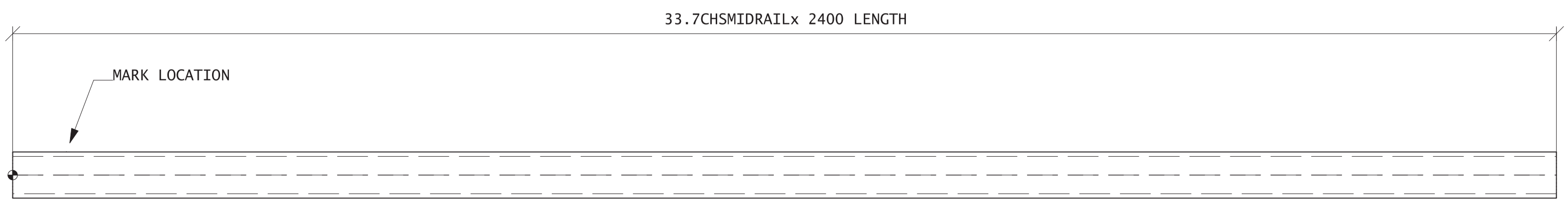
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



4 REQ'D AS DRN MARKED 236-PART
PHASE SP034UPPER(4)
FINISH SP034HDG(4)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 5.7 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 236-PART | REV.

STRUCA

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
238-PART	42.4CHSTOPRAIL	300+	281	1	0.8
				TOTAL	0.8

SHOP MATERIAL LIST FOR 18 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
238-PART	42.4CHSTOPRAIL	300+	281	18	14.4
				TOTAL	14.4

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

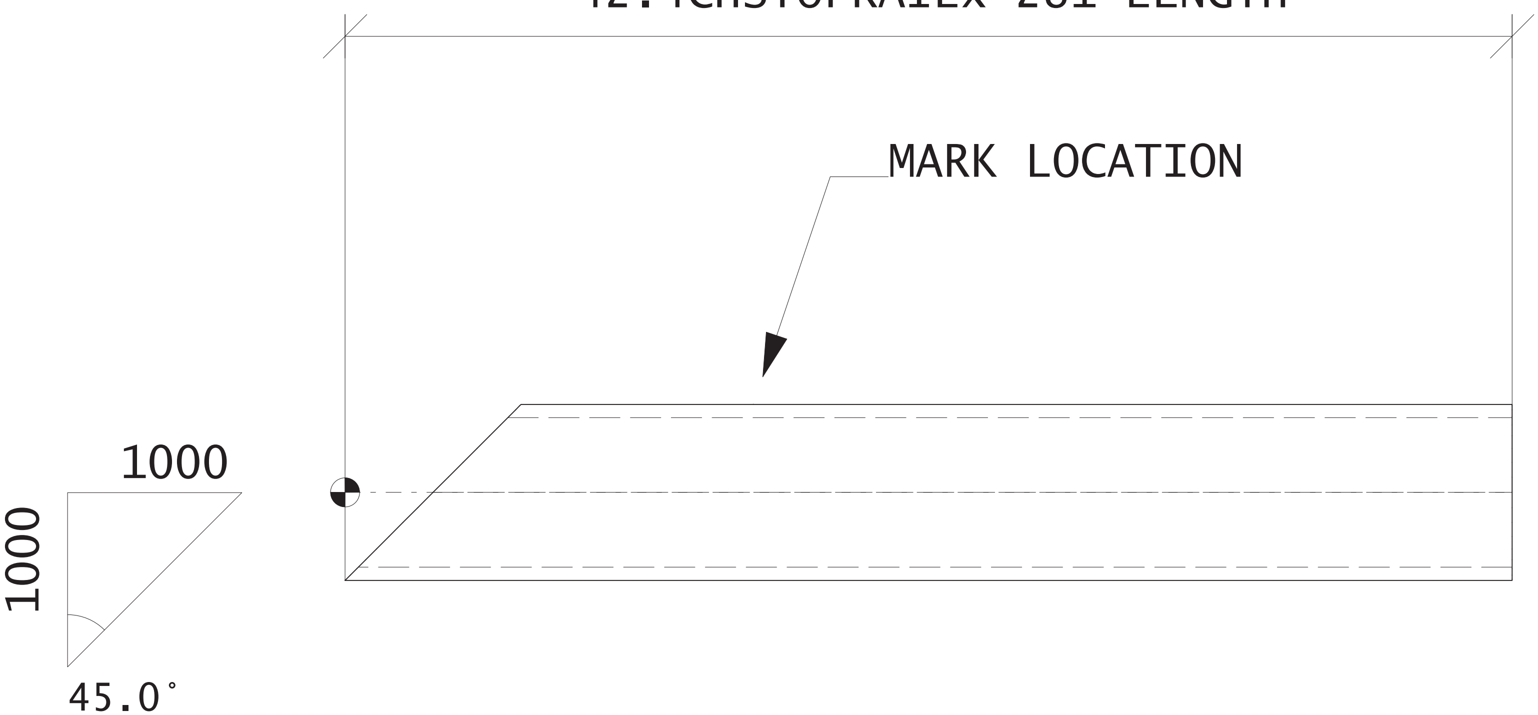
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



18 REQ'D AS DRN MARKED 238-PART
PHASE SP034UPPER(18)
FINISH SP034HDG(18)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 0.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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FAX - 07 4613 4716
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EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

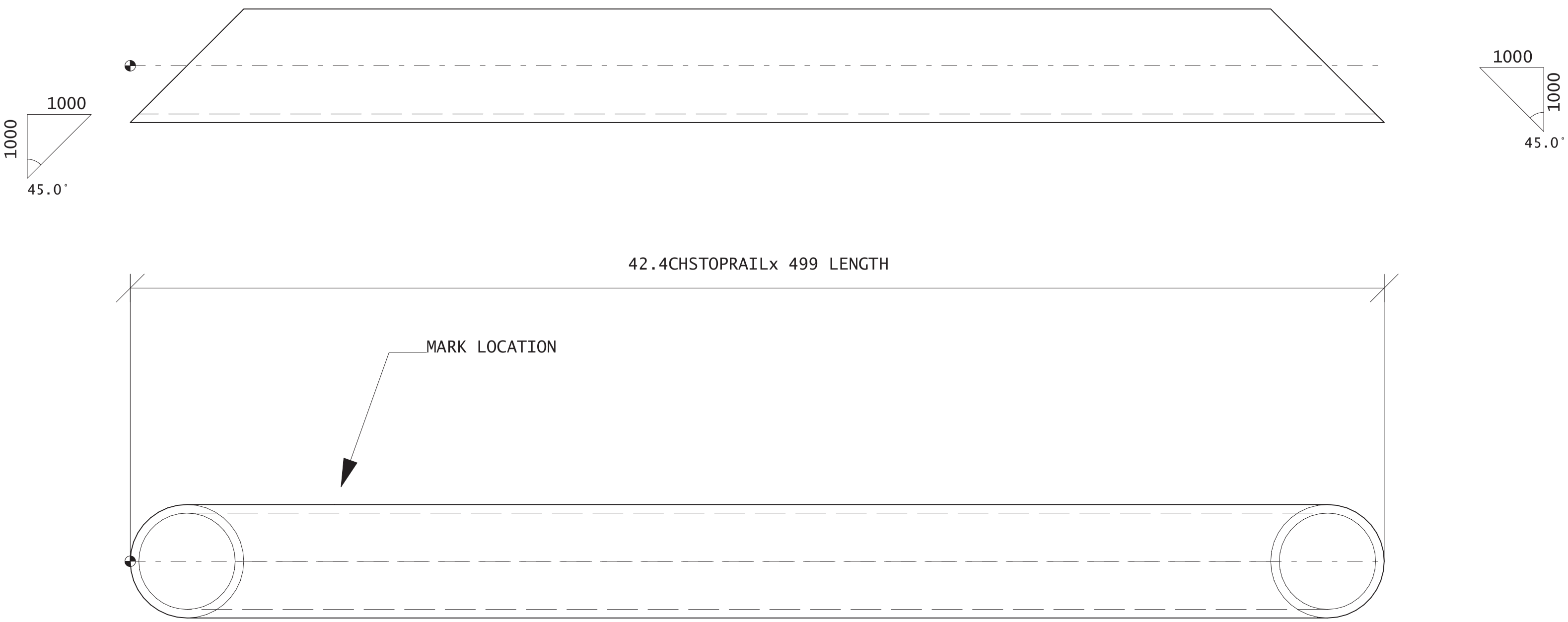
CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 238-PART | REV. A

STRUCA

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
239-PART	42.4CHSTOPRAIL	300+	499	1	1.4
				TOTAL	1.4

SHOP MATERIAL LIST FOR 18 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
239-PART	42.4CHSTOPRAIL	300+	499	18	25.3
				TOTAL	25.3



THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

18 REQ'D AS DRN MARKED 239-PART
PHASE SP034UPPER(18)
FINISH SP034HDG(18)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCA

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 1.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 239-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
240-PART	100X6KICKPLATE	300+	2842	1	13.4
				TOTAL	13.4

SHOP MATERIAL LIST FOR 4 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
240-PART	100X6KICKPLATE	300+	2842	4	53.6
				TOTAL	53.6

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

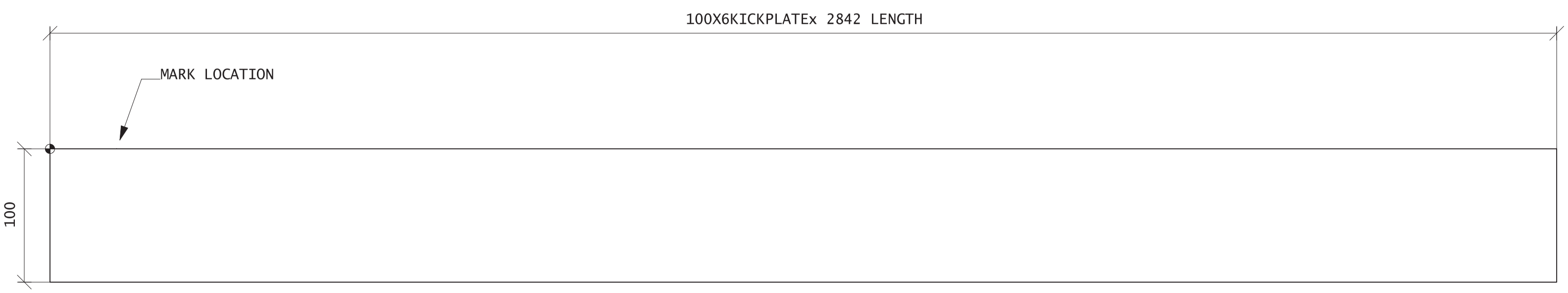
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



4 REQ'D AS DRN MARKED 240-PART
PHASE SP034UPPER(4)
FINISH SP034HDG(4)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 13.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

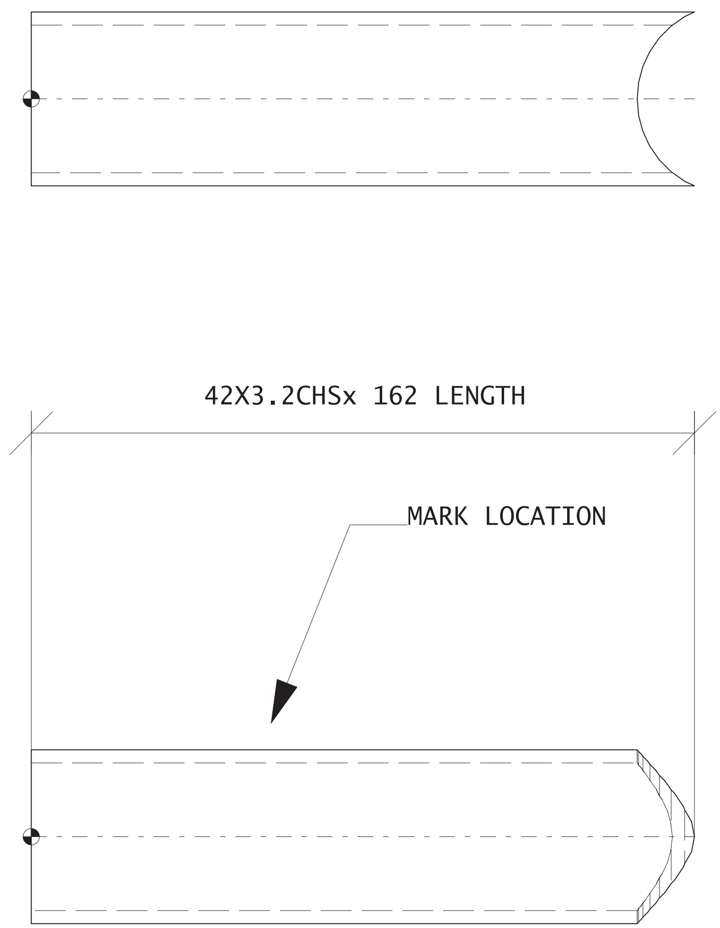
CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 240-PART | REV.

STRUCAD

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
241-PART	42X3.2CHS	300+	162	1	0.5
				TOTAL	0.5

SHOP MATERIAL LIST FOR 2 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
241-PART	42X3.2CHS	300+	162	2	0.9
				TOTAL	0.9



THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

2 REQ'D AS DRN MARKED 241-PART
PHASE SP034UPPER(2)
FINISH SP034HDG(2)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 0.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 241-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
242-PART	150X75PFC	300+	2334	1	39.6
PL119	75X12FL	300+	250	1	1.8
				TOTAL	41.4

THIS MEMBER TO BE HOT DIPPED GALVANISED.

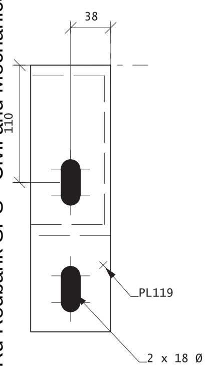
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

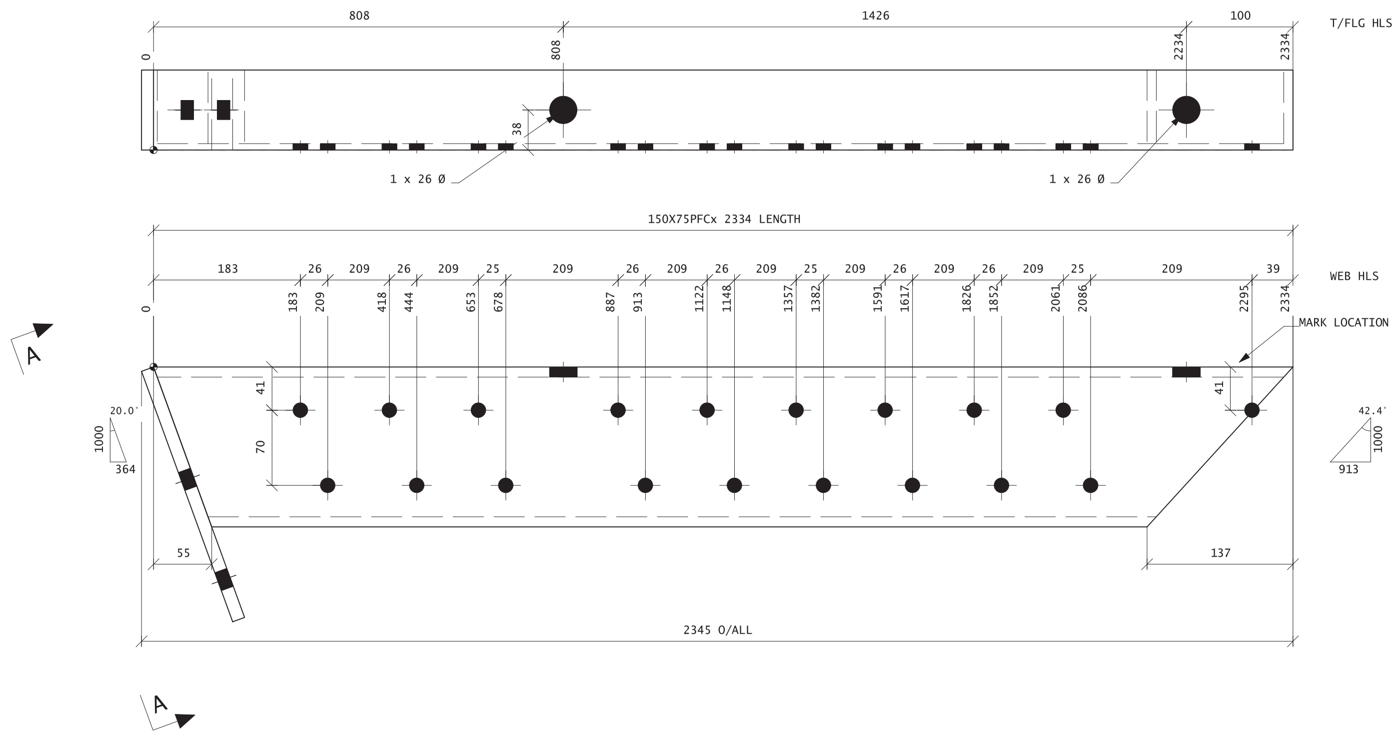
ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



VIEW A-A



1 REQ'D AS DRN MARKED 242-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCA

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 14 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 41.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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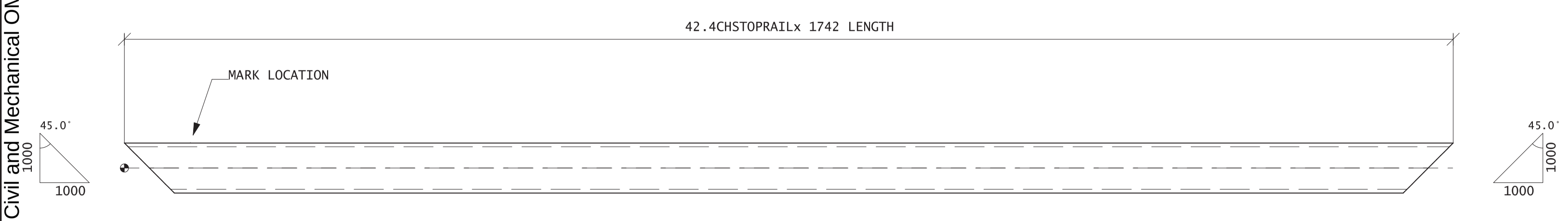
DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 242-PART | REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
244-PART	42.4CHSTOPRAIL	300+	1742	1	5.2
				TOTAL	5.2

SHOP MATERIAL LIST FOR 2 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
244-PART	42.4CHSTOPRAIL	300+	1742	2	10.5
				TOTAL	10.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

2 REQ'D AS DRN MARKED 244-PART
PHASE SP034UPPER(2)
FINISH SP034HDG(2)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 5.2 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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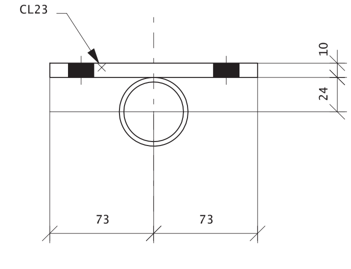
DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 244-PART | REV.



SECTION A - A

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
245-PART	48.3SSTAUNCHION	300+	1130	1	4.0
CL23	STANDARBP	300+	146	1	0.9
				TOTAL	4.9

SHOP MATERIAL LIST FOR 7 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
245-PART	48.3SSTAUNCHION	300+	1130	7	28.0
CL23	STANDARBP	300+	146	7	6.0
				TOTAL	34.0

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

7 REQ'D AS DRN MARKED 245-PART
PHASE SP034UPPER(7)
FINISH SP034HDG(7)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 4.9 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 245-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
246-PART	100X6KICKPLATE	300+	1742	1	8.2
				TOTAL	8.2

SHOP MATERIAL LIST FOR 2 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
246-PART	100X6KICKPLATE	300+	1742	2	16.4
				TOTAL	16.4

THIS MEMBER TO BE HOT DIPPED GALVANISED.

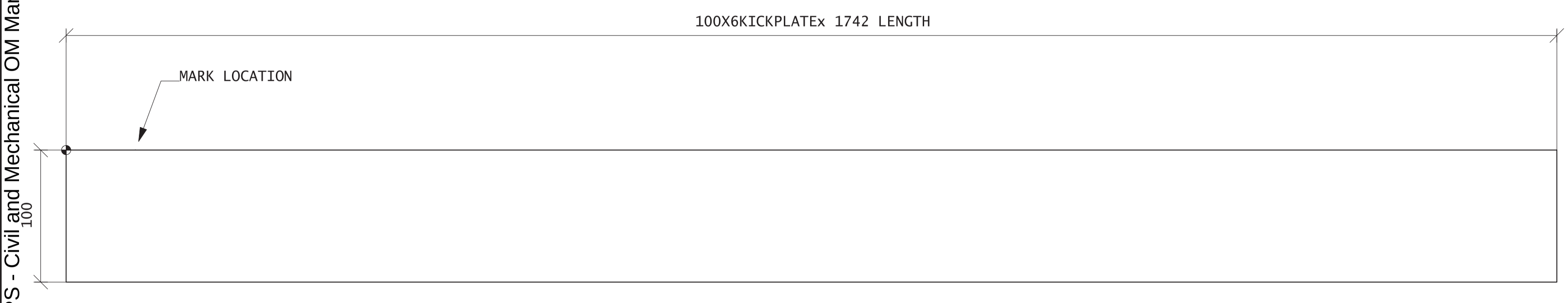
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



2 REQ'D AS DRN MARKED 246-PART

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 8.2 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 246-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
247-PART	100X6KICKPLATE	300+	3007	1	14.2
				TOTAL	14.2

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

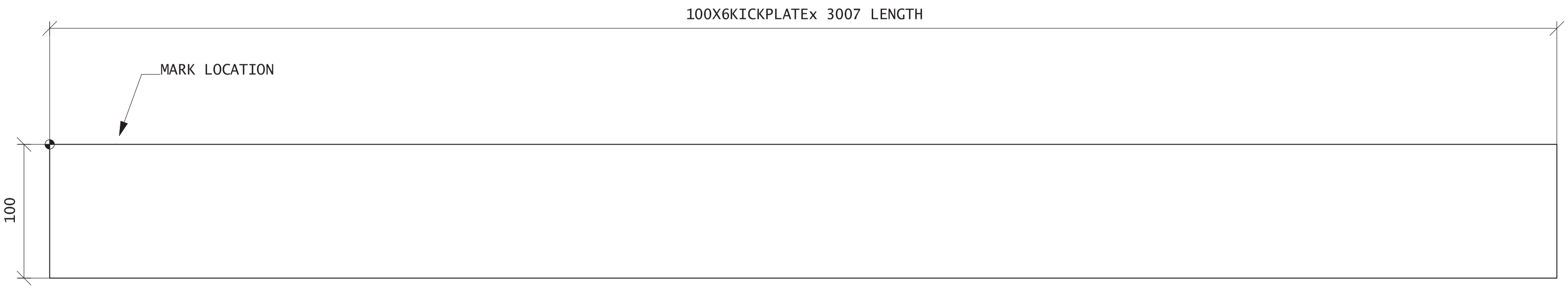
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 247-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 14.2 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 247-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
248-PART	33.7CHSMIDRAIL	300+	1300	1	3.1
				TOTAL	3.1

SHOP MATERIAL LIST FOR 2 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
248-PART	33.7CHSMIDRAIL	300+	1300	2	6.2
				TOTAL	6.2

THIS MEMBER TO BE HOT DIPPED GALVANISED.

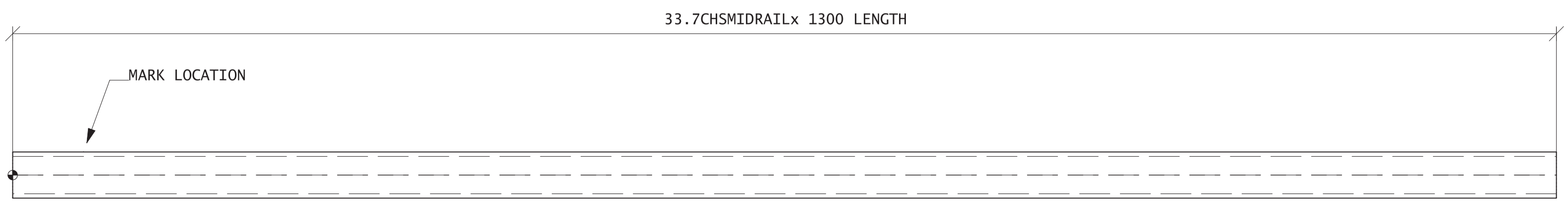
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



2 REQ'D AS DRN MARKED 248-PART
PHASE SP034UPPER(2)
FINISH SP034HDG(2)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES
BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
STEEL GRADE 300+
TOTAL WEIGHT 3.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL
JOB No. 1112-018 | SCALE. NTS | DRG No. 248-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
250-PART	33.7CHSMIDRAIL	300+	2565	1	6.1
				TOTAL	6.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

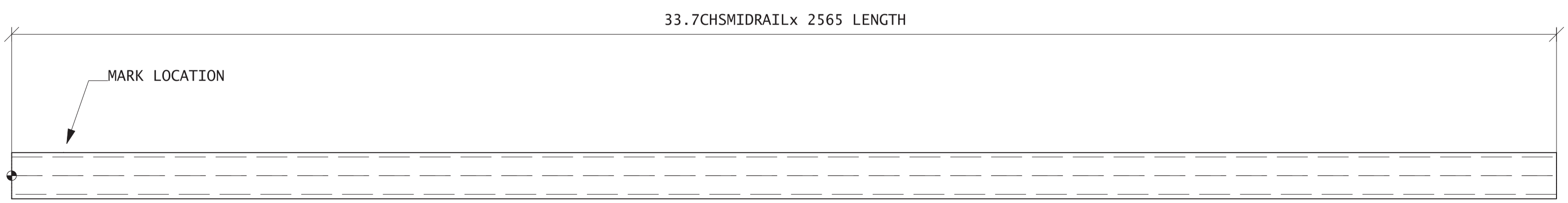
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

1 REQ'D AS DRN MARKED 250-PART
PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 6.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 250-PART | REV. A

STRUCAD

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
251-PART	42.4CHSTOPRAIL	300+	3007	1	9.1
				TOTAL	9.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

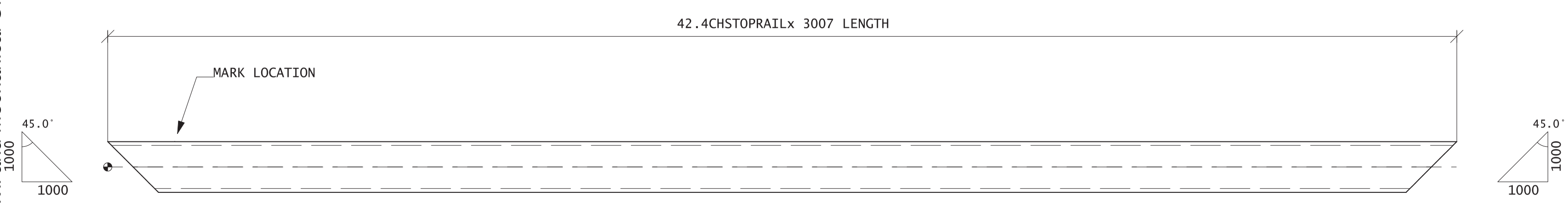
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 251-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 9.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 251-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
253-PART	42.4CHSTOPRAIL	300+	3985	1	12.1
				TOTAL	12.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

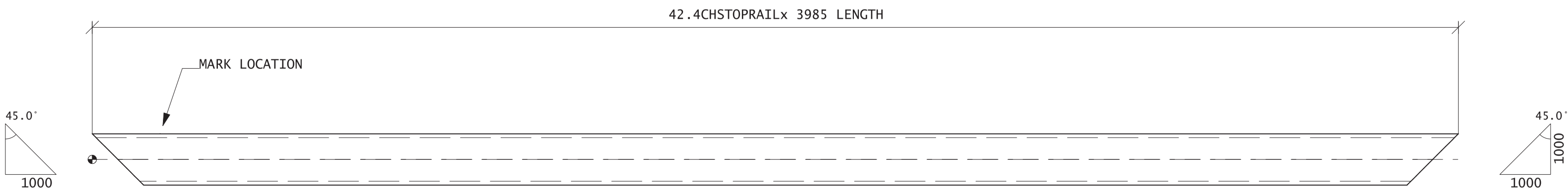
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQ'D AS DRN MARKED 253-PART
PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 12.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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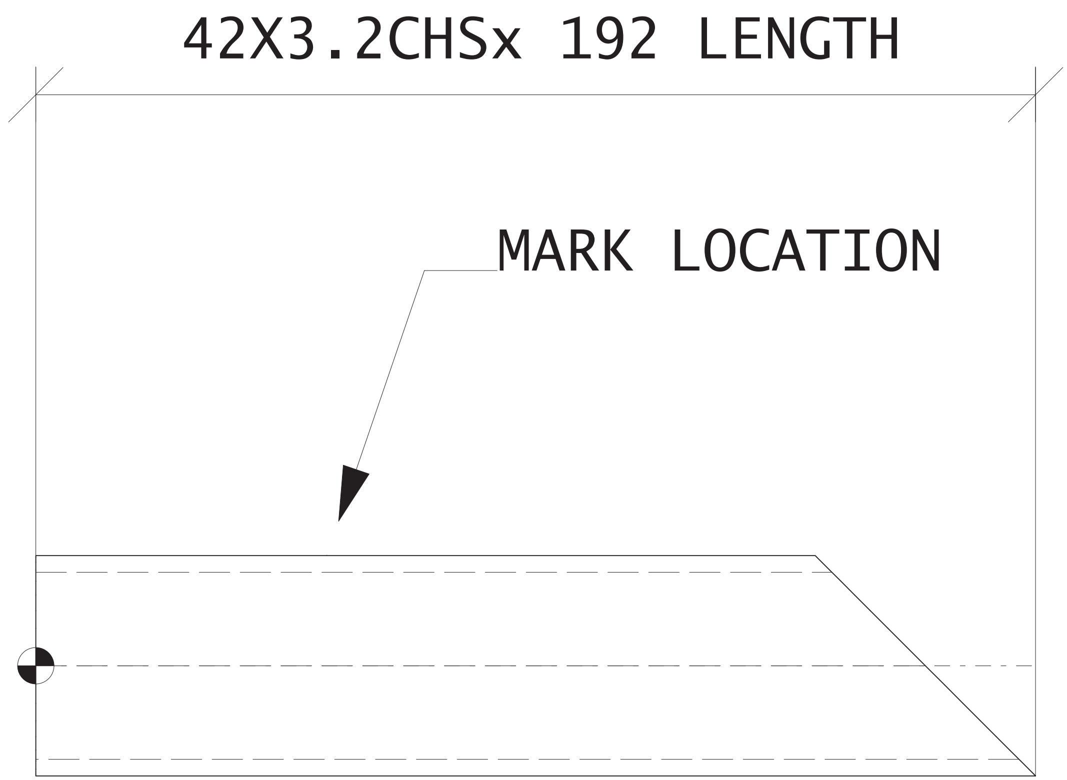
DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 253-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
254-PART	42X3.2CHS	300+	192	1	0.5
				TOTAL	0.5

SHOP MATERIAL LIST FOR 2 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
254-PART	42X3.2CHS	300+	192	2	1.1
				TOTAL	1.1



THIS MEMBER TO BE HOT DIPPED GALVANISED.

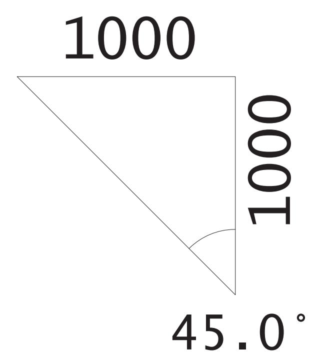
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

2 REQ'D AS DRN MARKED 254-PART
PHASE SP034UPPER(2)
FINISH SP034HDG(2)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 0.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING
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FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 254-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
255-PART	42X3.2CHS	300+	2581	1	7.8
				TOTAL	7.8

SHOP MATERIAL LIST FOR 2 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
255-PART	42X3.2CHS	300+	2581	2	15.7
				TOTAL	15.7

THIS MEMBER TO BE HOT DIPPED GALVANISED.

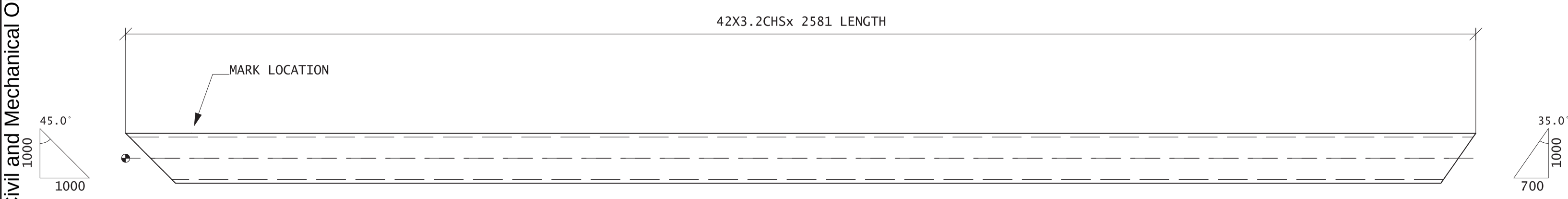
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



2 REQ'D AS DRN MARKED 255-PART

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 7.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
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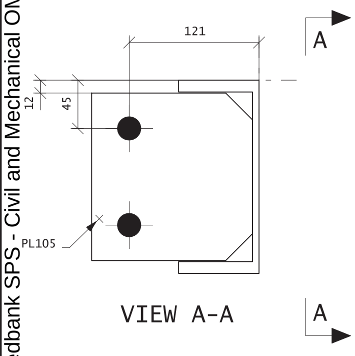
DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

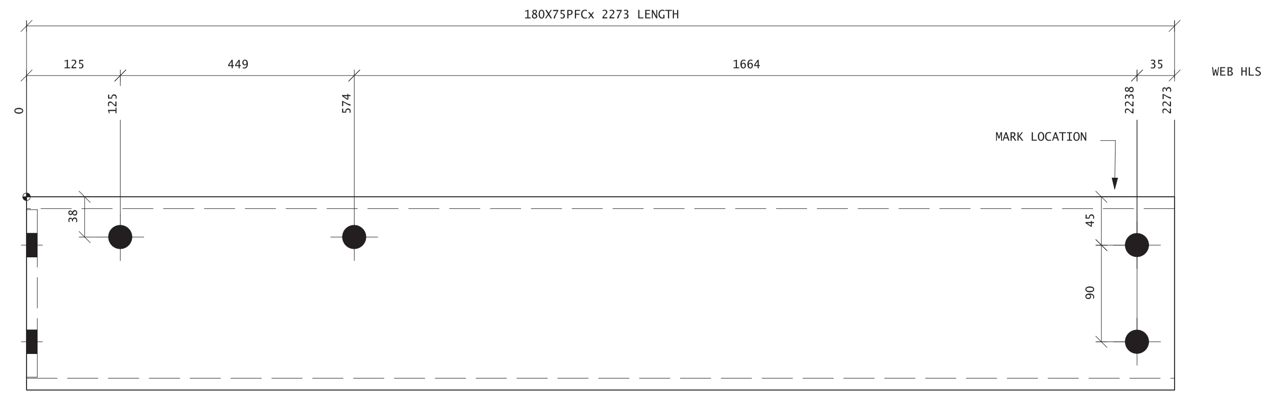
JOB No. 1112-018 | SCALE. NTS | DRG No. 255-PART | REV.

STRUCAD

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
256-PART	180X75PFC	300+	2272	1	47.4
PL105	150X10FL	300+	156	1	1.8
				TOTAL	49.2



VIEW A-A



THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

1 REQ'D AS DRN MARKED 256-PART
PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 49.2 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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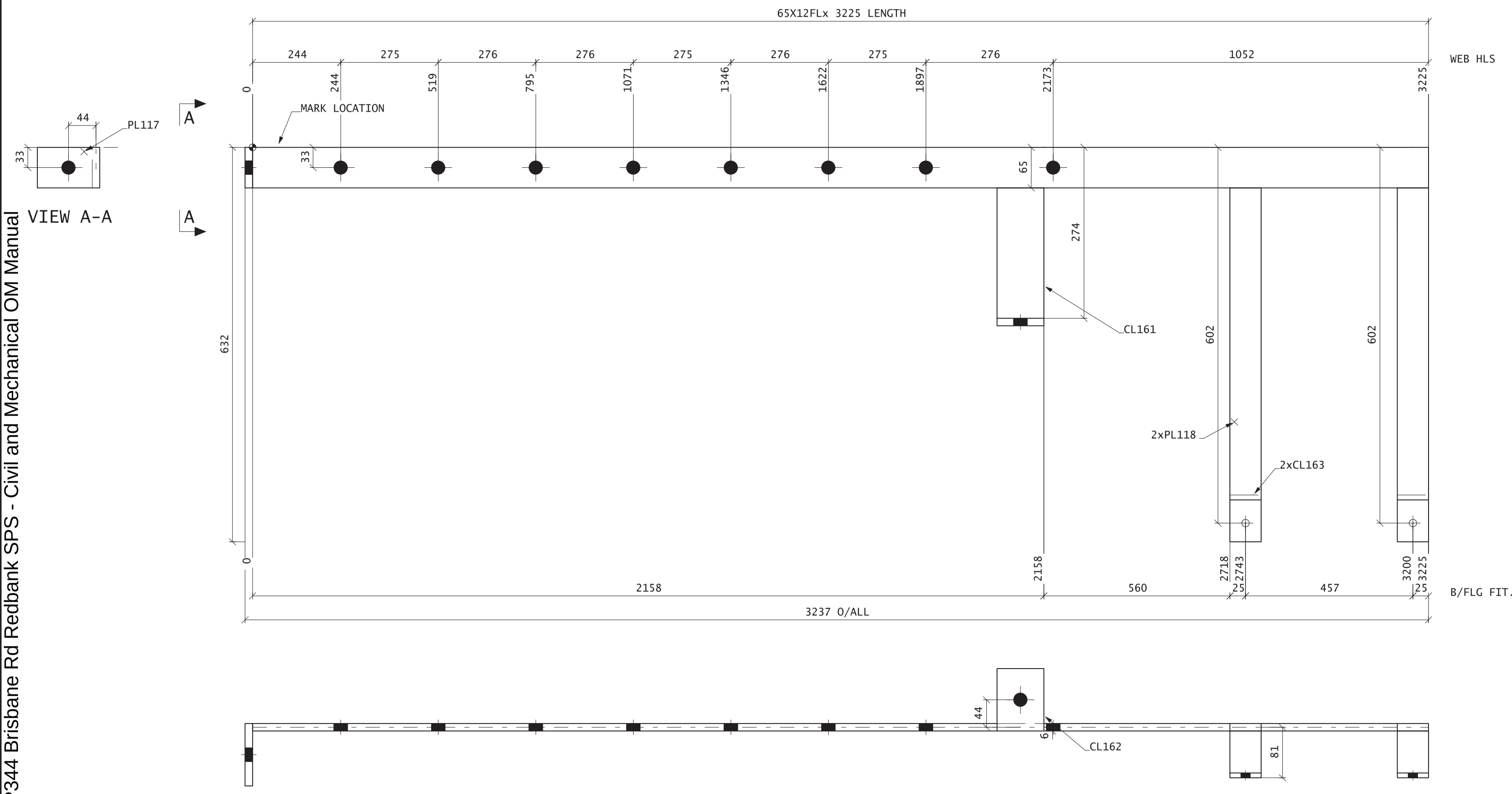
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS DATE. 13/10/12 ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 SCALE. NTS DRG No. 256-PART REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
258-PART	65X12FL	300+	3225	1	19.7
CL161	75X12FL	300+	209	1	1.5
CL162	75X12FL	300+	100	1	0.7
CL163	75X8EA	300+	50	2	0.9
PL117	65X12FL	300+	100	1	0.6
PL118	50X12FL	300+	500	2	4.7
				TOTAL	28.1



THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

1 REQ'D AS DRN MARKED 258-PART
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 28.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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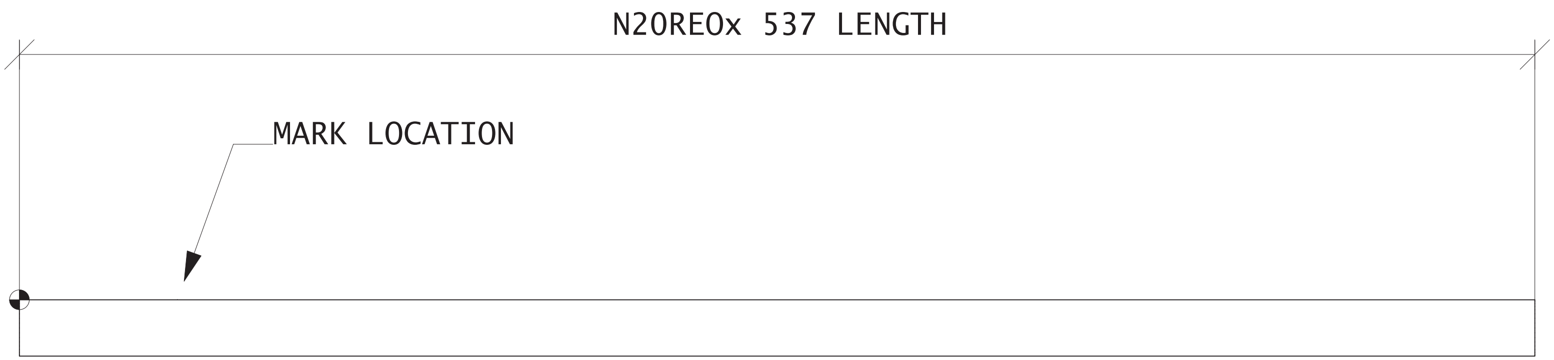
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS DATE. 13/10/12 ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL
JOB No. 1112-018 SCALE. NTS DRG No. 258-PART REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
259-PART	N20REO	300+	537	1	1.3
				TOTAL	1.3

SHOP MATERIAL LIST FOR 8 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
259-PART	N20REO	300+	537	8	10.5
				TOTAL	10.5

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

8 REQ'D AS DRN MARKED 259-PART
PHASE SP034UPPER(8)
FINISH SP034HDG(8)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 1.3 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 259-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
260-PART	33.7CHSMIDRAIL	300+	3532	1	8.5
				TOTAL	8.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

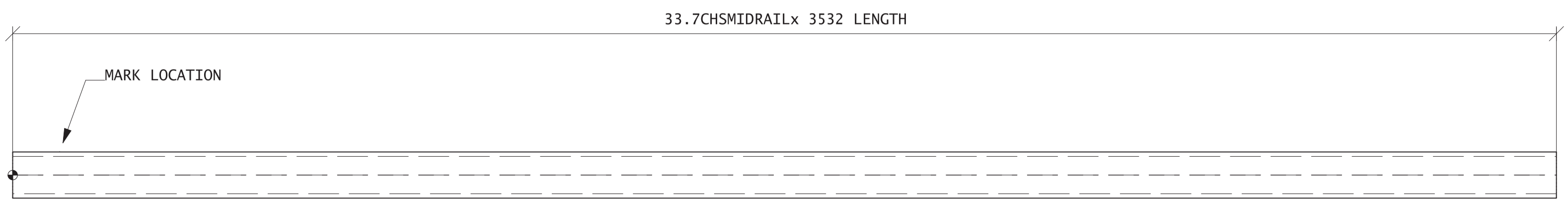
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 260-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 8.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 260-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
261-PART	65X12FL	300+	3225	1	19.7
CL161	75X12FL	300+	209	1	1.5
CL162	75X12FL	300+	100	1	0.7
PL117	65X12FL	300+	100	1	0.6
				TOTAL	22.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

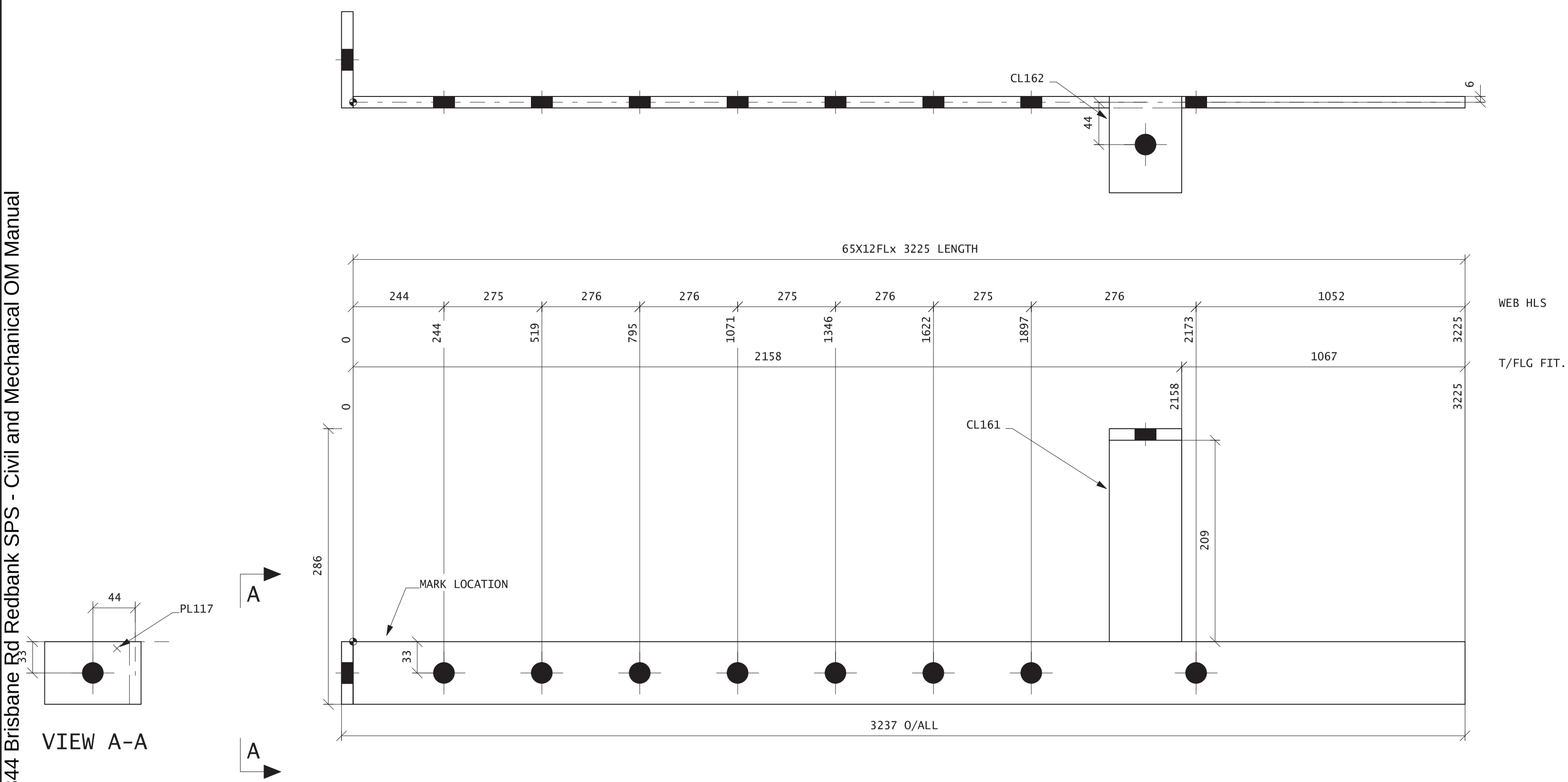
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 261-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 22.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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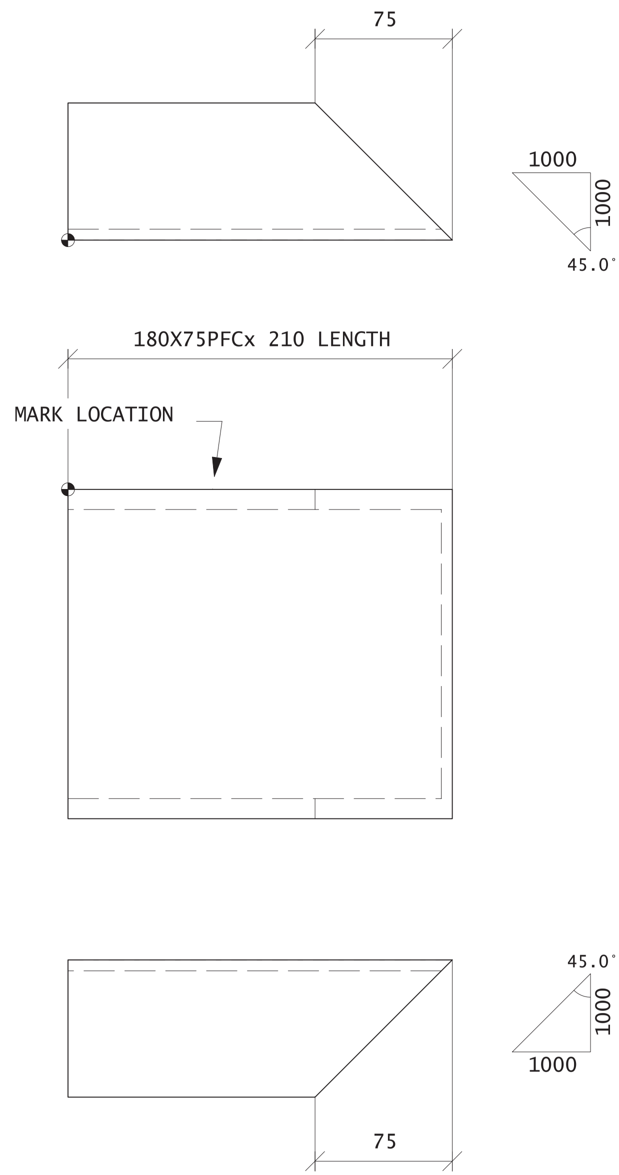
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 261-PART | REV.

STRUCA



1 REQ'D AS DRN MARKED 262-PART
PHASE SP034UPPER
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
262-PART	180X75PFC	300+	210	1	3.9
				TOTAL	3.9

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 3.9 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
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EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 262-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
263-PART	100X6KICKPLATE	300+	3985	1	18.8
				TOTAL	18.8

THIS MEMBER TO BE HOT DIPPED GALVANISED.

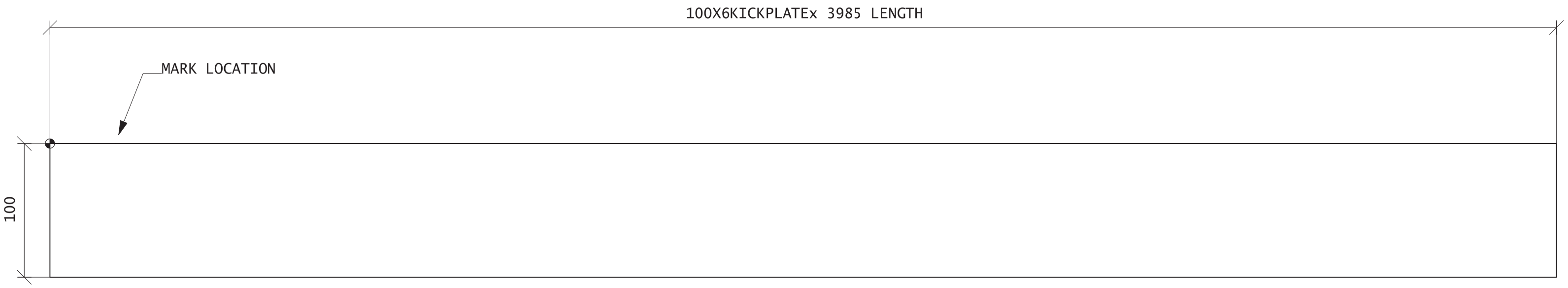
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 263-PART
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 18.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 263-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
266-PART	42.4CHSTOPRAIL	300+	735	1	2.1
				TOTAL	2.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

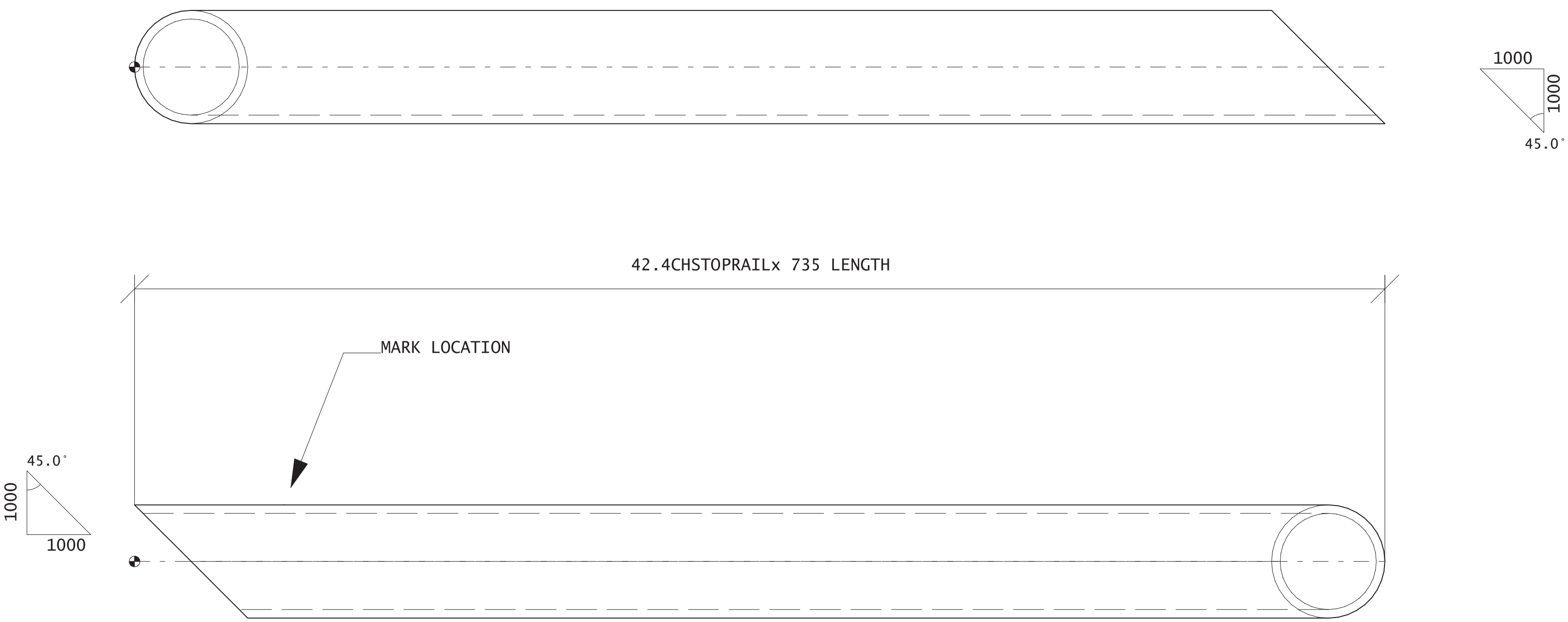
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 266-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 2.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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FAX - 07 4613 4716
MOB - 0411 574 591
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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 266-PART | REV.

STRUCAD

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
270-PART	33.7CHSMIDRAIL	300+	509	1	1.2
				TOTAL	1.2

THIS MEMBER TO BE HOT DIPPED GALVANISED.

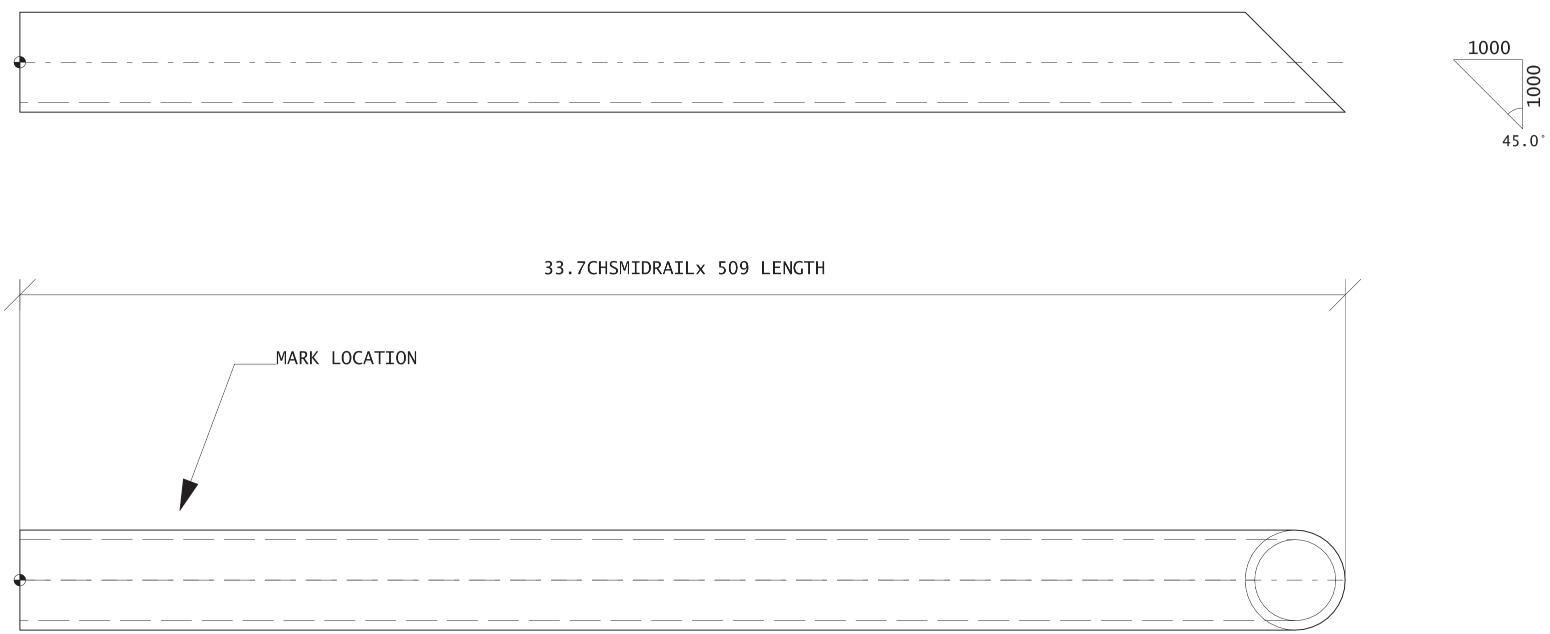
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 270-PART
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 1.2 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 270-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
271-PART	100X6KICKPLATE	300+	684	1	3.2
				TOTAL	3.2

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

1 REQ'D AS DRN MARKED 271-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 3.2 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

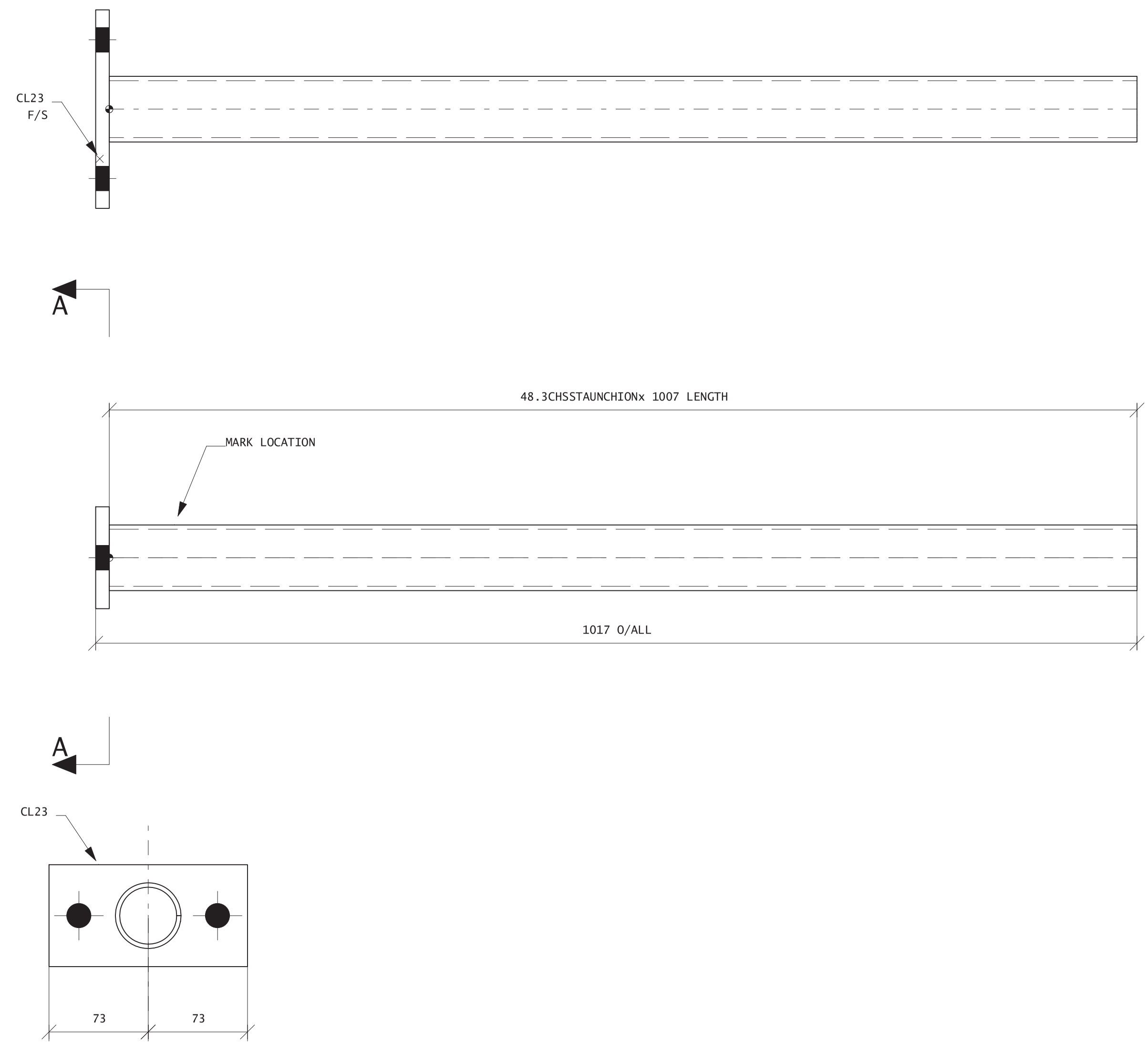
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 271-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
272-PART	48.3CHSSTAUNCHION	300+	1007	1	3.6
CL23	STANDARBP	300+	146	1	0.9
				TOTAL	4.4



SECTION A - A

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

1 REQ'D AS DRN MARKED 272-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCA

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 4.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 272-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
273-PART	42.4CHSTOPRAIL	300+	592	1	1.7
				TOTAL	1.7

THIS MEMBER TO BE HOT DIPPED GALVANISED.

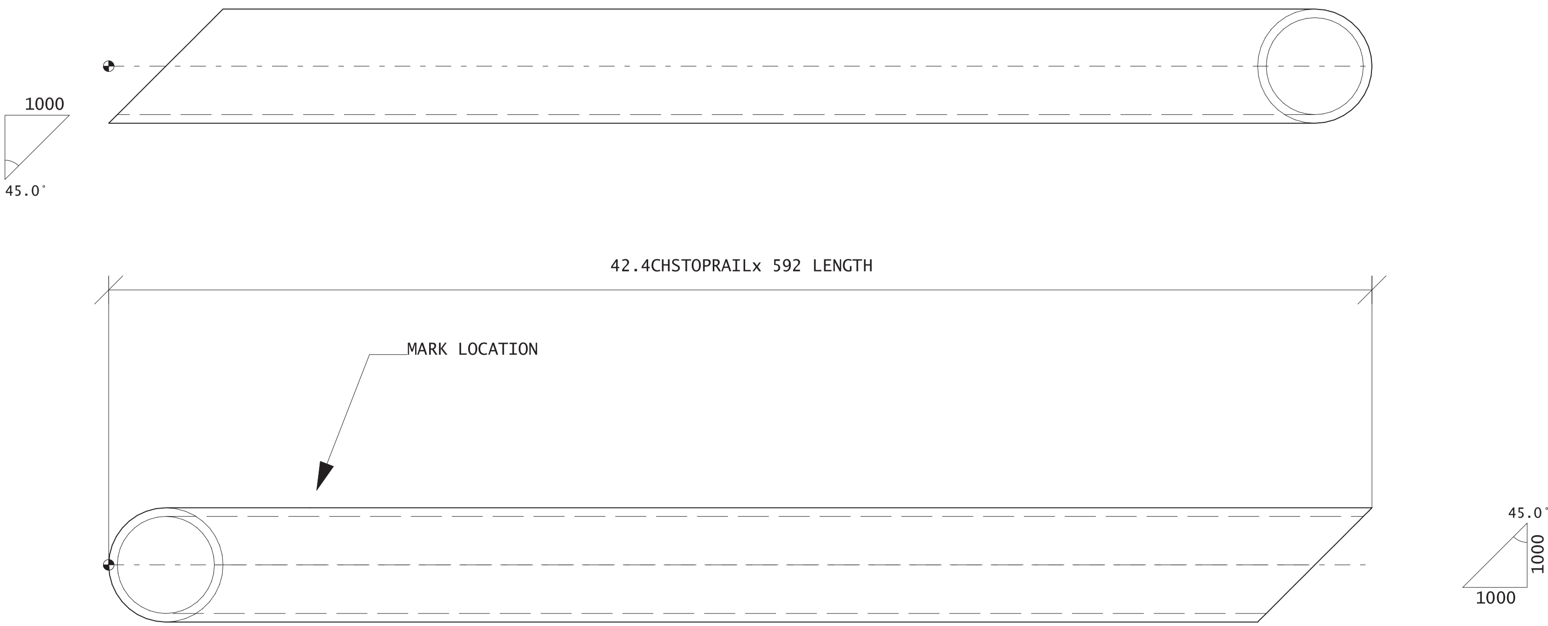
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 273-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 1.7 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 273-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
274-PART	33.7CHSMIDRAIL	300+	366	1	0.8
				TOTAL	0.8

THIS MEMBER TO BE HOT DIPPED GALVANISED.

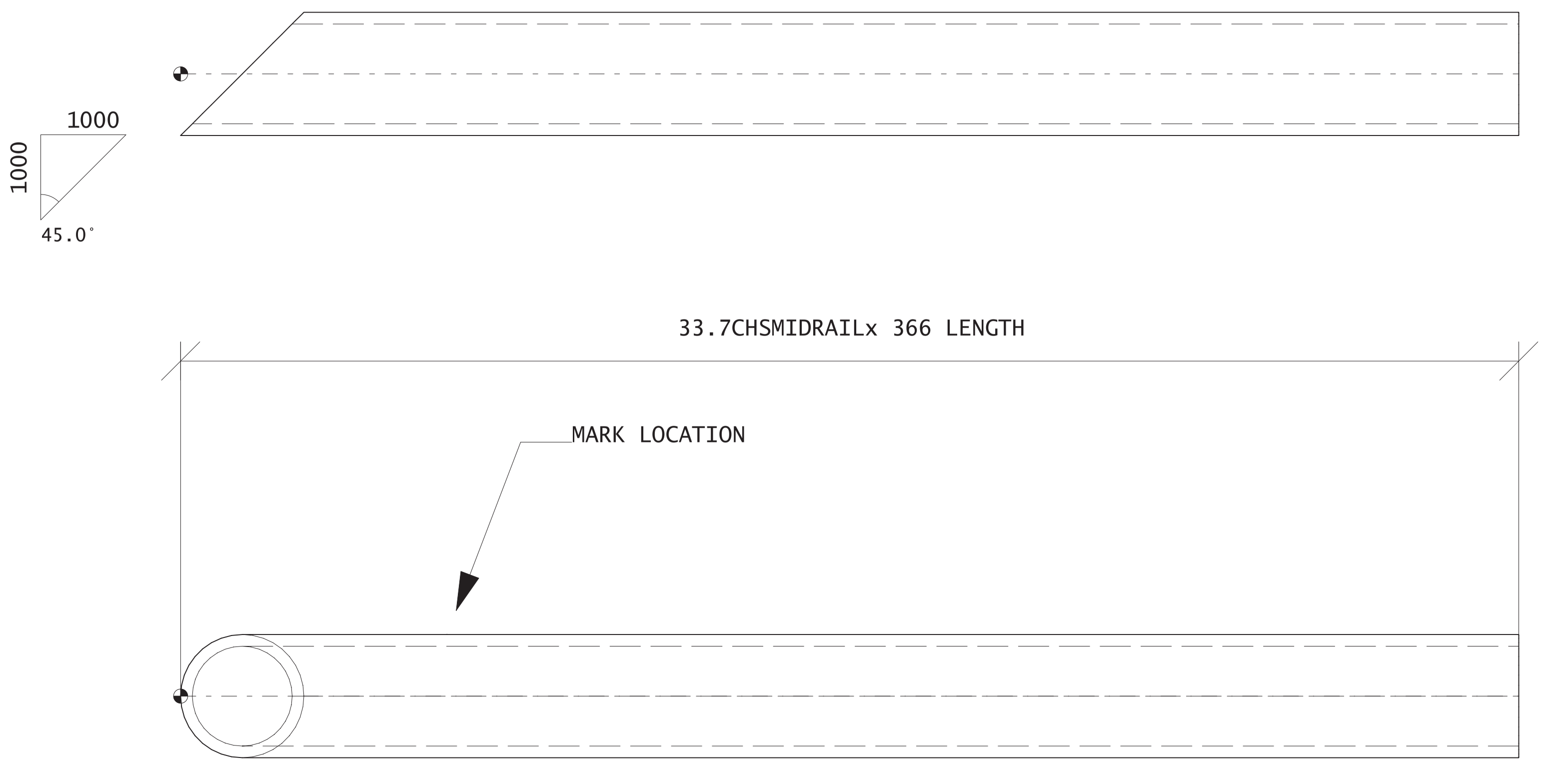
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 274-PART
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES
BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
STEEL GRADE 300+
TOTAL WEIGHT 0.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL
JOB No. 1112-018 | SCALE. NTS | DRG No. 274-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
275-PART	100X6KICKPLATE	300+	525	1	2.5
				TOTAL	2.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

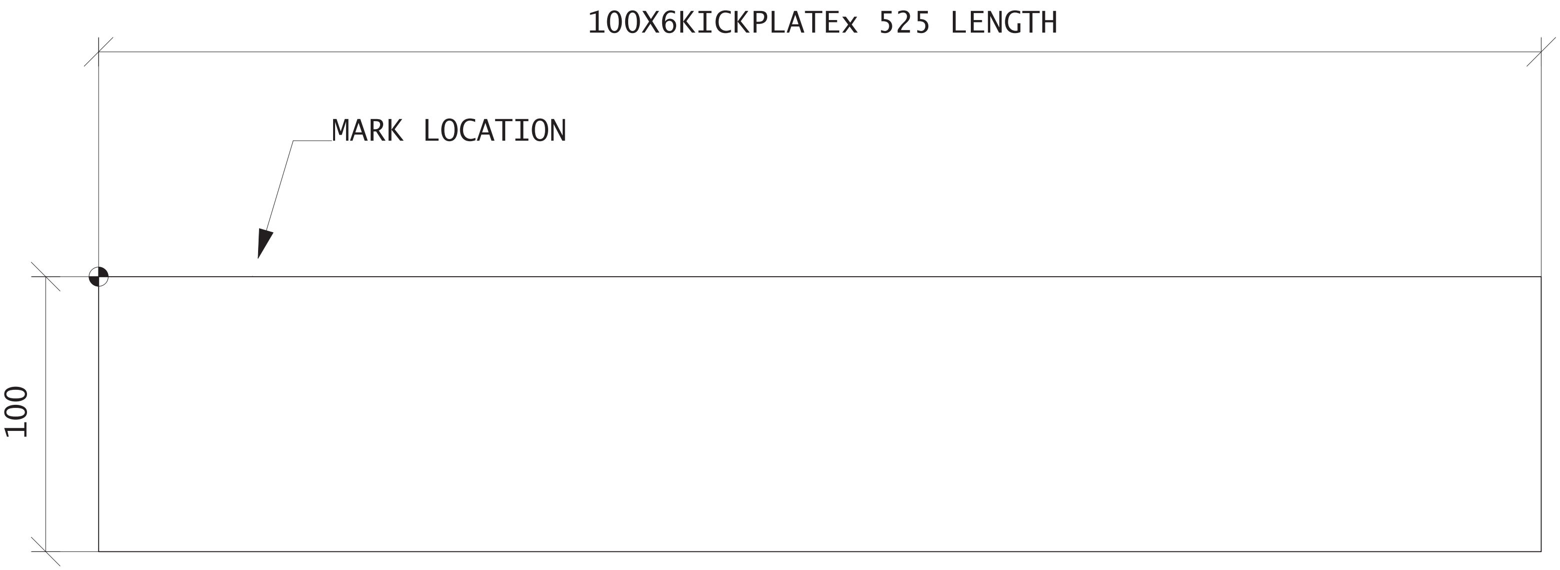
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 275-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 2.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

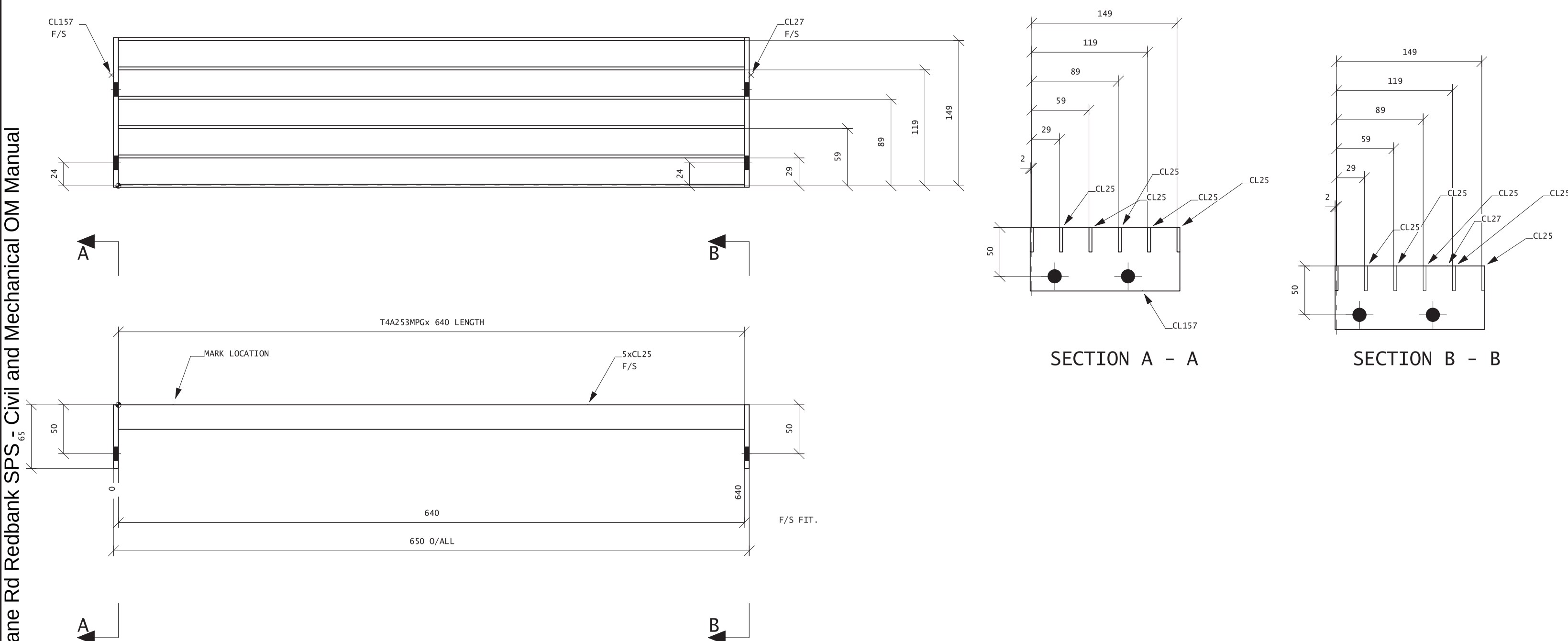
PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 275-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
33T01	T4A253MPG	300+	640	1	0.4
CL25	T4A253MPG	300+	640	5	1.9
CL27	TREADEND	300+	153	1	0.4
CL157	TREADEND	300+	153	1	0.4
				TOTAL	3.0

SHOP MATERIAL LIST FOR 11 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
33T01	T4A253MPG	300+	640	11	4.1
CL25	T4A253MPG	300+	640	55	20.7
CL27	TREADEND	300+	153	11	4.3
CL157	TREADEND	300+	153	11	4.3
				TOTAL	33.5



THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

11 REQ'D AS DRN MARKED 33T01
PHASE SP034UPPER(11)
FINISH SP033HDG(11)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 3.0 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 33T01 | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34G01	A253MPG	300+	1074	1	0.6
CL01	A253MPG	300+	993	1	0.6
CL149	A253MPG	300+	1324	18	14.0
CL150	A253MPG	300+	1074	2	1.3
CL151	A253MPG	300+	1580	13	12.1
CL152	A253MPG	300+	90	1	0.1
CL153	A253MPG	300+	540	1	0.3
CL154	A253MPG	300+	363	1	0.2
				TOTAL	29.2

THIS MEMBER TO BE HOT DIPPED GALVANISED.

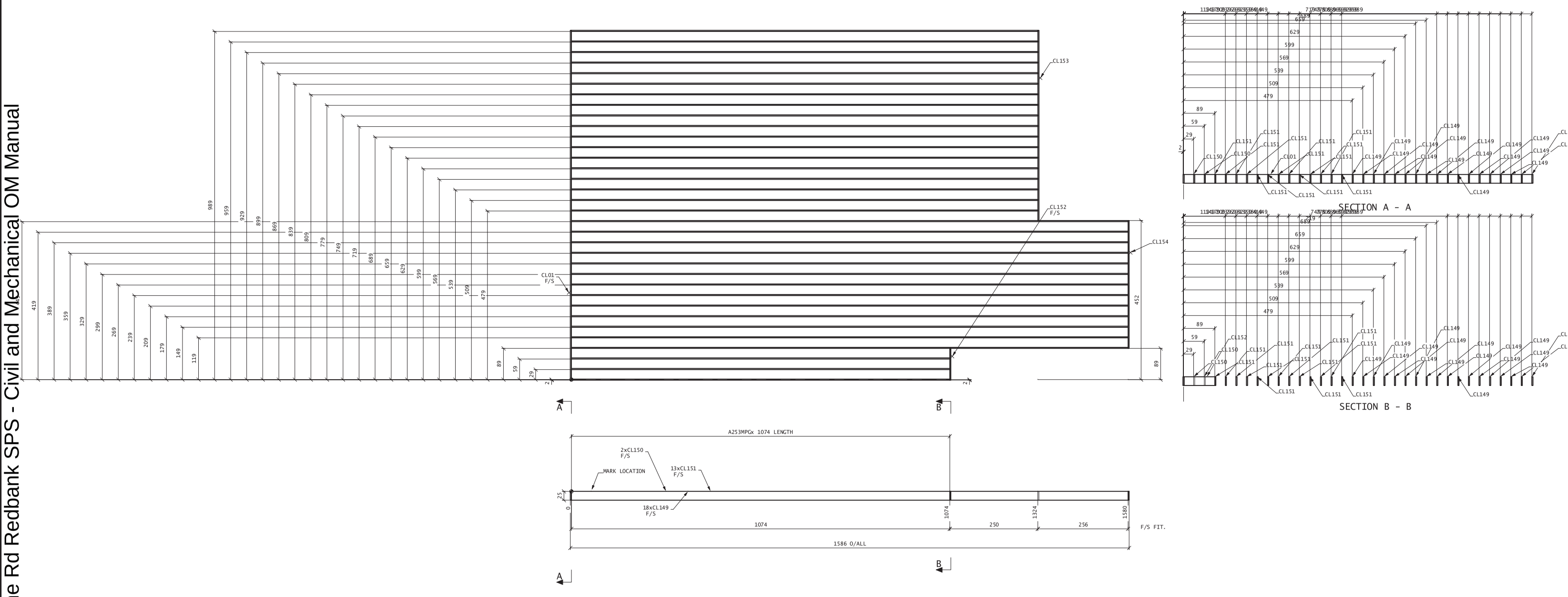
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 34G01

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 29.2 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

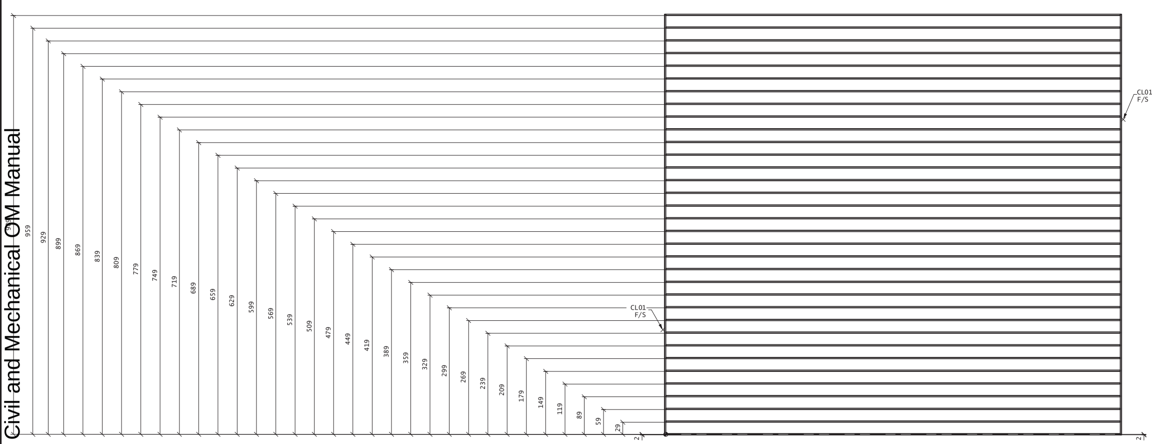
DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

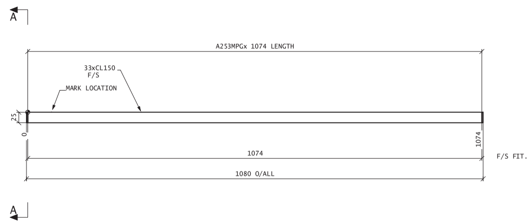
CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

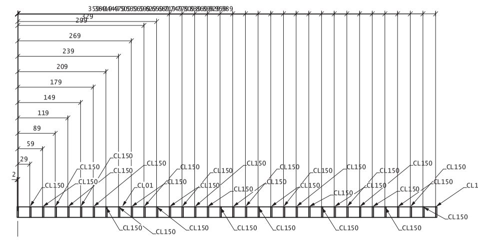
JOB No. 1112-018 | SCALE. NTS | DRG No. 34G01 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34G02	A253MPG	300+	1074	1	0.6
CL01	A253MPG	300+	993	2	1.2
CL150	A253MPG	300+	1074	33	20.9
				TOTAL	22.7

SHOP MATERIAL LIST FOR 3 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34G02	A253MPG	300+	1074	3	1.9
CL01	A253MPG	300+	993	6	3.5
CL150	A253MPG	300+	1074	99	62.6
				TOTAL	68.0







SECTION A - A

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

3 REQ'D AS DRN MARKED 34G02

PHASE SP034UPPER(3)
FINISH SP034HDG(3)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 22.7 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34G02 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34G03	A253MPG	300+	1834	1	1.1
CL01	A253MPG	300+	993	2	1.2
CL155	A253MPG	300+	1834	33	35.6
				TOTAL	37.9

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

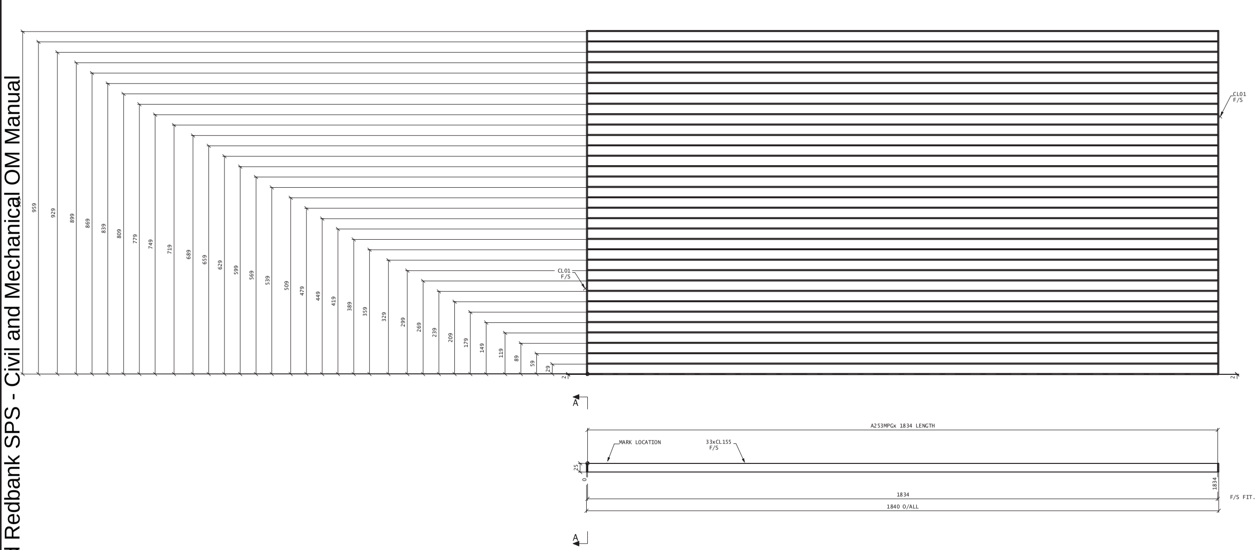
PROVIDE VENT HOLES
FOR DRAINAGE.

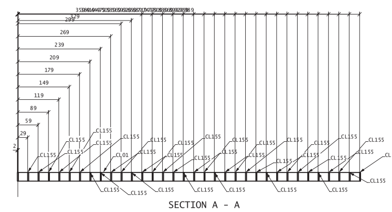
GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.





1 REQ'D AS DRN MARKED 34G03
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 37.9 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

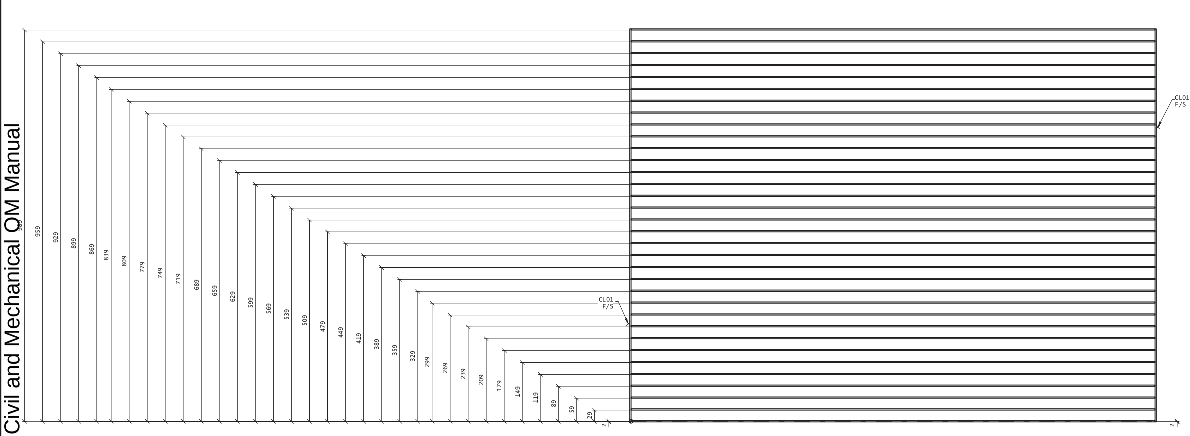
DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

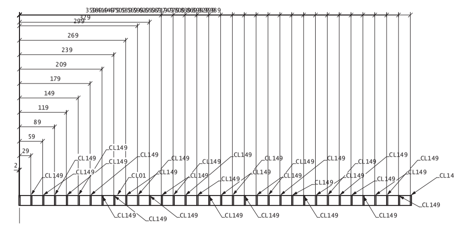
CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34G03 | REV.

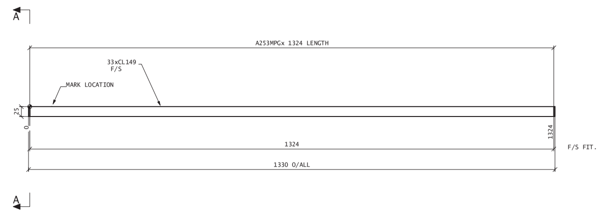
SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34G04	A253MPG	300+	1324	1	0.8
CL01	A253MPG	300+	993	2	1.2
CL149	A253MPG	300+	1324	33	25.7
				TOTAL	27.7

SHOP MATERIAL LIST FOR 4 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34G04	A253MPG	300+	1324	4	3.1
CL01	A253MPG	300+	993	8	4.7
CL149	A253MPG	300+	1324	132	102.9
				TOTAL	110.7





SECTION A - A



THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

4 REQ'D AS DRN MARKED 34G04

PHASE SP034UPPER(4)

FINISH SP034HDG(4)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 27.7 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34G04 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34G05	A253MPG	300+	1834	1	1.1
CL154	A253MPG	300+	363	2	0.4
CL155	A253MPG	300+	1834	12	13.0
				TOTAL	14.5

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

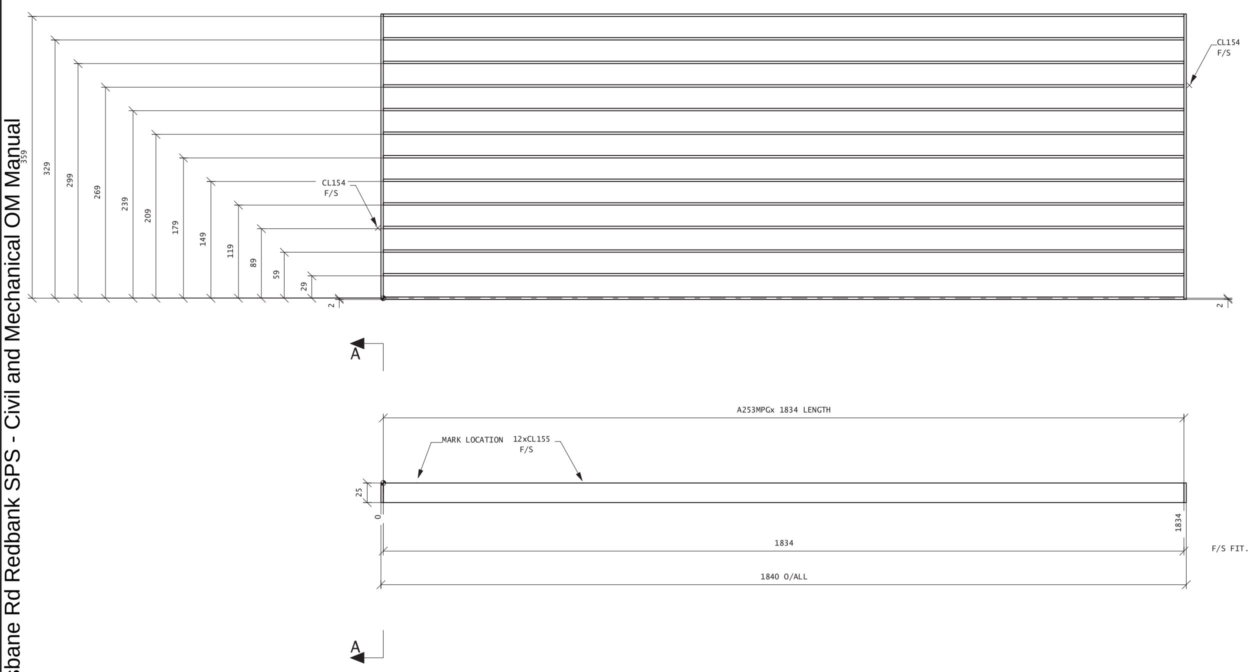
PROVIDE VENT HOLES
FOR DRAINAGE.

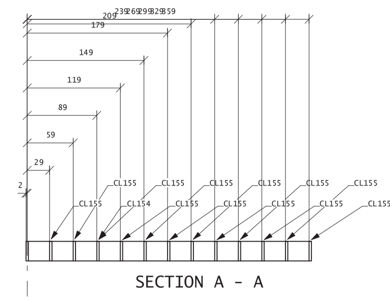
GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.





SECTION A - A

1 REQ'D AS DRN MARKED 34G05

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 14.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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PH - 07 4613 4961
FAX - 07 4613 4716
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EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34G05 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34G06	A253MPG	300+	744	1	0.4
CL01	A253MPG	300+	993	2	1.2
CL156	A253MPG	300+	744	33	14.5
				TOTAL	16.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

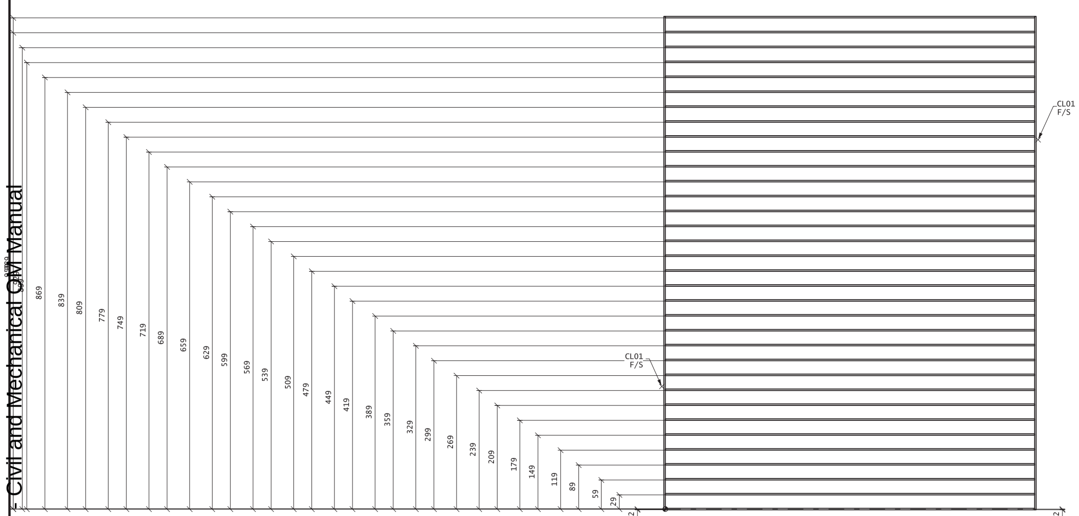
PROVIDE VENT HOLES FOR DRAINAGE.

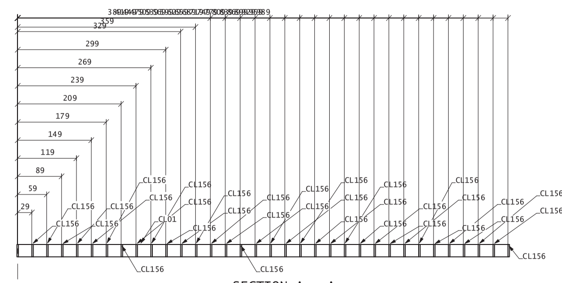
GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

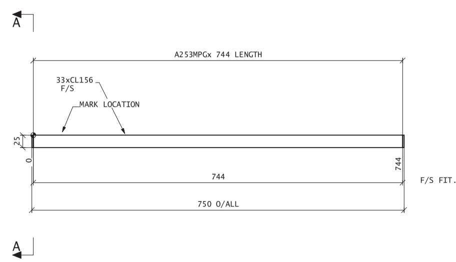
HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.





SECTION A - A



1 REQ'D AS DRN MARKED 34G06

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 16.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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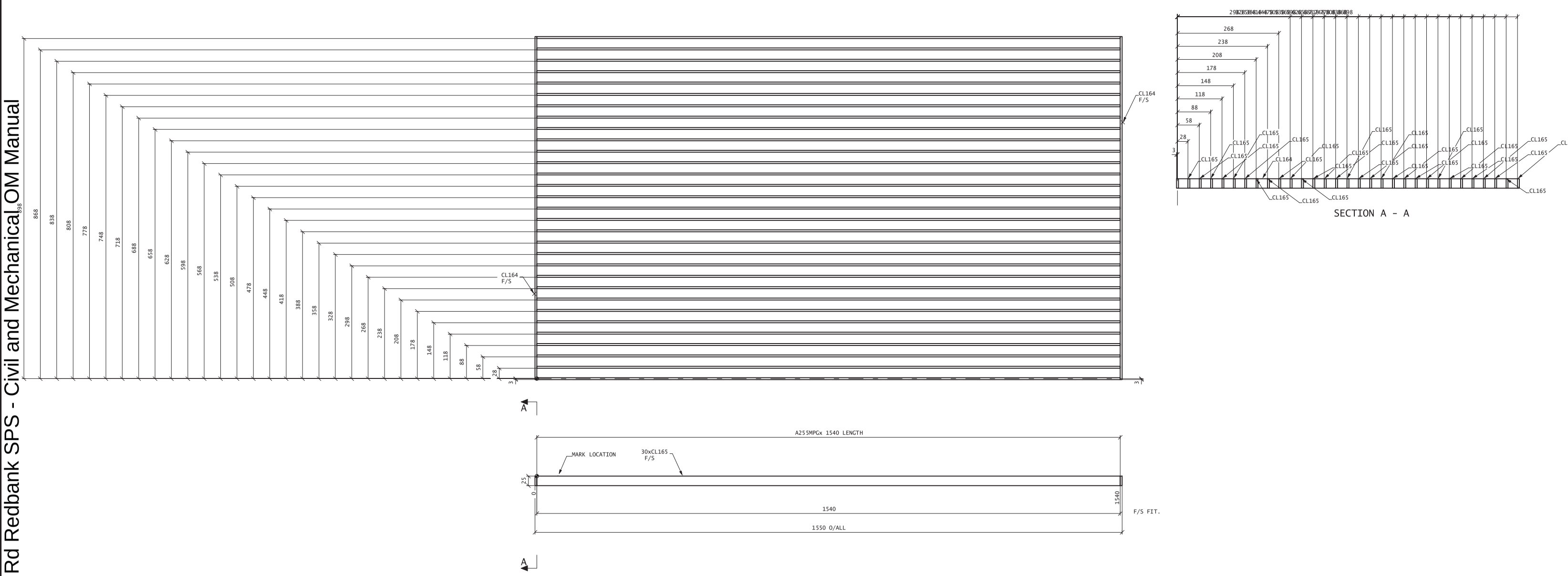
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34G06 | REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34G07	A255MPG	300+	1540	1	1.5
CL164	A255MPG	300+	905	2	1.8
CL165	A255MPG	300+	1540	30	45.3
				TOTAL	48.6

SHOP MATERIAL LIST FOR 6 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34G07	A255MPG	300+	1540	6	9.1
CL164	A255MPG	300+	905	12	10.7
CL165	A255MPG	300+	1540	180	272.0
				TOTAL	291.7

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

6 REQ'D AS DRN MARKED 34G07

PHASE SP034UPPER(6)
FINISH SP034HDG(6)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 48.6 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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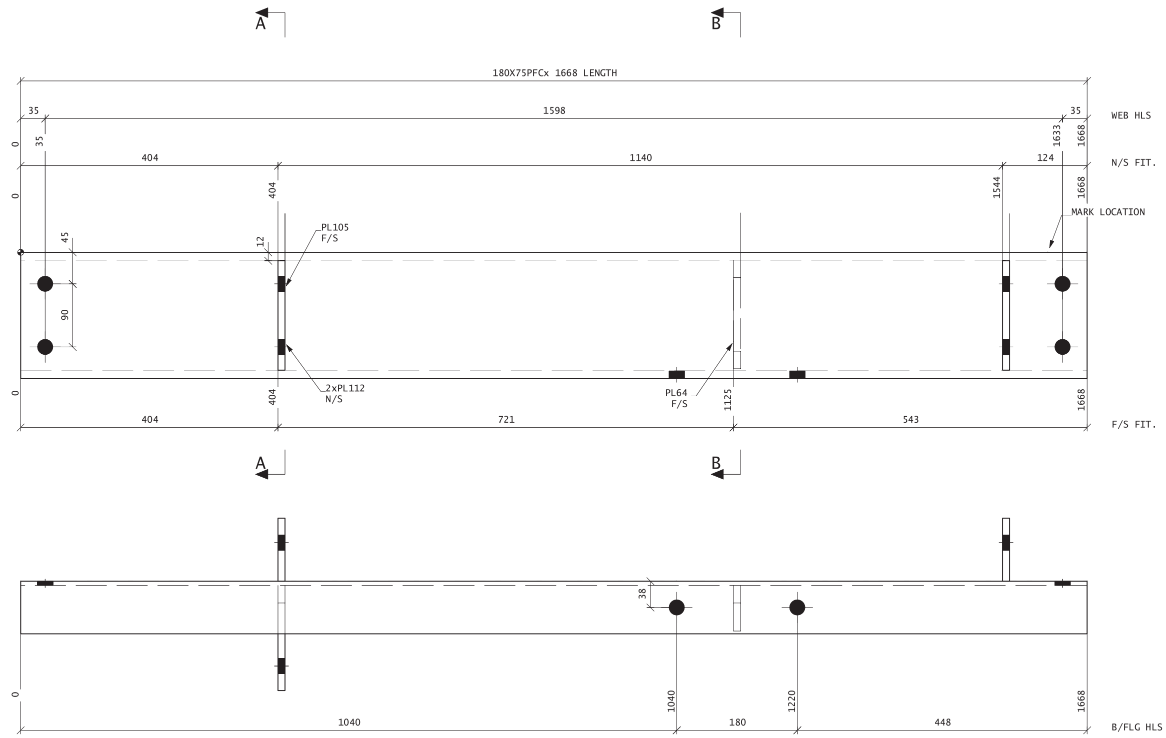
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34G07 | REV. A



SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M01	180X75PFC	300+	1668	1	34.8
PL64	65X10FL	300+	155	1	0.7
PL105	150X10FL	300+	156	1	1.8
PL112	90X10FL	300+	156	2	2.2
				TOTAL	39.6

THIS MEMBER TO BE HOT DIPPED GALVANISED.

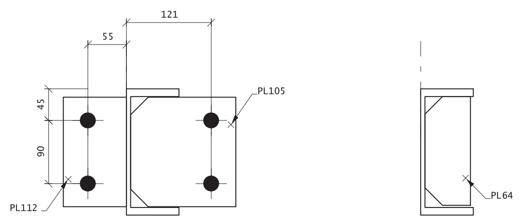
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



SECTION A - A

SECTION B - B

1 REQ'D AS DRN MARKED 34M01

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 39.6 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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FAX - 07 4613 4716
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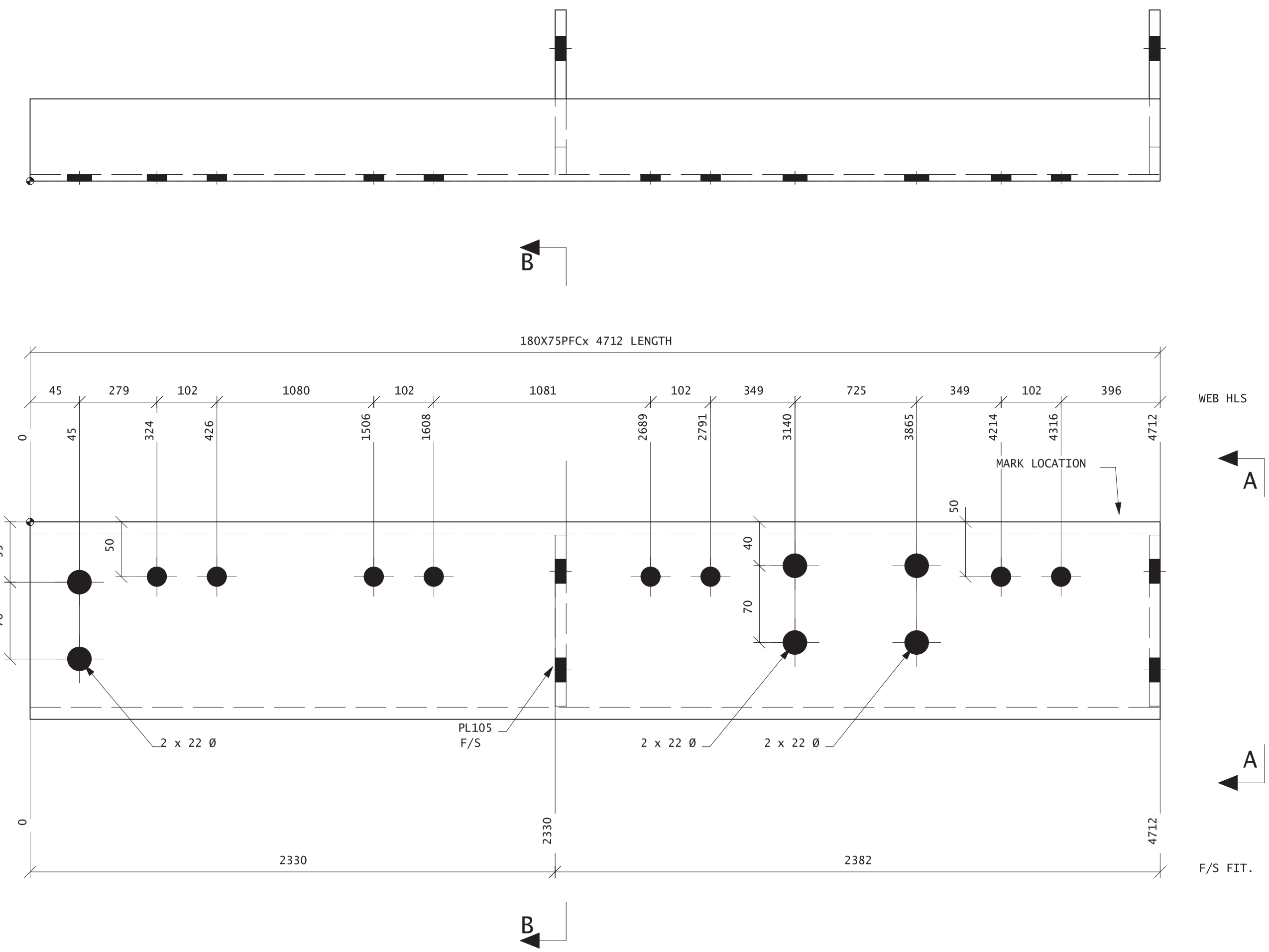
EMAIL - mcs80@bigpond.com

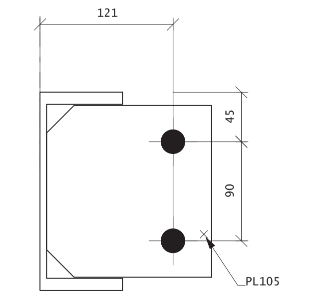
DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

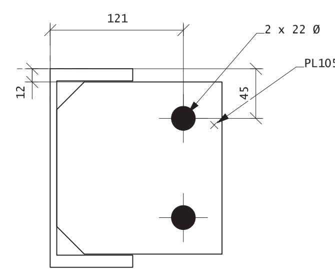
JOB No. 1112-018 | SCALE. NTS | DRG No. 34M01 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M02	180X75PFC	300+	4712	1	98.4
PL105	150X10FL	300+	156	2	3.6
				TOTAL	102.0





SECTION B - B



VIEW A-A

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

1 REQ'D AS DRN MARKED 34M02
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 18 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 102.0 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
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MOB - 0411 574 591
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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARDSON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M02 | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M03	89X3.5SHS	300+	1976	1	18.6
PL106	90X12FL	300+	250	2	4.2
PL107	75X10FL	300+	220	1	1.3
				TOTAL	24.1

SHOP MATERIAL LIST FOR 5 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M03	89X3.5SHS	300+	1976	5	92.8
PL106	90X12FL	300+	250	10	21.2
PL107	75X10FL	300+	220	5	6.5
				TOTAL	120.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

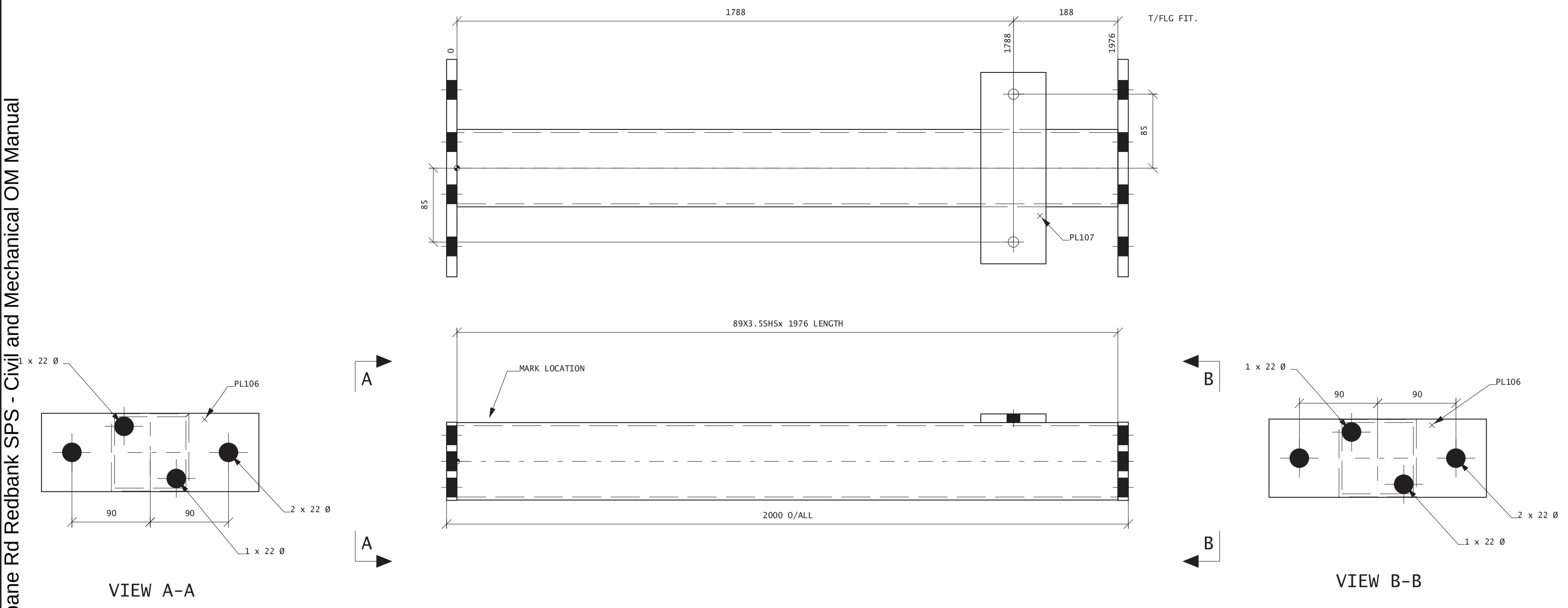
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

5 REQ'D AS DRN MARKED 34M03
PHASE SP034UPPER(5)
FINISH SP034HDG(5)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 24.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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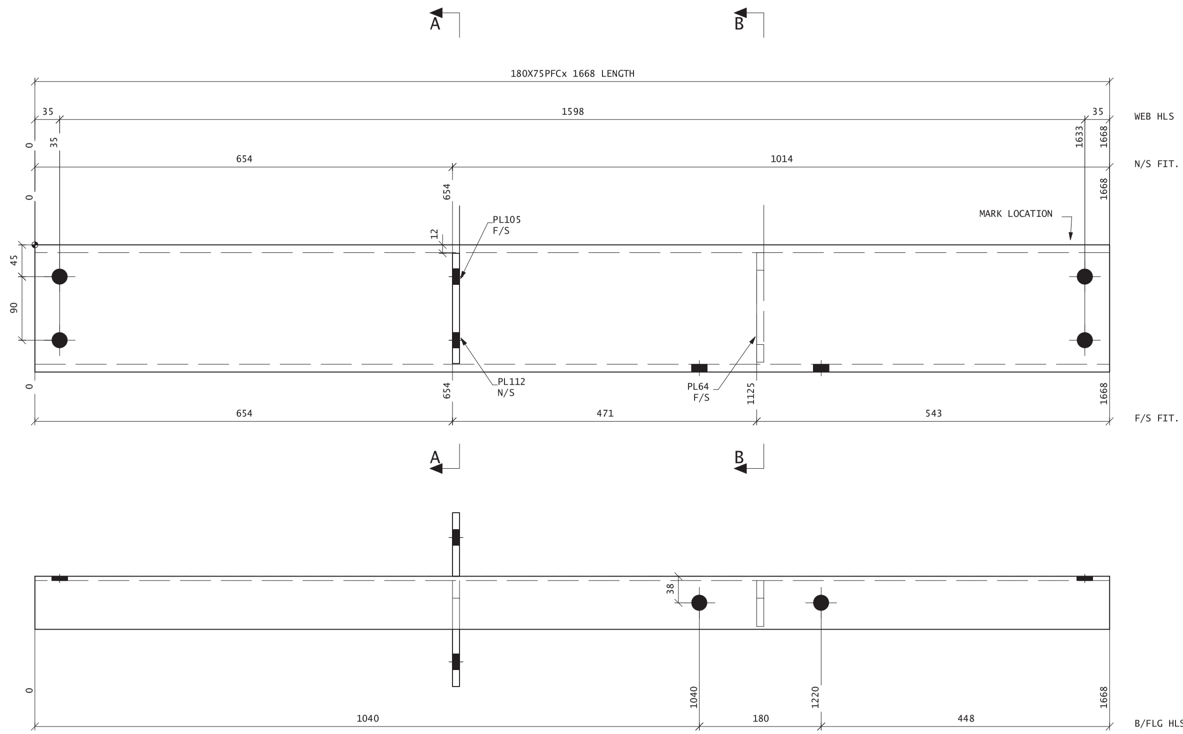
SPECIALIZING IN STRUCTURAL STEEL DETAILING

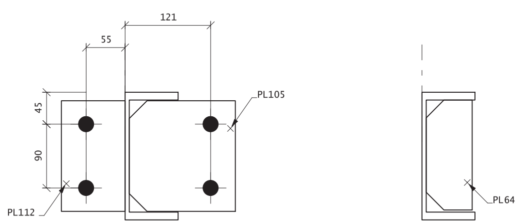
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M03 | REV.





SECTION A - A

SECTION B - B

1 REQ'D AS DRN MARKED 34M04

PHASE SP034UPPER
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M04	180X75PFC	300+	1668	1	34.8
PL64	65X10FL	300+	155	1	0.7
PL105	150X10FL	300+	156	1	1.8
PL112	90X10FL	300+	156	1	1.1
				TOTAL	38.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 38.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

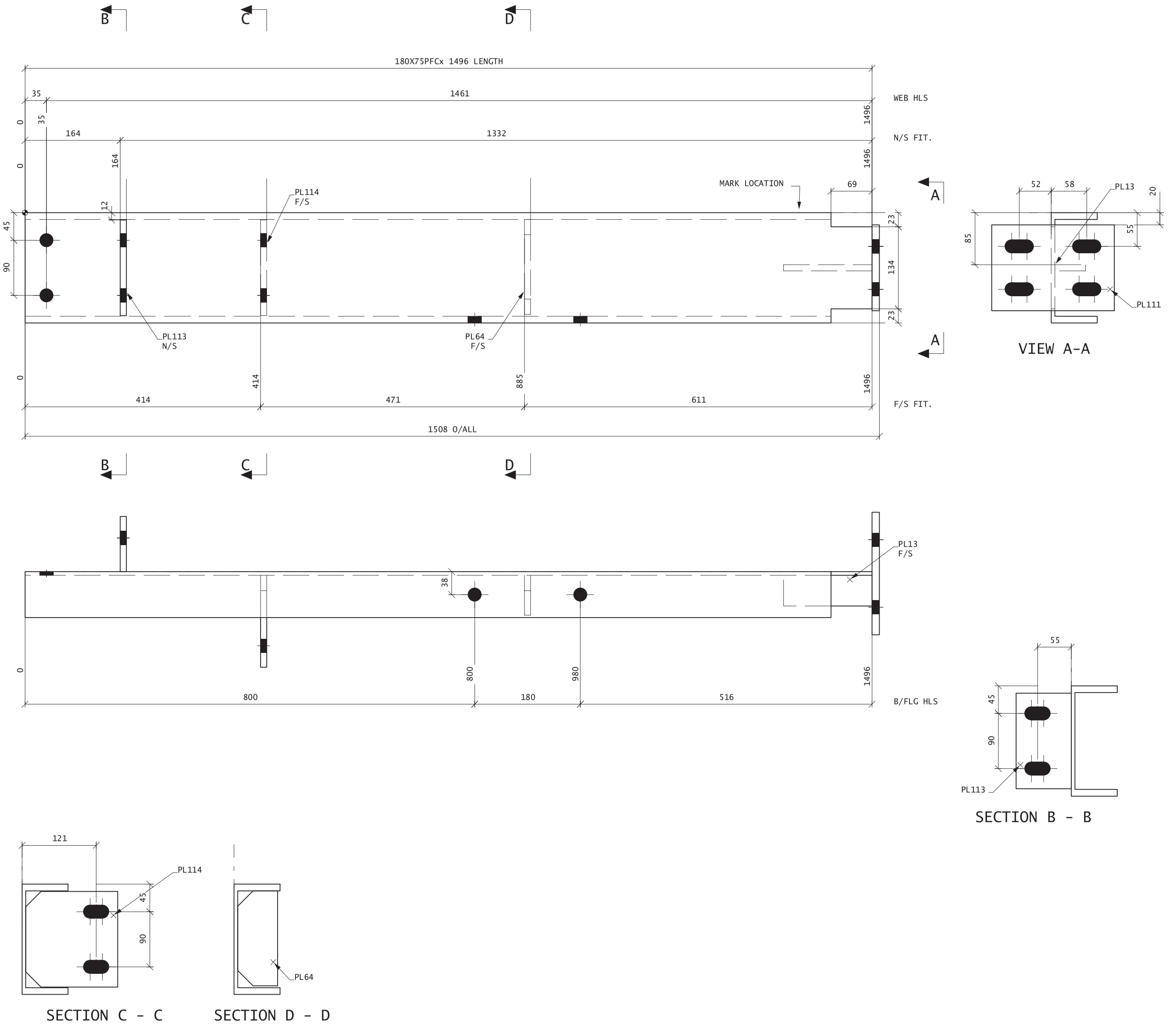
DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M04 | REV.



1 REQ'D AS DRN MARKED 34M05
PHASE SP034UPPER
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M05	180X75PFC	300+	1496	1	30.2
PL13	50X10FL	300+	150	1	0.6
PL64	65X10FL	300+	155	1	0.7
PL111	200X12FL	300+	140	1	2.6
PL113	90X10FL	300+	156	1	1.1
PL114	150X10FL	300+	156	1	1.8
				TOTAL	37.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 37.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M05 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M06	180X75PFC	300+	2176	1	45.4
				TOTAL	45.4

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

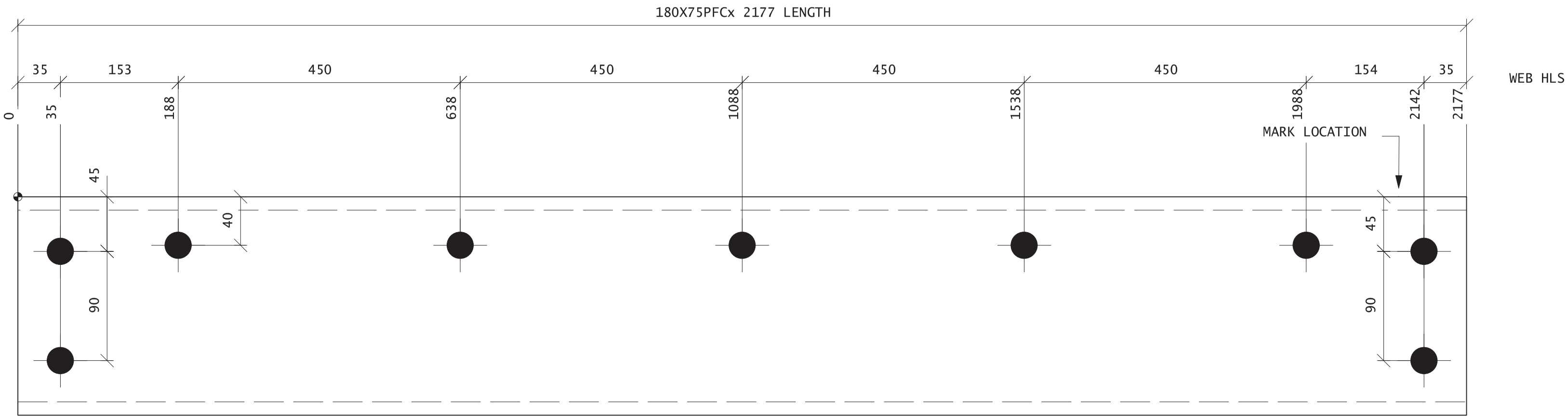
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 34M06

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 45.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M06 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M07	180X75PFC	300+	2302	1	48.1
PL105	150X10FL	300+	156	1	1.8
				TOTAL	49.8

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

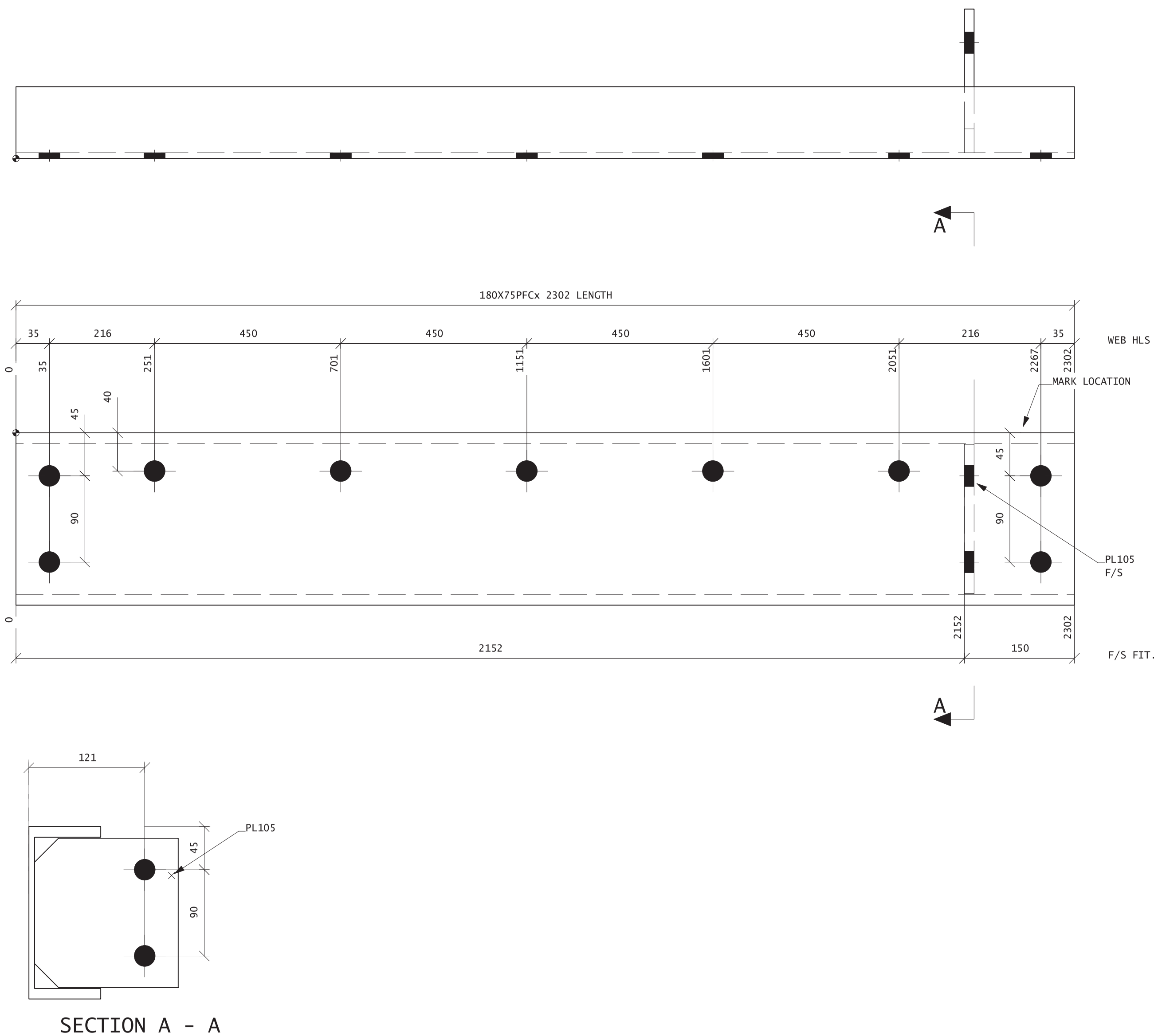
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 34M07
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 49.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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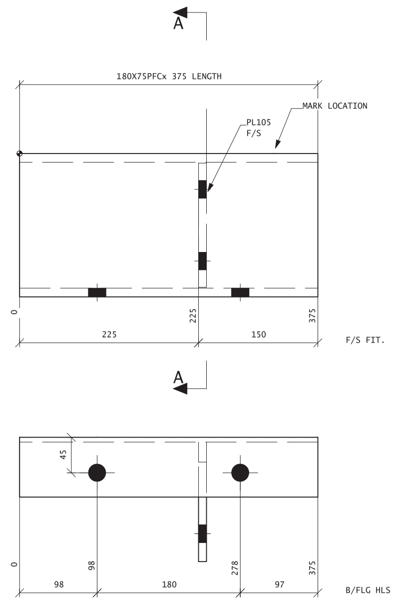
SPECIALIZING IN STRUCTURAL STEEL DETAILING

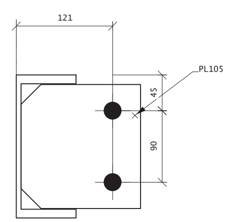
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M07 | REV.





SECTION A - A

1 REQ'D AS DRN MARKED 34M08

PHASE SP034UPPER
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M08	180X75PFC	300+	375	1	7.8
PL105	150X10FL	300+	156	1	1.8
				TOTAL	9.6

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 9.6 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON

PROJECT URBAN UTILITIES PUMP STATIONS

TITLE SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M08 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M09	89X3.5SHS	300+	1976	1	18.6
PL106	90X12FL	300+	250	2	4.2
				TOTAL	22.8

SHOP MATERIAL LIST FOR 3 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M09	89X3.5SHS	300+	1976	3	55.7
PL106	90X12FL	300+	250	6	12.7
				TOTAL	68.4

THIS MEMBER TO BE HOT DIPPED GALVANISED.

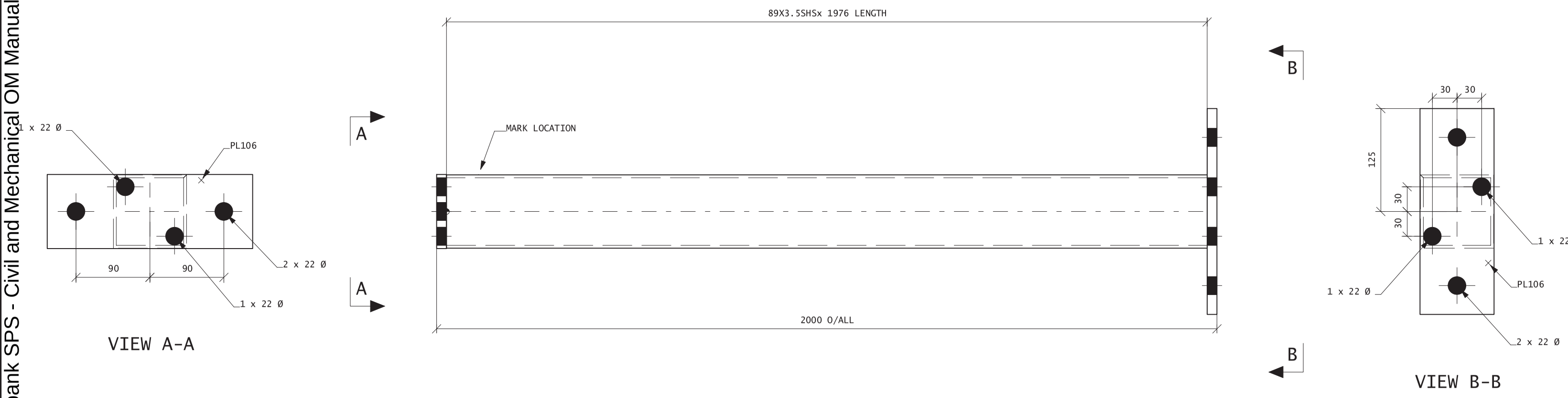
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



3 REQ'D AS DRN MARKED 34M09

PHASE SP034UPPER(3)
FINISH SP034HDG(3)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 22.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M09 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M10	89X3.5SHS	300+	1976	1	18.6
PL108	180X12FL	300+	180	2	4.6
PL109	75X10FL	300+	150	2	1.8
				TOTAL	24.9

SHOP MATERIAL LIST FOR 2 ASSEMBLIES					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M10	89X3.5SHS	300+	1976	2	37.1
PL108	180X12FL	300+	180	4	9.2
PL109	75X10FL	300+	150	4	3.5
				TOTAL	49.8

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

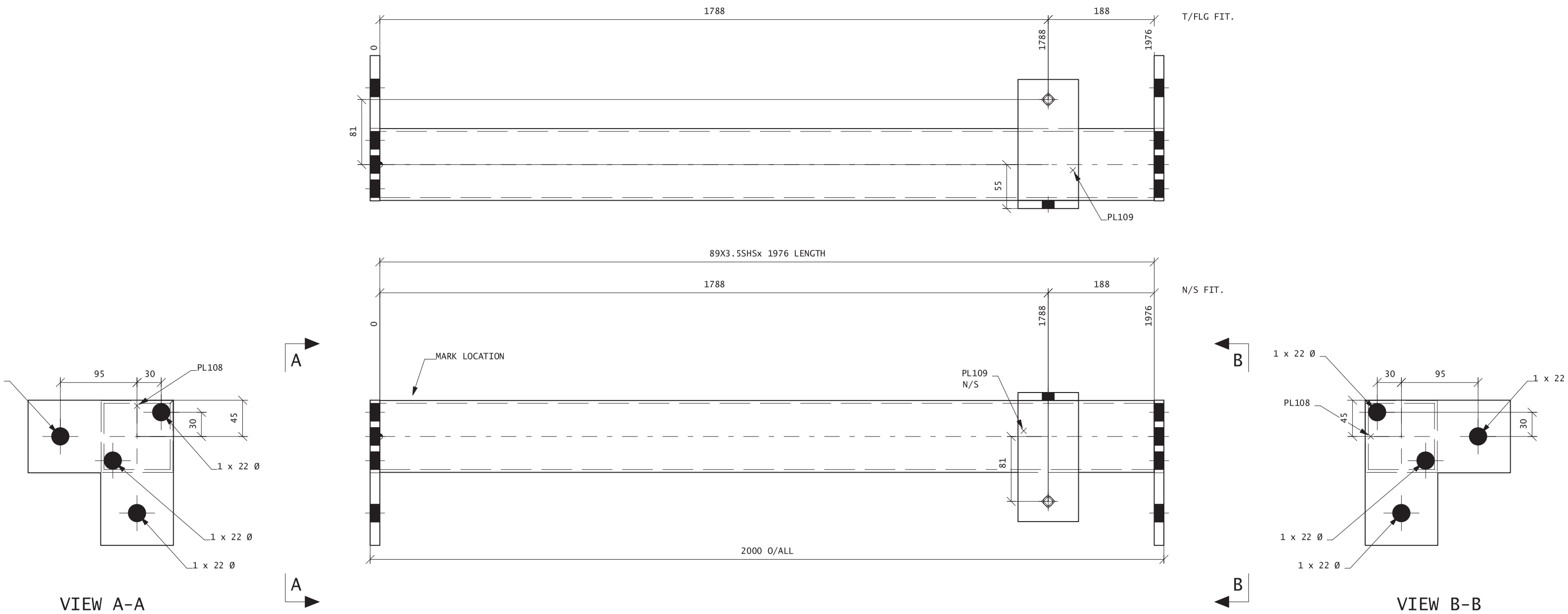
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



2 REQ'D AS DRN MARKED 34M10
PHASE SP034UPPER(2)
FINISH SP034HDG(2)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 24.9 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M10 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M11	65X6EA	300+	2302	1	12.8
				TOTAL	12.8

THIS MEMBER TO BE HOT DIPPED GALVANISED.

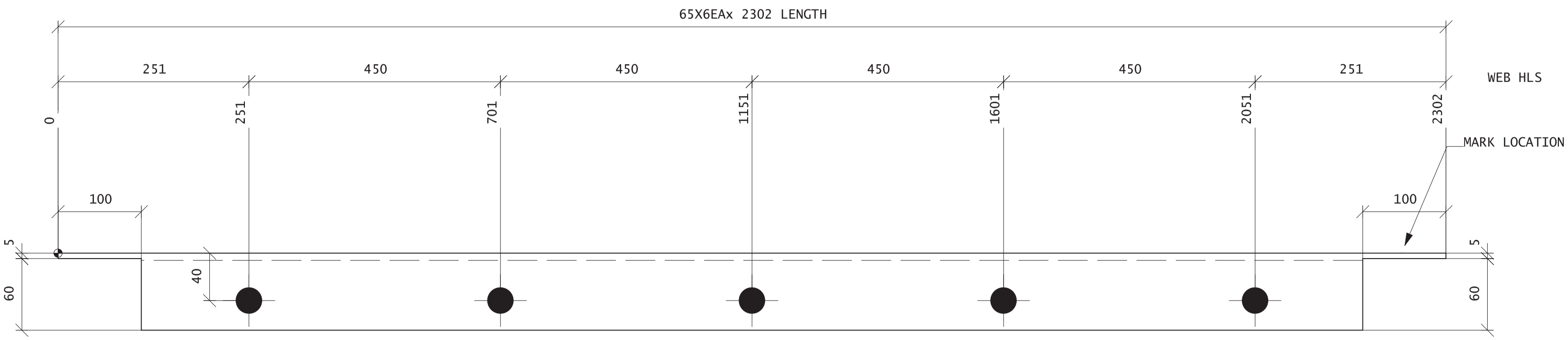
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 34M11

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 12.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON

PROJECT URBAN UTILITIES PUMP STATIONS

TITLE SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M11 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M12	65X6EA	300+	2176	1	12.1
				TOTAL	12.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

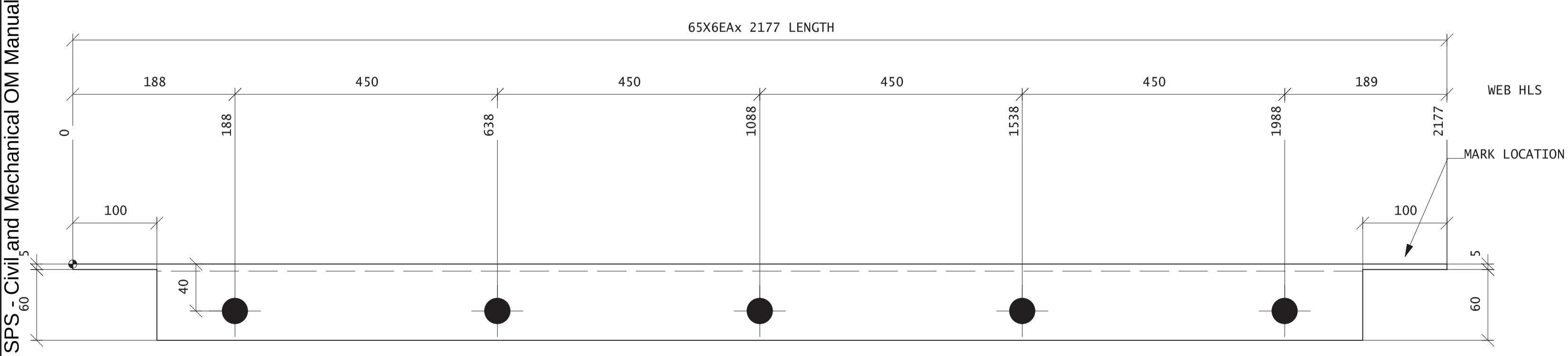
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 34M12

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 12.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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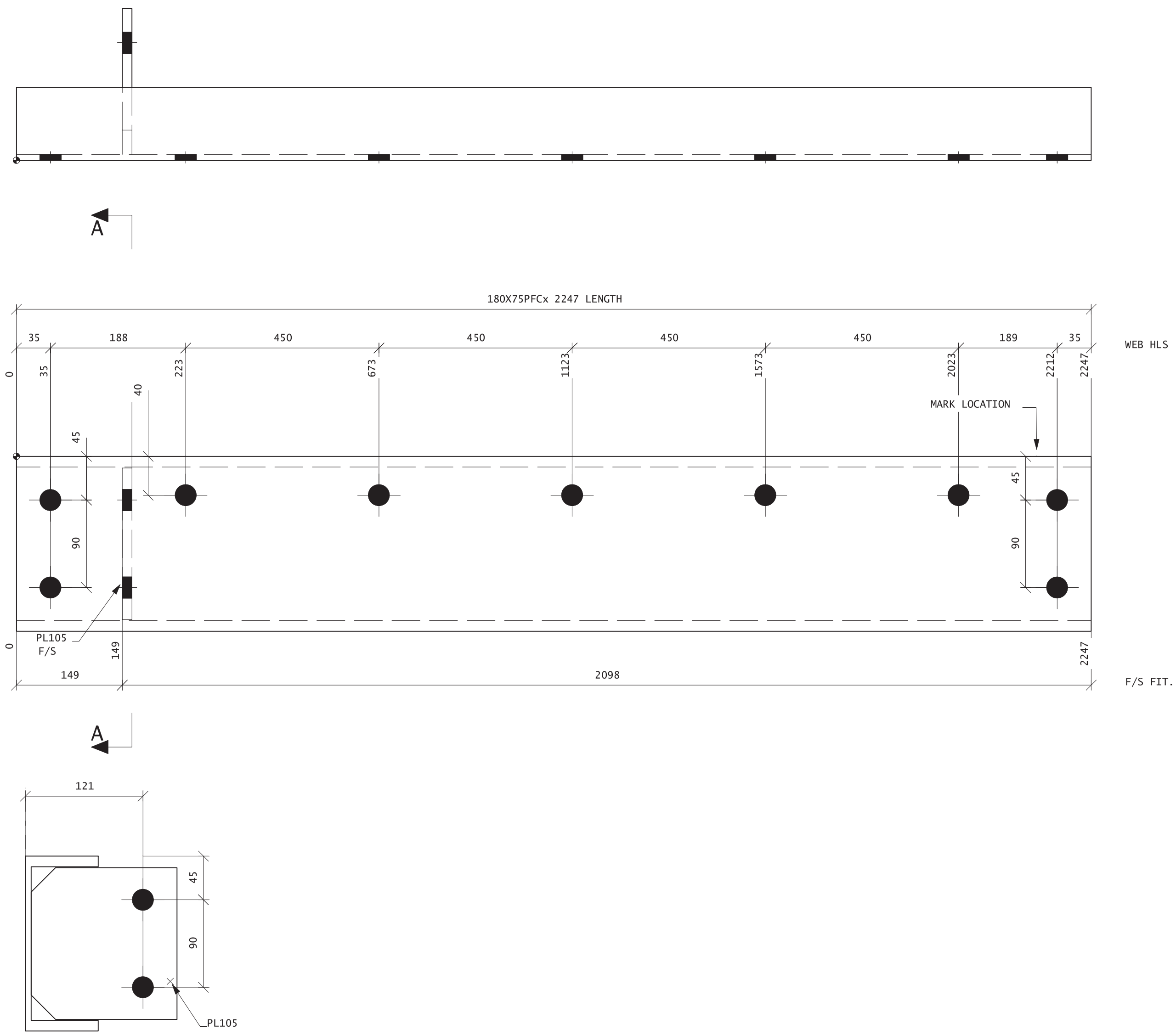
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M12 | REV.



SECTION A - A

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M13	180X75PFC	300+	2246	1	46.9
PL105	150X10FL	300+	156	1	1.8
				TOTAL	48.7

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQ'D AS DRN MARKED 34M13
PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 48.7 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

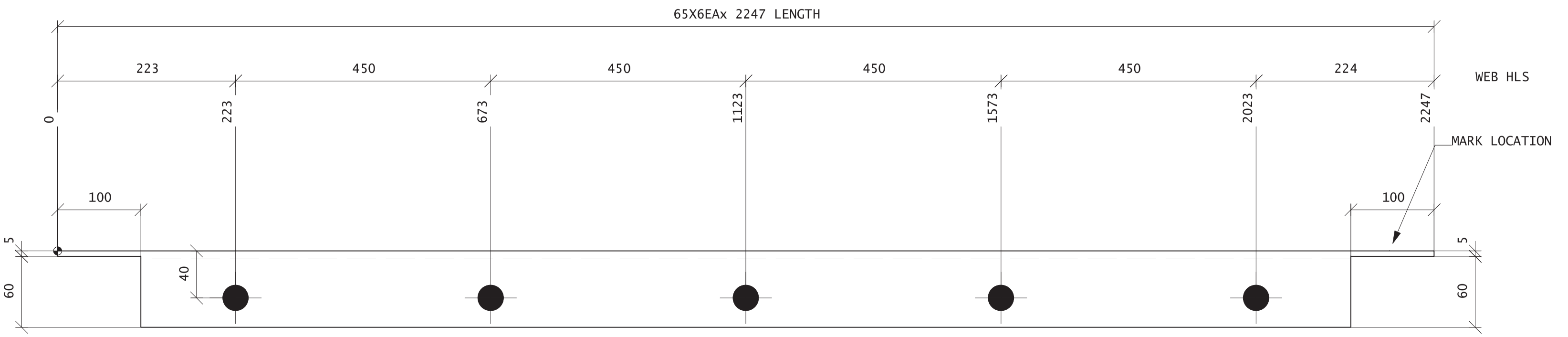
CLIENT LOGAN STEL - J & P RICHARSDON

PROJECT URBAN UTILITIES PUMP STATIONS

TITLE SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M13 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M14	65X6EA	300+	2246	1	12.5
				TOTAL	12.5



THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQ'D AS DRN MARKED 34M14

PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 12.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M14 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M15	180X75PFC	300+	2190	1	45.7
				TOTAL	45.7

THIS MEMBER TO BE HOT DIPPED GALVANISED.

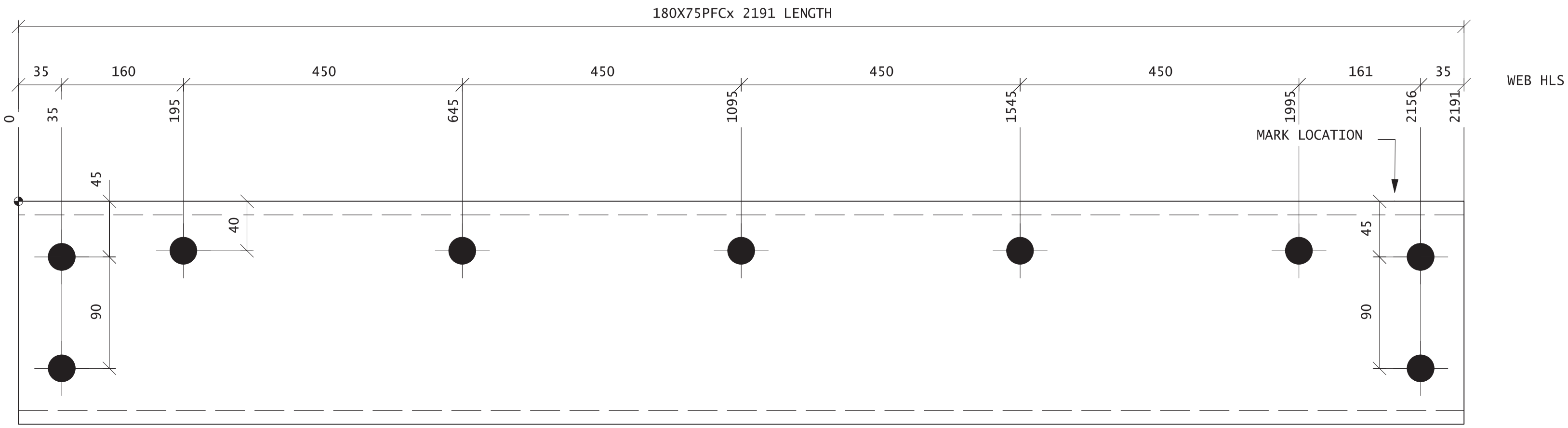
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQ'D AS DRN MARKED 34M15

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 45.7 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
industrial-commercial-rural

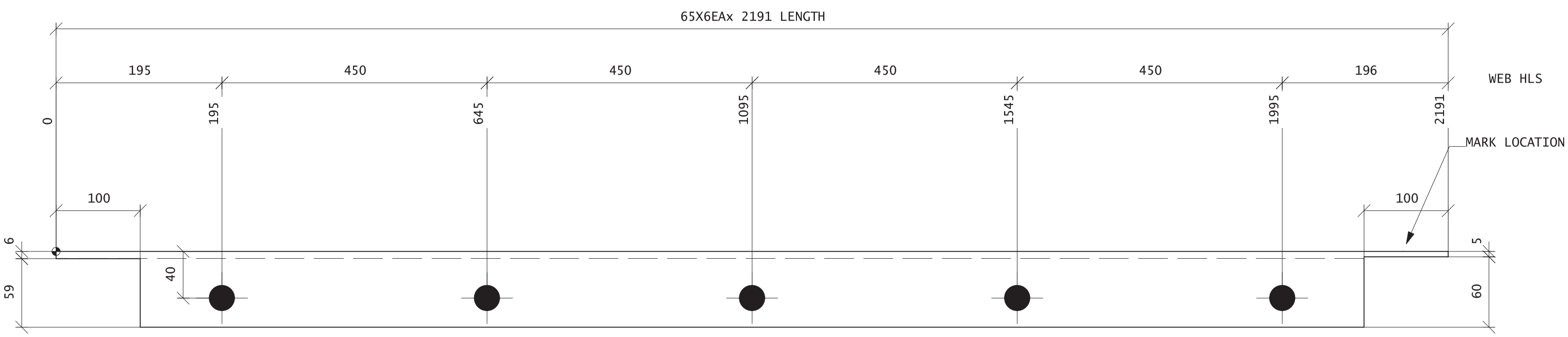
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. 34M15 | REV.



SHOP MATERIAL LIST FOR 1 ASSEMBLY					
MARK	DESCRIPTION	GRADE	LENGTH MM	QTY	WEIGHT KG
34M16	65X6EA	300+	2190	1	12.2
				TOTAL	12.2

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

1 REQ'D AS DRN MARKED 34M16
PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES
BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 12.2 kg.

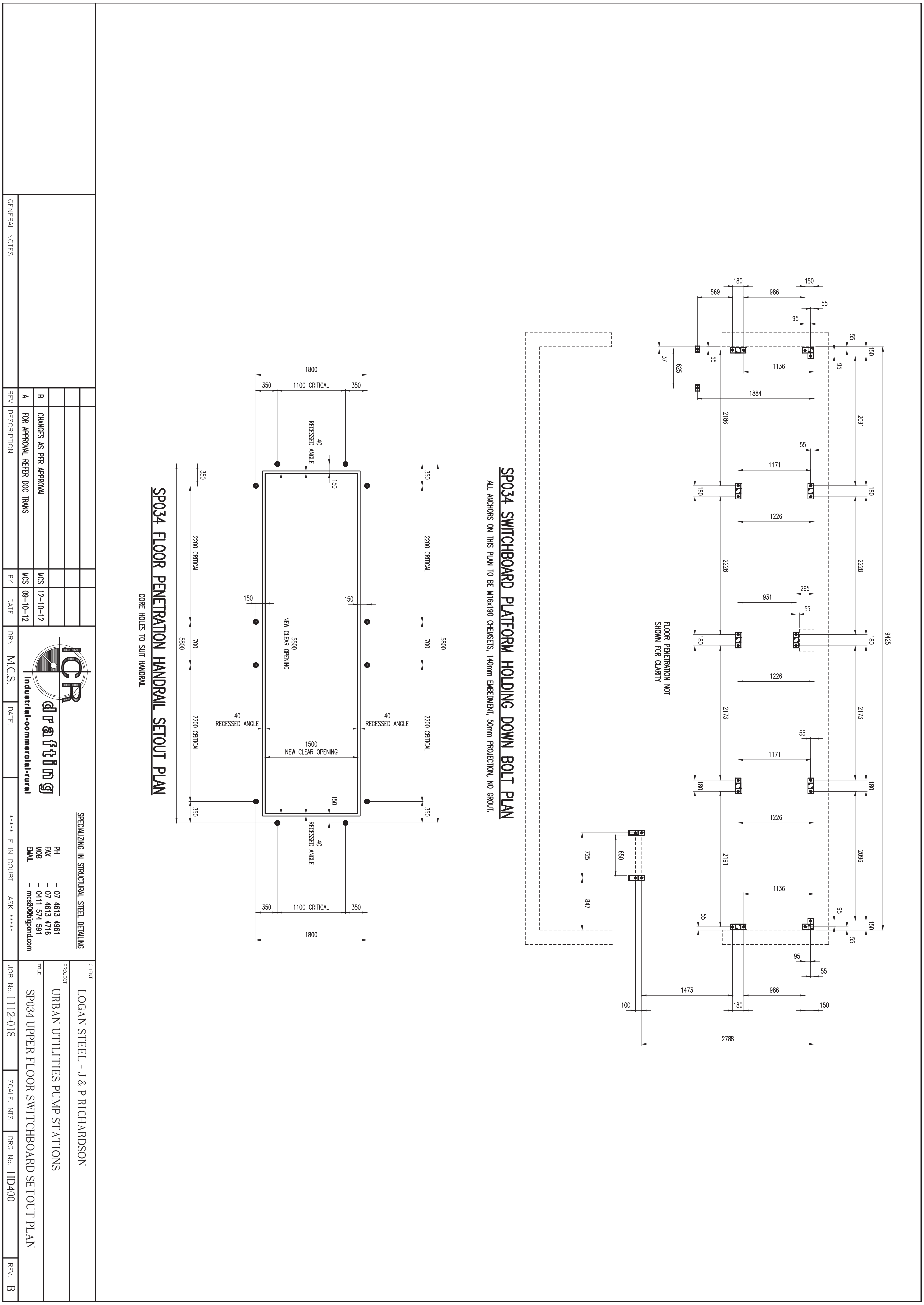
REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

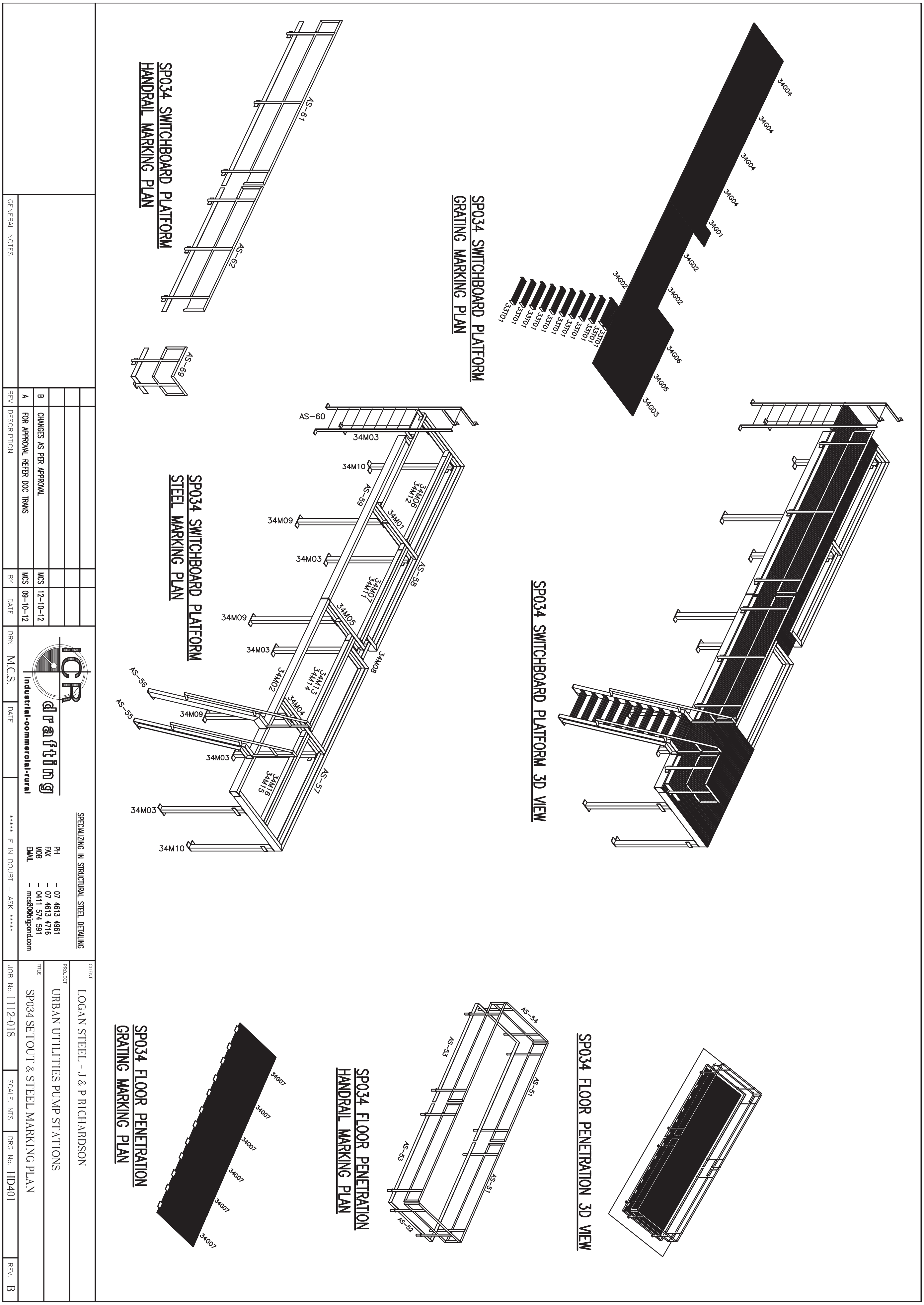
ICR drafting
industrial-commercial-rural
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

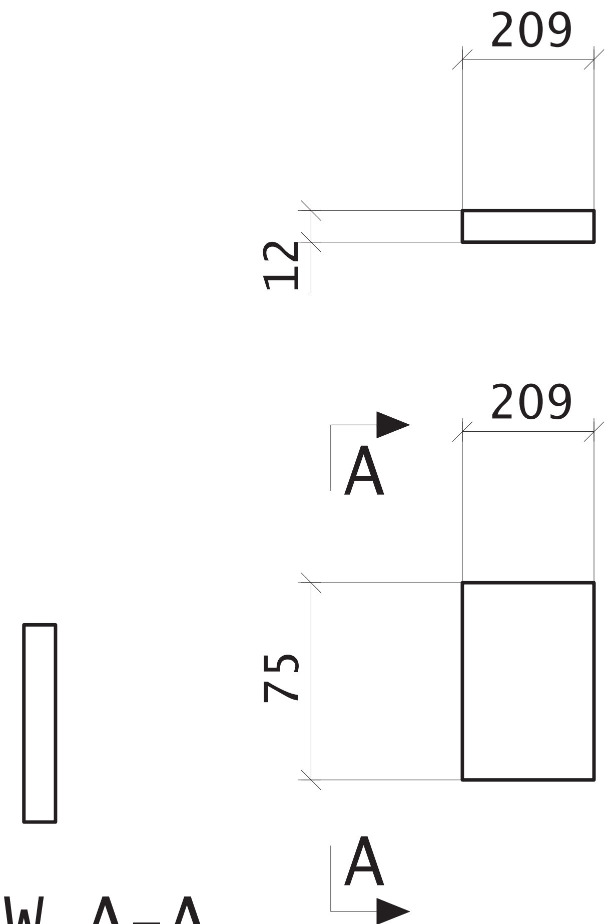
DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARDSON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL
JOB No. 1112-018 | SCALE. NTS | DRG No. 34M16 | REV.

STRUCAD


SP034 FLOOR PENETRATION HANDRAIL SETOUT PLAN
CORE HOLES TO SUIT HANDRAIL
SP034 SWITCHBOARD PLATFORM HOLDING DOWN BOLT PLAN
ALL ANCHORS ON THIS PLAN TO BE M16x190 CHEMSETS, 140mm EMBEDMENT, 50mm PROJECTION, NO GROUT.
FLOOR PENETRATION NOT SHOWN FOR CLARITY
1800
350
1100 CRITICAL
40 RECESSED ANGLE
150
2200 CRITICAL
700
5800
5500 NEW CLEAR OPENING
1500 NEW CLEAR OPENING
GENERAL NOTES
REV
DESCRIPTION
BY
DATE
B
CHANGES AS PER APPROVAL
MCS
12-10-12
A
FOR APPROVAL REFER DOC TRANS
MCS
09-10-12
DRN.
M.C.S.
DATE.
ICR drafting
industrial-commercial-rural
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com
***** IF IN DOUBT - ASK *****
CLIENT
LOGAN STEEL - J & P RICHARDSON
PROJECT
URBAN UTILITIES PUMP STATIONS
TITLE
SP034 UPPER FLOOR SWITCHBOARD SETOUT PLAN
JOB No. 1112-018
SCALE NTS
DRG No. HD400
REV. B


SP034 SWITCHBOARD PLATFORM HANDRAIL MARKING PLAN
AS-61
AS-62
AS-69
SP034 SWITCHBOARD PLATFORM GRATING MARKING PLAN
34G04
34G04
34G04
34G04
34G01
34G02
34G02
34G02
33T01
34G06
34G05
34G03
SP034 SWITCHBOARD PLATFORM STEEL MARKING PLAN
AS-60
34M03
34M10
AS-59
34M06
34M12
34M01
34M09
34M03
AS-58
34M07
34M11
34M09
34M05
34M03
34M08
34M02
34M13
34M14
34M04
AS-56
AS-55
34M09
34M03
AS-57
34M16
34M15
34M03
34M10
SP034 SWITCHBOARD PLATFORM 3D VIEW
SP034 FLOOR PENETRATION GRATING MARKING PLAN
34G07
34G07
34G07
34G07
34G07
34G07
SP034 FLOOR PENETRATION HANDRAIL MARKING PLAN
AS-54
AS-53
AS-51
AS-53
AS-51
AS-52
SP034 FLOOR PENETRATION 3D VIEW
GENERAL NOTES
REV
DESCRIPTION
BY
DATE
B
CHANGES AS PER APPROVAL
MCS
12-10-12
A
FOR APPROVAL REFER DOC TRANS
MCS
09-10-12
DRN.
M.C.S.
DATE.
ICR drafting
Industrial-commercial-rural
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com
***** IF IN DOUBT - ASK *****
CLIENT
LOGAN STEEL - J & P RICHARDSON
PROJECT
URBAN UTILITIES PUMP STATIONS
TITLE
SP034 SETOUT & STEEL MARKING PLAN
JOB No. 1112-018
SCALE. NTS
DRG No. HD401
REV. B



VIEW A-A

75X12FL X 209

2 REQUIRED AS DRAWN MARKED CL161

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

STRUCAD

GENERAL NOTES.
TOTAL WEIGHT 1.5 kg. Kg.
STEEL GRADE 300+

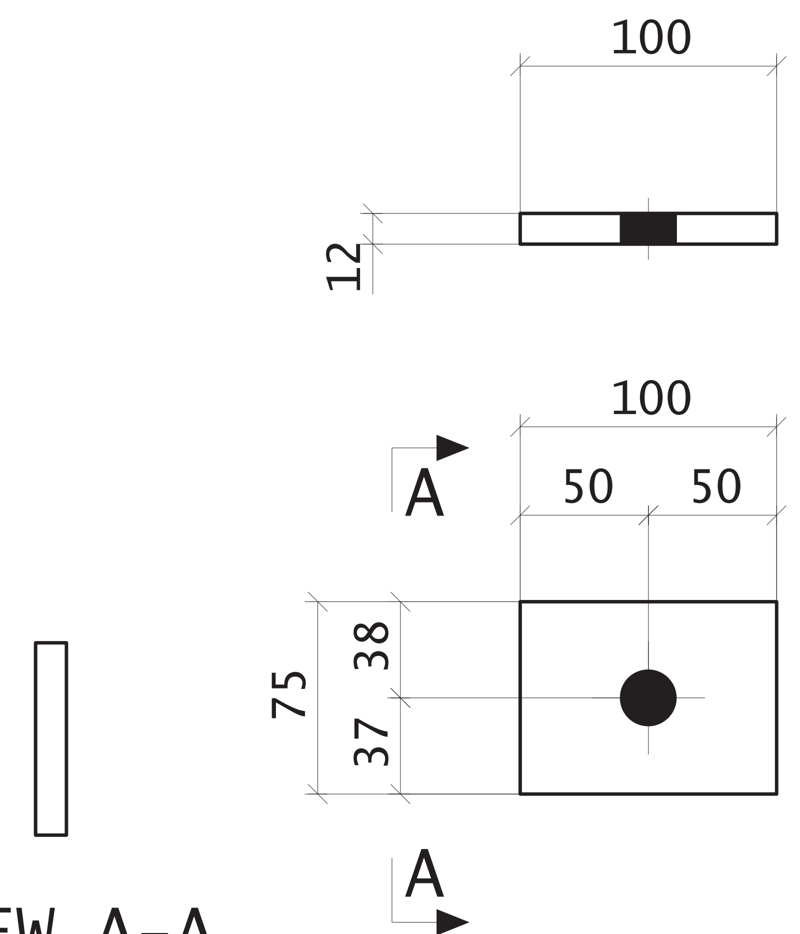
ICR drafting
industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: FITTING DETAILS

GENERAL NOTES.	DRN. MCS	DATE. 13/10/12	***** IF IN DOUBT - ASK *****	JOB No. 1112-018	SCALE. NTS	DRG No. CL161	REV.



VIEW A-A

75X12FL X 100

2 REQUIRED AS DRAWN MARKED CL162

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

STRUCAD

GENERAL NOTES.
TOTAL WEIGHT 0.7 kg. Kg.
STEEL GRADE 300+
ALL HOLES 22 mm DIA UNO.

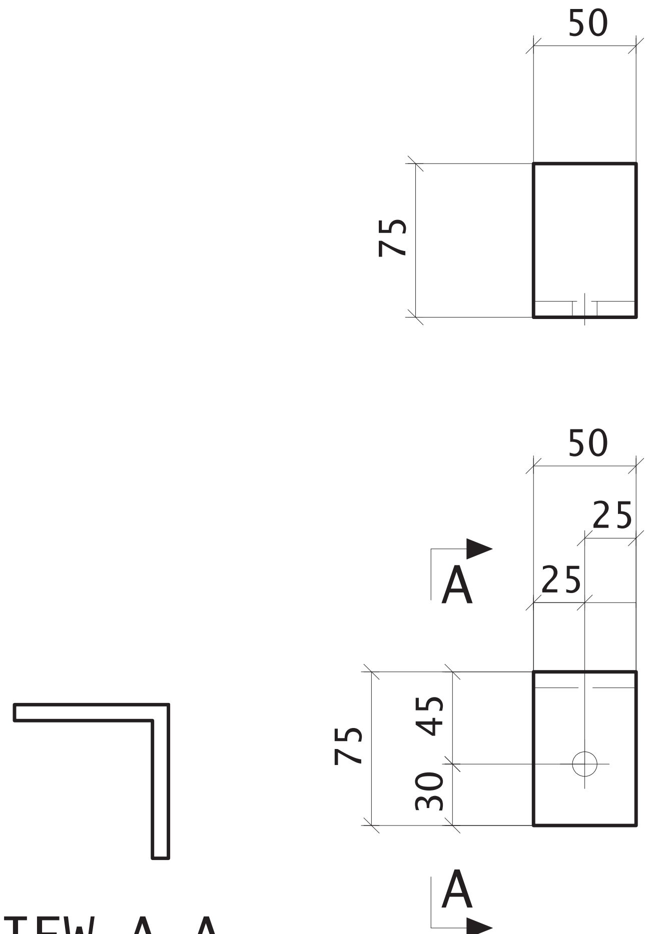
ICR drafting
industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

CLIENT	LOGAN STEL - J & P RICHARSDON
PROJECT	URBAN UTILITIES PUMP STATIONS
TITLE	FITTING DETAILS

GENERAL NOTES.	DRN. MCS	DATE. 13/10/12	***** IF IN DOUBT - ASK *****	JOB No. 1112-018	SCALE. NTS	DRG No. CL162	REV.



VIEW A-A

75X8EA X 50

2 REQUIRED AS DRAWN MARKED CL163

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

STRUCAD

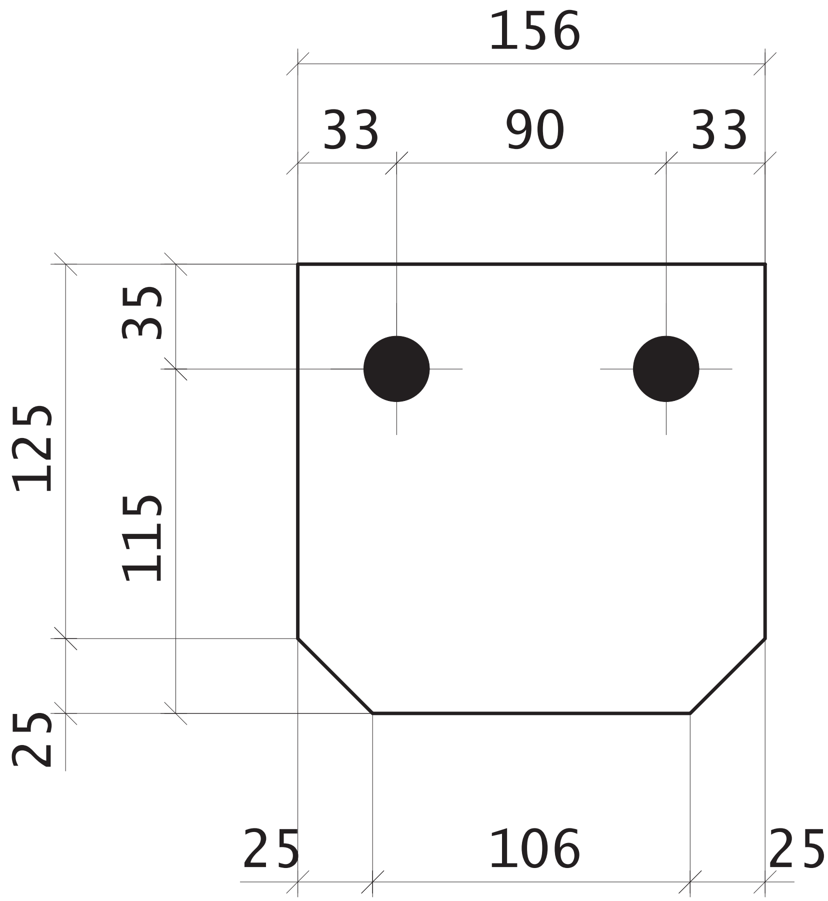
GENERAL NOTES.
TOTAL WEIGHT 0.4 kg. Kg.
STEEL GRADE 300+
ALL HOLES 15 mm DIA UNO.

ICR drafting industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

CLIENT	LOGAN STEL - J & P RICHARSDON					
PROJECT	URBAN UTILITIES PUMP STATIONS					
TITLE	FITTING DETAILS					
GENERAL NOTES.	DRN. MCS	DATE. 13/10/12	***** IF IN DOUBT - ASK *****	JOB No. 1112-018	SCALE. NTS	DRG No. CL163	REV.



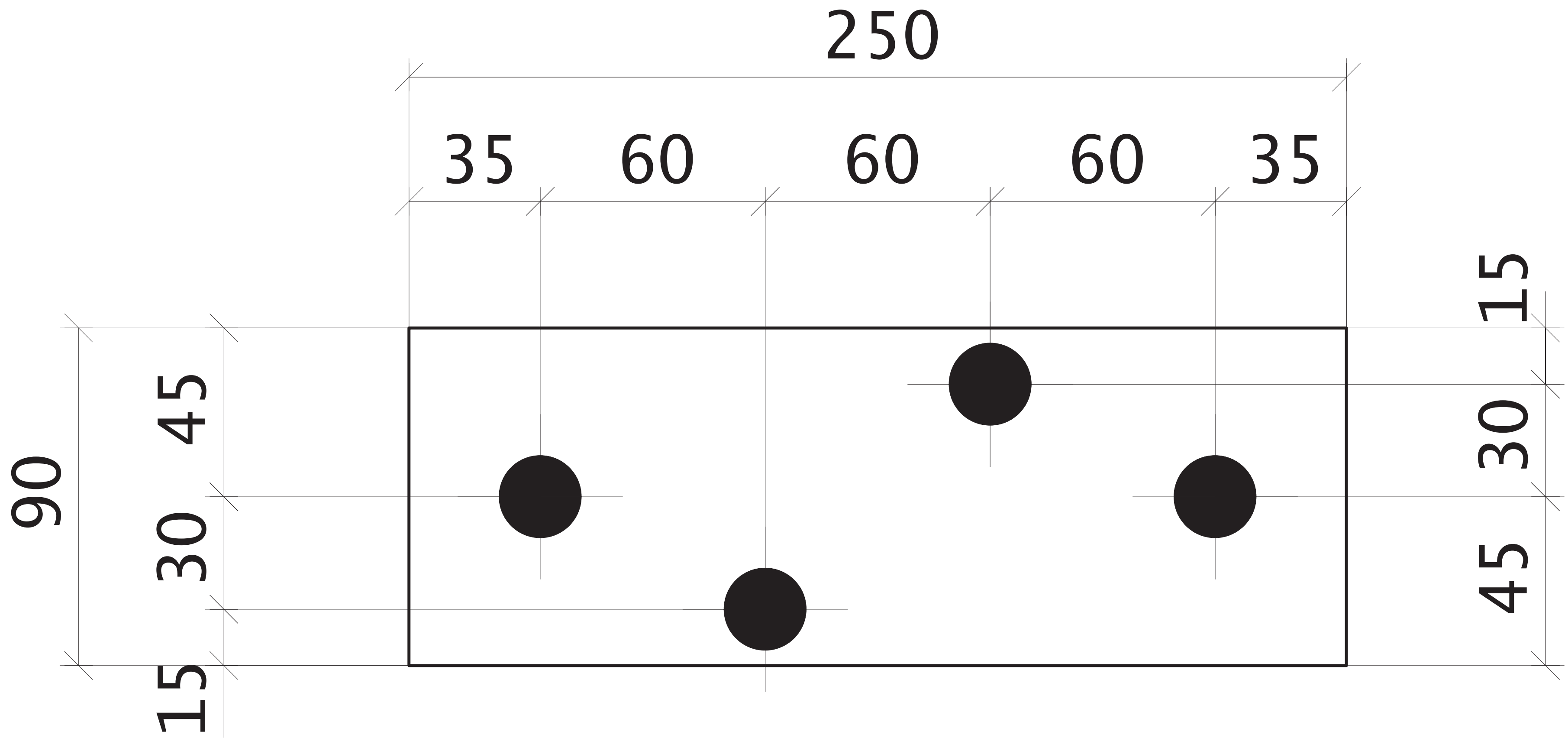
150X10FL X 156

13 REQUIRED AS DRAWN MARKED PL105

PHASE SP034UPPER(13)
FINISH SP034HDG(13)

STRUCAD

GENERAL NOTES. TOTAL WEIGHT 1.8 kg. Kg. STEEL GRADE 300+ ALL HOLES 22 mm DIA UNO.	ICR drafting industrial-commercial-rural SPECIALIZING IN STRUCTURAL STEEL DETAILING PH - 07 4613 4961 FAX - 07 4613 4716 MOB - 0411 574 591 EMAIL - mcs80@bigpond.com	CLIENT LOGAN STEL - J & P RICHARSDON PROJECT URBAN UTILITIES PUMP STATIONS TITLE FITTING DETAILS
GENERAL NOTES.	DRN. MCS / DATE. 13/10/12 / ***** IF IN DOUBT - ASK *****	JOB No. 1112-018 / SCALE. NTS / DRG No. PL105 / REV.



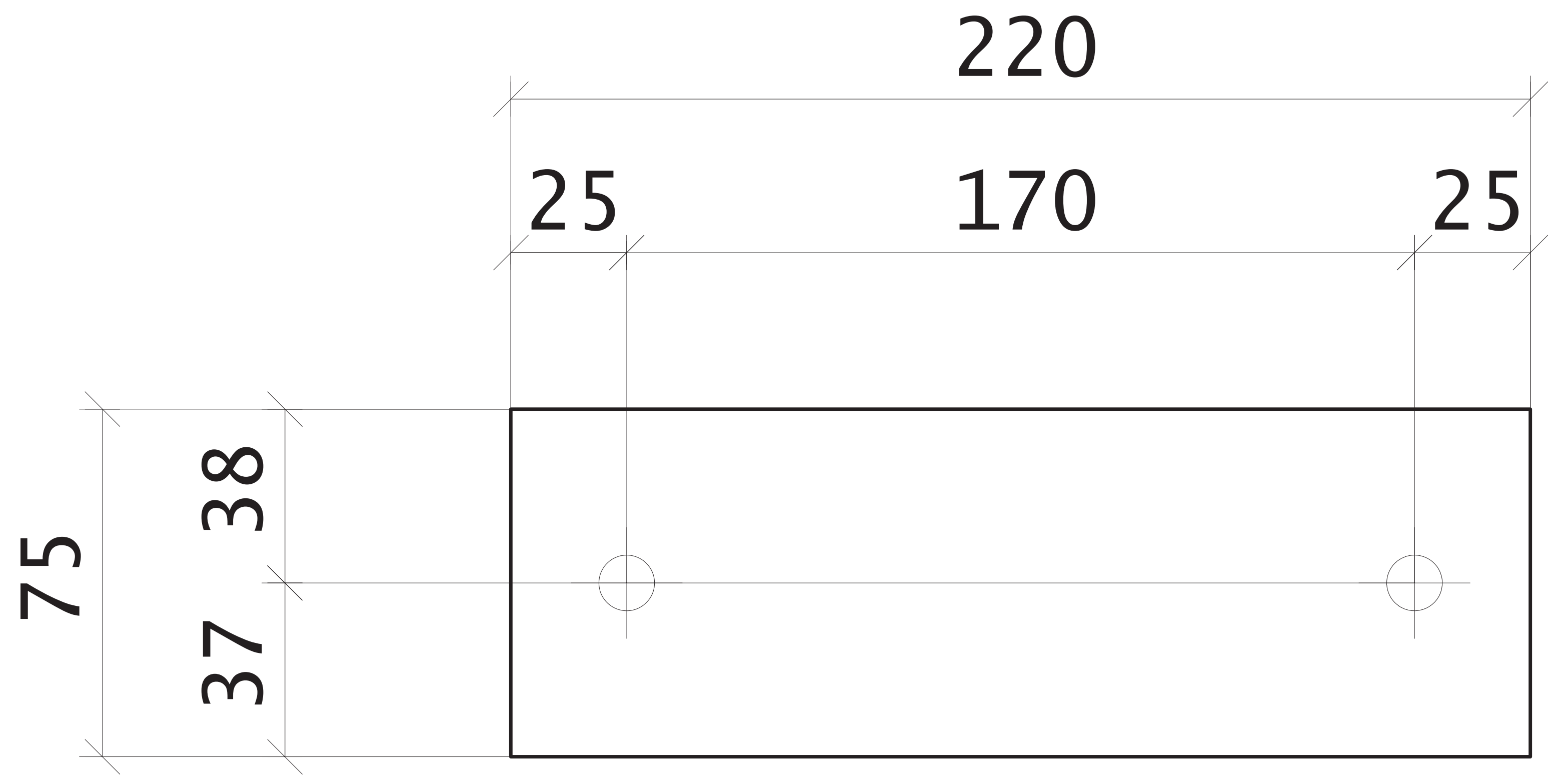
90X12FL X 250

16 REQUIRED AS DRAWN MARKED PL106

PHASE SP034UPPER(16)
FINISH SP034HDG(16)

STRUCAD

GENERAL NOTES. TOTAL WEIGHT 2.1 kg. Kg. STEEL GRADE 300+ ALL HOLES 22 mm DIA UNO.	ICR drafting industrial-commercial-rural SPECIALIZING IN STRUCTURAL STEEL DETAILING PH - 07 4613 4961 FAX - 07 4613 4716 MOB - 0411 574 591 EMAIL - mcs80@bigpond.com	CLIENT LOGAN STEL - J & P RICHARSDON PROJECT URBAN UTILITIES PUMP STATIONS TITLE FITTING DETAILS
GENERAL NOTES.	DRN. MCS · DATE. 13/10/12 · ***** IF IN DOUBT - ASK *****	JOB No. 1112-018 · SCALE. NTS · DRG No. PL106 · REV.



75X10FL X 220

5 REQUIRED AS DRAWN MARKED PL107

PHASE SP034UPPER(5)
FINISH SP034HDG(5)

STRUCAD

GENERAL NOTES.
TOTAL WEIGHT 1.3 kg. Kg.
STEEL GRADE 300+
ALL HOLES 15 mm DIA UNO.

ICR drafting
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SPECIALIZING IN STRUCTURAL STEEL DETAILING

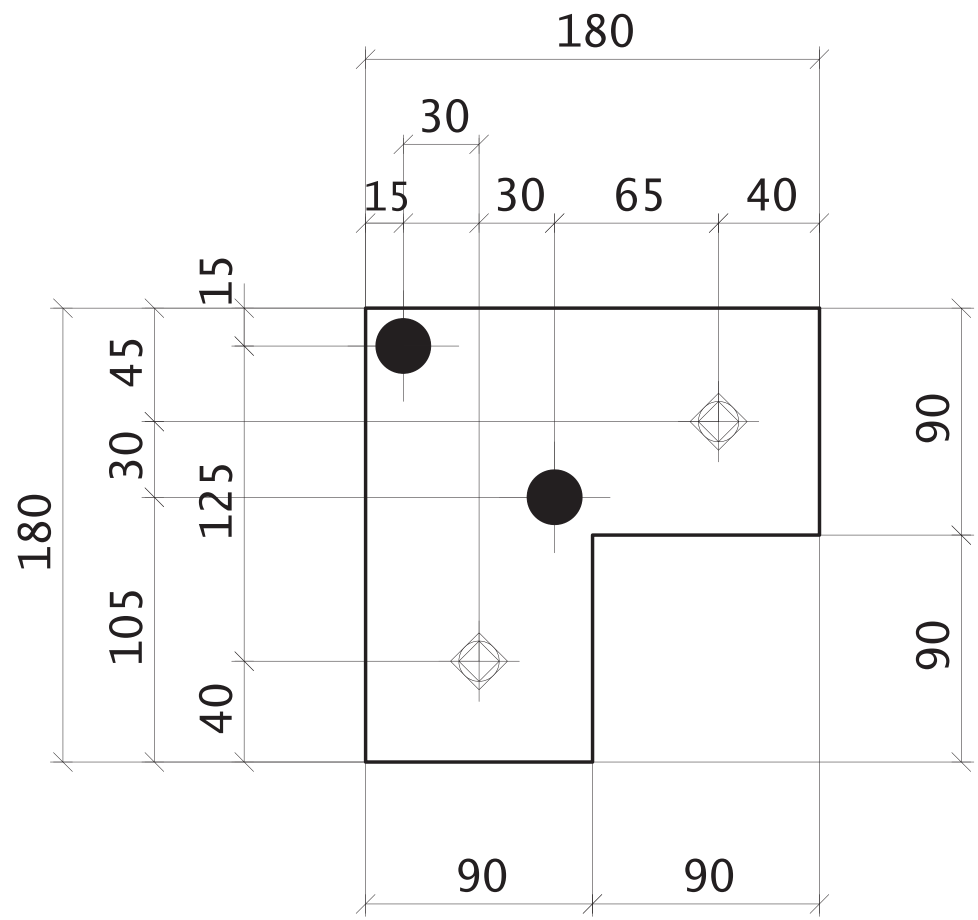
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

CLIENT LOGAN STEL - J & P RICHARSDON

PROJECT URBAN UTILITIES PUMP STATIONS

TITLE FITTING DETAILS

GENERAL NOTES.	DRN. MCS	DATE. 13/10/12	***** IF IN DOUBT - ASK *****	JOB No. 1112-018	SCALE. NTS	DRG No.	PL107	REV.



180X12FL X 180

4 REQUIRED AS DRAWN MARKED PL108

PHASE SP034UPPER(4)
FINISH SP034HDG(4)

STRUCAD

GENERAL NOTES.
TOTAL WEIGHT 2.3 kg. Kg.
STEEL GRADE 300+
ALL HOLES 22 mm DIA UNO.

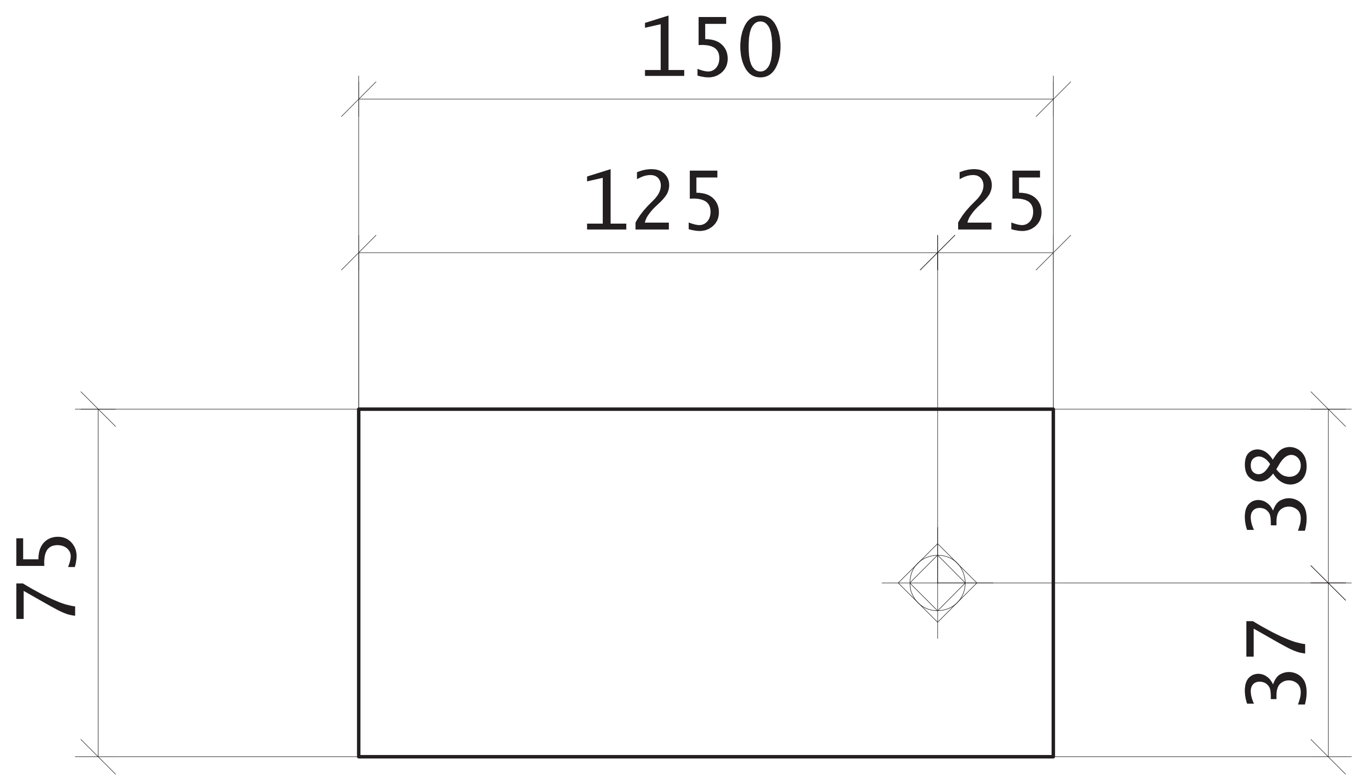
ICR drafting
industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

CLIENT	LOGAN STEL - J & P RICHARSDON
PROJECT	URBAN UTILITIES PUMP STATIONS
TITLE	FITTING DETAILS

GENERAL NOTES.	DRN. MCS	DATE. 13/10/12	***** IF IN DOUBT - ASK *****	JOB No. 1112-018	SCALE. NTS	DRG No. PL108	REV.



75X10FL X 150

4 REQUIRED AS DRAWN MARKED PL109

PHASE SP034UPPER(4)
FINISH SP034HDG(4)

STRUCAD

GENERAL NOTES.
TOTAL WEIGHT 0.9 kg. Kg.
STEEL GRADE 300+
ALL HOLES 15 mm DIA UNO.

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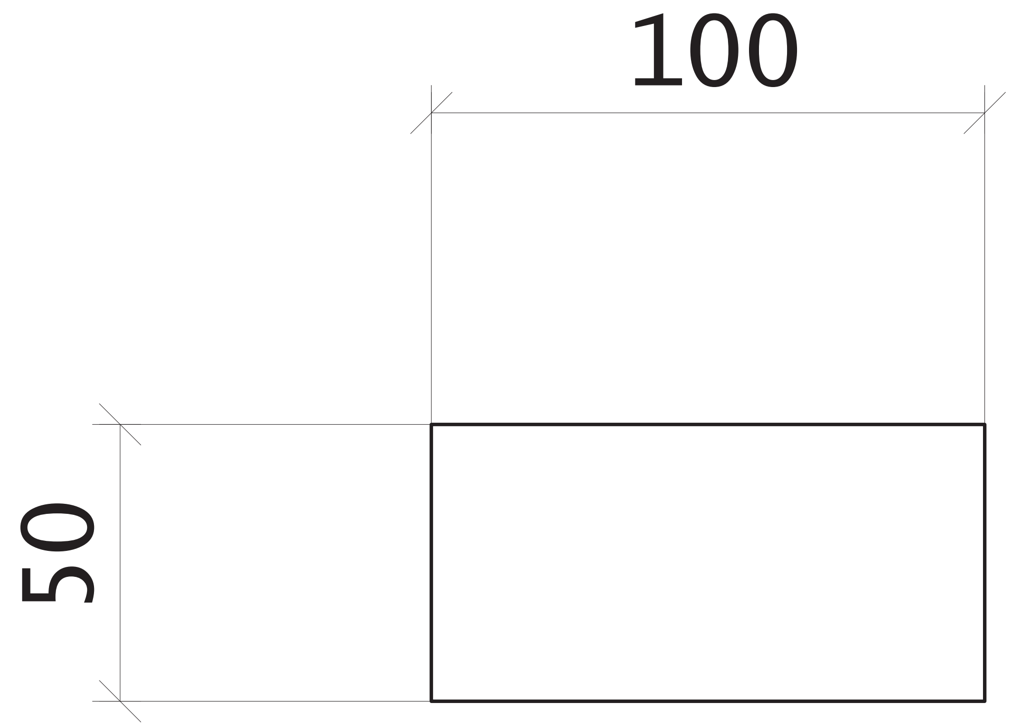
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

CLIENT	LOGAN STEL - J & P RICHARSDON							
PROJECT	URBAN UTILITIES PUMP STATIONS							
TITLE	FITTING DETAILS							
GENERAL NOTES.	DRN. MCS	DATE. 13/10/12	***** IF IN DOUBT - ASK *****	JOB No. 1112-018	SCALE. NTS	DRG No.	PL109	REV.



50X10FL X 100

2 REQUIRED AS DRAWN MARKED PL110

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

STRUCAD

GENERAL NOTES.
TOTAL WEIGHT 0.4 kg. Kg.
STEEL GRADE 300+

SPECIALIZING IN STRUCTURAL STEEL DETAILING

ICR drafting
industrial-commercial-rural

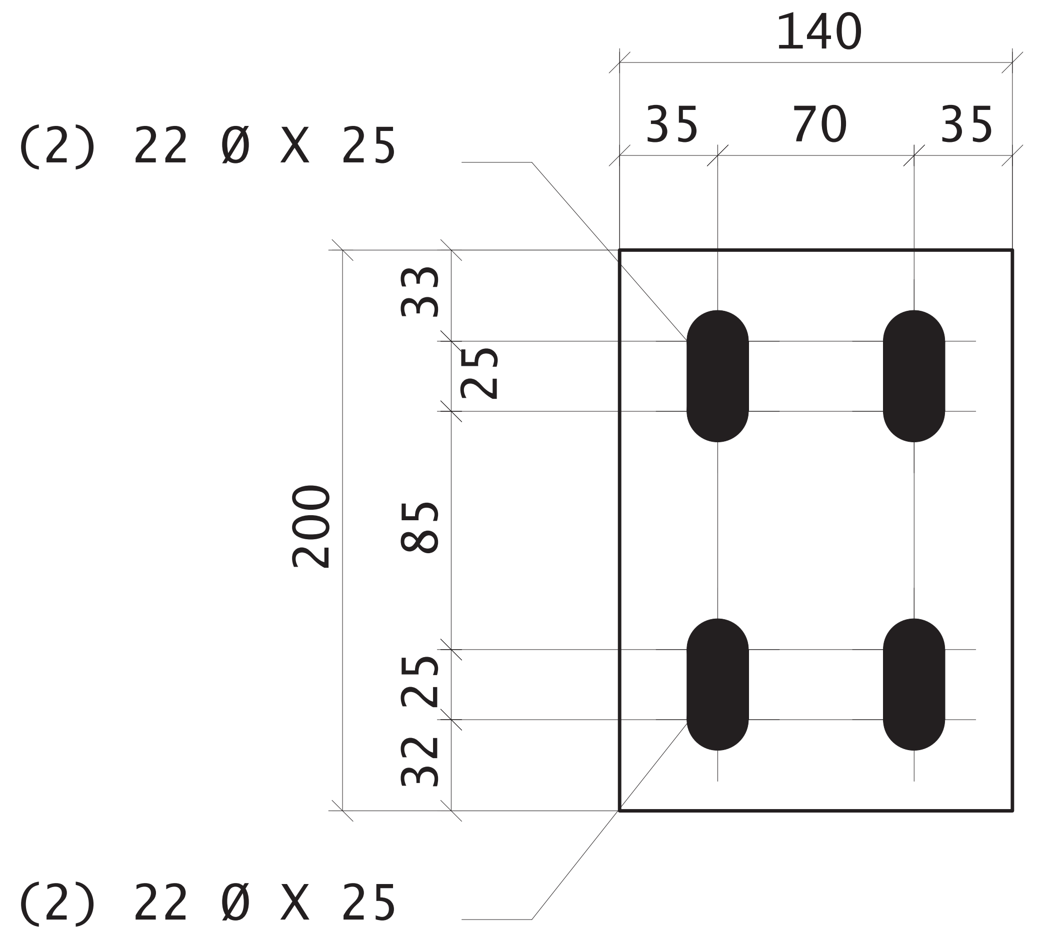
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

CLIENT LOGAN STEL - J & P RICHARSDON

PROJECT URBAN UTILITIES PUMP STATIONS

TITLE FITTING DETAILS

GENERAL NOTES.	DRN. MCS	DATE. 13/10/12	***** IF IN DOUBT - ASK *****	JOB No. 1112-018	SCALE. NTS	DRG No. PL110	REV.



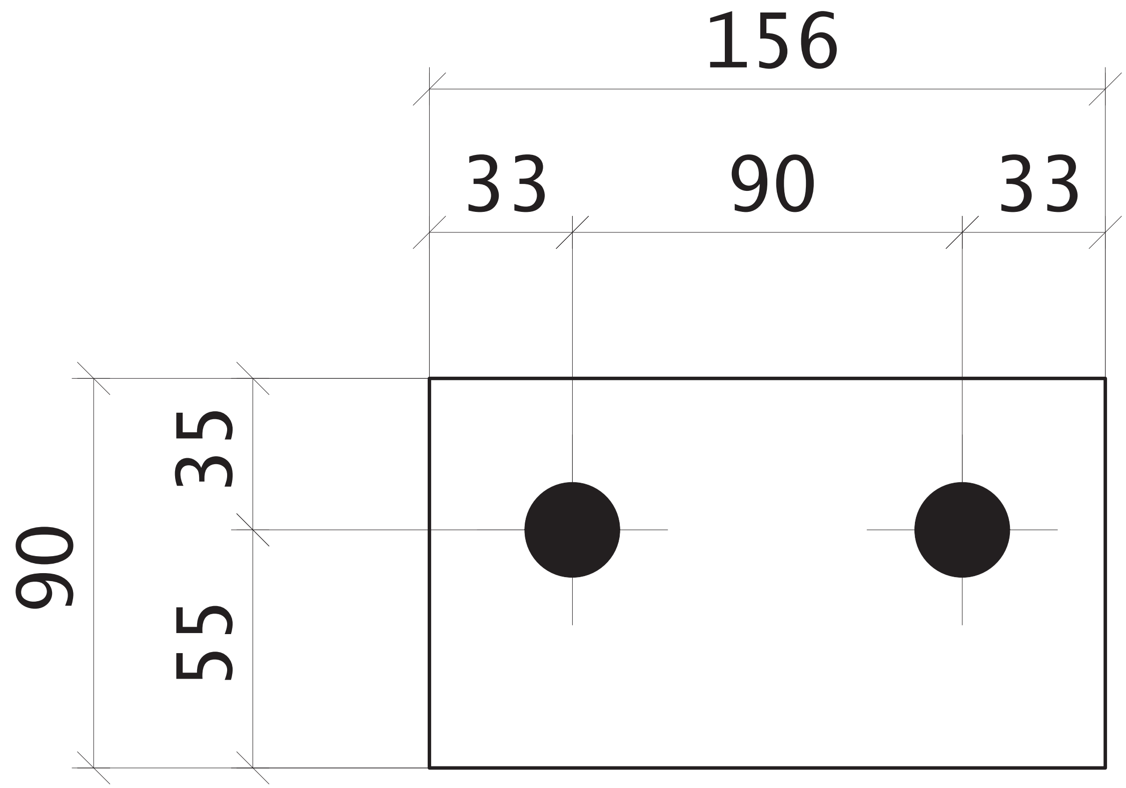
200X12FL X 140

1 REQUIRED AS DRAWN MARKED PL111

PHASE SP034UPPER
FINISH SP034HDG

STRUCAD

GENERAL NOTES. TOTAL WEIGHT 2.6 kg. Kg. STEEL GRADE 300+ ALL HOLES 22 mm DIA UNO.	ICR drafting industrial-commercial-rural SPECIALIZING IN STRUCTURAL STEEL DETAILING PH - 07 4613 4961 FAX - 07 4613 4716 MOB - 0411 574 591 EMAIL - mcs80@bigpond.com	CLIENT LOGAN STEL - J & P RICHARSDON PROJECT URBAN UTILITIES PUMP STATIONS TITLE FITTING DETAILS
GENERAL NOTES.	DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****	JOB No. 1112-018 | SCALE. NTS | DRG No. PL111 | REV.



90X10FL X 156

3 REQUIRED AS DRAWN MARKED PL112

PHASE SP034UPPER(3)
FINISH SP034HDG(3)

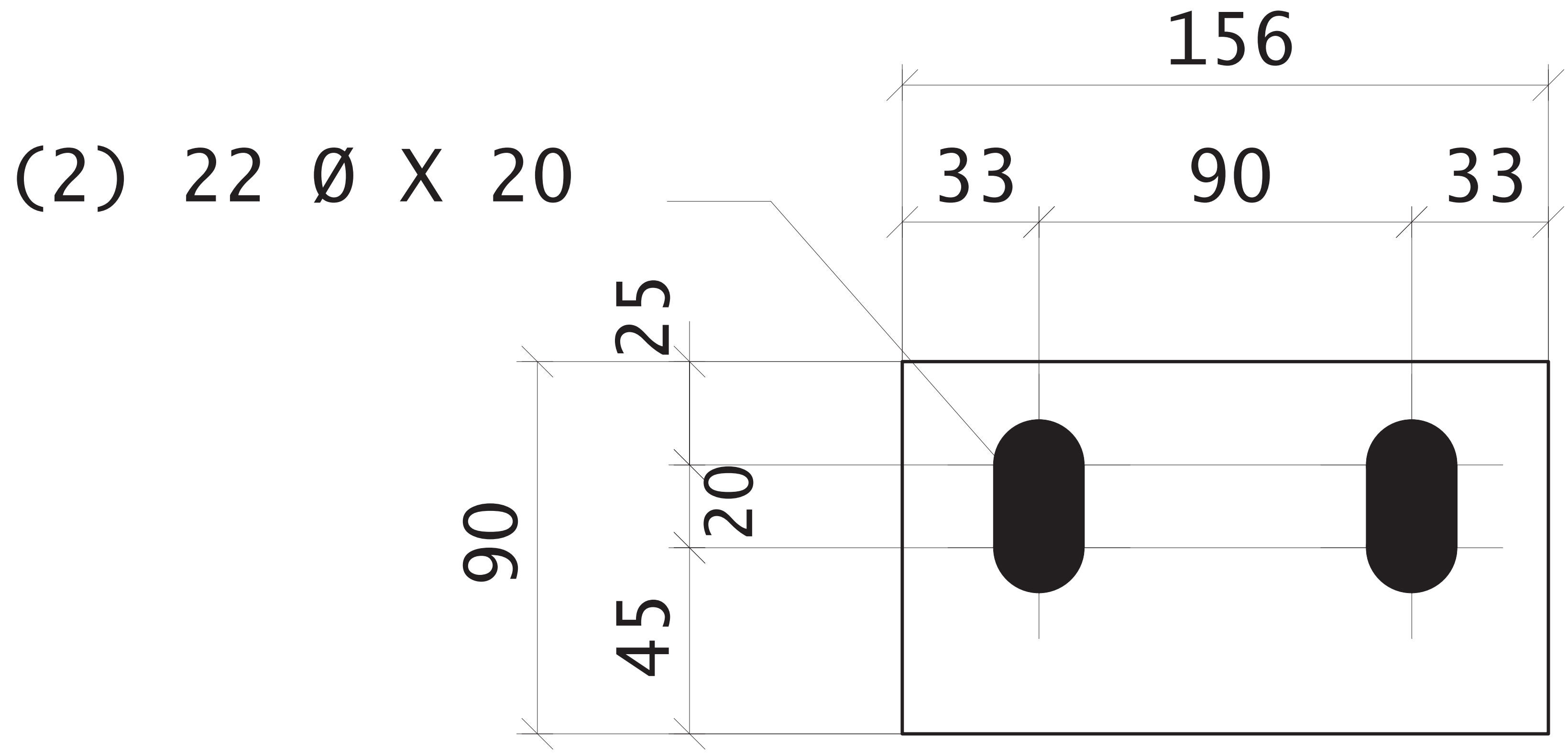
STRUCAD

GENERAL NOTES.
TOTAL WEIGHT 1.1 kg. Kg.
STEEL GRADE 300+
ALL HOLES 22 mm DIA UNO.

ICR drafting
industrial-commercial-rural
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE FITTING DETAILS

GENERAL NOTES.	DRN. MCS	DATE. 13/10/12	***** IF IN DOUBT - ASK *****	JOB No. 1112-018	SCALE. NTS	DRG No. PL112	REV.



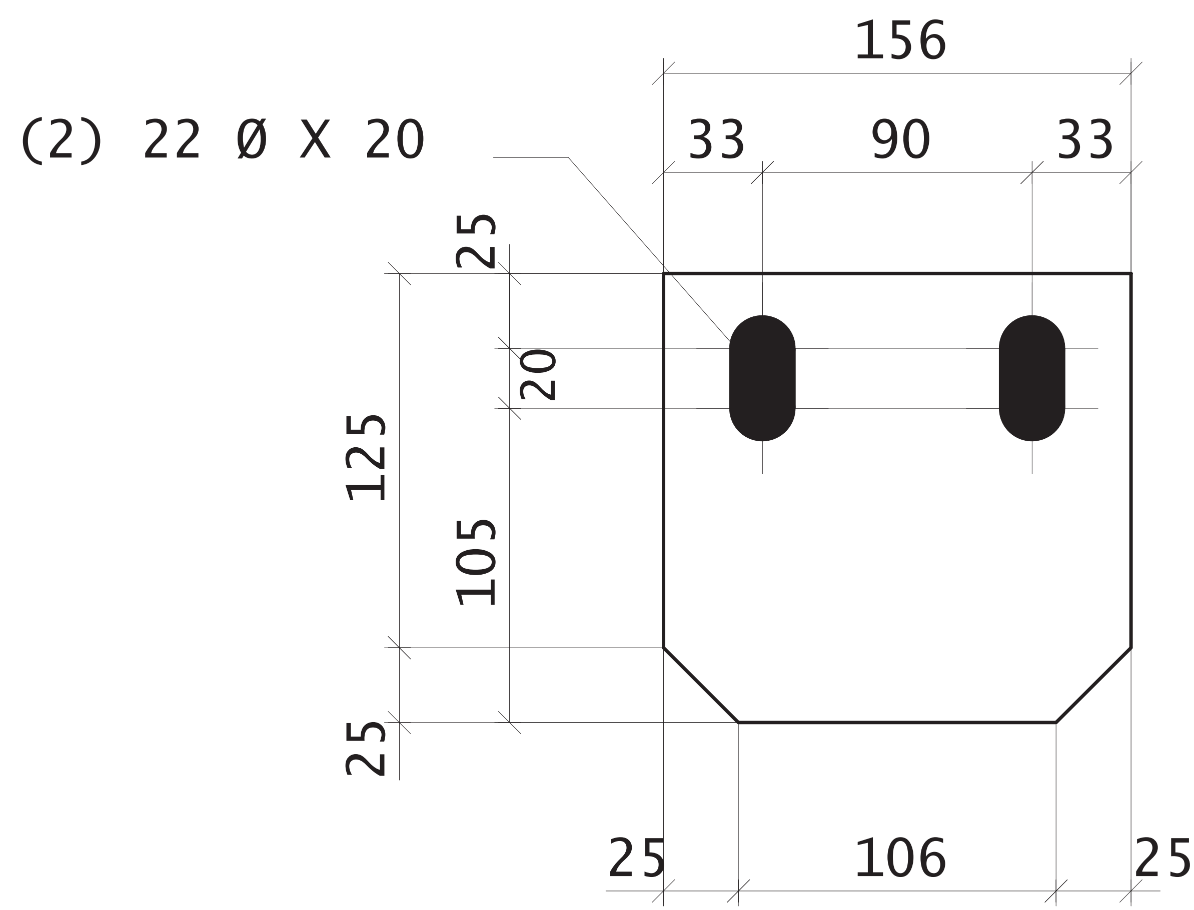
90X10FL X 156

1 REQUIRED AS DRAWN MARKED PL113

PHASE SP034UPPER
FINISH SP034HDG

STRUCAD

GENERAL NOTES. TOTAL WEIGHT 1.1 kg. Kg. STEEL GRADE 300+ ALL HOLES 22 mm DIA UNO.	ICR drafting industrial-commercial-rural SPECIALIZING IN STRUCTURAL STEEL DETAILING PH - 07 4613 4961 FAX - 07 4613 4716 MOB - 0411 574 591 EMAIL - mcs80@bigpond.com	CLIENT LOGAN STEL - J & P RICHARSDON PROJECT URBAN UTILITIES PUMP STATIONS TITLE FITTING DETAILS
GENERAL NOTES.	DRN. MCS / DATE. 13/10/12 / ***** IF IN DOUBT - ASK *****	JOB No. 1112-018 / SCALE. NTS / DRG No. PL113 / REV.



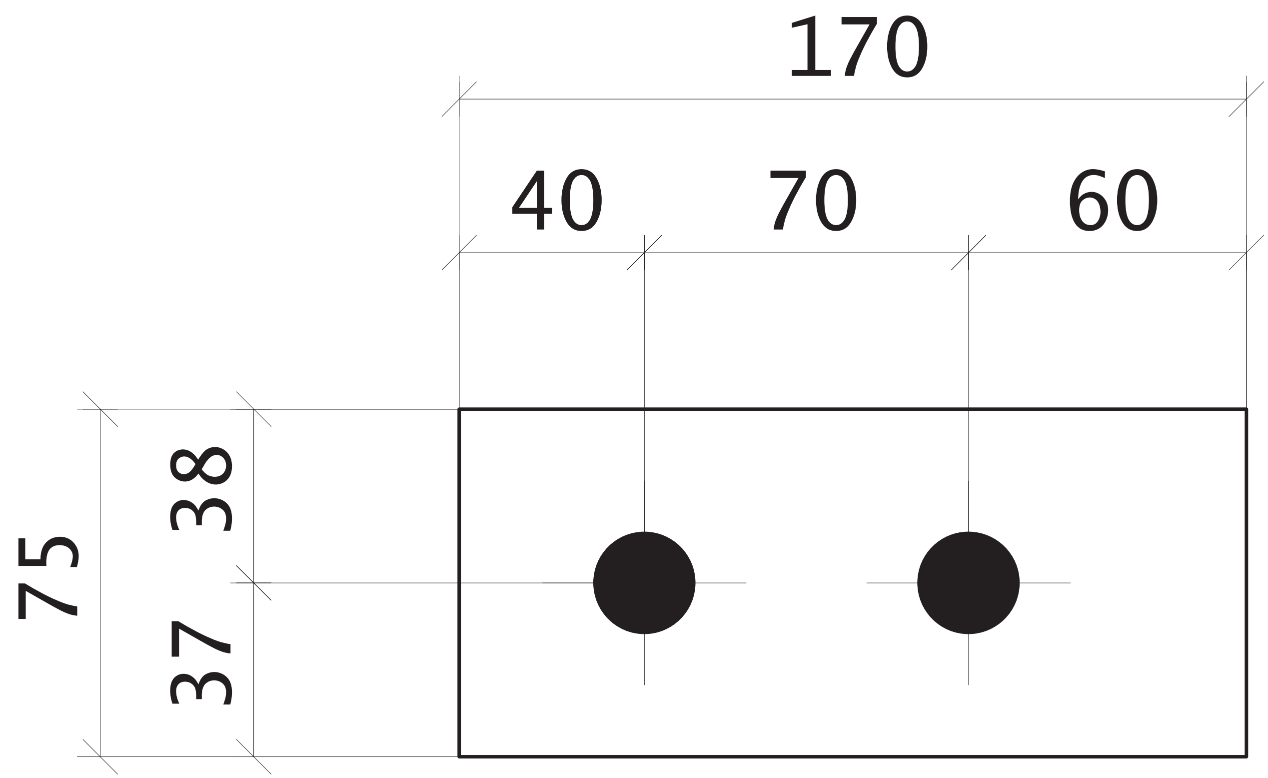
150X10FL X 156

1 REQUIRED AS DRAWN MARKED PL114

PHASE SP034UPPER
FINISH SP034HDG

STRUCAD

GENERAL NOTES. TOTAL WEIGHT 1.8 kg. Kg. STEEL GRADE 300+ ALL HOLES 22 mm DIA UNO.	ICR drafting industrial-commercial-rural SPECIALIZING IN STRUCTURAL STEEL DETAILING PH - 07 4613 4961 FAX - 07 4613 4716 MOB - 0411 574 591 EMAIL - mcs80@bigpond.com	CLIENT LOGAN STEL - J & P RICHARSDON PROJECT URBAN UTILITIES PUMP STATIONS TITLE FITTING DETAILS
GENERAL NOTES.	DRN. MCS / DATE. 13/10/12 / ***** IF IN DOUBT - ASK *****	JOB No. 1112-018 / SCALE. NTS / DRG No. PL114 / REV.



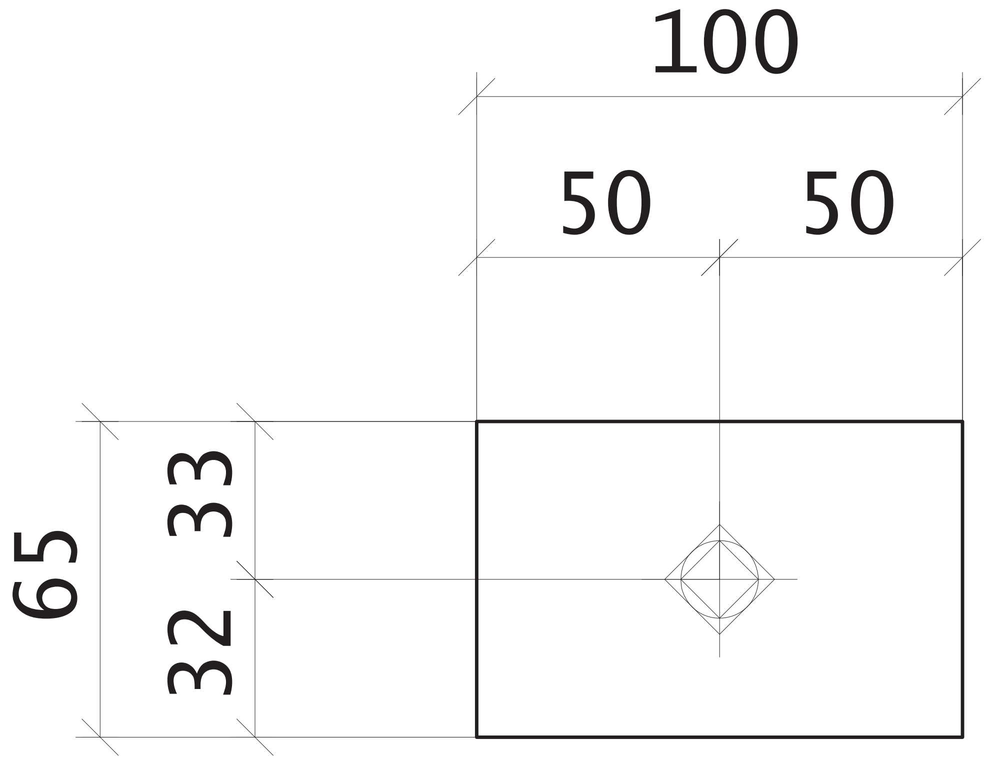
75X12FL X 170

2 REQUIRED AS DRAWN MARKED PL116

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

STRUCAD

GENERAL NOTES. TOTAL WEIGHT 1.2 kg. Kg. STEEL GRADE 300+ ALL HOLES 22 mm DIA UNO.	ICR drafting industrial-commercial-rural SPECIALIZING IN STRUCTURAL STEEL DETAILING PH - 07 4613 4961 FAX - 07 4613 4716 MOB - 0411 574 591 EMAIL - mcs80@bigpond.com	CLIENT LOGAN STEL - J & P RICHARSDON PROJECT URBAN UTILITIES PUMP STATIONS TITLE FITTING DETAILS
GENERAL NOTES.	DRN. MCS / DATE. 13/10/12 / ***** IF IN DOUBT - ASK *****	JOB No. 1112-018 / SCALE. NTS / DRG No. PL116 / REV. A



65X12FL X 100

2 REQUIRED AS DRAWN MARKED PL117

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

STRUCAD

GENERAL NOTES.
TOTAL WEIGHT 0.6 kg. Kg.
STEEL GRADE 300+
ALL HOLES 22 mm DIA UNO.

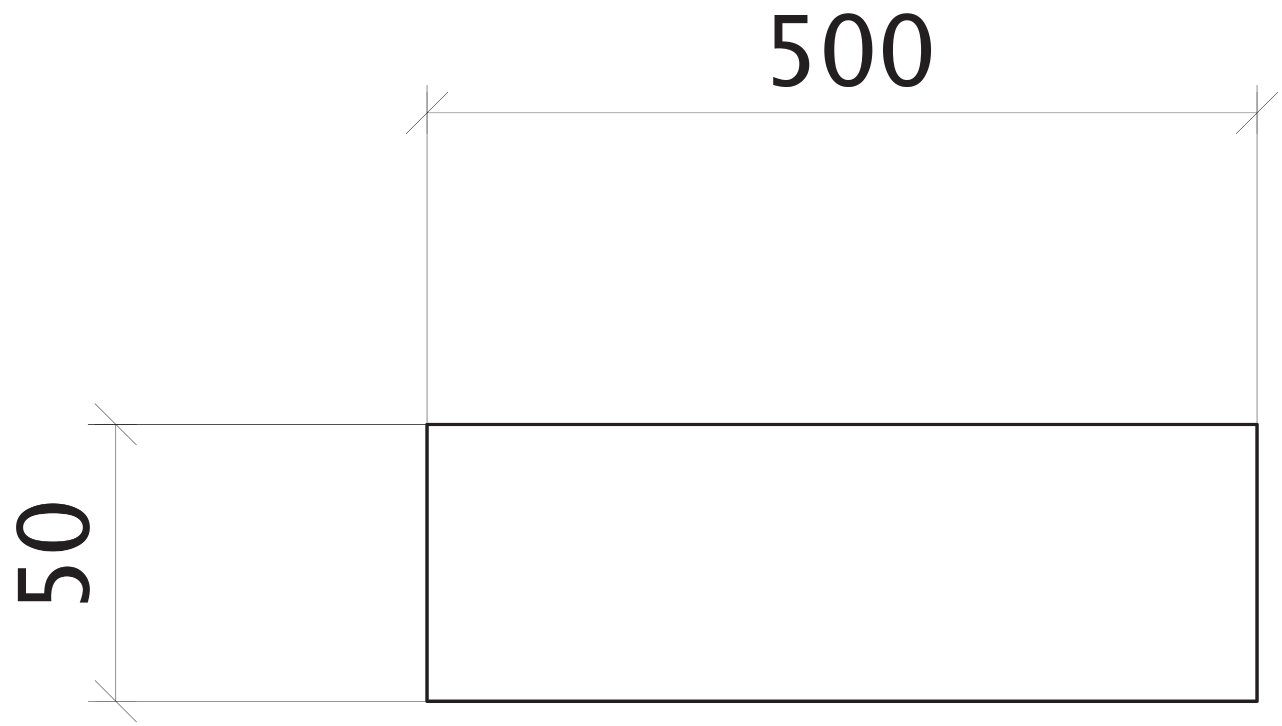
ICR drafting
industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

CLIENT	LOGAN STEL - J & P RICHARSDON
PROJECT	URBAN UTILITIES PUMP STATIONS
TITLE	FITTING DETAILS

GENERAL NOTES.	DRN. MCS	DATE. 13/10/12	***** IF IN DOUBT - ASK *****	JOB No. 1112-018	SCALE. NTS	DRG No. PL117	REV.



50X12FL X 500

2 REQUIRED AS DRAWN MARKED PL118

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

STRUCAD

GENERAL NOTES.
TOTAL WEIGHT 2.4 kg. Kg.
STEEL GRADE 300+

ICR drafting
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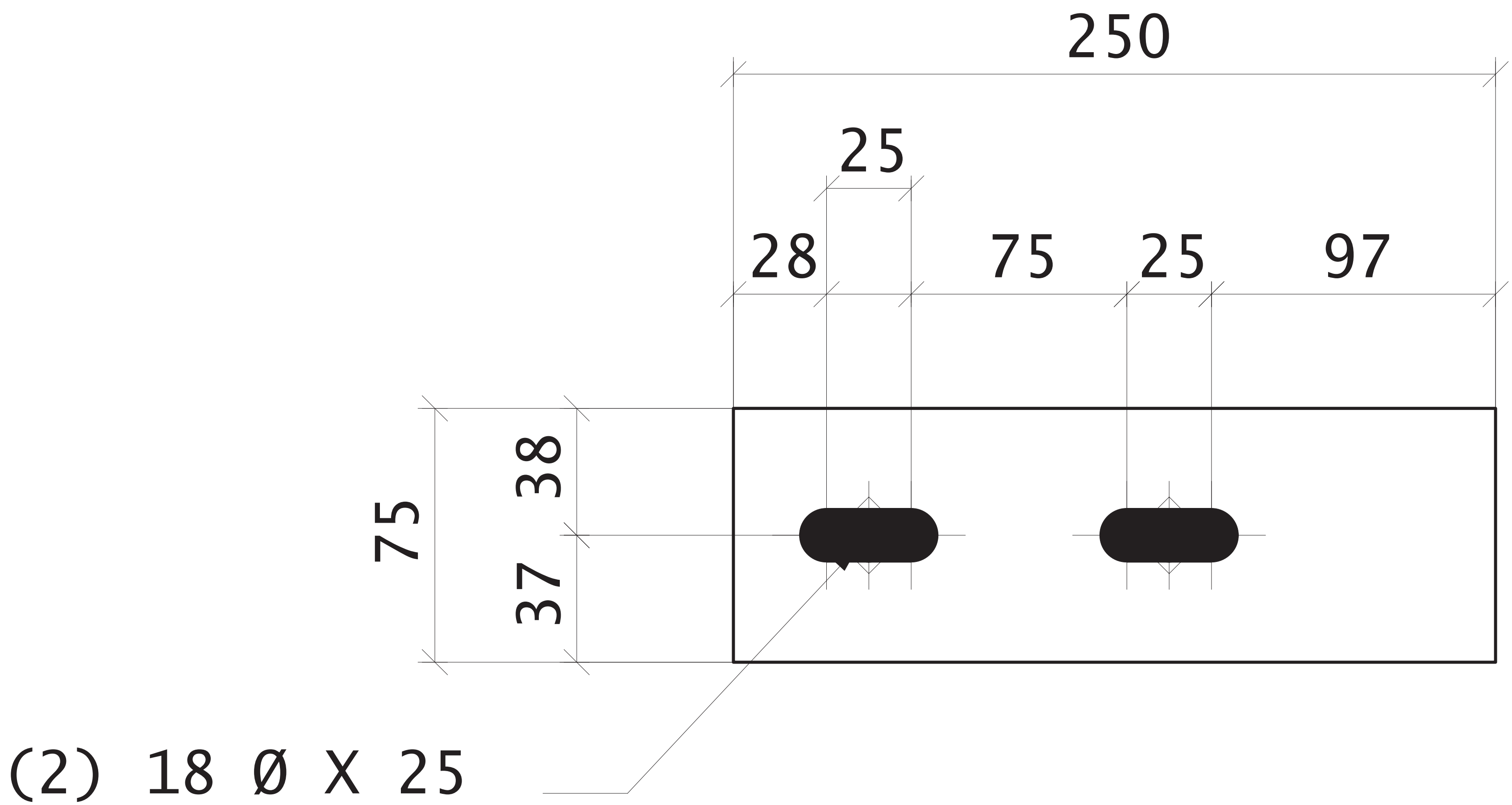
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

CLIENT	LOGAN STEL - J & P RICHARSDON
PROJECT	URBAN UTILITIES PUMP STATIONS
TITLE	FITTING DETAILS

GENERAL NOTES.	DRN. MCS	DATE. 13/10/12	***** IF IN DOUBT - ASK *****	JOB No. 1112-018	SCALE. NTS	DRG No. PL118	REV.



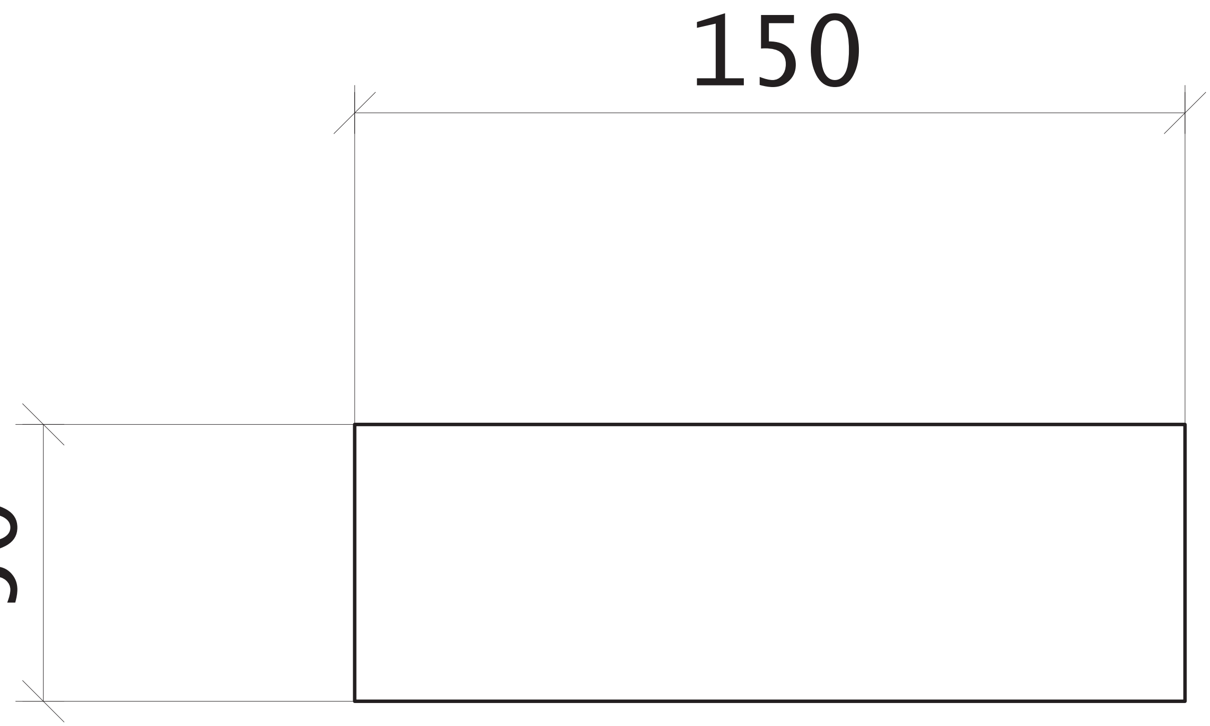
75X12FL X 250

2 REQUIRED AS DRAWN MARKED PL119

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

STRUCAD

GENERAL NOTES. TOTAL WEIGHT 1.8 kg. Kg. STEEL GRADE 300+ ALL HOLES 18 mm DIA UNO.	ICR drafting industrial-commercial-rural SPECIALIZING IN STRUCTURAL STEEL DETAILING PH - 07 4613 4961 FAX - 07 4613 4716 MOB - 0411 574 591 EMAIL - mcs80@bigpond.com	CLIENT LOGAN STEL - J & P RICHARSDON PROJECT URBAN UTILITIES PUMP STATIONS TITLE FITTING DETAILS
GENERAL NOTES.	DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****	JOB No. 1112-018 | SCALE. NTS | DRG No. PL119 | REV. A



50X10FL X 150

18 REQUIRED AS DRAWN MARKED PL13

PHASE SP001(17) , SP034UPPER(1)
FINISH SP001HDG(17) , SP034HDG(1)

STRUCAD

GENERAL NOTES.
TOTAL WEIGHT 0.6 kg. Kg.
STEEL GRADE 300+

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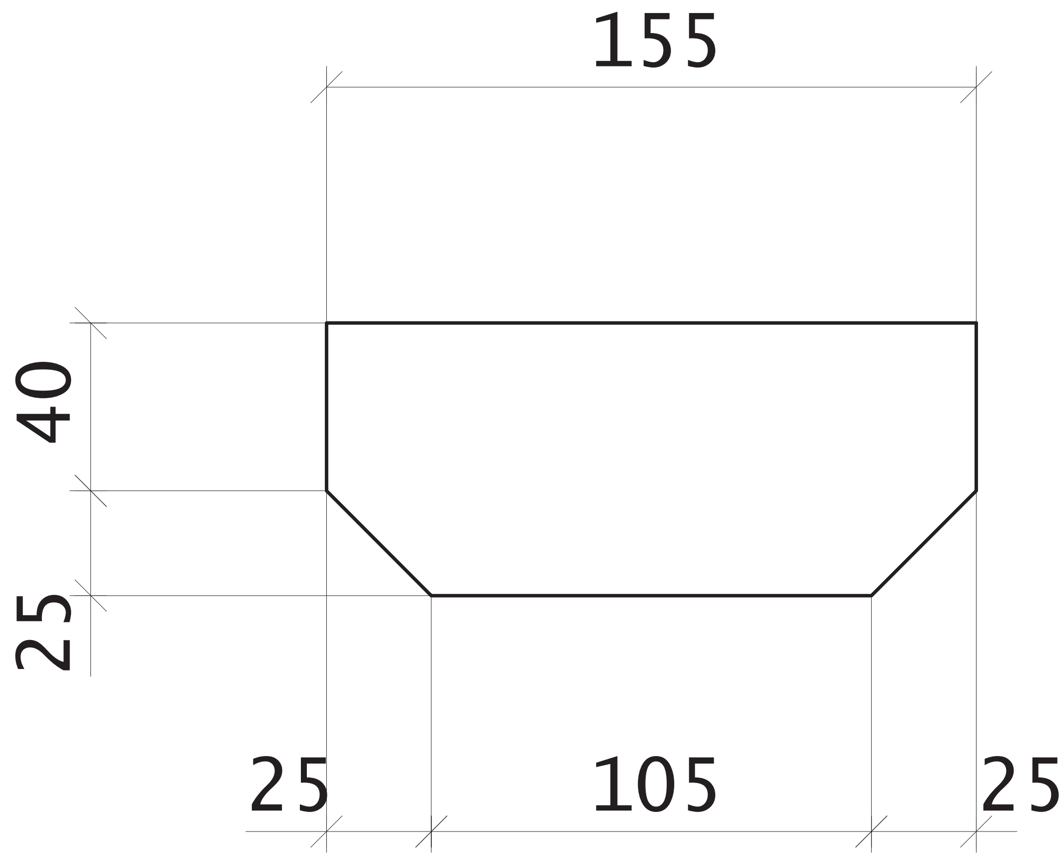
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE FITTING DETAILS

GENERAL NOTES.	DRN. MCS	DATE. 13/10/12	***** IF IN DOUBT - ASK *****	JOB No. 1112-018	SCALE. NTS	DRG No. PL13	REV. A



65X10FL X 155

9 REQUIRED AS DRAWN MARKED PL64

PHASE SP034UPPER(3) , SP033PLATFORM(6)
FINISH SP033HDG(6) , SP034HDG(3)

STRUCAD

GENERAL NOTES.
TOTAL WEIGHT 0.7 kg. Kg.
STEEL GRADE 300+

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industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE FITTING DETAILS

GENERAL NOTES.	DRN. MCS	DATE. 13/10/12	***** IF IN DOUBT - ASK *****	JOB No. 1112-018	SCALE. NTS	DRG No. PL64	REV. A

ICR Drafting Pty Ltd STRUCAD FITTING LIST Model : 1112018

Client : LOGAN STEEL
Contract : LOGAN STEL - J & P RICHARSDON
Site : URBAN UTILITIES PUMP STATIONS
PHASE : SP034UPPER

Date : 13-10-12
Time : 10:22:16
Draughtsman : MCS

Mark	No.	Section Size	Mass (kg/m)	Grade	Length (m)	Area (m2)	Mass (t)	Cut Note
CL01	19	A253MPG	0.59	300+	0.993	1.059	0.011	
CL23	8	STANDARBP	5.89	300+	0.146	0.211	0.007	
CL25	55	T4A253MPG	0.59	300+	0.640	1.979	0.021	
CL27	11	TREADEND	2.55	300+	0.153	0.243	0.004	
CL29	12	STAUNCOLLAR	2.00	300+	0.010	0.050	0.002	
CL149	150	A253MPG	0.59	300+	1.324	11.144	0.117	
CL150	101	A253MPG	0.59	300+	1.074	6.090	0.064	
CL151	13	A253MPG	0.59	300+	1.580	1.152	0.012	
CL152	1	A253MPG	0.59	300+	0.090	0.005	0.000	
CL153	1	A253MPG	0.59	300+	0.540	0.030	0.000	
CL154	3	A253MPG	0.59	300+	0.363	0.061	0.001	
CL155	45	A253MPG	0.59	300+	1.834	4.628	0.049	
CL156	33	A253MPG	0.59	300+	0.744	1.380	0.014	
CL157	11	TREADEND	2.55	300+	0.153	0.243	0.004	
CL161	2	75X12FL	7.07	300+	0.209	0.076	0.003	
CL162	2	75X12FL	7.07	300+	0.100	0.038	0.001	
CL163	2	75X8EA	8.73	300+	0.050	0.034	0.001	
CL164	12	A255MPG	0.98	300+	0.905	0.655	0.011	
CL165	180	A255MPG	0.98	300+	1.540	16.677	0.272	
PL13	1	50X10FL	3.92	300+	0.150	0.019	0.001	
PL64	3	65X10FL	5.10	300+	0.155	0.069	0.002	BEV'D
PL105	13	150X10FL	11.78	300+	0.156	0.668	0.023	BEV'D
PL106	16	90X12FL	8.48	300+	0.250	0.851	0.034	
PL107	5	75X10FL	5.89	300+	0.220	0.194	0.006	
PL108	4	180X12FL	16.96	300+	0.180	0.229	0.009	BEV'D
PL109	4	75X10FL	5.89	300+	0.150	0.108	0.004	
PL110	2	50X10FL	3.92	300+	0.100	0.026	0.001	
PL111	1	200X12FL	18.84	300+	0.140	0.064	0.003	
PL112	3	90X10FL	7.07	300+	0.156	0.099	0.003	
PL113	1	90X10FL	7.07	300+	0.156	0.033	0.001	
PL114	1	150X10FL	11.78	300+	0.156	0.051	0.002	BEV'D
PL116	2	75X12FL	7.07	300+	0.170	0.063	0.002	
PL117	2	65X12FL	6.12	300+	0.100	0.034	0.001	
PL118	2	50X12FL	4.71	300+	0.500	0.126	0.005	
PL119	2	75X12FL	7.07	300+	0.250	0.091	0.004	
Totals PHASE		SP034UPPER			723 Fittings	48.482	0.695	

ICR Drafting Pty Ltd STRUCAD FITTING LIST Model : 1112018

Client : LOGAN STEEL
Contract : LOGAN STEL - J & P RICHARSDON
Site : URBAN UTILITIES PUMP STATIONS
PHASE : SP034UPPER

Date : 13-10-12
Time : 10:22:16
Draughtsman : MCS

Mark	No.	Section Size	Mass (kg/m)	Grade	Length (m)	Area (m2)	Mass (t)	Cut Note
CL163	2	75X8EA	8.73	300+	0.050	0.034	0.001	
Totals for		75X8EA			2 Fittings	0.034	0.001	
CL29	12	STAUNCOLLAR	2.00	300+	0.010	0.050	0.002	
Totals for		STAUNCOLLAR			12 Fittings	0.050	0.002	
PL13	1	50X10FL	3.92	300+	0.150	0.019	0.001	
PL110	2	50X10FL	3.92	300+	0.100	0.026	0.001	
Totals for		50X10FL			3 Fittings	0.045	0.001	
PL118	2	50X12FL	4.71	300+	0.500	0.126	0.005	
Totals for		50X12FL			2 Fittings	0.126	0.005	
PL64	3	65X10FL	5.10	300+	0.155	0.069	0.002	BEV'D
Totals for		65X10FL			3 Fittings	0.069	0.002	
PL117	2	65X12FL	6.12	300+	0.100	0.034	0.001	
Totals for		65X12FL			2 Fittings	0.034	0.001	
PL107	5	75X10FL	5.89	300+	0.220	0.194	0.006	
PL109	4	75X10FL	5.89	300+	0.150	0.108	0.004	
Totals for		75X10FL			9 Fittings	0.302	0.010	
CL161	2	75X12FL	7.07	300+	0.209	0.076	0.003	
CL162	2	75X12FL	7.07	300+	0.100	0.038	0.001	
PL116	2	75X12FL	7.07	300+	0.170	0.063	0.002	
PL119	2	75X12FL	7.07	300+	0.250	0.091	0.004	
Totals for		75X12FL			8 Fittings	0.268	0.010	
PL112	3	90X10FL	7.07	300+	0.156	0.099	0.003	
PL113	1	90X10FL	7.07	300+	0.156	0.033	0.001	
Totals for		90X10FL			4 Fittings	0.132	0.004	
PL106	16	90X12FL	8.48	300+	0.250	0.851	0.034	
Totals for		90X12FL			16 Fittings	0.851	0.034	
PL105	13	150X10FL	11.78	300+	0.156	0.668	0.023	BEV'D
PL114	1	150X10FL	11.78	300+	0.156	0.051	0.002	BEV'D
Totals for		150X10FL			14 Fittings	0.719	0.025	
PL108	4	180X12FL	16.96	300+	0.180	0.229	0.009	BEV'D
Totals for		180X12FL			4 Fittings	0.229	0.009	

1112018/rep/fitbysec_PHASE_SP034 Page 1

ICR Drafting Pty Ltd STRUCAD FITTING LIST Model : 1112018

Client : LOGAN STEEL
Contract : LOGAN STEL - J & P RICHARSDON
Site : URBAN UTILITIES PUMP STATIONS
PHASE : SP034UPPER

Date : 13-10-12
Time : 10:22:16
Draughtsman : MCS

Mark	No.	Section Size	Mass (kg/m)	Grade	Length (m)	Area (m2)	Mass (t)	Cut Note
PL111	1	200X12FL	18.84	300+	0.140	0.064	0.003	
Totals for		200X12FL			1 Fittings	0.064	0.003	
CL01	19	A253MPG	0.59	300+	0.993	1.059	0.011	
CL25	55	T4A253MPG	0.59	300+	0.640	1.979	0.021	
CL149	150	A253MPG	0.59	300+	1.324	11.144	0.117	
CL150	101	A253MPG	0.59	300+	1.074	6.090	0.064	
CL151	13	A253MPG	0.59	300+	1.580	1.152	0.012	
CL152	1	A253MPG	0.59	300+	0.090	0.005	0.000	
CL153	1	A253MPG	0.59	300+	0.540	0.030	0.000	
CL154	3	A253MPG	0.59	300+	0.363	0.061	0.001	
CL155	45	A253MPG	0.59	300+	1.834	4.628	0.049	
CL156	33	A253MPG	0.59	300+	0.744	1.380	0.014	
Totals for		A253MPG			421 Fittings	27.530	0.289	
CL164	12	A255MPG	0.98	300+	0.905	0.655	0.011	
CL165	180	A255MPG	0.98	300+	1.540	16.677	0.272	
Totals for		A255MPG			192 Fittings	17.332	0.283	
CL27	11	TREADEND	2.55	300+	0.153	0.243	0.004	
CL157	11	TREADEND	2.55	300+	0.153	0.243	0.004	
Totals for		TREADEND			22 Fittings	0.486	0.009	
CL23	8	STANDARBP	5.89	300+	0.146	0.211	0.007	
Totals for		STANDARBP			8 Fittings	0.211	0.007	
Totals PHASE		SP034UPPER			723 Fittings	48.482	0.695	

1112018/rep/fitbysec_PHASE_SP034 Page 2

ICR Drafting Pty Ltd STRUCAD HOT-ROLLED MEMBER LIST Model : 1112018

Client : LOGAN STEEL
Contract : LOGAN STEL - J & P RICHARSDON
Site : URBAN UTILITIES PUMP STATIONS
PHASE : SP034UPPER

Date : 13-10-12
Time : 10:22:17
Draughtsman : MCS

Mark	No.	Section Size	Mass (kg/m)	Grade	Length (m)	Area (m2)	Mass (t)	Cut Note
34M01	1	180X75PFC	20.90	300+	1.668	1.086	0.035	
34M02	1	180X75PFC	20.90	300+	4.712	3.059	0.098	
34M04	1	180X75PFC	20.90	300+	1.668	1.086	0.035	
34M05	1	180X75PFC	20.90	300+	1.496	0.949	0.030	
34M06	1	180X75PFC	20.90	300+	2.176	1.416	0.045	
34M07	1	180X75PFC	20.90	300+	2.301	1.497	0.048	
34M08	1	180X75PFC	20.90	300+	0.375	0.248	0.008	
34M13	1	180X75PFC	20.90	300+	2.247	1.461	0.047	
34M15	1	180X75PFC	20.90	300+	2.191	1.425	0.046	
196-PART	1	180X75PFC	20.90	300+	1.544	0.993	0.032	BEV'D
197-PART	1	180X75PFC	20.90	300+	4.520	2.909	0.093	BEV'D
198-PART	1	180X75PFC	20.90	300+	3.969	2.564	0.082	BEV'D
200-PART	1	180X75PFC	20.90	300+	4.470	2.876	0.092	BEV'D
201-PART	1	180X75PFC	20.90	300+	1.754	1.129	0.036	BEV'D
206-PART	1	180X75PFC	20.90	300+	0.404	0.254	0.008	BEV'D
222-PART	1	180X75PFC	20.90	300+	0.654	0.416	0.013	BEV'D
224-PART	1	180X75PFC	20.90	300+	0.338	0.194	0.006	BEV'D
225-PART	1	180X75PFC	20.90	300+	0.338	0.194	0.006	BEV'D
256-PART	1	180X75PFC	20.90	300+	2.272	1.478	0.047	
262-PART	1	180X75PFC	20.90	300+	0.210	0.129	0.004	BEV'D
Totals for		180X75PFC			20 Members	25.362	0.813	
233-PART	1	150X75PFC	17.70	300+	2.334	1.321	0.040	BEV'D
242-PART	1	150X75PFC	17.70	300+	2.334	1.321	0.040	BEV'D
Totals for		150X75PFC			2 Members	2.643	0.079	
34M11	1	65X6EA	5.87	300+	2.301	0.576	0.013	
34M12	1	65X6EA	5.87	300+	2.176	0.543	0.012	
34M14	1	65X6EA	5.87	300+	2.247	0.561	0.012	
34M16	1	65X6EA	5.87	300+	2.191	0.547	0.012	
Totals for		65X6EA			4 Members	2.228	0.050	
34M03	5	89X3.5SHS	9.07	300+	1.976	3.434	0.093	
34M09	3	89X3.5SHS	9.07	300+	1.976	2.060	0.056	
34M10	2	89X3.5SHS	9.07	300+	1.976	1.374	0.037	
Totals for		89X3.5SHS			10 Members	6.868	0.186	
226-PART	2	42X3.2CHS	3.09	300+	1.038	0.258	0.006	BEV'D
227-PART	2	42X3.2CHS	3.09	300+	0.276	0.066	0.002	BEV'D
230-PART	2	42X3.2CHS	3.09	300+	0.164	0.033	0.001	BEV'D
241-PART	2	42X3.2CHS	3.09	300+	0.162	0.040	0.001	BEV'D
254-PART	2	42X3.2CHS	3.09	300+	0.192	0.044	0.001	BEV'D
255-PART	2	42X3.2CHS	3.09	300+	2.581	0.643	0.016	BEV'D
Totals for		42X3.2CHS			12 Members	1.084	0.026	
272-PART	1	48.3CHSSTAUNCHI	5.56	300+	1.007	0.146	0.004	
Totals for		48.3CHSSTAUNCHION			1 Members	0.146	0.004	
235-PART	4	42.4CHSTOPRAIL	4.00	300+	2.842	1.416	0.034	BEV'D
238-PART	18	42.4CHSTOPRAIL	4.00	300+	0.281	0.599	0.014	BEV'D
239-PART	18	42.4CHSTOPRAIL	4.00	300+	0.499	1.046	0.025	BEV'D
244-PART	2	42.4CHSTOPRAIL	4.00	300+	1.742	0.430	0.010	BEV'D
251-PART	1	42.4CHSTOPRAIL	4.00	300+	3.007	0.375	0.009	BEV'D
253-PART	1	42.4CHSTOPRAIL	4.00	300+	3.985	0.498	0.012	BEV'D
266-PART	1	42.4CHSTOPRAIL	4.00	300+	0.735	0.088	0.002	BEV'D

1112018/rep/hrmemsec_PHASE_SP034 Page 1

ICR Drafting Pty Ltd   STRUCAD HOT-ROLLED MEMBER LIST   Model : 1112018

Client   : LOGAN STEEL   Date   : 13-10-12
Contract : LOGAN STEL - J & P RICHARSDON Time   : 10:22:17
Site   : URBAN UTILITIES PUMP STATIONS Draughtsman : MCS
PHASE   : SP034UPPER

Mark	No.	Section Size	Mass (kg/m)	Grade	Length (m)	Area (m2)	Mass (t)	Cut Note
273-PART	1	42.4CHSTOPRAIL	4.00	300+	0.592	0.070	0.002	BEV'D
Totals for		42.4CHSTOPRAIL			46 Members	4.521	0.110	
236-PART	4	33.7CHSMIDRAIL	3.50	300+	2.400	0.951	0.023	
248-PART	2	33.7CHSMIDRAIL	3.50	300+	1.300	0.258	0.006	
250-PART	1	33.7CHSMIDRAIL	3.50	300+	2.565	0.254	0.006	
260-PART	1	33.7CHSMIDRAIL	3.50	300+	3.532	0.350	0.008	
270-PART	1	33.7CHSMIDRAIL	3.50	300+	0.509	0.049	0.001	BEV'D
274-PART	1	33.7CHSMIDRAIL	3.50	300+	0.366	0.035	0.001	BEV'D
Totals for		33.7CHSMIDRAIL			10 Members	1.896	0.046	
245-PART	7	48.3SSTAUNCHION	5.56	300+	1.129	1.147	0.028	
Totals for		48.3SSTAUNCHION			7 Members	1.147	0.028	
234-PART	12	48.3CSTAUNCHION	5.56	300+	1.167	2.032	0.050	
Totals for		48.3CSTAUNCHION			12 Members	2.032	0.050	
259-PART	8	N20REO	2.46	300+	0.537	0.275	0.011	
Totals for		N20REO			8 Members	0.275	0.011	
257-PART	1	DROPBAR	1.00	300+	0.525	0.034	0.001	
Totals for		DROPBAR			1 Members	0.034	0.001	
258-PART	1	65X12FL	6.12	300+	3.225	0.498	0.020	
261-PART	1	65X12FL	6.12	300+	3.225	0.498	0.020	
Totals for		65X12FL			2 Members	0.996	0.039	
240-PART	4	100X6KICKPLATE	4.71	300+	2.842	2.415	0.054	
246-PART	2	100X6KICKPLATE	4.71	300+	1.742	0.741	0.016	
247-PART	1	100X6KICKPLATE	4.71	300+	3.007	0.639	0.014	
263-PART	1	100X6KICKPLATE	4.71	300+	3.985	0.846	0.019	
271-PART	1	100X6KICKPLATE	4.71	300+	0.684	0.146	0.003	
275-PART	1	100X6KICKPLATE	4.71	300+	0.525	0.112	0.002	
Totals for		100X6KICKPLATE			10 Members	4.900	0.109	
33T01	11	T4A253MPG	0.59	300+	0.640	0.396	0.004	
34G01	1	A253MPG	0.59	300+	1.074	0.060	0.001	
34G02	3	A253MPG	0.59	300+	1.074	0.181	0.002	
34G03	1	A253MPG	0.59	300+	1.834	0.103	0.001	
34G04	4	A253MPG	0.59	300+	1.324	0.297	0.003	
34G05	1	A253MPG	0.59	300+	1.834	0.103	0.001	
34G06	1	A253MPG	0.59	300+	0.744	0.042	0.000	
Totals for		A253MPG			22 Members	1.182	0.012	
34G07	6	A255MPG	0.98	300+	1.540	0.556	0.009	
Totals for		A255MPG			6 Members	0.556	0.009	

1112018/rep/hrmemsec_PHASE_SP034   Page 2

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 ICR Drafting Pty Ltd     STRUCAD HOT-ROLLED MEMBER LIST      Model : 1112018
-------------------------------------------------------------------------------------
 Client   : LOGAN STEEL                                 Date        : 13-10-12
 Contract : LOGAN STEL - J & P RICHARSDON               Time        : 10:22:17
 Site     : URBAN UTILITIES PUMP STATIONS               Draughtsman : MCS
 PHASE    : SP034UPPER
-------------------------------------------------------------------------------------
 Mark        No.  Section Size      Mass  Grade  Length     Area       Mass   Cut
                                  (kg/m)           (m)      (m2)        (t)   Note
-------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------
 Totals PHASE        SP034UPPER            173 Members     55.868     1.571
-------------------------------------------------------------------------------------
```

ICR Drafting Pty Ltd PARTS LIST BY MARK Model : 1112018

Client : LOGAN STEEL
Contract : LOGAN STEL - J & P RICHARSDON
Site : URBAN UTILITIES PUMP STATIONS
PHASE : SP034UPPER

Date : 13-10-12
Time : 10:22:17
Draughtsman : MCS

Mark	Qty	Section Size	Mass (kg/m)	Grade	Length (m)	Area (m2)	Mass (t)
33T01	11	T4A253MPG	0.59	300+	0.640	2.861	0.033
34G01	1	A253MPG	0.59	300+	1.074	2.782	0.029
34G02	3	A253MPG	0.59	300+	1.074	6.485	0.068
34G03	1	A253MPG	0.59	300+	1.834	3.609	0.038
34G04	4	A253MPG	0.59	300+	1.324	10.550	0.111
34G05	1	A253MPG	0.59	300+	1.834	1.378	0.014
34G06	1	A253MPG	0.59	300+	0.744	1.533	0.016
34G07	6	A255MPG	0.98	300+	1.540	17.888	0.292
34M01	1	180X75PFC	20.90	300+	1.668	1.226	0.040
34M02	1	180X75PFC	20.90	300+	4.712	3.161	0.102
34M03	5	89X3.5SHS	9.07	300+	1.976	4.160	0.121
34M04	1	180X75PFC	20.90	300+	1.668	1.193	0.038
34M05	1	180X75PFC	20.90	300+	1.496	1.140	0.037
34M06	1	180X75PFC	20.90	300+	2.176	1.416	0.045
34M07	1	180X75PFC	20.90	300+	2.301	1.548	0.050
34M08	1	180X75PFC	20.90	300+	0.375	0.300	0.010
34M09	3	89X3.5SHS	9.07	300+	1.976	2.379	0.068
34M10	2	89X3.5SHS	9.07	300+	1.976	1.710	0.050
34M11	1	65X6EA	5.87	300+	2.301	0.576	0.013
34M12	1	65X6EA	5.87	300+	2.176	0.543	0.012
34M13	1	180X75PFC	20.90	300+	2.247	1.512	0.049
34M14	1	65X6EA	5.87	300+	2.247	0.561	0.012
34M15	1	180X75PFC	20.90	300+	2.191	1.425	0.046
34M16	1	65X6EA	5.87	300+	2.191	0.547	0.012
AS-69	1	42.4CHSTOPRAIL	4.00	300+	0.735	1.046	0.025
AS-62	1	42.4CHSTOPRAIL	4.00	300+	3.007	2.021	0.048
AS-61	1	42.4CHSTOPRAIL	4.00	300+	3.985	2.447	0.058
AS-60	1	65X12FL	6.12	300+	3.225	1.614	0.062
AS-59	1	180X75PFC	20.90	300+	3.969	4.273	0.137
AS-58	1	180X75PFC	20.90	300+	4.520	4.272	0.137
AS-57	1	180X75PFC	20.90	300+	4.470	4.537	0.146
AS-56	1	180X75PFC	20.90	300+	0.338	2.134	0.062
AS-55	1	180X75PFC	20.90	300+	0.338	2.134	0.062
AS-54	1	42.4CHSTOPRAIL	4.00	300+	1.742	1.244	0.030

1112018/rep/prtbymrk_PHASE_SP034 Page 1

ICR Drafting Pty Ltd PARTS LIST BY MARK Model : 1112018

Client : LOGAN STEEL
Contract : LOGAN STEL - J & P RICHARSDON
Site : URBAN UTILITIES PUMP STATIONS
PHASE : SP034UPPER

Date : 13-10-12
Time : 10:22:17
Draughtsman : MCS

Mark	Qty	Section Size	Mass (kg/m)	Grade	Length (m)	Area (m2)	Mass (t)
AS-53	2	42.4CHSTOPRAIL	4.00	300+	2.842	3.450	0.082
AS-52	1	42.4CHSTOPRAIL	4.00	300+	1.742	1.244	0.030
AS-51	2	42.4CHSTOPRAIL	4.00	300+	2.842	3.450	0.082

PHASE	SP034UPPER	Totals for 66 Parts	104.351	2.266

1112018/rep/prtbymrk_PHASE_SP034 Page 2

ICR Drafting Pty Ltd — STRUCAD SITE BOLT SUMMARY — Model : 1112018

Client : LOGAN STEEL
Contract : LOGAN STEL - J & P RICHARSDON
Site : URBAN UTILITIES PUMP STATIONS
PHASE : SP034UPPER

Date : 13-10-12
Time : 10:22:17
Draughtsman : MCS

Diameter (mm)	Bolt Grade	Bolt Type	Length (mm)	Total Quantity
12	8.8S	BNW	35	44
12	CHE	RAMSET	160	18
12	DYN	RAMSET	70	16
16	8.8S	BNW	40	20
16	8.8S	BNW	45	14
16	8.8S	BNW	75	2
16	CHE	RAMSET	190	26
20	8.8S	BNW	45	2
20	8.8S	BNW	50	44
20	8.8S	BNW	55	20

1112018/rep/sibltsum_PHASE_SP034 Page 1

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
196-PART	180X75PFC	300+	1544	1	0.99	31.7
				TOTAL	0.99	31.7

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

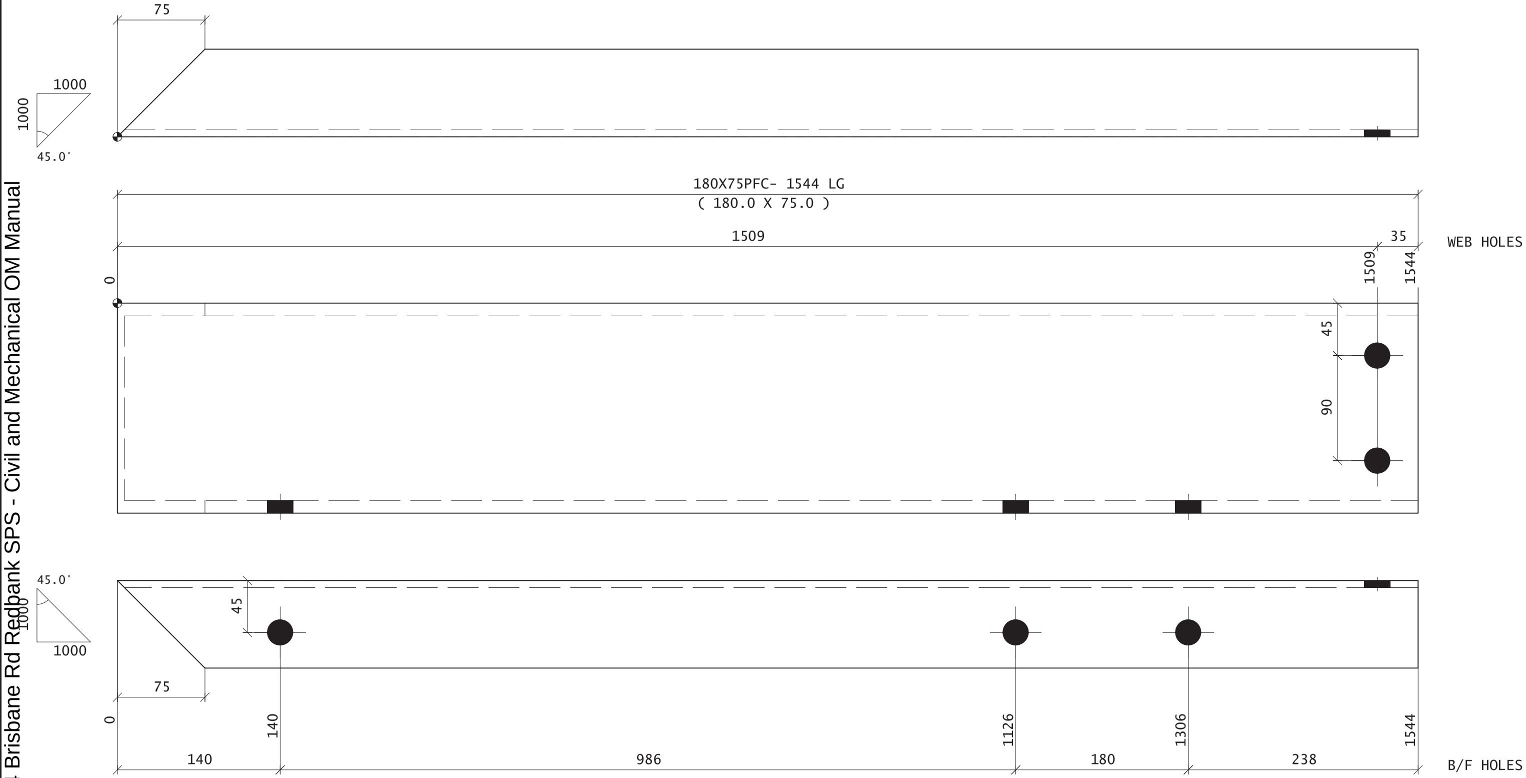
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 196-PART
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES
BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 31.7 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
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SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL
JOB No. 1112-018 | SCALE. NTS | DRG No. X196-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
197-PART	180X75PFC	300+	4520	1	2.91	93.4
				TOTAL	2.91	93.4

THIS MEMBER TO BE HOT DIPPED GALVANISED.

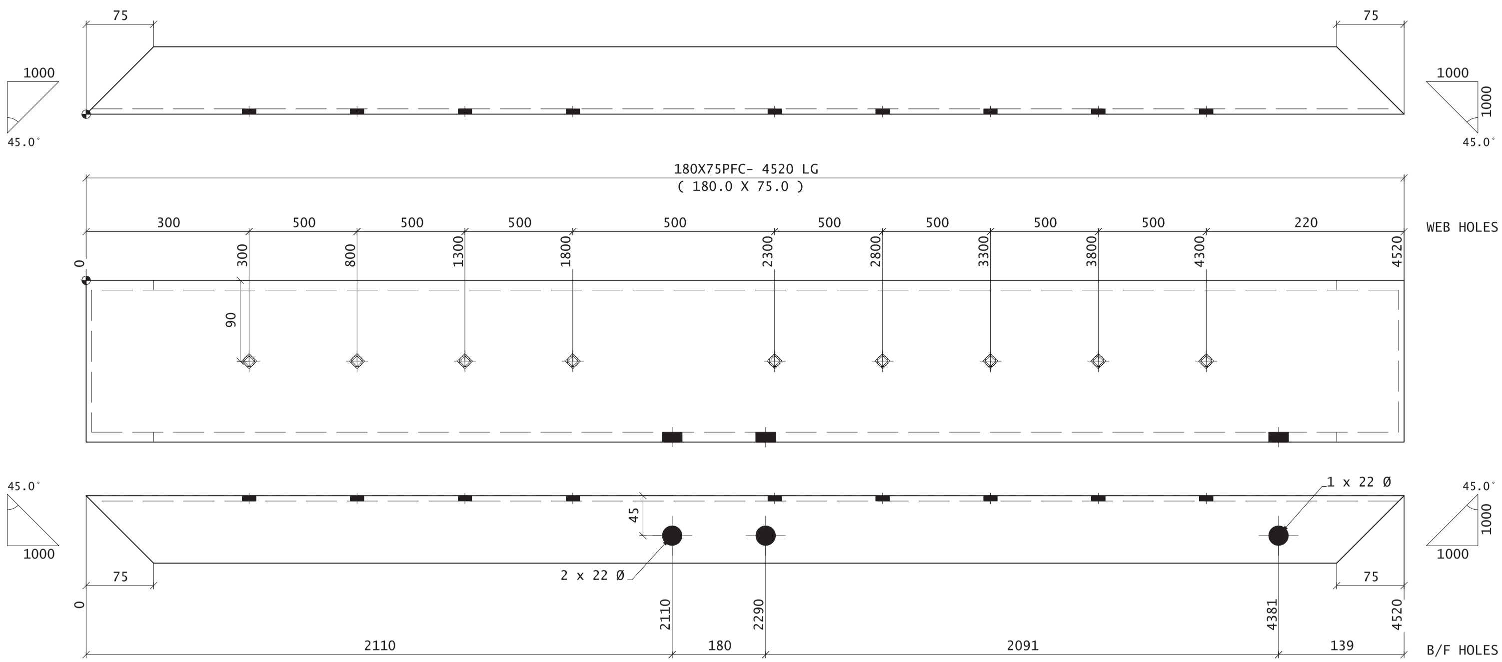
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 197-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 15 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 93.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

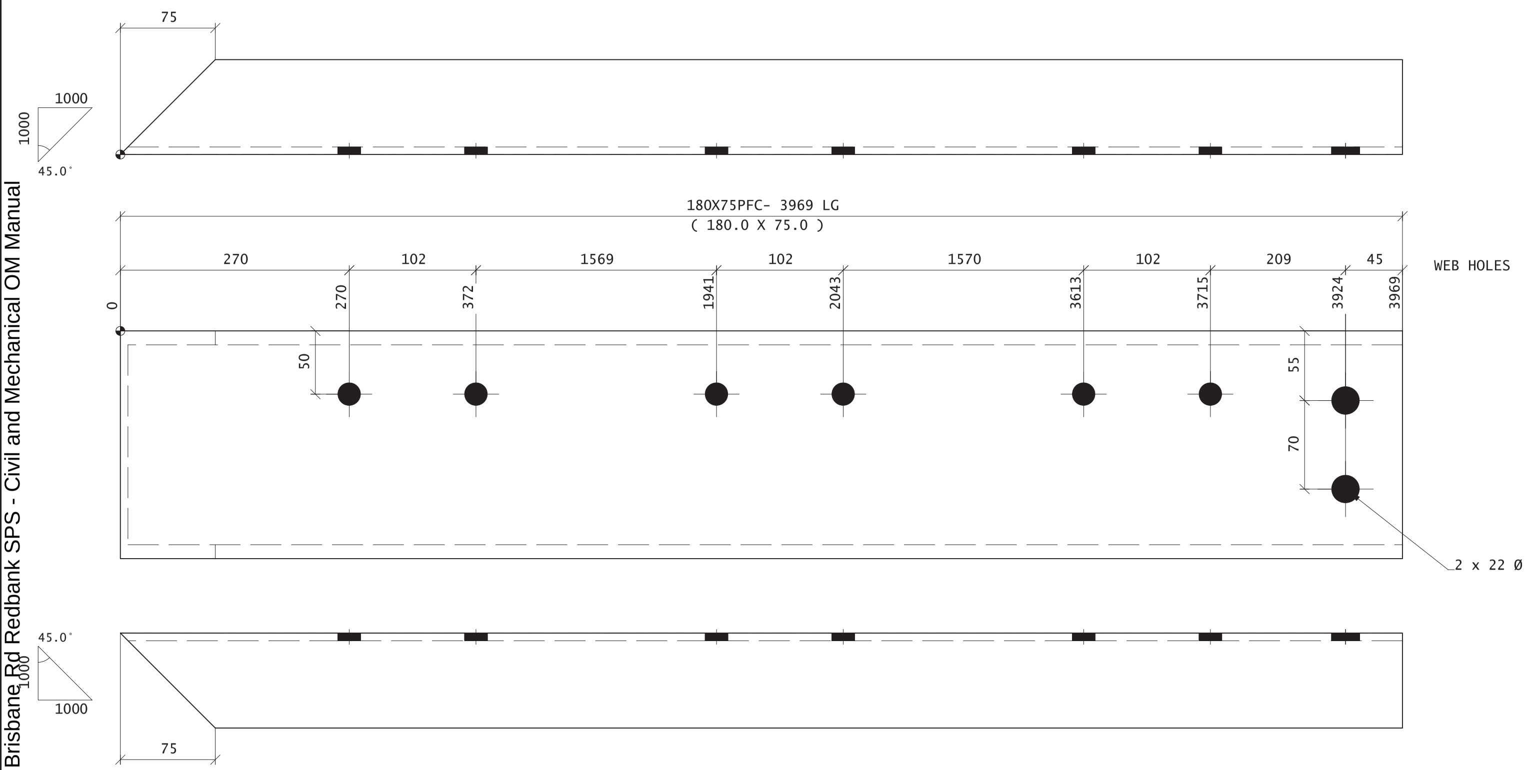
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X197-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
198-PART	180X75PFC	300+	3969	1	2.56	82.4
				TOTAL	2.56	82.4



THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQUIRED AS DRAWN MARKED 198-PART

PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 18 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 82.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X198-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
200-PART	180X75PFC	300+	4470	1	2.88	92.3
				TOTAL	2.88	92.3

THIS MEMBER TO BE HOT DIPPED GALVANISED.

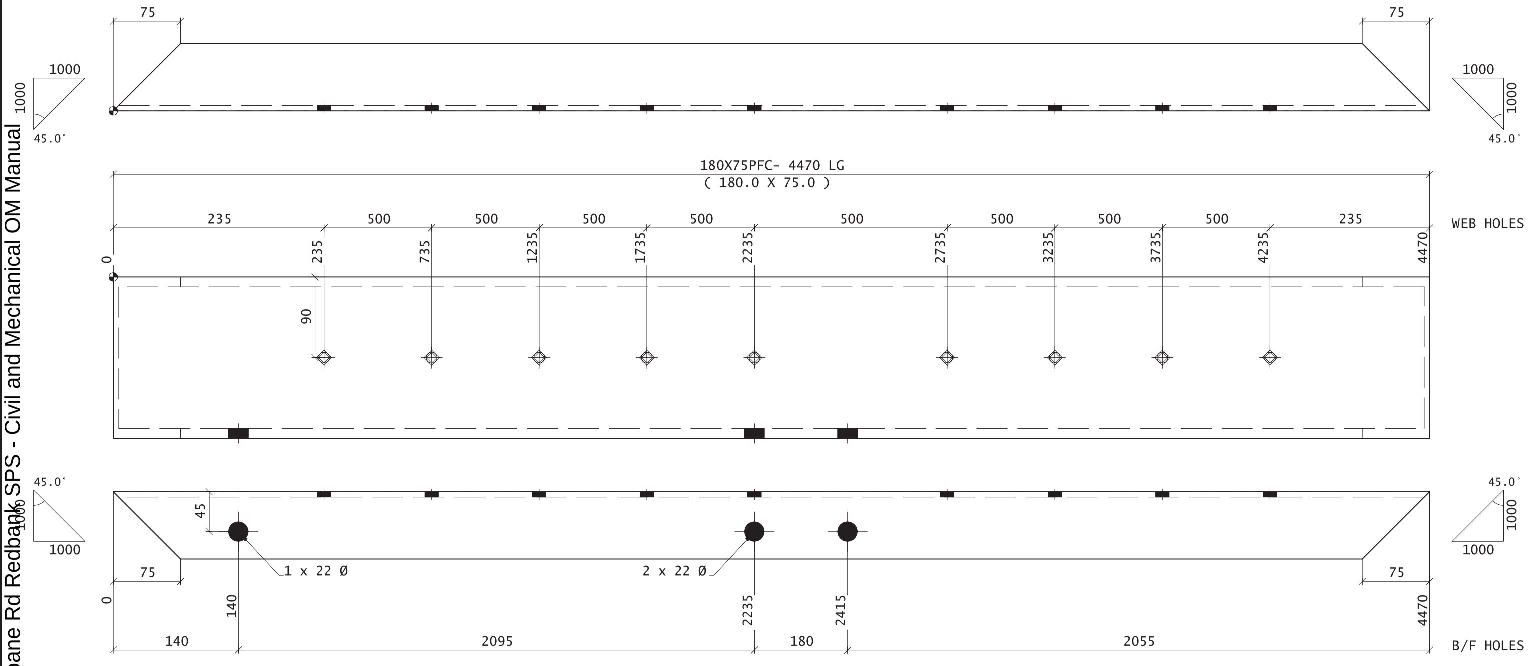
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQUIRED AS DRAWN MARKED 200-PART

PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 15 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 92.3 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

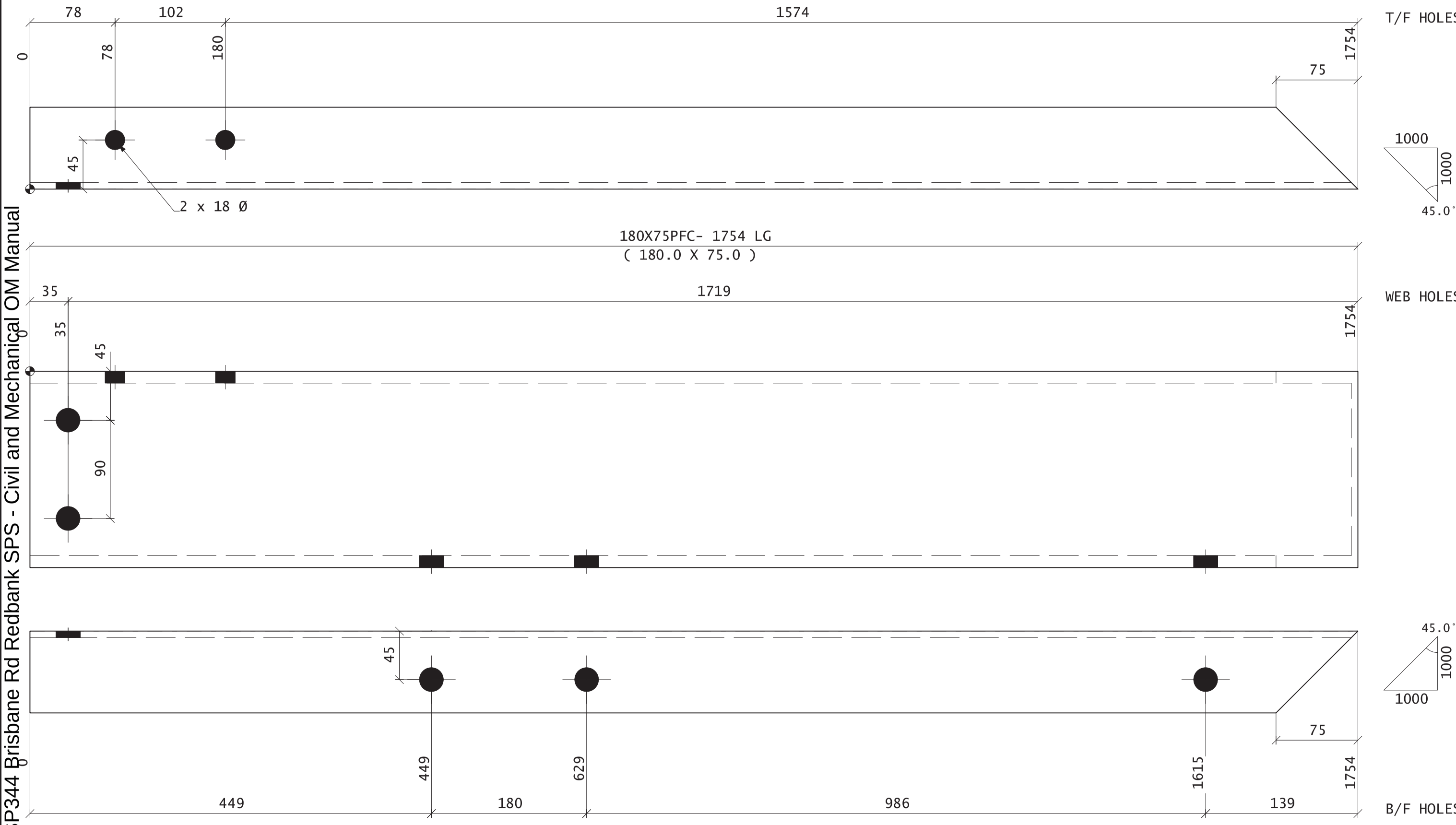
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS DATE. 13/10/12 ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 SCALE. NTS DRG No. X200-PART REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
201-PART	180X75PFC	300+	1754	1	1.13	36.1
				TOTAL	1.13	36.1



THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

1 REQUIRED AS DRAWN MARKED 201-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 36.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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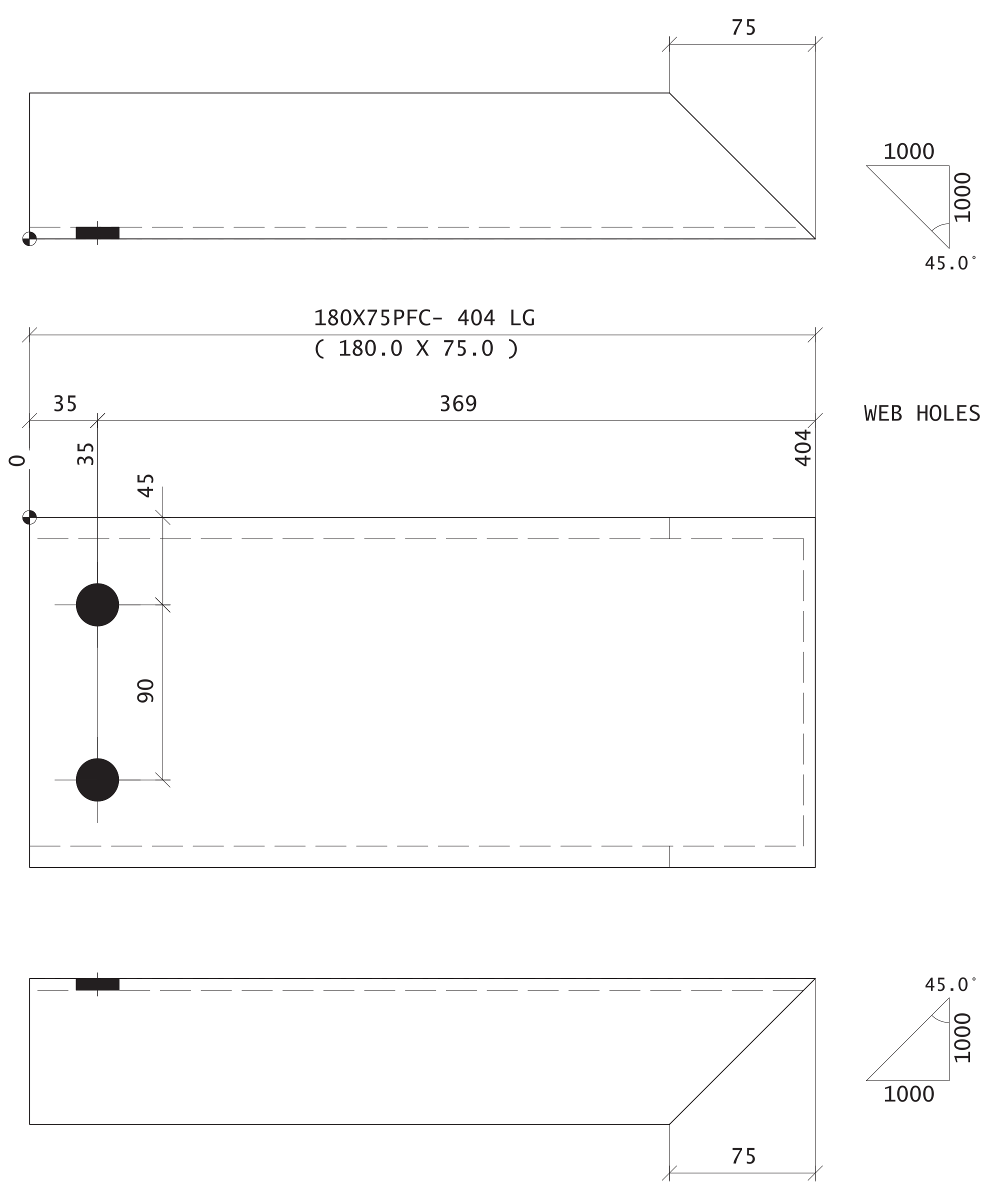
SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X201-PART | REV. A



1 REQUIRED AS DRAWN MARKED 206-PART (NO ASSEMBLY)

PHASE SP034UPPER
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY

MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
206-PART	180X75PFC	300+	404	1	0.25	7.9
				TOTAL	0.25	7.9

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 7.9 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

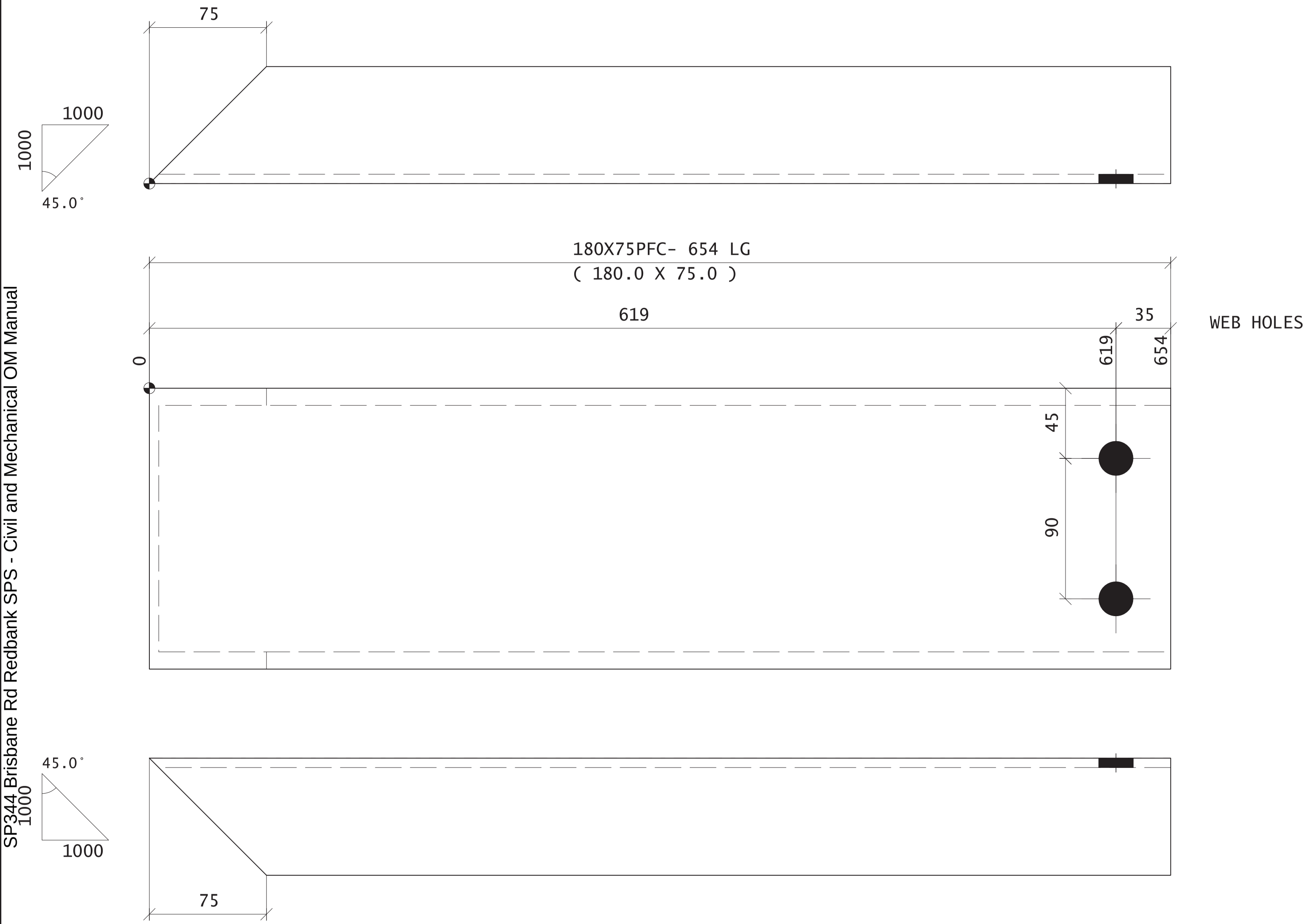
CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X206-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
222-PART	180X75PFC	300+	654	1	0.42	13.1
				TOTAL	0.42	13.1



THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

1 REQUIRED AS DRAWN MARKED 222-PART (NO ASSEMBLY)

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 13.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
industrial-commercial-rural

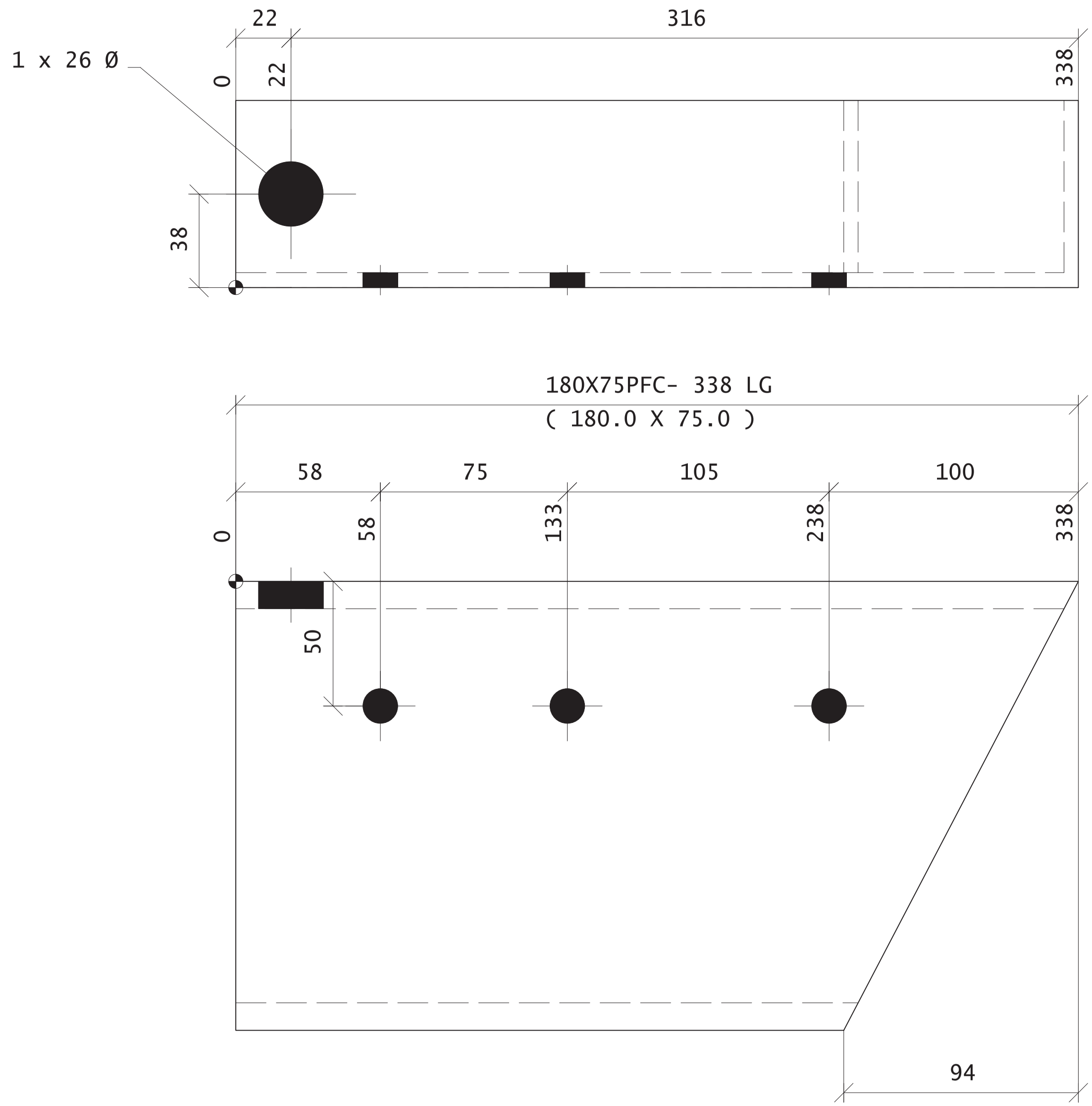
SPECIALIZING IN STRUCTURAL STEEL DETAILING

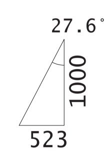
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X222-PART | REV.





1 REQUIRED AS DRAWN MARKED 224-PART
PHASE SP034UPPER
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
224-PART	180X75PFC	300+	338	1	0.19	6.1
				TOTAL	0.19	6.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 14 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 6.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
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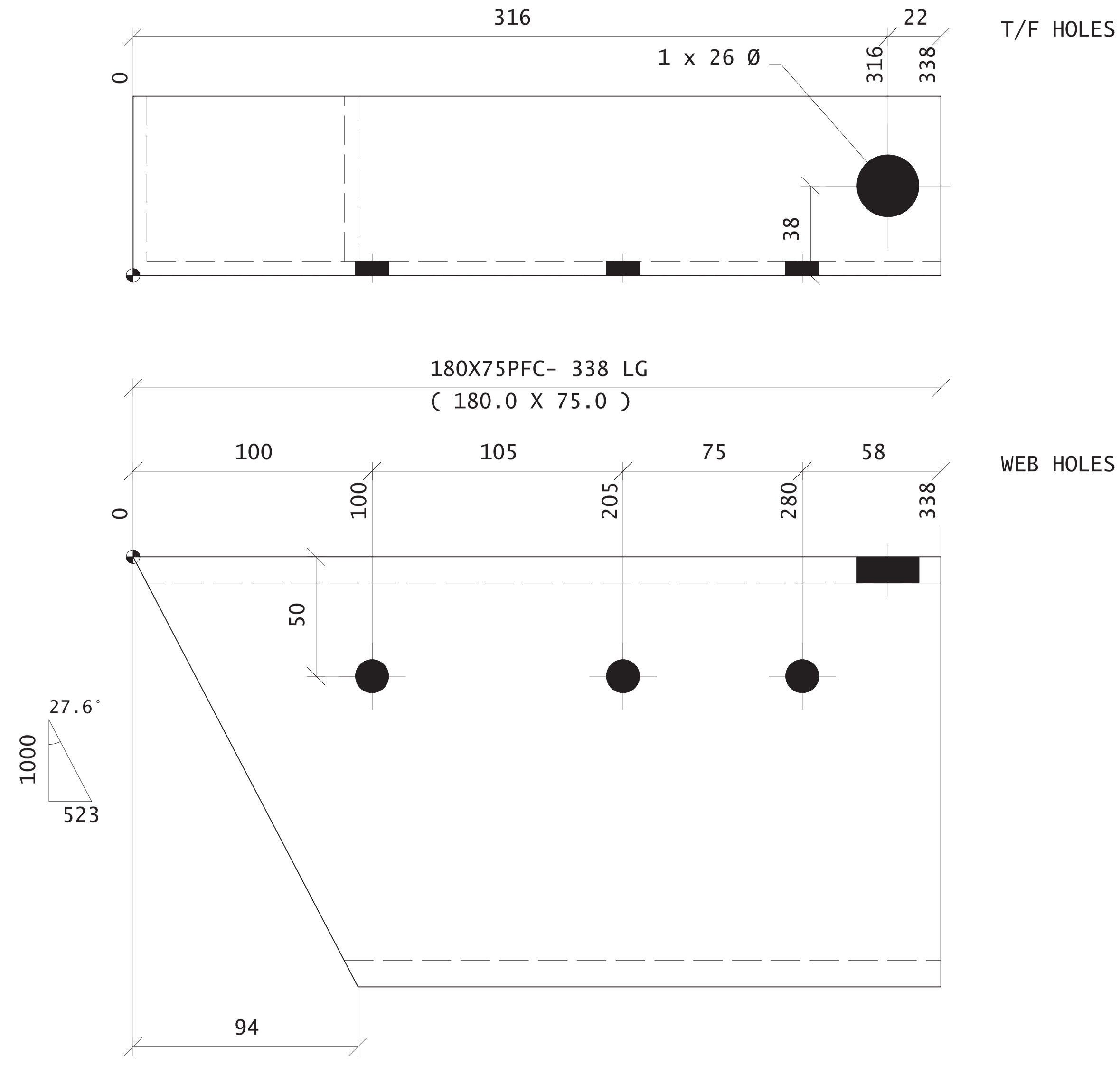
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X224-PART | REV. A



1 REQUIRED AS DRAWN MARKED 225-PART
PHASE SP034UPPER
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
225-PART	180X75PFC	300+	338	1	0.19	6.1
				TOTAL	0.19	6.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 14 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 6.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X225-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
226-PART	42X3.2CHS	300+	1038	1	0.13	3.1
				TOTAL	0.13	3.1

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

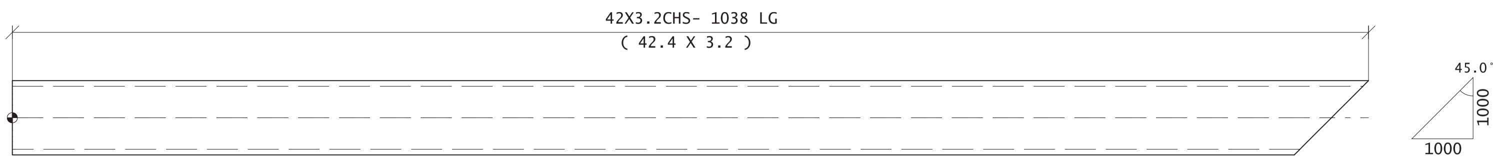
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

2 REQUIRED AS DRAWN MARKED 226-PART (NO ASSEMBLY)
PHASE SP034UPPER(2)
FINISH SP034HDG(2)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 3.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL
JOB No. 1112-018 | SCALE. NTS | DRG No. X226-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
227-PART	42X3.2CHS	300+	276	1	0.03	0.8
				TOTAL	0.03	0.8

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

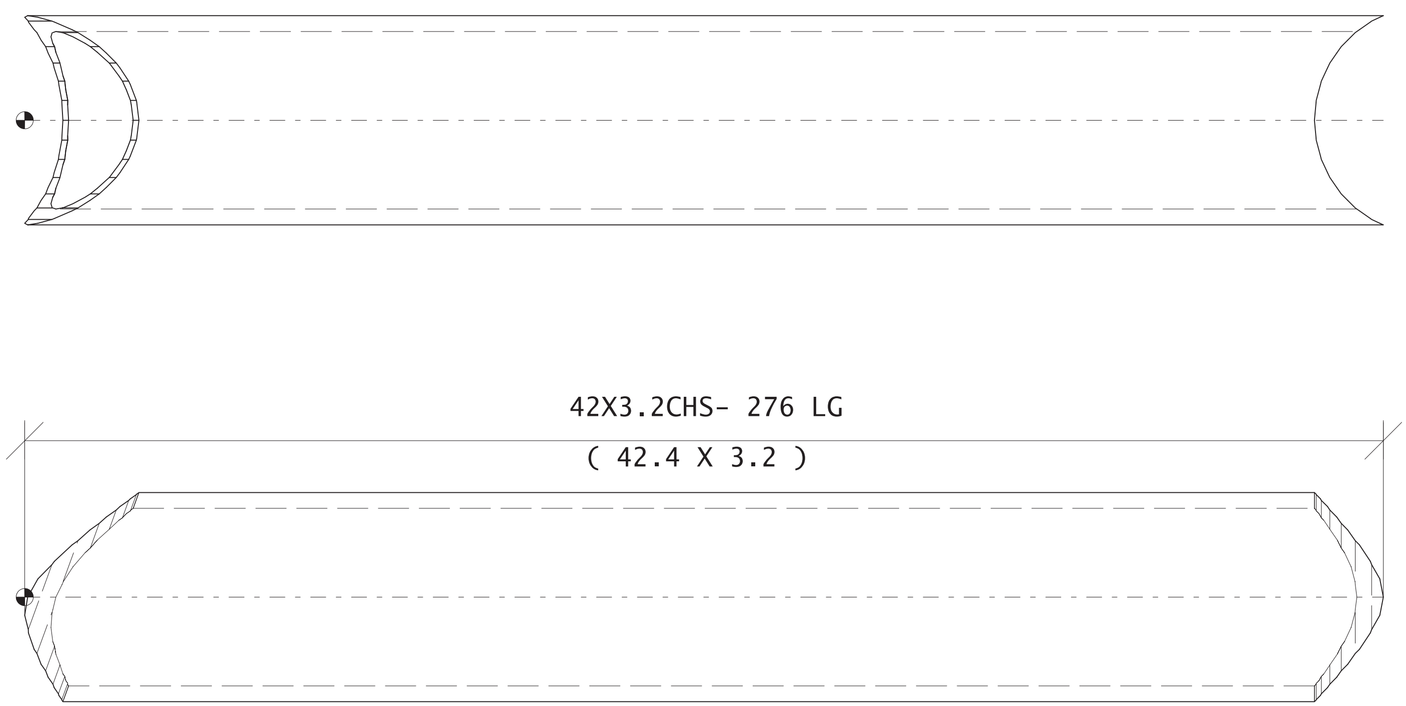
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



2 REQUIRED AS DRAWN MARKED 227-PART (NO ASSEMBLY)

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 0.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X227-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
230-PART	42X3.2CHS	300+	164	1	0.02	0.4
				TOTAL	0.02	0.4

THIS MEMBER TO BE HOT DIPPED GALVANISED.

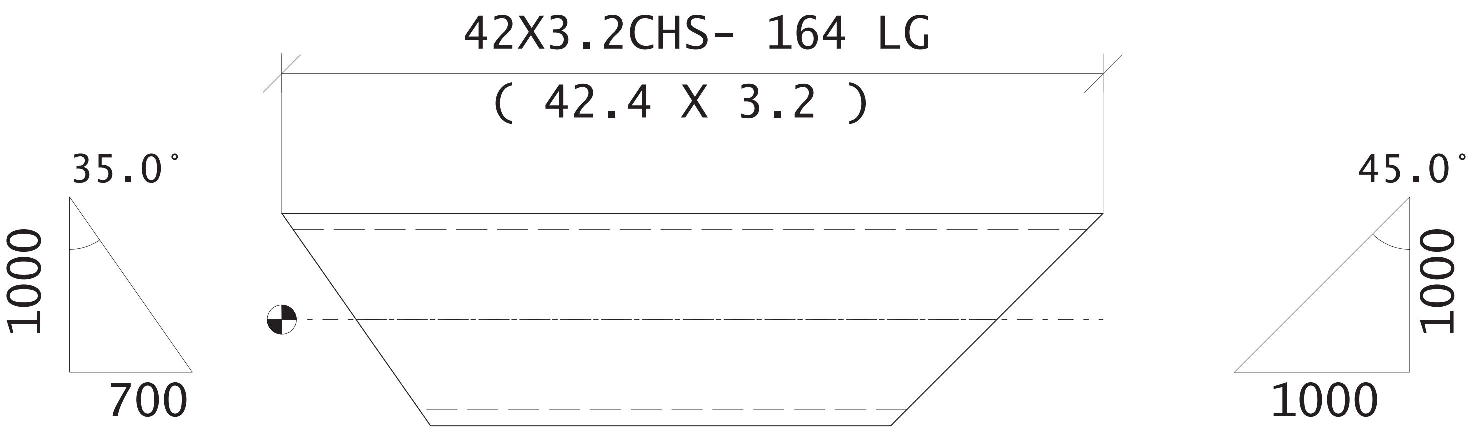
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



2 REQUIRED AS DRAWN MARKED 230-PART (NO ASSEMBLY)

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 0.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X230-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
233-PART	150X75PFC	300+	2334	1	1.32	39.6
				TOTAL	1.32	39.6

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

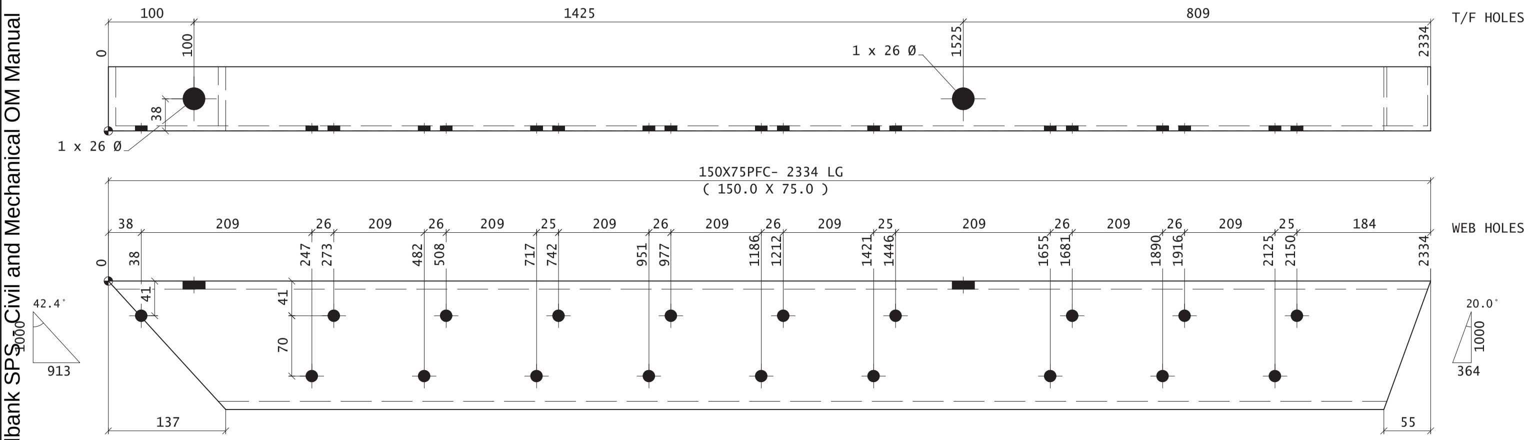
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQUIRED AS DRAWN MARKED 233-PART

PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 14 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 39.6 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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MOB - 0411 574 591
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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL
JOB No. 1112-018 | SCALE. NTS | DRG No. X233-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
234-PART	48.3CSTAUNCHION	300+	1167	1	0.17	4.1
				TOTAL	0.17	4.1

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

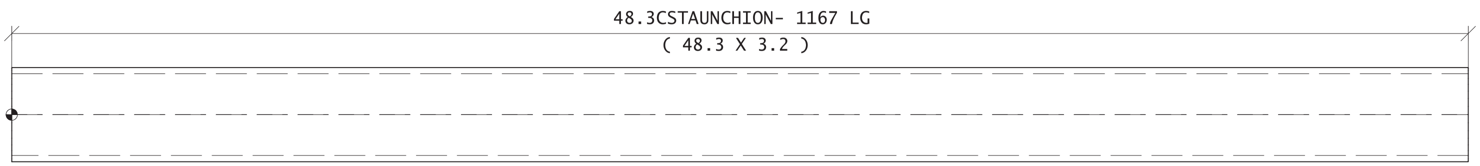
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

12 REQUIRED AS DRAWN MARKED 234-PART
PHASE SP034UPPER(12)
FINISH SP034HDG(12)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 4.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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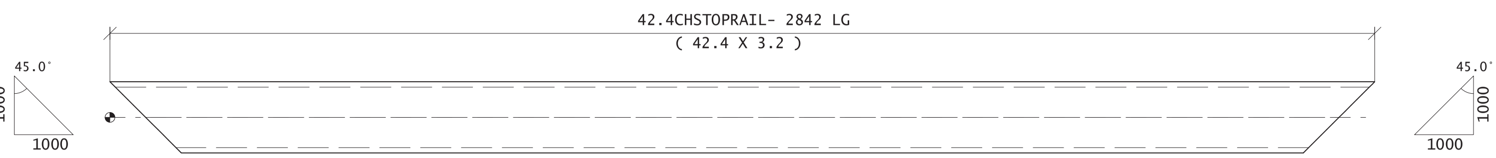
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X234-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
235-PART	42.4CHSTOPRAIL	300+	2842	1	0.35	8.6
				TOTAL	0.35	8.6



THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

4 REQUIRED AS DRAWN MARKED 235-PART (NO ASSEMBLY)
PHASE SP034UPPER(4)
FINISH SP034HDG(4)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 8.6 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X235-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
236-PART	33.7CHSMIDRAIL	300+	2400	1	0.24	5.7
				TOTAL	0.24	5.7

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

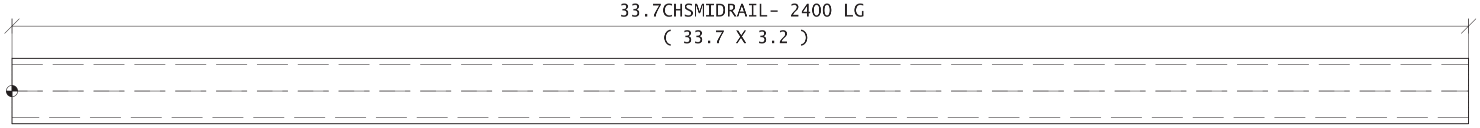
GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

33.7CHSMIDRAIL- 2400 LG
(33.7 X 3.2)



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

4 REQUIRED AS DRAWN MARKED 236-PART (NO ASSEMBLY)
PHASE SP034UPPER(4)
FINISH SP034HDG(4)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 5.7 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING
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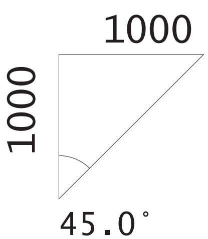
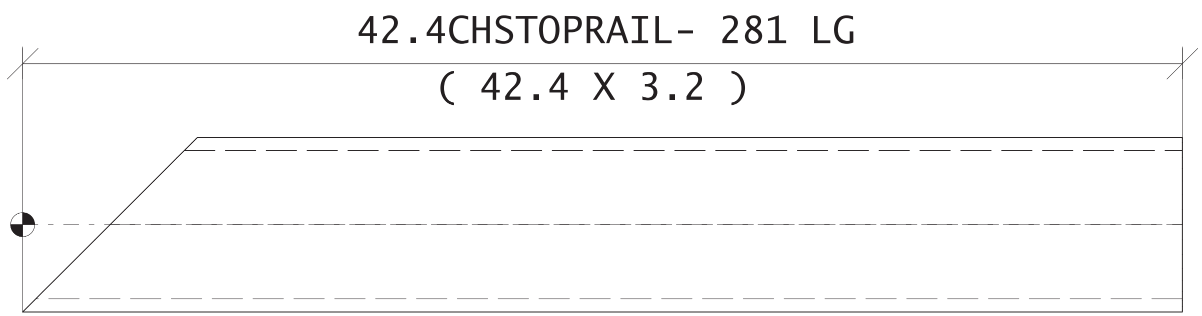
DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X236-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
238-PART	42.4CHSTOPRAIL	300+	281	1	0.03	0.8
				TOTAL	0.03	0.8





THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

18 REQUIRED AS DRAWN MARKED 238-PART (NO ASSEMBLY)

PHASE SP034UPPER(18)
FINISH SP034HDG(18)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 0.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING
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MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X238-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
239-PART	42.4CHSTOPRAIL	300+	499	1	0.06	1.4
				TOTAL	0.06	1.4

THIS MEMBER TO BE HOT DIPPED GALVANISED.

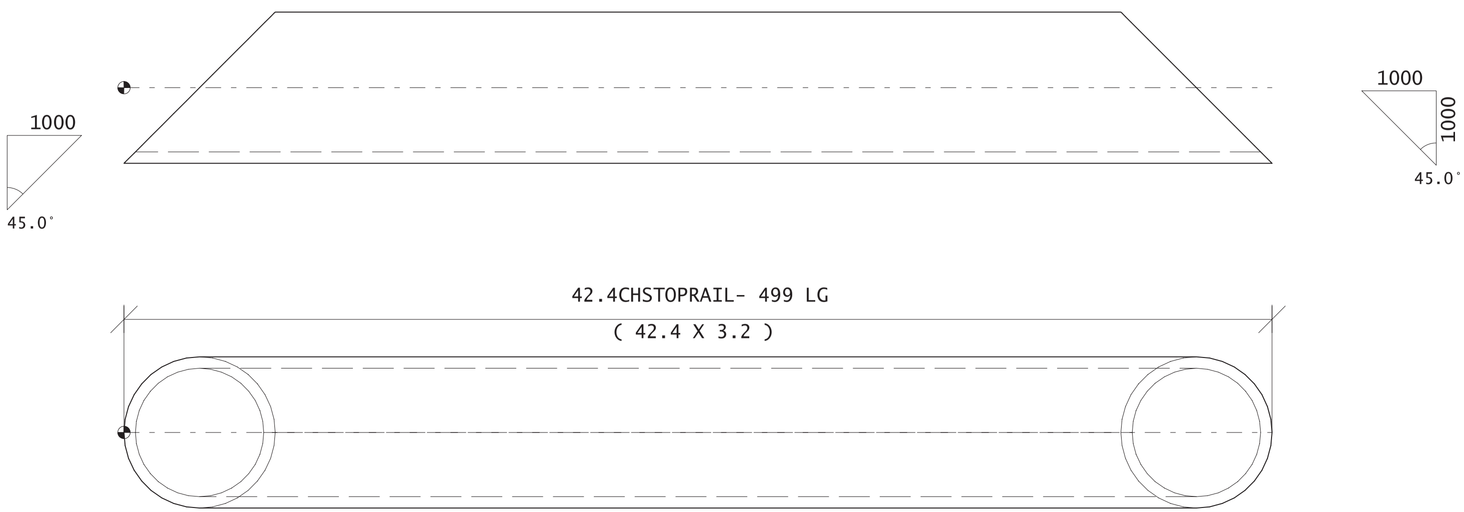
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



18 REQUIRED AS DRAWN MARKED 239-PART (NO ASSEMBLY)

PHASE SP034UPPER(18)
FINISH SP034HDG(18)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 1.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X239-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
241-PART	42X3.2CHS	300+	162	1	0.02	0.5
				TOTAL	0.02	0.5

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

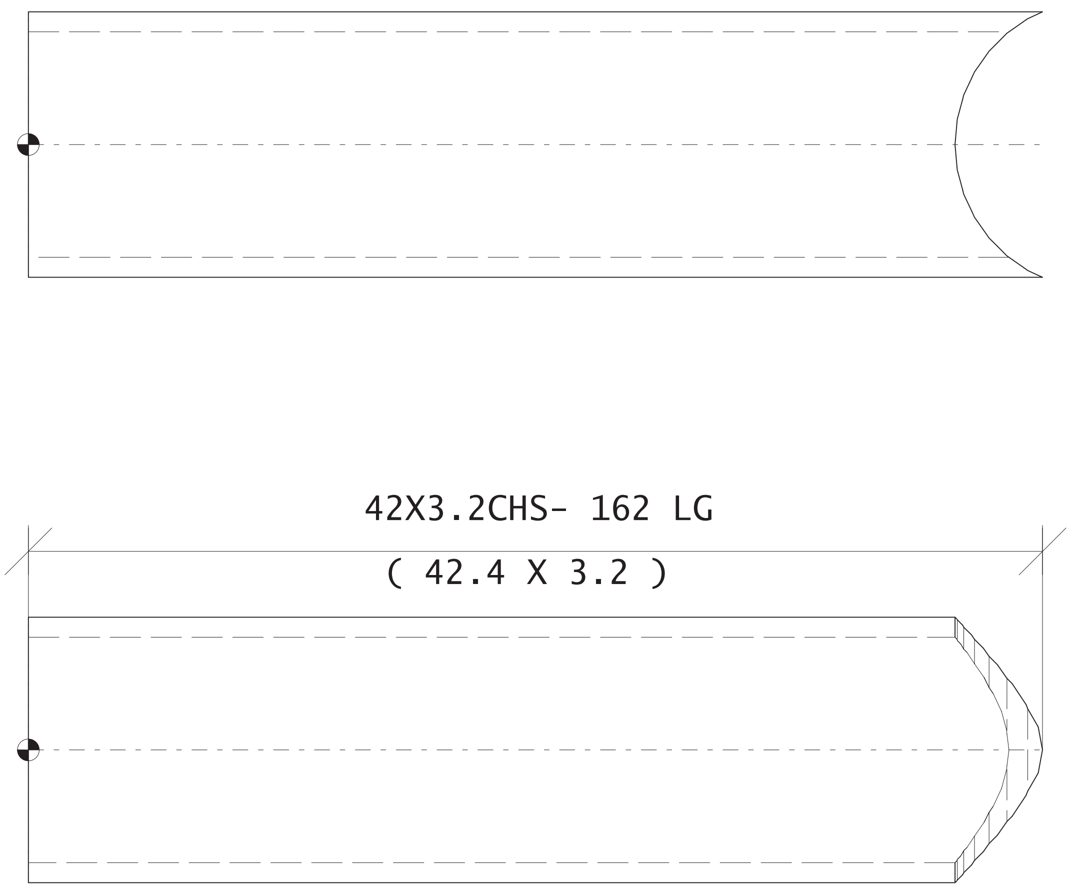
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

2 REQUIRED AS DRAWN MARKED 241-PART (NO ASSEMBLY)
PHASE SP034UPPER(2)
FINISH SP034HDG(2)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 0.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X241-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
242-PART	150X75PFC	300+	2334	1	1.32	39.6
				TOTAL	1.32	39.6

THIS MEMBER TO BE HOT DIPPED GALVANISED.

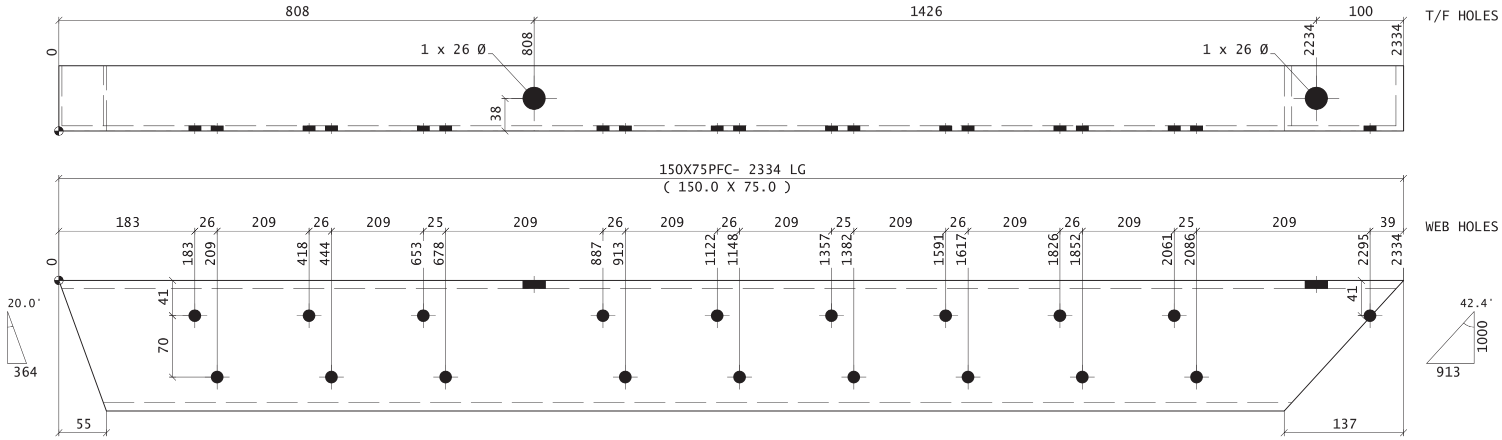
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 242-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 14 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 39.6 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X242-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
244-PART	42.4CHSTOPRAIL	300+	1742	1	0.22	5.2
				TOTAL	0.22	5.2

THIS MEMBER TO BE HOT DIPPED GALVANISED.

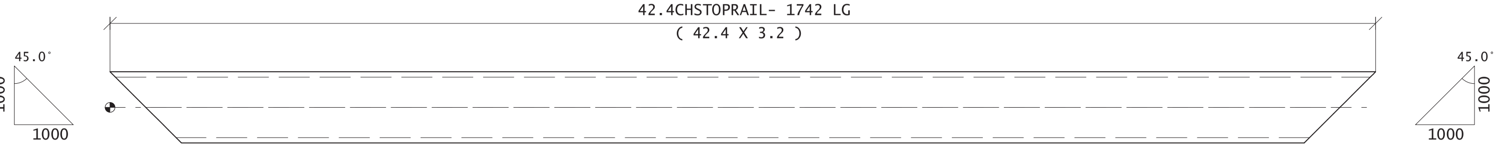
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



2 REQUIRED AS DRAWN MARKED 244-PART (NO ASSEMBLY)

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 5.2 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X244-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY

MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
245-PART	48.3SSTAUNCHION	300+	1130	1	0.16	4.0
				TOTAL	0.16	4.0

THIS MEMBER TO BE HOT DIPPED GALVANISED.

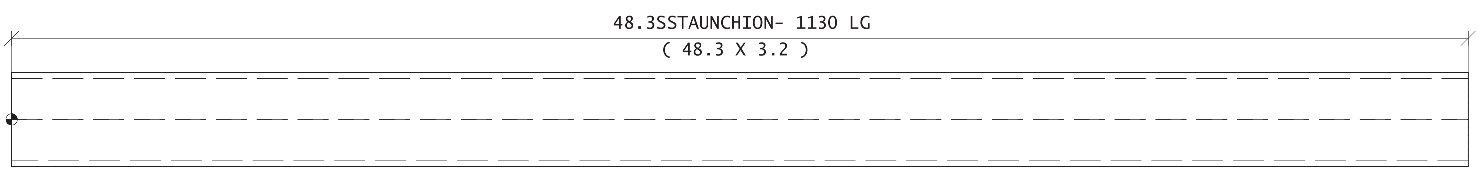
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



7 REQUIRED AS DRAWN MARKED 245-PART
PHASE SP034UPPER(7)
FINISH SP034HDG(7)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 4.0 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X245-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
248-PART	33.7CHSMIDRAIL	300+	1300	1	0.13	3.1
				TOTAL	0.13	3.1

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

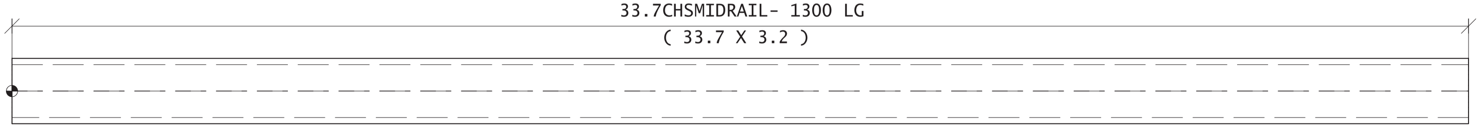
GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

33.7CHSMIDRAIL- 1300 LG
(33.7 X 3.2)



2 REQUIRED AS DRAWN MARKED 248-PART (NO ASSEMBLY)
PHASE SP034UPPER(2)
FINISH SP034HDG(2)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES
BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 3.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL
JOB No. 1112-018 | SCALE. NTS | DRG No. X248-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
250-PART	33.7CHSMIDRAIL	300+	2565	1	0.25	6.1
				TOTAL	0.25	6.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

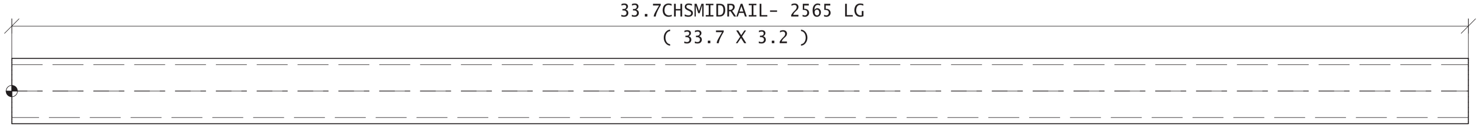
GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

33.7CHSMIDRAIL- 2565 LG
(33.7 X 3.2)



1 REQUIRED AS DRAWN MARKED 250-PART (NO ASSEMBLY)
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 6.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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FAX - 07 4613 4716
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EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X250-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY

MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
251-PART	42.4CHSTOPRAIL	300+	3007	1	0.37	9.1
				TOTAL	0.37	9.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

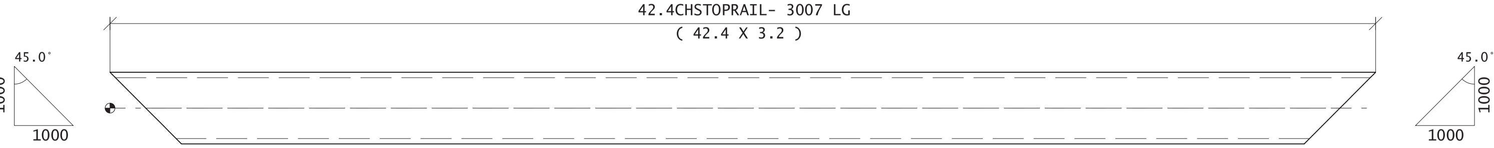
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 251-PART (NO ASSEMBLY)

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 9.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X251-PART | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
253-PART	42.4CHSTOPRAIL	300+	3985	1	0.50	12.1
				TOTAL	0.50	12.1

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

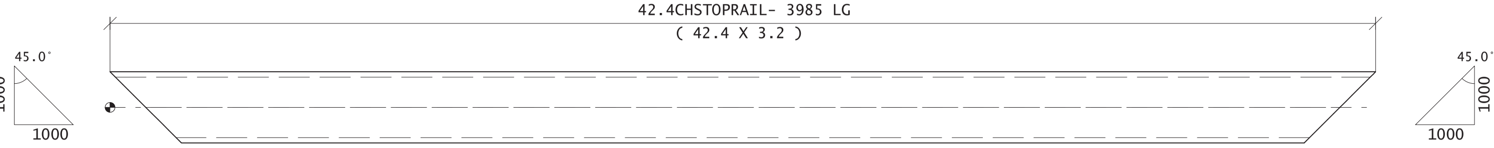
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 253-PART (NO ASSEMBLY)

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 12.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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DRN. MCS DATE. 13/10/12 ***** IF IN DOUBT - ASK *****

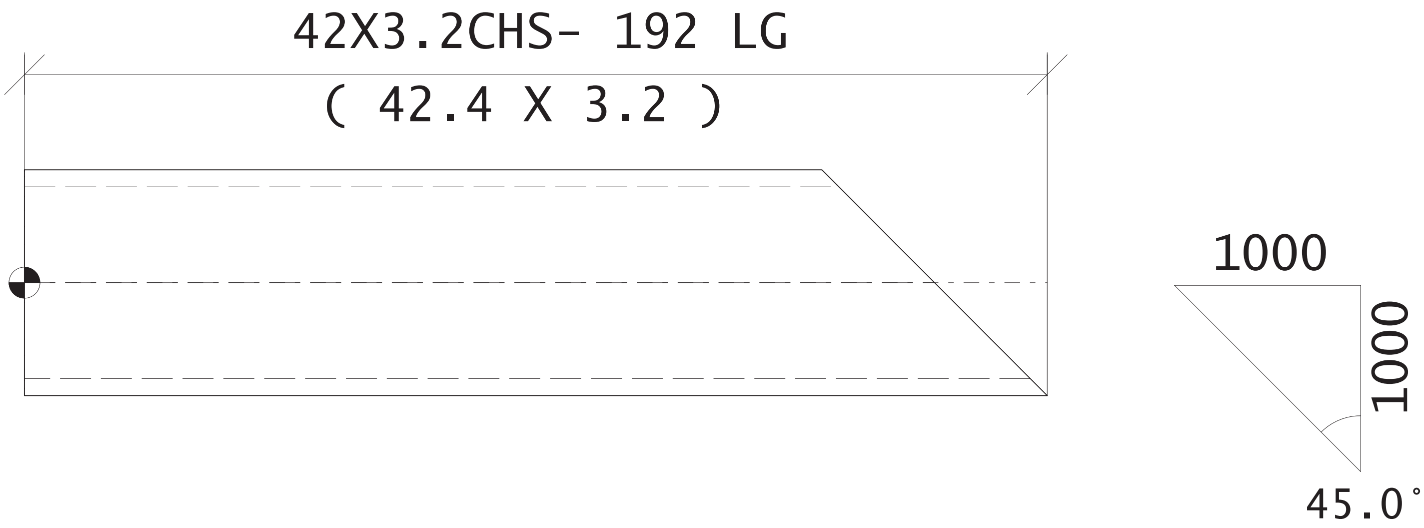
CLIENT LOGAN STEL - J & P RICHARSDON

PROJECT URBAN UTILITIES PUMP STATIONS

TITLE SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 SCALE. NTS DRG No. X253-PART REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
254-PART	42X3.2CHS	300+	192	1	0.02	0.5
				TOTAL	0.02	0.5



THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

2 REQUIRED AS DRAWN MARKED 254-PART (NO ASSEMBLY)

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 0.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X254-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
255-PART	42X3.2CHS	300+	2581	1	0.32	7.8
				TOTAL	0.32	7.8

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

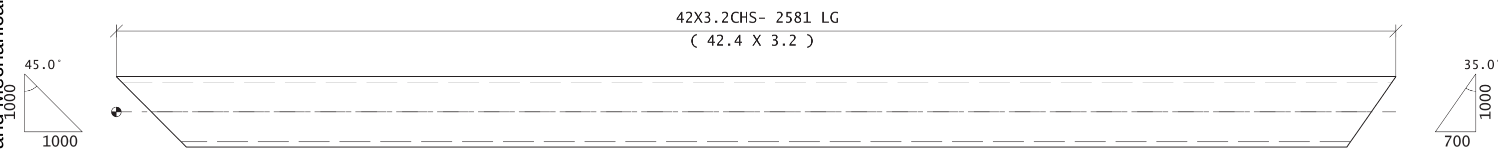
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

2 REQUIRED AS DRAWN MARKED 255-PART (NO ASSEMBLY)

PHASE SP034UPPER(2)
FINISH SP034HDG(2)

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 7.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

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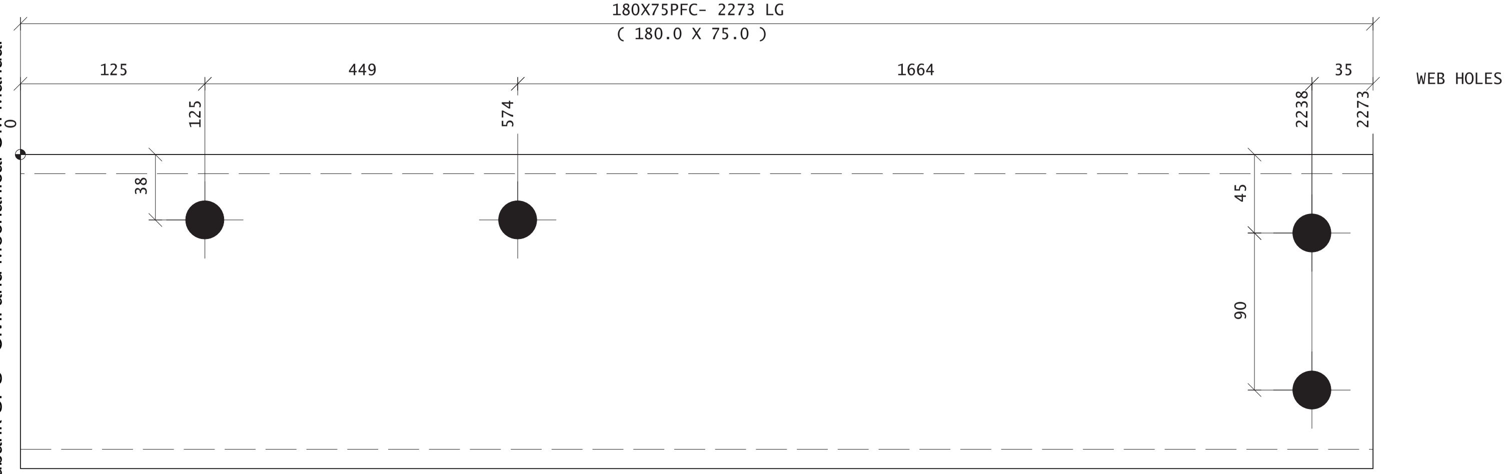
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X255-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
256-PART	180X75PFC	300+	2272	1	1.48	47.4
				TOTAL	1.48	47.4



THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQUIRED AS DRAWN MARKED 256-PART
PHASE SP034UPPER
FINISH SP034HDG

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 47.4 kg.

GENERAL NOTES

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X256-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
258-PART	65X12FL	300+	3225	1	0.50	19.7
				TOTAL	0.50	19.7

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

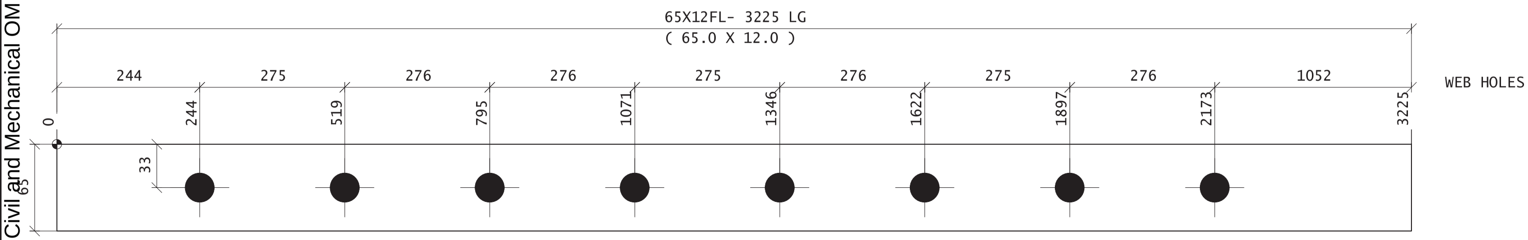
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 258-PART

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 19.7 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X258-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
260-PART	33.7CHSMIDRAIL	300+	3532	1	0.35	8.5
				TOTAL	0.35	8.5

THIS MEMBER TO BE HOT DIPPED GALVANISED.

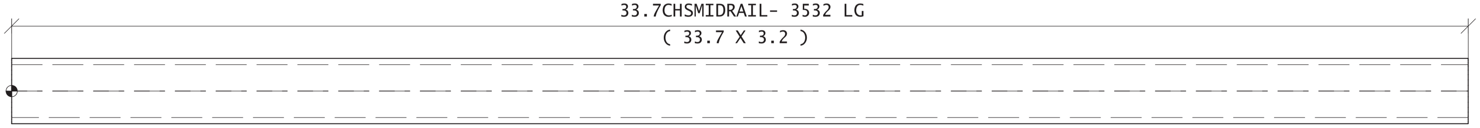
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 260-PART (NO ASSEMBLY)

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 8.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X260-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
261-PART	65X12FL	300+	3225	1	0.50	19.7
				TOTAL	0.50	19.7

THIS MEMBER TO BE HOT DIPPED GALVANISED.

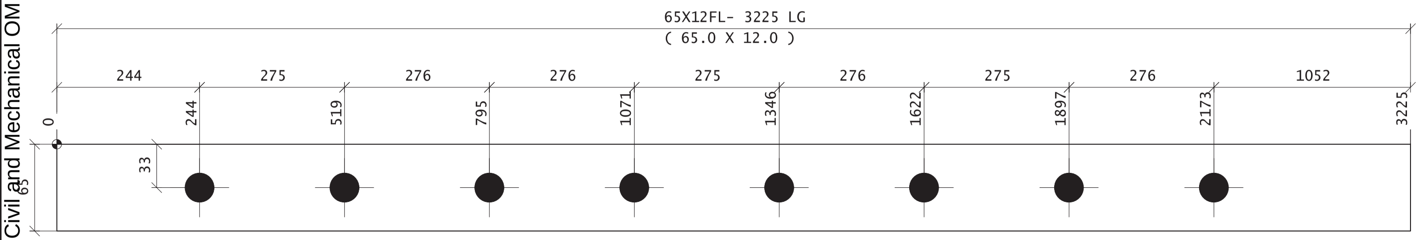
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



WEB HOLES

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQUIRED AS DRAWN MARKED 261-PART
PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES
BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 19.7 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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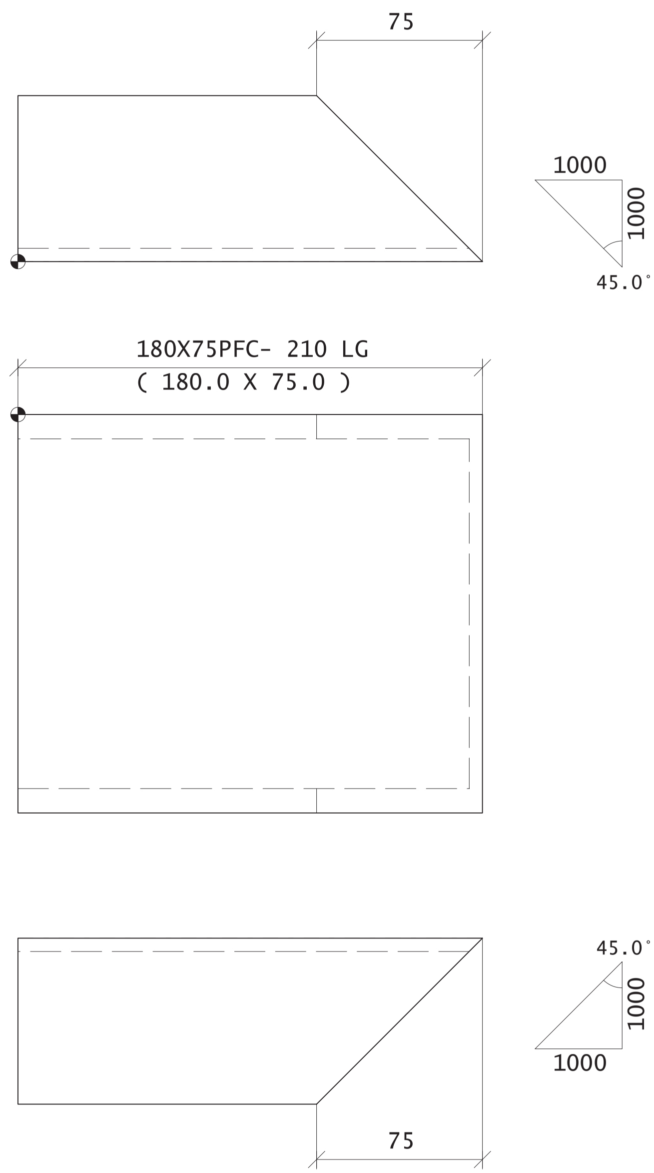
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS DATE. 13/10/12 ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL
JOB No. 1112-018 SCALE. NTS DRG No. X261-PART REV.



1 REQUIRED AS DRAWN MARKED 262-PART (NO ASSEMBLY)
PHASE SP034UPPER
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY

MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
262-PART	180X75PFC	300+	210	1	0.13	3.9
				TOTAL	0.13	3.9

THIS MEMBER TO BE HOT DIPPED GALVANISED.

PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 3.9 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X262-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
266-PART	42.4CHSTOPRAIL	300+	735	1	0.09	2.1
				TOTAL	0.09	2.1

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

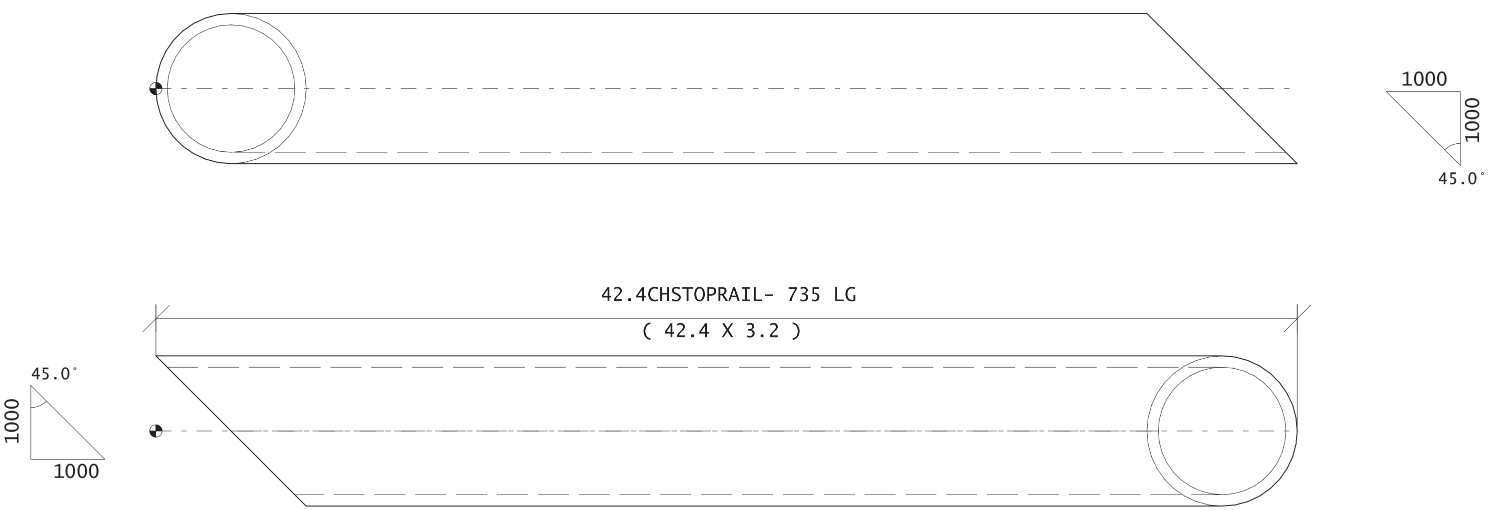
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 266-PART (NO ASSEMBLY)
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 2.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS DATE. 13/10/12 ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 SCALE. NTS DRG No. X266-PART REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
270-PART	33.7CHSMIDRAIL	300+	509	1	0.05	1.2
				TOTAL	0.05	1.2

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

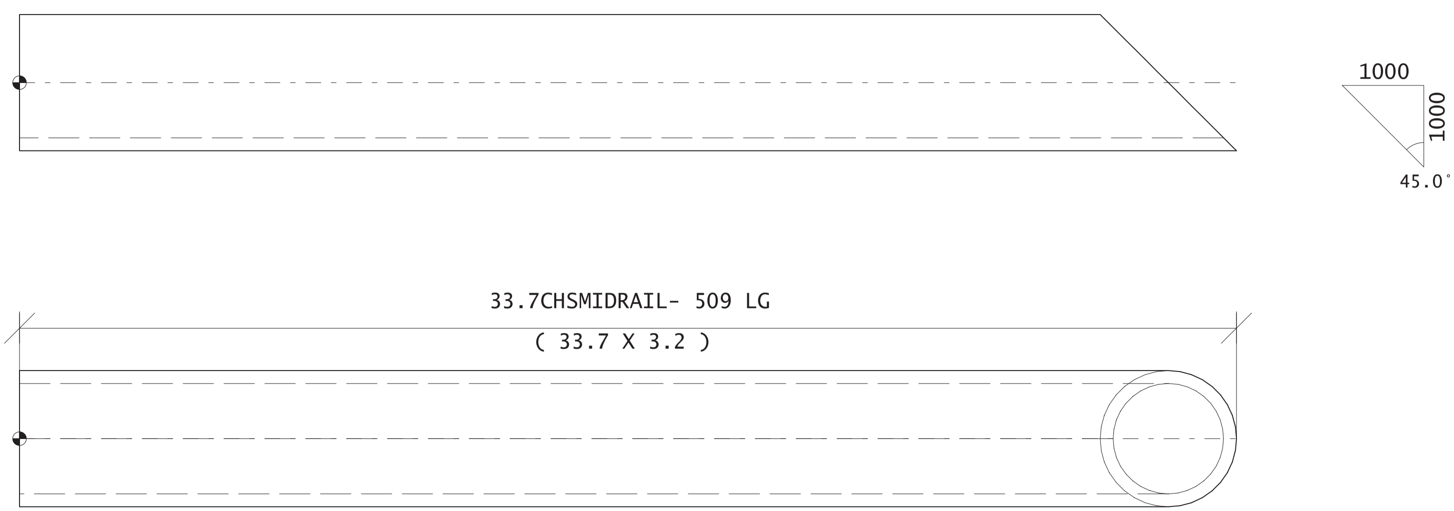
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 270-PART (NO ASSEMBLY)
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES
BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 1.2 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL
JOB No. 1112-018 | SCALE. NTS | DRG No. X270-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
272-PART	48.3CHSSTAUNCHION	300+	1007	1	0.15	3.6
				TOTAL	0.15	3.6

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

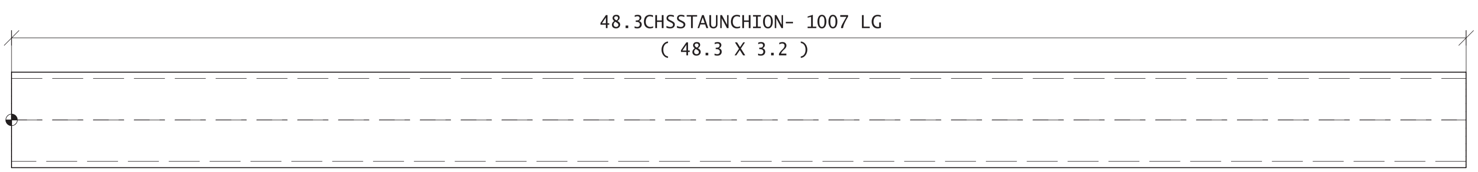
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQUIRED AS DRAWN MARKED 272-PART
PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES
BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
STEEL GRADE 300+
TOTAL WEIGHT 3.6 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS DATE. 13/10/12 ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 ASSEMBLY PART DETAIL
JOB No. 1112-018 SCALE. NTS DRG No. X272-PART REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
273-PART	42.4CHSTOPRAIL	300+	592	1	0.07	1.7
				TOTAL	0.07	1.7

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

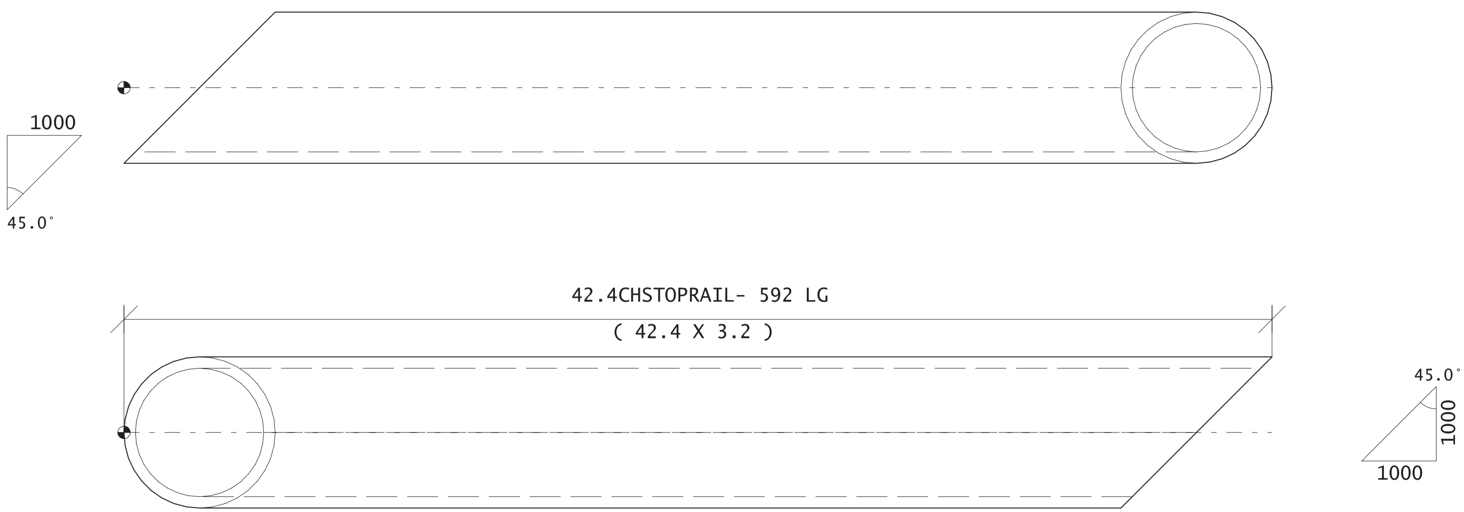
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 273-PART (NO ASSEMBLY)

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 1.7 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X273-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
274-PART	33.7CHSMIDRAIL	300+	366	1	0.03	0.8
				TOTAL	0.03	0.8

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

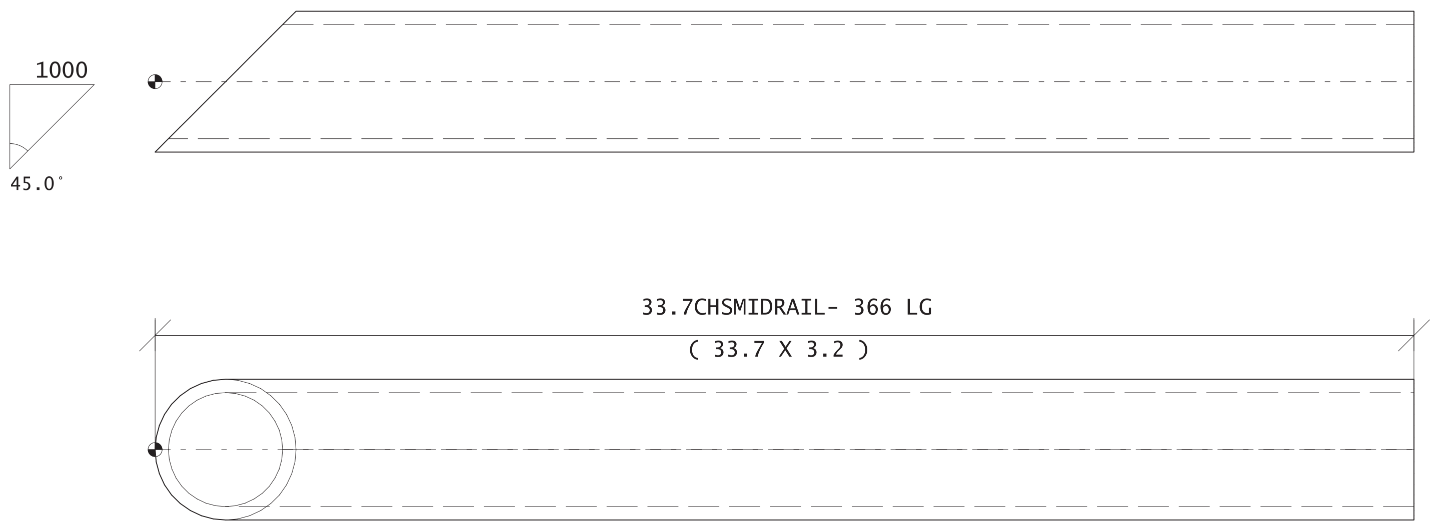
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 274-PART (NO ASSEMBLY)
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 0.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 ASSEMBLY PART DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X274-PART | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M01	180X75PFC	300+	1668	1	1.09	34.8
				TOTAL	1.09	34.8

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

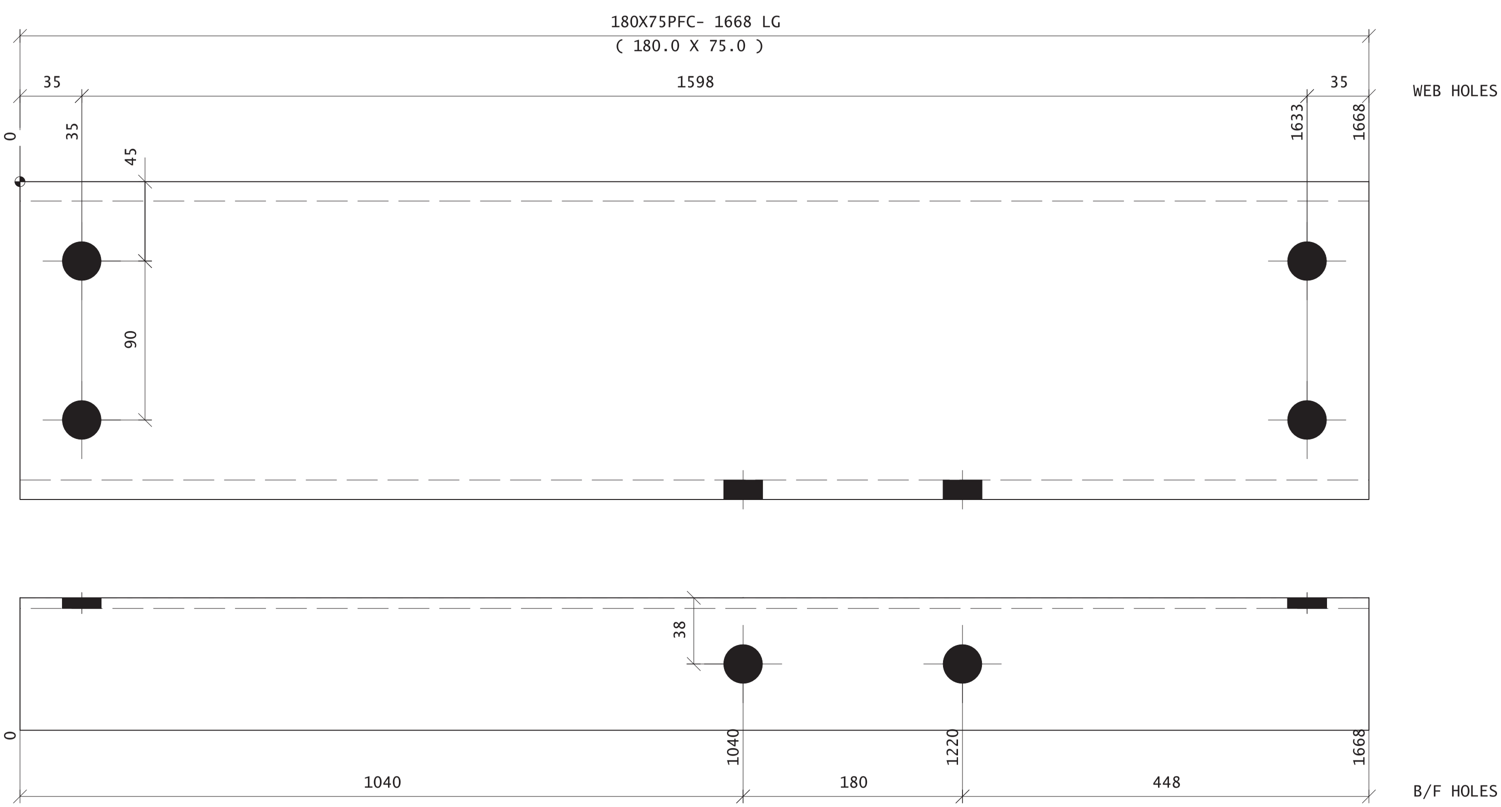
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQUIRED AS DRAWN MARKED 34M01
PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 34.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M01 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M02	180X75PFC	300+	4712	1	3.06	98.4
				TOTAL	3.06	98.4

THIS MEMBER TO BE HOT DIPPED GALVANISED.

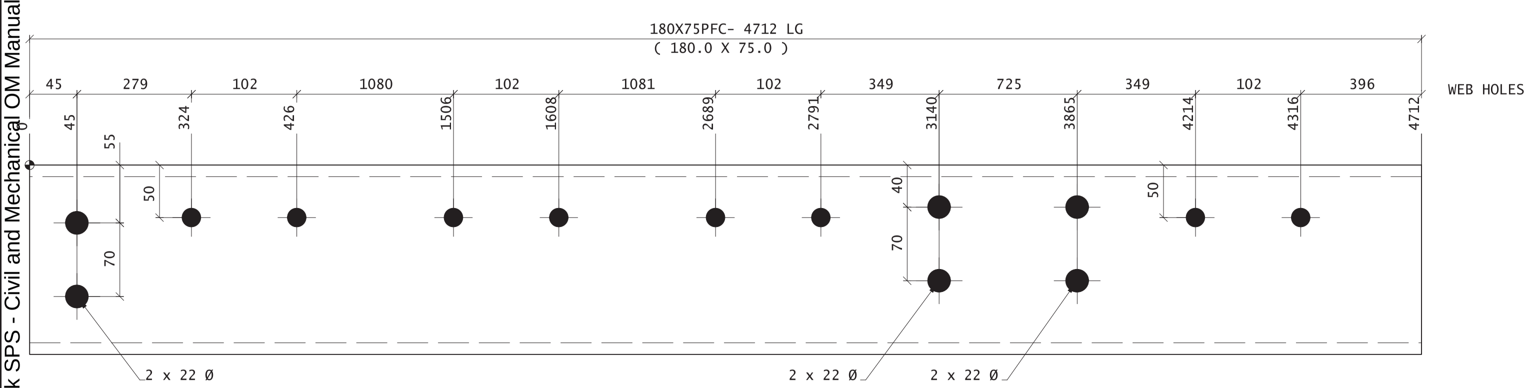
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 34M02

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 18 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 98.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M02 | REV. A

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M03	89X3.5SHS	300+	1976	1	0.69	18.6
				TOTAL	0.69	18.6

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

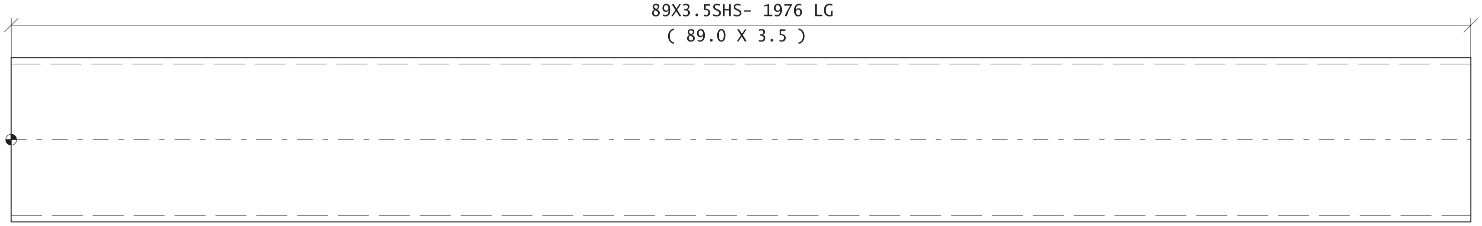
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



5 REQUIRED AS DRAWN MARKED 34M03
PHASE SP034UPPER(5)
FINISH SP034HDG(5)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 18.6 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS DATE. 13/10/12

***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 MEMBER DETAIL

JOB No. 1112-018 SCALE. NTS DRG No. X34M03 REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M04	180X75PFC	300+	1668	1	1.09	34.8
				TOTAL	1.09	34.8

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

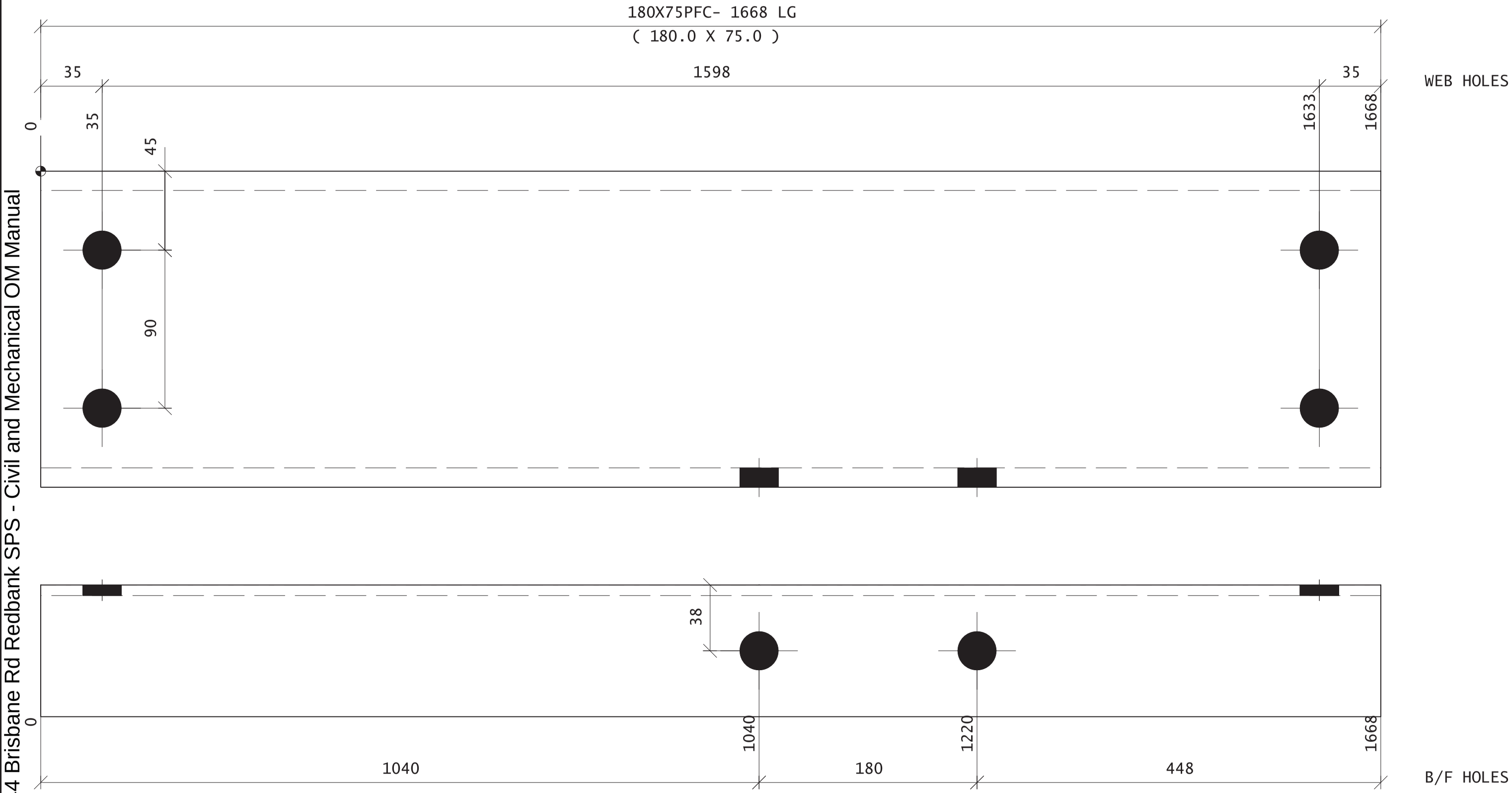
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 34M04
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES
BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 34.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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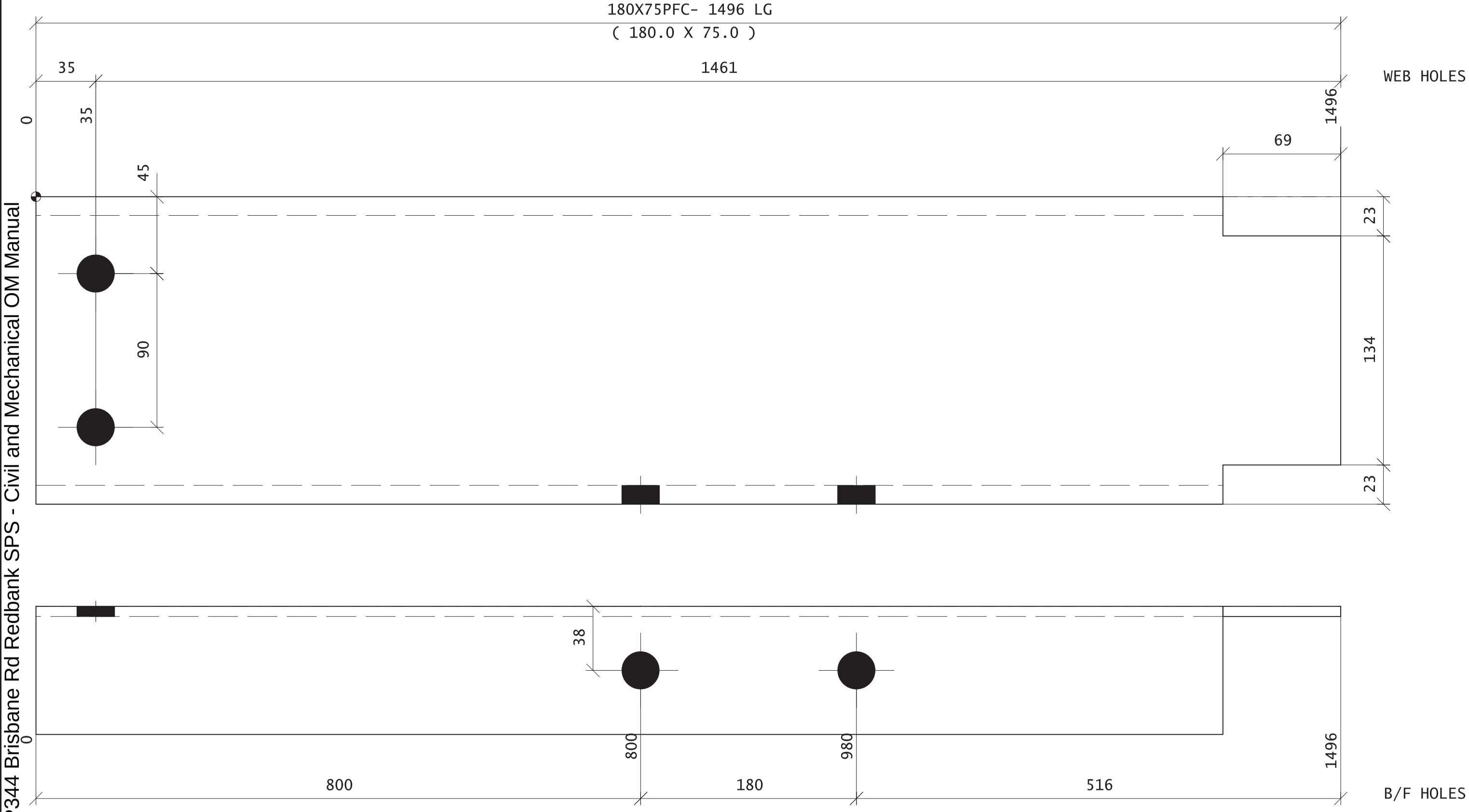
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M04 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M05	180X75PFC	300+	1496	1	0.95	30.2
				TOTAL	0.95	30.2



THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQUIRED AS DRAWN MARKED 34M05

PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 30.2 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

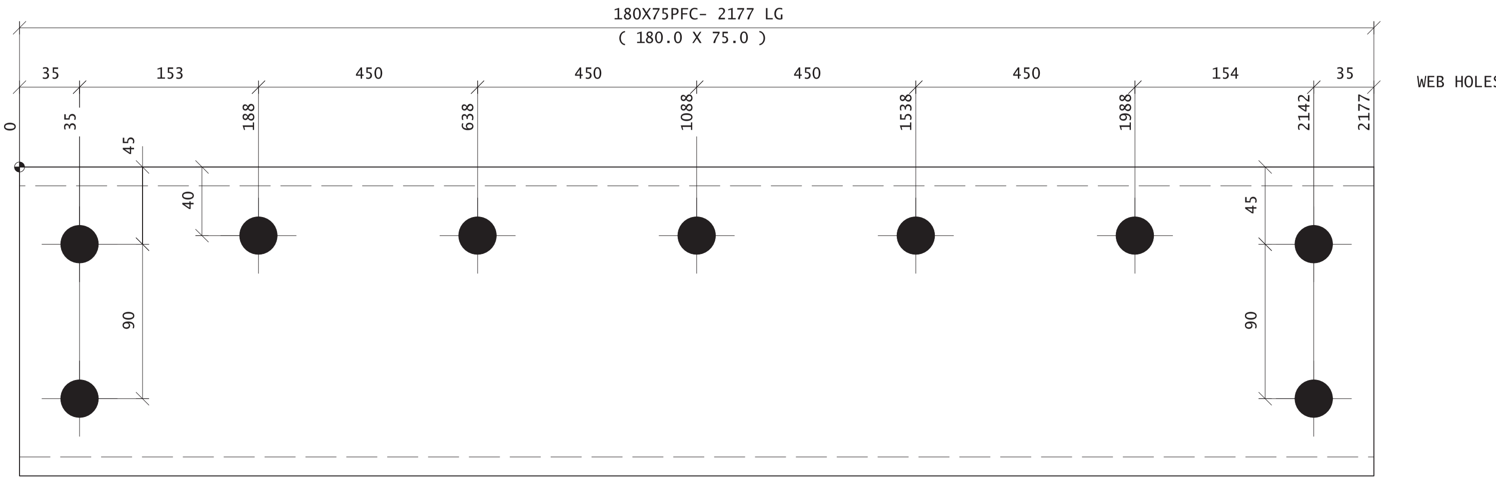
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M05 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M06	180X75PFC	300+	2176	1	1.42	45.4
				TOTAL	1.42	45.4



THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQUIRED AS DRAWN MARKED 34M06 (NO ASSEMBLY)

PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 45.4 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

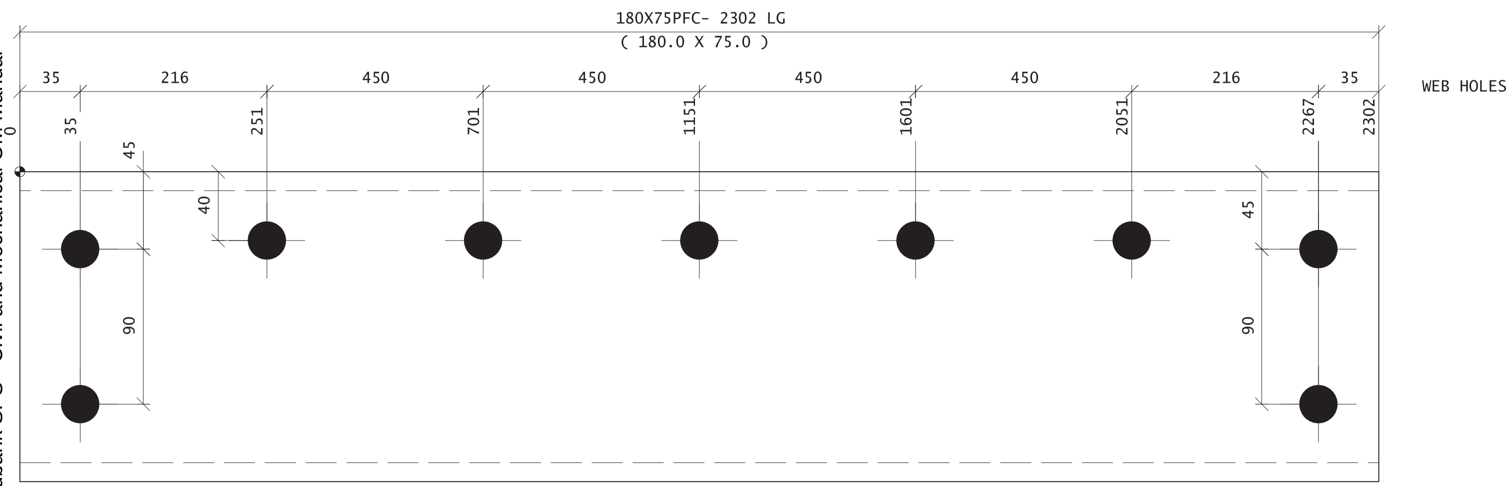
CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M06 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M07	180X75PFC	300+	2302	1	1.50	48.1
				TOTAL	1.50	48.1



THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQUIRED AS DRAWN MARKED 34M07
PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 48.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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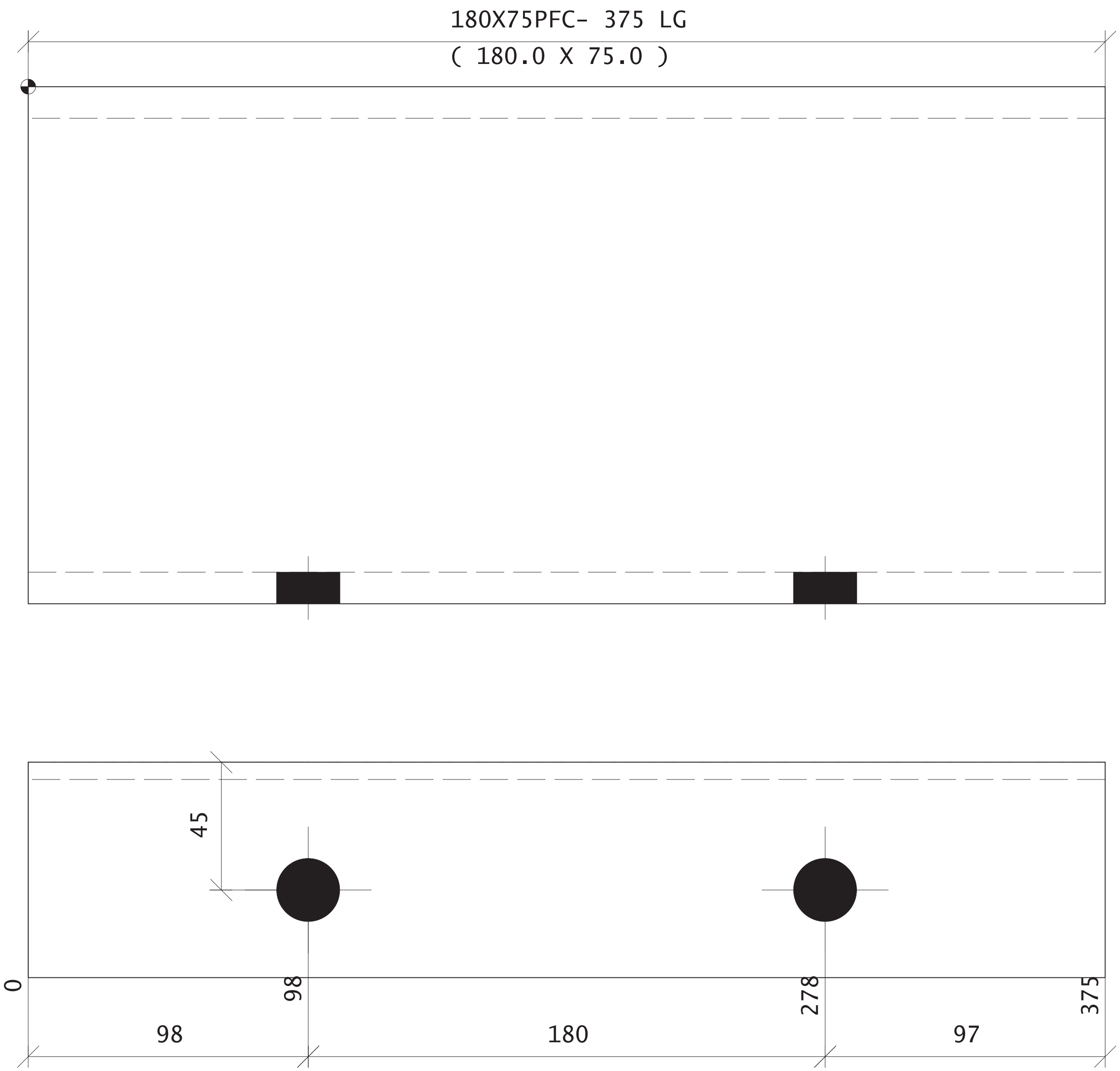
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M07 | REV.



B/F HOLES

1 REQUIRED AS DRAWN MARKED 34M08

PHASE SP034UPPER
FINISH SP034HDG

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M08	180X75PFC	300+	375	1	0.25	7.8
				TOTAL	0.25	7.8

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 7.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M08 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY

MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M09	89X3.5SHS	300+	1976	1	0.69	18.6
				TOTAL	0.69	18.6

THIS MEMBER TO BE HOT DIPPED GALVANISED.

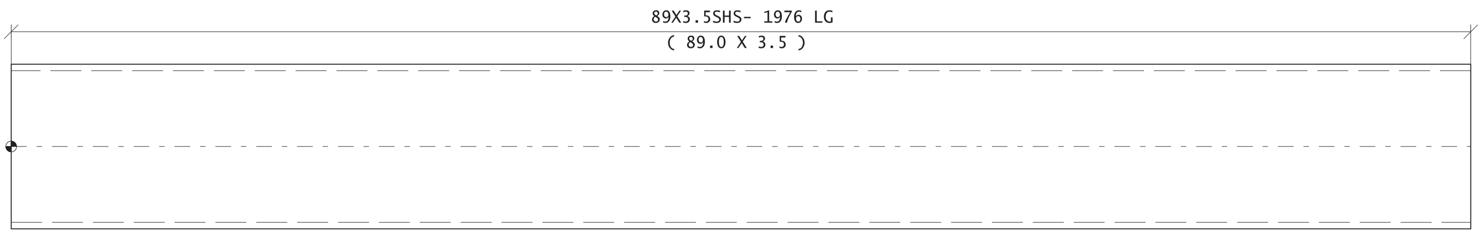
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



3 REQUIRED AS DRAWN MARKED 34M09

PHASE SP034UPPER(3)
FINISH SP034HDG(3)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 18.6 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M09 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY

MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M10	89X3.5SHS	300+	1976	1	0.69	18.6
				TOTAL	0.69	18.6

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

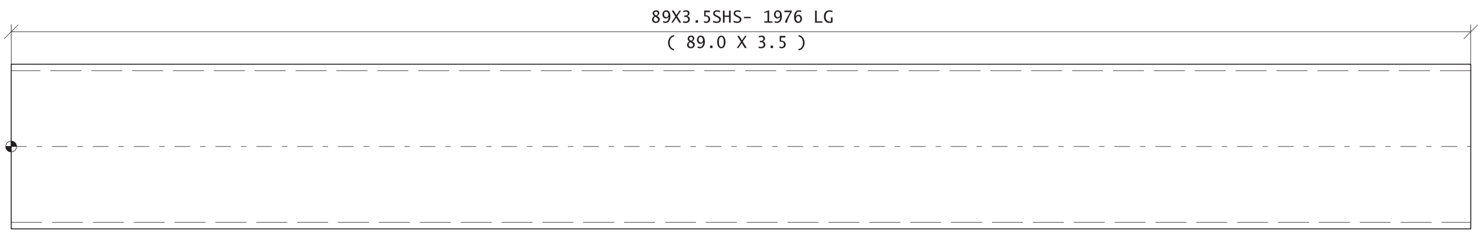
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



2 REQUIRED AS DRAWN MARKED 34M10
PHASE SP034UPPER(2)
FINISH SP034HDG(2)

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.

STEEL GRADE 300+
TOTAL WEIGHT 18.6 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS DATE. 13/10/12 ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 MEMBER DETAIL

JOB No. 1112-018 SCALE. NTS DRG No. X34M10 REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M11	65X6EA	300+	2302	1	0.58	12.8
				TOTAL	0.58	12.8

THIS MEMBER TO BE HOT DIPPED GALVANISED.

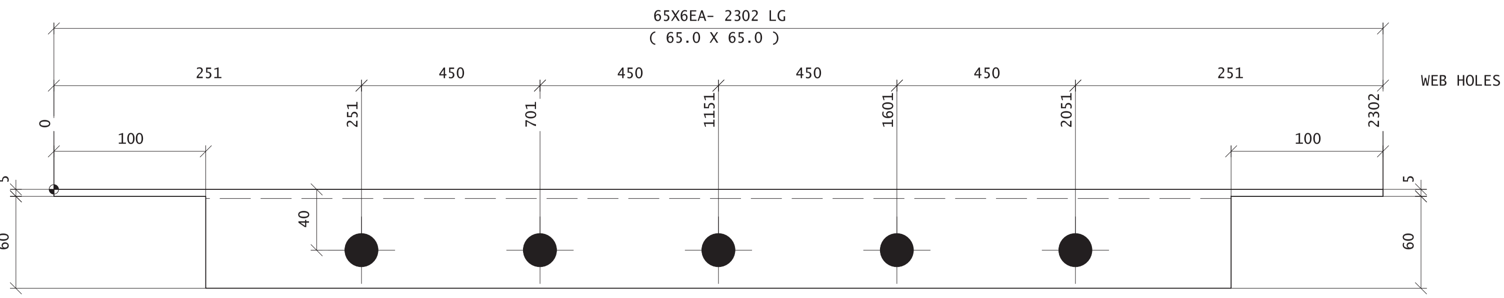
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 34M11 (NO ASSEMBLY)

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 12.8 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
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SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M11 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M12	65X6EA	300+	2176	1	0.54	12.1
				TOTAL	0.54	12.1

THIS MEMBER TO BE HOT DIPPED GALVANISED.

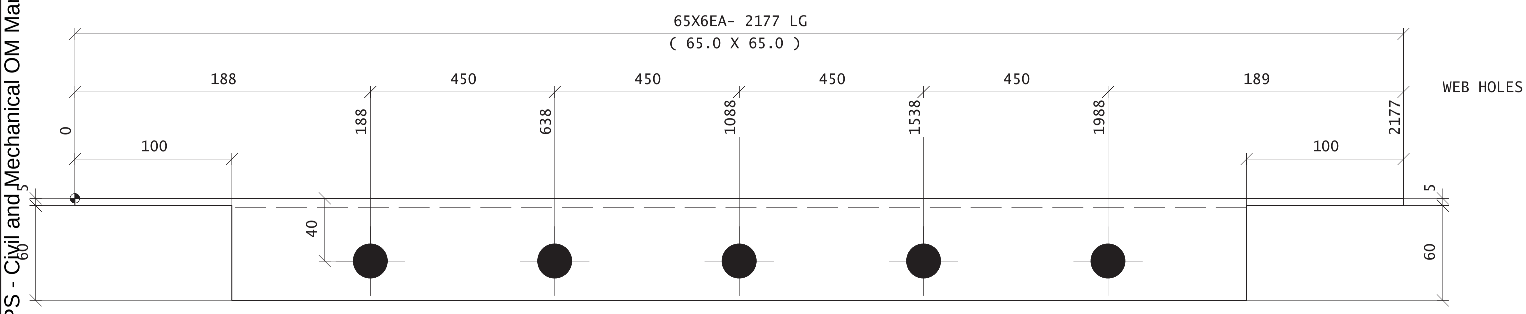
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

1 REQUIRED AS DRAWN MARKED 34M12 (NO ASSEMBLY)

PHASE SP034UPPER
FINISH SP034HDG

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 12.1 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON

PROJECT: URBAN UTILITIES PUMP STATIONS

TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M12 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M13	180X75PFC	300+	2246	1	1.46	46.9
				TOTAL	1.46	46.9

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

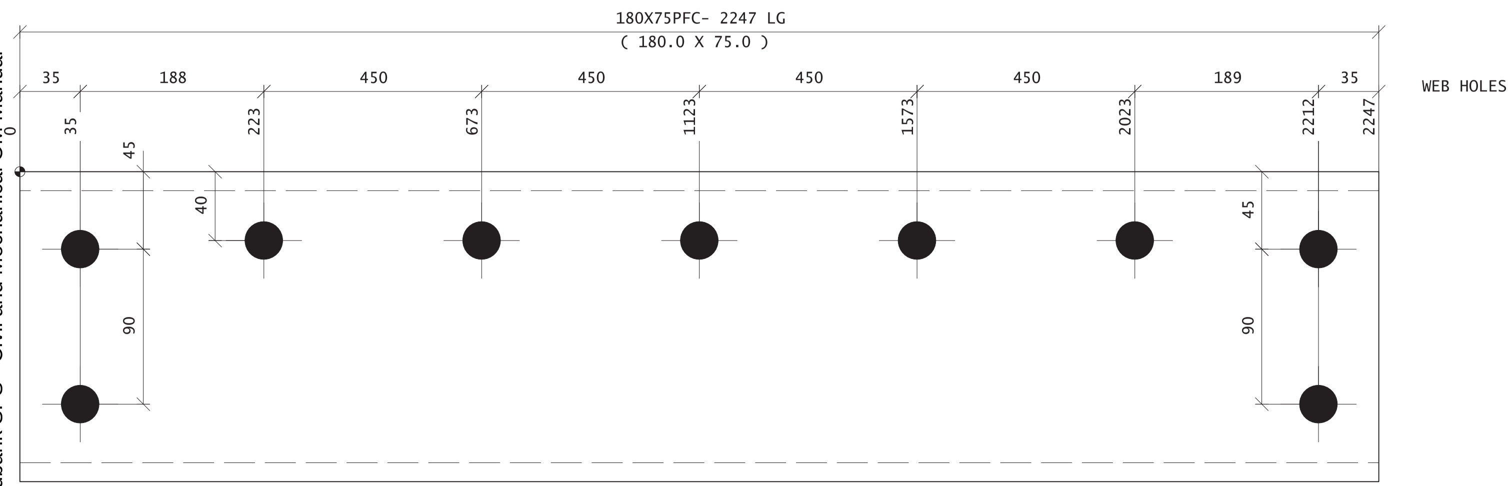
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 34M13
PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 46.9 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M13 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M14	65X6EA	300+	2246	1	0.56	12.5
				TOTAL	0.56	12.5

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

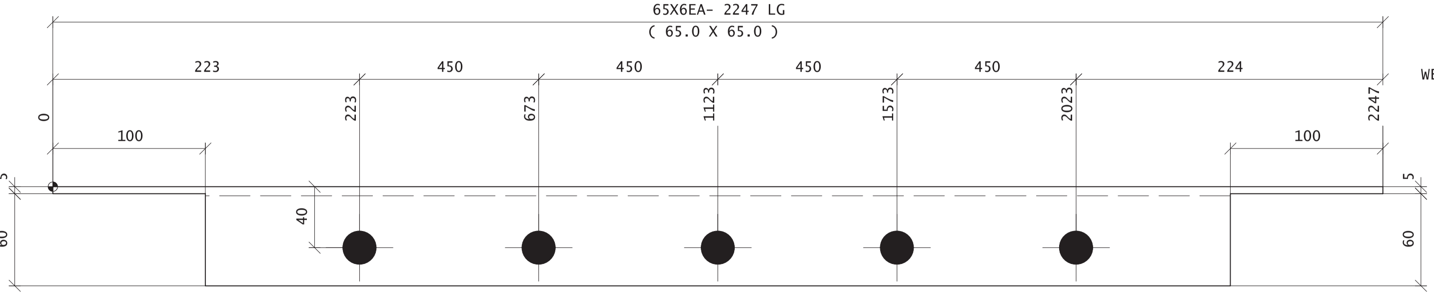
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 34M14 (NO ASSEMBLY)

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 12.5 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT LOGAN STEL - J & P RICHARSDON
PROJECT URBAN UTILITIES PUMP STATIONS
TITLE SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M14 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M15	180X75PFC	300+	2190	1	1.42	45.7
				TOTAL	1.42	45.7

THIS MEMBER TO BE HOT DIPPED GALVANISED.

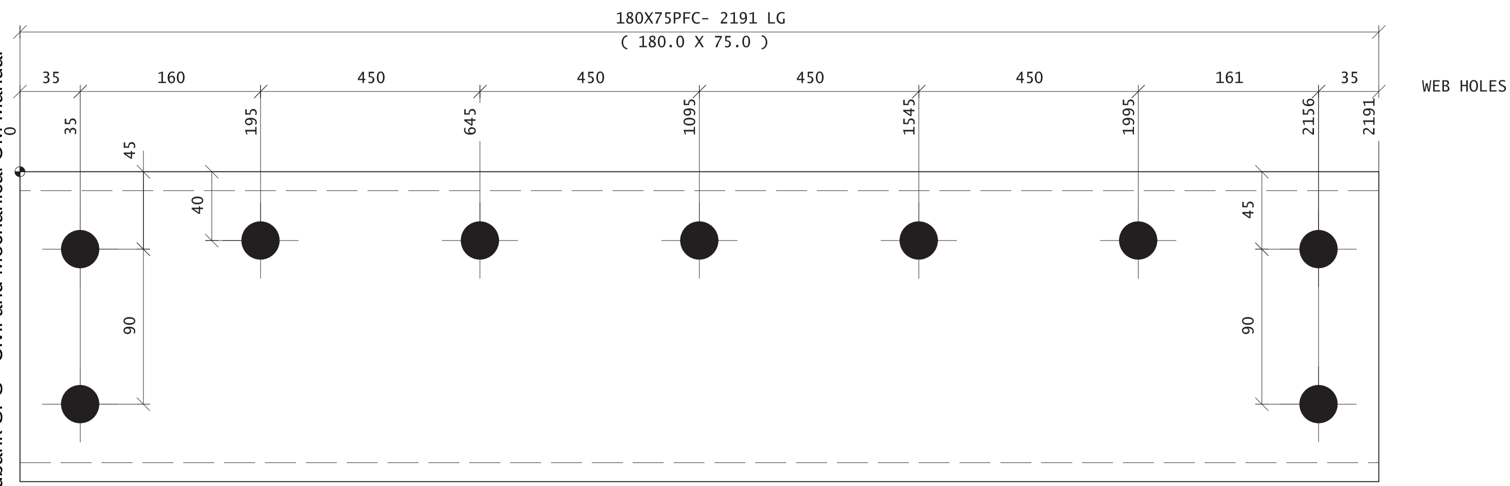
PROVIDE VENT HOLES FOR DRAINAGE.

GRIND ALL WELDS SMOOTH AND FLUSH.

ALL MITRE JOINTS ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE SHOWN FIGURATIVE ONLY. HANDRAIL MITRE JOINTS TO BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS TO HAVE BOLTING FACES FREE FROM PAINT, HDG, GREASE, RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 34M15 (NO ASSEMBLY)

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 45.7 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
industrial-commercial-rural
SPECIALIZING IN STRUCTURAL STEEL DETAILING
PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M15 | REV.

SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
34M16	65X6EA	300+	2190	1	0.55	12.2
				TOTAL	0.55	12.2

THIS MEMBER TO BE
HOT DIPPED GALVANISED.

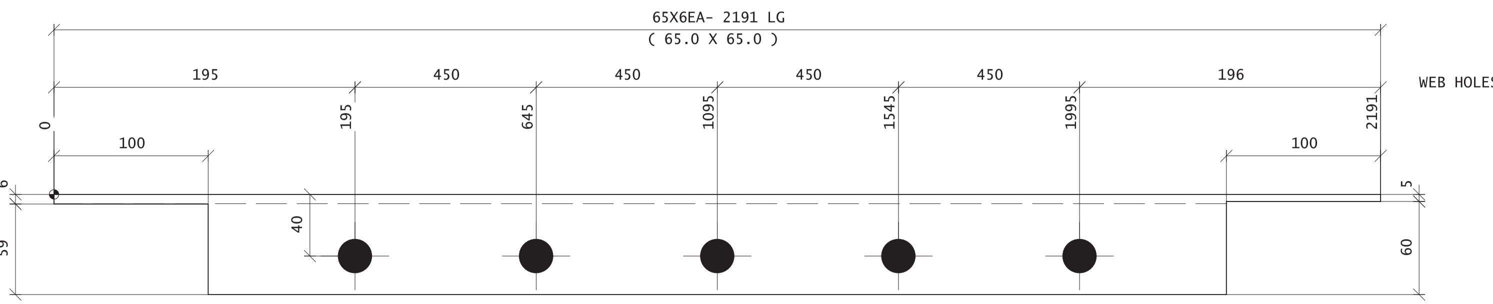
PROVIDE VENT HOLES
FOR DRAINAGE.

GRIND ALL WELDS
SMOOTH AND FLUSH.

ALL MITRE JOINTS
ARE TO BE FSBW.

HANDRAIL MITRE JOINTS ARE
SHOWN FIGURATIVE ONLY.
HANDRAIL MITRE JOINTS TO
BE ROUNDED IF REQUIRED.

ALL TB & TF BOLT CONNECTIONS
TO HAVE BOLTING FACES FREE
FROM PAINT, HDG, GREASE,
RUST AND PROTRUSIONS.



1 REQUIRED AS DRAWN MARKED 34M16 (NO ASSEMBLY)

PHASE SP034UPPER
FINISH SP034HDG

PROCESS	DATE
ISSUED TO WORKSHOP BY:	
PROCESSED BY:	
FABRICATION BY:	
CHECKED BY:	
COMPLETED: YES NO	
LEAVE WORKSHOP BY:	
FINISH: PAINT HDG OTHER	
FINISHED BY:	
WELD TEST REQUIRED: YES NO	
PAINT TEST REQUIRED: YES NO	

STRUCAD

GENERAL NOTES

BUTT WELDS NOMINATED FSBW SHALL BE
FULL STRENGTH/PENATRATION CAT. SP UNO.
ALL FILLET WELDS 6mm CFW CAT. SP UNO.
ALL HOLES 22 mm DIA UNO.
STEEL GRADE 300+
TOTAL WEIGHT 12.2 kg.

REV	DESCRIPTION	BY	DATE
		MCS	13/10/12

ICR drafting
industrial-commercial-rural

SPECIALIZING IN STRUCTURAL STEEL DETAILING

PH - 07 4613 4961
FAX - 07 4613 4716
MOB - 0411 574 591
EMAIL - mcs80@bigpond.com

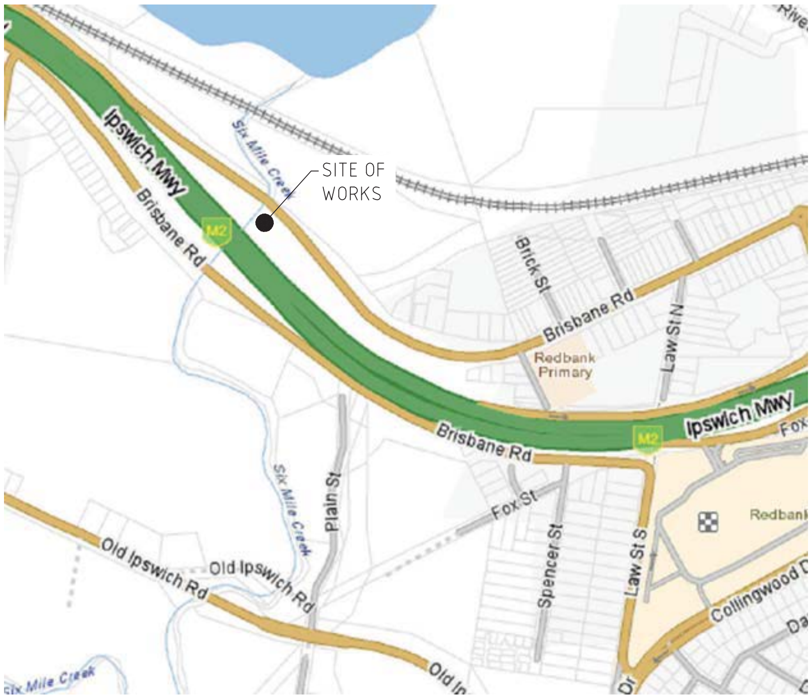
DRN. MCS | DATE. 13/10/12 | ***** IF IN DOUBT - ASK *****

CLIENT: LOGAN STEL - J & P RICHARSDON
PROJECT: URBAN UTILITIES PUMP STATIONS
TITLE: SP034 MEMBER DETAIL

JOB No. 1112-018 | SCALE. NTS | DRG No. X34M16 | REV.

7. QUU Drawings AS INSTALLED

SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344



LOCALITY PLAN
N.T.S

CHECK PRINT - INCOMPLETE REVISION
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PLOT DATE Tuesday, 17 September 2013 1:36:46 PM

THIS PUMP STATION ORIGINALLY KNOWN AS G33, THEN SP034, PUMPING INTO RISING MAIN No. RM1

DRAWING LIST

DRAWING NUMBER	REV	TITLE
486-5-7-0383-001	2	SEWAGE PUMP STATION SP344 - LOCALITY PLAN AND DRAWING LIST
486-5-7-0383-002	2	SEWAGE PUMP STATION SP344 - SITE PLAN
486-5-7-0383-003	1	SEWAGE PUMP STATION SP34 - DEMOLITION WORKS - DEMOLITION NOTES
486-5-7-0383-004	1	SEWAGE PUMP STATION SP34 - DEMOLITION WORKS - EXISTING GROUND FLOOR & CONTROL ROOM PLAN
486-5-7-0383-005	1	SEWAGE PUMP STATION SP34 - DEMOLITION WORKS - EXISTING SECTIONS - SHEET 1
486-5-7-0383-006	1	SEWAGE PUMP STATION SP34 - DEMOLITION WORKS - EXISTING SECTIONS - SHEET 2
486-5-7-0383-007	1	SEWAGE PUMP STATION SP34 - DEMOLITION WORKS - EXISTING SECTIONS - SHEET 3
486-5-7-0383-008	1	SEWAGE PUMP STATION SP34 - DEMOLITION WORKS - EXISTING SECTIONS - SHEET 4
486-5-7-0383-009	2	SEWAGE PUMP STATION SP344 - GENERAL ARRANGEMENT
486-5-7-0383-010	2	SEWAGE PUMP STATION SP344 - WATER FITTING SCHEDULE
486-5-7-0383-011	2	SEWAGE PUMP STATION SP344 - GROUND FLOOR MODIFICATIONS
486-5-7-0383-012	2	SEWAGE PUMP STATION SP344 - MODIFICATION SECTIONS SHEET 1
486-5-7-0383-013	2	SEWAGE PUMP STATION SP344 - MODIFICATION SECTIONS SHEET 2
486-5-7-0383-014	2	SEWAGE PUMP STATION SP344 - MODIFICATION SECTIONS SHEET 3
486-5-7-0383-015	2	SEWAGE PUMP STATION SP344 - MODIFICATION SECTIONS SHEET 4
486-5-7-0383-016	2	SEWAGE PUMP STATION SP344 - MODIFICATION SECTIONS SHEET 5
486-5-7-0383-017	2	SEWAGE PUMP STATION SP344 - TYPICAL DETAILS
486-5-7-0383-018	2	SEWAGE PUMP STATION SP344 - ODOUR CONTROL FACILITY - SITE LAYOUT
486-5-7-0383-019		SEWAGE PUMP STATION SP344 - ODOUR CONTROL FACILITY - PLAN VIEW
486-5-7-0383-020		SEWAGE PUMP STATION SP344 - ODOUR CONTROL FACILITY SECTIONS
486-5-7-0383-021		SEWAGE PUMP STATION SP344 - ODOUR CONTROL FACILITY - SLAB CIVIL DETAILS
486-5-7-0383-022	2	SEWAGE PUMP STATION SP344 - ODOUR CONTROL FACILITY - ODOUR CONTROL INLET PIPE DETAIL
486-5-7-0383-023	2	SEWAGE PUMP STATION SP344 - LEGEND - SHEET 1
486-5-7-0383-024	2	SEWAGE PUMP STATION SP344 - LEGEND - SHEET 2
486-5-7-0383-025	2	SEWAGE PUMP STATION SP344 - P & ID
486-5-7-0383-026	2	SEWAGE PUMP STATION SP344 - GENERAL NOTES
486-5-7-0383-027	2	SEWAGE PUMP STATION SP344 - FLOOR PLANS
486-5-7-0383-028	2	SEWAGE PUMP STATION SP344 - WELL PLATFORMS ELEVATIONS
486-5-7-0383-029	2	SEWAGE PUMP STATION SP344 - STEEL DETAILS
486-5-7-0383-030	2	SEWAGE PUMP STATION SP344 - CONCRETE AND MASONRY DETAILS
486-5-7-0383-031	2	SEWAGE PUMP STATION SP344 - GENERATOR PLATFORM PAD - CONCRETE DETAILS.
486-5-7-0383-032	2	SEWAGE PUMP STATION SP344 - MONORAIL GENERAL ARRANGEMENT.

DRAWING NUMBERS RESERVED FOR USE BY SIEMENS

QUU STANDARD DRAWINGS

DRAWING NUMBER	TITLE
486/5/25-0003-401	ALUMINIUM COVER NOTES AND PUMP WELL COVER PLAN
486/5/25-0003-402	ALUMINIUM COVER PUMP WELL FRAME, SAFETY MESH PANELS AND COVER UNDERSIDE DETAILS
486/5/25-0003-403	ALUMINIUM COVER PUMP WELL HINGE AND SEAL DETAILS
486/5/25-0003-404	ALUMINIUM COVER PUMP WELL AND LATCH MECHANISM BOX GENERAL ARRANGEMENT
486/5/25-0003-405	ALUMINIUM COVER PUMP WELL AND VALVE PIT LATCH MECHANISM BOX DETAILS
486/5/25-0003-406	ALUMINIUM COVER PUMP WELL AND VALVE PIT STRIKER PLATE ON FRAMES DETAILS
486/5/25-0003-407	ALUMINIUM COVER VALVE PIT GENERAL ARRANGEMENT PLAN
486/5/25-0003-408	ALUMINIUM COVER VALVE PIT SECTIONS AND DETAILS
486/5/25-0003-632	LADDER FOR VALVE PIT LADDER INSTALLATION
486/5/25-0003-633	LADDER FOR VALVE PIT LADDER COMPONENT DETAILS

Date ....
RPEQ No.

Date ....
RPEQ No.

Richard Mulligan Date 17/09/2013
RPEQ No. 7850

AS INSTALLED

REV	DESCRIPTION	DATE	POSITION	NAME	SIGNATURE
			DRAFTING	A.ENGELBRECHT	
			DESIGN	R. MULLIGAN	
			DESIGN VERIFICATION	G.VIOLETT	
2	AS INSTALLED	07/01/2013	PROJECT APPROVAL	R. MULLIGAN	
1	ISSUED FOR CONSTRUCTION	01/08/2011	CLIENT		
0	ISSUED FOR CONSTRUCTION	22/07/11			

QUEENSLAND UrbanUtilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

DRAWING SCALE: N.T.S.
DRAFTER: A.ENGELBRECHT
ORIG. SIZE: A1

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
LOCALITY PLAN & DRAWING LIST

DRAWING No. 486-5-7-0383-001
REVISION 2

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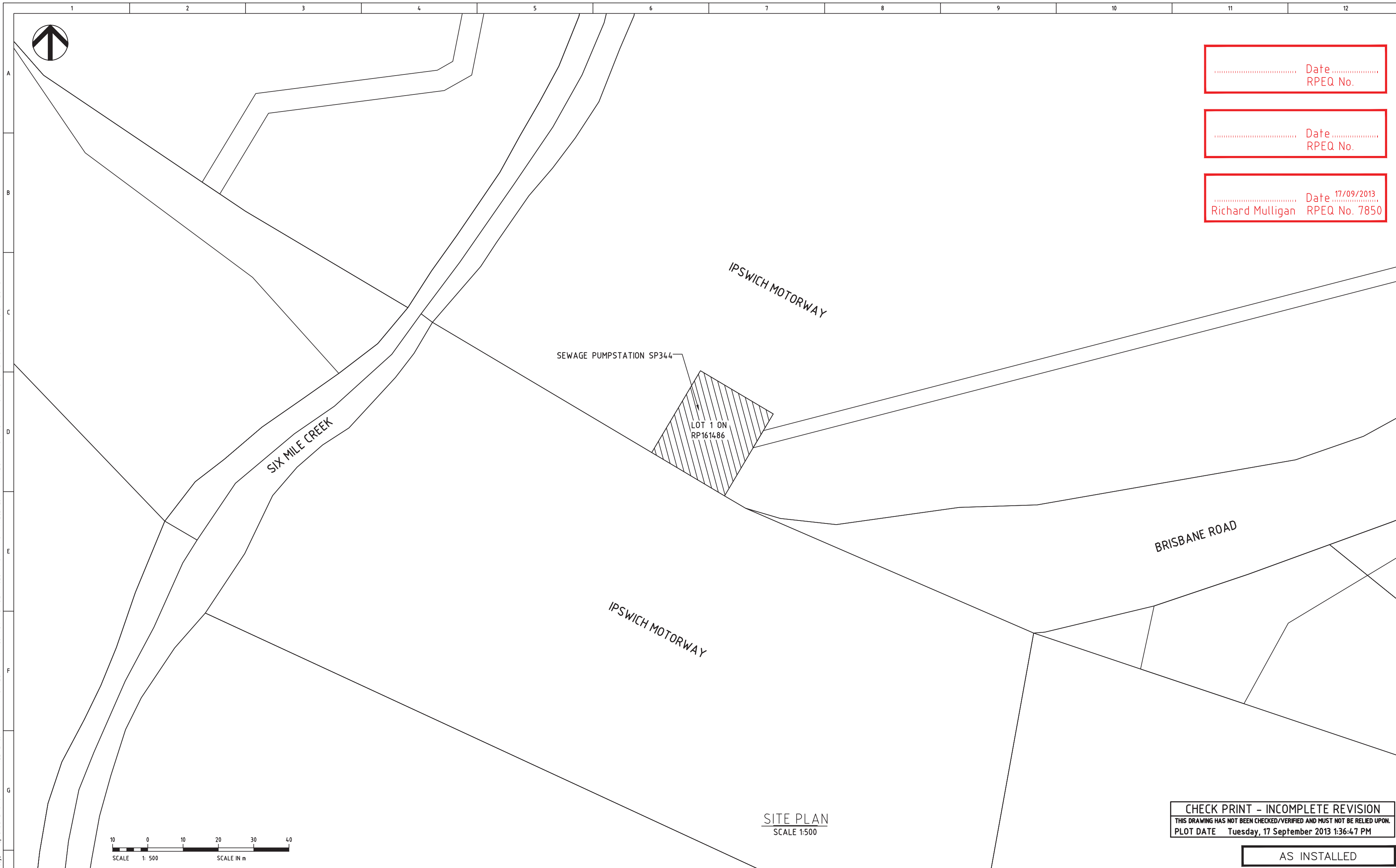

SITE PLAN
SCALE 1:500

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PLOT DATE Tuesday, 17 September 2013 1:36:47 PM

AS INSTALLED

REV	DESCRIPTION	DATE	POSITION	NAME	SIGNATURE
			DRAFTING	A.ENGELBRECHT	
			DESIGN	R. MULLIGAN	
			DESIGN VERIFICATION	G.VIOLETT	
2	AS INSTALLED	07/01/2013	PROJECT APPROVAL	R. MULLIGAN	
1	ISSUED FOR CONSTRUCTION	01/08/2011	CLIENT		
0	ISSUED FOR CONSTRUCTION	22/07/11			

QUEENSLAND Urban Utilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

DRAWING SCALE N.T.S.
DRAFTER: A.ENGELBRECHT
ORIG. SIZE A1

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
SITE PLAN

DRAWING No. 486-5-7-0383-002
REVISION 2

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NOTE:

A QUU REPRESENTATIVE WILL NOMINATE , PRIOR TO DEMOLITION, WHETHER THE EXISTING ASSETS NOMINATED FOR DEMOLITION ON THE FOLLOWING DRAWINGS ARE TO BE EITHER,

1. TRANSPORTED AND STOCKPILED AT A QUU FACILITY FOR FUTURE USE OR;
2. DISPOSED OF AT AN APPROVED WASTE/RECYCLING FACILITY.

DEMOLITION WORKS

1. PERFORM THE DEMOLITION WORKS NECESSARY TO CARRY OUT THE WORKS IN ACCORDANCE WITH, BUT NOT LIMITED TO:
- AS 2601 DEMOLITION OF STRUCTURES, INCLUDING DOCUMENTS REFERENCED THEREIN;
- QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT, 1995 AND WORKPLACE HEALTH AND SAFETY REGULATIONS, 1997 AND WORKPLACE HEALTH AND SAFETY AMENDMENT REGULATION (NO. 1), 2000, AND ALL OTHER SUBORDINATE REGULATIONS;
- NATIONAL OCCUPATIONAL HEALTH AND SAFETY COMMISSION (NOHSC) "ASBESTOS: CODE OF PRACTICE AND GUIDANCE NOTES", 2005, INCLUDING THE SUBORDINATE GUIDELINES AND CODES OF PRACTICE:
  - NOHSC "GUIDE TO THE CONTROL OF ASBESTOS HAZARDS IN BUILDINGS AND STRUCTURES";
  - NOHSC "CODE OF PRACTICE FOR THE SAFE REMOVAL OF ASBESTOS";
  - NOHSC "GUIDANCE NOTE ON THE MEMBRANE FILTER METHOD FOR ESTIMATING AIRBORNE ASBESTOS DUST".
- QUEENSLAND DIVISION OF WORKPLACE HEALTH & SAFETY, ASBESTOS REMOVAL, ADVISORY STANDARD, 2004;
- QUEENSLAND DIVISION OF WORKPLACE HEALTH & SAFETY, NOISE, ADVISORY STANDARD, 2004;
- QUEENSLAND DIVISION OF WORKPLACE HEALTH & SAFETY, RISK MANAGEMENT, ADVISORY STANDARD, 2000;
- QUEENSLAND DIVISION OF WORKPLACE HEALTH & SAFETY, SCAFFOLDING, ADVISORY STANDARD, 2004;
- ENVIRONMENTAL - ENVIRONMENTAL PROTECTION ACT, 1994 AND ENVIRONMENTAL PROTECTION REGULATION, 1998, AND ALL OTHER SUBORDINATE REGULATIONS;
- AUSTRALIAN STANDARDS, INCLUDING, BUT NOT LIMITED TO: AS1319; AS1324; AS1418; AS1576; AS1657; AS1689; AS1715; AS1716; AS1801; AS1891; AS2601; AS2626; AS2187; AS2188; AS2294; AS2430; AS2436; AS2550; AS3000; AS3012; AS3544; AS4361.1; AS4361.2; BS6187;
- QUEENSLAND DIVISION OF WORKPLACE HEALTH & SAFETY, "ADVISORY STANDARD 2003 FOR HAZARDOUS SUBSTANCES", 2003;
- QUEENSLAND DIVISION OF WORKPLACE HEALTH & SAFETY "GLASSWOOL AND ROCKWOOL" INDUSTRY CODE OF PRACTICE, 2000;
- NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL (NH&MRC) "EXPOSURE STANDARDS FOR ATMOSPHERIC CONTAMINANTS IN THE OCCUPATIONAL ENVIRONMENT", 1995, INCLUDING UPDATED EXPOSURE STANDARDS FOR SPECIFIC CONTAMINANTS;
- NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL (NH&MRC) "CONTROL OF INORGANIC LEAD AT WORK", 1994;
- AUSTRALIAN & NEW ZEALAND ENVIRONMENT AND CONSERVATION COUNCIL (ANZECC) "IDENTIFICATION OF PCB-CONTAINING CAPACITORS", 1997 AND "PCB MANAGEMENT PLAN", 1996; AND
- OZONE PROTECTION ACT 1989 AND OZONE PROTECTION REGULATION 1997.

2. EXISTING PROPERTY AND SERVICES - PROTECT PROPERTY AND SERVICES THAT ARE TO REMAIN ON OR ADJACENT TO THE SITE FROM INTERFERENCE OR DAMAGE AND USE APPROPRIATE MEANS INCLUDING FENCING, FRAMING, BRACING, SHORING, PROTECTIVE SCREENS AND SHEETING, AND LOCAL AUTHORITY APPROVED SAFETY HOARDING AND BARRIERS.
3. DILAPIDATION RECORD - MAINTAIN A PHOTOGRAPHIC AND WRITTEN RECORD OF THE WORKS AND ADJOINING AREAS.
4. EXPLOSIVES - EXPLOSIVES SHALL NOT BE USED.
5. DEMOLISHED MATERIALS SHALL NOT BE STORED ON PUMP WELL TOP SLAB.
6. MAKE GOOD ANY DAMAGE TO MATCH EXISTING STRUCTURES AND SERVICES AND LEAVE THE SITE IN A SAFE, STABLE AND FREE DRAINING MANNER AT COMPLETION OF THE DEMOLITION WORKS.

Richard Mulligan Date 17/09/2013
RPEQ No. 7850

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FOR CONSTRUCTION

REV	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	01/08/2011
0	ISSUED FOR CONSTRUCTION	22/07/11

POSITION	NAME	SIGNATURE
DRAFTING	A.ENGELBRECHT	
DESIGN	R. MULLIGAN	
DESIGN VERIFICATION	G.VIOLETT	
PROJECT APPROVAL	R. MULLIGAN	
CLIENT		

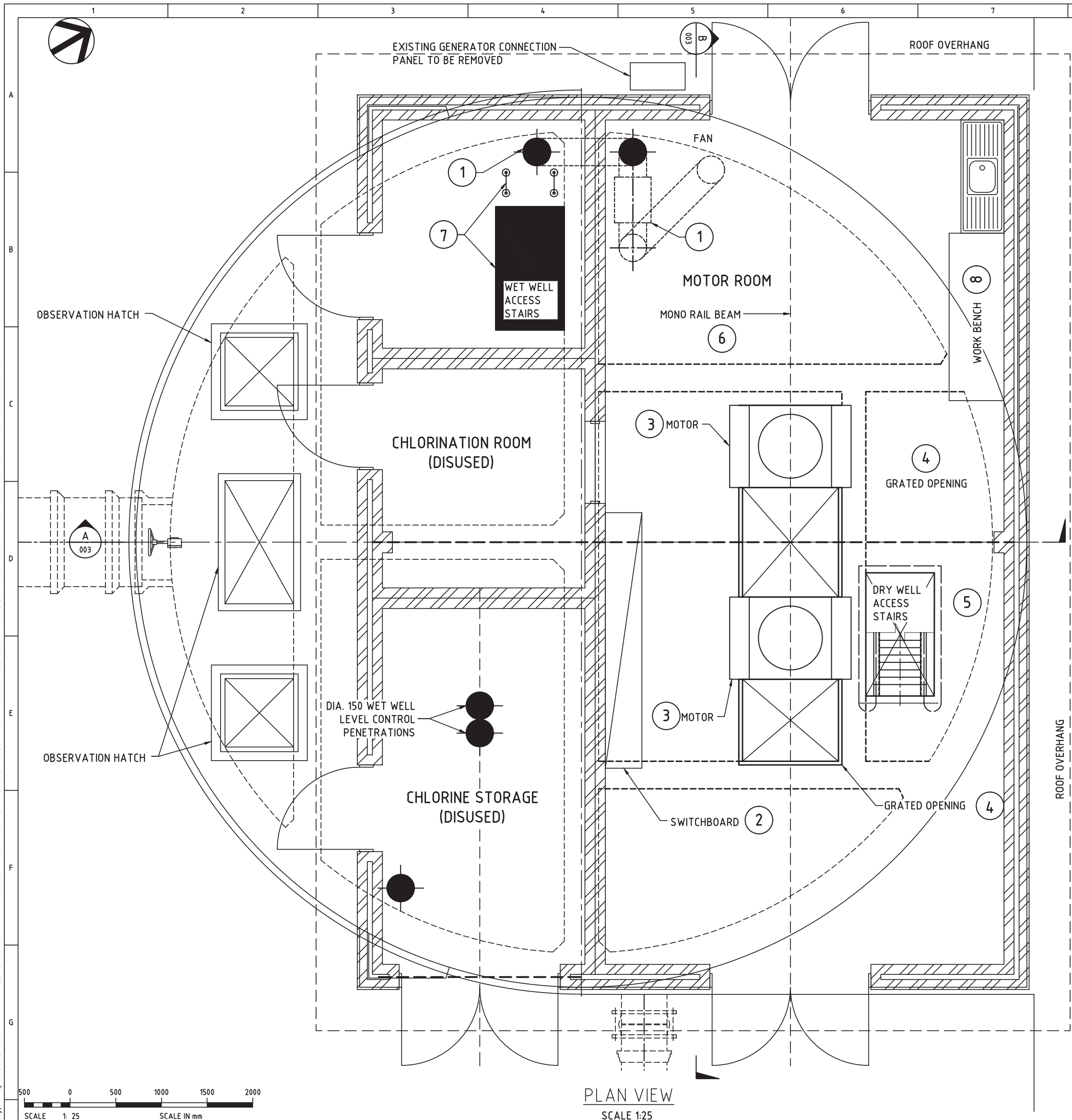
QUEENSLAND UrbanUtilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP34
DEMOLITION NOTES

DRAWING SCALE: N.T.S.
DRAFTER: A.ENGELBRECHT
ORIG. SIZE: A1
DRAWING No. 486-5-7-0383-003
REVISION: 1

DATE: Tuesday, 17 September 2013 1:36:47 PM FILE: L:\C54000 QUU IPSWICH REGION SP01 SP33 SP34 UPGRADE PROJECT\16 DRAWINGS\01 RECEIVED\QUU FINAL DRAWINGS\SP344\486-5-7-0383-003\SP34\486-5-7-0383-003.DWG



DEMOLITION NOTES

1. REMOVE RETURN AIR DUCT & FANS TO WET WELL INCLUDING ALL SUPPORT FRAMES. ALL PENETRATIONS - FLOOR SLAB AND DIVIDING WALL TO BE CLOSED OFF WITH CONCRETE INFILL.
2. REMOVE EXISTING SWITCHBOARD & REDUNDANT CIRCUITS, SEAL ALL PENETRATIONS NO LONGER REQUIRED.
3. EXISTING PUMP MOTORS AND ASSOCIATED SUPPORT STRUCTURE TO BE REMOVED.
4. REMOVE EXISTING GRATED OPENING. REFER TO DRG No. 486-5-7-0383-0011 FOR NEW OPENINGS.
5. REMOVE EXISTING ACCESS STAIRS. REFER TO DRG No. 486-5-7-0383-0011 FOR NEW LOCATION.
6. REMOVED & REPLACED MONORAIL BEAM AND CRANE. REFER TO DRG No. 486-5-7-0383-0011
7. REMOVE STAIR ACCESS TO WET WELL. REMOVE GRABRAILS, INFILL PENETRATION TO MATCH EXISTING SLAB. ALL PENETRATIONS - FLOOR SLAB AND DIVIDING WALL TO BE CLOSED OFF WITH CONCRETE INFILL.
8. REMOVE WORKBENCH
9. CONCRETE REPAIR TO EXPOSED PROJECTIONS, (BOLTS, REINFORCEMENT ETC):
   - 9.1. CUT BACK EXPOSED PROJECTION 50mm MINIMUM INTO CONCRETE SURFACE
   - 9.2. BLAST CLEAN CONCRETE SURFACE AROUND REPAIR
   - 9.3. APPLY 'SIKA TOP-110' EPOCOM BONDING MORTAR
   - 9.4. APPLY 'SIKA MONO TOP-615 HB' REPAIR MORTAR.

GENERAL NOTES

1. TIMING OF DEMOLITION WORKS NOT INDICATED. CONTRACTOR TO CONFIRM TIMING TO SUIT CONSTRUCTION WORKS AND INTERFACE REQUIREMENTS.
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.

WARNING

CONTRACTOR TO CONFIRM ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORKS.

CONTRACTOR TO CONFIRM DIAMETER OF EXISTING ASSETS PRIOR TO COMMENCEMENT OF WORKS THE DESIGN IS BASED ON INFORMATION SUPPLIED BY SERVICES AUTHORITIES AND SELECTIVE SERVICE IDENTIFICATION.

THE CONTRACTOR SHALL VERIFY THE POSITION OF EACH UNDERGROUND SERVICE BEFORE COMMENCING EXCAVATIONS.

Richard Mulligan Date 17/09/2013 RPEQ No. 7850

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FOR CONSTRUCTION

REV	DESCRIPTION	DATE	POSITION	NAME	SIGNATURE
			DRAFTING	A.ENGELBRECHT	
			DESIGN	R. MULLIGAN	
			DESIGN VERIFICATION	G.VIOLETT	
			PROJECT APPROVAL	R. MULLIGAN	
1	ISSUED FOR CONSTRUCTION	01/08/2011	CLIENT		
0	ISSUED FOR CONSTRUCTION	22/07/11			

QUEENSLAND UrbanUtilities ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd ABN 91 007 660 317

DRAWING SCALE: AS SHOWN
DRAFTER: A.ENGELBRECHT
ORIG. SIZE: A1

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP34 - DEMOLITION WORKS
EXISTING GROUND FLOOR & CONTROL ROOM PLAN

DRAWING No. 486-5-7-0383-004
REVISION 1

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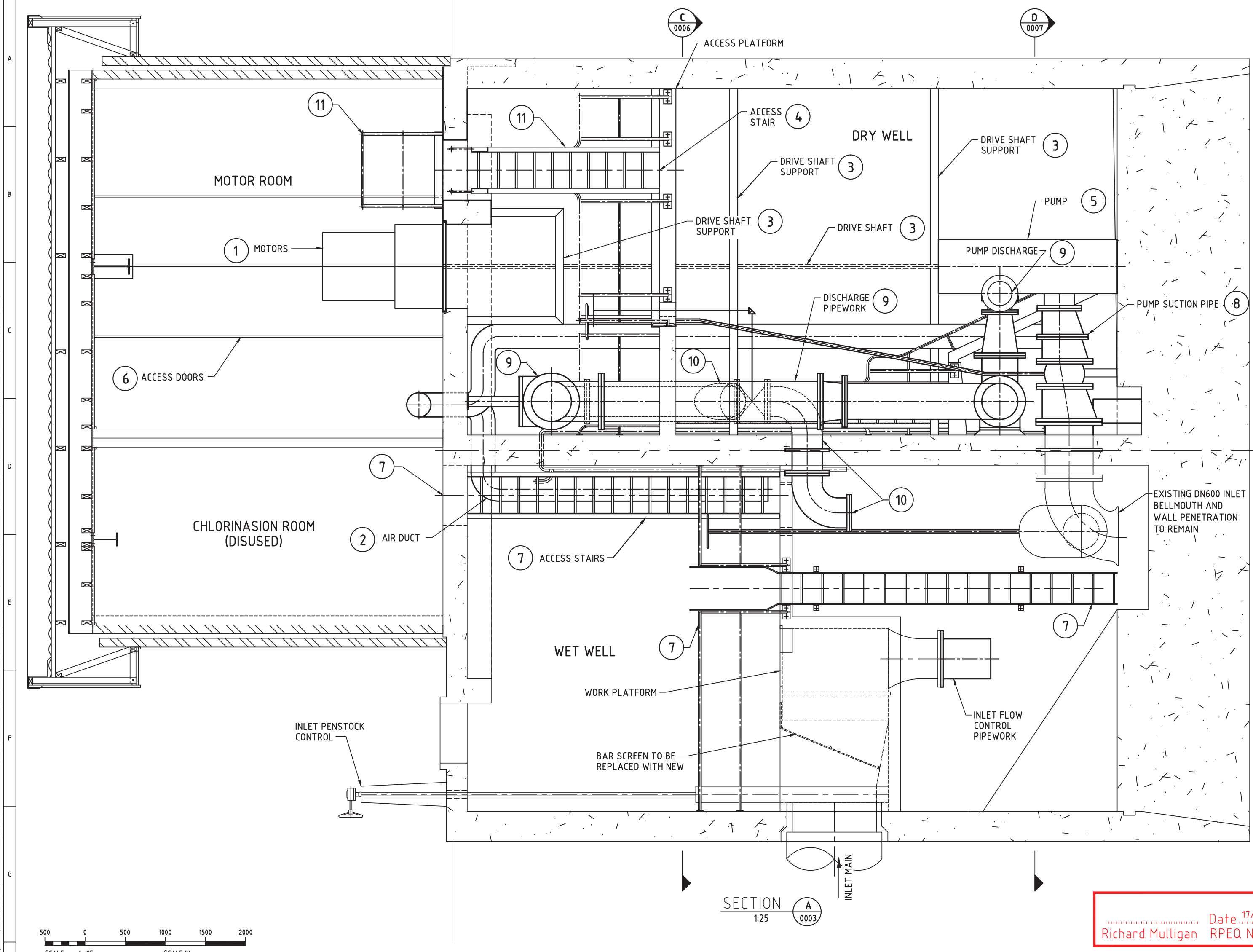

DEMOLITION NOTES

1. REMOVE MOTORS AND ASSOCIATED SUPPORTING STRUCTURE, INFILL EXISTING HATCH PENETRATION. FOR DETAILS REFER DRG NO 486-5-7-0383-0011.
2. REMOVE RETURN AIR DUCT IN WET WELL INCLUDING SUPPORTING STRUCTURE. CONCRETE INFILL ALL PENETRATIONS IN SLAB AND WALLS.
3. REMOVE PUMP DRIVE SHAFTS AND SUPPORTING FRAMING.
4. RELOCATE ACCESS STAIRS. REFER TO DRG No. 486-5-7-0383-0011.
5. REMOVE PUMP AND ASSOCIATED SUPPORT STRUCTURE.
6. EXISTING DOUBLE DOORS AT EACH END OF MOTOR ROOM TO BE MODIFIED. REFER DRG 486-5-7-0383-0011.
7. REMOVE WET WELL ACCESS HATCH, LADDERS, AND HANDRAIL, LEAVING WORK PLATFORM IN PLACE. INFILL HATCH TO MATCH EXISTING PUMP STATION ROOF
8. REMOVE PUMP SUCTION VALVE AND PIPEWORK AND ASSOCIATED SUPPORT STRUCTURES.
9. REMOVE DISCHARGE VALVES AND PIPEWORK AND ASSOCIATED SUPPORTING STRUCTURES.
10. REMOVE SCOUR PIPEWORK, WET WELL DISCHARGE PIPEWORK AND WALL PENETRATION INCLUDING VALVES AND SUPPORTING STRUCTURES. NOTE THAT EXISTING FLANGES ARE BURIED IN CONCRETE WALL. SCOUR BEND REMAINED IN WALL.
11. REMOVE DRY WELL ACCESS HATCH, HANDRAIL, AND STAIRS TO FIRST WORK PLATFORM. INFILL GROUND FLOOR SLAB TO NEW LAYOUT REFER DRG 486-5-7-0383-0011 FOR NEW LOCATION.
12. CONCRETE REPAIR TO EXPOSED PROJECTIONS, (BOLTS, REINFORCEMENT ETC):
    - 12.1. CUT BACK EXPOSED PROJECTION 50mm MINIMUM INTO CONCRETE SURFACE
    - 12.1. BLAST CLEAN CONCRETE SURFACE AROUND REPAIR
    - 12.1. APPLY 'SIKA TOP-110' EPOCOM BONDING MORTAR
    - 12.1. APPLY 'SIKA MONO TOP-615 HB' REPAIR MORTAR.

GENERAL NOTES

1. TIMING OF DEMOLITION WORKS NOT INDICATED. CONTRACTOR TO CONFIRM TIMING TO SUIT CONSTRUCTION WORKS AND INTERFACE REQUIREMENTS.
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.

WARNING

CONTRACTOR TO CONFIRM ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORKS.

CONTRACTOR TO CONFIRM DIAMETER OF EXISTING ASSETS PRIOR TO COMMENCEMENT OF WORKS THE DESIGN IS BASED ON INFORMATION SUPPLIED BY SERVICES AUTHORITIES AND SELECTIVE SERVICE IDENTIFICATION.

THE CONTRACTOR SHALL VERIFY THE POSITION OF EACH UNDERGROUND SERVICE BEFORE COMMENCING EXCAVATIONS.

Richard Mulligan Date 17/09/2013 RPEQ No. 7850

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THIS DRAWING HAS NOT BEEN CHECKED/VERIFIED AND MUST NOT BE RELIED UPON.
PLOT DATE Tuesday, 17 September 2013 1:36:49 PM

FOR CONSTRUCTION

REV	DESCRIPTION	DATE	POSITION	NAME	SIGNATURE
			DRAFTING	A.ENGELBRECHT	
			DESIGN	R. MULLIGAN	
			DESIGN VERIFICATION	G.VIOLETT	
1	ISSUED FOR CONSTRUCTION	01/08/2011	PROJECT APPROVAL	R. MULLIGAN	
0	ISSUED FOR CONSTRUCTION	22/07/11	CLIENT		

QUEENSLAND UrbanUtilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

DRAWING SCALE: AS SHOWN
DRAFTER: A.ENGELBRECHT
ORIG. SIZE: A1

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP34 - DEMOLITION WORKS
EXISTING SECTIONS - SHEET 1

DRAWING No. 486-5-7-0383-005
REVISION 1

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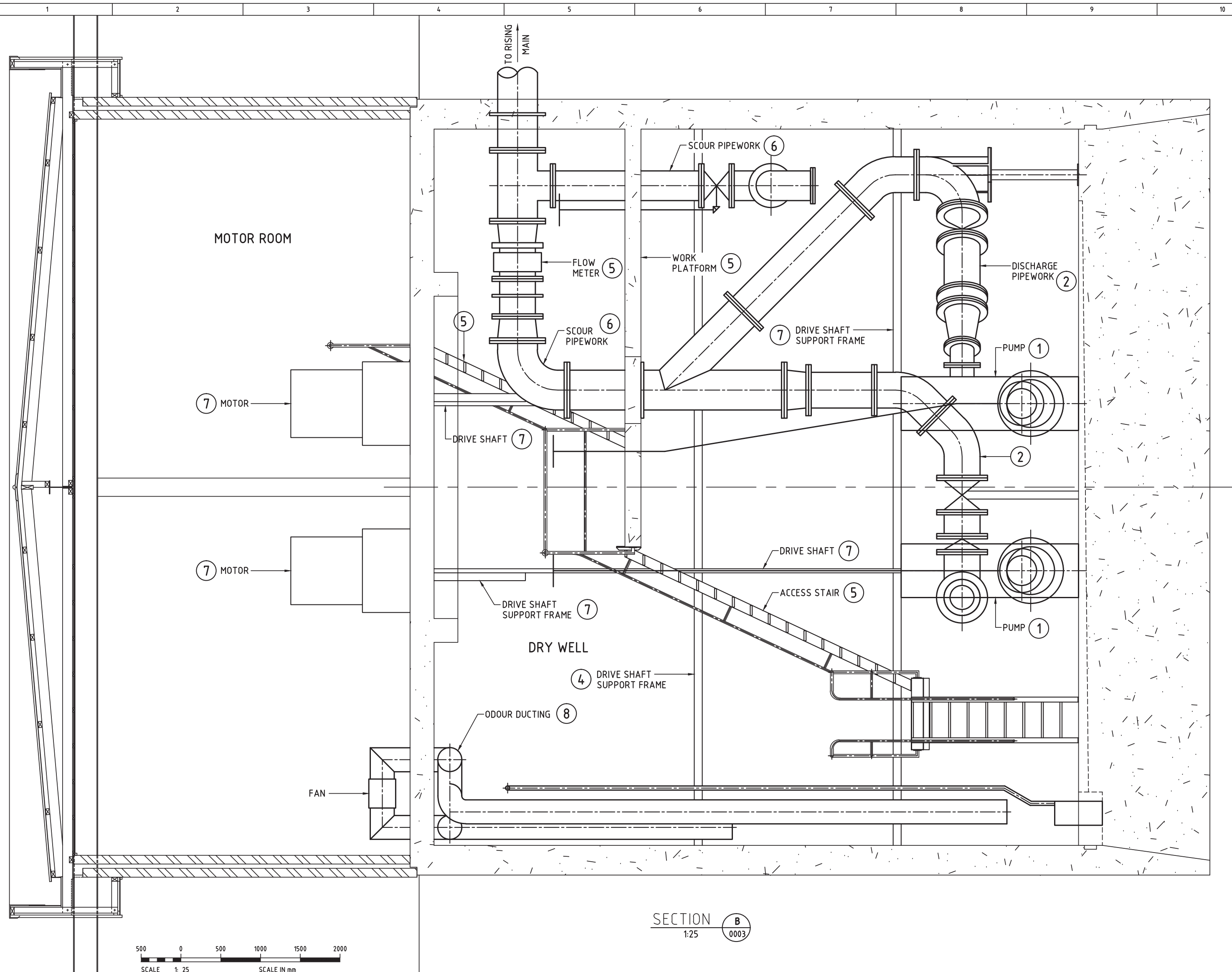

SECTION B / 0003
1:25

DEMOLITION NOTES

1. REMOVE PUMP AND ASSOCIATED SUPPORT STRUCTURE.
2. REMOVE DISCHARGE PIPEWORK VALVES AND ASSOCIATED SUPPORTING STRUCTURES.
3. REMOVE ALL VALVE SPINDLES
4. REMOVE EQUIPMENT SUPPORT FRAMES.
5. REMOVE ACCESS STAIRS AND EXTERNAL HANDRAIL OF TOP WORK PLATFORM. CONCRETE INFILL EXISTING HATCH PENETRATION FOR DETAILS REFER DRG No. 486-5-7-0383-0011.
6. REMOVE SCOUR PIPEWORK, WET WELL DISCHARGE PIPEWORK, WALL PENETRATION, VALVES AND SUPPORTING STRUCTURES.
7. REMOVE MOTORS AND ASSOCIATED SUPPORTING STRUCTURE. CONCRETE INFILL EXISTING MAINTENANCE PENETRATION INCLUDING EXTENDED DRIVE SHAFTS. REFER DRG No. 486-5-7-0383-0011.
8. REMOVE RETURN AIR DUCT IN WET WELL INCLUDING SUPPORT STRUCTURES. CONCRETE INFILL ALL PENETRATION IN SLAB AND WALLS.
9. CONCRETE REPAIR TO EXPOSED PROJECTIONS, (BOLTS, REINFORCEMENT ETC):
   - 9.1. CUT BACK EXPOSED PROJECTION 50mm MINIMUM INTO CONCRETE SURFACE
   - 9.2. BLAST CLEAN CONCRETE SURFACE AROUND REPAIR
   - 9.3. APPLY 'SIKA TOP-110' EPOCOM BONDING MORTAR
   - 9.4. APPLY 'SIKA MONO TOP-615 HB' REPAIR MORTAR.

GENERAL NOTES

1. TIMING OF DEMOLITION WORKS NOT INDICATED. CONTRACTOR TO CONFIRM TIMING TO SUIT CONSTRUCTION WORKS AND INTERFACE REQUIREMENTS.
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.

WARNING

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Richard Mulligan Date 17/09/2013 RPEQ No. 7850

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			DESIGN	R. MULLIGAN	
			DESIGN VERIFICATION	G.VIOLETT	
			PROJECT APPROVAL	R. MULLIGAN	
1	ISSUED FOR CONSTRUCTION	01/08/2011	CLIENT		
0	ISSUED FOR CONSTRUCTION	22/07/11			

QUEENSLAND Urban Utilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP34 - DEMOLITION WORKS
EXISTING SECTIONS - SHEET 2

DRAWING SCALE: AS SHOWN | ORIG. SIZE: A1 | DRAWING No.: 486-5-7-0383-006 | REVISION: 1
DRAFTER: A.ENGELBRECHT

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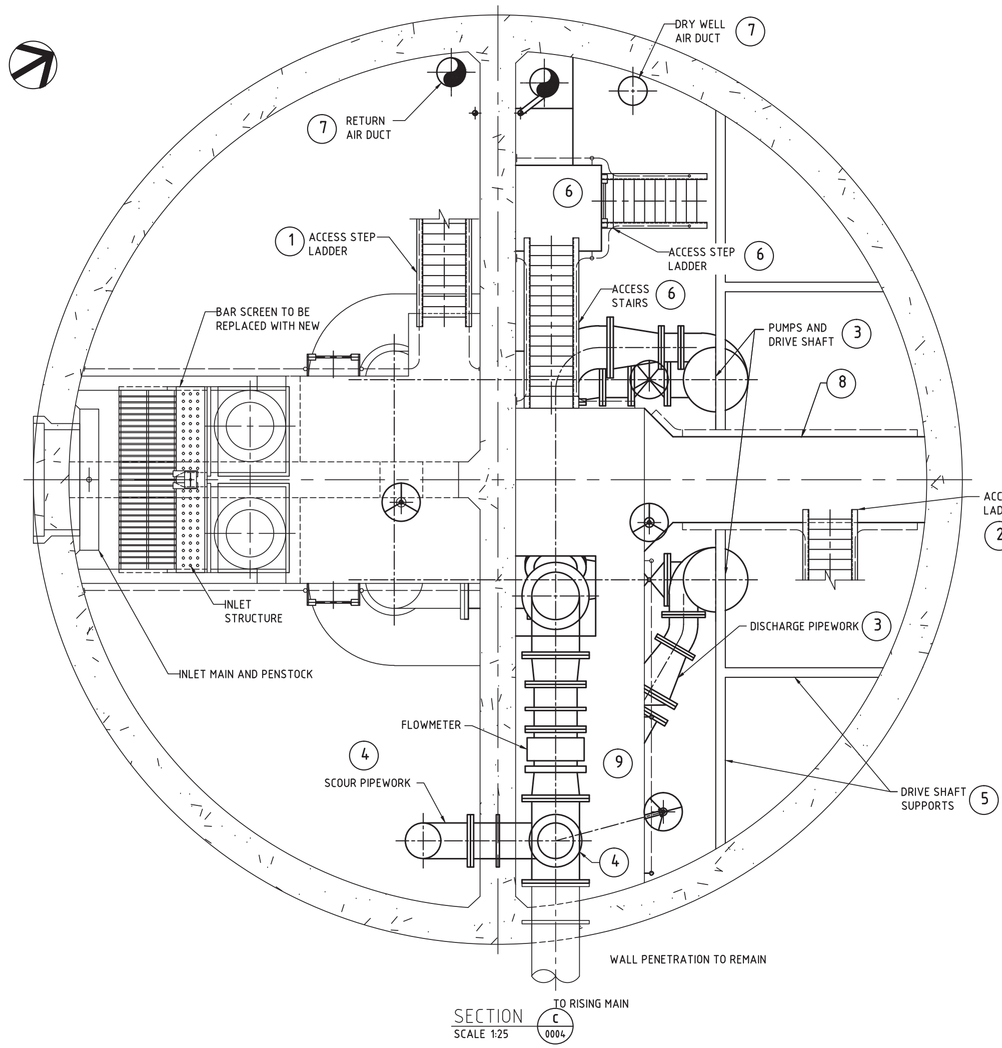

DEMOLITION NOTES:

1. REMOVE STEP LADDER, HAND RAILS, & LADDERS INTO WET WELL. WORK PLATFORM TO REMAIN. (CONDITION ASSESSMENT REPORT IS TO DETERMINE EXTENT OF REPAIRS REQUIRED TO WORK PLATFORM.)
2. REMOVE DRY WELL STEP LADDER, HAND RAILS, INFILL GROUND FLOOR SLAB. FOR EXTENT OF INFILL REFER DRAWING 486-5-7-0383-0011. DRY WELL ACCESS LADDER TO BE REMOVED.
3. REMOVE PUMPS, SUCTION AND DISCHARGE MANIFOLDS INCLUDING SUPPORT PLINTHS TO BE REMOVED.
4. REMOVE SCOUR PIPEWORK IN BOTH WET & DRY WELLS INCLUDING DEMOLITION OF WALL PENETRATION. REFER DRAWING 486-5-7-0383-014 & 016 FOR DETAILS.
5. DRIVE SHAFT SUPPORT FRAMES TO BE REMOVED.
6. REMOVE & REPLACE DRY WELL ACCESS STEP LADDER, PLATFORM, HANDRAIL FOR NEW DRY WELL ACCESS REFER DRAWINGS IW-SP0344-1-CIV-14-0713, 0714 & 0715.
7. REMOVE RETURN AIR DUCT TO WET WELL INCLUDING ALL SUPPORT FRAMES. ALL PENETRATIONS - FLOOR SLAB AND DIVIDING WALL TO BE CLOSED OFF WITH CONCRETE INFILL.
8. REMOVE WALKWAY, HAND RAIL,GRATING AND SUPPORT STRUCTURE TO EXTENT SHOWN.
9. INFILL EXISTING PENETRATIONS OF PLATFORM, REMOVE HANDRAIL AND EXTEND LENGTH AND WIDTH OF PLATFORM. FOR DETAILS REFER DRAWING 486-5-7-0383-011, 013 & 014.

GENERAL NOTES

1. TIMING OF DEMOLITION WORKS NOT INDICATED. CONTRACTOR TO CONFIRM TIMING TO SUIT CONSTRUCTION WORKS AND INTERFACE REQUIREMENTS.
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.
3. DRAWING TO BE READ IN CONJUNCTION WITH 486-5-7-0383-005 & 006.

WARNING

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CONTRACTOR TO CONFIRM DIAMETER OF EXISTING ASSETS PRIOR TO COMMENCEMENT OF WORKS THE DESIGN IS BASED ON INFORMATION SUPPLIED BY SERVICES AUTHORITIES AND SELECTIVE SERVICE IDENTIFICATION.

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Richard Mulligan Date 17/09/2013 RPEQ No. 7850

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PLOT DATE Tuesday, 17 September 2013 1:36:50 PM

FOR CONSTRUCTION

SCALE 1: 25 — 500 0 500 1000 1500 2000 — SCALE IN mm

REV	DESCRIPTION	DATE	POSITION	NAME	SIGNATURE
			DRAFTING	A.ENGELBRECHT	
			DESIGN	R. MULLIGAN	
			DESIGN VERIFICATION	G.VIOLETT	
			PROJECT APPROVAL	R. MULLIGAN	
1	ISSUED FOR CONSTRUCTION	01/08/2011	CLIENT		
0	ISSUED FOR CONSTRUCTION	22/07/11			

QUEENSLAND Urban Utilities ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd ABN 91 007 660 317

TITLE: SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP34 - DEMOLITION WORKS
EXISTING SECTIONS - SHEET 3

DRAWING SCALE: AS SHOWN | ORIG. SIZE: A1 | DRAWING No.: 486-5-7-0383-007 | REVISION: 1
DRAFTER: A.ENGELBRECHT

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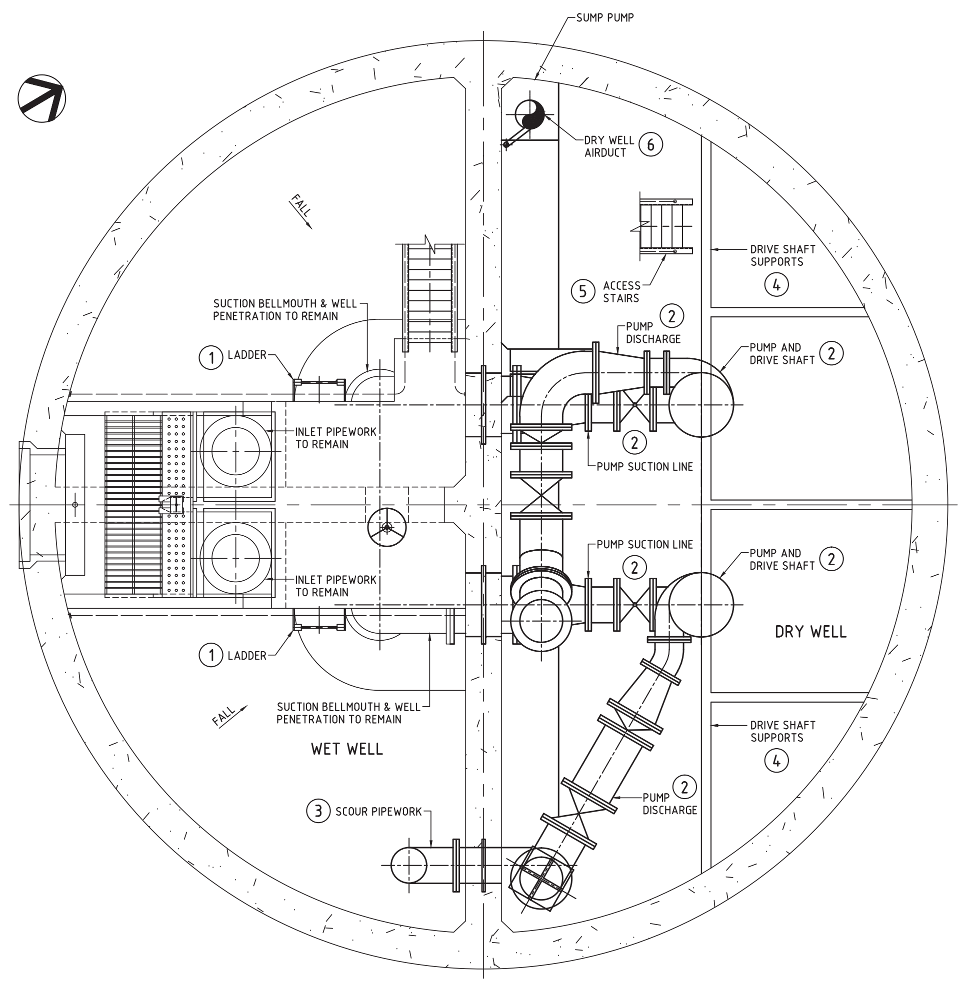

SECTION D
1:25 0004

DEMOLITION NOTES

1. REMOVE STEP LADDER, HAND RAILS, & LADDERS INTO WET WELL. WORK PLATFORM TO REMAIN. CONDITION ASSESSMENT REPORT IS TO DETERMINE EXTENT OF REPAIRS REQUIRED TO WORK PLATFORM.
2. REMOVE PUMPS, SUCTION AND DISCHARGE MANIFOLDS INCLUDING SUPPORT PLINTHS TO BE REMOVED.
3. REMOVE SCOUR PIPEWORK IN BOTH WET & DRY WELLS INCLUDING DEMOLITION OF WALL PENETRATION. REFER DRAWING 486-5-7-0383-013 & 016 FOR DETAILS.
4. DRIVE SHAFT SUPPORT FRAMES TO BE REMOVED.
5. REMOVE & REPLACE DRY WELL ACCESS STEP LADDER, PLATFORM, HANDRAIL FOR NEW DRY WELL ACCESS REFER DRAWINGS IW-SP0344-1-CIV-14-0713, 0714 & 0715.
6. REMOVE RETURN AIR DUCT TO WET WELL INCLUDING ALL SUPPORT FRAMES. ALL PENETRATIONS - FLOOR SLAB AND DIVIDING WALL TO BE CLOSED OFF WITH CONCRETE INFILL.

GENERAL NOTES

1. TIMING OF DEMOLITION WORKS NOT INDICATED. CONTRACTOR TO CONFIRM TIMING TO SUIT CONSTRUCTION WORKS AND INTERFACE REQUIREMENTS.
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.
3. DRAWING TO BE READ IN CONJUNCTION WITH 486-5-7-0383-005 & 007.

WARNING

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Richard Mulligan Date 17/09/2013 RPEQ No. 7850

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PLOT DATE Tuesday, 17 September 2013 1:36:50 PM

FOR CONSTRUCTION

SCALE 1: 25 — 500 0 500 1000 1500 2000 SCALE IN mm

REV	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	01/08/2011
0	ISSUED FOR CONSTRUCTION	22/07/11

POSITION	NAME	SIGNATURE
DRAFTING	A.ENGELBRECHT	
DESIGN	R. MULLIGAN	
DESIGN VERIFICATION	G.VIOLETT	
PROJECT APPROVAL	R. MULLIGAN	
CLIENT		

QUEENSLAND UrbanUtilities ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd ABN 91 007 660 317

DRAWING SCALE AS SHOWN
DRAFTER: A.ENGELBRECHT
ORIG. SIZE A1

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP34 - DEMOLITION WORKS
EXISTING SECTIONS - SHEET 4

DRAWING No. 486-5-7-0383-008
REVISION 1

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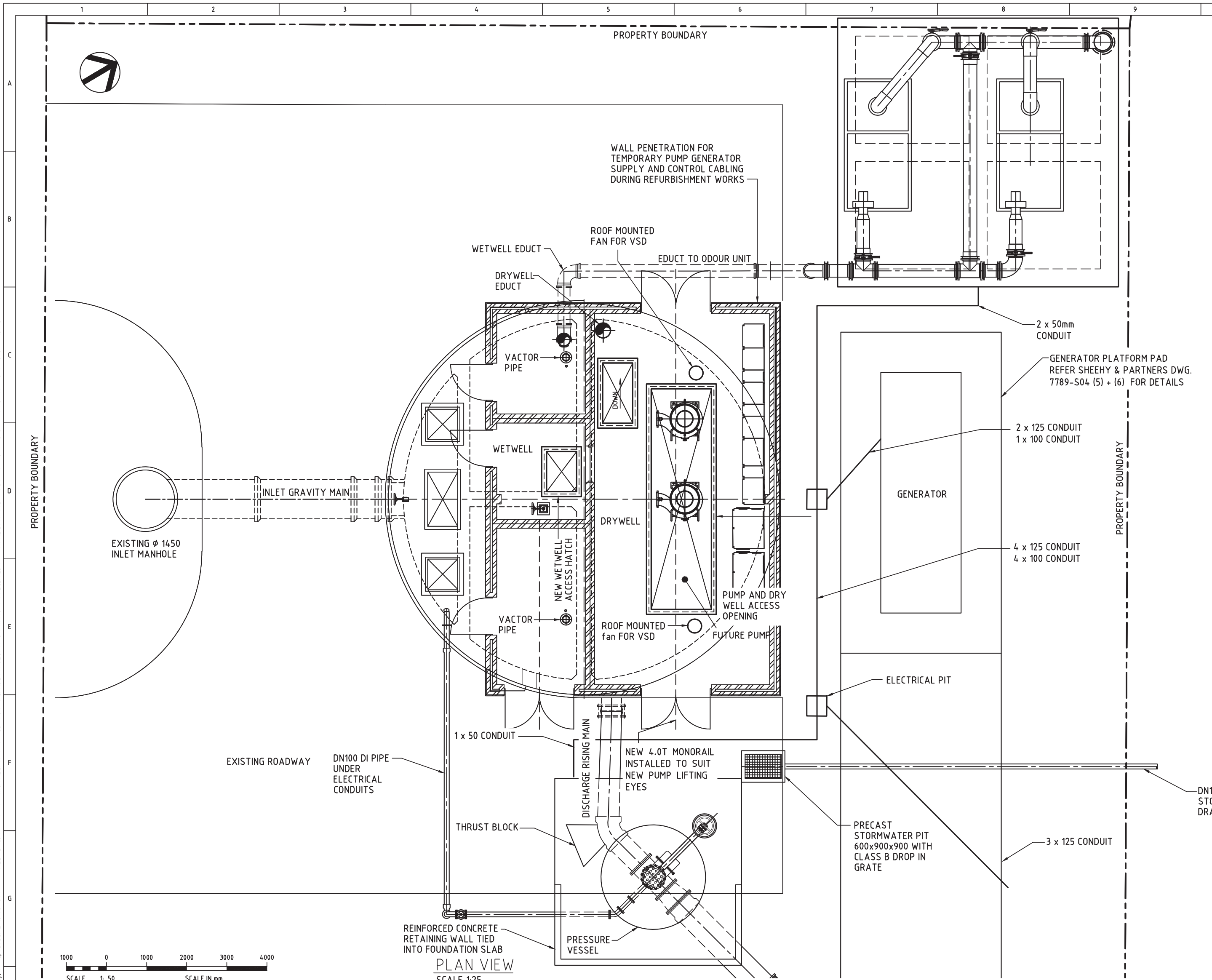

PLAN VIEW
SCALE 1:25

NOTES
1. CONNECT EDUCTS TO FAN POLE VIA ODOUR TREATMENT SYSTEM. FOUL AIR DUCT SHOULD SLOPE TOWARDS THE WET WELL (MINIMUM GRADIENT 1:50). OTHER DETAILS TO BE CONFIRMED BY ODOUR CONTROL VENDOR.
2. EDUCT & INDUCT DIAMETERS ARE ONLY INDICATIVE & NEED TO BE CONFIRMED BY ODOUR VENDOR. VENTILATION DUCTING FOR COLLECTION MANHOLE TO BE LEFT IN PLACE.
3. EACH INDUCT TO BE FITTED WITH: A ONE-WAY VALVE TO PREfan FOUL AIR FROM FLOWING OUT THE INDUCT; AND A DAMPER TO REGULATE THE FLOW OF FRESH AIR INTO THE WET WELL. MINIMUM CLEARANCES BETWEEN INDUCT TERMINATION AND SEWAGE ARE: 1m ABOVE UTWL & 0.1m ABOVE MAX TWL (DURING OVERFLOW)
4. PROVIDE KNEE OPERATED HAND WASH FACILITY WHICH DRAINS TO WET WELL.
5. EDUCT OFF TAKE IS TO BE FITTED WITH A DAMPER AND A FLOW MEASUREMENT PROVISION.
6. HARMONIC FILTERS REQUIREMENTS SHALL BE CONFIRMED BY VSD SUPPLIER.
7. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.

Date ....
RPEQ No.

Date ....
RPEQ No.

Richard Mulligan Date 17/09/2013
RPEQ No. 7850

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AS INSTALLED

REV	DESCRIPTION	DATE	POSITION	NAME	SIGNATURE
			DRAFTING	A.ENGELBRECHT	
			DESIGN	R. MULLIGAN	
			DESIGN VERIFICATION	G.VIOLETT	
2	AS INSTALLED	07/01/2013	PROJECT APPROVAL	R. MULLIGAN	
1	ISSUED FOR CONSTRUCTION	01/08/2011	CLIENT		
0	ISSUED FOR CONSTRUCTION	22/07/11			

PROPERTY BOUNDARY

QUEENSLAND UrbanUtilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd ABN 91 007 660 317

DRAWING SCALE: AS SHOWN
DRAFTER: A.ENGELBRECHT
ORIG. SIZE: A1

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
GENERAL ARRANGEMENT

DRAWING No. 486-5-7-0383-009
REVISION 2

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NOTE:
1. ALL DICL PIPE TO BE PN35 FLANGED PN16 TO AS 4087.
2. CONTRACTOR MAY UTILIZE UNI-FLAGES UPON WRITTEN ACCEPTANCE FROM SUPERINTENDENT.

NOTE
1. DRAWING TO BE READ IN CONJUNTION WITH 486-5-7-0383-012, 013, 014, 015 & 016.

Item	Qty	Make & Number	Req. No.
1	12	250dia. B.N.W.G. SET 316SS TC	P7328
2	5	300dia. B.N.W.G. SET 316SS TC	P7328
3	26	450dia. B.N.W.G. SET 316SS TC	P7328
4	1	500dia. B.N.W.G. SET 316SS TC	P7328
5	8	600dia. B.N.W.G. SET 316SS TC	P7328
6	1	600dia. DF PIPE 250Lg	P7328
7	1	600dia. DF PIPE 275Lg	P7328
8	2	300dia. - 250dia. DF ECCENTRIC TAPER	P7328
9	1	300dia. BLANK FLANGE	P7328
10	2	250dia. FL/SP PIPE 188Lg	P7328
11	4	250dia. NON THRUST DISMANTLING JOINT	P7328
12	2	250dia. FL/SP PIPE 238Lg	P7328
13	2	250dia. DF PIPE 623Lg	P7328
14	2	250dia. DF 90deg. DUCKFOOT BEND	P7328
15	2	450dia. - 250dia. DF CONCENTRIC TAPER	P7328
16	2	600dia. BLANK FLANGE c/w 1" BSP HOLE TAPPED CENTRAL	P7328
17	5	450dia. THRUST DISMANTLING JOINT	P7329
18	3	450dia. ALL FL TEE	P7329
19	2	450dia. BLANK FLANGES	P7329
20	1	450dia. DF PIPE 336Lg	P7329
21	3	450dia. DF PIPE 335Lg	P7329
22	1	450dia. DF PIPE 1661Lg	P7329
23	1	450dia. DF 90deg. BEND	P7329
24	1	450dia. DF PIPE 2700Lg	P7329
25	1	450dia. DF PIPE 1110Lg	P7329
26	1	450dia. 1" BSP TAPPING BAND	P7329
27	1	500dia. - 450dia. DF CONCENTRIC TAPER	P7329
28	1	600dia. - 300dia. PIPEWORK HEADER	P7309
29	2	600dia. LUGGED KNIFEGATE VALVE	P7327
30	2	300dia. LUGGED KNIFEGATE VALVE	P7327
31	2	450dia. DF VALMATIC FLEX CHECK VALVE	P7327
32	2	450dia. LUGGED KNIFEGATE VALVE	P7327
33	1	450dia. ENDRESS & HAUSER FLOWMETER	P7307
34	2	450dia. LUGGED KNIFEGATE VALVE (INLET VALVES)	
35	1	450dia. LUGGED KNIFEGATE VALVE (IN WALL BETWEEN WET WELLS	

Item	Qty	Make & Number	Req. No.
36	6	25mm BSP HEX. NIPPLE	
37	4	25mm BSP FULL PORT 2 PIECE BALL VALVE	
38	2	25mm BSP x MALE CAMLOCK PURPLE PIR PART No.300210430	
39	4m	M28-316SS BROOKER ROD	
40	24	M28-316SS NUTS	
41	8	28mm-316SS FLAT WASHERS	
42	16	28mm GALV. SQUARE WASHERS	
43	8	M16x220 SS STUD ANCHORS	
44	16	16mm GALV. SQUARE WASHERS	
45	16	M16-316SS NUTS	
46	3	450dia. PIPE SUPPORT BRACKET TO DETAIL 1	
47	1	450dia. PIPE SUPPORT SADDLE TO DETAIL 2	
48	8	M16x100 SS STUD ANCHORS	
49	6	M14x50-316SS SET SCREWS	
50	6	M14-316SS NUTS	
51	6	M14-316SS FLAT WASHERS	
52	1	32 - 25mm 316SS HEX. REDUCING NIPPLE	
53	1	32mm 316SS FULL PORT 2 PIECE BALL VALVE	
AIR BLEED			
54	2	50mm 316SS HEX. NIPPLE	
55	1	50mm 316SS FULL PORT 2 PIECE BALL VALVE	
56	1	50mm 316SS F/F UNION	
57	3	50mm 316SS TOE NIPPLES	
58	1.5m	50mm 316SS SCH.10 PIPE	
59	1	50mm 316SS F/F 90deg. ELBOWS	
60	1	50mm 316SS TABLE D SOW FLANGE	
61	1	450dia. 2" BSP TAPPING BAND	
SAMPLE POINT			
	1	450dia. 1" BSP TAPPING BAND	
62	1	25mm 316SS HEX. NIPPLE	
63	1	25mm 316SS FULL PORT 2 PIECE BALL VALVE	
64	2	McBERNS AUTO WELL WASHER	
65	*1*	***450dia. 1" BSP TAPPING BAND***	
66	*1*	***25mm 316SS HEX. NIPPLE***	
67	*1*	***25mm 316SS FULL PORT 2 PIECE BALL VALVE***	
68	*1*	***25mm 316SS F/F UNION***	
69	*4*	***25mm 316SS TOE NIPPLES***	
70	*1*	***25mm 316SS F/F 90deg. ELBOWS***	
71	*2m*	***25mm 316SS SCH.10 PIPE***	
72	*1*	***25mm 316SS TABLE D SOW FLANGE***	

Date ....
RPEQ No.

Date ....
RPEQ No.

Richard Mulligan Date 17/09/2013
RPEQ No. 7850

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AS INSTALLED

REV	DESCRIPTION	DATE
2	AS INSTALLED	07/01/2012
1	ISSUED FOR CONSTRUCTION	01/08/2011
0	ISSUED FOR CONSTRUCTION	22/07/11

POSITION	NAME	SIGNATURE
DRAFTING	A.ENGELBRECHT	
DESIGN	R. MULLIGAN	
DESIGN VERIFICATION	G.VIOLETT	
PROJECT APPROVAL	R. MULLIGAN	
CLIENT		

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ABN 86 673 835 011

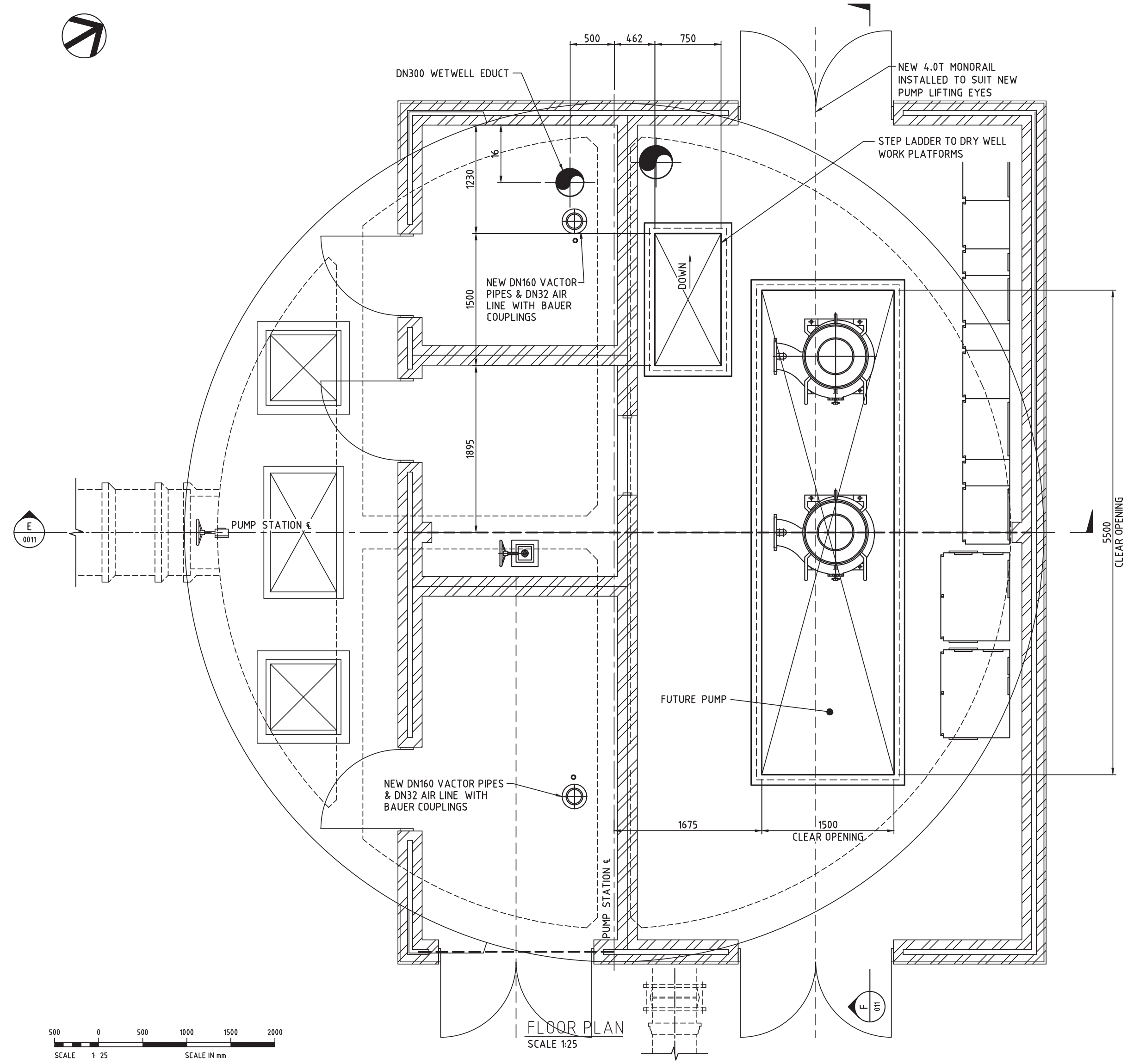
Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd ABN 91 007 660 317

DRAWING SCALE N.T.S.
DRAFTER: A.ENGELBRECHT
ORIG. SIZE A1

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
WATER FITTINGS SCHEDULE

DRAWING No. 486-5-7-0383-010
REVISION 2

© Kellogg Brown & Root DATE: Tuesday, 17 September 2013 1:36:52 PM FILE: L:\C54000 QUU IPSWICH REGION SP01 SP33 SP34 UPGRADE PROJECT\16 DRAWINGS\01 RECEIVED\QUU FINAL DRAWINGS\SP344\486-5-7-0383-010\SP344\486-5-7-0383-010.DWG



FLOOR PLAN
SCALE 1:25

NOTES

1. DETAIL DESIGN OF THE SWITCHBOARD DOORS SHALL ALLOW ADEQUATE ACCESS ACCORDING TO ASNZS 3000:2007.
2. DRAWING TO BE READ IN CONJUNCTION WITH 486-5-7-0383-012 & 013.
3. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.

Date ....
RPEQ No.

Date ....
RPEQ No.

Richard Mulligan Date 17/09/2013
RPEQ No. 7850

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PLOT DATE Tuesday, 17 September 2013 1:40:30 PM

FOR CONSTRUCTION

500 0 500 1000 1500 2000
SCALE 1: 25 SCALE IN mm

REV	DESCRIPTION	DATE	POSITION	NAME	SIGNATURE
			DRAFTING	A.ENGELBRECHT	
			DESIGN	R. MULLIGAN	
			DESIGN VERIFICATION	G.VIOLETT	
2	AS INSTALLED	07/01/2013	PROJECT APPROVAL	R. MULLIGAN	
1	ISSUED FOR CONSTRUCTION	01/08/2011	CLIENT		
0	ISSUED FOR CONSTRUCTION	22/07/11			

QUEENSLAND Urban Utilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
GROUND FLOOR MODIFICATIONS

DRAWING SCALE: AS SHOWN
DRAFTER: A.ENGELBRECHT
ORIG. SIZE: A1
DRAWING No.: 486-5-7-0383-011
REVISION: 2

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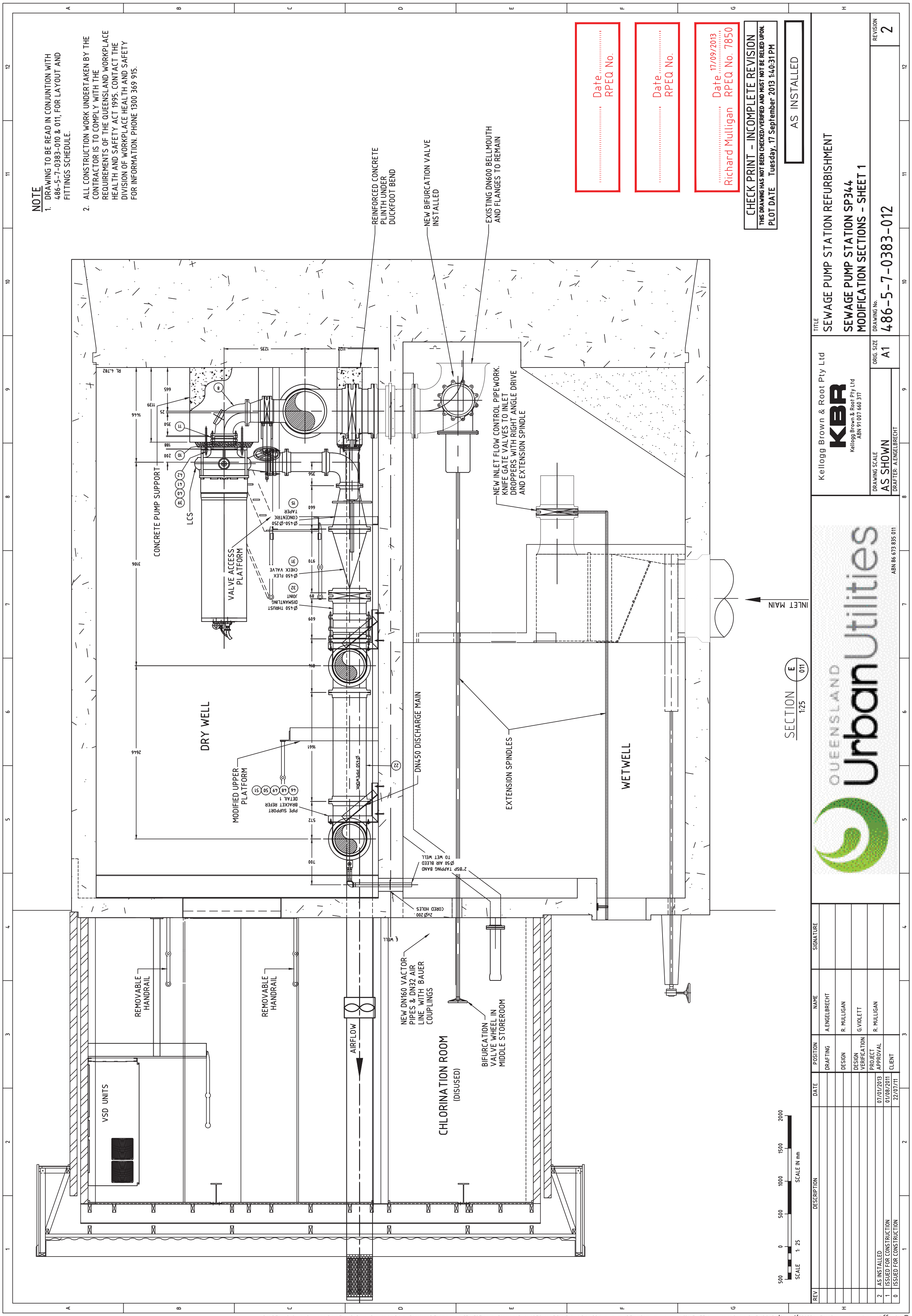
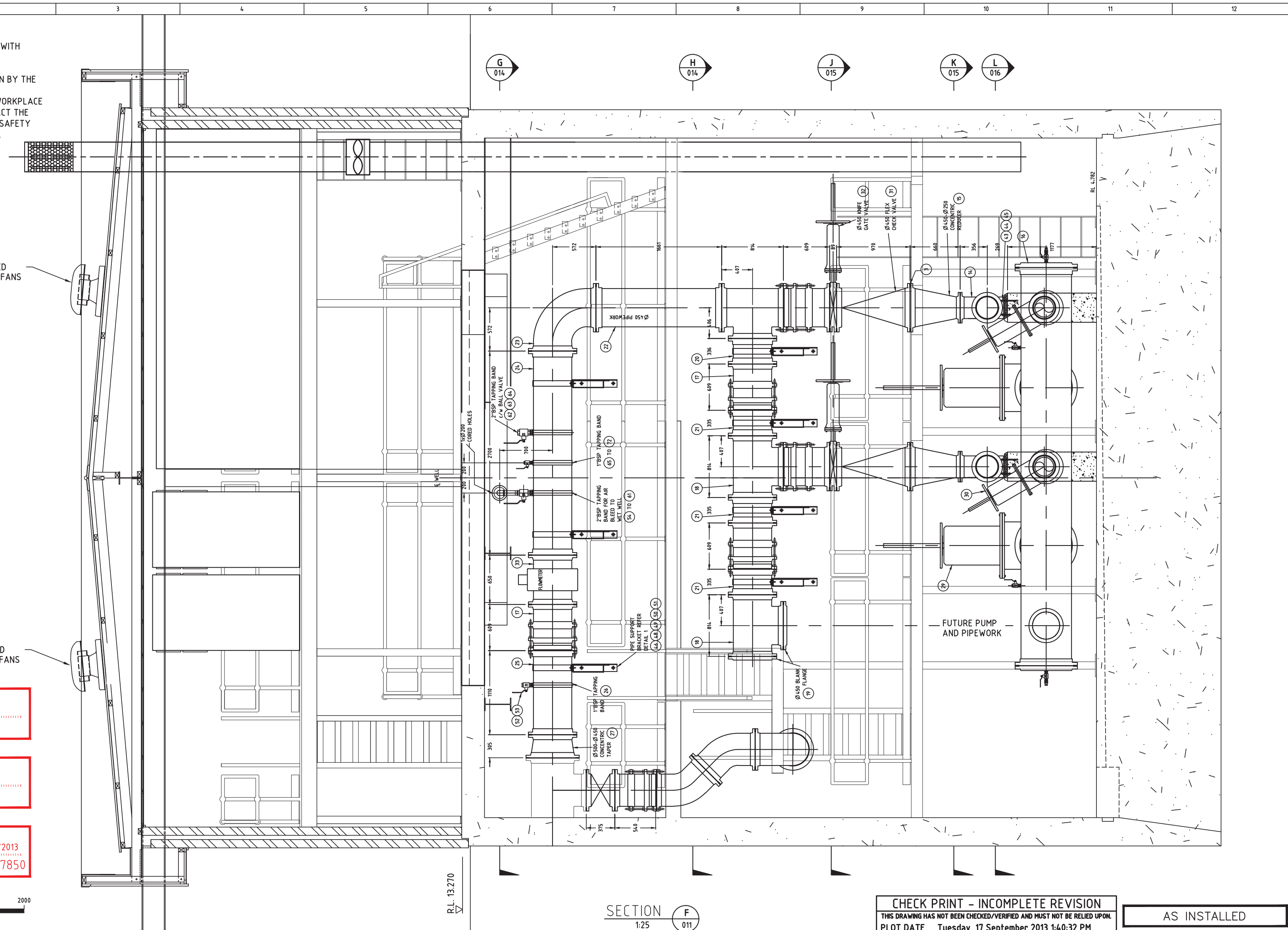

NOTE
1. DRAWING TO BE READ IN CONJUNTION WITH 486-5-7-0383-010 & 011, FOR LAYOUT AND FITTINGS SCHEDULE.
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.
REINFORCED CONCRETE PLINTH UNDER DUCKFOOT BEND
NEW BIFURCATION VALVE INSTALLED
EXISTING DN600 BELLMOUTH AND FLANGES TO REMAIN
NEW INLET FLOW CONTROL PIPEWORK. KNIFE GATE VALVES TO INLET DROPPERS WITH RIGHT ANGLE DRIVE AND EXTENSION SPINDLE
CONCRETE PUMP SUPPORT
LCS
VALVE ACCESS PLATFORM
DRY WELL
MODIFIED UPPER PLATFORM
DN450 DISCHARGE MAIN
EXTENSION SPINDLES
WETWELL
INLET MAIN
SECTION 1:25
REMOVABLE HANDRAIL
REMOVABLE HANDRAIL
VSD UNITS
AIRFLOW
NEW DN160 VACTOR PIPES & DN32 AIR LINE WITH BAUER COUPLINGS
BIFURCATION VALVE WHEEL IN MIDDLE STOREROOM
CHLORINATION ROOM (DISUSED)
CHECK PRINT - INCOMPLETE REVISION
THIS DRAWING HAS NOT BEEN CHECKED/VERIFIED AND MUST NOT BE RELIED UPON.
PLOT DATE Tuesday, 17 September 2013 1:40:31 PM
AS INSTALLED
Richard Mulligan Date 17/09/2013 RPEQ No. 7850
Kellogg Brown & Root Pty Ltd
KBR
QUEENSLAND UrbanUtilities
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344 MODIFICATION SECTIONS - SHEET 1
DRAWING SCALE AS SHOWN
ORIG. SIZE A1
DRAWING No. 486-5-7-0383-012
REVISION 2
2 AS INSTALLED 07/01/2013
1 ISSUED FOR CONSTRUCTION 01/08/2011
0 ISSUED FOR CONSTRUCTION 22/07/11
DRAFTING A.ENGELBRECHT
DESIGN R. MULLIGAN
DESIGN VERIFICATION G.VIOLETT
PROJECT APPROVAL R. MULLIGAN
SCALE 1:25
SCALE IN mm

NOTES

1. DRAWING TO BE READ IN CONJUNCTION WITH 486-5-7-0383-010.
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.



SECTION F/011
1:25

Date			RPEQ No.
Date			RPEQ No.
Richard Mulligan	Date 17/09/2013		RPEQ No. 7850

SCALE 1: 25 — SCALE IN mm (500, 0, 500, 1000, 1500, 2000)

CHECK PRINT - INCOMPLETE REVISION
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PLOT DATE Tuesday, 17 September 2013 1:40:32 PM

AS INSTALLED

REV	DESCRIPTION	DATE
2	AS INSTALLED	P.C.
1	ISSUED FOR CONSTRUCTION	01/08/2011
0	ISSUED FOR CONSTRUCTION	22/07/11

POSITION	NAME	SIGNATURE
DRAFTING	A.ENGELBRECHT	
DESIGN	R. MULLIGAN	
DESIGN VERIFICATION	G.VIOLETT	
PROJECT APPROVAL	R. MULLIGAN	
CLIENT		

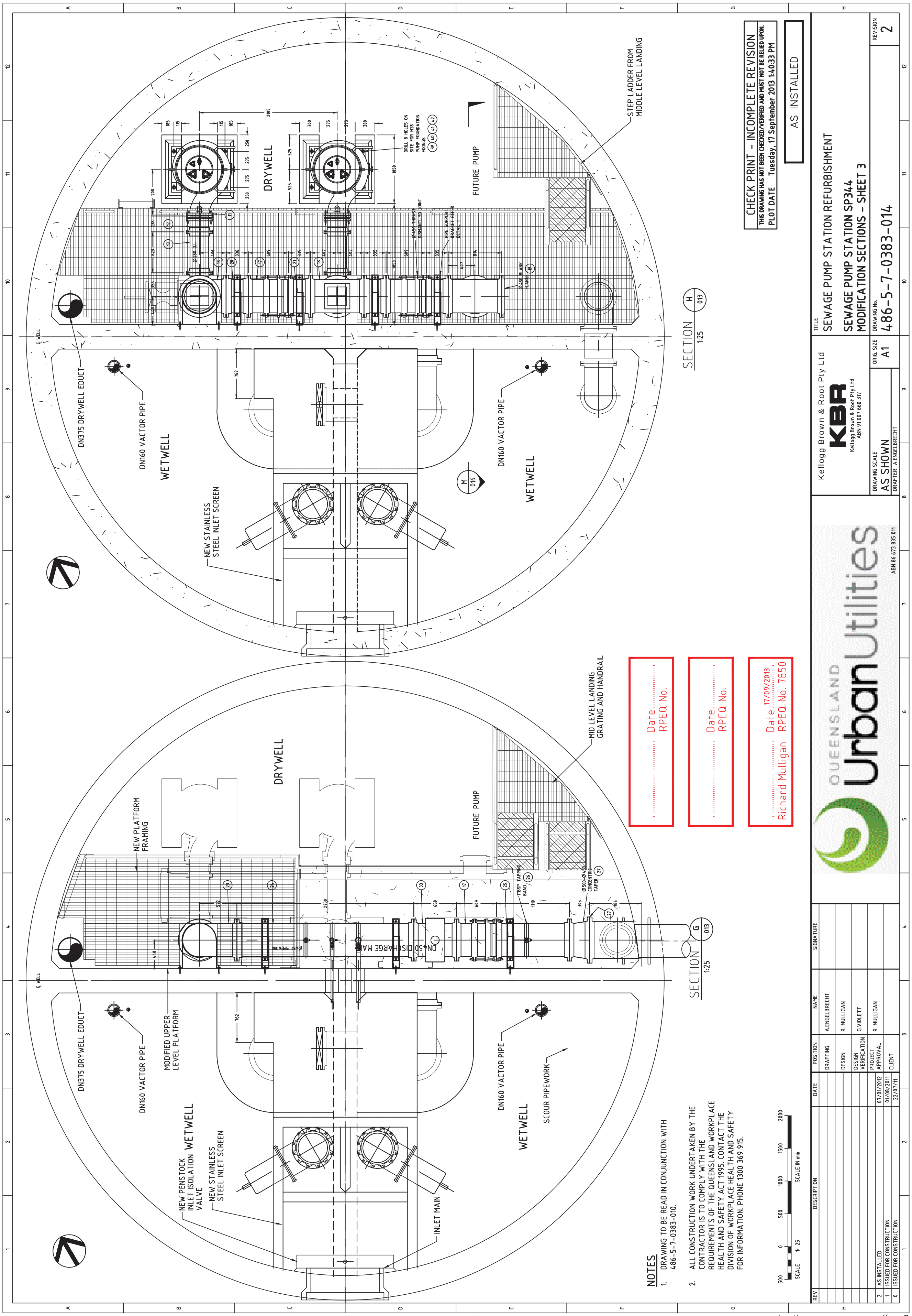
QUEENSLAND UrbanUtilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
MODIFICATION SECTIONS - SHEET 2

DRAWING SCALE: AS SHOWN
DRAFTER: A.ENGELBRECHT
ORIG. SIZE: A1
DRAWING No.: 486-5-7-0383-013
REVISION: 2

DATE: Tuesday, 17 September 2013 1:40:32 PM FILE: L:\C54000 QUU IPSWICH REGION SP01 SP33 SP34 UPGRADE PROJECT\16 DRAWINGS\01 RECEIVED\QUU FINAL DRAWINGS\SP344\486-5-7-0383-013\SP344\486-5-7-0383-013.DWG



CHECK PRINT - INCOMPLETE REVISION
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PLOT DATE Tuesday, 17 September 2013 1:40:33 PM
AS INSTALLED
STEP LADDER FROM MIDDLE LEVEL LANDING
FUTURE PUMP
DRYWELL
WETWELL
DN375 DRYWELL EDUCT
DN160 VACTOR PIPE
NEW STAINLESS STEEL INLET SCREEN
SECTION H 013 1:25
SECTION G 013 1:25
MID LEVEL LANDING GRATING AND HANDRAIL
NEW PLATFORM FRAMING
MODIFIED UPPER LEVEL PLATFORM
NEW PENSTOCK INLET ISOLATION VALVE
SCOUR PIPEWORK
INLET MAIN
DN450 DISCHARGE MAIN
Date 17/09/2013
RPEQ No. 7850
Richard Mulligan
NOTES
1. DRAWING TO BE READ IN CONJUNCTION WITH 486-5-7-0383-010.
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.
SCALE 1:25
SCALE IN mm
Kellogg Brown & Root Pty Ltd
KBR
ABN 91 007 660 317
QUEENSLAND UrbanUtilities
ABN 86 673 835 011
TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
MODIFICATION SECTIONS - SHEET 3
DRAWING SCALE AS SHOWN
DRAFTER: A.ENGELBRECHT
ORIG. SIZE A1
DRAWING No. 486-5-7-0383-014
REVISION 2
DRAFTING A.ENGELBRECHT
DESIGN R. MULLIGAN
DESIGN VERIFICATION G.VIOLETT
PROJECT APPROVAL R. MULLIGAN
2 AS INSTALLED 07/01/2012
1 ISSUED FOR CONSTRUCTION 01/08/2011
0 ISSUED FOR CONSTRUCTION 22/07/11
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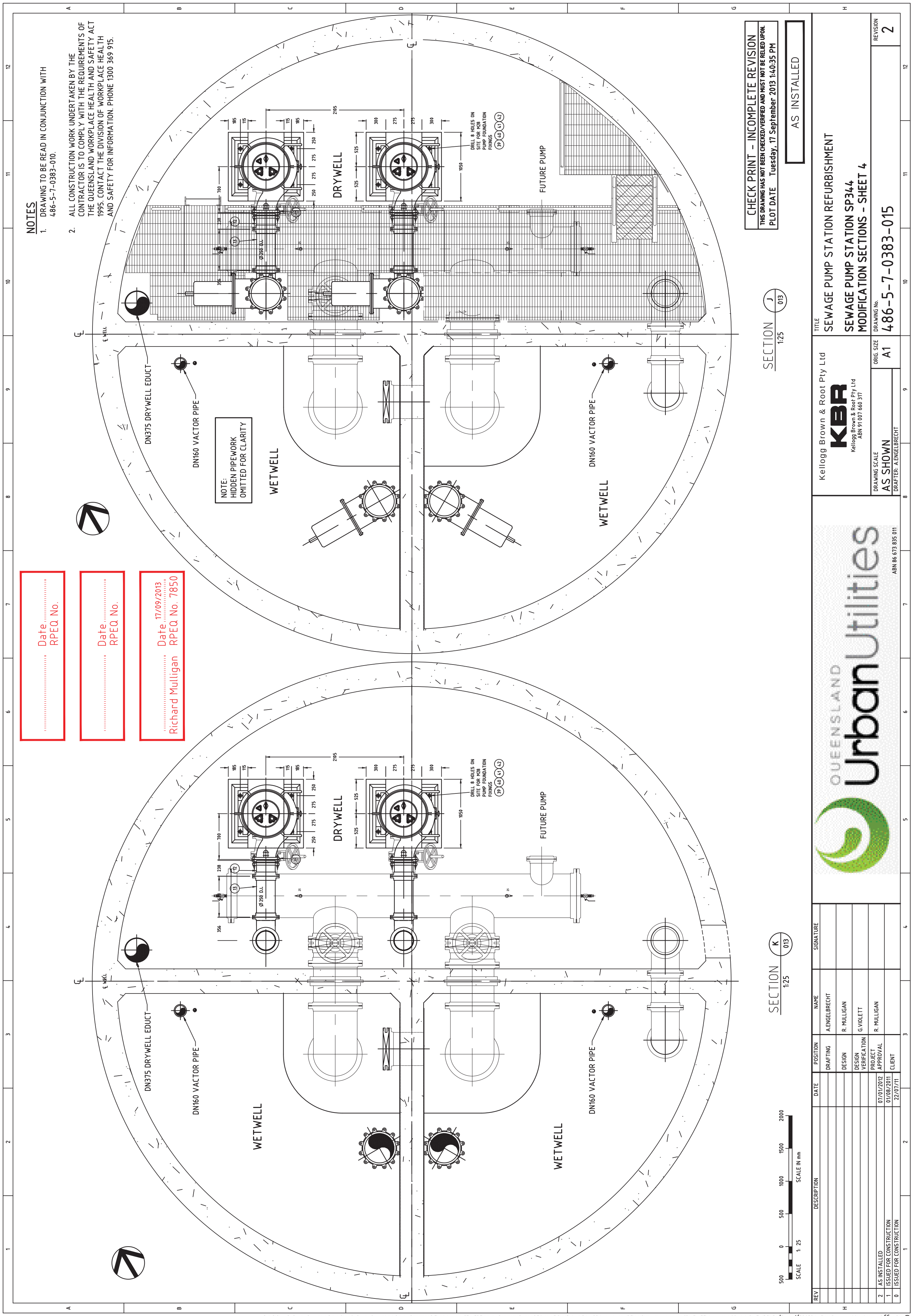
NOTES
1. DRAWING TO BE READ IN CONJUNCTION WITH 486-5-7-0383-010.
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.
CHECK PRINT - INCOMPLETE REVISION
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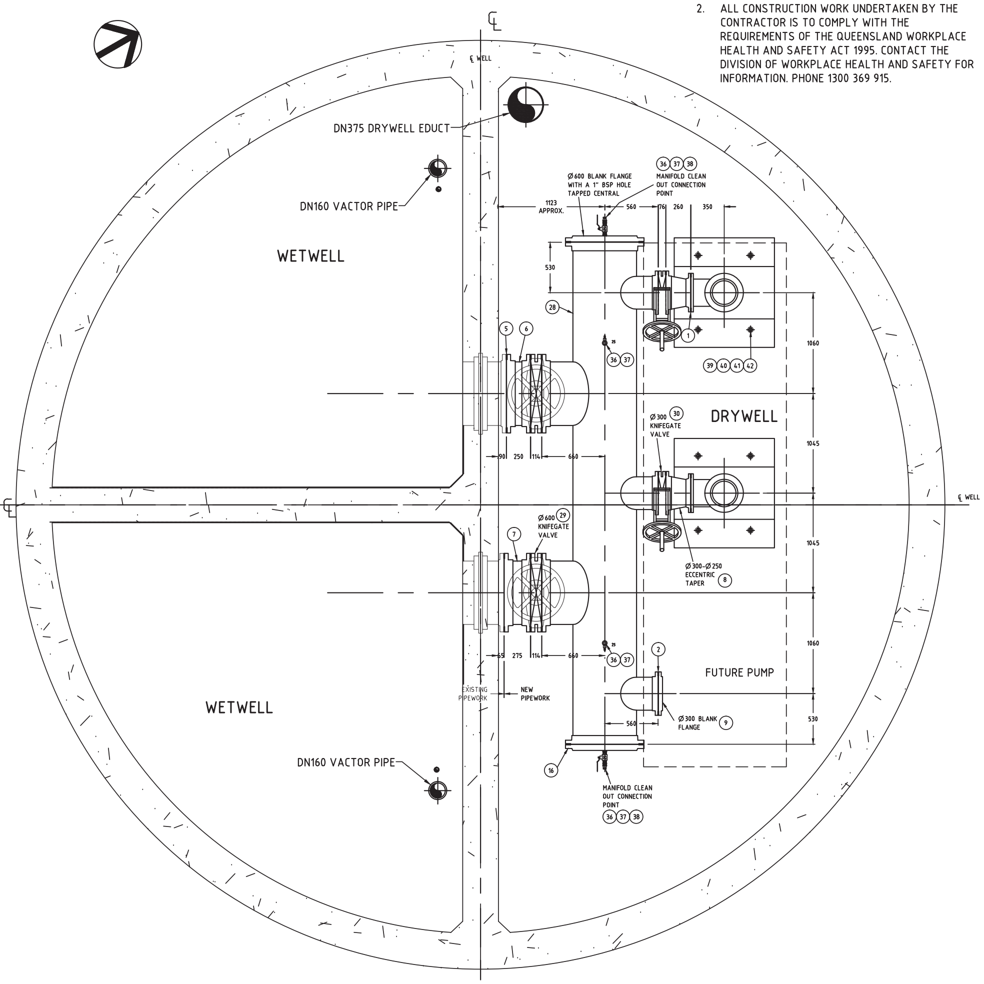
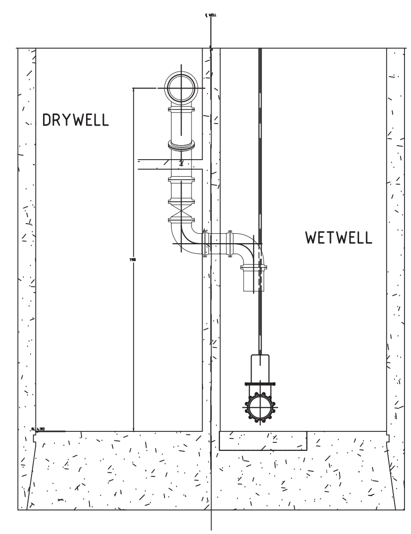
PLOT DATE Tuesday, 17 September 2013 1:40:35 PM
AS INSTALLED
DRYWELL
WETWELL
FUTURE PUMP
DN375 DRYWELL EDUCT
DN160 VACTOR PIPE
NOTE: HIDDEN PIPEWORK OMITTED FOR CLARITY
SECTION J 013 1:25
SECTION K 013 1:25
Date 17/09/2013
RPEQ No. 7850
Richard Mulligan
Date
RPEQ No.
Kellogg Brown & Root Pty Ltd
KBR
TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
MODIFICATION SECTIONS - SHEET 4
DRAWING No. 486-5-7-0383-015
ORIG. SIZE A1
REVISION 2
DRAWING SCALE AS SHOWN
DRAFTER: A.ENGELBRECHT
QUEENSLAND UrbanUtilities
DRAFTING A.ENGELBRECHT
DESIGN R. MULLIGAN
DESIGN VERIFICATION G.VIOLETT
PROJECT APPROVAL R. MULLIGAN
2 AS INSTALLED 07/01/2012
1 ISSUED FOR CONSTRUCTION 01/08/2011
0 ISSUED FOR CONSTRUCTION 22/07/11
REV DESCRIPTION DATE POSITION NAME SIGNATURE
SCALE 1:25
SCALE IN mm

NOTES

1. DRAWING TO BE READ IN CONJUNCTION WITH 486-5-7-0383-010.
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.



SECTION L
1:25
013



SECTION M
1:50
014

SCALE 1: 25 — SCALE IN mm (500, 0, 500, 1000, 1500, 2000)

Date .... RPEQ No.

Date .... RPEQ No.

Richard Mulligan Date 17/09/2013 RPEQ No. 7850

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PLOT DATE Tuesday, 17 September 2013 1:40:35 PM

AS INSTALLED

REV	DESCRIPTION	DATE
2	AS INSTALLED	07/01/2013
1	ISSUED FOR CONSTRUCTION	01/08/2011
0	ISSUED FOR CONSTRUCTION	22/07/11

POSITION	NAME	SIGNATURE
DRAFTING	A.ENGELBRECHT	
DESIGN	R. MULLIGAN	
DESIGN VERIFICATION	G.VIOLETT	
PROJECT APPROVAL	R. MULLIGAN	
CLIENT		

QUEENSLAND UrbanUtilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
MODIFICATION SECTIONS - SHEET 5

DRAWING SCALE: AS SHOWN
DRAFTER: A.ENGELBRECHT
ORIG. SIZE: A1
DRAWING No.: 486-5-7-0383-016
REVISION: 2

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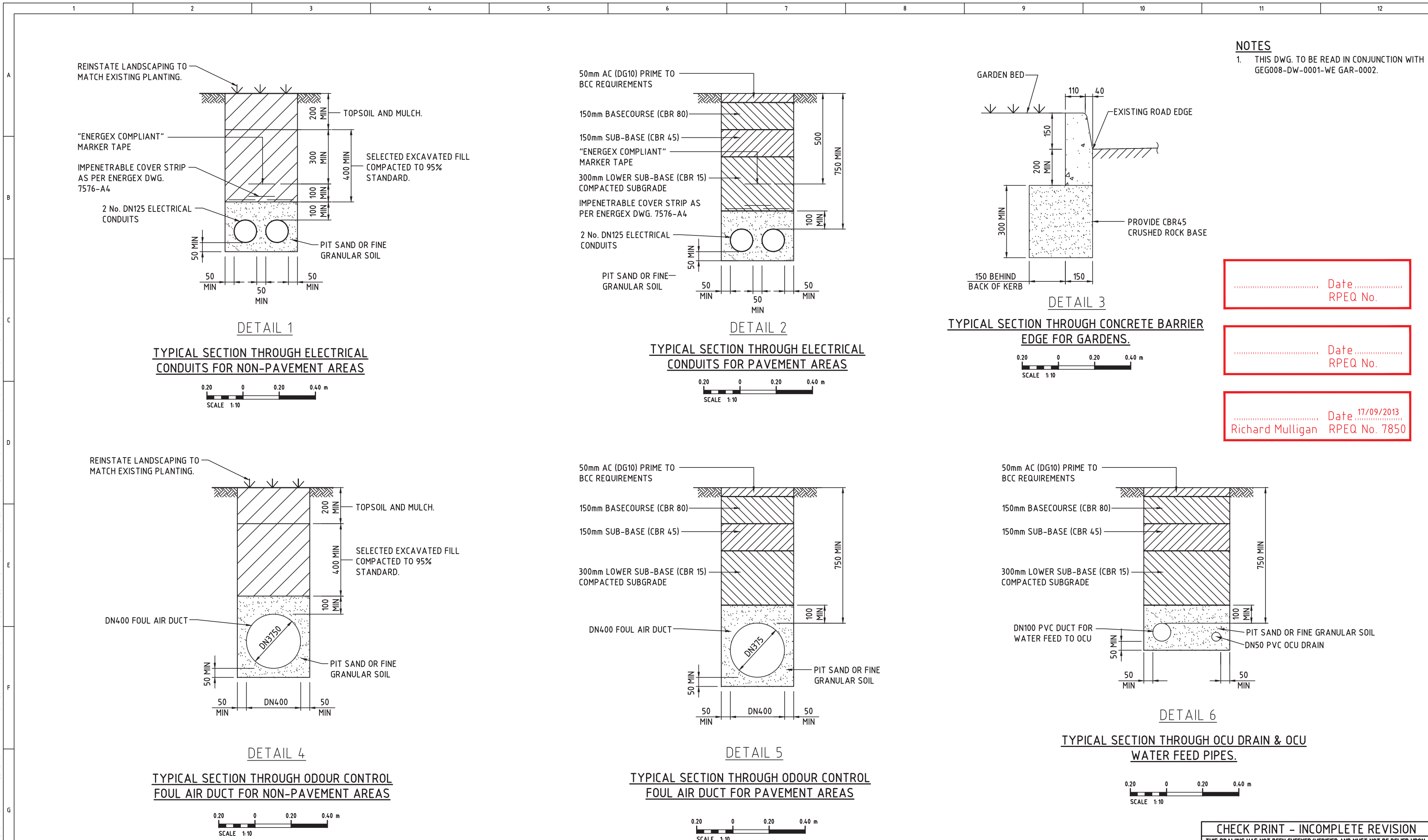

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PLOT DATE Tuesday, 17 September 2013 1:40:36 PM

AS INSTALLED

REV	DESCRIPTION	DATE	POSITION	NAME	SIGNATURE
			DRAFTING	A.ENGELBRECHT	
			DESIGN	R. MULLIGAN	
			DESIGN VERIFICATION	G.VIOLETT	
2	AS INSTALLED	07/01/2013	PROJECT APPROVAL	R. MULLIGAN	
1	ISSUED FOR CONSTRUCTION	01/08/2011	CLIENT		
0	ISSUED FOR CONSTRUCTION	22/07/11			

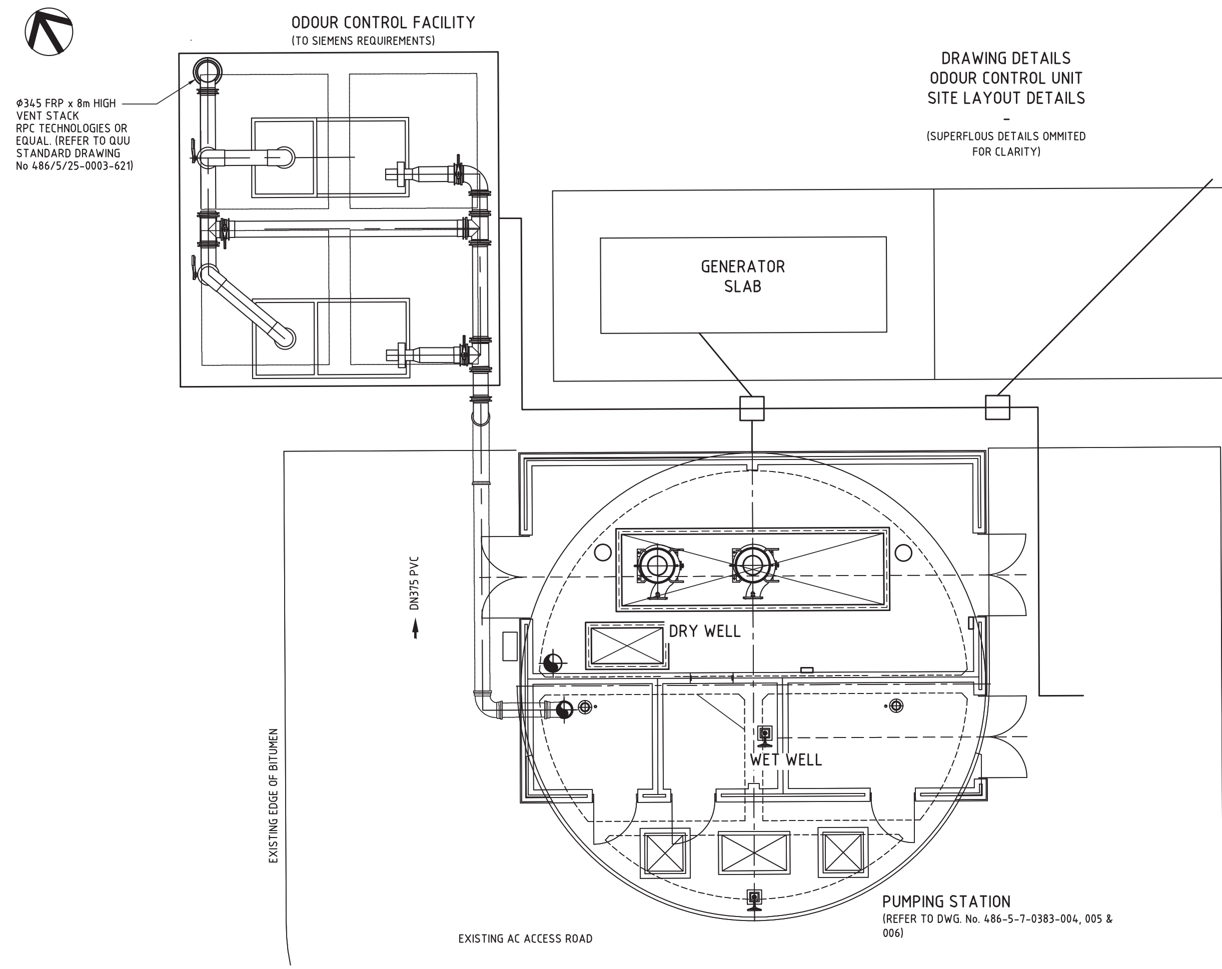
QUEENSLAND Urban Utilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd ABN 91 007 660 317

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
TYPICAL DETAILS

DRAWING SCALE AS SHOWN
DRAFTER: A.ENGELBRECHT
ORIG. SIZE A1
DRAWING No. 486-5-7-0383-017
REVISION 2

© Kellogg Brown & Root DATE: Tuesday, 17 September 2013 1:40:36 PM FILE: L:\C54000 QUU IPSWICH REGION SP01 SP33 SP34 UPGRADE PROJECT\16 DRAWINGS\01 RECEIVED\QUU FINAL DRAWINGS\SP344\486-5-7-0383-017\SP344\486-5-7-0383-017.DWG



SITE PLAN
SCALE 1:50

DRAWING DETAILS
ODOUR CONTROL UNIT
SITE LAYOUT DETAILS
-
(SUPERFLOUS DETAILS OMMITED FOR CLARITY)

NOTES

1. FOR COVER DETAILS REFER TO STANDARD DRAWINGS IPSWICH CITY COUNCIL STD.S015 AND STD.S020
2. VENTILATION DUCTING FOR COLLECTION MANHOLE TO BE LEFT IN PLACE.
3. MINIMUM CLEARANCES BETWEEN INDUCT TERMINATION AND SEWAGE ARE: 1m ABOVE UTWL & 0.1m ABOVE MAX TWL (DURING OVERFLOW)
4. IT WILL BE NECESSARY TO UNDERTAKE THE PARTIAL REMOVAL OF EXISTING LANDSCAPE TO FACILITATE THE CONSTRUCTION OF ODOUR CONTROL UNITS (OCU). THE CONTRACTOR SHALL MINIMIZE THE OCU CONSTRUCTION FOOTPRINT AND REINSTATE DISTURBED LANDSCAPE AREAS WITH SPECIES TO MATCH EXISTING.
5. THE Q100 FLOOD LEVEL RL. IS 15.8m AHD. THE TOP SLAB LEVEL IS RL. 13.27m AHD.
6. ELECTRICAL RETICULATION AND FOOTPRINT FOR ODOUR TREATMENT TO BE CONFIRMED BY ODOUR TREATMENT CONTRACTOR.
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.

LEGEND:

— — — — FENCE & PROPERTY BOUNDARY

● BOLLARD

ALL DIMENSIONS SHOWN ARE INDICATIVE ONLY
ALL DIMENSIONS INCLUDING PIPE SIZING AND BIOTRICKLING UNIT DIMENSIONS AND QUANTITIES TO BE DESIGNED BY ODOUR VENDOR

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PLOT DATE Tuesday, 17 September 2013 1:40:36 PM

AS INSTALLED

.... Date ....
RPEQ No.

.... Date ....
RPEQ No.

Richard Mulligan Date 17/09/2013
RPEQ No. 7850

1000 0 1000 2000 3000 4000
SCALE 1: 50 SCALE IN mm

REV	DESCRIPTION	DATE	POSITION	NAME	SIGNATURE
			DRAFTING	A.ENGELBRECHT	
			DESIGN	R. MULLIGAN	
			DESIGN VERIFICATION	G.VIOLETT	
2	AS INSTALLED	07/01/2013	PROJECT APPROVAL	R. MULLIGAN	
1	ISSUED FOR CONSTRUCTION	01/08/2011	CLIENT		
0	ISSUED FOR CONSTRUCTION	22/07/11			

QUEENSLAND UrbanUtilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

DRAWING SCALE: AS SHOWN
DRAFTER: A.ENGELBRECHT
ORIG. SIZE: A1

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
ODOUR CONTROL FACILITY - SITE LAYOUT

DRAWING No. 486-5-7-0383-018
REVISION 2

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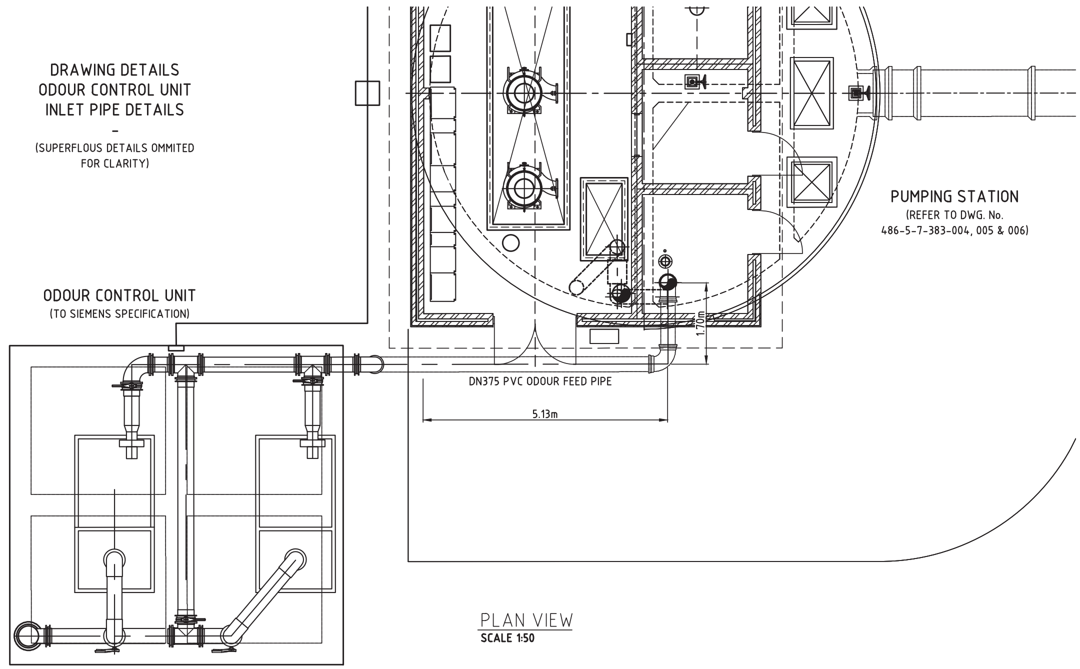
NOTES

1. FOR TRENCH BACKFILL AND REISTATEMENT DETAILS REFER TO DETAILS 4 & 5 ON DWG. No. 486-5-7-0383-017
2. ALL CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 1995. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE 1300 369 915.

DRAWING DETAILS
ODOUR CONTROL UNIT
INLET PIPE DETAILS
-
(SUPERFLOUS DETAILS OMMITED FOR CLARITY)



PLAN VIEW
SCALE 1:50

ALL DIMENSIONS SHOWN ARE INDICATIVE ONLY
ALL DIMENSIONS INCLUDING PIPE SIZING AND BIOTRICKLING UNIT DIMENSIONS AND QUANTITIES TO BE DESIGNED BY ODOUR VENDOR

Date ....
RPEQ No.

Date ....
RPEQ No.

Richard Mulligan Date 17/09/2013
RPEQ No. 7850

CHECK PRINT - INCOMPLETE REVISION
THIS DRAWING HAS NOT BEEN CHECKED/VERIFIED AND MUST NOT BE RELIED UPON.
PLOT DATE Tuesday, 17 September 2013 1:40:37 PM

AS INSTALLED

SCALE 1: 50 — 1000 0 1000 2000 3000 4000 SCALE IN mm

REV	DESCRIPTION	DATE	POSITION	NAME	SIGNATURE
			DRAFTING	A.ENGELBRECHT	
			DESIGN	R. MULLIGAN	
			DESIGN VERIFICATION	G.VIOLETT	
2	AS INSTALLED	08/01/2013	PROJECT APPROVAL	R. MULLIGAN	
1	ISSUED FOR CONSTRUCTION	01/08/2011	CLIENT		
0	ISSUED FOR CONSTRUCTION	22/07/11			

QUEENSLAND Urban Utilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
ODOUR CONTROL FACILITY - ODOUR CONTROL INLET PIPE DETAIL

DRAWING SCALE	ORIG. SIZE	DRAWING No.	REVISION
AS SHOWN	A1	486-5-7-0383-022	2

DRAFTER: A.ENGELBRECHT

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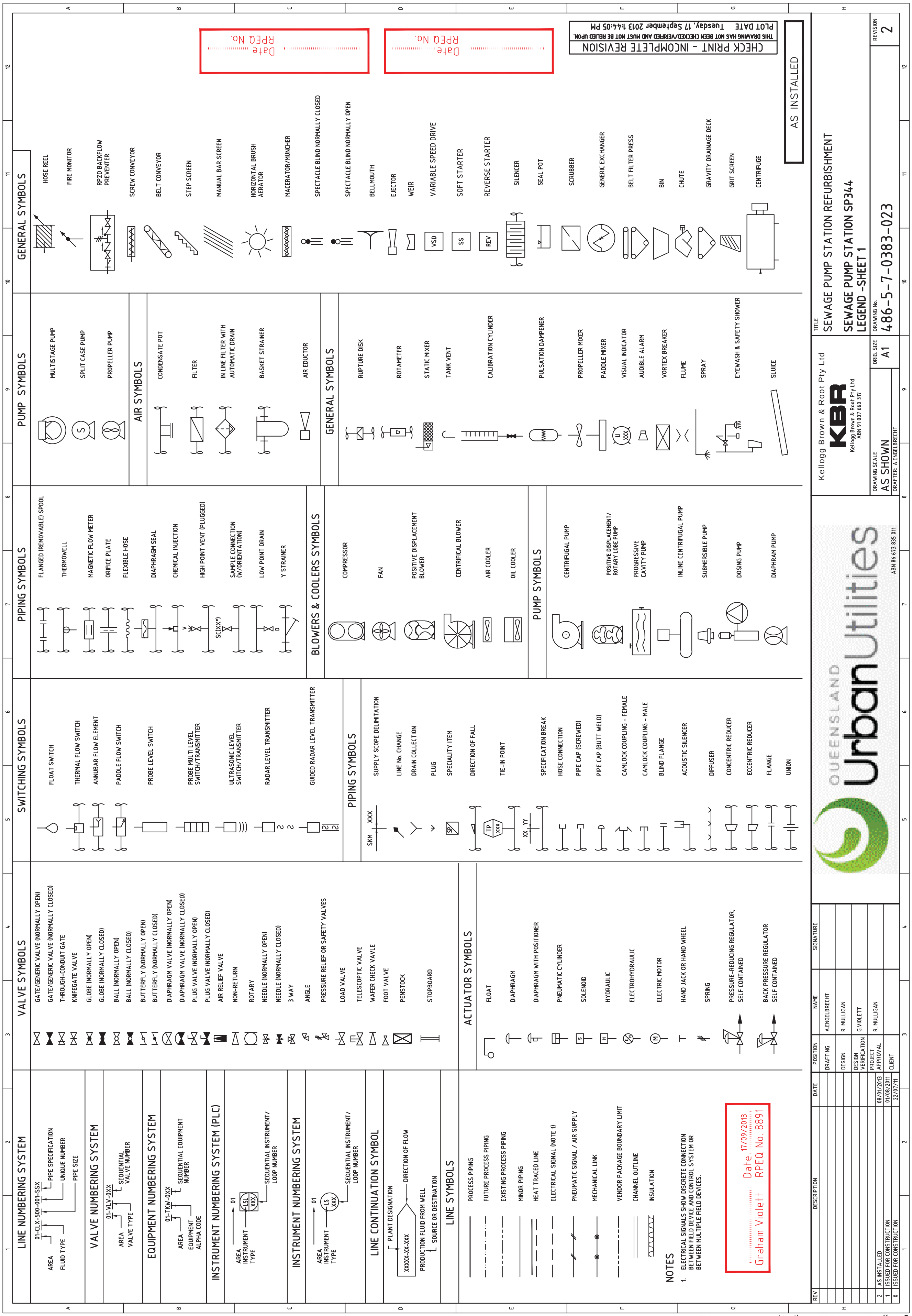
LINE NUMBERING SYSTEM
01-CLX-500-001-SSX
AREA
FLUID TYPE
PIPE SPECIFICATION
UNIQUE NUMBER
PIPE SIZE
VALVE NUMBERING SYSTEM
01-VLV-0XX
AREA
VALVE TYPE
SEQUENTIAL VALVE NUMBER
EQUIPMENT NUMBERING SYSTEM
01-TKW-0XX
AREA
EQUIPMENT ALPHA CODE
SEQUENTIAL EQUIPMENT NUMBER
INSTRUMENT NUMBERING SYSTEM (PLC)
AREA INSTRUMENT TYPE
SEQUENTIAL INSTRUMENT/ LOOP NUMBER
INSTRUMENT NUMBERING SYSTEM
AREA INSTRUMENT TYPE
SEQUENTIAL INSTRUMENT/ LOOP NUMBER
LINE CONTINUATION SYMBOL
PLANT DESIGNATION
XXXXX-XX-XXX
DIRECTION OF FLOW
PRODUCTION FLUID FROM WELL
SOURCE OR DESTINATION
LINE SYMBOLS
PROCESS PIPING
FUTURE PROCESS PIPING
EXISTING PROCESS PIPING
MINOR PIPING
HEAT TRACED LINE
ELECTRICAL SIGNAL (NOTE 1)
PNEUMATIC SIGNAL / AIR SUPPLY
MECHANICAL LINK
VENDOR PACKAGE BOUNDARY LIMIT
CHANNEL OUTLINE
INSULATION
NOTES
1. ELECTRICAL SIGNALS SHOW DISCRETE CONNECTION BETWEEN FIELD DEVICE AND CONTROL SYSTEM OR BETWEEN MULTIPLE FIELD DEVICES.
Graham Violett Date 17/09/2013 RPEQ No. 8891
VALVE SYMBOLS
GATE/GENERIC VALVE (NORMALLY OPEN)
GATE/GENERIC VALVE (NORMALLY CLOSED)
THROUGH-CONDUIT GATE
KNIFEGATE VALVE
GLOBE (NORMALLY OPEN)
GLOBE (NORMALLY CLOSED)
BALL (NORMALLY OPEN)
BALL (NORMALLY CLOSED)
BUTTERFLY (NORMALLY OPEN)
BUTTERFLY (NORMALLY CLOSED)
DIAPHRAGM VALVE (NORMALLY OPEN)
DIAPHRAGM VALVE (NORMALLY CLOSED)
PLUG VALVE (NORMALLY OPEN)
PLUG VALVE (NORMALLY CLOSED)
AIR RELIEF VALVE
NON-RETURN
ROTARY
NEEDLE (NORMALLY OPEN)
NEEDLE (NORMALLY CLOSED)
3 WAY
ANGLE
PRESSURE RELIEF OR SAFETY VALVES
LOAD VALVE
TELESCOPTIC VALVE
WAFER CHECK VAVLE
FOOT VALVE
PENSTOCK
STOPBOARD
ACTUATOR SYMBOLS
FLOAT
DIAPHRAGM
DIAPHRAGM WITH POSITIONER
PNEUMATIC CYLINDER
SOLENOID
HYDRAULIC
ELECTROHYDRAULIC
ELECTRIC MOTOR
HAND JACK OR HAND WHEEL
SPRING
PRESSURE-REDUCING REGULATOR, SELF CONTAINED
BACK PRESSURE REGULATOR SELF CONTAINED
SWITCHING SYMBOLS
FLOAT SWITCH
THERMAL FLOW SWITCH
ANNUBAR FLOW ELEMENT
PADDLE FLOW SWITCH
PROBE LEVEL SWITCH
PROBE MULTI LEVEL SWITCH/TRANSMITTER
ULTRASONIC LEVEL SWITCH/TRANSMITTER
RADAR LEVEL TRANSMITTER
GUIDED RADAR LEVEL TRANSMITTER
PIPING SYMBOLS
SKM XXX
SUPPLY SCOPE DELIMITATION
LINE No. CHANGE
DRAIN COLLECTION
PLUG
SPECIALITY ITEM
DIRECTION OF FALL
TIE-IN POINT
XX YY
SPECIFICATION BREAK
HOSE CONNECTION
PIPE CAP (SCREWED)
PIPE CAP (BUTT WELD)
CAMLOCK COUPLING - FEMALE
CAMLOCK COUPLING - MALE
BLIND FLANGE
ACOUSTIC SILENCER
DIFFUSER
CONCENTRIC REDUCER
ECCENTRIC REDUCER
FLANGE
UNION
PIPING SYMBOLS
FLANGED (REMOVABLE) SPOOL
THERMOWELL
MAGNETIC FLOW METER
ORIFICE PLATE
FLEXIBLE HOSE
DIAPHRAGM SEAL
CHEMICAL INJECTION
HIGH POINT VENT (PLUGGED)
SC(XX*)
SAMPLE CONNECTION (W/ORIENTATION)
LOW POINT DRAIN
Y STRAINER
BLOWERS & COOLERS SYMBOLS
COMPRESSOR
FAN
POSITIVE DISPLACEMENT BLOWER
CENTRIFICAL BLOWER
AIR COOLER
OIL COOLER
PUMP SYMBOLS
CENTRIFUGAL PUMP
POSITIVE DISPLACEMENT/ ROTARY LOBE PUMP
PROGRESSIVE CAVITY PUMP
INLINE CENTRIFUGAL PUMP
SUBMERSIBLE PUMP
DOSING PUMP
DIAPHRAM PUMP
PUMP SYMBOLS
MULTISTAGE PUMP
SPLIT CASE PUMP
PROPELLER PUMP
AIR SYMBOLS
CONDENSATE POT
FILTER
IN LINE FILTER WITH AUTOMATIC DRAIN
BASKET STRAINER
AIR EDUCTOR
GENERAL SYMBOLS
RUPTURE DISK
ROTAMETER
STATIC MIXER
TANK VENT
CALIBRATION CYLINDER
PULSATION DAMPENER
PROPELLER MIXER
PADDLE MIXER
VISUAL INDICATOR
AUDIBLE ALARM
VORTEX BREAKER
FLUME
SPRAY
EYEWASH & SAFETY SHOWER
SLUICE
GENERAL SYMBOLS
HOSE REEL
FIRE MONITOR
RPZD BACKFLOW PREVENTER
SCREW CONVEYOR
BELT CONVEYOR
STEP SCREEN
MANUAL BAR SCREEN
HORIZONTAL BRUSH AERATOR
MACERATOR/MUNCHER
SPECTACLE BLIND NORMALLY CLOSED
SPECTACLE BLIND NORMALLY OPEN
BELLMOUTH
EJECTOR
WEIR
VSD
VARIABLE SPEED DRIVE
SS
SOFT STARTER
REV
REVERSE STARTER
SILENCER
SEAL POT
SCRUBBER
GENERIC EXCHANGER
BELT FILTER PRESS
BIN
CHUTE
GRAVITY DRAINAGE DECK
GRIT SCREEN
CENTRIFUGE
Date RPEQ No.
Date RPEQ No.
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PLOT DATE Tuesday, 17 September 2013 1:44:05 PM
AS INSTALLED
REV | DESCRIPTION | DATE
2 | AS INSTALLED | 08/01/2013
1 | ISSUED FOR CONSTRUCTION | 01/08/2011
0 | ISSUED FOR CONSTRUCTION | 22/07/11
POSITION | NAME | SIGNATURE
DRAFTING | A.ENGELBRECHT
DESIGN | R. MULLIGAN
DESIGN VERIFICATION | G.VIOLETT
PROJECT APPROVAL | R. MULLIGAN
CLIENT
QUEENSLAND UrbanUtilities
ABN 86 673 835 011
Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd ABN 91 007 660 317
DRAWING SCALE AS SHOWN
DRAFTER: A.ENGELBRECHT
ORIG. SIZE A1
TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
LEGEND -SHEET 1
DRAWING No. 486-5-7-0383-023
REVISION 2
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DATE: Tuesday, 17 September 2013 1:44:06 PM
FILE: L:\CS4000 QUU IPSWICH REGION SP01 SP33 SP34 UPGRADE PROJECT\16 DRAWINGS\01 RECEIVED\QUU FINAL DRAWINGS\SP344\486-5-7-0383-023\SP344\486-5-7-0383-023.DWG

INSTRUMENT & FUNCTION SYMBOLS

- DISCRETE FIELD MOUNTED INSTRUMENT/DEVICE
- REMOTE PANEL MOUNTED DISCRETE INSTRUMENT/DEVICE WITH INDICATION/CONTROL
- MAIN PLANT PLC INPUT OR OUTPUT WITH ASSOCIATED FUNCTIONALITY, OPERATOR ACCESSIBLE
- VENDOR PACKAGE PLC INPUT OR OUTPUT
- I GENERAL HARDWIRED INTERLOCK

PLANT NUMBER

THE PROPOSED PLANT NUMBER IS A SEMI-INTELLIGENT NUMBER WHICH ALLOWS FOR READY IDENTIFICATION OF ASSET OWNER, SITE, PROCESS AND ASSET TYPE, FOLLOWED BY AN INCREMENTAL NUMBER ie

PLANT NUMBER

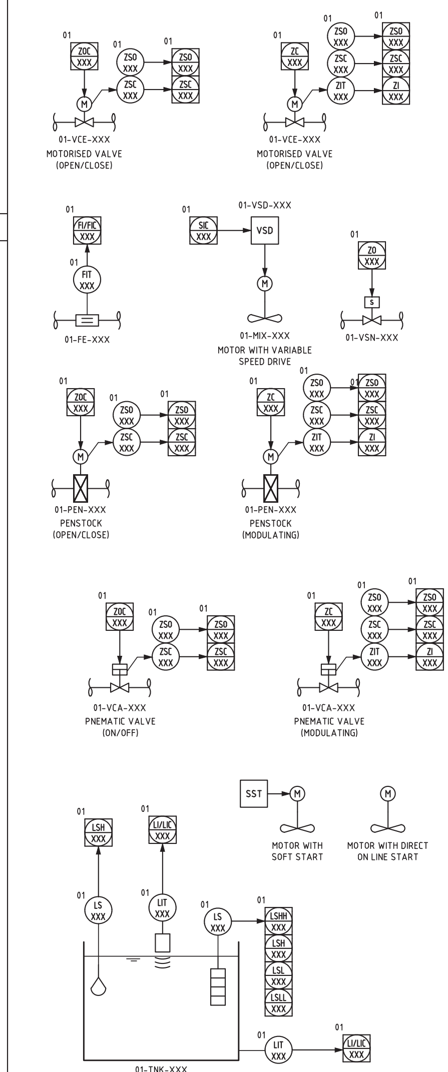
I W R W S T P 0 1 F M R 0 0 1

SITE ID NUMBER — ASSET TAG NUMBER

- IW - ASSET OWNER OR REGION (IPSWICH WATER) - 2 Characters
- BDSTP - SITE (BUNDAMBA SEWAGE TREATMENT PLANT) - 5 Characters
- 01 - PROCESS AREA (INLET WORKS) - 2 Characters
- FMR - ASSET GROUP (FLOW METER) - 3 Characters
- 001 - INCREMENTAL NUMBER - 3 Characters

NB: ONLY LAST 8 CHARACTERS TO BE SHOWN ON P&ID
SITE ID TO BE SHOWN AT THE BOTTOM OF EACH P&ID

TYPICAL INSTALLATIONS



NOTES

1. -

AREA

01	-	INLET WORKS
02	-	PRIMARY TREATMENT
03	-	BIOLOGICAL REACTORS
04	-	SECONDARY CLARIFICATION/MEMBRANES
05	-	DISINFECTION
06	-	DIGESTION
07	-	SLUDGE DEWATERING
08	-	TERTIARY TREATMENT
09	-	CHEMICAL TREATMENT
10	-	EFFLUENT OUTFALL
11	-	CONTROL SYSTEMS
12	-	POWER SUPPLY
13	-	GENERAL SITE
14	-	SEWAGE PUMPING
15	-	VENTILATION/ODOUR CONTROL
16	-	STORAGE
17	-	PURE WATER PUMPING
18	-	FILTRATION
19	-	RECYCLE REUSE PUMPING
20	-	ODOUR CONTROL

PIPE MATERIAL

ABS	-	ACRYLONITRILE BUTADIENE STYRENE
ACX	-	ASBESTOS CEMENT
CCE	-	CONCRETE CHANNEL EPOXY LINED
CCX	-	CONCRETE CHANNEL
CIX	-	CAST IRON
CIC	-	CAST IRON CEMENT LINED
CUX	-	COPPER
DIC	-	DUCTILE IRON CEMENT LINED
DIE	-	DUCTILE IRON EPOXY LINED
DOC	-	DUCTILE IRON CALCIUM ALUMINATE CEMENT LINED
FRC	-	FIBRE REINFORCED CONCRETE
FRP	-	FIBREGLASS REINFORCED PLASTIC
GMS	-	GALVANISED MILD STEEL
HDP	-	HIGH DENSITY POLYETHYLENE
LDP	-	LOW DENSITY POLYETHYLENE
MSC	-	MILD STEEL CEMENT LINED
MSK	-	MILD STEEL FUSION BONDED POLYETHYLENE COATED
MSP	-	MILD STEEL FUSION BONDED POLYETHYLENE COATED AND LINED
PEX	-	POLYETHYLENE
PVC	-	POLYVINYL CHLORIDE
PVG	-	PVC SCHEDULE 80 (GREY PVC)
RCP	-	REINFORCED CONCRETE PIPE
SSX	-	STAINLESS STEEL 316 L SCHEDULE 10
SSW	-	STAINLESS STEEL 316 L SPIRAL-WELD
VCX	-	VITRIFED CLAY

PIPE CONTENTS CODE

AIR	-	AIR (LOW PRESSURE)	LSN	-	LIME SUPERNATANT
ALM	-	ALUM	LSL	-	LIME SLUDGE/SLURRY
BCX	-	BIOSOLIDS CAKE	MET	-	METHANOL
BFR	-	BIOTRICKLING FILTER RECIRCULATION	MLQ	-	MIXED LIQUOR
BYS	-	BYPASS SEWAGE	NUT	-	NUTRIENT (FOR ODOUR CONTROL)
CAS	-	COMPRESSED AIR	PPD	-	POLYMER POWDER
CAU	-	CAUSTIC	PRW	-	PERMEATE
CBW	-	CLEAN BACKWASH	PSX	-	POLYMER SOLUTION
CLX	-	SODIUM HYPOCHLORITE	PWA	-	POTABLE WATER
CIT	-	CITRIC ACID	RAS	-	RETURN ACTIVATED SLUDGE
CAU	-	CAUSTIC SODA	REE	-	RECLAIMED EFFLUENT (CLASS A)
DBW	-	DIRTY FILTER BACKWASH	RSG	-	RAW SEWAGE
DNW	-	DIRTY DRAINWATER	RSL	-	RAW SLUDGE
DSX	-	DIGESTED SLUDGE	SCM	-	SCUM
DSL	-	DIESEL	SEF	-	SECONDARY EFFLUENT
FXT	-	FILTRATE/CENTRATE	SNT	-	SUPERNATANT
FAX	-	FOUL AIR	SWA	-	STORMWATER
FTE	-	FILTERED EFFLUENT	TWA	-	THICKENED WAS
GRS	-	GRIT SLURRY	WAS	-	WASTE ACTIVATED SLUDGE
LPD	-	LIME POWDER			

P&ID ABBREVIATIONS

AIT	Analyser	FSH	Flow Switch High	SSH	Safety Showers
AIC	Analyser Control	FSL	Flow Switch Low	SCR	Scrapers
AI	Analyser Indication	FT	Flow Transmitter	SSR	Screen - Drum
NH4	Analysis - Ammonia	FTB	Flow Tube/ Rotameter	SCN	Screen - Manual
DO	Analysis - Disolved Oxygen	GDD	Gravity Drainage Deck	SSR	Screen - Step
H2S	Analysis - Hydrogen Sulphide	HTR	Heating Coil	SCY	Screw Conveyor
NO3	Analysis - Nitrate	HPR	Hopper - Fixed	SCH	Scum Harvester
NO2	Analysis - Nitrite	ISU	Insulation	SIL	Silencer
Nu	Analysis - Nutrient	LIC	Level Indicating Control	SLR	Slip Rings
ORP	Analysis - Oxidation Reduction Potential	LIT	Level Indicating Transmitter	SLU	Sluice - Channel
pH	Analysis - pH	LI	Level Indication	SST	Soft Starter
CL	Analysis - Residual Chlorine	LE	Level Sensing Element	SIC	Speed Control
SSD	Analysis - Suspendid Solids	LS	Level Switch	SS	Speed Switch
TCL	Analysis - Total Chlorine	LSH	Level Switch High	SSL	Speed Switch Low
TM	Analysis - Transmittance	LSHH	Level Switch High High	STB	Stopboards
TUR	Analysis - Turbidity	LSL	Level Switch Low	STR	Strainer
BGU	Bagging Unit	LSL	Level Switch Low	BLS	Structure Building
BIN	Bin - Removable	LSLL	Level Switch Low Low	TNK	Tank
BLO	Blower	LT	Level Transmitter	TKP	Tank Pressure
BND	Bund	WE	Load Cell	TIC	Temperature Indicating Control
CCL	Calibration Cylinder	MES	Managed Eternet Switch	TIT	Temperature Indicating Transmitter
CDR	Card Reader	MNH	Manhole	TI	Temperature Indication
CNT	Centrifuge	MTR	Motor	TEX	Temperature Sensing Element
CHU	Chute - Select	MNC	Muncher/ Macerator	TS	Temperature Switch
CLF	Clarifier	OCU	Odour Control Unit	TTX	Temperature Transmitter
ZSC	Closed Position/ Switch	ZSO	Open Position/ Switch	WSH	Torque High
CMP	Compressor	PEN	Penstock	WS	Torque Switch
ZC	Control Modulating	PIT	Pit	UVB	UV Bank
ZOC	Control Open/Close	MNH	Pit Manhole	VCA	Valve Control - Air
CNV	Conveyors - Belt	ZIT	Position Indicating Transmitter	VCE	Valve Control - Electric
CRN	Crane	ZI	Position Indication	VLV	Valve Manual
DMP	Dampener	ZSP	Position Parked	VNR	Valve Non Return
DVT	Davit	ZSX	Position Switch	ZO	Valve Open Control (Solenoid)
DIF	Diffuser	PGX	Pressure Gauge	VPR	Valve Pressure Reduction
DRY	Dryer	PIC	Pressure Indicating Control	VPF	Valve Pressure Relief
EJC	Ejector	PIT	Pressure IndicatingTransmitter	VPS	Valve Pressure Sustaining
EXH	Exhaust Stack	PI	Pressure Indication	VSN	Valve Solenoid
FAN	Fan	PRG	Pressure Regulator	VSD	Variable Speed Drive
FLT	Filter	PEX	Pressure Sensing Element	VIB	Vibrator
FLM	Flame Arrester	PSH	Pressure Switch High	WSP	Washpactor
FIC	Flow Indicating Control	PSL	Pressure Switch Low	WIC	Weight Indicating Control
FIT	Flow Indicating Transmitter	PTX	Pressure Transmitter	WIT	Weight Indicating Transmitter
FI	Flow Indication	PMP	Pump Conventional	WI	Weight Indication
FE	Flow Sensing Element	PDO	Pump Dosing		

Date. RPEQ No.

Date. RPEQ No.

Graham Violett Date. 17/09/2013 RPEQ No. 8891

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AS INSTALLED

REV	DESCRIPTION	DATE	POSITION	NAME	SIGNATURE
			DRAFTING	A.ENGELBRECHT	
			DESIGN	R. MULLIGAN	
			DESIGN VERIFICATION	G.VIOLETT	
2	AS INSTALLED	08/01/2013	PROJECT APPROVAL	R. MULLIGAN	
1	ISSUED FOR CONSTRUCTION	01/08/2011	CLIENT		
0	ISSUED FOR CONSTRUCTION	22/07/11			

QUEENSLAND UrbanUtilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd ABN 91 007 660 317

DRAWING SCALE: AS SHOWN
DRAFTER: A.ENGELBRECHT
ORIG. SIZE: A1

TITLE: SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
LEGEND -SHEET 2

DRAWING No. 486-5-7-0383-024
REVISION 2

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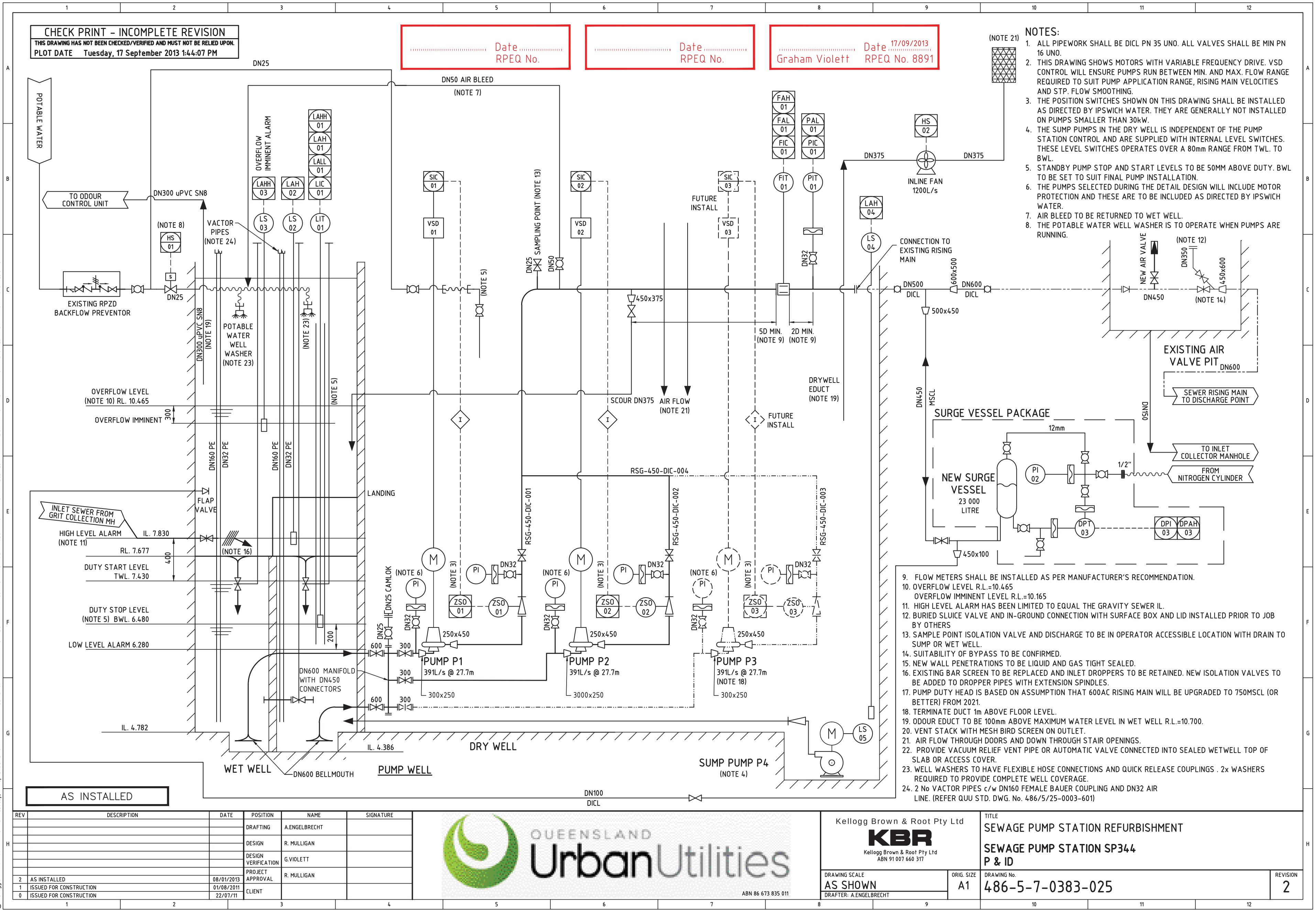
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PLOT DATE Tuesday, 17 September 2013 1:44:07 PM
Date
RPEQ No.
Date
RPEQ No.
Graham Violett Date 17/09/2013 RPEQ No. 8891
NOTES:
1. ALL PIPEWORK SHALL BE DICL PN 35 UNO. ALL VALVES SHALL BE MIN PN 16 UNO.
2. THIS DRAWING SHOWS MOTORS WITH VARIABLE FREQUENCY DRIVE. VSD CONTROL WILL ENSURE PUMPS RUN BETWEEN MIN. AND MAX. FLOW RANGE REQUIRED TO SUIT PUMP APPLICATION RANGE, RISING MAIN VELOCITIES AND STP. FLOW SMOOTHING.
3. THE POSITION SWITCHES SHOWN ON THIS DRAWING SHALL BE INSTALLED AS DIRECTED BY IPSWICH WATER. THEY ARE GENERALLY NOT INSTALLED ON PUMPS SMALLER THAN 30kW.
4. THE SUMP PUMPS IN THE DRY WELL IS INDEPENDENT OF THE PUMP STATION CONTROL AND ARE SUPPLIED WITH INTERNAL LEVEL SWITCHES. THESE LEVEL SWITCHES OPERATES OVER A 80mm RANGE FROM TWL. TO BWL.
5. STANDBY PUMP STOP AND START LEVELS TO BE 50MM ABOVE DUTY. BWL TO BE SET TO SUIT FINAL PUMP INSTALLATION.
6. THE PUMPS SELECTED DURING THE DETAIL DESIGN WILL INCLUDE MOTOR PROTECTION AND THESE ARE TO BE INCLUDED AS DIRECTED BY IPSWICH WATER.
7. AIR BLEED TO BE RETURNED TO WET WELL.
8. THE POTABLE WATER WELL WASHER IS TO OPERATE WHEN PUMPS ARE RUNNING.
9. FLOW METERS SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATION.
10. OVERFLOW LEVEL R.L.=10.465
OVERFLOW IMMINENT LEVEL R.L.=10.165
11. HIGH LEVEL ALARM HAS BEEN LIMITED TO EQUAL THE GRAVITY SEWER IL.
12. BURIED SLUICE VALVE AND IN-GROUND CONNECTION WITH SURFACE BOX AND LID INSTALLED PRIOR TO JOB BY OTHERS
13. SAMPLE POINT ISOLATION VALVE AND DISCHARGE TO BE IN OPERATOR ACCESSIBLE LOCATION WITH DRAIN TO SUMP OR WET WELL.
14. SUITABILITY OF BYPASS TO BE CONFIRMED.
15. NEW WALL PENETRATIONS TO BE LIQUID AND GAS TIGHT SEALED.
16. EXISTING BAR SCREEN TO BE REPLACED AND INLET DROPPERS TO BE RETAINED. NEW ISOLATION VALVES TO BE ADDED TO DROPPER PIPES WITH EXTENSION SPINDLES.
17. PUMP DUTY HEAD IS BASED ON ASSUMPTION THAT 600AC RISING MAIN WILL BE UPGRADED TO 750MSCL (OR BETTER) FROM 2021.
18. TERMINATE DUCT 1m ABOVE FLOOR LEVEL.
19. ODOUR EDUCT TO BE 100mm ABOVE MAXIMUM WATER LEVEL IN WET WELL R.L.=10.700.
20. VENT STACK WITH MESH BIRD SCREEN ON OUTLET.
21. AIR FLOW THROUGH DOORS AND DOWN THROUGH STAIR OPENINGS.
22. PROVIDE VACUUM RELIEF VENT PIPE OR AUTOMATIC VALVE CONNECTED INTO SEALED WETWELL TOP OF SLAB OR ACCESS COVER.
23. WELL WASHERS TO HAVE FLEXIBLE HOSE CONNECTIONS AND QUICK RELEASE COUPLINGS. 2x WASHERS REQUIRED TO PROVIDE COMPLETE WELL COVERAGE.
24. 2 No VACTOR PIPES c/w DN160 FEMALE BAUER COUPLING AND DN32 AIR LINE. (REFER QUU STD. DWG. No. 486/5/25-0003-601)
POTABLE WATER
TO ODOUR CONTROL UNIT
EXISTING RPZD BACKFLOW PREVENTOR
VACTOR PIPES (NOTE 24)
POTABLE WATER WELL WASHER (NOTE 23)
OVERFLOW IMMINENT ALARM
INLINE FAN 1200L/s
CONNECTION TO EXISTING RISING MAIN
NEW AIR VALVE
EXISTING AIR VALVE PIT
SEWER RISING MAIN TO DISCHARGE POINT
TO INLET COLLECTOR MANHOLE
FROM NITROGEN CYLINDER
SURGE VESSEL PACKAGE
NEW SURGE VESSEL 23 000 LITRE
OVERFLOW LEVEL (NOTE 10) RL. 10.465
OVERFLOW IMMINENT
INLET SEWER FROM GRIT COLLECTION MH
HIGH LEVEL ALARM (NOTE 11) IL. 7.830
RL. 7.677
DUTY START LEVEL TWL. 7.430
DUTY STOP LEVEL (NOTE 5) BWL. 6.480
LOW LEVEL ALARM 6.280
IL. 4.782
IL. 4.386
DN600 MANIFOLD WITH DN450 CONNECTORS
PUMP P1 391L/s @ 27.7m
PUMP P2 391L/s @ 27.7m
PUMP P3 391L/s @ 27.7m (NOTE 18)
SUMP PUMP P4 (NOTE 4)
WET WELL
PUMP WELL
DRY WELL
DN600 BELLMOUTH
LANDING
FLAP VALVE
SCOUR DN375
AIR FLOW (NOTE 21)
FUTURE INSTALL
DRYWELL EDUCT (NOTE 19)
SAMPLING POINT (NOTE 13)
DN50 AIR BLEED (NOTE 7)
RSG-450-DIC-001
RSG-450-DIC-002
RSG-450-DIC-003
RSG-450-DIC-004
AS INSTALLED
REV | DESCRIPTION | DATE
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SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
P & ID
DRAWING No. 486-5-7-0383-025
REVISION 2

GENERAL NOTES :

G1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ENGINEERING AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ALL DISCREPANCIES SHALL BE REFERRED TO THE SUPERINTENDENT'S REPRESENTATIVE FOR DECISION BEFORE PROCEEDING WITH THE WORK.

G2. ALL DIMENSIONS RELEVANT TO SETTING OUT AND OFF-SITE WORK SHALL BE VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION AND FABRICATION IS COMMENCED. THE ENGINEERING DRAWINGS SHALL NOT BE SCALED.

G3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE IN A STABLE CONDITION DURING CONSTRUCTION. NO PART OF THE STRUCTURE SHALL BE OVERSTRESSED BY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT AS REQUIRED TO ENSURE THE STABILITY OF ALL CONSTRUCTION WORKS.

G4. ALL WORK AND MATERIALS SHALL COMPLY WITH THE RELEVANT CURRENT S.A.A. CODES – INCLUDING AMENDMENTS – AND THE REQUIREMENTS OF LOCAL STATUTORY AUTHORITIES, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

G5. ALL DIMENSIONS ARE STATED IN MILLIMETRES AND LEVELS IN METRES, UNLESS NOTED OTHERWISE.

G6. GENERAL ABBREVIATIONS:
NTS – NOT TO SCALE
UNO – UNLESS NOTED OTHERWISE
EW – EACH WAY
TF – TOP FACE
BF – BOTTOM FACE
CRS – CENTRES
CJ – CONSTRUCTION JOINT

G7. THE SUPERINTENDENT'S REPRESENTATIVE SHALL ACCEPT NO RESPONSIBILITY FOR THE WORKS UNLESS THEY ARE INSPECTED AND APPROVED BY THE SUPERINTENDENT'S REPRESENTATIVE DURING CONSTRUCTION. AT LEAST 48 HOURS NOTICE SHALL BE PROVIDED FOR ALL INSPECTIONS.

G8. APPROVAL TO SUSPEND SERVICES FROM STRUCTURE SHALL BE OBTAINED FROM THE STRUCTURAL ENGINEER. HOLES SHALL NOT BE MADE IN STRUCTURE WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER.

G9. WHERE PROPRIETARY PRODUCTS ARE SPECIFIED ALTERNATIVES ARE ONLY PERMITTED WITH APPROVAL OF THE STRUCTURAL ENGINEER. ALL PROPRIETARY PRODUCTS ARE TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.

DESIGN PARAMETERS :

D1. IMPORTANCE LEVEL OF BUILDING: 2

D2. WIND ACTIONS
REGION: B
TERRAIN CATEGORY: 2
ULTIMATE PROBABILITY OF EXCEEDANCE: 1/500
REGIONAL ULTIMATE WIND SPEED: 57m/s
H(z): 4 m
Mz,cat: 0.91

D3. EARTHQUAKE ACTIONS
SITE FACTOR: 2
ACCELERATION COEFFICIENT: 0.05
PROBABILITY OF EXCEDANCE: 1/500
Kp: 1.0

D4. DESIGN LOADS
DESIGN IMPOSED LOADS
WALKWAYS AND PLATFORMS: 2.5kPa
PRECAST PIT LIDS – 5kPa, W80 and A160 IN ACCORDANCE WITH AS5100
ROOF: 0.25kPa or 1.5kN POINT LOAD
STEEL AND ALUMINIUM ACCESS COVERS: 2.5kPa

SUPERIMPOSED DEAD LOADS
PLATFORMS AND WALKWAYS 0.5kPa
SWITCH BOARDS: 15 kN
GENERATOR: 5.0t WET MASS
FLOOR SLAB: 5.0t

D5. FLOOD LOADING:
FLOOD AND DEBRIS LOADING IN ACCORDANCE WITH AS5100
DESIGN VELOCITY 3m/s

FOOTING NOTES :

F1. ALL WORK AND MATERIALS SHALL COMPLY WITH AS2870 AND AS3798 AND THE STANDARDS REFERENCED THEREIN, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

F2. ALL FOOTING EXCAVATIONS SHALL BE CLEANED OF LOOSE MATERIAL AND WATER PRIOR TO AND DURING CONSTRUCTION OF THE FOOTINGS.

F3. UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL PROVIDE FORMWORK WHERE THE SIDES OF THE FOOTING EXCAVATIONS ARE NOT STABLE.

F4. UNLESS NOTED OTHERWISE, FOOTINGS SHALL BE LOCATED CENTRALLY UNDER WALLS AND COLUMNS.

F5. FOOTINGS SHALL BE FOUNDED IN FIRM NATURAL SOIL OR COMPACTED FILL WITH MINIMUM ALLOWABLE BEARING CAPACITY OF 50 kPa.

F6. FOUNDING LEVELS SHALL NOT BE CHANGED FROM THOSE SPECIFIED, UNLESS AUTHORISED BY THE SUPERINTENDENT'S REPRESENTATIVE.

F7. WHERE OVER-EXCAVATION IS REQUIRED IN ORDER TO ACHIEVE THE REQUIRED FOUNDING LEVELS, THE ADDITIONAL EXCAVATION SHALL BE BACKFILLED WITH GRADE N15 MASS CONCRETE.

F8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT FOOTING EXCAVATIONS ARE INSPECTED BY A SUITABLY QUALIFIED ENGINEER IN ORDER TO VERIFY THE ADEQUACY OF THE FOUNDATION BEARING CAPACITY.

F9. PIPES, RETAINING WALLS AND EXCAVATIONS SHALL NOT BE LOCATED WITHIN A 1V:2H ZONE OF INFLUENCE FROM THE BOTTOM EDGE OF FOOTINGS WITHOUT THE APPROVAL OF THE SUPERINTENDENT'S REPRESENTATIVE.

REINFORCED CONCRETE NOTES :

C1. ALL WORK AND MATERIALS SHALL COMPLY WITH AS3600 AND THE STANDARDS REFERENCED THEREIN, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

C2. THE FOLLOWING TABLE OF CONCRETE CLASSES SHALL APPLY. THE SLUMP RANGE SPECIFIED SUPERSEDES THE SLUMP TOLERANCE IN AS 1379. ALL CEMENT SHALL BE NORMAL PORTLAND GREY.

CLASS	F`c AT 28 DAYS (MPA)	MAX SIZE OF COARSE AGGREGATE	SLUMP RANGE	CEMENT
N32	32	20	80 ±15mm	GP
N40	40	20	80 ±15mm	GP

C3. UNLESS NOTED OTHERWISE, THE ABOVE CONCRETE CLASSES SHALL BE USED IN THE FOLLOWING LOCATIONS, ALONG WITH THE FOLLOWING EXPOSURE CLASSIFICATIONS AND CONCRETE COVER TO REINFORCEMENT:

ELEMENT	CLASS		EXPOSURE CLASSIFICATION	CONCRETE COVER (mm)
PAD/STRIP FOOTINGS	N32	AGAINST GROUND	A2	40
		OTHER	B1	40
CAST IN SITU LIDS	N40	BOTTOM FACE AND PENETRATIONS	U	50
		OTHER	B1	40
VALVE PITS	N40	INTERNAL	U	50
		OTHER	A2	40

C4. EXPOSED TRAFFICABLE SURFACES TO HAVE A MEDIUM BROOM FINISH.

C5. SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.

C6. BEAM DEPTHS INCLUDE SLAB THICKNESS, WHERE APPLICABLE.

C7. CONSTRUCTION JOINTS, WHERE NOT SHOWN, SHALL BE LOCATED TO THE APPROVAL OF THE SUPERINTENDENT'S REPRESENTATIVE.

C8. NO HOLES OR CHASES, OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS, SHALL BE MADE IN CONCRETE ELEMENTS WITHOUT THE APPROVAL OF THE SUPERINTENDENT'S REPRESENTATIVE.

C9. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY. IT IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.

C10. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN ON THE DRAWINGS. THE WRITTEN APPROVAL OF THE SUPERINTENDENT'S REPRESENTATIVE SHALL BE OBTAINED FOR ANY OTHER SPLICES. WHERE THE LAP LENGTH IS NOT SHOWN, IT SHALL BE SUFFICIENT TO DEVELOP THE FULL STRENGTH OF THE REINFORCEMENT. UNLESS NOTED OTHERWISE, MINIMUM LAP LENGTHS AND COGS SHALL BE AS FOLLOWS:

BAR DIAMETER (mm)	MIN LAP LENGTH (mm)	MIN COG LENGTH (mm)
12	550	200
16	800	250
20	1000	300

REINFORCING FABRIC SHALL BE OVERLAPPED BY A MINIMUM OF TWO TRANSVERSE WIRES.

C11. REINFORCEMENT SHALL NOT BE WELDED WITHOUT THE APPROVAL OF THE SUPERINTENDENT'S REPRESENTATIVE, UNLESS SHOWN ON THE STRUCTURAL DRAWINGS.

C12. PIPES OR CONDUITS SHALL NOT BE PLACED WITHIN THE CONCRETE COVER TO REINFORCEMENT WITHOUT THE APPROVAL OF THE SUPERINTENDENT'S REPRESENTATIVE. CONCRETE COVER TO EMBEDDED PIPES SHALL BE A MINIMUM OF 20mm.

C13. REINFORCEMENT ABBREVIATIONS:
N – DENOTES GRADE 500N HOT ROLLED DEFORMED BARS TO AS/NZS 4671
R – DENOTES GRADE 250R HOT ROLLED PLAIN BARS TO AS/NZS 4671
SL – DENOTES HARD DRAWN WIRE REINFORCING FABRIC TO AS/NZS 4671
W – DENOTES HARD DRAWN PLAIN WIRE TO AS/NZS 4671

C14. ALL REINFORCING FABRIC SHALL COMPLY WITH AS/NZS 4671 AND SHALL BE SUPPLIED AS FLAT SHEETS.

C15. ALL REINFORCEMENT SHALL BE WIRED TO AND SUPPORTED BY APPROVED CHAIRS TO THE REQUIRED HEIGHT. SUPPORTS FOR REINFORCING FABRIC SHALL BE SPACED AT MAXIMUM 900mm CENTRES BOTH WAYS, UNLESS NOTED OTHERWISE.

C16. FORMWORK FOR VISIBLE FACES SHALL BE A MINIMUM OF CLASS 2, COLOUR CONTROLLED AND SHALL BE IN ACCORDANCE WITH AS3600 AND AS3610.

C17. STEEL REINFORCEMENT SHALL COMPLY WITH THE CURRENT EDITION OF AS/NZS 4671. ACCEPTABLE MANUFACTURERS AND PROCESSORS OF STEEL REINFORCEMENT MUST HOLD A VALID CERTIFICATE OF APPROVAL, ISSUED BY THE AUSTRALIAN CERTIFICATION AUTHORITY FOR REINFORCING STEEL (ACRS) OR BY AN EQUIVALENT CERTIFICATION SYSTEM AS MAY BE APPROVED IN WRITING BY THE SUPERINTENDENT. THE CONTRACTOR SHALL PROVIDE EVIDENCE OF COMPLIANCE BEFORE ANY REINFORCEMENT IS SUPPLIED TO THE PROJECT.

C18. ALL EXTERNAL EDGES SHALL BE CHAMFERED 15x15mm UNLESS NOTED OTHERWISE.

MODIFICATIONS TO EXISTING STRUCTURES :

E1. MODIFICATIONS TO THE EXISTING STRUCTURE OTHER THAN THOSE SHOWN ON THE DRAWINGS ARE TO BE APPROVED BY THE STRUCTURAL ENGINEER.

E2. SHOULD ANY MODIFICATIONS EXPOSE DETERIORATION OR DAMAGE TO THE EXISTING STRUCTURE WORKS ARE TO STOP AND BE INSPECTED BY THE STRUCTUAL ENGINEER PRIOR TO WORK PROCEEDING. ANY REMEDIATIONS WORKS ARE TO BE UNDERTAKEN.

E3. NEW PENETRATIONS IN EXISTING CONCRETE ARE TO BE UNDERTAKEN USING PRIMARILY SAW CUTTING OR CORING METHODS. IMPACT TOOLS ARE NOT TO BE USED WHERE THERE IS THE POTENTIAL OF DAMAGE OR CRACKING OF THE CONCRETE OUTSIDE OF THE PENETRATION AREA. FLAME CUTTING OF REINFORCEMENT IS NOT PERMITTED.

E4. OVERCUTTING OR DAMAGE IS TO BE INSPECTED BY THE STRUCTURAL ENGINEER AND ANY REMEDIATION UNDERTAKEN PRIOR TO WORK PROCEEDING.

E5. EXPOSED REINFORCEMENT IS TO BE GROUND BACK 10MM AND PROTECTED WITH SIKA SIKATOP-110 EPOCHEM EPOXY COATING.

E6. MASONARY BLOCKS THAT ARE CRACKED OR UNSEATED ADJACENT TOO, OR AS A RESULT OF, ANY MODIFICATIONS ARE TO BE REPLACED AND RESEATED.

E7. MODIFICATIONS TO EXISTING STRUCTURAL STEEL, INCLUDING BUT NOT LIMITED TO WELDING, CUTTING OR DRILLING, ARE TO BE COATED WITH A SUITABLE ZINC RICH PAINT.

E8. REDUNDANT CONCRETE FASTENERS ARE TO BE GROUND BACK AND PAINTED WITH AN EPOXY COATING. REDUNDANT BRACKETS ARE TO BE REMOVED.

STRUCTURAL STEELWORK NOTES :

S1. ALL WORK AND MATERIALS SHALL COMPLY WITH AS4100 AND AS1554 AND THE STANDARDS REFERENCED THEREIN, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

S2. UNLESS NOTED OTHERWISE, ALL STEEL SHALL BE IN ACCORDANCE WITH:
AS3679 GRADE 300 PLUS FOR ROLLED SECTIONS
AS1163 GRADE 350 FOR RHS AND CHS SECTIONS
AS3678 GRADE 250 FOR HOT ROLLED PLATES

S3. THE CONTRACTOR SHALL PROVIDE 3 COPIES OF THE SHOP DRAWINGS TO THE SUPERINTENDENT'S REPRESENTATIVE. FABRICATION SHALL NOT COMMENCE UNTIL THE DRAWINGS HAVE BEEN REVIEWED BY THE SUPERINTENDENT'S REPRESENTATIVE. THIS REVIEW DOES NOT REMOVE RESPONSIBILITY FOR INTERPRETATION OF DRAWINGS OR DIMENSIONAL ACCURACY FROM THE CONTRACTOR/FABRICATOR.

S4. THE CONTRACTOR SHALL PROVIDE ALL CLEATS AND HOLES NECESSARY FOR FIXING STEELWORK AND ATTACHING NON-STRUCTURAL ELEMENTS TO STEELWORK, WHETHER OR NOT DETAILED ON THE STRUCTURAL DRAWINGS.

S5. ALL WELDS ON THIS PROJECT SHALL BE CATEGORY 'SP' IN ACCORDANCE WITH AS1554.

S6. UNLESS NOTED OTHERWISE, ALL WELDS SHALL BE 6mm CONTINUOUS FILLET AND ALL PLATES 10mm THICK.

S7. BOLTS ARE DESIGNATED ON THE DRAWINGS BY NUMBER, DIAMETER, GRADE AND TIGHTENING PROCEDURE IN ACCORDANCE WITH AISC BUILDING PROCEDURES. UNLESS NOTED OTHERWISE, STEEL TO STEEL CONNECTIONS SHALL BE MINIMUM 2M20 8.8/S PER CONNECTION.

S8. BOLTS, NUTS AND WASHERS OF TYPE 4.6/S SHALL CONFORM TO AS1111 AND AS4100. BOLTS, NUTS AND WASHERS OF TYPE 8.8/S, 8.8/TB AND 8.8/TF SHALL CONFORM TO AS1252 AND AS4100 AND SHALL BE TIGHTENED TO THE CORRECT TENSION USING APPROVED LOAD INDICATING WASHERS. CONTACT SURFACES OF ALL CONNECTIONS WITH TYPE 8.8/TF BOLTS SHALL BE LEFT UNPAINTED.

S9. ALL HIGH-STRENGTH STEEL BOLTS AND ASSOCIATED NUTS AND WASHERS SHALL COMPLY WITH THE PERFORMANCE REQUIREMENTS OF THE LATEST EDITION OF AS/NZS 1252. HIGH STRENGTH STEEL NUTS THAT COMPLY WITH DIMENSIONAL REQUIREMENTS OF AS/NZS1252:1996, THE CURRENT STANDARD FOR HIGH STRENGTH BOLTS, ARE NOT AVAILABLE IN AUSTRALIA – NUTS MAY COMPLY WITH THE DIMENSIONAL REQUIREMENTS OF THE PREVIOUS STANDARD AS1252:1983. THE CONTRACTOR SHALL PROVIDE COMPLIANCE CERTIFICATES TO VERIFY THE ABOVE FOR EACH BATCH OF BOLTS, NUTS AND WASHERS TO BE USED ON THE PROJECT. IF THE SUPERINTENDENT DEEMS SUCH CERTIFICATES UNACCEPTABLE, THEN BOLTS, NUTS AND WASHERS FROM EACH TYPE AND BATCH TO BE USED ON THE PROJECT SHALL BE TESTED BY A NATA ACCREDITED TESTING FACILITY FOR AS/NZS 1252 COMPLIANCE WITH PARTICULAR CONSIDERATION GIVEN TO:
TENSILE STRENGTH
PROOF LOAD - BOLTS AND NUTS
HARDNESS - BOLTS, NUTS AND WASHERS
CHEMICAL COMPOSITION FROM ORIGINAL HEAT CERTIFICATE.

S10. SECTIONS SHALL NOT BE SPLICED UNLESS SHOWN ON THE DRAWINGS.

S11. ALL HANDRAILING SHALL BE MONOWILLS OR APPROVED EQUIVALENT AND SHALL HAVE KICKPLATE AS REQUIRED. STANCHIONS SHALL BE LOCATED 300mm FROM ALL CHANGES OF DIRECTION AND ENDS OF HANDRAILING.

S12. ALL BOLT HOLES IN STEELWORK SHALL BE 2mm GREATER THAN THE BOLT DIAMETER, UNLESS NOTED OTHERWISE. FOR BASEPLATES, HOLES SHALL BE 4mm GREATER THAN THE BOLT DIAMETER, UNLESS NOTED OTHERWISE.

S13. CONNECTIONS SHALL BE CONCENTRIC USING CENTRE OF AREA UNLESS NOTED OTHERWISE, EXCEPT FOR :
CHANNELS – BACK OF CHANNEL
BRACING USING BOLTS – CENTRE OF BOLT GAUGE LINE OR BOLT GROUP

S14. ALL GROUT UNDER BASEPLATES SHALL BE 20mm NOMINAL THICKNESS, UNLESS NOTED OTHERWISE. GROUT SHALL BE NON-SHRINK AND HAVE A MINIMUM STRENGTH OF 50MPa.

S15. UNLESS NOTED OTHERWISE, PROTECTIVE SURFACE TREATMENT SHALL BE AS FOLLOWS: HOT DIP GALVANISED IN ACCORDANCE WITH AS/NZS4680 WITH MINIMUM COATING OF 600g/m2

S16. COATINGS DAMAGED DURING TRANSPORT OR ERECTION SHALL BE MADE GOOD.

S17. UNLESS NOTED OTHERWISE, CHEMICAL ANCHORING INTO CONCRETE IS TO BE UNTERTAKEN USING GRADE 5.8 GALVANISED RAMSET CHEMSET ANCHOR STUDS WITH RAMSET CHEMSET INJECTION 801. MINIMUM EMBEDMENT IS TO BE 125mm FOR M16 STUDS AND 150mm for M20 STUDS.

MEMBER SCHEDULE

MARK	MEMBER SIZE AND TYPE
B1	200UB25 FLOOR BEAM
B2	360UB44 FLOOR BEAM
B3	150 PFC FLOOR BEAM
B4	180 PFC FLOOR BEAM
B5	200 PFC FLOOR BEAM
B6	75x75x6 EA FLOOR BEAM
B7	150x150x12 EA FLOOR BEAM
A1	Φ48.3x4.0 CHS ANTENNA POLE
R1	C200-15 ROOF FRAME
C1	89x89x3.5 SHS COLUMN
C2	100x100x5 SHS COLUMN
C3	150x150x6 SHS COLUMN
CB1	460 UB 74 MONORAIL BEAM
E1	75x50x6 UA SUPPORT ANGLE
E2	125x75x6 UA SUPPORT ANGLE
BR1	90x90x6 EA BRACING STRUT
BR2	150x150x6 SHS BRACING STRUT

.... Date ....
RPEQ No.

.... Date ....
RPEQ No.

Richard Mulligan Date 17/09/2013
RPEQ No. 7850

CHECK PRINT - INCOMPLETE REVISION
THIS DRAWING HAS NOT BEEN CHECKED/VERIFIED AND MUST NOT BE RELIED UPON.
PLOT DATE Tuesday, 17 September 2013 1:44:08 PM

REV	DESCRIPTION	DATE	POSITION	NAME	SIGNATURE
			DRAFTING	N. SLOAN	
			DESIGN	P.HOCKING	
			DESIGN VERIFICATION	T. LWIN	
2	AS INSTALLED	08/01/2013	PROJECT APPROVAL	R. MULLIGAN	
1	ISSUED FOR CONSTRUCTION	02/08/2011	CLIENT		
0	ISSUED FOR CONSTRUCTION	21/07/11			

QUEENSLAND UrbanUtilities
ABN 86 673 835 011

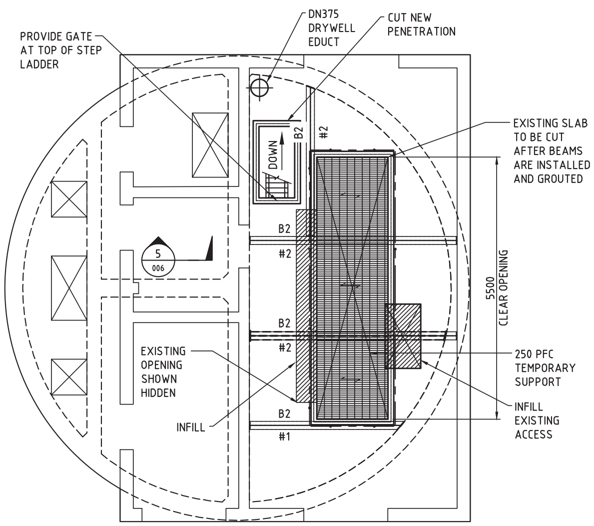
Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

DRAWING SCALE: AS SHOWN
ORIG. SIZE: A1
DRAFTER: R.WHITTON

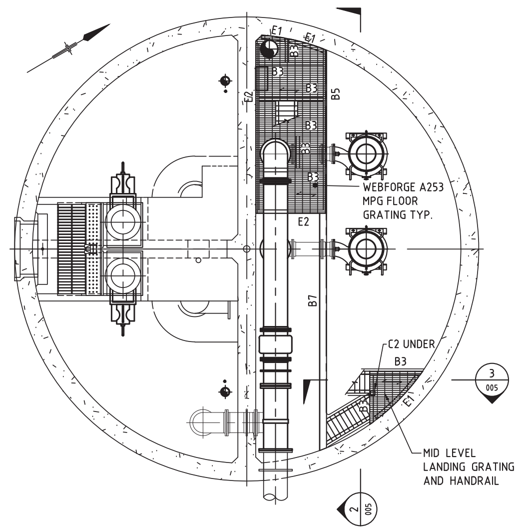
TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
GENERAL NOTES

DRAWING No. 486-5-7-0383-026
REVISION 2

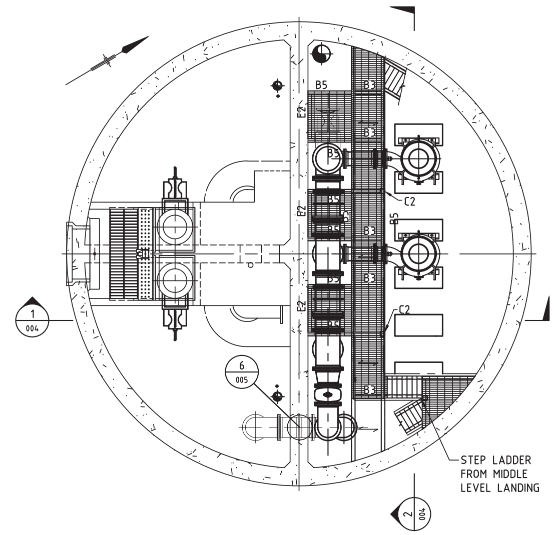
DATE: Tuesday, 17 September 2013 1:44:08 PM FILE: L:\CS4000 QUU IPSWICH REGION SP01 SP33 SP34 UPGRADE PROJECT\16 DRAWINGS\01 RECEIVED\QUU FINAL DRAWINGS\SP344\486-5-7-0383-026\SP344-486-5-7-0383-026.DWG



CONTROL ROOM FLOOR ALTERATIONS - PLAN VIEW
SCALE 1:50



UPPER LEVEL PLATFORM FRAMING PLAN
SCALE 1:50



LOWER LEVEL PLATFORM FRAMING PLAN
SCALE 1:50

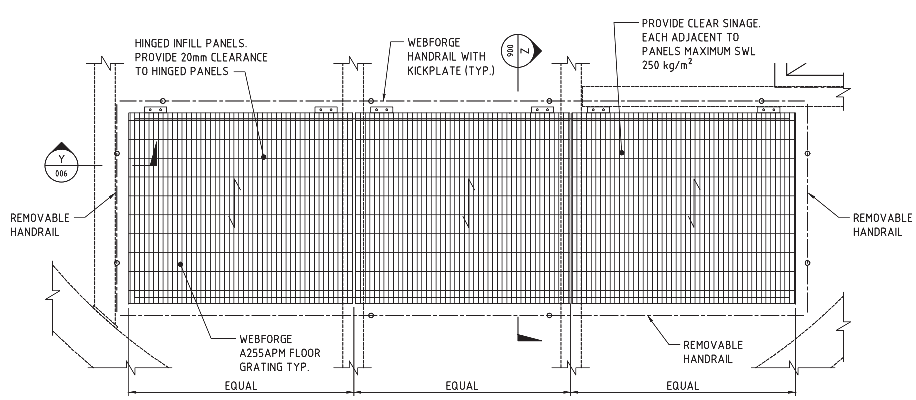
SLAB STRENGTHING NOTES :

SS1. REFER TO GENERAL NOTES FOR ADDITIONAL REQUIREMENTS FOR MODIFICATION OF EXISTING STRUCTURES

SS2. DURING THE INSTALLATION OF THE SLAB BEAMS THE FLOOR LOAD IS TO BE LIMITED TO 2.5kPa.

SS3. THE FOLLOWING CONSTRUCTION SEQUENCE IS TO BE ADOPTED TO ENSURE STRUCTURAL INTEGRITY OF THE SLAB DURING THE STRENGTHENING PROCESS.

SEQUENCE:
1. INSTALL NEW BRACKETS UNDER SLAB
2. INSTALL 250PFC TEMPORARY STRENGTHENING BEAM
3. INSTALL AND GROUT OUSIDE BEAM (MARKED #1).
4. CUT BEAM BELOW SLAB AT LOCATION OF INTERNAL BEAMS
5. INSTALL AND GROUT ALL OTHER BEAMS (MARKED #2)
6. REMOVE 250PFC
7. CUT ENLARGED PENETRATIONS IN SLAB
8. FORM AND INSTALL REINFORCEMENT FOR INFILL PENETRATIONS.
9. POUR INFILL SLAB



FLOOR PENETRATION DETAILS
SCALE 1:20

SCALE 1: 20 — 400 0 400 800 1200 1600 SCALE IN mm

SCALE 1: 50 — 1000 0 1000 2000 3000 4000 SCALE IN mm

Date .... RPEQ No.

Date .... RPEQ No.

Richard Mulligan Date 17/09/2013 RPEQ No. 7850

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REV	DESCRIPTION	DATE
2	AS INSTALLED	08/01/2013
1	ISSUED FOR CONSTRUCTION	02/08/2011
0	ISSUED FOR CONSTRUCTION	21/07/11

POSITION	NAME	SIGNATURE
DRAFTING	N. SLOAN	
DESIGN	P.HOCKING	
DESIGN VERIFICATION	T. LWIN	
PROJECT APPROVAL	R. MULLIGAN	
CLIENT		

QUEENSLAND UrbanUtilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd ABN 91 007 660 317

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
FLOOR PLANS

DRAWING SCALE: AS SHOWN
DRAFTER: R.WHITTON
ORIG. SIZE: A1
DRAWING No.: 486-5-7-0383-027
REVISION: 2

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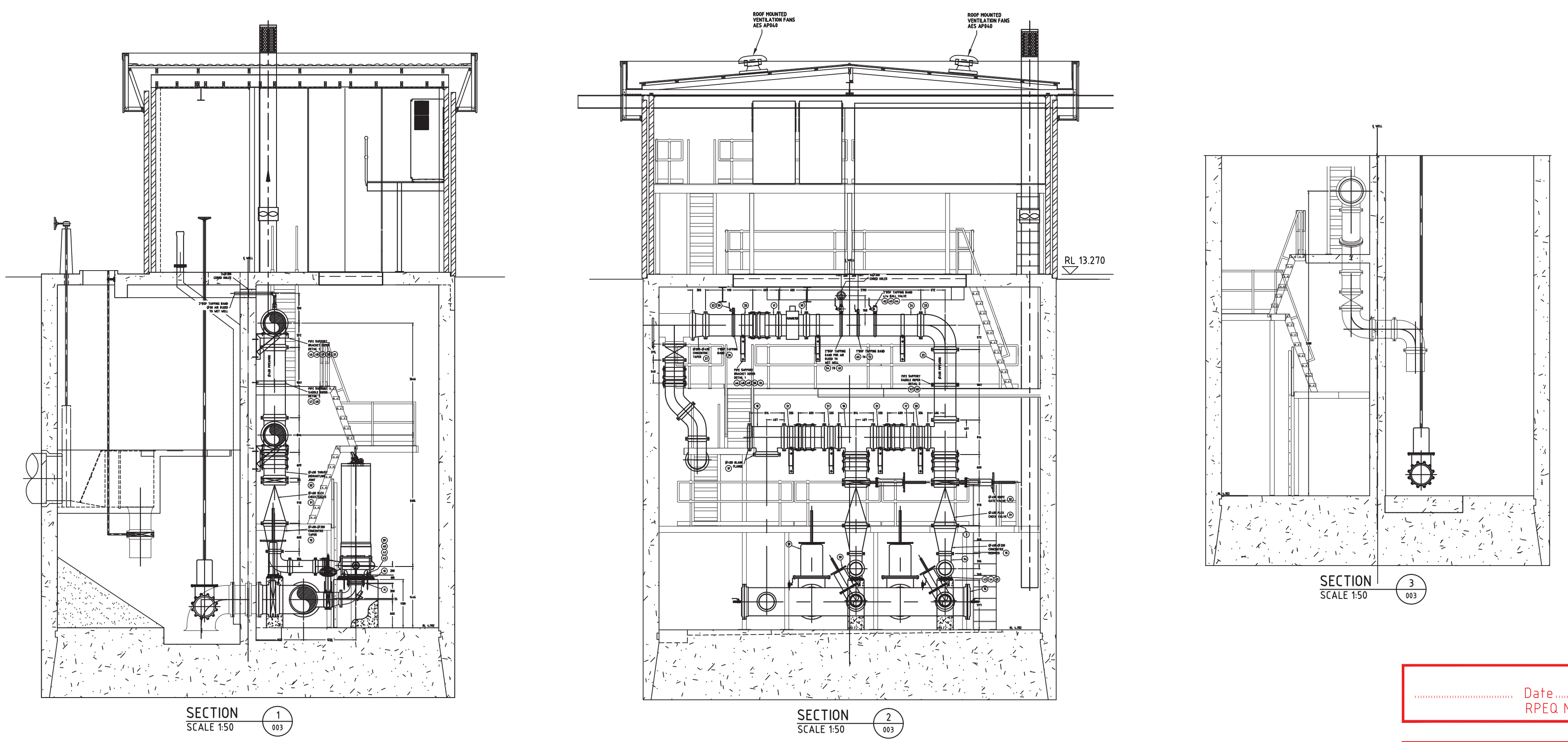

Date .... RPEQ No.

Date .... RPEQ No.

Richard Mulligan Date 17/09/2013 RPEQ No. 7850

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PLOT DATE Tuesday, 17 September 2013 1:44:10 PM

SCALE 1: 50 — SCALE IN mm (1000, 0, 1000, 2000, 3000, 4000)

REV	DESCRIPTION	DATE	POSITION	NAME	SIGNATURE
			DRAFTING	N. SLOAN	
			DESIGN	P.HOCKING	
			DESIGN VERIFICATION	T. LWIN	
2	AS INSTALLED	08/01/2013	PROJECT APPROVAL	R. MULLIGAN	
1	ISSUED FOR CONSTRUCTION	02/08/2011	CLIENT		
0	ISSUED FOR CONSTRUCTION	21/07/11			

QUEENSLAND Urban Utilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
WELL PLATFORM ELEVATIONS

DRAWING SCALE	ORIG. SIZE	DRAWING No.	REVISION
AS SHOWN	A1	486-5-7-0383-028	2

DRAFTER: R.WHITTON

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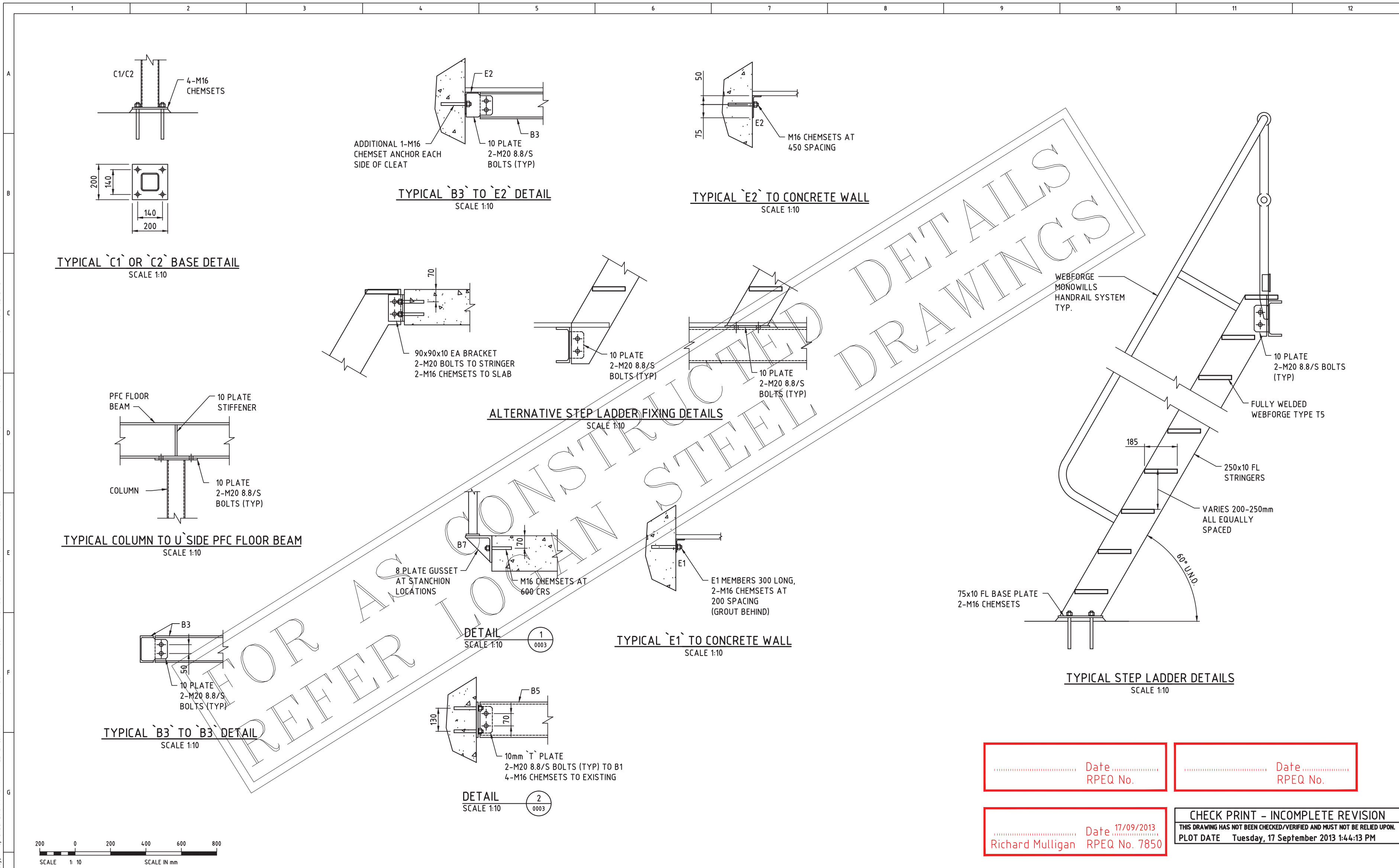

Date .... RPEQ No.

Date .... RPEQ No.

Richard Mulligan Date 17/09/2013 RPEQ No. 7850

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REV	DESCRIPTION	DATE
2	AS INSTALLED	08/01/2012
1	ISSUED FOR CONSTRUCTION	02/08/2011
0	ISSUED FOR CONSTRUCTION	21/07/11

POSITION	NAME	SIGNATURE
DRAFTING	N. SLOAN	
DESIGN	P.HOCKING	
DESIGN VERIFICATION	T. LWIN	
PROJECT APPROVAL	R. MULLIGAN	
CLIENT		

QUEENSLAND UrbanUtilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd ABN 91 007 660 317

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
STEEL DETAILS

DRAWING SCALE AS SHOWN
DRAFTER: R.WHITTON
ORIG. SIZE A1
DRAWING No. 486-5-7-0383-029
REVISION 2

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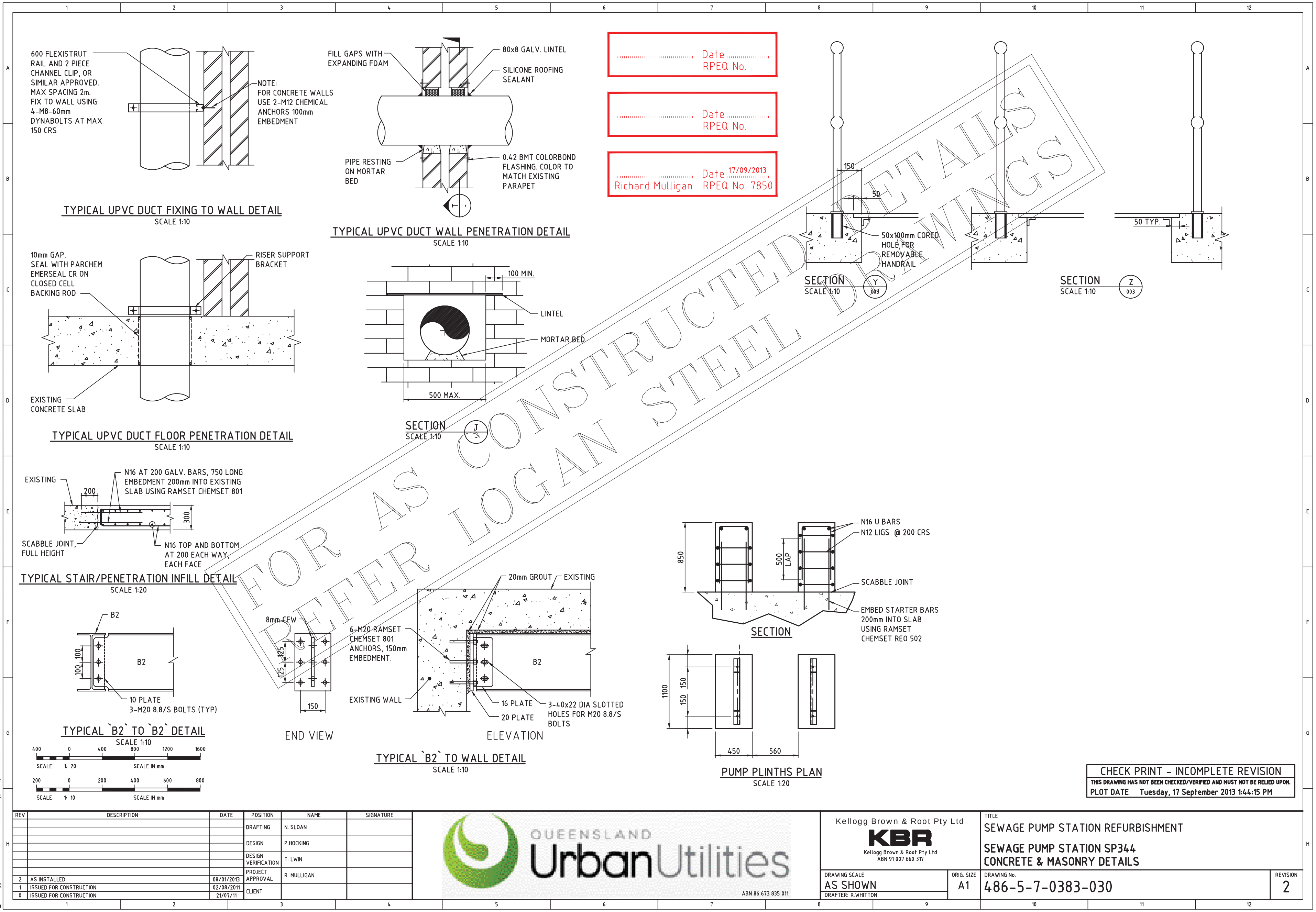
600 FLEXISTRUT RAIL AND 2 PIECE CHANNEL CLIP, OR SIMILAR APPROVED. MAX SPACING 2m. FIX TO WALL USING 4-M8-60mm DYNABOLTS AT MAX 150 CRS
NOTE: FOR CONCRETE WALLS USE 2-M12 CHEMICAL ANCHORS 100mm EMBEDMENT
TYPICAL UPVC DUCT FIXING TO WALL DETAIL
SCALE 1:10
FILL GAPS WITH EXPANDING FOAM
80x8 GALV. LINTEL
SILICONE ROOFING SEALANT
PIPE RESTING ON MORTAR BED
0.42 BMT COLORBOND FLASHING. COLOR TO MATCH EXISTING PARAPET
TYPICAL UPVC DUCT WALL PENETRATION DETAIL
SCALE 1:10
10mm GAP. SEAL WITH PARCHEM EMERSEAL CR ON CLOSED CELL BACKING ROD
RISER SUPPORT BRACKET
EXISTING CONCRETE SLAB
TYPICAL UPVC DUCT FLOOR PENETRATION DETAIL
SCALE 1:10
100 MIN.
LINTEL
MORTAR BED
500 MAX.
SECTION
SCALE 1:10
Date
RPEQ No.
Date
RPEQ No.
Richard Mulligan
Date 17/09/2013
RPEQ No. 7850
150
50
50x100mm CORED HOLE FOR REMOVABLE HANDRAIL
SECTION
SCALE 1:10
50 TYP.
SECTION
SCALE 1:10
FOR AS CONSTRUCTED DETAILS
REFER LOGAN STEEL DRAWINGS
EXISTING
200
N16 AT 200 GALV. BARS, 750 LONG EMBEDMENT 200mm INTO EXISTING SLAB USING RAMSET CHEMSET 801
300
SCABBLE JOINT, FULL HEIGHT
N16 TOP AND BOTTOM AT 200 EACH WAY, EACH FACE
TYPICAL STAIR/PENETRATION INFILL DETAIL
SCALE 1:20
B2
100
100
B2
10 PLATE
3-M20 8.8/S BOLTS (TYP)
TYPICAL `B2` TO `B2` DETAIL
SCALE 1:10
8mm CFW
125
125
150
END VIEW
6-M20 RAMSET CHEMSET 801 ANCHORS, 150mm EMBEDMENT.
EXISTING WALL
20mm GROUT
EXISTING
B2
16 PLATE
20 PLATE
3-40x22 DIA SLOTTED HOLES FOR M20 8.8/S BOLTS
ELEVATION
TYPICAL `B2` TO WALL DETAIL
SCALE 1:10
850
500 LAP
N16 U BARS
N12 LIGS @ 200 CRS
SCABBLE JOINT
EMBED STARTER BARS 200mm INTO SLAB USING RAMSET CHEMSET REO 502
SECTION
1100
150
150
450
560
PUMP PLINTHS PLAN
SCALE 1:20
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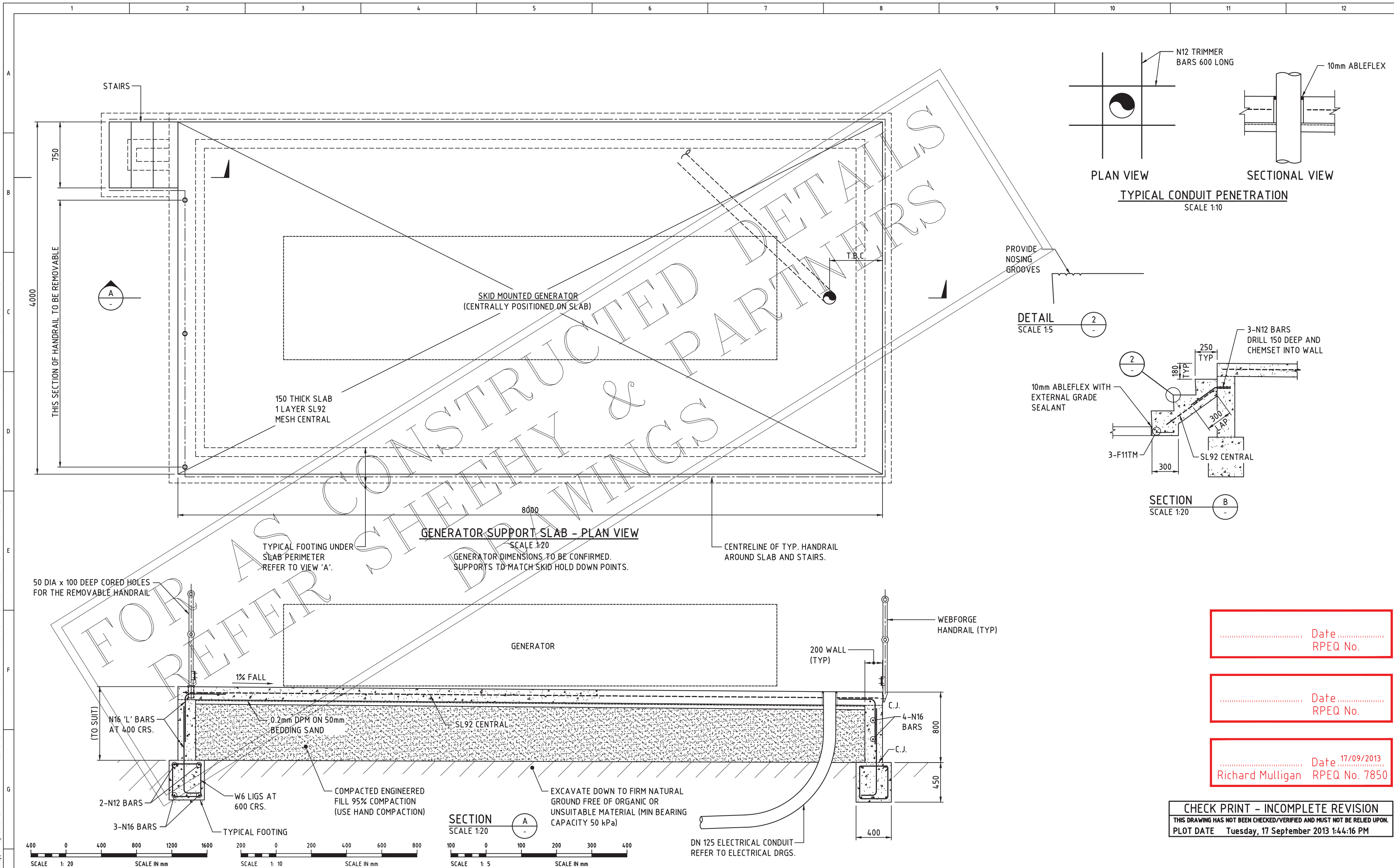
PLOT DATE Tuesday, 17 September 2013 1:44:15 PM
SCALE 1:20 SCALE IN mm
SCALE 1:10 SCALE IN mm
REV DESCRIPTION DATE
2 AS INSTALLED 08/01/2013
1 ISSUED FOR CONSTRUCTION 02/08/2011
0 ISSUED FOR CONSTRUCTION 21/07/11
POSITION NAME SIGNATURE
DRAFTING N. SLOAN
DESIGN P.HOCKING
DESIGN VERIFICATION T. LWIN
PROJECT APPROVAL R. MULLIGAN
CLIENT
QUEENSLAND UrbanUtilities
ABN 86 673 835 011
Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd ABN 91 007 660 317
DRAWING SCALE AS SHOWN
DRAFTER: R.WHITTON
ORIG. SIZE A1
TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
CONCRETE & MASONRY DETAILS
DRAWING No. 486-5-7-0383-030
REVISION 2



Date .... RPEQ No.

Date .... RPEQ No.

Richard Mulligan Date 17/09/2013 RPEQ No. 7850

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REV	DESCRIPTION	DATE
2	AS INSTALLED	08/01/2013
1	ISSUED FOR CONSTRUCTION	02/08/2011
0	ISSUED FOR CONSTRUCTION	21/07/11

POSITION	NAME	SIGNATURE
DRAFTING	N. SLOAN	
DESIGN	P.HOCKING	
DESIGN VERIFICATION	T. LWIN	
PROJECT APPROVAL	R. MULLIGAN	
CLIENT		

QUEENSLAND Urban Utilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

DRAWING SCALE: AS SHOWN
DRAFTER: R.WHITTON
ORIG. SIZE: A1

TITLE
SEWAGE PUMP STATION REFURBISHMENT
SEWAGE PUMP STATION SP344
GENERATOR PLATFORM PAD - CONCRETE DETAILS

DRAWING No. 486-5-7-0383-031
REVISION 2

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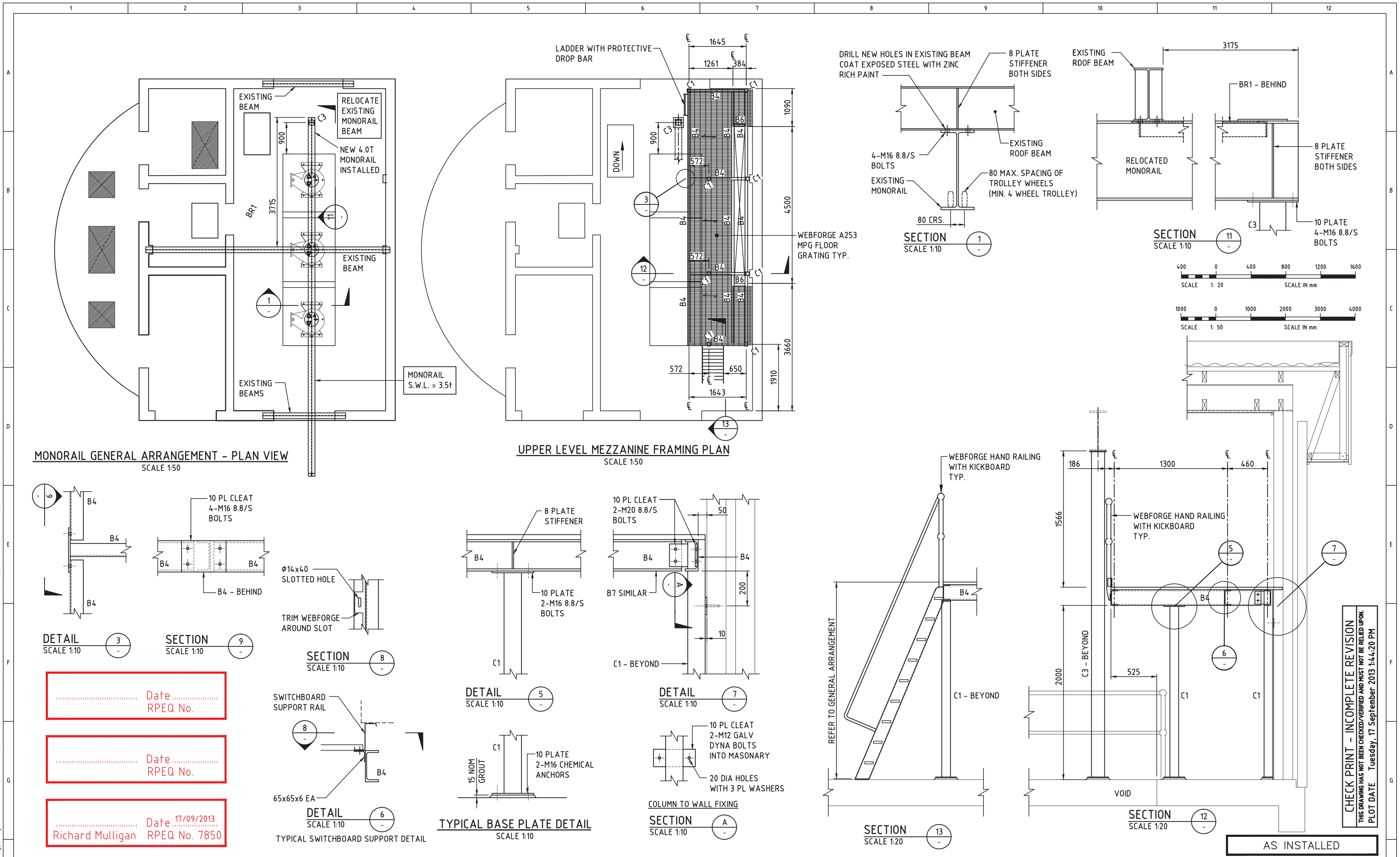

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			DESIGN	P. HOCKING	
2	AS INSTALLED	08/01/2013	DESIGN VERIFICATION	T. LWIN	
1	RE-ISSUED FOR CONSTRUCTION	01/08/2011	PROJECT APPROVAL	R. MULLIGAN	
0	ISSUED FOR CONSTRUCTION	21/07/2011			
B	ISSUED FOR TENDER	29/03/2011	CLIENT		
A	ISSUED FOR 80% CLIENT REVEIW	24/03/2011			

QUEENSLAND UrbanUtilities
ABN 86 673 835 011

Kellogg Brown & Root Pty Ltd
KBR
Kellogg Brown & Root Pty Ltd
ABN 91 007 660 317

TITLE
SEWAGE PUMP STATION REFURBISHMENT
PUMP STATION SP344
MONORAIL GENERAL ARRANGEMENT

DRAWING SCALE: SCALE 1:50, 1:20 & 1:10
DRAFTER: R. WHITTON
ORIG. SIZE: A1
DRAWING No.: 486-5-7-0383-032
REVISION: 2

© Kellogg Brown & Root DATE: Tuesday, 17 September 2013 1:44:20 PM FILE: L:\CS4000 QUU IPSWICH REGION SP01 SP33 SP34 UPGRADE PROJECT\16 DRAWINGS\01 RECEIVED\QUU FINAL DRAWINGS\SP344\486-5-7-0383-032\SP344\486-5-7-0383-032.DWG

8. Spray Coating

certificate of registration

This is to certify that the management systems of

Construct Environmental

have been formally assessed by International Certifications and found to comply with the requirements of

AS/NZS 4801:2001

Occupational Health & Safety Management Systems - Specifications with guidance for use

03 Jun 2011

Issue Date

11 May 2014

Expiry Date

D. L. Evans
Managing Director
International Certifications Ltd

INTERNATIONAL CERTIFICATIONS • REGISTRATION NUMBER •

C27321

Scope of Registration:

Asset Rehabilitation associated with the mining, water and sewerage, civil construction, hydro electrical, tanking and marine sectors including rehabilitation and protection of various substrates including steel, timber and concrete.

Registered Site(s):

32 Cessna Drive , Caboolture , QLD , 4510, Australia

JAS-ANZ

AS/NZS 4801
www.intlcert.com

certificate of registration

This is to certify that the management systems of

Construct Environmental

have been formally assessed by International Certifications and found to comply with the requirements of

Eco Warranty:2010

Environmental Management Systems - Requirements

03 Jun 2011

Issue Date

11 May 2014

Expiry Date

D. L. Evans
Managing Director
International Certifications Ltd

INTERNATIONAL CERTIFICATIONS • REGISTRATION NUMBER •

C28301

Scope of Registration:

Asset Rehabilitation associated with the mining, water and sewerage, civil construction, hydro electrical, tanking and marine sectors including rehabilitation and protection of various substrates including steel, timber and concrete

Registered Site(s):

32 Cessna Drive , Caboolture , QLD , 4510, Australia

certificate of registration

INTERNATIONAL CERTIFICATIONS

This is to certify that the management systems of

Construct Environmental

have been formally assessed by International Certifications and found to comply with the requirements of

ISO 9001:2008

Quality Management Systems - Requirements

03 Jun 2011

Issue Date

11 May 2014

Expiry Date

D. L. Evans
Managing Director
International Certifications Ltd

INTERNATIONAL CERTIFICATIONS • REGISTRATION NUMBER •

C27324

Scope of Registration:

Asset Rehabilitation associated with the mining, water and sewerage, civil construction, hydro electrical, tanking and marine sectors including rehabilitation and protection of various substrates including steel, timber and concrete.

Registered Site(s):

32 Cessna Drive , Caboolture , QLD , 4510, Australia

JAS-ANZ

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

ISO 9001 www.intlcert.com

certificate of registration

This is to certify that the management systems of

Construct Environmental

have been formally assessed by International Certifications and found to comply with the requirements of

ISO 14001:2004

Environmental Management Systems - Requirements with guidance for use

03 Jun 2011

Issue Date

11 May 2014

Expiry Date

D. L. Evans
Managing Director
International Certifications Ltd

Scope of Registration:

Asset Rehabilitation associated with the mining, water and sewerage, civil construction, hydro electrical, tanking and marine sectors including rehabilitation and protection of various substrates including steel, timber and concrete.

Registered Site(s):

32 Cessna Drive , Caboolture , QLD , 4510, Australia

INTERNATIONAL CERTIFICATIONS • REGISTRATION NUMBER •

C27323

www.intlcert.com

certificate of registration

INTERNATIONAL CERTIFICATIONS

This is to certify that the management systems of

Construct Environmental

have been formally assessed by International Certifications and found to comply with the requirements of

OHSAS 18001:2007

Occupational Health & Safety Management Systems - Requirements

03 Jun 2011

Issue Date

11 May 2014

Expiry Date

Scope of Registration:

Asset Rehabilitation associated with the mining, water and sewerage, civil construction, hydro electrical, tanking and marine sectors including rehabilitation and protection of various substrates including steel, timber and concrete.

Registered Site(s):

32 Cessna Drive , Caboolture , QLD , 4510, Australia

D. L. Evans
Managing Director
International Certifications Ltd

INTERNATIONAL CERTIFICATIONS • REGISTRATION NUMBER •

C27322

JAS-ANZ

OHSAS 18001 www.intlcert.com

SprayWall

**spray-applied polyurethane
for structural rehabilitation,
infiltration control,
corrosion management
and peace of mind**

. . .the gold standard

SPRAYROQ® Protective Lining Systems

TYPICAL USES

SprayWall is ideally designed for applications on surfaces that are exposed to acids, corrosives and other caustic elements.

Some of the structures include:

- **Manholes**
- **Lift Stations**
- **Wet Wells**
- **Tanks**
- **Grit Chambers**
- **Clarifiers**
- **Digesters**
- **Junction Boxes**
- **Pipelines** *(Man Entry Only)*
- **Tunnels**
- **Secondary Containment**
- **Lagoons**

DESCRIPTION

SprayWall is a 100% VOC-free self-priming polyurethane coating which reinstates structural integrity, provides infiltration control and chemical resistance for concrete, steel, masonry, fiberglass and other surfaces.

Developed for use in ambient operating conditions up to 140°F / 60°C, SprayWall is a tough, corrosion and abrasion resistant coating that can be spray applied at any desired thickness in a single mobilization.

Spraywall's quick curing time allows the newly protected structure to be returned to service immediately after the application is completed.

COLOR

Gold is the standard product color. SprayWall's color is derived from the natural coloration of our raw materials.

SOLIDS BY VOLUME & VOC'S

100% VOC (Volatile Organic Compounds) Free

COVERAGE

16 square feet per gallon at 1/10" (100 mil) thickness.
.4 square meters per liter at 2.5 mm thickness.

APPLICATION METHOD

SprayWall is applied by utilizing a proprietary heated plural component spray system. Complete integrated spray system information is available by contacting Sprayroq technical support.

SURFACE TEMPERATURE

55°F / 13°C minimum recommended
122°F / 50°C maximum recommended
for optimum protection

CURE & RECOAT TIME

After the A and B components are mixed, SprayWall begins to gel in about 8 seconds, with a tack free condition after one minute. Within 30 minutes, the initial cure is completed and the structure is capable of accepting flow while the complete curing continues for the next 4-6 hours.

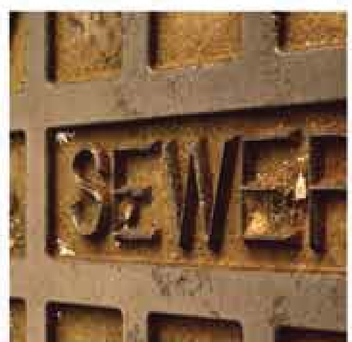
SprayWall may be applied up to 500 mils (½" / 13mm) thick in a single application.

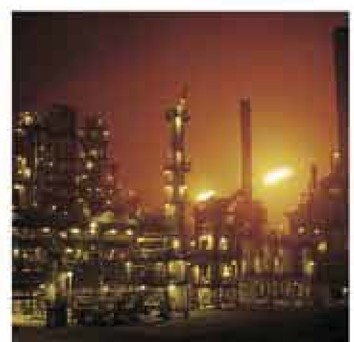
Note: If several coats are applied, no more than 1 hour should be allowed between coat applications. Surfaces should be cleaned thoroughly to remove any contaminants between coats. In addition, all precaution should be taken to protect the application surfaces between coats.

Biobased* Content
0%

*Biobased Content

Biobased percentage is defined by the amount of biobased, recycled or renewable source materials contained in the finished manufactured spray-applied product





PREPARATION
Surfaces to be treated must be cleaned of all oil, grease, rust, scale, deposits and other debris or contaminants. All resins, including SprayWall, require a clean and dry substrate for optimal technical performance of the product.

STEEL
Solvent Cleaning (SSPC-SP1) may be necessary for steel. Surfaces to be coated should be prepared in accordance with SSPC-SP10 or NACE No.2: "Near White Blast Cleaning".

When applicable, an alternate procedure may be employed using high (>5,000 psi / >34.5 MPa) or ultrahigh (>10,000 psi / >69.0 MPa) pressure water cleaning or water with sand injection and approved rust inhibitors. The surface profile must be a minimum of 2 mils / 0.05 mm.

CONCRETE AND MASONRY
Low (2,500 – 3,000 psi / 17.2-20.7 MPa) to high (>5,000 psi / >34.5 MPa) pressure water cleaning, shot blasting, abrasive blasting or combination acid etching and water cleaning can be used to prepare these surfaces.

FIBERGLASS
Prepare fiberglass by rinsing, neutralizing, scarifying and cleaning with water or a mixture of water and solvent. Be sure that all dust and loose particles are removed. The surface should be thoroughly dry before application of SprayWall.

PACKAGING
SprayWall is sold exclusively to Sprayroq Certified Partners in 1,500 lb. / 680.4 kg sets of material.

COMPONENTS & MIX RATIO
Part A, Resin.
Part B, Hardener.
.65 : 1.00 by volume

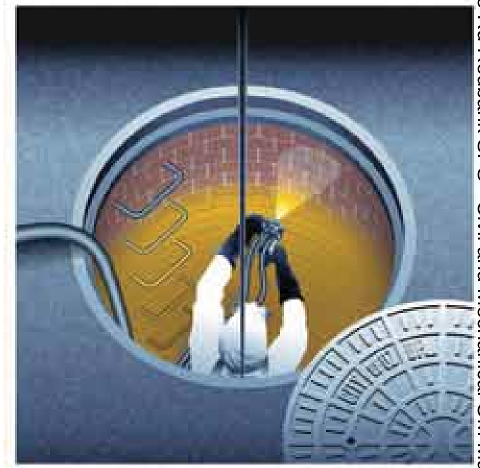
SHELF LIFE & STORAGE
Shelf Life: 1 year in sealed, unmixed containers at 60°F / 15°C. Store in a sheltered area between 60°F and 85°F / 15°C and 30°C.

SAFETY
Consult the Material Safety Data Sheet for this product concerning health and safety information before using. Strictly follow all notices on the Material Safety Data Sheet and container label. If you do not fully understand the notices and procedures provided or if you cannot strictly comply with them, do not use this product. Actual safety measures are dependent on application methods and work environment. Contact Sprayroq to obtain a copy of the Material Safety Data Sheet at 205-957-0020.

WARRANTY AND DISCLAIMER
As best determined, the technical data represented for all Sprayroq products is deemed to be accurate. All products are to be applied by trained and approved Sprayroq Certified Partners only and in strict accordance with the directions for usage and installation of the Sprayroq product.

Sprayroq guarantees the products to conform to the quality assurance procedures established by Sprayroq and its resin blending partners. We assume no responsibility for coverage, performance or injuries resulting from the use of our products.

Liability, if any, is limited to the replacement of the product for a period of three years from the date of application only. Sprayroq is not responsible for any treble expenses, liquidated damages or related labor expenses stemming from the use of this product. No other warranty is made by Sprayroq, expressed or implied, statutory or by operation of the law, including merchantability and fitness for a particular purpose.



for nearly two decades, SprayWall from Sprayroq has provided structural rehabilitation for over 150,000 water and wastewater structures around the world

SprayWall
PERFORMANCE TESTING

DESCRIPTION	METHOD	RESULTS IMPERIAL	RESULTS METRIC
Flexural Modulus	ASTM D790	735,000 psi*	5,067.6 MPa*
Long Term Flexural Modulus of Elasticity	ASTM D2990	529,000 psi*	3647.3 MPa*
Compressive Strength	ASTM D695	18,000 psi*	124.1 MPa*
Tensile Strength	ASTM D638	7,450 psi*	51.4 MPa*
Tensile Modulus	ASTM D638	425,000 psi*	2,930.3 MPa*
Elongation	ASTM D638	4% at break*	4% at break*
Mannings "N" Factor	-------- -------	.009*	.009*
Abrasion (Taber CS17)	ASTM D4060	17.7 mg loss*	17.7 mg loss*
Hardness, Shore D	ASTM D2240	90†	90†
Density	-------- -------	87 lbs./cf†	1,394 Kg/m3†
Adhesion to concrete	ASTM D4541	Substrate Failure†	Substrate Failure†

*Texas Research Institute, Austin, TX   †Sprayroq Inc. Laboratory

SPRAYROQ® Protective Lining Systems

PO Box 101717 · 4707 Alton Court · Birmingham, AL 35210 USA
205.957.0020 · 205.957.0021 (f) · Toll Free in USA 800.634.0504

...the gold standard   www.sprayroq.com · info@sprayroq.com

ABOUT SPRAYROQ

Sprayroq®, Inc. develops specialized protective lining systems for a variety of ever increasing markets and applications worldwide.

Established water and wastewater markets for our products include: municipal, industrial, telecommunication, chemical plants, paper mills, refineries, electrical and power generation customers.

Sprayroq, Inc. partners with contractors worldwide to promote and install our protective coating and lining systems. Sprayroq Certified Partners are licensed, trained and supported by Sprayroq operations, technical and marketing staff to efficiently and successfully operate in specific geographic territories.

Process Specification

Structural Rehabilitation & Corrosion Protection for Circular Structures in Wastewater Collection Systems and Potable Water Systems

SECTION 1: GENERAL

1.01 DESCRIPTION

This specification includes all work, materials and equipment required for the structural rehabilitation of circular structures. The purpose is to eliminate infiltration, repair voids, restore structural integrity and provide corrosion protection by the application of a spray-applied monolithic resin liner to the wall and bench surfaces of brick/concrete structures or structures produced with any other masonry construction material. These structures include, but are not limited to manholes, wet wells, lift stations and pump stations.

1.02 QUALITY ASSURANCE

A. Furnish materials of quality required by the American Society for Testing and Materials (ASTM) standards or other approved standards and specifications.

B. Provide guarantee against defective materials and workmanship in accordance with the requirements of these specifications.

C. The contractor installing the finished protective liner will be a certified trained applicator of the specified process.

D. Provide verifiable independent third party creep test results documenting no less than 70% retention of flexural modulus of elasticity after 50 years of service. The third party testing firm may not be affiliated with the manufacturer in any way.

1.03 REFERENCES

American Society for Testing and Materials (ASTM) Annual Book of Standards:

A. ASTM D638-91: Test Method for Tensile Properties of Plastics.

B. ASTM D790-91: Test Methods for Flexural Properties of Unreinforced and reinforced Plastics and Electrical Insulating Materials.

1.04 PROJECT/SITE CONDITIONS

Co-ordinate with the Construction Manager for traffic control during rehabilitation work at each designated location.

1.05 SEQUENCING

All required interruptions of flow through manholes, wet wells, pump stations or any other portion of the plant sanitary sewer system shall be coordinated with and approval received from the Facility Manager or Construction Manager prior to the interruption.

SECTION 2: PRODUCTS

2.01 MATERIALS

I. **Infiltration Control mix**:

A. Minor Infiltration.

1. Cementicious Grout (De Neef Industrial Products)

A rapid-setting cementitious grout or chemical grout specifically formulated for leak control should be used to stop minor water infiltration. It should be mixed and applied according to the manufacturer's recommendations and should meet the following minimum requirements.

Compressive strength	ASTM C 109	1,800 psi @ ½ hr 4,000 psi @ 24 hrs 5,000 psi @ 7 days
Tensile strength	ASTM C 190	300 psi @ 7 days 350 psi @ 28 days

B. Very Active Infiltration

1. Chemical Grout (De Neef Industrial Chemicals)

a. A chemical grout must be used for stopping very active infiltration, filling voids and should be mixed and applied according to manufacturer’s recommendations. The cementitious grout should be volume stable having a minimum 1 day compressive strength of 50 psi and a 28 day compressive strength of 250 psi.

b. Chemical grouts can be used for stopping very active infiltration and should be mixed and applied per manufacturer’s recommendations.

II. **Patching and profiling mix:**

A. Cementicious Compound (Strong Seal or equivalent product)

A quick setting cementitious material can be used to bring the substrate to profile by filling voids, cracks, missing mortar and other substrate defects. It should be mixed and applied according to the manufacturer's recommendations and should meet the following minimum requirements.

Compressive strength	ASTM C 109	1000 psi @ 1 hr 3500 psi @ 48 hrs 5000 psi @ 28 days
Tensile strength	ASTM C 307	200 psi @ 24 hrs 300 psi @ 7 days

III. **Resin Based Liner:**

A. The resin based material shall be used to form the sprayed on/structural enhanced monolithic liner covering all interior surfaces of the structure including benches and inverts of manholes. The finished liner shall be SprayWall® as manufactured by Sprayroq, Inc. or approved equal and conform to the minimum physical requirements listed below.

Compressive strength	ASTM D 695	10,500 psi
Tensile strength	ASTM D 638	7,000 psi
Flexural strength	ASTM D 790	12,000 psi
Bond		Shall exceed tensile strength of substrate
Flexural modulus (initial)	ASTM D 790	735,000 psi
Density		87 ± pcf

a. The finished structure shall be corrosion resistant to: Hydrogen Sulfide; 20% sulfuric Acid; 17% Nitric Acid; 5% Sodium Hydroxide; road salts for winter conditions as well as other common ingredients of the sanitary sewage environment.

b. The wall of the resin based liner will be structurally designed to withstand the hydraulic load generated by the groundwater table & restore structural integrity. The long term (50 yr.) value of the flexural modulus of elasticity will be a minimum of 500,000 psi and is an integral part of the engineering equation used to design the wall thickness of the structural liner.

For this reason the value of the long term flexural modulus of the proposed product will be certified by an independent, third party testing lab and submitted with the design calculations for each individual structure.

Definition**-** Long term value will be identified as initial flexural modulus less the reduction in value caused by Creep over a fifty (50) year minimum period and verified by DMA testing.

B. Other Materials: Because of the advantages associated with rapid cure and infinite thickness capabilities, no resin based materials other than polyurethane shall be used to achieve the structural enhancement without prior approval of the Construction Manager.

SECTION 3: EXECUTION

3.01 INSPECTION

A. Evaluation of Atmosphere: Prior to entering structures, an evaluation of the atmosphere will be conducted to determine the presence of toxic, flammable vapors or possible lack of oxygen. The evaluation shall be in accordance with local, state or federal safety regulations.

3.02 PREPARATION

A. Place covers over all pipe openings to prevent extraneous material from entering the sewer system. All foreign material shall be removed from the structures' wall and bench/floor using a pressure water spray (minimum 2500 psi). The use of acid for cleaning purposes, no matter how dilute, will not be allowed. Loose or protruding brick, mortar and concrete shall be removed by using a mason's hammer and chisel. Fill any large voids with quick setting patch mix as described in Paragraph (2.01 IIA). The surface to be repaired must be clean and free of any loose materials.

B. Minor leaks shall be stopped using the quick-setting specially formulated infiltration control mix (paragraph 2.01 IA) and shall be mixed and applied per manufacturer's recommendations. When severe infiltration is present, drilling may be required in order to pressure grout outside the structure using either a cementitious or chemical grout (paragraph 2.01 IB). Manufacturer's recommendations shall be followed when pressure grouting is required.

3.03 INSTALLATION/APPLICATION

A. Application Temperatures: Application of liner shall not be made unless the ambient temperature inside the structure is 50 degrees or higher.

B. Bench/Invert Repair:

1. The manhole bench must be sprayed but depending on availability and future plans, some judgment consideration will have to be made regarding the invert. Important issue here is the necessity to insure a monolithic system is achieved.

2. After blocking flow through the structure and thorough cleaning/preparatory work has been achieved. The sprayed on resin-based liner shall be applied to the invert, bench and wall areas in the same manner as specified for the liner application below. The spray shall be applied such that the entire structure receives a structurally enhanced monolithic liner.

3. The finished invert surfaces shall be smooth, free of ridges and will be sloped in the direction of flow. Special care shall be used to insure a smooth transition between the new manhole invert and intersecting pipeline inverts such that flow will not be impaired.

C. Liner Application: The resin based liner shall be manually sprayed on to all surfaces by a trained technician who is experienced in the application of a spray applied resin and has been certified by the manufacturer. Appropriate personal protection equipment shall be utilized but in every case when applying the liner, the sprayer and personnel in direct contact with the spray atmosphere, will always be protected by supplied air.

The minimum thickness of the material applied is to be no less than 250 mils (1/4”) in order to support structural integrity. No other products such as cement or grouts may be used as part of the structural reinstatement, however, said products may be used as part of the repair process prior to sprayed application of the structure as specified in 2.01 IIA.

Application of the spray applied material must be completed in one (1) mobilization in order to minimize the disruption and cost of excessive bypassing, pipeline plugging, traffic control and all other support services.

The finished manhole must be returned to full service immediately after the spray application is complete.

D. Curing: The structure should be allowed to cure for 24 hours and return to ambient temperature prior to any physical testing, including vacuum testing.

3.04 FIELD QUALITY CONTROL

A. The following test/inspection will be performed by the Construction Manager.

1. Visually verify the absence of leaks from infiltration.

B. The following tests shall be performed by the Contractor.

1. Vacuum Test: A vacuum test conforming to the requirements of ASTM C1244 shall be performed for every lined manhole or circular structure where practical.

Document: QUU12-04

Queensland Urban Utilities
Level 6, Brisbane Transit Centre
171 Roma Street
Brisbane

To Whom It May Concern:

RE : WARRANTY ON SPRAYWALL COATING FOR IPSWICH PUMP WELLS – SP01- Old Toowoomba Road, SP33-McAuliffe Street and SP34-Brisbane Road.- HALLCO ENGINEERING.

Please accept this letter as confirmation that we are happy to extend the warranty to a total of ten (10) years, on the coating of the pump wells through Ipswich.

As licensed applicators of Sprayroq, our staff have been extensively trained in the preparation and coating of various projects including pump stations. Strict conditions are contained in our contract with Sprayroq to ensure projects are completed in the manner specified by Sprayroq.

These requirements, coupled with the quality of the Spraywall product, and our International Certifications for Quality, WPH&S and Environment offer our clients the highest level of comfort that they are receiving the best available service in their coatings contractor.

Sprayroq, offers a three (3) year warranty as a standard and we, Construct Environmental Pty Ltd are happy to extend that warranty to ten years based on a number of conditions –

1/ The coating supplied will be monolithic, in that it will be one coating, unbroken throughout the pump well. Should penetrations be required post-project, Construct Environmental must be employed to “make good” the area after the penetration is complete.

The overall effectiveness of the coating is based on a number of crucial factors, one of which is that there are no areas where gas/acid can gain access to the protected substrate behind the coating.

2/ The pump station will be used day to day to collect and deliver sewerage and all the chemicals etc which can be reasonably expected.

The Spraywall product has been proven in test conditions and in completed projects to resist the chemicals generally and reasonably found in sewer.

Any abnormally high level of chemical/s (not generally or reasonably found in sewerage) should be made known to Construct Environmental who may decide to complete an inspection of the coating to ensure its longevity.

As part of our standard procedure, Construct Environmental completes an inspection of all of the projects completed after the first year and then after three years. These inspections are designed to ensure we identify, address any issues as soon as possible.

In this case, we will conduct inspections at 1 year, 3 years, five years and ten years.

Spraywall has been life tested in these conditions. The results show, after 50 years exposed to the environmental and chemical conditions found in a sewer system, a loss of just 27% of its physical properties is the resultant.

It is with this in mind that I have no hesitation in complying with the requested extension of the warranty.

I trust that this document provides the satisfaction you require. Please feel free to contact me regarding this matter at any time.

Kind Regards,

Dave Turnbull
Managing Director

Construct environmental

32 Cessna Drive | Caboolture | Qld | 4510
PO Box 1158 | Caboolture | Qld | 4510
P | 07 3139 1697
D | 07 5499 3012
M | 0407 224 700
E | dturnbull@constructenvironmental.com.au
W | www.constructenvironmental.com.au
W | www.pdstrategic.com.au

Form: F1109/0

J & P RICHARDSON INDUSTRIES PTY LTD

INSPECTION & TEST PLAN

*** Legend**
x = Perform **H = Hold (mandatory)**
w = Witness **h = hold (optional)**
a = Accept **c = Certify**
r = Random

ITP No. C54000-SP34-Spray Coating

Project: Spray Coating

Contract No: I112-024

Customer: Queensland Urban Utilities

Item No	Process Sequence	Acceptance Criteria	Activity By*		Reference Documents	Remarks/Records
			JPR	CUST		
1	**DESIGN**					
1.1	**Design Documents**					
1.1.1	Civil Drawings - Approved for Construction	Complies with specification, drawings and schedules	a + h	x	Contract Drawings & Documents	
1.1.2	Scope of Works and Project Specification	Documentation provided as IFC and sufficiently complete for JPR to proceed	a + h	x	Contract Drawings & Documents	
2	**IMPLEMENTATION**					
2.1	**Site Works**					
2.1.1	Preparation for Spray Coating	Complies with specification, drawings and schedules	x	w	Specification, drawings	
2.1.2	Completion of Prepation for Spray Coating	Complies with specification, drawings and schedules	x	w	Specification, drawings	
2.1.3	Installation of Spray Coating	Complies with specification, drawings and schedules	x	a + h	Specification, drawings	
3	**HANDOVER**					
3.1	JPR - Inspecition and Checklist	Completed in accordance with contract documents	x		Contract documents	Customer accepted
3.2	As Installed Drawings	Complies with drawings, schedules and contract documents	x		Drawings and schedules, contract documents	As-Installed documentation

9. Brisbane Road Commissioning Plan

QUEENSLAND UrbanUtilities

Typical New Sewage Pump Station

Commissioning Plan

Site ID and Name	SP344
Commissioning Date(s)	19 DECEMBER 2012.

In Attendance

Name	Role During Commissioning	Company
DARREN WEDLEY	CONTRACTOR	J&P RICHARDSON.

Contents

1 ELECTRICAL WORKS CHECKLIST

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

1.1 SWITCHBOARD FACTORY ACCEPTANCE TEST

Task	**Completed**
FAT has been completed as per QUU FAT Document and all defects that were identified have been rectified.	1/6/12

1.2 SWICHBOARD ELECTRICAL INSPECTION

Task	Completed
The following QUU Factory Inspection has been completed and all defects have been rectified. CHE28 Factory Inspection Checks - Switchboard	2/8/12

1.3 RADIO ANTENNA MAST LOCATION

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

1.4 SUPPLY AUTHORITY

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

1.5 TELECOMMUNICATION AUTHORITY (FOR SITES LAND LINES)

Contractor Task N/A.	Result

The relevant telecommunication authority has been organised to install the land line into the Switchboard. N / A	Company ________ Booked for / / @ ________ (time) Ref # ________

Contactor's Supervisor
Name: DARREN WEDLEY
Date: 19/12/12
Signature: D

QUU Commissioning Manager
Name: ....
Date: ....
Signature: ......

2 ELECTRICAL INSTALLATION CHECKS

2.1 INSTALL NEW SWITCHBOARD

2.1.1 Install Switchboard

Contractor Task	Outcome
Install and connect the required mains and earth.	OK ☑
Record the cable insulation resistance of the 3 phases 126 127 125.	A __Megohm B__Megohm. C__Megohm
Record earth resistance	0.1 ohms
Point to point phase continuity	R to L1 OK☑ Wto L2 OK☑ B to L3 OK☑
Install the direct connected kWhr Meter N/A.	OK ☐

2.1.2 Install Generator Mains (For Sites with Permanent Generators)

Contractor Task	Outcome
Record insulation resistance of the 3-phases 22 23 21	**A__Megohm** **B_ Megohm.** **C__ Megohm**
Record earth resistance	0.1 ohms
Point to point phase continuity	R to L1 OK☑ Wto L2 OK☑ B to L3 OK☑

2.1.3 Energise New Switchboard

Contractor Task	Outcome
Retrieve mains 3-phase pole fuses from lock out box as per QUU Isolation and Lock Out procedure.	OK ☑ DW
Ensure new switchboard main incomer is turned "Off".	OK ☑ DW
Install the 3-phase pole fuses.	OK ☑ DW

Turn on mains switch	OK ☑ DW
Check 3 phase voltages	AB 416 V BC 417 V CA 415 V
Check MEN connection.	OK ☑ DW

Contactor's Supervisor
Name: DARREN WEDLEY
Date: 19/12/13
Signature: DW

QUU Commissioning Manager
Name: ....
Date: ....
Signature: ....

2.2 CONNECT FIELD INSTRUMENTATION TO NEW SWITCHBOARD

2.2.1 Field Devices

Contractor Task	Outcome
Install and connect the hydrostatic level probe to the transmitter	OK ☑ DW 0 to ___ (m)
Connect the delivery pressure probe to the transmitter	OK ☑ DW 0 to ___ (m)
Connect the delivery flow meter to the flow meter transmitter	OK ☑ DW 0 to ___ (l/s)
Install and connect the Multitrode LR3 wet well high level relay Probe	OK ☑ DW 0 to ___ (m)
Install and connect the Multitrode SIR surcharge imminent level relay Probe	OK ☑ DW 0 to ___ (m)
Connect the moisture in oil sensor for each pump (sites with option A only)	OK ☑ DW N/A ☐
Connect the moisture in stator for each pump (sites with option B1 only)	OK ☑ DW N/A ☐
Connect the motor bearing temperature for each pump (sites with option B2 only)	OK ☑ DW N/A ☐
Connect the reflux valve micro switch for each pump (sites with option C only)	OK ☑ DW N/A ☐
Connect the upstream manhole surcharge imminent probe (sites with option D only)	OK ☑ DW N/A ☐
Connect the Multitrode LR2 sump pump start/ stop probes (sites with option E only)	OK ☑ DW N/A ☐
Connect the Multitrode LR4 sump pump high/trip probes (sites with option E only)	OK ☑ DW N/A ☐
Connect the sump pump (sites with option E only)	OK ☑ DW N/A ☐
Connect the generator IO cables (sites with option F only)	OK ☑ DW N/A ☐
Connect the thermistors for each pump (sites with option I only)	OK ☑ DW N/A ☐

2.2.2 Radio Antenna Installation

QUU Programmer Task	Outcome

Install new mast with Antenna, orientate antenna to the position determined in section 3.1.2 connect coaxial cable plugs.	OK ☐

2.2.3 Radio antenna Installation

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

2.2.4 Electrical Inspection

QUU Electrical Inspector	Outcome
The following QUU Site Inspection tests have been completed and all defects have been rectified.	
CHE68 Site Inspection Checks – Cables	/ /
CHE69 Site Inspection Checks – Electric Motors	/ /
CHE70 Site Inspection Checks – Instruments	/ /
CHE71 Site Inspection Checks – Switchboards	/ /
CHE72 Site Inspection Checks – Cable Ladder/Tray/Duct	/ /

3 CIVIL STRUCTURE TESTING

Before this test can commence, the electrical installation of the wet well level sensor must be complete and the SCADA system must be recording the wet well level.

3.1 TESTING FOR LIQUID RETAINING STRUCTURES (7 DAY FILL TEST)

N/A.

As per section 7 of AS 3735, civil structures must be tested of liquid tightness. A printout of the wet well level over the entire test period shall be attached in the commissioning report.

Contractor Task	Outcome
Fill the wet well As per the following procedure the wet well shall be filled to the surcharge imminent level: With the formal agreement of the engineer, the structure should be filled at a uniform rate of not greater that 2m in a 24 hour period. When first filled the liquid shall maintained by the addition of further liquid for a stabilising period of 7 days while absorption and	OK ☐

autogenic healing takes place. After the stabilising period the level of the liquid surface shall be recorded at 24 hour intervals for test period of 7 days.			
	Date (dd/mm/yy)	Time (hh::mm)	Level (mAHD)
Initial level			
Day 1			
Day 2			
Day 3			
Day 4			
Day 5			
Day 6			
Day 7			

3.2 TESTING FOR LIQUID TIGHTNESS (7 DAY EMPTY TEST)

N/A.

Once the structure has been tested for liquid retention, the wet well and upstream system must also be tested for system infiltration. To do this the wet well must be emptied and the wet well level monitored over a 7 day period. A printout of the wet well level over the entire test period shall be attached in the commissioning report.

Contractor Task			**Outcome**
Empty the wet well below the stop duty A level record the wet well level at 24 hour intervals for test period of 7 days.			OK ☐
	Date (dd/mm/yy)	Time (hh::mm)	Level (mAHD)
Initial level			
Day 1			
Day 2			
Day 3			
Day 4			
Day 5			
Day 6			
Day 7			

4 ELECTRICAL, MECHANICAL & HYDRAULIC COMMISSIONING

To ensure that the station is fully operations BEFORE it is cut into the live sewage system, the station shall undergo a full functional test by closing the rising main isolation valve and recirculating flow through the flow meter and back to the wet well via the scour system.

4.1 MECHANICAL INTEGRITY CHECKS

Contractor Task	Outcome
Visual examination of the whole of the Works for completeness and acceptable standard of workmanship and finish.	OK ☑ DW
Inspect pump mounting bolts, guide rail, flange and support bracket bolts have been tightened	OK ☑ DW
Visual inspections to ensure all sealing gaskets are in place; all supporting brackets have been fastened.	OK ☑ DW
Operational testing of all valves and check on sealing and direction of closing, reflux valves mounted for the correct direction of flow	OK ☑ DW

4.2 HYDRAULIC PRESSURE TEST

Contractor Task	Outcome
Visual inspection for leaks during hydraulic pressure test for the pump discharge piping up to the rising main isolation valve. Pressure test shall be 1.5 times the pump shut off head	OK ☑ DW

4.3 FLOWMETER INTEGRITY CHECKS

Contractor Task	Outcome
Visual examination of the whole of the Works for completeness and acceptable standard of workmanship and finish.	OK ☑ DW
Inspect and check flange bolts for tightness, visual inspections to ensure all sealing gaskets are in place.	OK ☑ DW

4.4 ELECTRICAL COMMISSIONING OF PUMPS

QUU Programmer & Contractor Task	Outcome
Check the rotation of each pump by bumping the pump On / Off via the local "Emergency Start" switch.	Pmp1OK☑ DW Pmp2OK☑ DW
PUMP 1: While running the pump via the Emergency Start switch - Check the 3-phase motor current.	A____ Amps B____ Amps C____ Amps

PUMP 2: While running the pump via the Emergency Start switch - Check the 3-phase motor current.	A____ Amps B____ Amps C____ Amps
At this stage the Brisbane Water Programmer must complete the following procedures From the SSM086 Standard Fixed Speed Sewage Pumping Station (S.A.T.) Section2 : On Site Commissioning Procedure	OK ☐

4.5 SCADA TESTING

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

4.6 PRELIMINARY PUMP PERFORMANCE CHECKS

A single pump performance curve at the indicated Hz, for each pump, shall be generated by throttling of the scour valve. The curve to be plotted from five points while pump is operating 50 Hz at QUUL and TWL. Plotted points are to be Head v Flow.

Contractor Task	Outcome
Fill the wet well with clean water to the Top Water Level (TWL)-See Drawing 486/5/7-0048-005	OK ☐ N/A
Close rising main isolation valve and check pigging connection isolation valve closed	OK ☐ N/A
Check both pump isolation valves open	OK ☑ DW
Partially open Scour valve	OK ☑ DW
Open air bleed/Anue well washer pump 1 and 2	OK ☑ DW
Run pump 1 and bleed air from the discharge piping/ stop pump	OK ☑ DW
Run pump 2 and bleed air from the discharge piping/ stop pump	OK ☑ DW
Isolate air bleeds and Anue well washer	OK ☑ DW
Operate pump 1 from 50 to 25 Hz at 5 Hz increments, check for abnormal movement or vibration	OK ☐
Operate pump 2 from 50 to 25 Hz at 5 Hz increments, check for abnormal movement or vibration	OK ☐
Visual inspection of both pumps and all piping, fittings and flanged joints for	OK ☑ DW

leakage.	

4.7 PUMP CURVES PERFORMANCE CHECKS

Contractor Task	Outcome
The tables in section 4.8 and 4.9 are to be filled out by checking the pump curve performance by throttling the scour valve until flow meter records the required flow (l/s) and recording the discharge pressure, motor amps and voltage readings in the table provided.	OK ☑ ✓ DW
Open Anue washer isolation valve, operate Pump 2, check operation of Anue well washer	OK ☐ N/A
Pump curves to be generated from tabled information and added to the " As Constructed Drawings"	OK ☑ ✓ DW

4.8 TOP WATER OPERATION

4.8.1 50 Hz Operation

Pump Number	Hz	Flow L/s	Discharge Pressure (mAHD)	Wet well Level (mAHD)	Motor Amps	Voltage
1	**50**	**0**				
1	**50**	**50**				
1	**50**	**100**				
1	**50**	**125**				
1	**50**	**150**				
2	**50**	**0**				
2	**50**	**50**				
2	**50**	**100**				
2	**50**	**125**				
2	**50**	**150**				

4.8.2 33 Hz OPERATION

Pump Number	Hz	Flow L/s	Discharge Pressure (mAHD)	Wet well Level (mAHD)	Motor Amps	Voltage
1	**33**	**0**				

1	33	40				
1	33	60				
1	33	100				
1	33	120				
2	33	0				
2	33	40				
2	33	60				
2	33	100				
2	33	120				

4.8.3 25 Hz OPERATION

Pump Number	Hz	Flow L/s	Discharge Pressure (mAHD)	Wet well Level (mAHD)	Motor Amps	Voltage
1	25	0				
1	25	40				
1	25	60				
1	25	100				
2	25	0				
2	25	40				
2	25	60				
2	25	100				

5 FUNCTIONALITY TESTING OF VFD

The following test should be carried out once the "SSM085 Standard Fixed Speed SP - FAT v1-10.doc" has been completed. NOTE: the VFD drive has 2 setups – local and remote – both of which are configurable. To ensure full functionality, the test below are often repeated for both local and remote mode.

Task	VFD 1	VFD 2
Local/Remote Mode Setup: When the station local-remote selector switch is selected to Remote: setup 1 is active on both Drives Local: setup 2 is active on both Drives	☐ ☐	☐ ☐
Drive in Auto Mode: In both local and remote modes repeat the following: Ensure that the Auto mode is active Press the "Hand Start" button on the keypad Ensure that the Auto mode feedback deactivates Press the "Auto Start" button on the keypad Ensure that the Auto mode is active	☐ ☐ ☐	☐ ☐ ☐
Run Command, Speed Control and Speed Feedback, Run at Maximum		
In Remote: – Setup 1 - DO FOR BOTH PUMPS SEPERATLY Command the pump to run via the digital output from the PLC. Ensure that the VFD runs and the running signal is received from by the RTU. Ensure that the VFD speed is controlled by the RTU Analog output. Ensure that the speed of the pump from the VFD to the RYU is accurate. Ensure that the Maximum Speed is 50Hz (or whatever the current design max is). Initiate Surcharge Pumping mode. Ensure that all required pumps are commanded to run at maximum speed and that the run at max is active. Stop Surcharge Pumping mode but activate duty A and then Duty B start commands Ensure that the duty A and then the duty B pumps are commanded to run at the PID speed control and that the speed feedback is accurate. Set the Drive to run in remote at minimum speed, then force the run at max output. Ensure that the drive runs at maximum speed.	☐ ☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐ ☐
In Local: Setup 2 - DO FOR BOTH PUMPS SEPERATLY Command the pump to run via the start pushbutton (output from the PLC) Ensure that the VFD runs and the running signal is received from by the	☐	☐

RTU.	☐	☐
Ensure that the VFD speed is controlled by the POT.	☐	☐
Ensure that the Maximum Speed is 50Hz (or whatever the current design max is)	☐	☐
Ensure that the speed of the pump from the VFD to the RTU is accurate.	☐	☐
If the site is interlocked: Try to start 2nd pump		
Ensure that it gets commanded to run and does so	☐	☐
If the site is interlocked: Try to start 2nd pump		
Ensure that it does NOT get commanded to run and does not run	☐	☐
Set the Drive to run in local at minimum speed, then force the run at max output.		
Ensure that the drive DOES NOT runs at maximum speed.		
VFD Ready / Thermistor Fault / Reset: (Repeat the following for local & remote modes)		
Trigger the thermistor fault.	☐	☐
Ensure that the VFD ready signal deactivates (fault).		
Re-enable the thermistor and ensure that the VFD is still not ready.		
Activate the reset output from the PLC.	☐	☐
Ensure that the VFD resets.		

Testing Officer : Name ....

Signature :.. Date...........................

10. Surge Tank

Cardno Bowler
Shaping the Future

Cardno Bowler Pty Ltd
ABN: 74 128 806 735

Address:
1 Fox Road,
Acacia Ridge QLD 4110

Telephone: 3320 8500
Facsimile: 3320 8599
Email: cardnobowlerlab@cardno.com.au
Website: www.cardno.com.au

DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Hallco Engineering Pty Ltd	Report Number:	1986/R/3956-1
Client Address:	PO Box 12, MOFFAT BEACH	Project Number:	1986/P/223
Project:	6 Mile Creek, McEwan Rd, Dinmore	Lot Number:	
Location:	McEwan Rd Dinmore	Report Date:	31/01/2013
Component:	Surge Tank - Fill	Client Reference/s:	
Area Description:		Page Number:	Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	1986/S/8310			
ID / Client ID	-			
Lot Number	-			
Date / Time Tested	24/01/2013			
Material Source	Unknown			
Material Type	Base			
Sampling Method	AS1289.1.2.1 Cl 6.4b			
Test / Layer Depth (mm)	150 / -			
Standard or Modified	Standard			
LOCATION	Fill under surge tank FL o/s Centre of pad			
Test Fraction (mm)	< 19.0 mm			
Sample Oversize Wet (%)	0			
Sample Oversize Dry (%)	0			
MDR Sample Number	1986/S/8310			
MDR Sample Date / Update	24/01/2013			
Assigned MDR (Yes / No)	No			
Moisture Test Results:				
Field Moisture Content (%)	4.6			
Optimum Moisture Content (%)	8.0			
Variation from OMC (%)	3.5% Dryer than OMC			
Moisture Ratio (%)	**57.5**			
Density Test Results:				
Field Dry Density (t/m³)	2.18			
Maximum Dry Density (t/m³)	2.16			
Dry Density Ratio Required (%)	98			
Dry Density Ratio (%)	**101.0**			

Remarks

NATA

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards

Accredited for compliance with ISO/IEC 17025

Laboratory Accreditation Number: 1986

Approved Signatory: Andrew Lenkeit

Form ID: W27ASRep Rev 1

Cardno BOWLER
Shaping the Future

Our Ref 10408ms1.13
Contact SUNNY SINGH

Cardno Bowler Pty Ltd
ABN 74 128 806 735

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1 Fox Road
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Phone: 61 7 3320 8500
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29 January 2013

Dave Cox
Hallco Engineering

E: hallcoeng@bigpond.com

Dear Dave

REPORT ON PILING INSPECTIONS
SIX MILE CREEK PUMP STATION
REDBANK

This is to confirm that Cardno Bowler carried out inspections of bored piles at the Six Mile Creek pump station. Inspections were carried out on the 23rd and 24th of January 2013.

The minimum specified requirements for the foundations were as follows:-

All piles inspected required a minimum embedment depth of 4500mm and an allowable bearing capacity of 400kPa.

We confirm that the piles at Six Mile Creek pump station meet the minimum requirements as per the specifications above.

I trust this meets with your requirements.

For further information or queries in regards to this letter, please contact Sunny Singh on 3320 8500 or 0423 564 829.

Yours faithfully

SUNNY SINGH
GEOTECHNICAL ENGINEER
For **Cardno Bowler**

David Stirling RPEQ
SENIOR GEOTECHNICAL ENGINEER

Queensland • Hillcrest • Cairns • Townsville • Mackay • Moranbah • Rockhampton • Gladstone • Sunshine Coast • Geebung • Ipswich • Gold Coast **New South Wales** • Sydney • Newcastle • Coffs Harbour **Victoria** • Bendigo • Dandenong • Tullamarine • Geelong

Site Inspection of Pile works at Six Mile Creek Pump Station Project 13th November 2012.

Inspected the rebar cages to be used for the pile works and found them to be robustly built using the specified rebar. The cage sizes were as design drawings stipulated.

The bored holes were free of loose material and to design width and depth in clay ground.

Cages were located in the bore holes using clip on PVC spacers to keep a central position to ensure adequate concrete cover.

Brendan Hatherly

13 February 2013

Senior Contracts Manager

Major Projects & Commercial Services – CPWP

1 Lower Cross Street

Goodna, QLD, 4300

T 07 34362847 | M 0478300893

E Brendan.hatherly@urbanutilities.com.au

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19 Nott Street, South Brisbane Qld 4101
P.O. Box 3250, South Brisbane Qld 4101
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Hanson
HEIDELBERGCEMENT Group

CLIENT HALLCO ENGINEERING PTY LTD
PO BOX 12
MOFFAT BEACH, QLD 4551

Report No. 74003890
Sample Date : 23-01-13
Page 1 of 1
FINAL REPORT

PROJECT NEXT TO SIX MILE CREEK {BRISBANE RD
BRISBANE RD
Cross Street: TILE ST
REDBANK, QLD 4301

This report replaces all previous issues of Report Number : 74003890

CONCRETE CYLINDER COMPRESSIVE STRENGTH REPORT (1)
AS1012.9

Batch Details						Specimen Details										
Plant Truck	F'c MAS Slump	Delivery Docket	Batch Time Sample Time	Actual Slump 2nd Slump (2)	Sample Method Comp (3,4,5,6)	Sample No.	Date Tested	Dimensions Avg Dia. (mm) (8)	Hght (mm)	Mass per Unit Vol (Kg/m3) (7,8)	Cap (9)	Initial Curing (hrs)	Std Curing (days) (10)	Age Days or Hrs	Strength (MPa)	Mark
3095 PLC4500	S40MPa 20.0 mm 100 mm	57148235 T4473914	14:07 14:30	100 -	7.2.1 E	02077A	30/01/13	99.4	197	2420	G	22	6	7D	34.0	N
						02077B	20/02/13	100.2	198	2380	G	22	27	28D	48.5	N
						02077C	20/02/13	100.2	198	2380	G	22	27	28D	48.5	N

Casting Authority :
Sample Remarks : AS1012.1,3.1,8.1 conducted by Allied Concrete Testing NATA Accredited Facility # 18303, Report No as per Sample No

Product Description : PMP M700SH 40/20/100
Location : PIERS

REPORT REMARKS **Failure Mode** N = Normal **Condition Prior**

* NON STD INITIAL CURING
* REASON

Note 1 All tests carried out to relevant parts of AS1012 unless noted otherwise.
Note 2 Slump tests to AS1012.3.1.
Note 3 The clause shown indicates the sample method from AS1012.1.
Note 4 Compaction method to AS1012.8.1 Clause 7.
Note 5 Not Used
Note 6 Compaction code H = Hand Rodding, I = Int. Vibration, E = Ext, Vibration, R = Ramming.
Note 7 Density of hardened concrete reported to AS1012.12.1.
Note 8 Specimens uncapped and saturated surface dry.
Note 9 Cap Type R = Rubber, S = Sulphur, D = Double Rubber, U = Double Sulphur, G = End Ground, N = No Capping.
Note 10 Curing to AS1012.8.1 Clause 9.1(b) Tropical Zone

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/National Standards.

NATA Accredited Laboratory Number : 415

TECHNICAL SERVICES, BRISBANE
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Hanson
HEIDELBERGCEMENT Group

CLIENT HALLCO ENGINEERING PTY LTD
PO BOX 12
MOFFAT BEACH, QLD 4551

Report No. 74004223
Sample Date : 13-02-13
Page 1 of 1
INTERIM REPORT

PROJECT NEXT TO SIX MILE CREEK {BRISBANE RD
BRISBANE RD
Cross Street: TILE ST
REDBANK, QLD 4301

This report replaces all previous issues of Report Number : 74004223

CONCRETE CYLINDER COMPRESSIVE STRENGTH REPORT (1)
AS1012.9

Batch Details						Specimen Details										
Plant Truck	F'c MAS Slump	Delivery Docket	Batch Time Sample Time	Actual Slump 2nd Slump (2)	Sample Method Comp (3,4,5,6)	Sample No.	Date Tested	Dimensions Avg Dia. (mm) (8)	Hght (mm)	Mass per Unit Vol (Kg/m3) (7,8)	Cap (9)	Initial Curing (hrs)	Std Curing (days) (10)	Age Days or Hrs	Strength (MPa)	Mark
3097 PLC4555	S40MPa 20.0 mm 100 mm	57252370 T4505738	09:34 09:55	110 -	7.2.1 E	44591601A	20/02/13	100.3	196	2340	G	26	6	7D	33.5	N

Casting Authority :
Sample Remarks :

Product Description : PMP M700SH 40/20/100
Location : GROUND SLAB

REPORT REMARKS **Failure Mode** N = Normal **Condition Prior**

*** NON STD INITIAL CURING**
*** REASON**

Note 1 All tests carried out to relevant parts of AS1012 unless noted otherwise.
Note 2 Slump tests to AS1012.3.1.
Note 3 The clause shown indicates the sample method from AS1012.1.
Note 4 Compaction method to AS1012.8.1 Clause 7.
Note 5 Not Used
Note 6 Compaction code H = Hand Rodding, I = Int. Vibration, E = Ext, Vibration, R = Ramming.
Note 7 Density of hardened concrete reported to AS1012.12.1.
Note 8 Specimens uncapped and saturated surface dry.
Note 9 Cap Type R = Rubber, S = Sulphur, D = Double Rubber, U = Double Sulphur, G = End Ground, N = No Capping.
Note 10 Curing to AS1012.8.1 Clause 9.1(b) Tropical Zone
Note 11 Air Content (if reported) to AS1012.4.2.

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/National Standards.

NATA Accredited Laboratory Number : 415

Approved Signatory Richard Cusack
Form Number CER002.0
Run Date 21/2/13 11:20 AM
Version 3.0 : 05/06

MDR

Manufacturer's Data Report

Project:	Cardno / Redbank
Desc:	EUV Bladder Surge Vessel
Customer:	J & P Richardson
Vol:	23000L
Design Pressure:	16 BAR
Test Pressure:	24 BAR
Serial Number(s):	**23000KU7**

Vol 1 of 1

CHARLATTE RESERVOIRS
FAYAT GROUP

AQ 0094-06 FR/GB

SUMARY

HYDROPNEUMATIC VESSEL N° : **23000KU7**

DRAWING N° : **KU007M00000**

CUSTOMER : **OLAER AUSTRALIA Pty Ltd**

MDR AS 4458	
Test certificat	AQ 0226
Declaration of conformity	AQ 0337
Inspection certificate Bureau Véritas	
WELDING FILE	
Procédures specifications	
Procédures qualifications records	
Welders Qualification Certificates	
MATERIALS FILE	
Metal Characteristics	AQ 0078
Shell Metal Certificate	
Dished Ends Metal Certificate	
INSPECTION FILE	
Accreditated Certificate ol non destructive test inspection	AQ 0245
Name Plaque (OLAER AUSTRALIA)	
Report of Thickness control	AQ 0058
Report of Visual control	AQ 0059
Inspection Report of Dimensions	AQ 0064
Inspection Report of Paint Thickness	AQ 0066
Roughness measurement test report	AQ 0069
Dye penetrant examination test report	AQ 0376
Inspection on radiographie inspection	AQ 0108
NOTE AND DRAWING	
Commissioning and maintenance instructions	SPT 0163
Instructions for changing the bladder	SPT 0212
Drawing	

NSW GOVERNMENT | WorkCover

CERTIFICATE OF PLANT DESIGN REGISTRATION

Work Health & Safety Act 2011
Work Health & Safety Regulation 2011

ABN: 77 682 742 966
Phone: (02) 4321 5498
Fax: (02) 4325 5094

Registration No: PV 6-163450/12 **ABN:** 89000983915 **Issue Date:** 27/11/2012

Registration Holder OLAER AUSTRALIA PTY LTD
Postal Address: 13 BOOLA PLACE
CROMER
NSW 2099

Plant Type: Pressure Vessel Original

Model Number/ Trade Name: SEWAGE WATER SURGE VESSEL 23000L

Technical Standard : AS1210-2010 PRESSURE VESSELS

Engineering Principles: No

Design Description:

Quality System	No
Hazard Level	B
Contents	Non Harmful
Chamber 1 Volume (l)	23000
Chamber 1 Design Pressure (kPa)	0 TO 1600
Chamber 1 Temperature (°C)	0 TO 60
Chamber 1 Fluid Type	Gas
Drawing Number & Revisions	KU007M00000 REV 04
Steam Vessel	Other
Other Type	BLADDER SURGE VESSEL
Number of Chambers	1

Note: The design of an item of plant registered under the Occupational Health and Safety Regulation immediately before the repeal of that regulation is deemed to have been registered under part 5.3 of the WHS Regulation.

Fee Paid: $ 65.00 **Receipt Date:** 2/11/2012 **Receipt No:** 30-8371

WC00951 1012

HRL Technology Pty Ltd
ABN 95 062 076 199
677 Springvale Road
Mulgrave Victoria
Australia 3170
Ph: +61 3 9565 9888
Fax: +61 3 9565 9777

PRESSURE VESSEL DESIGN VERIFICATION CERTIFICATE

HRL Technology Report No 48121304
For: Olaer Australia
Designed by: Sven Geboers
Pressure Vessel Description: 23,000 L 1.6 MPa vertical bladder surge vessel
Design Pressure: 1.6 MPa, Design Temperature: 0°C to 60°C,
Hazard Level: B, Contents: Water, Nitrogen
Hydrostatic Test Pressure: 2.4 MPa, Class: AS 1210-2A

I have verified the design described by the following documents:

Drawings
Drawing No. KU007M00000 Rev.4, 'SEWAGE WATER SURGE VESSEL 23000 LITRES', dated 25/10/2012

Pressure Vessel Calculations
Calculation Ref. OAU327 Rev.2, 'AS1210-2010 Pressure Vessel Calculation Sheet', dated 24/10/2012

Exclusions or other relevant documents (if applicable)
N/A

Mechanical Testing Requirements
N/A

Design and Verification Standard:
AS 1210-2010 Pressure Vessels

I certify that the above plant design has been assessed to the requirements of the above code and based on the information provided is deemed to comply with the requirements of that code.

NATA Signatory: James Taylor

Signature: James Taylor

Date: 29/10/12

NATA
WORLD RECOGNISED
ACCREDITATION

This document is issued in accordance with ISO/IEC 17020 and the accreditation requirements of **NATA**. This document may not be reproduced except in full.

Accreditation # **561**
Site # **16028**

QA 397 C	Date: 28/11/11	Page 1 of 1

AQ 0226-05-FR-GB

PROCÈS VERBAL D'ÉPREUVE d'appareils à pression de gaz
TEST CERTIFICATE for gaz pressurised vessels

Suivant AS1210-1
AS1210-1 according

Demandeur redevable et lieu de l'épreuve :
Test requested by and chargeable to :

17 rue Paul Bert 89400 MIGENNES
Tél : 03.86.92.30.00 Fax : 03.86.92.30.01

CHARLATTE RESERVOIRS FAYAT GROUP

CARACTÉRISTIQUES DE L'ÉPREUVE
TEST CHARACTERISTICS

Date du test : *Date of test :*	**11-déc-12**	Année de fabrication : *Year of manufacture :*	**2012**
Pression de calcul, service **PS** : *Working pressure :*	**16** bar	Pression de test **PT** : *Test pressure :*	**24** bar
Volume V : *Volume :*	**23000** litres	Fluide de température d'essai : *Fluid and temperatur of test :*	**EAU 20°C** ***Water 20° C***

Désignation des appareils : *Description of vessels :* — **ACCUMULATEUR HYDROPNEUMATIQUE** ***HYDROPNEUMATIC ACCUMULATOR***

Matériau : *Material :* — **SA516 GR60**

Constructeur : *Manufacturer :* — CHARLATTE RESERVOIRS FAYAT GROUP

Nombre d'appareil : *Number of vessels :* — **1**

Numéro (s) d'appareil (s) : *Serial number :* — **23000KU7**

Gaz : *Gas :* — **AZOTE OU AIR** ***NITROGEN OR AIR***

Observations :
Remarks :

CERTIFICAT DE VISITE DE L'APPAREIL AVANT ÉPREUVE
CERTIFICATE OF VESSEL VISIT BEFORE HYDRAULIC TEST

Le contrôleur certifie avoir visité intérieurement et extérieurement dans toutes ses parties, tant en cours de construction qu'après son achèvement, l'appareil ci-dessus visé. Il a constaté que cet appareil est construit dans ses différents éléments, et dans l'assemblage de ces éléments entre eux, sans défaut ni malfaçon. Cet appareil peut en conséquence être soumis à l'épreuve hydrostatique finale.

I the undersigned, quality control inspector, certify having carried out a thorough internal and external inspection, both during and after manufacture, of the above mentionned pressure vessel. I certify that this vessel is constructed in its different components, and in the assembly of these components, without fault or defect. This vessel can there fore undergo the reglementary hydraulic test.

Fait le : *At :* **11-déc-12** — par : *by :* Mr ~~RAPPENEAU~~, Mr CARON / Mr ~~LAFORGE~~, Mr ~~PIACENTINI~~ — contrôleur

Le responsable CE :

Le contrôleur :

CONTRÔLE QUALITÉ CHARLATTE

CHARLATTE
RESERVOIRS
FAYAT GROUP
17 Rue PAUL BERT 89400 MIGENNES
Tel : 03.86.92.30.00 Fax : 03.86.92.30.01
Email : reservoir@charlattereservoirs.fayat.com
Site : http:// www.charlatte.fr

DECLARATION DE CONFORMITE
établi par l'industriel fournisseur
DECLARATION OF CONFORMITY
written by the supplier
DECLARACION DE CONFORMIDAD
Establecido por el proveedor
WERKSBESCHEINIGUNG
Eingefürt von industriell lieferant

Page 1/1

LLOYD'S REGISTER QUALITY ASSURANCE ISO9001

Raison sociale du client /*Customer*
Cliente/Kunde **OLAER AUSTRALIA PTY LTD**

Adresse/*Adress* :
Dirección/Adresse: **13 BOOLA PLACE**
NSW 2099 - AUSTRALIE

Numéro de la commande/*Order number*
Número del pedido/Auftragsnummer: **12492**

Affaire/*Job* :
Asunto/Geschäft : **PROJECT CARDNO**

Désignation/*Designation* : **ACCUMULATEUR HYDROPNEUMATIQUE/*HYDROPNEUMATIC ACCUMULATOR***
Descripción/Bezeichnung: ***ACUMULADOR HIDRONEUMATICO/DRUCKWASSERSPEICHER***

N° plan/*Drawing number* :
N° de plano/Plansnummer : **KU007M00000** / **Catégorie IV**

Quantité/*Quantity* :
Cantidad/Ansahl : **1**

N° de série/*Serial number* :
N° de serie/Seriennummer : **23000KU7**

Autres renseignements/*Other information/Otra información/Weitere auskunft:*
Normes harmonisées : EN 287-1 ; EN 1092-1; EN 10028-2 ; EN 15614-1

AR n°: 8900

- Nous certifions que la fourniture citée, est conforme aux exigences de l' AS1210 en vigueur, ainsi qu'à la commande ou sous-commande du client.

- *We hereby certify that the above mentioned equipment has been manufactured according of AS1210 as per the specifications required by the he customer.*

- Certificamos que la expedición citada ha sido fabricada con les especificaciones AS 1210, así como al pedido o sub-pedido del cliente.

- Wir beglaubigen das erwähnte Material, gemäß AS 1210 und des Auftrags oder Teilauftrages des Auftrags oder Teilauftrages des Kunden.

CHARLATTE S.A. RESERVOIRS
SERVICE CONTRÔLE

Nom/Name/Nombre/Name: LAFORGE Alain
Date/Date/Fecha/Datum : : 11-déc-12
Signature/Signature/Firma/Unterschrift : :

CONTROLE QUALITE CHARLATTE

Date et visa du responsable nommé par la direction :
Of supervisor, appointed by the management :
Fecha y visto bueno del Responsable nombrado por la dirección :
Datum und Stempel des vor der Verwaltung ernannten Verantwortlichen :
11-déc-12 RAPPENEAU Etienne

AQ 0337-02 FR/GB/ES/DE

AS 4458—1997

AUSTRALIAN STANDARD 4458
MANUFACTURER'S DATA REPORT— PRESSURE VESSEL

S/N: 23000KU7
Reg. No:

Items 1 to 9 inclusive to be completed for all vessels

1 TITLE OF VESSEL/COMPONENT: Surge Vessel - Bladder Accumulator
2 MANUFACTURED BY: Charlatte Reservoirs
3 MANUFACTURED FOR: OLAER Australia Pty Ltd
4 LOCATION OF INSTALLATION: Redbank Queensland Australia

5 DESIGN REGISTRATION: STATE NSW NO DATE
6 MANUFACTURER'S S/N 23000KU7 INTERNAL VOLUME 23 m³
7 LOCATION OF REGISTRATION No With Documentation & Metal Label
8 TYPE Surge Bladder Vessel CODE & CLASS AS1210-2A HAZARD LEVEL B
9 DRAWING Nos ku007m000000-04

Items 10 to 16 inclusive to be completed for single wall vessels, jackets of jacketed vessels, or shells of heat exchangers.

10 DESIGN PRESS 1.6 MPa DESIGN TEMP 60 °C max 0 °C min
11 PRESSURIZING FLUID (Steam, air, gas, etc) Water & Gas (either Nitrogen or Compressed Air)
12 SHELL: Diameter 2500 mm Length 4160 mm Nom. Thickess 25 mm
Corrosion Allowance 2.00 mm Material (Spec.&Grade) SA516 Gr.60
Longitudinal Joint Double, butt Heat Treat. nr NDT Spot Joint Eff. 0.85 (long)
(double, single, double, butt, etc.) (temp C, time h, Part) (RT, UT, Full, Spot)
Circumferential Joint Single Welded Joggled Butt Joint

13 ENDS:

	Location (top, bottom)	Shape (ellip, tor, spher, coni, flat)	Side to Pressure (concave, convex)	Dia (mm)	Thickness min. (mm)
(a)	Top	Ellipsoidal 1.9:1	Concave	2500	19.25
(b)	Bottom	Ellipsoidal 1.9:1	Concave	2500	19.25

	Corossion Allow. (mm)	Crown Radius (mm)	Knuckle Radius (mm)	Done Apex Angle (deg)	Material (Spec.&Grade)	Joint Eff.	Method of attachement
(a)	2	na	na	na	As shell	1	Double, butt
(b)	2	na	na	na	As shell	1	Double, butt

If removable: Bolting Size and Number Not removable Material (Spec.&Grade) na
14 QUICK ACTUATING DOOR: Type (Bayonet etc.) na Interlock fitted (Yes, No)
15 JACKET: Type na Closure (Ogee, bar, etc & Dimensions)
16 STAYS: Size (Diam, thickness)
Material (Spec.&Grade) Attachement

Items 17 to 23 inclusive must be completed for all vessels where applicable

17 BRANCHES:

No.	Size(mm)	Material (Spec.&Grade)	No.	Size(mm)	Material (Spec.&Grade)
1	457	SA106Gr.B (located on the bottom)	2	114.3	SA106Gr.B (located on the bottom)

Flange Spec. DN450PN16 AS4331 Flange Rating 16BAR
18 INSPECTION OPENINGS Manhole: No 1 Size (mm) 600 Location Top
Handhole:
Sighthole:
19 SUPPORTS: Type Legs No. 4 Location Bottom 90° Apart
20 SAFETY DEVICES: Safety Valves: No. Size Type Location
Other Devices: Size Type Location
21 WELDER QUALIFICATION &/OR CERTIFICATION See attached files
22 TESTS: Production Test Plates (Yes,No) YES Test Pressure 2.4 MPa
Press. Test Medium (Hydro, Pneum, Combin.) Hydro Test Position (Vert, Horiz) Vertical
Max. Permanent Stretch (%) na Location of max stretch na
23 CERTIFICATE OF MANUFACTURER: I certify the data in this report are correct and that all details of material, manufacture and workmanship satisfy the requirements of AS1210

Manufacturer CHARLATTE Réservoirs Signed E. RAPPENEAU Date 11/12/2012

REMARKS This vessel type has fluid contained inside the butyl bladder.

Industry & Facilities Division

BUREAU VERITAS

INSPECTION CERTIFICATE

LCS 412025 C41 JP

PROJECT: Redbank Queensland - Australia	***Ref:* AR 8900 – OLAER AUSTRALIA Pty Ltd CROMER**
BV Client: CHARLATTE RESERVOIRS-MIGENNES	***P/o nr: 4500028600 dated 14/11/2012*** *(client to BV)*
Manufacturer: CHARLATTE RESERVOIRS-MIGENNES	***P/o nr:* 012492 *dated 05 September 2012*** *(client to CHARLATTE RÉSERVOIRS)*
Inspection requested by: CHARLATTE RESERVOIRS-MIGENNES	

SUPPLY / SUBJECT OF INSPECTION

- 1 ANTI WATER HAMMER HYDROCHOC Serial n° 23000 KU 7 - Drawing N° KU 007 M00000 rev 4 - PS: 16 bar - PT: 24 bar - Design Temperature : 0°C/60°C

Scope of inspection:

The following inspections were performed on 11th December 2012.

- Visual and dimensional examination
- Manufacturer's file
- Measurement equipment calibration
- Measurement of thickness of tank
- Hydrostatic test at 24 bar
- Marking on vessel

Conclusion –

No deviation found. Vessel met the requirements of AS 1210-2010-2A. It is identified with a nameplate: manufacturer, 2012, volume, PS, PT, TS, serial number.

The undersigned, inspector to Bureau Veritas, certifies that the here above mentioned supply was inspected in conformity with the applicable requirements of the purchase order and the contractual requirements governing the mission entrusted to Bureau Veritas without any remarks.

Inspected by:...

Name: JM PLANET Signature:...

Date of issue:...13th of December 2012

Inspection centre: BV LE CREUSOT

Checked by:...

Name:... Signature:...

BUREAU VERITAS INDUSTRIE LE CREUSOT BV STAMP

P.O

Distribution: ☐ CLIENT ☒ MANUFACTURER ☐ ☐

Company Name	Olaer Australia
Engineer:	Sven Geboers
Application Date	24-Oct-12
Olaer Reference	OAU327rev2.xlsx
Manufacturer:	Charlatte Reservoirs
Desc	23000m^3 Vertical 16 bar EUV Surge Vessel
Drawing Number(s)	KU007M00000-04
OLAER Calculation Ref	OAU327rev2.xlsx

Location

8/30/12 redbank queensland - Google Maps

Address Redbank QLD

maps.google.com.au/maps?hl=en&q=redbank+queensland&ie=UTF8&hq=&hnear=Redbank+Queens... 1/1

Checks:

Shell thickness:	ok
End Thickness:	ok
Manhole Thickness:	ok
Inner manhole Thickness:	ok
Branch thickness:	ok
Flange Allowable Operating Pressure >= Vessel Design pressure	ok
Flange Test Pressure >= Vessel Test pressure	ok
Inspection Opening for general purpose vessels	ok
MANHOLE Reinforcement	ok
OUTLET Reinforcement	ok
Lifting Lugs	ok
Bolts and Legs	ok
Local Loads Leg Supports	ok

Design Loadings Considered Section 3.2.3 AS1210-2012

a	Internal and External Design Pressures	yes
b	Maximum Static Head of contained fluid under normal operating conditions and under any specified abnormal fluid levels above normal operating conditions, including the effect of fluids with a specific gravity greater than 1	yes
c	The force due to standard gravity acting on the mass of the vessel and normal contents under operating and test conditions, including conditions of reduced or zero pressure, if applicable	yes
d	Superimposed loads, such as other vessels, attached piping weight and operating loads, lining, insulation, operating equipment, platforms, snow, water, ice and the like	no
e	Wind Loads - See appendix J for wind loads	yes
f	Earthquake Loads - See appendix J and AS/NZS1200 for selection of earthquake loads	yes
g	For transportable vessels, the inertia forces and loads from the chassis or support frames due to motion during transport	n/a
h	Local stresses at:	
	Lugs	no
	saddles	no
	girders	n/a
	supports	no
	nozzles	no
	due to the reaction of vessel supports and loads from internal and external structures and connecting piping, considering all creditable imposed loading acting concurrently	no
i	Forces caused by the method of support during lifting, transit and erection	yes
j	Shock loads due to changes in fluid flow, surging of contents, sloshing of fluids, or reaction forces (e.g. Relief valve discharge)	no
k	Moments due to eccentricity of the centre of pressure relative to the neutral axis of the section	n/a
l	Forces due to temperature conditions, including the effects of differential expansion of parts or attached piping	no
m	Other external or environmental conditions (e.g. Floodings, wave action, impact, collision or earth loads	no
n	Forces due to fluctuating pressure or temperature	yes

Design Strength

1. Shell

	40 °C		65 °C		100 °C	
Steel type:	tensile	yield	tensile	yield	tensile	yield
SA-516M Gr.60	414	221	414	208	414	201

R_m =	414	MPa	tensile strength	40	°C	Rm/3.5=	118.3
R_e =	221	MPa	yield strength	40	°C	Re/1.5=	147.3
R_m =	414	MPa	tensile strength	65	°C	Rm/3.5=	118.3
R_e =	208	MPa	yield strength	65	°C	Re/1.5=	138.7
R_m =	414	MPa	tensile strength	100	°C	Rm/3.5=	118.3
R_e =	201	MPa	yield strength	100	°C	Re/1.5=	134.0

414

Design Temperature: 60 | 414 | Rm/3.5= | 118.3 | 210.6
211 | Re/1.5= | 140.4

414

f =	118.3	MPa	design strength used

209

2. Ends

	40 °C		65 °C		100 °C	
Steel type:	tensile	yield	tensile	yield	tensile	yield
SA-516M Gr.60	414	221	414	208	414	201

R_m =	414	MPa	tensile strength	40	°C	Rm/3.5=	118.3
R_e =	221	MPa	yield strength	40	°C	Re/1.5=	147.3
R_m =	414	MPa	tensile strength	65	°C	Rm/3.5=	118.3
R_e =	208	MPa	yield strength	65	°C	Re/1.5=	138.7
R_m =	414	MPa	tensile strength	100	°C	Rm/3.5=	118.3
R_e =	201	MPa	yield strength	100	°C	Re/1.5=	134.0

414

Design Temperature: 60 | 414 | Rm/3.5= | 118.3 | 210.6
211 | Re/1.5= | 140.4

414

f =	118.3	MPa	design strength used

209

3. Manhole cover

Steel type:	40 °C tensile	40 °C yield	65 °C tensile	65 °C yield	100 °C tensile	100 °C yield
SA-516M Gr.60	414	221	414	208	414	201

R_m =	414	MPa	tensile strength	40	°C	Rm/3.5=	118.3
R_e =	221	MPa	yield strength	40	°C	Re/1.5=	147.3
R_m =	414	MPa	tensile strength	65	°C	Rm/3.5=	118.3
R_e =	208	MPa	yield strength	65	°C	Re/1.5=	138.7
R_m =	414	MPa	tensile strength	100	°C	Rm/3.5=	118.3
R_e =	201	MPa	yield strength	100	°C	Re/1.5=	134.0

414

Design Temperature: 60 | 414 | Rm/3.5= | 118.3 | 210.6

211 | Re/1.5= | 140.4

414

f =	118.3	MPa	design strength used

209

4. Outlet Branche

Steel type:	40 °C tensile	40 °C yield	65 °C tensile	65 °C yield	100 °C tensile	100 °C yield
SA-106 Gr. B	414	241	414	227	414	220

R_m =	414	MPa	tensile strength	40	°C	Rm/3.5=	118.3
R_e =	241	MPa	yield strength	40	°C	Re/1.5=	160.7
R_m =	414	MPa	tensile strength	65	°C	Rm/3.5=	118.3
R_e =	227	MPa	yield strength	65	°C	Re/1.5=	151.3
R_m =	414	MPa	tensile strength	100	°C	Rm/3.5=	118.3
R_e =	220	MPa	yield strength	100	°C	Re/1.5=	146.7

414

Design Temperature: 60 | 414 | Rm/3.5= | 118.3 | 229.8

230 | Re/1.5= | 153.2

414

f =	118.3	MPa	design strength used

228

5. Outlet Nozzle

	40 ^oC		65 ^oC		100 ^oC	
Steel type:	tensile	yield	tensile	yield	tensile	yield
SA-106 Gr. B	414	241	414	227	414	220

R_m =	414	MPa	tensile strength	40	^oC	Rm/3.5=	118.3	
R_e =	241	MPa	yield strength	40	^oC	Re/1.5=	160.7	
R_m =	414	MPa	tensile strength	65	^oC	Rm/3.5=	118.3	
R_e =	227	MPa	yield strength	65	^oC	Re/1.5=	151.3	
R_m =	414	MPa	tensile strength	100	^oC	Rm/3.5=	118.3	
R_e =	220	MPa	yield strength	100	^oC	Re/1.5=	146.7	
								414
Design Temperature:	60		414	Rm/3.5=	118.3			229.8
			230	Re/1.5=	153.2			
								414
	f =		118.3	MPa	design strength used			228

6. Manhole Reinforcement

	40 ^oC		65 ^oC		100 ^oC	
Steel type:	tensile	yield	tensile	yield	tensile	yield
SA-516M Gr.60	414	221	414	208	414	201

R_m =	414	MPa	tensile strength	40	^oC	Rm/3.5=	118.3	
R_e =	221	MPa	yield strength	40	^oC	Re/1.5=	147.3	
R_m =	414	MPa	tensile strength	65	^oC	Rm/3.5=	118.3	
R_e =	208	MPa	yield strength	65	^oC	Re/1.5=	138.7	
R_m =	414	MPa	tensile strength	100	^oC	Rm/3.5=	118.3	
R_e =	201	MPa	yield strength	100	^oC	Re/1.5=	134.0	
								414
Design Temperature:	60		414	Rm/3.5=	118.3			210.6
			211	Re/1.5=	140.4			
								414
	f =		118.3	MPa	design strength used			209

7. Outlet Reinforcement

Steel type:	40 °C tensile	40 °C yield	65 °C tensile	65 °C yield	100 °C tensile	100 °C yield
SA-516M Gr.60	414	221	414	208	414	201

R_m =	414	MPa	tensile strength	40	°C	Rm/3.5=	118.3
R_e =	221	MPa	yield strength	40	°C	Re/1.5=	147.3
R_m =	414	MPa	tensile strength	65	°C	Rm/3.5=	118.3
R_e =	208	MPa	yield strength	65	°C	Re/1.5=	138.7
R_m =	414	MPa	tensile strength	100	°C	Rm/3.5=	118.3
R_e =	201	MPa	yield strength	100	°C	Re/1.5=	134.0

414

Design Temperature:	60	414	Rm/3.5=	118.3	210.6
		211	Re/1.5=	140.4	

414

f =	118.3	MPa	design strength used

209

8. Nozzle Reinforcement

Steel type:	40 °C tensile	40 °C yield	65 °C tensile	65 °C yield	100 °C tensile	100 °C yield
N/A	0	0	0	0	0	0

R_m =	0	MPa	tensile strength	40	°C	Rm/3.5=	0.0
R_e =	0	MPa	yield strength	40	°C	Re/1.5=	0.0
R_m =	0	MPa	tensile strength	65	°C	Rm/3.5=	0.0
R_e =	0	MPa	yield strength	65	°C	Re/1.5=	0.0
R_m =	0	MPa	tensile strength	100	°C	Rm/3.5=	0.0
R_e =	0	MPa	yield strength	100	°C	Re/1.5=	0.0

0

Design Temperature:	60	0	Rm/3.5=	0.0	0
		0	Re/1.5=	0.0	

0

f =	0.0	MPa	design strength used

0

9. Lifting Lugs

	40 °C		65 °C		100 °C	
Steel type:	tensile	yield	tensile	yield	tensile	yield
SA-516M Gr.60	414	221	414	208	414	201

9. Lifting Lugs		SA-516M Gr.60						
R_m =	414	MPa	tensile strength	40	°C	Rm/3.5=	118.3	
R_e =	221	MPa	yield strength	40	°C	Re/1.5=	147.3	
R_m =	414	MPa	tensile strength	65	°C	Rm/3.5=	118.3	
R_e =	208	MPa	yield strength	65	°C	Re/1.5=	138.7	
R_m =	414	MPa	tensile strength	100	°C	Rm/3.5=	118.3	
R_e =	201	MPa	yield strength	100	°C	Re/1.5=	134.0	
								414
Design Temperature:		60	414	Rm/3.5=	118.3			210.6
			211	Re/1.5=	140.4			
								414
		f =	118.3	MPa	design strength used			209

10. Leg Supports

	40 °C		65 °C		100 °C	
Steel type:	tensile	yield	tensile	yield	tensile	yield
SA-516M Gr.60	414	221	414	208	414	201

10. Leg Supports		SA-516M Gr.60						
R_m =	414	MPa	tensile strength	40	°C	Rm/3.5=	118.3	
R_e =	221	MPa	yield strength	40	°C	Re/1.5=	147.3	
R_m =	414	MPa	tensile strength	65	°C	Rm/3.5=	118.3	
R_e =	208	MPa	yield strength	65	°C	Re/1.5=	138.7	
R_m =	414	MPa	tensile strength	100	°C	Rm/3.5=	118.3	
R_e =	201	MPa	yield strength	100	°C	Re/1.5=	134.0	
								414
Design Temperature:		60	414	Rm/3.5=	118.3			210.6
			211	Re/1.5=	140.4			
								414
		f =	118.3	MPa	design strength used			209

Olaer Fawcett Christie
13 Boola Place, Cromer
NSW 2093 Australia
Ph: 02 9981 6888 Fx: 02 9981 6144

AS1210-2010 Pressure Vessel

Calculation Sheet

Vessel Information

D_{inside} =	2455.6	mm		
$h_{elliptical\ end}$=	636	mm	$\frac{\pi * D^2_{inside} * h}{6}$	= *volume of elliptical end*
r_{inside}	1227.8	mm		
$h_{cylinder\ part\ of\ vessel}$	4,000	mm	height of cylinder part of vessel	
Volume of Cylinder part of vessel	18,943	Ltr	$\pi * r^2 * h$	*= volume of cylinder part of vessel*
Volume of 2 elliptical ends	4,016	Ltr		
Volume of Vessel	22,959	Ltr		
Weight of Vessel	12,099	kg	300	E
Design Pressure	1.6	MPa	300 1000	D
Test Pressure $P_{h=}$ ($P*1.5*f_h/f$)	2.4	MPa	1000 10000	C
Corrosion Allowance	2	mm		
Design Temperature	60	℃	10000 300000000	B
Material:	SA-516M Gr.60		3E+08	A
Manufacturing Tolerance:	0.8	(mm) for shell nom. Thickne 25		
	3.75	(mm) for end nom. Thicknes 25		
Construction	AS1210-2010 Class 2A			

Hazard Level Calculation

Contents 1	Water		
Contents 2	Air/Nitrogen		
f_c =	10	Compressibility factor for gas	
f_f =	1	non harmful gas	
f_s =	3	service factor	
$P*V*f_c*f_f*f_s$ =	1,102,037	MPaL	
Hazard Level	B		AS4343-2005

Design Strength - Shell

f =	118.3	MPa	design strength used @	60	℃	SA-516M Gr.60

*N/mm2 = MPa

Design Strength - Ends

f =	118.3	MPa	design strength used	60	℃	SA-516M Gr.60

*N/mm2 = MPa

Shell Thickness (internal pressure)

P_1 =	1.66	MPa	calculated pressure = P+Static Head Pressure		
p =	1000	kg/m³	density of water		
g =	9.81	m/s^2	gravity		
h =	6.199	mtrs	height of vessel in metres		
pgh =	0.061	MPa	density * gravity * height / 10^6		
T =	24.2	mm	min.- Nominal Thickness is:	25	**Manu. toll. Worse Case**
Do =	2500	mm	external diameter of the shell		24.2 ok
D =	2455.6	mm	internal diameter of the shell		
η =	0.85		efficiency of the welded joint		Table 3.5.1.7
t =	$\frac{P_1 D}{2fn - P_1}$	mm	calculated shell thickness		3.7.3(1)
t =	20.45	mm			
t_c =	2.00	mm	corossion allowance		
	22.45	mm	minimum required thickness		

Shell thickness: ok

End Thickness (internal pressure)

P_1 =	1.66	Mpa	calculated pressure = P+Static Head Pressure		
T =	21.25	mm	min.- Nominal Thickness is:	25	**Manu. toll. Worse Case**
Do =	2500	mm	outside diameter of end		21.25 ok
D =	2462	mm	inside diameter of end		
η =	1		efficiency of the welded joint		
t =	$\frac{P_1 DK}{2fn - P_1}$	mm	calculated shell thickness		3.12.5.1
t =	17.40		mm		
t_c =	2.00	mm	corossion allowance		
K =	1		factor for ellipsiodal ends		3.12.5.1
	19.40	mm	minimum required thickness		

End Thickness: ok

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Manhole Cover

f =	118.3	MPa	design strength used	60	℃	SA-516M Gr.60
D =	700	mm	pitch centre diameter of bolt hole drilling		3.15.1 (p)	
P_1 =	1.60	MPa	calculation pressure (no liquid head pressure)			
K =	4.0		attachment factor		Table 3.15.1 AS1210-2010	
n =	1		joint efficiency			
T =	45.0	mm	thickness at bolts			

$$t = D\left(\frac{P_1}{Kfn}\right)^{0.5}$$

50

Manu. toll. Worse Case	
45.0	10.00%

t =	40.71	mm
t_c=	2.00	
	42.71	mm

Manhole Thickness: ok

Shell Outlet Branch

DN150 PN16

f =	118.3	MPa	design strength used	60	℃	SA-106 Gr. B
P_1 =	1.66	MPa	calculation pressure			
T =	7.0	mm	min. actual	8		
D_o =	457	mm	outside diameter of the branch			
D =	445		internal diameter			
η =	1		efficiency of the welded joint			
t =	$\frac{P_1 D}{2fn - P_1}$	mm	calculated shell thickness		3.7.3(1)	
t =	3.15	mm				
t_c =	2.00	mm	corossion allowance			
	5.15	mm	minimum required thickness			

Manu. toll. Worse Case	
7.0	12.50%

Branch thickness: ok

Based on 30 years 4 cycles a day:

Fatigue Analysis Appendix M AS1210-2010 (Not Required)

Outlet Flange

Flange:	DN450 PN16 AS4331	
Vessel Design Pressure=	16	bar
Vessel Test Pressure	24	bar
Flange Allowable Operating Pressure (AOL) =	16	bar
Flange maximum test pressure	24	bar

Flange Allowable Operating Pressure >= Vessel Design pressure	**OK**
Flange Test Pressure >= Vessel Test pressure	**OK**

Outlet Nozzle

DN100

	118.3	MPa	design strength used @	60	°C	SA-106 Gr. B
P_1 =	1.66	MPa	calculated pressure = P+Static Head Pressure			
p =	1000	kg/m³	density of water			
g =	9.81	m/s^2	gravity			
	12.50%		manuf. Toll			
T =	7.70	mm	min.- Nominal Thickness is:	8.8		
Do =	114.3	mm	external diameter of the shell			
D =	102.9	mm	internal diameter of the shell			
η =	1		efficiency of the welded joint		Table 3.5.1.7	
t =	$\frac{P_1 D}{2fn - P_1}$	mm	calculated shell thickness		3.7.3(1)	
t =	0.73	mm				
t_c =	2.00	mm	corossion allowance			
	2.73	mm	minimum required thickness			

Manu. toll. Worse Case	
7.70	12.50%

Shell thickness: ok

Inspection Opening for general purpose vessels

Inside diameter	2455.6	mm	
length shell (note 2)	4,000	mm	
			Location
Outlet Inside Opening Size	480	mm	End
Inspection Opening size	600	mm	End

Inside diameter	Minimum Clearance size of openings (mm)	Minimum number of openings (note 2)	Location of openings
>1500	Elliptical manhole or equivalent (see table 3.20.9 in AS1210-2010)	One for shells of any length	In the shell or end to give ready ingress and egress
	-	-	-

ϒ Either handhole or headhole option may be selected

Notes:

1. Size openings for jackets of jacketed vessels need not exceed 65 mm OD
2. The length of shell is measured between the welds attaching the ends to the cylindrical shell
3. Inspection, head- and handholes may be omitted if a manhole is provided
4. For shells longer than 3000mm, the number of openings shall be increased so the maximum distance between handholes does not exceed 2000 mm and that of the handholes 3000 mm
5. For shells up to 2000 mm long, a single headhole in one end may be used

Inspection Openings Comply? **Yes**

MANHOLE Reinforcement

P_1 =	1.66	MPa	calculated pressure = design pressure+static head pressure			
T_1 =	23.00	mm	thickness at opening of end cap (nominal thickness - corrosion allowance)			
n =	1.00		factor for seamless sphere (always 1.0 for fictional areas)			
if limit parallel to vessel is > 80% of vessel diameter than t =				17.4 mm	3.18.7.2	as1210-2010
if limit parallel to vessel is <= 80% of vessel diameter than t =			$\frac{P_1 2K_1 D}{4fn-P_1}$ =	15.6 mm	3.18.7.2	as1210-2010

t=	15.6	mm	thickness required for a seamless end		
d =	604.00	mm	diameter of the finished opening (+2*corrosion allowance)		
n =	0.85		welded end (is there a weld in the reinforcement area)		
F =	1		factor		
T_{b1} =	80	mm	nominal thickness of branch wall (less corrosion allowance AND less bolthole)		
t_b =	$\frac{P_1 d}{2f-P_1}$				
t_b =	4.27	mm	calculated thickness of a seamless branch wall		
	100	mm	Thickness of reinforcement element		
T_{r1}	0	mm	Extra reinforcement attached to vessel		
2.5 * T_1 =	57.50	mm	Limit of reinforcement 3.18.10.3 (a) p.157		
2.5 * T_{b1} + T_{r1}	200.00	mm	Limit of reinforcement 3.18.10.3 (b) p.157		
L_{n1} =	55	mm	height of reinforcing element outside shell		
f_{r1} =	1.00		design strength of set through branch divided by design strength of shell end		
f_{r2} =	1.00		design str. of branch wall extended beyond the shell thickness divided by design str of shell		
D_o =	800	mm	outside diameter of manhole flange		
d_1 =	600	mm	inside diameter of manhole flange		
BH =	18	mm	diameter of bolt hole		
L_{BH} =	37	mm	length of bolt hole		
h =	20	mm	height of manhole flange protruding into the shell		
ca =	2.00	mm	corrosion allowance		
D/2h	2.00				
K_1 =	0.9		value for spherical radius factor K_1 - AS1210 - table 3.18.7.2 Pg.153		
D_{inside} =	2459.6	mm	Inside Diameter of Vessel + 2 x Corrosion		
K_1D =	2213.6	mm	sphere radius - AS1210 - 3.18.7.2		
f_{endcap} =	118.3	MPa	design strength of end cap @	60 ℃	SA-516M Gr. 60
$f_{manhole\ reinforcement}$	118.3	MPa	design strength of reinf. Element	60 ℃	SA-516 M Gr.60

Limits:

Parallel to vessel wall

(2*d)	1208.0 mm	3.18.10.2a AS1210-2010
2*(0.5d+T_1+T_{b1})	810.00 mm	3.18.10.2b AS1210-2010
Max Value	**1208.0 mm**	**Value used for calculating A1**

Normal to vessel wall

2.5 * T_1 =	57.50 mm	
2.5 * T_{b1} + T_{r1}	200.00 mm	as per 3.18.10.3 (a)
Min. value:	**57.50 mm**	as per 3.18.10.3 (b)
Min Value	57.50 mm	
0.8*$(dT_{b1})^{0.5}$+T_{r1}	175.85 mm	
Limit is:	**175.85 mm**	as per 3.18.10.3 (b) is limit
L_{n1} =	55 mm	
Limit is:	175.85 mm	
Min. value:	**55.00 mm**	**Value used for calculating A2**

2.5 * T_1 =	57.50 mm	
2.5 * T_{b1} + T_{r1}	200.00 mm	as per 3.18.10.3 (a)
Min. value:	**57.50 mm**	as per 3.18.10.3 (b)
Min Value	57.50 mm	
Limit is:	**175.85 mm**	as per 3.18.10.3 (b) is limit
Height (h)	20.0 mm	
Limit is:	175.85 mm	
Min. value:	**20.00 mm**	**Value used for calculating A3**

3.18.10 from AS1210-2010

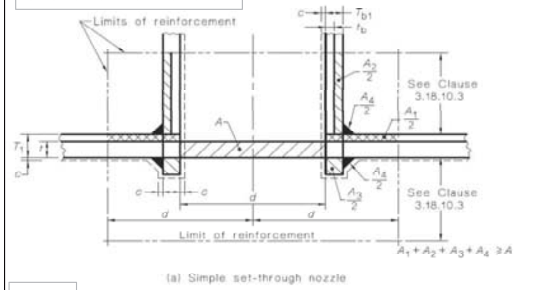

Fig 1

$A_{additional}$	
n/a	
$A_{additional}$	0

A = *d*t*F+2*T_{b1}*t*F*(1-f_{r1})*

A =	9,420 mm^2	Please see fig 1 for area A

A1 = *(n* T1-F*t)*d-2*T_{b1}*(n*T1-F*t)*(1-f_{r1})*

A1 =	2397 mm^2	Please see fig 1 for area A_1

A2 = *2*(T_{b1}-t_b)*L_{n1}*f_{r2}*

A2 =	8,330 mm^2	Please see fig 1 for area A_2

$A_{reduction}$		
Boltholes	2*BH*L_{BH}	n/a
		0

A3 = (width*height)*2

width = 96.00 mm *(D_0-d_1)/2-(2*corrosion allowance)*

height = 18.00 mm *(h-T_1)-corrosion allowance*

A3 =	3,456 mm^2	Please see fig 1 for area A_3	(2*width *height)-(2*
$A_{additional}$	0 mm^2		
$A_{reduction}$	1,332		

A2 + A3 + A_{add} - A_{red}=	12,851 mm^2	A1+A2+A3 + A_{add} - A_{red} >A =	OK

OUTLET Reinforcement

P_1 =	1.66 MPa	calculated pressure = design pressure+static head pressure				
	25.00 mm	nominal thickness of end cap				
T_1 =	23.00 mm	thickness at opening of end cap - corrosion allowance				
n =	1.00	factor for seamless sphere (always 1.0 for fictional areas)				
if limit parallel to vessel is > 80% of vessel diameter than t =				17.4 mm	3.18.7.2	as1210-2010
if limit parallel to vessel is <= 80% of vessel diameter than t =		$\frac{P_1 2K_1 D}{4fn\text{-}P_1}$ =		15.6 mm	3.18.7.2	as1210-2010
t =	15.6 mm	thickness required for a seamless end				
d =	559 mm	diameter of the finished opening (+2*corrosion allowance)				
n =	1	welded end - *flange will be welded to the cylindrical shell*				
F =	1	factor AS1210-2010 Figure 3.18.7				
T_{b1} =	92.5 mm	nominal thickness of branch wall (less corrosion allowance)				
t_b =	$\frac{P_1 d}{2f\text{-}P_1}$					
t_b =	3.95 mm	calculated thickness of a seamless branch wall				
	100 mm	Thickness of flange				
T_{r1}	0 mm	Extra reinforcement attached to vessel				
2.5 * T_1 =	57.50 mm	Limit of reinforcement 3.18.10.3 (a) p.157				
2.5 * T_{b1} + T_{r1}	231.25 mm	Limit of reinforcement 3.18.10.3 (b) p.157				
L_{n1} =	55 mm	height of reinforcing element (on the outside)				
f_{r1} =	1.00	design strength of set through branch divided by design strength of shell end				
f_{r2} =	1.00	design strength of branch wall extended beyond the shell thickness divided by design strength of shell				
D_o =	780 mm	outside diameter of outlet flange				
d_1 =	555 mm	inside diameter of outlet flange (worse case is the larger inside diameter)				
BH =	18 mm	diameter of bolt hole				
L_{BH} =	50 mm	length of bolt hole				
h =	20 mm	height of outlet flange protruding the shell				
ca =	2.00 mm	corrosion allowance				
D/2h	2.00					
K_1 =	0.90	value for spherical radius factor K_1 - AS1210 - table 3.18.7.2 Pg.153				
D =	2459.6 mm	inside diameter less wall thickness				
K_1D =	2213.6 mm	sphere radius - AS1210 - 3.18.7.2				
f_{endcap}=	118.3 MPa	design strength of end cap @	60 ℃	SA-516M Gr. 60		
$f_{reinforcement\ element}$=	118.3 MPa	design strength reinf. Elem. @	60 ℃	SA-516M G r.60		
d_2	480 mm	inside diameter small				

Limits:
Parallel to vessel wall

2*d	1118.0 mm	3.18.10.2a AS1210-2010
$2*(0.5d+T_1+T_{b1})$	790.00 mm	3.18.10.2b AS1210-2010
Max Value	**1118.0 mm**	**Value used for calculating A1**

Normal to vessel wall

$2.5 * T_1$ =	57.50 mm	
$2.5 * T_{b1} + T_{r1}$	231.25 mm	as per 3.18.10.3 (a)
Min. value:	**57.50 mm**	as per 3.18.10.3 (b)
Min Value	57.50 mm	
$0.8*(dT_{b1})^{0.5}+T_{r1}$	181.91 mm	
Limit is:	**181.91 mm**	as per 3.18.10.3 (b) is limit
L_{n1} =	55.00 mm	
Limit is:	181.91 mm	
Min. value:	**55.00 mm**	**Value used for calculating A2**

$2.5 * T_1$ =	57.50 mm	
$2.5 * T_{b1} + T_{r1}$	231.25 mm	as per 3.18.10.3 (a)
Min. value:	**57.50 mm**	as per 3.18.10.3 (b)
Min Value	57.50 mm	
Limit is:	**181.91 mm**	as per 3.18.10.3 (b) is limit
Height (h)	20.00 mm	
Limit is:	181.91 mm	
Min. value:	**20.00 mm**	**Value used for calculating A3**

3.18.10 from AS1210-2010

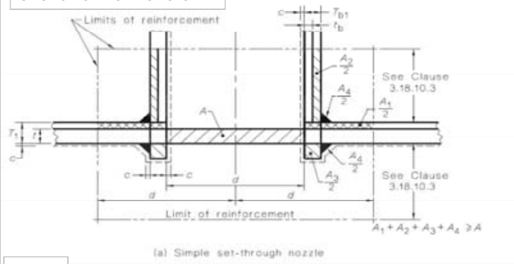

Fig 1

A = $d*t*F+2*T_{b1}*t*F*(1-f_{r1})$

A =	8,717.7 mm^2

Please see fig 1 for area A

A1 = $(n*T1-F*t)*d-2*T_{b1}*(n*T1-F*t)*(1-f_{r1})$

A1 =	4154.1 mm^2

Please see fig 1 for area A_1

A2 = $2*(T_{b1}-t_b)*L_{n1}*f_{r2}$

A2 =	9,740.3 mm^2

Please see fig 1 for area A_2

width =	108.50 mm	$(D_0-d_1)/2-(2*\text{corrosion allowance})$
height =	18.00 mm	*h-corrosion allowance*

A3 = (width*height)*2

A3 =	3,906.0 mm^2

Please see fig 1 for area A_3

$A_{reduction}$	0.0 mm^2
$A_{additional}$ =	0 mm^2

$A_{additional}$	
Add. Reinforcement	0
Welds	0
$A_{additional}$	0

$A_{reduction}$	
Edges	0.00
Boltholes in A3	0
	0

$A1 + A2 + A3 + A_{additional} - A_{reduction}$ =	17,800 mm^2

$A1 + A2 + A3 + A_{additional} - A_{reduction}$ =	OK

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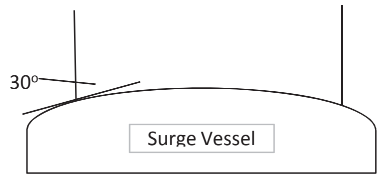
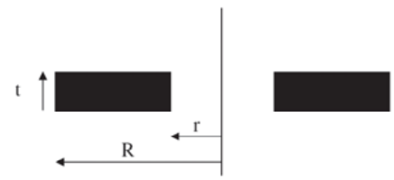
Lifting Lugs

Lifting scenario calculated. min lifting angle: 30^{o}.



Description	Units	Symbol	Value	Comments
Lifting arrangement	-	-	2	Lifting Lugs
Material	-	-		SA-516M Gr.60
Allowable design strength	MPa	f	118.3	SA-516M Gr.60
Lug Details				
Number of lifting lugs	-	N	2	
Lug thickness	mm	t	30	
Eye Radius	mm	r	50	
Lug edge radius	mm	R	100	
Eye centre to top of lug	mm	a	100	
Distance from base to centre of hole	mm	y	110	
Lug base length	mm	L	300	
lug height	mm	H	210	
cross sectional area of lug at hole	mm2	Ahole	3000.00	A_{hole} = 2t(R-r) ……As shown in image above
Shear area at hole	mm2	Aholes	2400.00	4/5 x Cross sectional area of lug at hole)
Lug weld details				
Type of weld			Weld detail J on drawing	
Length of attachment weld	mm	L	300	
Width of attachment weld	mm	W	30	
Fillet weld leg	mm	Lw	14	
Weld throat	mm	tw	9.90	
Cross sectional Area of weld	mm2	Aw	6534	(2L + 2W)t
Shear Area of weld	mm2	As	5227	4/5*Cross sectional area of weld
Moment of inertia of weld area	mm4	I	68228344	
Lifting loads				
Dynamic factor for lifting	-	F	2	
Weight of vessel	kg	W	12,099	
	N	W	118691	
Design Load	N		237382	
Vertical static load on each lug	N	Fv	118691	
Sling Load	N	Fs	137053	
Horizontal Load	N	Fh	68526	
Bending moment	Nmm	M	7537903	
Stress at base				
Shear stress due to force	MPa	Ss	13.11	
Direct stress due to force	MPa	Sd	18.17	
Bending stress due to moment	MPa	Sb	16.57	
Combined stress	MPa	Sc	37.13	
Allowable stress	MPa	Sa	82.8	70% allowable
Actual Stress > Allowable Stress			Complies	
Stress at hole				
Shear stress due to force	MPa	Ss	28.55	
Direct stress due to force	MPa	Sd	39.56	
Combined stress	MPa	Sc	48.79	
Allowable stress	MPa	Sa	82.8	70% allowable
Actual Stress > Allowable Stress			Complies	



SUPPORT LEGS & BOLTS

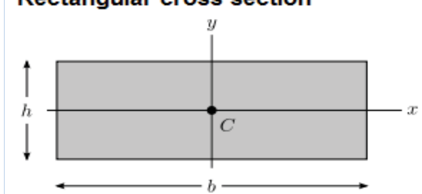
Load cases calculated: Wind + Empty vessel
Wind + Full vessel
Earthquake + Empty vessel
Earthquake + Full vessel
Ph + Full Vessel

Leg steel Type	SA-516M Gr.60			
number of legs		n	4	
outside diameter		D	2500	mm
weight vessel				
empty		W_e	118570.20	N
full		W_f	343569.42	N
Force				
wind		F_w	20344.64	N
earthquake		F_e	18858.28	N
Center of leg weld to center point of gravity		H	2080	mm
Length of support leg		L	1970	mm
Support Leg thickness		Sth	20	mm
Width of Support leg		h	500	mm
distance bolts between opposite legs		D_b	2040	mm
Extreme Fiber distance in leg cross section		e	10	mm

(incl reinforcement plate if applicable)

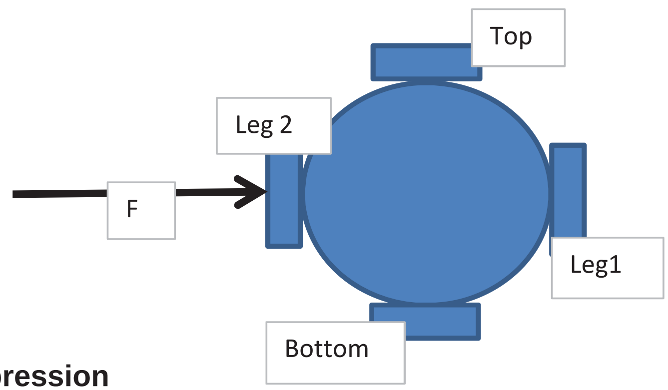
I_{xx} = (h*Sth³)/12	top & bottom	208333333.3	mm^4
I_{xx} = (Sth*h³)/12	leg 1 & 2	333333.3	mm^4
Ratio	R	0.001	

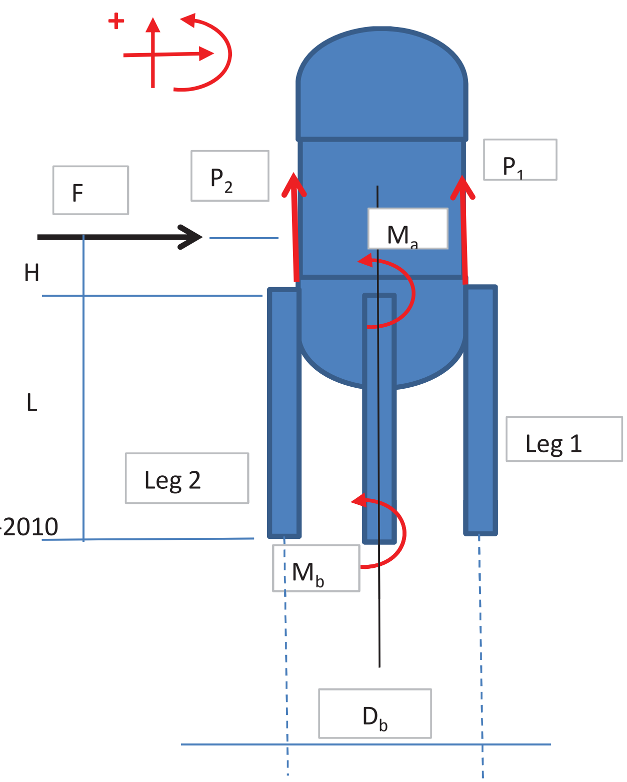
Rectangular cross section



$$J_{xx} = \frac{bh^3}{12}$$
$$J_{yy} = \frac{hb^3}{12}$$

- b = width (x-dimension),
- h = height (y-dimension)





Tension / Compression

Bolts:

Type		M24		as per AS1210-2010
Cross sec. Area	A	324.00	mm^2	3.21.5.4.6 AS 1210-2010
Yield Strength	σ_y	400.00	MPa (N/mm^2)	
Allowable	σ_y*0.6	240.00	Mpa	

Support Legs:

Steel type:			SA-516M Gr.60	
yield strength (σ_y) @	60	^oC	211	Mpa
Allowable	σ_y * 0.9		189.5	MPa

Results for Axial + Bending stresses

			magnitude			
	Axial + Bending stress		**Axial + Bending stress**			
Load case	**Leg1**	**Leg2**	**Leg1**	**Leg2**	F_{bolt2} (N)	σ_{bolt2} (Mpa)
Wind + Empty vessel	10.27	-4.13	19.59	4.13	51137.62	157.8
Wind + Full vessel	21.52	-26.63	42.09	26.63	-5112.19	-15.8
Earthquake + Empty vessel	9.96	-4.69	19.02	4.69	45235.91	139.6
Earthquake + Full vessel	21.21	-33.46	41.52	33.46	-11013.89	-34.0
Ph + Full Vessel	18.14	-33.40	35.32	33.40	n/a	n/a

Leg supports allowable	**189.5**	**>**	**each case of combined stresses**	**42.1**	**ok**
Bolts allowable force	**240**	**>**	**highest total force**	**157.8**	**ok**

Calculations

Wind + Empty vessel			
$M_a=F_w*H$		42316841.0	Nmm
$M_b=F_w*(L+H)$		82395772.1	Nmm
$F_{bolt2}=(M_b/(db/2))-W_e/n$		51137.62	N
$P_1=-M_a/D$		-16926.74	N
$P_2=M_a/D$		16926.74	N
$T_{leg1}=(-M_a/D)-W_e/n$		-46569.29	N
$T_{leg2}=(M_a/D)-W_e/n$		-12715.81	N
Axial stress Leg1	σ_1	-4.66	N/mm^2
Axial stress Leg2	σ_2	-1.27	N/mm^2
Leg 1			
$M_{l1} = ((R*F_w)*L)-T_{leg1}*e$		497704.79	Nmm
Bending stress	$\sigma_1 = (M_{l1} * y)/ I$	14.9	MPa
Leg 2			
$M_{l2} = ((R*F_w)*L)+T_{leg2}*e$		-95146.21	Nmm
Bending stress	$\sigma_2 = (M_{l1} * y)/ I$	-3	MPa

Wind + Full vessel			
$M_a=F_w*H$		42316841.0	Nmm
$M_b=F_w*(L+H)$		82395772.1	Nmm
$F_{bolt2}=(M_b/(db/2))-W_f/n$		-5112.19	N
$P_1=-M_a/D$		-16926.74	N
$P_2=M_a/D$		16926.74	N
$T_{leg1}=(-M_a/D)-W_f/n$		-102819.09	N
$T_{leg2}=(M_a/D)-W_f/n$		-68965.62	N
Axial stress leg 1	σ_1	-10.28	N/mm^2
Axial stress leg 2	σ_2	-6.90	N/mm^2
Leg 1			
$M_{l1} = ((R*F_w)*L)-T_{leg1}*e$		1060202.84	Nmm
Bending stress	$\sigma_1 = (M_{l1} * y)/ I$	31.8	MPa
Leg 2			
$M_{l2} - ((R*F_w)*L)+T_{leg2}*e$		-657644.26	Nmm
Bending stress	$\sigma_2 = (M_{l1} * y)/ I$	-20	MPa

Earthquake + Empty vessel			
$M_a=F_e*H$		39225222.3	Nmm
$M_b=F_e*(L+H)$		76376033.8	Nmm
$F_{bolt2}=(M_b/(db/2))-W_e/n$		45235.91	N
$P_1=-M_a/D$		-15690.09	N
$P_2=M_a/D$		15690.09	N
$T_{leg1}=(-M_a/D)-W_e/n$		-45332.64	N
$T_{leg2}=(M_a/D)-W_e/n$		-13952.46	N
Axial stress Leg1	σ_1	-4.53	
Axial stress Leg2	σ_2	-1.40	
Leg 1			
$M_{l1} = ((R*F_e)*L)-T_{leg1}*e$		482999.56	Nmm

Earthquake + Full vessel			
$M_a=F_e*H$		39225222.3	Nmm
$M_b=F_e*(L+H)$		76376033.8	Nmm
$F_{bolt2}=(M_b/(db/2))-W_f/n$		-11013.89	N
$P_1=-M_a/D$		-15690.09	N
$P_2=M_a/D$		6.28	N
$T_{leg1}=(-M_a/D)-W_f/n$		-101582.44	N
$T_{leg2}=(M_a/D)-W_f/n$		-85886.08	N
Axial stress Leg1	σ_1	-10.16	
Axial stress Leg2	σ_2	-8.59	
Leg 1			
$M_{l1} = ((R*F_e)*L)-T_{leg1}*e$		1045497.61	Nmm

$\sigma_1 = (M_{l1} * y)/ I$		14.5	MPa
Leg 2			
$M_{l2} = ((R*F_e)*L)+T_{leg2}*e$		-109851.44	Nmm
$\sigma_2 = (M_{l1} * y)/ I$		-3.3	MPa

$\sigma_1 = (M_{l1} * y)/ I$	31.4	MPa
Leg 2		
$M_{l2} - ((R*F_e)*L)+T_{leg2}*e$	-829187.61	Nmm
$\sigma_2 = (M_{l1} * y)/ I$	-24.9	MPa

Ph (Hydrostatic test) + full vessel			
$M_a=F*H$		n/a	Nmm
$M_b=F*(L+H)$		n/a	Nmm
$F_{bolt2}=(M_b/(db/2))-W_f/n$		n/a	N
$P_1=-M_a/D$		n/a	N
$P_2=M_a/D$		n/a	N
$T_{leg1}=(-M_a/D)-W_f/n$		-85892.35	N
$T_{leg2}=(M_a/D)-W_f/n$		-85892.35	N
Axial stress Leg1	σ_1	-8.59	
Axial stress Leg2	σ_2	-8.59	
Leg 1			
$M_{l1} = ((R*F)*L)-T_{leg1}*e$		890935.47	Nmm
$\sigma_1 = (M_{l1} * y)/ I$		26.7	MPa
Leg 2			
$M_{l2} - ((R*F)*L)+T_{leg2}*e$		-826911.62	Nmm
$\sigma_2 = (M_{l1} * y)/ I$		-24.8	MPa

Shear stresses have not been accounted for but are very small

Olaer Fawcett Christie
13 Boola Place
Cromer NSW 2099
Ph: 02 9981 6888 Fax: 02 9981 6144

AS1170.4 - 2007 STATIC ANALYSIS - EARTHQUAKE LOADS

Design Data			**SECTION**
Location	Redbank QLD		spec. G1-TE-S-0000-SPC0002
Design Working Life	25 years		AS1210-2010 Appendix J2
Hazard Level - AS4343-2005	B		
Importance Level	3		AS1210-2010 Appendix J3 (table J1)
Site sub-soil class	Class Ae		Assumption based on Concrete slabs
Probability factor (kp)	1.0		p.18 1170.4-2007 section 3
Annual probability of exceedance (P)	1/500		AS1170.0 Amendment 4 - Table 3.3
Hazard factor (Z)	0.07		AS1170.4 2007 table 3.2
Weight of Vessel (kg)	12,099		
Weight of Water (kg)	22,959		
Weight (kg)	35058		
Seismic Weight (kN)	343920		
Length of extended legs (just extension)	0.75	m	
EARTHQUAKE DESIGN CATEGORY (ED	II		AS1170.4 - Table 2.1

5.4.2.3 Simplified design for structures not exceeding 15m

	Fi =	**Ks[kpZSp/μ]Wi**		**. . . 5.4**
	Ks =	2.3		**Table 5.4**
	Sp =	1	Structural Performance Factor	**. . . 6.5 (B)**
	μ =	2	Structural Ductility	
	Wi =	343920	Seismic Weight	
Minimum Horizontal Static Force	**Fi =**	**27685.56**	N	**. . . 5.4**
Permissable Stress Forces	**Fip =**	**Fi / 1.5**		
	Fip =	18457.04	N	
Over Turning Moment About Base	**Fip x L =**	28.65	kN/m	
	L =	1.552	m Distance from base to centre of vessel	

EQUIVALENT STATIC ANALYSIS

6.2.3 Natural period of the structure	**T1 =**	**$1.25 * k_t * h_n$^0.75**	
	k_t =	0.05	for moment resisting steel frames
	h_n =	6.95	height of vessel (metres)
	T1 =	0.26750	
SPECTRAL SHAPE FACTOR (Ch(T))	(Ch(T)) =	2.35	Table 6.4

HORIZONTAL EQUIVALENT STATIC DESIGN FORCE (Fi)

Fi = $$= \frac{W_i h_i^k}{\sum_{j=1}^{n}\left(W_j h_j^k\right)}\left[k_p Z C_h(T_1)\frac{S_p}{\mu}\right]W_t \qquad \ldots 6.3(2)$$

Fi = 28287.42
18858.3

WIND AS1170.2 & AS1210-2010 APPENDIX J

DESIGN DATA					SECTION
Location:		Redbank QLD			
Region:		B			AA1170.2-2002 Fig 3.1
Terrain:		Category 1			AS1170.2:2002 4.2.1
Importance Level		3			AS1210-2010 Appendix J3 (table J1)
Design Working Life		25 years			AS1210-2010 Appendix J2
Annual probability of exceedance (P)		1/500			AS1170.0 Amendment 4 - Table 3.3
Reginal Wind Speed V_r:	V_{500} =	57	m/s		AS1170.2-2002 Table 3.1
Md		1.00			AS1170.2 Table 3.2 (Only region A or W)
Permissable Stress Design Speed	V_{des} =	0.817 x Vr			…. J4 AS1210-2010 - Appendix J
	V_{des} =	47			
Total height of vessel including leg supports		6.95	m		
Area side of vessel:	A =	17.4	m^2		Largest side of vessel (incl. Extention legs)
Lever Arm	L =	1.55	m		From Ground to centre of vessel
Air Density	P_{air} =	1.2	kg/m3 (standard)		
Aerodynamics Shape Factor	C_{fig} =	0.9		2 < h/d <7	Table J2 - AS1210-2010
Dynamic Response Factor	C_{dyn} =	3.74	Hz		
	∴ C_{dyn} =	1			
Design Wind Pressure	P =	$0.5.P_{air}.V_{des}{}^2.C_{fig}.C_{dyn}$	pascals		
	P =	1171.08	pascals		
Wind Force (transverse case)	F_t =	p x A			
	F_t =	20344.635	N		
Wind Overturning Moment (transverse)	M_{wt} =	F_t x L			
	M_{wt} =	31574.87	Nm		

PD5500 Annex G - Local Load Shell-Leg Symbol

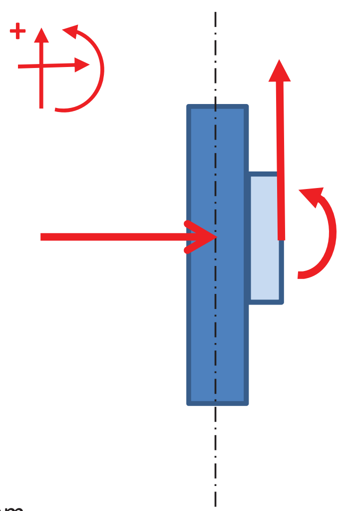
Local Loads Case: Wind + Full vessel

L>r	Go

Internal Pressure	P	1.6	MPa	
Allowable Design Strength at design temp.	f	118	MPa	
Mean Radius of cylinder	r	1238.9	mm	avarage in- and outside r
Thickness	t	22.20	mm	
Length of cylind. Part of shell	L	4,000	mm	
Centre of load to mid-length shell	d	1935	mm	all the way at the end
Ratio of d/L	d/L	0.48		
equivalent length of shell	L_e	256		
Ratio for equivalent length of shell	L_e/L	0.06		
Weight of vessel (empty)	M	12099.00	kg	
Volume	V	22959.10	l	
Total weight (vessel full)	W	35058.10	kg	
		343.57	kN	
Length of weld		130		
Width of supp leg		500		
half length of square loading area	C	127.5	calc ok for rectangular att to shell	
1/2 rectangular loading area - axial	C_x	65		
1/2 rectangular loading area - circumferential	C_Φ	250		

C1	if Cx>CΦ	127.5		
	if CΦ>Cx	227.5		
half side of equivalent shell length		C_1	227.5	$C_1=C$

$2C_x/L_e$	$2C_x/L_e$	0.508		
C_Φ/C_x	C_Φ/C_x	3.85		
Angle to edge of loading area - circular	φ_1	0.200		0.202
Ratio of angle radius / axial load length	$\varphi_1 r/C_x$	3.82		
	x	65.00		
Ratio of distance to point / axial load length	x/C_x	1	x=Cx	
C_Φ/r	C_Φ/r	0.202		
Ratio of axial length of load area / radius	C_x/r	0.052		
Ratio of radius to thickness	r/t	56		
Non-dimensional group, fig. G.5	$64r/t(C_x/r)^2$	9.83		
Radial Load (F*R)	F_r	-16.25	N	
Circumferential shear force	F_c	0	N	
Longitudinal shear force	F_l	102819.09	N	
Torsion moment	M_t	0	Nmm	
Circumferential moment	M_c	0	Nmm	
Longitudinal moment	M_l	1141291.91	Nmm	
Value from figure G.6	M_Φ/W	0.02	Nmm/mm	
Value from figure G.7	M_x/W	0.05	Nmm/mm	
Value from figure G.8	$N_\Phi t/W$	-0.15	N/mm	



Value from figure G.9	$N_x t/W$	-0.02	N/mm	
Value from figure G.10	M_Φ/W	-0.025	Nmm/mm	
Value from figure G.11	M_x/W	0	Nmm/mm	
Value from figure G.12	$N_\Phi t/W$	-0.0875	N/mm	
Value from figure G.13	$N_x t/W$	-0.01	N/mm	
Value from figure G.14	M_Φ/W	0.2	Nmm/mm	
Value from figure G.15	M_x/W	0.17	Nmm/mm	
Value from figure G.16	$N_\Phi t/W$	-0.21	N/mm	
Value from figure G.17	$N_x t/W$	-0.065	N/mm	
Description				
Stresses due to radial load				
Longtitudinal membrane stress	σ_{Nx}	0.00	$(N_x t/W)F_R/t^2$	
Longtitudinal bending stress	σ_{Mx}	-0.01	$(M_x/W)6F_R/t^2$	
Circumferential membrane stress	$\sigma_{N\Phi}$	0.00	$(N_\Phi t/W)F_R/t^2$	
Circumferential bending stress	$\sigma_{M\Phi}$	0.00	$(M_\Phi/W)6F_R/t^2$	
Stresses due to circumferential moment				
Longtitudinal membrane stress	σ_{Nx}	0	$(N_x t/W)1.5(M_c/C_\Phi)/t^2$	
Longtitudinal bending stress	σ_{Mx}	0	$(M_x/W)9(Mc/C_\Phi)/t^2$	
Circumferential membrane stress	$\sigma_{N\Phi}$	0	$(N_\Phi t/W)1.5(M_c/C_\Phi)/t^2$	
Circumferential bending stress	$\sigma_{M\Phi}$	0	$(M_\Phi/W)9(Mc/C_\Phi)/t^2$	
Stresses due to longtitudinal moment				
Longtitudinal membrane stress	σ_{Nx}	-3.5	$(N_x t/W)1.5(M_L/C_x)/t^2$	
Longtitudinal bending stress	σ_{Mx}	54.5	$(M_x/W)9(M_L/C_x)/t^2$	
Circumferential membrane stress	$\sigma_{N\Phi}$	-11.2	$(N_\Phi t/W)1.5(M_L/C_x)/t^2$	
Circumferential bending stress	$\sigma_{M\Phi}$	64.1	$(M_\Phi/W)9(M_L/C_x)/t^2$	1
				1
Stresses due to internal pressure				2
Longtitudinal membrane stress	σ_{xp}	44.6	Pr/2t	
Circumferential membrane stress	$\sigma_{\Phi p}$	89.3	Pr/t	Complies
Shear stress from torsion moment	T_m	0.0	$2M_t/(\pi c_1^2 t)$	Does Not Comply
Shear stress from circumferential force	T_c	0.0	$2F_c/(\pi C_1 t)$	
Shear stress from longtitudinal force	T_l	13.0	$2F_L/(\pi C_1 t)$	

Load combination	Condition	Design	AS1210-2010 3.1.6
	Combination	C	AS1210-2010 3.1.6
	k=	1.2	AS1210-2010 3.1.6
stress combination Axial + Bending (fm + fb + fg)		3	AS1210-2010 APP. H

Stress Summary at edge of loaded area in shell

Max stress intensities

Membrane + bending	167.25	MPa	vs.	355	MPa
Membrane	103.54	MPa	vs.	142	MPa
	Complies				

Summation of shell stresses, values in Mpa

Quadrant	Q1		Q2		Q3		Q4	
Surface	inside	outside	inside	outside	inside	outside	inside	outside
Circumferential stresses								
Membrane component due to:								
1 Radial Load	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2 Circumferential Moment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 Longitudinal Moment	-11.22	-11.22	11.22	11.22	11.22	11.22	-11.22	-11.22
4 Sub total due to local loads	-11.22	-11.22	11.22	11.22	11.22	11.22	-11.22	-11.22
5 Pressure	89.29	89.29	89.29	89.29	89.29	89.29	89.29	89.29
6 Sub total	78.07	78.07	100.51	100.51	100.51	100.51	78.07	78.07
Bending component due to:								
7 Radial Load	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8 Circumferential Moment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 Longitudinal Moment	64.13	-64.13	-64.13	64.13	-64.13	64.13	64.13	-64.13
10 Sub total	64.12	-64.12	-64.13	64.13	-64.13	64.13	64.12	-64.12
11 Total Circumferential Stress	142.19	13.94	36.38	164.65	36.38	164.65	142.19	13.94
Longitudinal Stresses								
Membrane component due to:								
12 Radial Load	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13 Circumferential Moment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14 Longitudinal Moment	-3.47	-3.47	3.47	3.47	3.47	3.47	-3.47	-3.47
15 Sub total due to local loads	-3.47	-3.47	3.47	3.47	3.47	3.47	-3.47	-3.47
16 Pressure	44.65	44.65	44.65	44.65	44.65	44.65	44.65	44.65
17 Sub total	41.17	41.17	48.12	48.12	48.12	48.12	41.17	41.17
Bending component due to:								
18 Radial Load	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01
19 Circumferential Moment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20 Longitudinal Moment	54.51	-54.51	-54.51	54.51	-54.51	54.51	54.51	-54.51
21 Sub total	54.50	-54.50	-54.52	54.52	-54.52	54.52	54.50	-54.50
22 Total Longitudinal Stress	95.67	-13.33	-6.40	102.64	-6.40	102.64	95.67	-13.33
Shear stresses due to:								
23 Torsion Moment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24 Circumferential Shear Force	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25 Longitudinal Shear force	12.96	12.96	12.96	12.96	12.96	12.96	12.96	12.96
26 Total Shear Force	12.96	12.96	12.96	12.96	12.96	12.96	12.96	12.96
Total Stress Intensity (membrane + bending)			Allowable stress for membrane + bending:				354.86	
27 $f_1=\{f_\Phi+f_x+[(f_\Phi-f_x)^2+4T^2]^{1/2}\}/2$	145.56	19.12	40.00	167.25	40.00	167.25	145.56	19.12
28 $f_1=\{f_\Phi+f_x-[(f_\Phi-f_x)^2+4T^2]^{1/2}\}/2$	92.30	-18.50	-10.02	100.04	-10.02	100.04	92.30	-18.50
Stress intensity	145.56	19.12	40.00	167.25	40.00	167.25	145.56	19.12
OK if stresses < allowable								
Total Stress Intensity (membrane)			Allowable stress for membrane:				141.94	
$f_1=\{f_{\Phi m}+f_{xm}+[(f_{\Phi m}-f_{xm})^2+4T^2]^{1/2}\}/2$	82.17	82.17	103.54	103.54	103.54	103.54	82.17	82.17
$f_1=\{f_{\Phi m}+f_{xm}-[(f_{\Phi m}-f_{xm})^2+4T^2]^{1/2}\}/2$	37.07	37.07	45.09	45.09	45.09	45.09	37.07	37.07
Stress intensity	82.17	82.17	103.54	103.54	103.54	103.54	82.17	82.17
OK if stresses < allowable								

SOUDAGE

WELDING FILE

OLAER Australia Pty Ltd

AR 8900 **23000 litres** **n°23000KU7**

KU007M00000

PRESSURE VESSEL	WPS		PQR	WOPQ or WPQ
1 X 23000 L	A (121)	WPS 1	11,01	DUPRE Eric D
N°23000KU7	B (121)	WPS 1	11,01	DUSSAULT Jean-Claude B
	C (121)	WPS 1	11,01	DUPRE Eric D
	D (135)	WPS 4	11,01	BUCHET Philippe O
	E (135)	WPS 5	11,02	LABARBE Philippe T
	F (135)	WPS 1412.0034B.04 M1.1	02,04	LABARBE Philippe T
	G (135)	WPS 1412.0034B.04 M1.7	02,04	LABARBE Philippe T
	H (135)	WPS 1412.0034B.04 M1.5	02,04	LABARBE Philippe T
	I (135)	WPS 1412.0034B.04 M1.6	02,04	LABARBE Philippe T
	J (135)	WPS 1412.0034B.04 M1.7	02,04	LABARBE Philippe T
	K (135)	WPS 1412.0034B.04 M1.1	02,04	LABARBE Philippe T
	L (135)	WPS 1412.0034B.04 M1.1	02,04	LABARBE Philippe T

CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)
Section IX, ASME Boiler and Pressure Vessel Code

Company Name: **CHARLATTE RESERVOIRS** BY: **E RAPPENEAU**
Welding Procedure Specification N°: **1**
Revision N° **1** Date **16/11/2012** Supportinng PQR N°(s) **11,01**
Welding Processes **GMAW+SAW** Types **Semi automatic + Machine**
Automatics, Manual, Machine, or Semi auto

JOINTS (QW-402)

Joint Design: **Groove Weld**

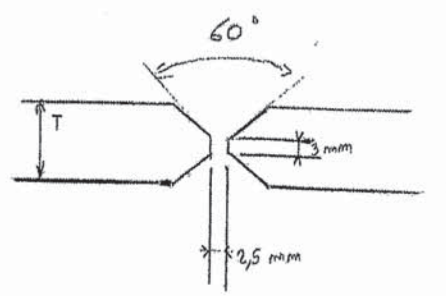
Backing (Yes) **YES for SAW** (No)
Backing Material (Type): **Weld**
(Refer to both backing and retainers.)

Metal: **YES** Non Fusing Metal

Nonmetallic Other **No retainers used**

Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.

(At the option of the Mfgr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process procedures, etc.)



1 pass -> GMAW
2 to n -> SAW

BASE METALS (QW-403)

P-No **1** Group No **1** To P-No **1** Group No **1**
OR
Specification type and grade: /
To specificaton type and grade /
OR
Chem. Analyse and Mech. Prop. /
To chem. Analyse and Mech. Prop. /
Thickeness Range:

Base Metal	Groove	5mm to 200mm	Fillet	All thickness
Pipe Dis. Range	Groove	All diameter	Fillet	All diameter

Other **No pass greater than 13 mm**

*FILLER METAL (QW-404)	GMAW	SAW
Spec. No. (SFA)	5.18	5.17
AWS No. (Class)	ER 70S-6	EM12K
-No	6	6
A-No	1	1
Size of filler Metals	1mm Solid	3,2mm Solid
Weld Metal		
Thickness Range:		
Groove	6 mm max	200 mm
Fillet	All thickness	All thickness
Electrode-Flux (Class)		AWS A5.17 F7A4 (neutral)
Flux Trade Name		/
Consumable Insert	/	/
Other	Pittarc; No alloy elements QW404.24.27.32 Not Used	Pittarc No recrushed flux

* Each base metal-filler metal combination should be recorder individually. The tack weld is performed according to the first pass

AQ0293-03

CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)
Section IX, ASME Boiler and Pressure Vessel Code

POSITIONS (QW-405)
Position(s) of groove **FLAT**
Welding Progression UP: **No** Down: **No**
Position(s) of Fillet /

POSTWELD HEAT TREATMENT (QW-407)
Temperature Range: **No**
Time Range **No**

PREHEAT (QW-406)
Preheat Temp. Min. **>5°C**
Interpass Temp. Max. **250°C**
Preheat Maintenance /
(Contiuous or special healthing where applicable should be recorded)

GAS (QW-408)

	Percent composition		
	Gas(es)	(Mixture)	Rate
Shielding	**Arcal 14**	**Arg (96%) CO_2(3%) O_2(1%)**	**18L/min$^{+/-3}$**
Trailing	/	/	/
Backing	/	/	/

ELECTRICAL CHARRACTERISTICS (QW-409)
Current AC or DC **DC** Polarity **+**
Amps (Range) **(+/- 10%)** Volts (range) **(+/- 10%) see bolow**

Amps and volts range should be recorded for each electrode size,
position, and thickness, etc. This information may be listed in a tabular or similar so that shown below.)

Tungsten electrode Size and Type /
Mode of Metal Transfer for GMAW **Spray arc**
Electrode Wire feed speed range **GMAW: 240 sm/min$^{+/-10\%}$; SAW: 240 cm$^{+/-10\%}$**

TECHNIQUE (QW-410)

String of Weave Bead **String Bead**
Office or Gas Cup size **ø 10 mm**
Initial and interpass Cleaning (Brushing, grinding, etc.) **Brushing - Grinding**

Method of Back Gouging **Grinding**
Oscillation **No**
Contact Tube to Work distance **20 mm$^{+/-5}$**
Multiple or Single pass (per side) **Multipass and Monopass**
Multiple or Single Electrodes **Single**
Travel speed **GMAW 20 cm/min$^{+/-10\%}$; SAW 40 cm/min$^{+/-10\%}$**
Peening **Not permitted**
Other **Use of thermal processes: No**
Electrode spacing : No

Weld Layer	Process	Filler Metal Class	Filler Metal Dia	Current Type Polar.	Current Amp Range	Volt Range	Travel speed range	Other (e.g remarks, Comments, Hot wire, addition, Technique, Torch angle, etc)
1	GMAW	ER70S-6	1	DC+	$255^{+/-10\%}$	$30^{+/-10\%}$	12/22cm/min	/
2 to n	SAW	EM12K	3,2	DC+	$565^{+/-10\%}$	$32^{+/-10\%}$	$40^{+/-10\%}$	/

AQ0293-03

CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)
Section IX, ASME Boiler and Pressure Vessel Code

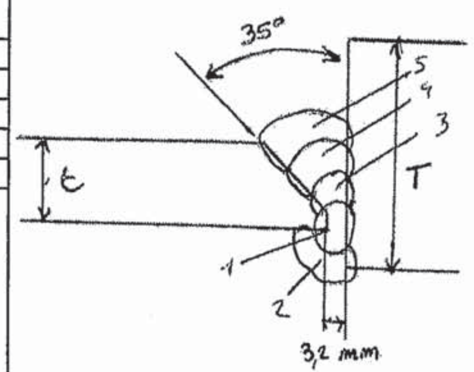
Company Name: **CHARLATTE RESERVOIRS** BY: **E. RAPPENEAU**
Welding Procedure Specification N°: **4**
Revision N° **3** Date **15/11/2012** Supportinng PQR N°(s) **11,01**
Welding Processes **GMAW + SAW including tack weld** Types **Semi Automatic + Machine**
Automatics, Manual, Machine, or Semi auto

JOINTS (QW-402)
Joint Design: **Groove Weld**

Backing (Yes) **Yes for SAW** (No)
Backing Material (Type): **weld**
(Refer to both backing and retainers.)
Metal: **Yes** Non Fusing Metal
Nonmetallic Other **No retainers used**

Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.

(At the option of the Mfgr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process procedures, etc.)



1=GMAW
2 to n = SAW

BASE METALS (QW-403)
P-No **1** Group No **1 or 2** To P-No **1** Group No **1**
OR
Specification type and grade: /
To specificaton type and grade /
OR
Chem. Analyse and Mech. Prop. /
To chem. Analyse and Mech. Prop. /
Thickeness Range:
Base Metal — Groove **5 to 200mm** — Fillet **All Thickness**
Pipe Dis. Range — Groove **All diameter** — Fillet **All diameter**
Other **No pass greater than 13 mm**

*FILLER METAL (QW-404)	GMAW	SAW
Spec. No. (SFA)	5.18	5.17
WS No. (Class)	ER70S-6	EM12K
-No	6	6
A-No	ER70S-6	1
Size of filler Metals	1 mm solid	3,2 mm solid
Weld Metal		
Trickness Range:		
Groove	6 mm max	200 mm
Fillet	All thickness	All thickness
Electrode-Flux (Class)	/	AWS A5.17 F74A (neutral)
Flux Trade Name	/	/
Consumable Insert	/	/
Other	Pittarc QW404.24.27.32 not used	Pittarc No recrushed flux

* Each base metal-filler metal combination should be recorder individually. The tack weld is performed according to the first pass

AQ0293-03

CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)
Section IX, ASME Boiler and Pressure Vessel Code

POSITIONS (QW-405)
Position(s) of groove **FLAT**
Welding Progression UP: **No** Down: **No**
Position(s) of Fillet **/**

POSTWELD HEAT TREATMENT (QW-407)
Temperature Range: **No**
Time Range **No**

PREHEAT (QW-406)
Preheat Temp. Min. **>5°C**
Interpass Temp. Max. **250°C**
Preheat Maintenance **/**
(Contiuous or special healthing where applicable should be recorded)

GAS (QW-408)

	Gas(es)	Percent composition (Mixture)	Rate
Shielding	Arcal 14	Arg (96%) CO_2 (3%) O_2(1%)	18L/min $^{+/-3}$
Trailing	No	No	No
Backing	No	No	No

ELECTRICAL CHARRACTERISTICS (QW-409)
Current AC or DC **DC** Polarity **+**
Amps (Range) **+/- 10%** Volts (range) **+/- 10%**

Amps and volts range should be recorded for each electrode size, position, and thickness, etc. This information may be listed in a tabular or similar so that shown below.)

Tungsten electrode Size and Type **/**
Mode of Metal Transfer for GMAW **Spray arc**
Electrode Wire feed speed range **GMAW: 240 cm/min $^{+/-10\%}$; SAW: 240 cm/min $^{+/-10\%}$**

TECHNIQUE (QW-410)

String of Weave Bead **String Bead**
Office or Gas Cup size **ø 10 mm**
Initial and interpass Cleaning (Brushing, grinding, etc.) **Brushing-Grinding**

Method of Back Gouging **Grinding**
Oscillation **No**
Contact Tube to Work distance **20 mm $^{+/-5}$**
Multiple or Single pass (per side) **Multipass**
Multiple or Single Electrodes **Single**
Travel speed **GMAW: 18 cm/min $^{+/-10\%}$; SAW: 40 cm/min $^{+/-10\%}$**
Peening **Not permitted**
Other **Used of thermal processes: No**
Electrode spacing: No

Weld Layer	Process	Filler Metal Class	Filler Metal Dia	Current Type Polar.	Current Amp Range	Volt Range	Travel speed range	Other (e.g remarks, Comments, Hot wire, addition, Technique, Torch angle, etc)
1	GMAW	ER70S-6	1	DC+	$240^{+/-10\%}$	$28^{+/-10\%}$	$17^{+/-10\%}$	/
2 to 5	SAW	EM12	3,2	DC+	$500^{+/-10\%}$	$30^{+/-10\%}$	$40^{+/-10\%}$	/

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CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)

Section IX, ASME Boiler and Pressure Vessel Code

Company Name: **CHARLATTE RESERVOIRS** BY: **E.RAPPENEAU**

Welding Procedure Specification N°: **5**

Revision N° **2** Date **16/11/2012** Supportinng PQR N°(s) **11,02**

Welding Processes **GMAW including tack welds** Types **Semi-Automatic**

Automatics, Manual, Machine, or Semi auto

JOINTS (QW-402)

Joint Design: **Groove weld**

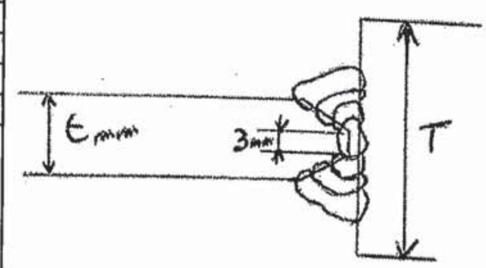
Backing (Yes) **Yes** (No) ____

Backing Material (Type): **Weld**

(Refer to both backing and retainers.)

Metal: **YES** Non Fusing Metal ____

Nonmetallic ____ Other **No retainers used**



Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.

(At the option of the Mfgr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process procedures, etc.)

BASE METALS (QW-403)

P-No **1** Group No **1 or 2** To P-No **1** Group No **1**

OR

Specification type and grade: /

To specificaton type and grade /

OR

Chem. Analyse and Mech. Prop. /

To chem. Analyse and Mech. Prop. /

Thickeness Range:

Base Metal — Groove **5 to 200mm** — Fillet **All thickness**

Pipe Dis. Range — Groove **All diameter** — Fillet **All diameter**

Other **No pass greater than 13mm**

*FILLER METAL (QW-404)		
Spec. No. (SFA)	5,18	
WS No. (Class)	ER70S-6	
-No	6	
A-No	ER70S-6	
Size of filler Metals	1mm solid	
Weld Metal		
Trickness Range:		
Groove	200mm max	
Fillet	All thickness	
Electrode-Flux (Class)	/	
Flux Trade Name	/	
Consumable Insert	/	
Other	Pittarc QW404-24-27-32 Not used No alloy elements	

* Each base metal-filler metal combination should be recorder individually. The tack weld is performed according to the first pass

AQ0293-03

CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)
Section IX, ASME Boiler and Pressure Vessel Code

POSITIONS (QW-405)
Position(s) of groove **FLAT**
Welding Progression UP: **No** Down: **No**
Position(s) of Fillet **/**

PREHEAT (QW-406)
Preheat Temp. Min. **>5°C**
Interpass Temp. Max. **250°C**
Preheat Maintenance **/**
(Contiuous or special healthing where applicable should be recorded)

POSTWELD HEAT TREATMENT (QW-407)
Temperature Range: **No**
Time Range **No**

GAS (QW-408)

	Percent composition Gas(es)	(Mixture)	Rate
Shielding	Arcal 14	Arg(96%) CO_2(3%) O_2(1%)	$18L/min^{+/-3}$
Trailing	No	No	No
Backing	No	No	No

ELECTRICAL CHARRACTERISTICS (QW-409)
Current AC or DC **DC** Polarity **+**
Amps (Range) **(+/- 10%)** Volts (range) **(+/- 10%)**

Amps and volts range should be recorded for each electrode size, position, and thickness, etc. This information may be listed in a tabular or similar so that shown below.)

Tungsten electrode Size and Type **/**
Mode of Metal Transfer for GMAW **Spray arc**
Electrode Wire feed speed range **240 cm/min** $^{+/-10\%}$

TECHNIQUE (QW-410)

String of Weave Bead **String Bead**
Office or Gas Cup size **ø 10mm**
Initial and interpass Cleaning (Brushing, grinding, etc.) **Brushing Grinding**

Method of Back Gouging **Grinding**
Oscillation **No**
Contact Tube to Work distance **20 mm** $^{+/-10\%}$
Multiple or Single pass (per side) **Multipass**
Multiple or Single Electrodes **Single**
Travel speed **See below**
Peening **Not permitted**
Other **Use of thermal processes: No**
Electrode spacing : No

Weld Layer	Process	Filler Metal Class	Dia	Current Type Polar.	Amp Range	Volt Range	Travel speed range	Other (e.g remarks, Comments, Hot wire, addition, Technique, Torch angle, etc)
1	GMAW	ER70S-6	1	DC+	$258^{+/-10\%}$	$28.5^{+/-10\%}$	$25+^{/-10\%}$	/
2 to n	GMAW	ER70S-6	1	DC+	$210^{+/-10\%}$	$28^{+/-10\%}$	$25^{+/-10\%}$	/

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CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)
Section IX, ASME Boiler and Pressure Vessel Code

Company Name: **CHARLATTE RESERVOIRS** BY: **C.BERTRAND**

Welding Procedure Specification N°: **1412-0034B-04-M1-1** **For application without impact test**

Revision N° **2** Date **16/11/2012** Supporting PQR N°(s) **02.04**

Welding Processes **GMAW** Types **Semi-Automatic**

Automatics, Manual, Machine, or Semi auto

JOINTS (QW-402)

Joint Design: **See sketches**

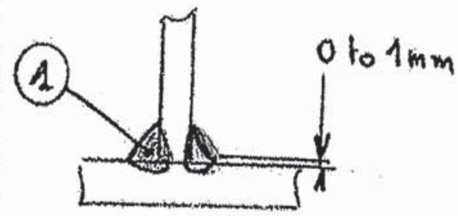
Backing (Yes) **Yes** (No)

Backing Material (Type): **Base Metal**

(Refer to both backing and retainers.)

Metal: **Yes** Non Fusing Metal

Nonmetallic Other **no retainers used**



Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.

(At the option of the Mfgr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process procedures, etc.)

BASE METALS (QW-403)

P-No **1** Group No **1 or 2** To P-No **1** Group No **1**

OR

Specification type and grade: /

To specificaton type and grade /

OR

Chem. Analyse and Mech. Prop. /

To chem. Analyse and Mech. Prop. /

Thickeness Range:

Base Metal Groove / Fillet /

Pipe Dis. Range Groove / Fillet **All diameter**

Other **No pass greater than 13mm**

*FILLER METAL (QW-404)		
Spec. No. (SFA)	**5,18**	
WS No. (Class)	**ER70S-6**	
-No	**6**	
A-No	**ER70S-6**	
Size of filler Metals	**ø 1mm solid**	
Weld Metal		
Trickness Range:		
Groove	/	
Fillet	**All**	
Electrode-Flux (Class)	/	
Flux Trade Name	/	
Consumable Insert	**NA**	
Other	**QW404-24-27-32** **Not used, No alloy elements**	

* Each base metal-filler metal combination should be recorder individually. The tack weld is performed according to the first pass

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CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)
Section IX, ASME Boiler and Pressure Vessel Code

POSITIONS (QW-405)
Position(s) of groove
Welding Progression UP: **No** Down: **No**
Position(s) of Fillet **Flat**

PREHEAT (QW-406)
Preheat Temp. Min. **10°C**
Interpass Temp. Max. **250°C**

Preheat Maintenance **No**

(Contiuous or special healthing where applicable should be recorded)

POSTWELD HEAT TREATMENT (QW-407)
Temperature Range: **Without**
Time Range **No**

GAS (QW-408)

	Gas(es)	Percent composition (Mixture)	Rate
Shielding	**Arcal 14**	**Arg(96%) CO_2(3%) O_2(1%)**	**18L/min$^{+/-3}$**
Trailing	**No**	**No**	**No**
Backing	**No**	**No**	**No**

ELECTRICAL CHARRACTERISTICS (QW-409)
Current AC or DC **DC** Polarity **+**
Amps (Range) **200A** $^{+/-10\%}$ Volts (range) **25V** $^{+/-2}$

Amps and volts range should be recorded for each electrode size, position, and thickness, etc. This information may be listed in a tabular or similar so that shown below.)

Tungsten electrode Size and Type **N/A**
Mode of Metal Transfer for GMAW **Spray arc**
Electrode Wire feed speed range **250 cm/min** $^{+/-10\%}$

TECHNIQUE (QW-410)

String of Weave Bead **String**
Office or Gas Cup size **ø 10mm**
Initial and interpass Cleaning (Brushing, grinding, etc.) **Brushing or Grinding**

Method of Back Gouging **No**
Oscillation **No**
Contact Tube to Work distance **20mm** $^{+/-5}$
Multiple or Single pass (per side) **Single or multiple**
Multiple or Single Electrodes **Single**
Travel speed **25 cm/min** $^{+/-5}$
Peening **Not permitted**
Other **Use of thermal processes: No**
Electrode spacing: No

Weld Layer	Process	Filler Metal Class	Filler Metal Dia	Current Type Polar.	Current Amp Range	Volt Range	Travel speed range	Other (e.g remarks, Comments, Hot wire, addition, Technique, Torch angle, etc)
1	GMAW.P	/	ø 1mm	DC+	200A$^{+/-10}$	25V$^{+/-2}$	25cm/min $^{+/-5}$	/

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CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)
Section IX, ASME Boiler and Pressure Vessel Code

Company Name: **CHARLATTE RESERVOIRS** BY: **C.BERTRAND**
Welding Procedure Specification N°: **1412-0034B-04-M1-7** **For applications without impact tests**
Revision N° **2** Date **16/11/2012** Supportinng PQR N°(s) **02.04**
Welding Processes **GMAW** Types **Semi-Automatic**
Automatics, Manual, Machine, or Semi auto

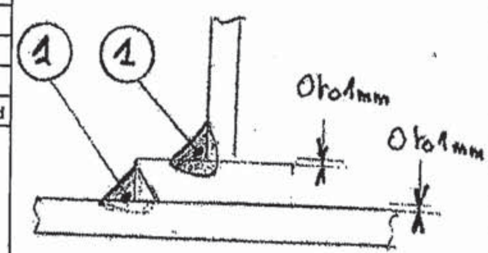
JOINTS (QW-402)

Joint Design: **See Sketches**

Backing (Yes) **Yes** (No)
Backing Material (Type): **Base Metal**
(Refer to both backing and retainers.)

Metal: **Yes** Non Fusing Metal

Nonmetallic Other **no retainers used**



Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.

(At the option of the Mfgr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process procedures, etc.)

BASE METALS (QW-403)

P-No **1** Group No **1** To P-No **1** Group No **1 or 2**
OR
Specification type and grade: /
To specificaton type and grade /
OR
Chem. Analyse and Mech. Prop. /
To chem. Analyse and Mech. Prop. /
Thickeness Range:
Base Metal Groove / Fillet **All**
Pipe Dis. Range Groove / Fillet **All diameter**
Other **No pass greater than 13mm**

*FILLER METAL (QW-404)		
Spec. No. (SFA)	**5,18**	
WS No. (Class)	**ER70S-6**	
-No	**6**	
A-No	**ER70S-6**	
Size of filler Metals	**ø 1mm solid**	
Weld Metal Thickness Range:		
Groove	/	
Fillet	**All thickness**	
Electrode-Flux (Class)	/	
Flux Trade Name	/	
Consumable Insert	**NA**	
Other	**QW 404-24-27-32 Not used, No alloy elements**	

* Each base metal-filler metal combination should be recorder individually. The tack weld is performed according to the first pass

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CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)
Section IX, ASME Boiler and Pressure Vessel Code

POSITIONS (QW-405)
Position(s) of groove
Welding Progression UP: **No** Down: **No**
Position(s) of Fillet **Flat**

POSTWELD HEAT TREATMENT (QW-407)
Temperature Range: **Without**
Time Range **No**

PREHEAT (QW-406)
Preheat Temp. Min. **10°C**
Interpass Temp. Max. **250°C**

Preheat Maintenance **No**

(Contiuous or special healthing where applicable should be recorded)

GAS (QW-408)

	Percent composition Gas(es)	(Mixture)	Rate
Shielding	Arcal 14	Arg(96%) CO_2(3%) O_2(1%)	18L/min $^{+/-3}$
Trailing	No	No	No
Backing	No	No	No

ELECTRICAL CHARRACTERISTICS (QW-409)
Current AC or DC **DC** Polarity **+ pulsed**
Amps (Range) **100A $^{+/-10\%}$** Volts (range) **25V $^{+/-10\%}$**

Amps and volts range should be recorded for each electrode size,
position, and thickness, etc. This information may be listed in a tabular or similar so that shown below.)

Tungsten electrode Size and Type **NA**
Mode of Metal Transfer for GMAW **Spray arc**
Electrode Wire feed speed range **250 cm/min $^{+/-10\%}$**

TECHNIQUE (QW-410)

String of Weave Bead **String**
Office or Gas Cup size **ø 10 mm**
Initial and interpass Cleaning (Brushing, grinding, etc.) **Brushing or Grinding**

Method of Back Gouging **No**
Oscillation **No**
Contact Tube to Work distance **20mm $^{+/-10\%}$**
Multiple or Single pass (per side) **Single or multiple**
Multiple or Single Electrodes **Single**
Travel speed **25 cm/min $^{+/-10\%}$**
Peening **Not permitted**
Other **Use of thermal processes: No**
Electrode spacing: No

Weld Layer	Process	Filler Metal Class	Filler Metal Dia	Current Type Polar.	Current Amp Range	Volt Range	Travel speed range	Other (e.g remarks, Comments, Hot wire, addition, Technique, Torch angle, etc)
1	GMAW	ER70S-6	ø 1mm	DC+	100A $^{+/-10}$	25 $^{+/-10\%}$	25 $^{+/-10\%}$	Pulsed

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CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)
Section IX, ASME Boiler and Pressure Vessel Code

Company Name: **CHARLATTE RESERVOIRS** BY: **E.RAPPENEAU**

Welding Procedure Specification N°: **1412-0034B-04-M1-5**

Revision N° **2** Date **16/11/2012** Supportinng PQR N°(s) **02.04**

Welding Processes **GMAW** Types

Automatics, Manual, Machine, or Semi auto

JOINTS (QW-402)

Joint Design: **See sketches**

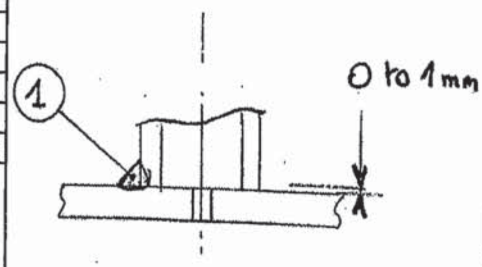
Backing (Yes) **Yes** (No)

Backing Material (Type): **Base Metal**

(Refer to both backing and retainers.)

Metal: **Yes** Non Fusing Metal

Nonmetallic Other **no retainers used**



Small nozzles

Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.

(At the option of the Mfgr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process procedures, etc.)

BASE METALS (QW-403)

P-No **1** Group No **1 or 2** To P-No **1** Group No **1**

OR

Specification type and grade: /

To specificaton type and grade /

OR

Chem. Analyse and Mech. Prop.

To chem. Analyse and Mech. Prop.

Thickeness Range:

Base Metal Groove / Fillet /

Pipe Dis. Range Groove / Fillet **All diameter**

Other **No pass greater than 13mm**

*FILLER METAL (QW-404)		
Spec. No. (SFA)	**5,18**	
WS No. (Class)	**ER70S-6**	
-No	**6**	
A-No	**ER70S-6**	
Size of filler Metals	**ø 1mm solid**	
Weld Metal		
Trickness Range:		
Groove	/	
Fillet	**All**	
Electrode-Flux (Class)	/	
Flux Trade Name	/	
Consumable Insert	**NA**	
Other	QW404-24-27-32 **Not used, No alloy elements**	

* Each base metal-filler metal combination should be recorder individually. The tack weld is performed according to the first pass

AQ0293-03

CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)
Section IX, ASME Boiler and Pressure Vessel Code

POSITIONS (QW-405)
Position(s) of groove
Welding Progression UP: **No** Down: **No**
Position(s) of Fillet **Flat**

POSTWELD HEAT TREATMENT (QW-407)
Temperature Range: **Without**
Time Range **NA**

PREHEAT (QW-406)
Preheat Temp. Min. **10°c**
Interpass Temp. Max. **250°c**
Preheat Maintenance **No**

(Contiuous or special healthing where applicable should be recorded)

GAS (QW-408)

	Percent composition		
	Gas(es)	(Mixture)	Flow
Rate	Arcal 14	Arg(96%) CO_2(3%) O_2(1%)	18L/min $^{+/-3}$
Trailing	No	No	No
Backing	No	No	No

ELECTRICAL CHARRACTERISTICS (QW-409)
Current AC or DC **DC** Polarity **+ pulsed**
Amps (Range) **200A** $^{+/-10\%}$ Volts (range) **25V** $^{+/-2}$

Amps and volts range should be recorded for each electrode size,
position, and thickness, etc. This information may be listed in a tabular or similar so that shown below.)

Tungsten electrode Size and Type **NA**
Mode of Metal Transfer for GMAW **Spray arc**
Electrode Wire feed speed range **250cm/min** $^{+/-10\%}$

TECHNIQUE (QW-410)

String of Weave Bead **String**
Office or Gas Cup size **ø 10mm**
Initial and interpass Cleaning (Brushing, grinding, etc.) **Brushing or Grinding**

Method of Back Gouging **No**
Oscillation **No**
Contact Tube to Work distance **20mm** $^{+/-5}$
Multiple or Single pass (per side) **Single or Multiple**
Multiple or Single Electrodes **Single**
Travel speed **25cm/min** $^{+/-5}$
Peening **Not permitted**
Other **Use of thermal processes: No**
Electrode spacing: No

Weld Layer	Process	Filler Metal Class	Filler Metal Dia	Current Type Polar.	Current Amp Range	Volt Range	Travel speed range	Other (e.g remarks, Comments, Hot wire, addition, Technique, Torch angle, etc)
1	GMAW.P	/	ø1mm	DC+	200A $^{+/-10}$	25V $^{+/-2}$	25cm/min $^{+/-5}$	/

AQ0293-03

CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)
Section IX, ASME Boiler and Pressure Vessel Code

Company Name: **CHARLATTE RESERVOIRS** BY: **C.BERTRAND**

Welding Procedure Specification N°: **1412-0034B-04-M1-6** **For applications without impact tests**

Revision N° **2** Date **16/11/2012** Supportinng PQR N°(s) **02.04**

Welding Processes **GMAW** Types **Semi-Automatic**

Automatics, Manual, Machine, or Semi auto

JOINTS (QW-402)

Joint Design: **See Sketches**

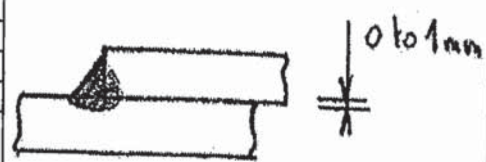
Backing (Yes) **Yes** (No)

Backing Material (Type): **Base Metal**

(Refer to both backing and retainers.)

Metal: **Yes** Non Fusing Metal

Nonmetallic Other **no retainers used**



Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.

(At the option of the Mfgr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process procedures, etc.)

BASE METALS (QW-403)

P-No **1** Group No **1 or 2** To P-No **1** Group No **1**

OR

Specification type and grade: /

To specificaton type and grade /

OR

Chem. Analyse and Mech. Prop. /

To chem. Analyse and Mech. Prop. /

Thickeness Range:

Base Metal Groove / Fillet /

Pipe Dis. Range Groove / Fillet **All diameter**

Other **No pass greater than 13mm**

*FILLER METAL (QW-404)		
Spec. No. (SFA)	**5,18**	
WS No. (Class)	**ER70S-6**	
-No	**6**	
A-No	**ER70S-6**	
Size of filler Metals	**ø 1mm solid**	
Weld Metal Trickness Range:		
Groove	/	
Fillet	**All**	
Electrode-Flux (Class)	/	
Flux Trade Name	/	
Consumable Insert	**NA**	
Other	**QW 404-24-27-32 Not used, No, alloy elements**	

* Each base metal-filler metal combination should be recorder individually. The tack weld is performed according to the first pass

AQ0293-03

CHARLATTE RESERVOIRS FAYAT GROUP

WELDING PROCEDURE SPECIFICATIONS (WPS)
Section IX, ASME Boiler and Pressure Vessel Code

POSITIONS (QW-405)
Position(s) of groove
Welding Progression UP: **No** Down: **No**
Position(s) of Fillet **Flat**

POSTWELD HEAT TREATMENT (QW-407)
Temperature Range: **Without**
Time Range **No**

PREHEAT (QW-406)
Preheat Temp. Min. **10°C**
Interpass Temp. Max. **250°C**
Preheat Maintenance **None**

(Contiuous or special healthing where applicable should be recorded)

GAS (QW-408)

	Percent composition		
	Gas(es)	(Mixture)	Rate
Shielding	Arcal 14	Arg(96%) CO_2(3%) O_2(1%)	18L/min $^{+/-3}$
Trailing	No	No	No
Backing	No	No	No

ELECTRICAL CHARRACTERISTICS (QW-409)
Current AC or DC **DC** Polarity **+ pulsed**
Amps (Range) **100A $^{+/-10\%}$** Volts (range) **25V $^{+/-2}$**

Amps and volts range should be recorded for each electrode size, position, and thickness, etc. This information may be listed in a tabular or similar so that shown below.)

Tungsten electrode Size and Type **NA**
Mode of Metal Transfer for GMAW **Spray arc**
Electrode Wire feed speed range **250 cm/min $^{+/-10\%}$**

TECHNIQUE (QW-410)

String of Weave Bead **String**
Office or Gas Cup size **ø 10 mm**
Initial and Interpass Cleaning (Brushing, grinding, etc.) **Brushing or Grinding**

Method of Back Gouging **No**
Oscillation **No**
Contact Tube to Work distance **20mm $^{+/-5}$**
Multiple or Single pass (per side) **Single or multiple**
Multiple or Single Electrodes **Single**
Travel speed **25 cm/min $^{+/-5}$**
Peening **Not permitted**
Other **Use of thermal processes: No**
Electrode spacing: No

Weld Layer	Process	Filler Metal Class	Filler Metal Dia	Current Type Polar.	Current Amp Range	Volt Range	Travel speed range	Other (e.g remarks, Comments, Hot wire, addition, Technique, Torch angle, etc)
1	GMAW	ER70S-6	ø 1mm	DC+	100$^{+/-10}$	25V$^{+/-2}$	25$^{+/-5}$	/

AQ0293-03

CHARLATTE RESERVOIRS
FAYAT GROUP

PROCEDURE QUALIFICATION RECORD (PQR)
(QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
Record Actual Conditions Used to Weld Test Coupon

Company Name: **CHARLATTE RESERVOIRS**

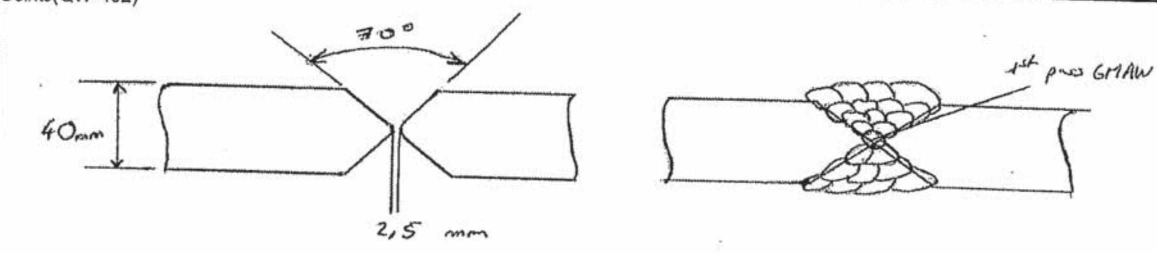
Procedure qualification Records N°: **11.01** Date: **20/10/2011**

WPS: **1**

Welding Process(es): **GMAW + SAW**

Types(Manual, Automatic, Semi-Auto...): **Semi-Auto + Machine**

Joints(QW-402)



1 → GMAW
2 to n → SAW

Groove design of test Coupon

(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used)

BASE METAL(QW-403)

Materiel spec.:	**SA 516 grade 60**
Type or grade:	**Grade 60**
P.N°:	**1**
To P.N°:	**1**
Thickness of test coupon:	**40mm**
Diameter of test coupon:	**N/A**
Other	**Heat number: 770 688**

POSTWELD HEAT TREATMENT (QW-407)

Temperature:	**No**
Time:	**No**
Other:	**No**

GAS (QW-408)

	Gas(es)	Percent Composition (Mixture)	Flow Rate
Shielding	**Arcal 14**	**Arg(96%) CO_2(3%) O_2(1%)**	**18L/min $^{+/-3}$**
Trailing	**No**	**No**	**No**
Backing	**No**	**No**	**No**

FILLER METALS (QW-404)

	GMAW	SAW
SHA Spécification:	**5.18**	**5.17**
AWS Classification:	**ER70S-6**	**EM12K**
Filler Metal F.N°:	**6**	**6**
Weld Metal Analysis A.N°:	**ER70S-6**	**1**
Size of Filler Metal:	**1mm solid**	**3,2mm solid**
Other:	**PITTARC**	**PITTARC Flux: F6AP2**
Weld Metal Thickness:	**3mm**	**37mm**

ELECTRICAL CHARACTERISTICS (QW-409)

Current **DC**

Polarity **EP (+)**

Amps. **265 $^{+/-10\%}$ GMAW** / **565 $^{+/-10\%}$ SAW** Volts **30 $^{+/-10\%}$ GMAW** / **32 $^{+/-10\%}$ SAW**

Tungsten Electrode size /

Other /

POSITION (QW-405)

Position of groove **1G**

Weld Progression (Uphill, Downhill) **N/A**

Other **N/A**

TECHNIQUE (QW-410)

Travel seed: /

String or Weave Bead: **String**

Oscillation: /

Multipass or single pass (per side): **Multipass**

Single or Multiple Electrodes: **Single wire**

Other: **Spray arc (GMAW)**

No recrushed flux / neutral flux

Used of thermal processes: No

No supplementary filler metal or alloy elements.

QW403.9 : not used

PREHEAT (QW-406)

Prehead temp.: **>5°C**

Interpass Temp **<250°C**

Other: /

AQ0294-03

CHARLATTE RESERVOIRS FAYAT GROUP

PROCEDURE QUALIFICATION RECORD (PQR)
(QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
Record Actual Conditions Used to Weld Test Coupon

QW-403 (Back)

PQR: **11.01**

Tensile Test (QW-150)

Specimen N°	Width	Thickness	Area	Ultimate Total Load Lb	Ultimate Unit Stress Mpa	Type of Failure & Location
1	19,10	21,07	404,44	/	503 Mpa	Base metal
2	19,07	21,06	401,61	/	506 Mpa	Base metal
3	19,07	21,08	401,00	/	507 Mpa	Base metal
4	19,07	21,08	402,42	/	503 Mpa	Base metal

Guided-Bend Tests (QW-160)

Type and Figure N°	Result
C1 Side band test 39×10	180° No defect: conform
C2 Side band test 39×10	180° No defect: conform
C3 Side band test 39×10	180° No defect: conform
C4 Side band test 30×10	180° No defect: conform

Thoughess Tests (QW-170)

Specimen N°	Notch Location	Specimen size	Test Temp.	Impact values FT .lbs	% Shear	Mils	Drop Weight Break (Y/N)
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/

Comments: **No comments**

Fillet-Weld Test (QW-180)

Result----Satisfactory: Yes: / No: /
Penetration in parent Metal: Yes: / No: /
Macro--- Result: /

Other Tests

Type of test: **Radiograhic test, No defect satisfactory**
Deposit Analysis:
Other:

Welder's Name: **BUCHET Philipe** Clock N°: / Stamp N° o
Test conducted by: **J. REYNAUD** Laboratery Test N°: **20115595-2-TP**

We certify that statement in this record are correct and that the test welds were prepared, welded andtested in accordance with the requirements of Section IX of the ASME Code.

Date: **29/10/2011** Manufacturer: CHARLATTE RESERVOIR
By: **RAPPENEAU**

(Detail of record tests are illustrative only and may be modified to conform to the type and number of test required by the code.)

AQ0294-03

CHARLATTE RESERVOIRS FAYAT GROUP

PROCEDURE QUALIFICATION RECORD (PQR)

(QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
Record Actual Conditions Used to Weld Test Coupon

Company Name: **CHARLATTE RESERVOIRS**

Procedure qualification Records N°: **11.02**

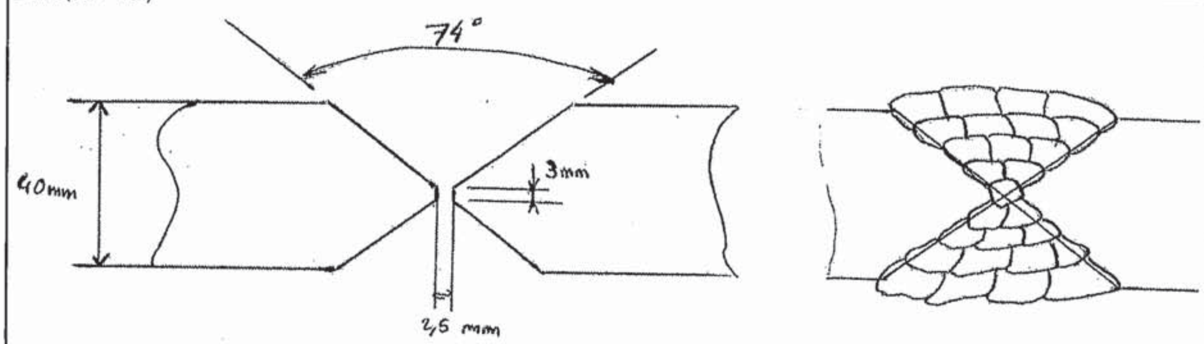
Date: **20/10/2011**

WPS: **2**

Welding Process(es): **GMAW**

Types(Manual, Automatic, Semi-Auto...): **Semi-Auto.**

Joints(QW-402)



Groove design of test Coupon

(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used)

BASE METAL(QW-403)

Materiel spec.:	SA 516
Type or grade:	Grade 60
P.N°:	1
To P.N°:	1
Thickness of test coupon:	40mm
Diameter of test coupon:	N/A
Other	Heat number: 103 926

POSTWELD HEAT TREATMENT (QW-407)

Temperature:	No
Time:	No
Other:	No

GAS (QW-408)

	Gas(es)	Percent Composition (Mixture)	Flow Rate
Shielding	Arcal 14	Arg(96%) CO_2(3%) O_2(1%)	18L/min $^{+/-3}$
Trailing	/	/	/
Backing	/	/	/

FILLER METALS (QW-404)

SHA Spécification:	5.18	
AWS Classification:	ER70S-6	
Filler Metal F.N°:	6	
Weld Metal Analysis A.N°:	ER70S-6	
Size of Filler Metal:	1,2mm	
Other:	PITTARC	
No supplementary filler metal or alloy elements		
Weld Metal Thickness:	40mm	

ELECTRICAL CHARACTERISTICS (QW-409)

Current	DC		
Polarity	EP (+)		
Amps.	240 to 290 A	Volts	25 to 27 V
Tungsten Electrode size		/	
Other	/		

POSITION (QW-405)

Position of groove: 1G

Weld Progression (Uphill, Downhill): N/A

Other: /

TECHNIQUE (QW-410)

Travel seed:	
String or Weave Bead:	String
Oscillation:	No
Multipass or single pass (per side):	Multipass
Single or Multiple Electrodes:	Single
Other:	Spray arc

Use of thermal processes: No

No pass greater than 13mm

PREHEAT (QW-406)

Prehead temp.: >10°C

Interpass Temp: <250°C

Other:

AQ0294-03

CHARLATTE RESERVOIRS FAYAT GROUP

PROCEDURE QUALIFICATION RECORD (PQR)
(QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
Record Actual Conditions Used to Weld Test Coupon

QW-403 (Back)

PQR: **11.02**

Tensile Test (QW-150)

Specimen N°	Width	Thickness	Area	Ultimate Total Load Lb	Ultimate Unit Stress Mpa	Type of Failure & Location
1	19,07	21,03	401,04	/	505	Base Metal
2	19,08	21,00	400,68	/	506	Base Metal
3	19,08	21,04	401,44	/	507	Base Metal
4	19,07	21,01	400,66	/	506	Base Metal

Guided-Bend Tests (QW-160)

Type and Figure N°	Result
C1 Side bend test 38×10	Defect size 1mm : Conform
C2 Side bend test 38×10	Defect size 0,8mm : Conform
C3 Side bend test 38×10	No defect: Conform
C4 Side bend test 38×10	No defect: Conform

Thoughess Tests (QW-170)

Specimen N°	Notch Location	Specimen size	Test Temp.	Impact values			Drop Weight Break (Y/N)
				FT .lbs	% Shear	Mils	
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
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/	/	/	/	/	/	/	/
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/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/

Comments: **No comments**

Fillet-Weld Test (QW-180)

Result----Satisfactory: Yes: / No: /
Penetration in parent Metal: Yes: / No: /
Macro--- Result: /

Other Tests

Type of test: **Radiographic test, No defect satisfactory**
Deposit Analysis:
Other:

Welder's Name: **TRIDON Sebastien** Clock N°: / Stamp N° **W**
Test conducted by: **J. NOEL** Laboratery Test N°: **20115595-3-TP**

We certify that statement in this record are correct and that the test welds were prepared, welded andtested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer: CHARLATTE RESERVOIR
Date: **26/10/2011** By: **RAPPENEAU**

(Detail of record tests are illustrative only and may be modified to conform to the type and number of test required by the code.)

AQ0294-03

CHARLATTE RESERVOIRS FAYAT GROUP

PROCEDURE QUALIFICATION RECORD (PQR)
(QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
Record Actual Conditions Used to Weld Test Coupon

Company Name: **CHARLATTE RESERVOIRS**

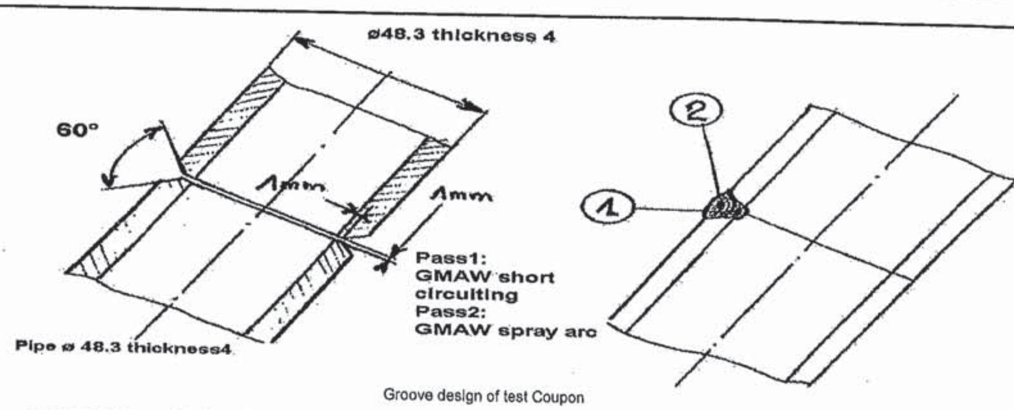
Procedure qualification Records N°: **02.04** Date: **01/02/2005**

WPS: **1412 0034 B04 M1 rev1**

Welding Process(es): **GMAW**

Types(Manual, Automatic, Semi-Auto...): **Semi-Auto.**

Joints(QW-402)



Groove design of test Coupon

(For combination qualifications, the deposited weld metal thickness shall be recorded for each filter metal or process used)

BASE METAL(QW-403)

Materiel spec.:	SA 106 grade B
Type or grade:	Grade B
P.N°:	1
To P.N°:	1
Thickness of test coupon:	4mm
Diameter of test coupon:	ø48,3
Other	None

POSTWELD HEAT TREATMENT (QW-407)

Temperature:	/
Time:	/
Other:	/

GAS (QW-408)

	Gas(es)	Percent Composition (Mixture)	Flow Rate
Shielding	Arcal 14	Arg(96%) CO_2(3%) O_2(1%)	18L/min $^{+/-3}$
Trailing	NA	NA	NA
Backing	NA	NA	NA

FILLER METALS (QW-404)

SHA Spécification:	5.18
AWS Classification:	ER70S-6
Filler Metal F.N°:	6
Weld Metal Analysis A.N°:	ER70S-6
Size of Filler Metal:	ø1mm solid
Other:	None
Weld Metal Thickness:	Short circuiting 2mm; Spray arc 2mm

ELECTRICAL CHARACTERISTICS (QW-409)

Current	DC		
Polarity	+		
Amps.	100 to 120A	Volts	17 to 25V
Tungsten Electrode size		/	
Other	/		

POSITION (QW-405)

Position of groove	6G
Weld Progression (Uphill, Downhill)	Uphill
Other	/

TECHNIQUE (QW-410)

Travel seed:	25cm/min $^{+/-5}$
String or Weave Bead:	String
Oscillation:	No
Multipass or single pass (per side):	Multipass or Single
Single or Multiple Electrodes:	Single
Other:	None

QW404-24 and 27not used

Use of thermal processes: No

QW403.9: not used

PREHEAT (QW-406)

Prehead temp.:	>10°C
Interpass Temp	<250°C
Other:	/

AQ0294-03

CHARLATTE RESERVOIRS FAYAT GROUP

PROCEDURE QUALIFICATION RECORD (PQR)
(QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
Record Actual Conditions Used to Weld Test Coupon

QW-403 (Back)

PQR: **02.04**

Tensile Test (QW-150)

Specimen N°	Width	Thickness	Area	Ultimate Total Load Lb	Ultimate Unit Stress Mpa	Type of Failure & Location
T1	18,95	3,97	75,23	/	433	Outside Weld
T2	19,02	4,10	77,98	/	423	Outside Weld

Guided-Bend Tests (QW-160)

Type and Figure N°	Result
P1 Trought Face Bend test 9,4×4	180° No Defect Conform
P2 Trought Face Bend test 9,4×4	180° No Defect Conform
P3 Trought Face Bend test 9,4×4	180° No Defect Conform
P4 Trought Face Bend test 9,4×4	180° No Defect Conform

Thoughess Tests (QW-170)

Specimen N°	Notch Location	Specimen size	Test Temp.	Impact values			Drop Weight Break (Y/N)
				FT .lbs	% Shear	Mils	
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/
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/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/

Comments: **No comments**

Fillet-Weld Test (QW-180)

Result----Satisfactory: Yes: / No: /
Penetration in parent Metal: Yes: / No: /
Macro--- Result: **Without Defect Satisfactory**

Other Tests

Type of test: **Radiographic test; No defect satisfactory**
Deposit Analysis: /
Other: /

Welder's Name: **MACHADO and OLMO** Clock N°: / Stamp N° **U and Q**
Test conducted by: **C. FAVEYRIAL** Laboratery Test N°: **VD28**

We certify that statement in this record are correct and that the test welds were prepared, welded andtested in accordance with the requirements of Section IX of the ASME Code.

Date: **21/05/2005** Manufacturer: CHARLATTE RESERVOIR
By: **C. BERTRAND**

(Detail of record tests are illustrative only and may be modified to conform to the type and number of test required by the code.)

AQ0294-03

CHARLATTE RESERVOIRS FAYAT GROUP

QW-484B FORMAT B
FOR WELDER OPERATOR PERFORMANCE QUALIFICATIONS (WOPQ)
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's name: **DUPRE Eric** Identification no.: **D**

Test Description (Information only)

Identification of WPS followed: **1P** ☐ Test coupon ☑ Production weld

Specification of base metal(s): **SA 516 grade 70** Thickness: **35**

Base number P or S-number: **1** To P or S-number: **1** Position (2G, 6G, 3F, etc): **1G**

☑ Plate ☐ Pipe (enter diameter if pipe or tube) : /

Filler metal (SFA) specification: **5.17** Filler metal or electrode classification: **F7A2- EM12**

Testing Conditions and Qualification Limits When Using Automatic Welding Equipement

Welding Variables (QW-361.1)	Actual Values	Range Qualified
Type of welding (Automatic):	/	/
Welding process:	/	/
Filler metal (EBW or LBW):	/	/
Type of laser for LBW (CO2 to YAG, etc.):	/	/
Continuous drive or inerta welding (FW):	/	/
Vacuum or out of vacuum (EBW):	/	/

Testing Condition and Qualification Limits When Using Machine Welding Equipement

Welding Variables (QW-361.2)	Actual Values	Range Qualified
Type of welding (Machine):	Machine	Machine
Welding process:	SAW	SAW
Direct or remove visual control:	Direct	Direct
Automatic arc voltage control (GTAW):	N/A	N/A
Automatic joint tracking:	No	With or Without
Position qualified (2G, 6G, 3F, etc.):	1 G	Flat
Consumable inserts (GTAW or PAW):	N/A	N/A
Backing (metal, weld metal, etc.):	With	With
Single or multiple passes per side:	Multiple	Multiple or Single

Results

Visual Examination of Completed Weld (QW-302.4): **Satisfactory**

☐ Bend test, ☐ Transverse root and face [QW-462.3(a)], ☐ Longitudinal root and face [QW-462.3(b)]

☐ Side [QW-462.2, ☐ Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)],

☐ Plate bend specimen, corrosion-resistant overlay [QW-462.5(d)],

☐ Macro test for fusion[QW-462.5(b)], ☐ Macro test for fusion[QW-462.5(e)],

Type	Result	Type	Result	Type	Result
/	/	/	/	/	/
/	/	/	/	/	/

Alternative radiographic examination results (QW-191): **Satisfactory 4500AV16 (100%)**

Fillet weld - fracture test (QW-180): /

Length and percent of defects: /

Macro examination (QW-184): /

Fillet size (in.): / × / Concavity / convexity (in.): /

Other tests: /

Film or specimens evaluated by: **A. LAFORGE ASNT RX level II**

Company: **CHARLATTE RESERVOIRS**

Mechanical tests conducted by: /

Laboratery test no.: /

Welding supervised by: **E. RAPPENEAU**

We certify that the statement in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of section IX of the ASME Code.

Date: **19/12/2011**

Organization: **CHARLATTE-QAM**
By: **E. RAPPENEAU**

AQ0315-02

CHARLATTE RESERVOIRS FAYAT GROUP

QW-484B FORMAT B
FOR WELDER OPERATOR PERFORMANCE QUALIFICATIONS (WOPQ)
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's name: **DUSSAULT Jean-Claude** Identification no.: **B**

Test Description (Information only)

Identification of WPS followed: **WPS 1P2** ☐ Test coupon ☑ Production weld

Specification of base metal(s): **SA 516 grade 70** Thickness: **35**

Base number P or S-number: **1** To P or S-number: **1** Position (2G, 6G, 3F, etc): **1G**

☑ Plate ☐ Pipe (enter diameter if pipe or tube) : /

Filler metal (SFA) specification: **5.17** Filler metal or electrode classification: **F7A2 - EM12**

Testing Conditions and Qualification Limits When Using Automatic Welding Equipement

Welding Variables (QW-361.1)	Actual Values	Range Qualified
Type of welding (Automatic):	/	/
Welding process:	/	/
Filler metal (EBW or LBW):	/	/
Type of laser for LBW (CO2 to YAG, etc.):	/	/
Continuous drive or inerta welding (FW):	/	/
Vacuum or out of vacuum (EBW):	/	/

Testing Condition and Qualification Limits When Using Machine Welding Equipement

Welding Variables (QW-361.2)	Actual Values	Range Qualified
Type of welding (Machine):	Machine	Machine
Welding process:	SAW	SAW
Direct or remove visual control:	Direct	Direct
Automatic arc voltage control (GTAW):	N/A	N/A
Automatic joint tracking:	No	With or Without
Position qualified (2G, 6G, 3F, etc.):	1G	Flat
Consumable inserts (GTAW or PAW):	N/A	N/A
Backing (metal, weld metal, etc.):	With	With
Single or multiple passes per side:	Multiple	Single or Multiple

Results

Visual Examination of Completed Weld (QW-302.4): **Satisfactory**

☐ Bend test, ☐ Transverse root and face [QW-462.3(a)], ☐ Longitudinal root and face [QW-462.3(b)]

☐ Side [QW-462.2, ☐ Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)],

☐ Plate bend specimen, corrosion-resistant overlay [QW-462.5(d)],

☐ Macro test for fusion[QW-462.5(b)], ☐ Macro test for fusion[QW-462.5(e)],

Type	Result	Type	Result	Type	Result
/	/	/	/	/	/
/	/	/	/	/	/

Alternative radiographic examination results (QW-191): **Satisfactory 4500AV16 (100%)**

Fillet weld - fracture test (QW-180): /

Length and percent of defects: /

Macro examination (QW-184): /

Fillet size (in.): / × / Concavity / convexity (in.): /

Other tests: /

Film or specimens evaluated by: **A. LAFORGE COFREND II RX**

Company: **CHARLATTE RESERVOIRS**

Mechanical tests conducted by: /

Laboratery test no.: /

Welding supervised by: **E. RAPPENEAU**

We certify that the statement in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of section IX of the ASME Code.

Date: **19/12/2011** Organization: **CHARLATTE-QAM**

By: **E. RAPPENEAU**

AQ0315-02

CHARLATTE RESERVOIRS FAYAT GROUP

QW-484B FORMAT B
FOR WELDER OPERATOR PERFORMANCE QUALIFICATIONS (WOPQ)
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's name: **ASCLAR Joël** Identification no.: **V**

Test Description (Information only)

Identification of WPS followed: **9** ☐ Test coupon ☑ Production weld

Specification of base metal(s): **SA 516 grade 70** Thickness: **16**

Base number P or S-number: **1** To P or S-number: **2** Position (2G, 6G, 3F, etc): **1 G**

☑ Plate ☐ Pipe (enter diameter if pipe or tube) : /

Filler metal (SFA) specification: **5.17** Filler metal or electrode classification: **F7A2 - EM12**

Testing Conditions and Qualification Limits When Using Automatic Welding Equipement

Welding Variables (QW-361.1)	Actual Values	Range Qualified
Type of welding (Automatic):	/	/
Welding process:	/	/
Filler metal (EBW or LBW):	/	/
Type of laser for LBW (CO2 to YAG, etc.):	/	/
Continuous drive or inerta welding (FW):	/	/
Vacuum or out of vacuum (EBW):	/	/

Testing Condition and Qualification Limits When Using Machine Welding Equipement

Welding Variables (QW-361.2)	Actual Values	Range Qualified
Type of welding (Machine):	Machine	Machine
Welding process:	SAW	SAW
Direct or remove visual control:	Direct	Direct
Automatic arc voltage control (GTAW):	N/A	N/A
Automatic joint tracking:	No	Without
Position qualified (2G, 6G, 3F, etc.):	1 G	Flat
Consumable inserts (GTAW or PAW):	N/A	N/A
Backing (metal, weld metal, etc.):	With	With
Single or multiple passes per side:	Multiple passes	Multiple passes or Single

Results

Visual Examination of Completed Weld (QW-302.4): **Satisfactory**

☐ Bend test, ☐ Transverse root and face [QW-462.3(a)], ☐ Longitudinal root and face [QW-462.3(b)]

☐ Side [QW-462.2, ☐ Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)],

☐ Plate bend specimen, corrosion-resistant overlay [QW-462.5(d)],

☐ Macro test for fusion[QW-462.5(b)], ☐ Macro test for fusion[QW-462.5(e)],

Type	Result	Type	Result	Type	Result
/	/	/	/	/	/
/	/	/	/	/	/

Alternative radiographic examination results (QW-191): **Satisfactory 2000AH 92S**

Fillet weld - fracture test (QW-180): /

Length and percent of defects: /

Macro examination (QW-184): /

Fillet size (in.): / × / Concavity / convexity (in.): /

Other tests: /

Film or specimens evaluated by: **A. LAFORGE ASNT RX level II**

Company: **CHARLATTE RESERVOIRS**

Mechanical tests conducted by: /

Laboratery test no.: /

Welding supervised by: **E. RAPPENEAU**

We certify that the statement in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of section IX of the ASME Code.

Date: **21/02/2012**

Organization: **CHARLATTES-QAM**
By: **E. RAPPENEAU**

AQ0315-02

CHARLATTE RESERVOIRS FAYAT GROUP

QW-484B FORMAT B
FOR WELDER OPERATOR PERFORMANCE QUALIFICATIONS (WOPQ)
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's name: **BUCHET Philippe** Identification no.: **O**

Test Description (Information only)

Identification of WPS followed: **WPS 1** ☑ Test coupon ☐ Production weld

Specification of base metal(s): **SA 516 grade 60** Thickness: **40mm**

Base number P or S-number: **1** To P or S-number: **1** Position (2G, 6G, 3F, etc): **1G**

☑ Plate ☐ Pipe (enter diameter if pipe or tube) : /

Filler metal (SFA) specification: **5.17** Filler metal or electrode classification: **EM12K**

Testing Conditions and Qualification Limits When Using Automatic Welding Equipement

Welding Variables (QW-361.1)	Actual Values	Range Qualified
Type of welding (Automatic):	/	/
Welding process:	/	/
Filler metal (EBW or LBW):	/	/
Type of laser for LBW (CO2 to YAG, etc.):	/	/
Continuous drive or inerta welding (FW):	/	/
Vacuum or out of vacuum (EBW):	/	/

Testing Condition and Qualification Limits When Using Machine Welding Equipement

Welding Variables (QW-361.2)	Actual Values	Range Qualified
Type of welding (Machine):	Machine	Automatic or Machine
Welding process:	SAW	SAW
Direct or remove visual control:	Direct	Direct
Automatic arc voltage control (GTAW):	N/A	N/A
Automatic joint tracking:	No	Without
Position qualified (2G, 6G, 3F, etc.):	1 G	Flat
Consumable inserts (GTAW or PAW):	/	/
Backing (metal, weld metal, etc.):	With	With
Single or multiple passes per side:	Multiple	Single or Multiple

Results

Visual Examination of Completed Weld (QW-302.4): /

☐ Bend test, ☐ Transverse root and face [QW-462.3(a)], ☐ Longitudinal root and face [QW-462.3(b)]

☐ Side [QW-462.2, ☐ Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)],

☐ Plate bend specimen, corrosion-resistant overlay [QW-462.5(d)],

☐ Macro test for fusion[QW-462.5(b)], ☐ Macro test for fusion[QW-462.5(e)],

Type	Result	Type	Result	Type	Result
/	/	/	/	/	/
/	/	/	/	/	/

Alternative radiographic examination results (QW-191): **Satisfactory**

Fillet weld - fracture test (QW-180): /

Length and percent of defects: /

Macro examination (QW-184): /

Fillet size (in.): / × / Concavity / convexity (in.): /

Other tests: /

Film or specimens evaluated by: **A. LAFORGE ASNT RX level II**

Company: **CHARLATTE RESERVOIRS**

Mechanical tests conducted by: /

Laboratery test no.: /

Welding supervised by: **E. RAPPENEAU**

We certify that the statement in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of section IX of the ASME Code.

Date: **21/10/2011** Organization: **CHARLATTE-QAM**

By: **E. RAPPENEAU**

AQ0315-02

CHARLATTE RESERVOIRS FAYAT GROUP

WELDER PERFORMANCE QUALIFICATIONS (WPQ)
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's name: **DUPRE Eric** Identification no.: **D**

Test Description

Identification of WPS followed: **1P** ☐ Test coupon ☑ Production weld

Specification of base metal(s): **SA 516 grade 70** thickness: **35**

Testing Conditions and Qualification Limits

Welding Variables (QW-350)	Actual Values	Range Qualified
Welding processes(es)	GMAW	GMAW
Type (i.e., manual, semi-auto) used	Semi-Auto	Semi-Auto
Backing (metal, weld metal, double-welded, etc.)	With	With
Plate or Pipe (enter diameter if pipe or tube)	Plate	Plate or Pipe>73
Base metal P- or S-Number to P-or S-number	P1 to P1	P1 to P15-P34-P41 to P49
Filler metal or electrode specification(s) (SFA)(info only)	5.18	/
Filler metal or electrode clacification(s) (info only)	N/A	/
Filler metal F-Numbers(s)	6	6
Consumable insert (GTAW or PAW)	N/A	N/A
Filler type (solid/metal or flux cored/powder) (GTAW or PAW)	N/A	N/A
Deposit thickness for each process	3	6
Position qualified (2G, 6G, 3F, etc.)	1 G	Flat
Vertical progression (uphill or downhill)	N/A	N/A
Type of fuel gas (OFW)	N/A	N/A
Ionert gas backing (GTAW, PAW, GMAW)	No	Yes or No
Transfer mode (spray/globular or pulse to short circuit-GMAW)	Spray arc	Spray arc or Globular
GTAW current type/polarity (AC, DCEP, DCEN)	N/A	N/A

Results

Visual Examination of Completed Weld (QW-302.4): **Satisfactory**

☐ Bend test, ☐ Transverse root and face [QW-462.3(a)], ☐ Longitudinal root and face [QW-462.3(b)]

☐ Side [QW-462.2, ☐ Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)],

☐ Plate bend specimen, corrosion-resistant overlay [QW-462.5(d)],

☐ Macro test for fusion[QW-462.5(b)], ☐ Macro test for fusion[QW-462.5(e)],

Type	Result	Type	Result	Type	Result
/	/	/	/	/	/
/	/	/	/	/	/

Alternative radiographic examination results (QW-191): **Satisfactory 4500 AV 16 (100%)**
Fillet weld - fracture test (QW-180): /
Length and percent of defects: /
Macro examination (QW-184): /
Fillet size (in.): / × / Concavity / convexity (in.): /
Other tests: /
Film or specimens evaluated by: **A. LAFORGE**
Company: **CHARLATTE**
Mechanical tests conducted by: /
Laboratery test no.: /
Welding supervised by: **E. RAPPENEAU**

We certify that the statement in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of section IX of the ASME Code.

Date: **19/12/2011**

Organization: **CHARLATTE-QAM**
By: **E. RAPPENEAU**

AQ0295-02

CHARLATTE RESERVOIRS FAYAT GROUP

WELDER PERFORMANCE QUALIFICATIONS (WPQ)
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's name: **DUSSAULT Jean-Claude** Identification no.: **B**

Test Description

Identification of WPS followed: **9** ☐ Test coupon ☑ Production weld

Specification of base metal(s): **SA-516 grade 70** thickness: **16**

Testing Conditions and Qualification Limits

Welding Variables (QW-350)	**Actual Values**	**Range Qualified**
Welding processes(es)	GMAW	GMAW
Type (i.e., manual, semi-auto) used	Semi-Auto	Semi-Auto
Backing (metal, weld metal, double-welded, etc.)	With	With
Plate or Pipe (enter diameter if pipe or tube)	Plate	Plate or Pipe>73mm
Base metal P- or S-Number to P-or S-number	P1 to P1	P1 to P15-P34-P41 to P49
Filler metal or electrode specification(s) (SFA)(info only)	5.18	/
Filler metal or electrode clacification(s) (info only)	N/A	/
Filler metal F-Numbers(s)	6	6
Consumable insert (GTAW or PAW)	N/A	N/A
Filler type (solid/metal or flux cored/powder) (GTAW or PAW)	N/A	N/A
Deposit thickness for each process	3	6
Position qualified (2G, 6G, 3F, etc.)	1G	Flat
Vertical progression (uphill or downhill)	N/A	N/A
Type of fuel gas (OFW)	N/A	N/A
Ionert gas backing (GTAW, PAW, GMAW)	No	Yes or No
Transfer mode (spray/globular or pulse to short circuit-GMAW)	Spray arc	Spray arc or Globular
GTAW current type/polarity (AC, DCEP, DCEN)	N/A	N/A

Results

Visual Examination of Completed Weld (QW-302.4): **Satisfactory**

☐ Bend test, ☐ Transverse root and face [QW-462.3(a)], ☐ Longitudinal root and face [QW-462.3(b)]

☐ Side [QW-462.2, ☐ Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)],

☐ Plate bend specimen, corrosion-resistant overlay [QW-462.5(d)],

☐ Macro test for fusion[QW-462.5(b)], ☐ Macro test for fusion[QW-462.5(e)],

Type	Result	Type	Result	Type	Result
/	/	/	/	/	/
/	/	/	/	/	/

Alternative radiographic examination results (QW-191): **Satisfactory 2000AH925**

Fillet weld - fracture test (QW-180): /

Length and percent of defects: /

Macro examination (QW-184): /

Fillet size (in.): / × / Concavity / convexity (in.): /

Other tests: /

Film or specimens evaluated by: **A. LAFORGE**

Company: **CHARLATTE**

Mechanical tests conducted by: /

Laboratery test no.: /

Welding supervised by: **A. LAFORGE**

We certify that the statement in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of section IX of the ASME Code.

Date: **14/02/2012**

Organization: **CHARLATTE--QAM**
By: **E. RAPPENEAU**

AQ0295-02

CHARLATTE RESERVOIRS FAYAT GROUP

WELDER PERFORMANCE QUALIFICATIONS (WPQ)
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's name: **BUCHET Philippe** Identification no.: **O**

Test Description

Identification of WPS followed: **14120034 B 02 02** ☑ Test coupon ☐ Production weld

Specification of base metal(s): **SA 516 grade 60** thickness: **6**

Testing Conditions and Qualification Limits

Welding Variables (QW-350)	Actual Values	Range Qualified
Welding processes(es)	GMAW	GMAW
Type (i.e., manual, semi-auto) used	Semi-Auto	Semi-Auto
Backing (metal, weld metal, double-welded, etc.)	Without	With or Without
Plate or Pipe (enter diameter if pipe or tube)	Plate	Plate >25mm O.D.
Base metal P- or S-Number to P-or S-number	1 to 1	1 to 1
Filler metal or electrode specification(s) (SFA)(info only)	5.18	/
Filler metal or electrode clacification(s) (info only)	N/A	/
Filler metal F-Numbers(s)	6	6
Consumable insert (GTAW or PAW)	N/A	N/A
Filler type (solid/metal or flux cored/powder) (GTAW or PAW)	N/A	N/A
Deposit thickness for each process	6mm	12mm
Position qualified (2G, 6G, 3F, etc.)	1G	Flat or Horizontal
Vertical progression (uphill or downhill)	N/A	N/A
Type of fuel gas (OFW)	N/A	N/A
Ionert gas backing (GTAW, PAW, GMAW)	Yes or No	Yes or No
Transfer mode (spray/globular or pulse to short circuit-GMAW)	Pulsed	Pulsed
GTAW current type/polarity (AC, DCEP, DCEN)	/	/

Results

Visual Examination of Completed Weld (QW-302.4): **Satisfactory**

☐ Bend test, ☐ Transverse root and face [QW-462.3(a)], ☐ Longitudinal root and face [QW-462.3(b)]

☐ Side [QW-462.2, ☐ Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)],

☐ Plate bend specimen, corrosion-resistant overlay [QW-462.5(d)],

☐ Macro test for fusion[QW-462.5(b)], ☐ Macro test for fusion[QW-462.5(e)],

Type	Result	Type	Result	Type	Result
Root	Satisfactory				
Face	Satisfactory				

Alternative radiographic examination results (QW-191): /

Fillet weld - fracture test (QW-180): /

Length and percent of defects: /

Macro examination (QW-184): /

Fillet size (in.): / × / Concavity / convexity (in.): /

Other tests: **None**

Film or specimens evaluated by: **C. BERTRAND**

Company: **CHARLATTE**

Mechanical tests conducted by: **BUREAU VERITAS**

Laboratery test no.: **BV n° VT73**

Welding supervised by: /

We certify that the statement in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of section IX of the ASME Code.

Date: **01/10/2007**

Organization: **CHARLATTE-QAM**
By: **C.BERTRAND**

AQ0295-02

CHARLATTE RESERVOIRS FAYAT GROUP

WELDER PERFORMANCE QUALIFICATIONS (WPQ)
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's name: **LABARBE Philippe** Identification no.: **T**

Test Description

Identification of WPS followed: **15E** ☑ Test coupon ☐ Production weld

Specification of base metal(s): **SA 516 grade 60** thickness: **14**

Testing Conditions and Qualification Limits

Welding Variables (QW-350)	Actual Values	Range Qualified
Welding processes(es)	GMAW	GMAW
Type (i.e., manual, semi-auto) used	Semi-Auto	Semi-Auto
Backing (metal, weld metal, double-welded, etc.)	With	With
Plate or Pipe (enter diameter if pipe or tube)	Plate	Pipe ≥ 73mm
Base metal P- or S-Number to P-or S-number	1 to 1	1 to 15F-P34-P41 to P49
Filler metal or electrode specification(s) (SFA)(info only)	5.18	/
Filler metal or electrode clacification(s) (info only)	ER70S-6	/
Filler metal F-Numbers(s)	6	6
Consumable insert (GTAW or PAW)	N/A	N/A
Filler type (solid/metal or flux cored/powder) (GTAW or PAW)	N/A	N/A
Deposit thickness for each process	14mm	*max to be welded
Position qualified (2G, 6G, 3F, etc.)	3G	Flat or Vertical
Vertical progression (uphill or downhill)	Uphill	Uphill
Type of fuel gas (OFW)	N/A	N/A
Ionert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	Spray arc	Spray or globular
GTAW current type/polarity (AC, DCEP, DCEN)	/	/

*** with a minimum of 3 layers**

Results

Visual Examination of Completed Weld (QW-302.4): /

☐ Bend test, ☐ Transverse root and face [QW-462.3(a)], ☐ Longitudinal root and face [QW-462.3(b)]
☐ Side [QW-462.2, ☐ Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)],
☐ Plate bend specimen, corrosion-resistant overlay [QW-462.5(d)],
☐ Macro test for fusion[QW-462.5(b)], ☐ Macro test for fusion[QW-462.5(e)],

Type	Result	Type	Result	Type	Result
/	/	/	/	/	/
/	/	/	/	/	/

Alternative radiographic examination results (QW-191): **Satisfactory**
Fillet weld - fracture test (QW-180): /
Length and percent of defects: /
Macro examination (QW-184): /
Fillet size (in.): / × / Concavity / convexity (in.): /
Other tests: **Radiographic inspection report AL111026/02**
Film or specimens evaluated by: **A. LAFORGE**
Company: **CHARLATTE**
Mechanical tests conducted by: /
Laboratery test no.: /
Welding supervised by: **E. RAPPENEAU**

We certify that the statement in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of section IX of the ASME Code.

Date: **26/10/2011**

Organization: **CHARLATTE- QAM**
By: **E. RAPPENEAU**

AQ0295-02

MATIERES

MATERIALS FILE

CHARLATTE
RESERVOIRS
FAYAT GROUP
17 Rue PAUL BERT 89400 MIGENNES
Tel : 03.86.92.30.00 Fax : 03.86.92.30.01
Email : reservoir@charlattereservoirs.fayat.com
Site : http:// www.charlatte.fr

Caracteristics of metals used

AQ 0078-06 GB | Page 1/1

n° : 23000KU7

n° Drawing KU007M00000

Caracteristics of metals used

(Parts of the vessel resisting to pressure or assembled by welding provisionally or definitively to a part of the apparatus which is under pressure)

Part of the apparatus	Mark on plan n° appended to the notice	metal	shade	norm or specifications or reference (with date and indication)	chemical coposition (maximun contenance) *1			mechanical characteristics			
					C	S *2	P *2	R N/mm² *3	Re H N/mm² *2 *4	A% mini Lo=5,65 x V¯so *2 *5	R X A mini *2 *5
Ends	1 & 2	STEEL	SA516GR60	ASME II	0.27	0.035	0.035	485-620	260	17	/
Shell	3 & 4	STEEL	SA516GR60	ASME II	0.27	0.035	0.035	485-620	260	17	/
Cover	8	STEEL	SA516GR60	ASME II	0.21	0.035	0.035	415-550	220	21	/
Inspection flange	6	STEEL	SA181-CL60	ASME II	0.21	0.035	0.035	415-550	220	21	/
OUTLET : Outlet flange	12	STEEL	SA516GR60	ASME II	0.21	0.035	0.035	415-550	220	21	/
Supports		STEEL	SA516GR60	ASME II	0.21	0.035	0.035	415-550	220	21	/
Handling eyes	22	STEEL	SA516GR60	ASME II	0.21	0.035	0.035	415-550	220	21	/
Support Name plate	49	STEEL	SA516GR60	ASME II	0.21	0.035	0.035	415-550	220	21	/
Feet	5	STEEL	SA516GR60	ASME II	0.21	0.035	0.035	415-550	220	21	/
Connection		STEEL	A105	ASME II	0.3	0.035	0.035	330-485	250	27	/
Connection		STEEL	A106	ASME II	0.35	0.04	0.035	330-485	250	27	/
Bolts	9 & 16	stainless steel	SA320-B8M	ASME II	0.37	0.04	0.035	860	720	16	/

*1 Maximum product values as indicated by the recomended standard or specification. Only to be indicated for steel parts to be welded by fusion.

*2 Value to be given only for parts of the vessel under pressure..

*3 For parts of the vessel resisting to pressure give the enveloppe of values as indicated by the recomended standard or specification.
For other parts give the maximum value of the enveloppe.

*4 For austenilic stainless steels, resistance to minimum traction guaranteed at maximum service temperature is given instead of the elasticity limit.

*5 Only to be indicated for gas pressure apparatus for there steel parts participating in the apparatus resistance to pressure.
It is necessary, except for wire wound. : A - at 12% for the bolts.
- at 14% in other cases (16.P100 for tubes and tubular products when the sample is taken in the direction of the generating line).
and RA > 10500 (or R (A-2) > 10500 for tubes and tubular products).

item (1) + (2)

FO_2500_25_63

12398

4

CONTROLE QUALITE CHARLATTE

Document
AQ 09.012 Rév 0

STEELFORMING
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CERTIFICAT DE FORMAGE conforme à l'ASME VIII

Works european certificate / Europäisch Abnahmeprüfzeugnis

Acheteur *Purchaser/Besteller* **CHARLATTE**

FELXD000081

Commande acheteur N° *Purchaser order N°/Kundenbestell Nr* **4500027376**

N° de commande *Order Nr/Bestellung Nr* **02517-2**

Nombre de pièces *Number of parts Stückzahl*	Type et dimensions *Designation and dimensions Bezeichnung und Abmessungen*	Nuance et qualité *Grade and quality Stahlsorte und Typ*	Provenance *Origin Ursprung*	Coulée *Heat Schmelze*	CCPU N° *Works certificate N° Abnahmeprüfzeugnis Nr*
2	ELL Ø 2500 EXT EP. 25 D	SA516GR60	LS.T	14365	41016/2012

NORME TOLERANCES NFE 81103/SVT ASME

Tôle(s) : *Plate Blech(e)* **Norme** *Standard Norm* **ASME SA** **Edition** *Issue Ausgabe*

Traitement thermique final des produits avant livraison/*Final heat treatment of ends before delivery/Letzte wärme Behandlung der Böden vor Lieferung*

Normalisation à °C *Normalizing Normalglühen* **NON** **Revenu** *Tempering Anlassen* **NON** **Hypertrempe à °C** *Solution annealing Lösungsglühen* **NON**

Formage à froid – Cold forming-Kaltverformung **OUI**
Formage à température de normalisation- *Forming at Normalizing temperature-Verformung bei Normalisierungstemperatur* **NON**
Formage à chaud-*Hot Forming-Warmformgebung* **NON**
Ressuage **NON**
Sablage **NON**

Contrôle dimensionnel : conforme
Inspection and dimensional : satisfactory
Mass und Besichtigungsprüfung : zufriedenstellend

Les qualifications des soudeurs ainsi que les modes opératoires sont disponibles chez Steel Forming, et ne sont pas transmis sans demande spécifique.

Nous attestons que les produits livrés sont conformes aux prescriptions de la commande
We certify that the delivered products comply with the prescriptions of the order
Wir bestätigen, daß die gelieferten Erzeugnisse den Vorschriften der Bestellung entsprechen.

Nom et qualité/Name and position/Name und Stellung
Service contrôle/Inspection department/Kontrollabteilung

Date/*Date/Datum* **13/11/2012**

Signature/*Signature/Unterschrift* Weiss

EURL AU CAPITAL 120.000 EUROS - SIRET 529 316 093 000 10 - APE 2550B
N° INTRACOMMUNAUTAIRE FR 91 529 316 093
Usine : B.P. 102 – Z.I.Moutois – Rue Raymond Poincaré – 89400 - Migennes
☎ 03 86 92 62 50 - 03 86 92 18 38

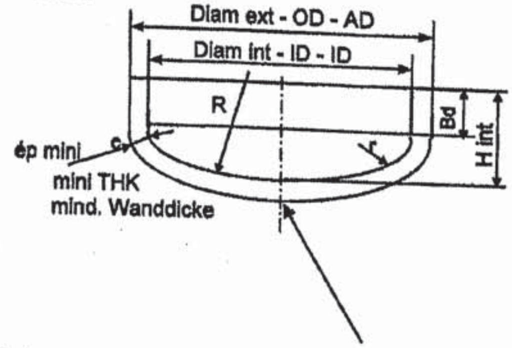
STEELFORMING
Le Style dans la Forme...
89400 MIGENNES

DOCUMENT N° : 02517-2
INSPECTION DOC. N° : AQ 98.030 Rév 0

WERKS N° :
Page : 1
Sheet :
Blatt :

Client : CHARLATTE
Customer :
Besteller :

N° Cde Client : 4500027376
Order n° :
Bestell n° :



Nb de fonds : 2
Qty of heads :
Stückzahl :

Profil : ELL 1.9/1
Type of heads :
Geometrische :

Matière : SA516 GR60
Material :
Werkstoff :

Norme : ASME
Specificatior
Norm :

Diamètre :
Diameter :
Durchmesser :

Int :
Inside :
Innen :

Ext : 2500
Outside :
Aussen :

Trou de centre 50
Center hole :
Loch :

Ep. nominale : 25
Nominal THK :
Wanddicke :

Ep.mini demandée(e): 19,44
Minimum THK (e):
Mindestwanddicke (e):

Développé : 7854 ±7
Expansion length :
Umfang :

Bord droit : 50
Straight flange :
Bordhöhe :

Rayon de fond (R): 2097
Spherical radius (R):
Kugel (R):

Rayon de carre (r) 450
Knuckle radius (r):
Kugel (r):

Hauteur int. : 693 +30/-15
Internal height :
Innere Höhe :

Dimensions et marquages relevés / Dimensions and marks checked / Masse und Stempel

Rep. Item Nr	Long. Develop. Exp length Umfang 0	Haut. Int. Internal height innere Höhe	Ep.Mini mini THK M wanddicke	Bd St. Fl Bord	R / r	N° coulée Heat num. Schmelze	N° tôle Plate numb Probe N°
1	7853	713	22	C	C	14365	768948-001
2	7855	707	22,5	C	C	14365	768948-001

Contrôle d'aspect et dimensionnel : *conforme*
Inspection and dimensional : *without objection*
Besichtigung und Ausmessung :
ohne Beanstandung

Date-Datum : 12/11/2012
Le Responsable Ass.Qualité: S.LANDOULSI
The Quality Manager:
Der QualitätLeiter:

Le Responsable Usine : JL.WEISS
The Works-Inspector:
Der Werksachverständige:

INSPEKČNÍ CERTIFIKÁT 3.1

EN 10204:2004

INSPECTION CERTIFICATE, ABNAHMEPRÜFZEUGNIS, CERTIFICAT DE RÉCEPTION

EVRAZ | EVRAZ VITKOVICE STEEL

41016/2012/A 02.10.2012 1/1

Salzgitter Mannesmann Stahlhandel

161185/2012

517418/611

711001108HG5

717739 315447250761 7 085 kg

Hot rolled steel plates in the quality ASME SA 516 Gr.60.

25-3000-12099 mm

7 085 kg

1 plate

SA516GR.60 MT LTV

SA516GR.60 MT LTV

ASME SA516-SA516M/2010

ASME SA20-SA20M/2010

ASME CODE Section II

PART A Ed.2010 Add.2011

14365 Y 1 325974 A T 20 C Rp0.2 A50 376 530 32.0 L -51 KV 176 190 198 188

heat	C	Mn	Si	P	S	Cu	Ni	Cr	Mo	V	Ti	Al	N	Nb	B	CEV
14365	0.152	1.080	0.340	0.013	0.004	0.008	0.048	0.023	0.005	0.008	0.002	0.038	0.004	0.005	0.0005	0.34

heat	test	plates	
14365	325974	755948	001

Radioisotope activity of the material did not exceed the value 100 Bq/kg.

NORMALIZED:walking beam furnace-length 70m,temperature 900°C/dwell 12min.

EVRAZ VITKOVICE STEEL

Milada KOKOVÁ

Independent authorized agent

SALZGITTER: 130069 31595811 E10/1960 30.10.2012 20694122.001 S. 1.v. 1

Item (3) + (4)

MFLLD000093
Comm. 4500029429

T0-25-60

12420

CONTROLE QUALITE CHARLATTE

ThyssenKrupp Steel Europe

ThyssenKrupp

Werks-Nr. / Works-No. / No de l'usine A08	Zeugnis-Nr. / Certificate-No. / No de certificat A03	Dispo-Nr. / Dispo-No. / No de disposition	Seite-Nr. / Page-No. / Page-No
8264668	1301286001	40837523	1

ThyssenKrupp Steel Europe AG · 47161 Duisburg A01

A06

BESCHEINIGUNG ÜBER MATERIALPRÜFUNGEN EN 10204
DOCUMENT ON MATERIAL TESTS EN 10204
DOCUMENT DE CONTROL DES MATERIAUX EN 10204

A02
ABNAHMEPRUEFZEUGNIS 3.1
INSPECTION CERTIFICATE 3.1

Bestell-Nr. / Order-No. / No de commande 1-F0-18405

A07.1-A07.5

11.2.2010
0203 52 75220 to
0203 52 75213
abnahme_zeugnisse.grobblech@thyssenkrupp.com A05

Werkstoff; Quality; Matériau / Lieferbedingungen; Specification; Conditions de livraison B02/B03

SA516GR.60 ASME 00.07 ASME CODE SECT.II/PART A/ED.2007
ADD.2008/SA20/S5
TOL.EN 10029 KL.B/N OB EN 10163 KL.B/2

Kennzeichnung: / Marking: / Marque: B06 WERKSTOFF; SCHMELZ-NR.; FERTIGUNGS-/PROBE-NR.
MATERIAL, HEAT-NO., MANUFACTURING/SAMPLE-NO.

Zeichen des Lieferwerkes: / Supplier's mark: / Marque d'usine: ThyssenKrupp Steel A04

ABNAHMEPRUEFSTEMPEL / INSPECTOR'S STAMP / POINCON DU RECEPTIONNAIRE

B01
ERZEUGNISFORM
TYPE OF PRODUCT

GROBBLECH, BESAEUMTE KANTEN
HEAVY PLATES, TRIMMED EDGES

LISTE DER MATERIALIDENTEN
LIST OF MATERIAL IDENTS

POS. / ITEM	B07 PAKET / BUNDLE	B07 BLECH-NR. / PLATE-NO.	B07 SCHMELZ-NR. / HEAT-NO.		B08 STUECK ZAHL / NUMBER PIECES	B13 GEWICHT GEWOG. / WEIGHT
002	B09 x B10 x B11 25,0 x 3000,0 x 12000 [mm]					Kg .
		21529101	616535		1	7.174
		21530101	616535		1	7.174
				*	2	14.348
				**	2	14.348

TRANSPORT-NR.
TRANSPORT-NO.
318048636878

CHEMISCHE ZUSAMMENSETZUNG DER SCHMELZE IN %
CHEMICAL COMPOSITION OF THE LADLE SAMPLES % C71-C99

B07 SCHMELZ-NR	C	SI	MN	P	S	AL-G	B-G	CR	CU	MO	N
616535	,080	,180	1,020	,008	,0010	,039	,0002	,060	,140	,010	,0040

	NB	NI	TI	V
616535	,014	,150	,003	,000

C70 SCHMELZVERFAHREN OXYGENSTAHL

ThyssenKrupp Steel Europe AG

Abnahme

-FOLGESEITE-

Werks-Nr. / Works-No. / No de l'usine: A08 8264668
Zeugnis-Nr. / Certificate-No. / No de certificat: A03 1301286001
Dispo-Nr. / Dispo-No. / No de disposition: 40837523
Seite-Nr. / Page-No. / Page-No: 2

C70 HEAT PROCESS OXYGEN STEEL

MECHANISCHE EIGENSCHAFTEN ZUGVERSUCH
MECHANICAL CHARACTERISTICS TENSILE TEST

B07 SCHM.-NR.	C00 PROBE-NR.	C01/02 LAGE	B05 ZUST.	C10 FORM	ALTER	C03 TEMP. °C	C11 R MPa	R Art	C12 Rm MPa	R/Rm %	L0 mm	C13 A %	Rm*A
616535	21529	0401	0004	0002	0006	+20	361	RE H	451	80	155	34	15334
616535	21530	0401	0004	0023	0006	+300	354	RP0,2%			203	30	13530
		0401	0004	0002	0006	+20	288	RP0,2%					
							365	RE H	453	81	155	34	15402
							361	RP0,2%			203	30	13590

MECHANISCHE EIGENSCHAFTEN KERBSCHLAG BIEGEVERSUCH
MECHANICAL CHARACTERISTICS IMPACT TEST

B07 SCHM.-NR.	C00 PROBE-NR.	C01/02 LAGE	B05 ZUST.	C40 FORM	C41 B mm	ALTER	C03 PRUEF-TEMP. °C	C42 ARBEIT [Joule] 1	C42 2	C42 3	C43 M
616535	21529	0401	0004	0007		0006	-20	271	312	348	310
		0101	0004	0007		0006	-51	282	288	233	268
616535	21530	0401	0004	0007		0006	-20	323	341	332	332
		0101	0004	0007		0006	-51	277	289	282	283

WAERMEBEHANDLUNG PRODUKT
HEAT TREATMENT PRODUCT

Pos.	TEMP °C	HALTEZEIT MIN.	ABKUEHLUNG
002	920	10,00	LUFT AIR

LEGENDEN
LEGENDS

PROBENZUSTAND
STAT.
0004 = NORMALISIERT
NORMALIZED

ALTERUNG
AGED
0006 = UNGEALTERT
NOT AGED

PROBENFORM KERBSCHLAG
TYPE IMPACT TEST
0007 = CHARPY- V
CHARPY- V

PROBENLAGE (IST)
POSIT (IST)
0101 = LAENGS KOPF OBERFLAECHE
LONG. TOP S
0401 = QUER KOPF OBERFLAECHE
TRANS. TOP S.

PROBENFORM ZUGVERSUCH
TYPE TENSILE TEST
0002 = FLACHZUG
FLAT TENSILE TEST
0023 = RUNDZUG
ROUND TENSILE TEST

LIEFERZUSTAND PRODUKT
STATUS PRODUCT

002 NORMALISIERT
NORMALIZED

ERGEBNIS DER BESICHTIGUNG UND MASSPRUEFUNG: KEINE BEANSTANDUNG

RESULT OF SURFACE CONTROL AND DIMENSIONAL CHECK: SATISFACTORY

ThyssenKrupp Steel Europe AG
Abnahme

-FOLGESEITE-

Works-Nr. Works-No. No de l'usine	A08 8264668	Zeugnis-Nr. Certificate-No. No de certificat	A03 1301286001	Dispo-Nr. Dispo-No. No de disposition	40837523	Seite-Nr. Page-No. Page-No	3

Z02

ABNAHMEBEAUFTRAGTER DES HERSTELLERS
THE MANUFACTURER'S AUTHORIZED INSPECTION REPRESANTATIVE
LE REPRÉSENTANT AUTORISÉ DU CONTRÔLEUR DU PRODUCTEUR

Kern

Z03 Prof. Dr.-Ing. Kern

ThyssenKrupp Steel Europe AG

Abnahme

Z01

Es wird bestätigt, dass die Lieferung den Vereinbarungen bei der Bestellung entspricht.
We hereby certify, that the above mentioned materials have been delivered in accordance with the terms of order.
Nous attestons que les produits livrés sont conformes aux stipulations de la commande.

TÜV CERT

Item 5/11 5/12

TEST REPORT - ASTM/ASME

METINVEST®

Metinvest Trametal spa

Società per azioni con socio unico - soggetta a direzione e coordinamento di Metinvest B.V.
STABILIMENTO: 33058 S. GIORGIO DI NOGARO (UD) VIA E. FERMI, 44
TEL. 0431/629989 (RIC. AUT.) - FAX 0431/629985 (RIC. AUT.)
SEDE LEGALE: 16121 GENOVA - VIA XII OTTOBRE, 3 - 6° PIANO
Capitale sociale € 300.120.000,00 I.V. - R.E.A. Genova n. 437720
C.F., P. Iva e Iscr. Reg. Imp. Genova n. 05956630965

(A) PROCESSO DI ELABORAZIONE / STEELMAKING PROCESS: E = ELECTRIC ; BO = BASIC OXYGEN
(B) STATO DI FORNITURA / DELIVERY CONDITION: AR = GREZZO DI LAMINAZIONE / AS ROLLED ;
N* = LAMINAZIONE A TEMPERATURA CONTROLLATA / NORMALIZING ROLLING ;
N = NORMALIZZATO / NORMALIZED ;
R = RICOTTO / ANNEALED ;
N+R = NORMALIZZATO + RINVENUTO / NORMALIZED + ANNEALED
(C) TRATTAMENTO TERMICO DEL CAMPIONE / HEAT TREATMENT OF SAMPLE:
N = 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
R = 650°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
(D) Ceq_1 = C + Mn/6 ; Ceq_2 = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15 ;
Pcm = C + Si/30 + (Mn + Cu + Cr)/20 + Ni/50 + Mo/15 + V/10 + B*5
(1) POSIZIONE / LOCATION: 1 = TESTA / TOP ; 2 = PIEDE / BOTTOM
(2) POSIZIONE / LOCATION: C = CUORE / 1/2 THICKNESS ; P = PELLE / SURFACE ; D = 1/4 SPESSORE / THICKNESS
(3) DIREZIONE / DIRECTION: L = LONGITUDINALE / LONGITUDINAL ; T = TRASVERSALE / TRANSVERSE
(4) FORMA DEL PROVINO / SHAPE OF TEST PIECE: P = PRISMATICO / PRISMATIC ; C = CILINDRICO / CYLINDRICAL
(5) ESITO PROVA DI PIEGA / RESULT: OK = COMPLYING ; NO = NOT COMPLYING

T0-20-120.

N° Certificato / Certificate no.	Data / Date
211778	10/08/2010
N° Ordine Trametal / Works order	**N° Ordine cliente / Customer's order**
31002116	227502
DDT	del / date
31013778	23/07/2010
Pratica / File no.	
del / date	

Cliente / Customer

CHARLATTE RESERVOIRS
17, RUE PAUL ALBERT
89400 MIGENNES **(FRANCE)**

CONTROLE QUALITE C

MFLLD020183 10454

Prodotto / Product: Lamiere / Hot rolled plates
Qualità / Steel grade: SA516GR60
Normativa / Specification: ASME

Marcatura di prodotto / Marking of the product
LAMIERA/ORDINE/N° INFORNAMENTO/DIMENSIONI/QUALITÀ
PLATE/ORDER/INTERNAL N°/DIMENSIONS/STEEL GRADE

ITEM	LAMIERA / PLATE	N° INFORN. / INTERNAL NUMBER	DIMENSIONI / DIMENSIONS [mm]	PESO TEORICO / THEORICAL WEIGHT [t]	LOTTO / BATCH NO.	PROCESSO ELAB. / STEELMAKING PROCESS (A)	STATO FORNITURA LAMIERA / DELIVERY CONDITION (B)	CAMPIONE / SAMPLE	TRATT. CAMPIONE / HEAT TREATMENT (C)	CAMPIONE PWHT / SAMPLE	TEMPERATURA INIZIO / BEGINNING TEMPERATURE °C	VELOCITÀ RISCALDO / HEATING RATE °C/h	TEMPERATURA TRATTAMENTO / TEMPERATURE TREATMENT °C	PERMANENZA / HOLDING TIME Min	VELOCITÀ RAFFREDDAMENTO / COOLING RATE °C/h	TEMPERATURA FINE / END TEMPERATURE °C	N° CICLI / CYCLES	CAMPIONE Q+T / SAMPLE	TEMPERATURA (Q) / TEMPERATURE °C	PERMANENZA (Q) / HOLDING TIME Min	RAFFREDDAMENTO / COOLING	TEMPERATURA (T) / TEMPERATURE °C	PERMANENZA (T) / HOLDING TIME Min	RAFFREDDAMENTO / COOLING
1	1SF846O801B	763869	20.00X3000X9500	4,47	249492	BO	N*	ZF970																
1	1SF906O101B	763781	20.00X3000X9500	4,47	249490	BO	N*	ZD026																
1	1SF910O401A	763828	20.00X3000X9500	4,47	249482	BO	N*	ZF996																
1	1SF910O401B	763828	20.00X3000X9500	4,47	249482	BO	N*	ZF996																
1	1SF910O402B	763829	20.00X3000X9500	4,47	249483	BO	N*	ZF969																

C71/C92 COMPOSIZIONE CHIMICA DI COLATA / HEAT CHEMICAL ANALYSIS

COLATA / HEAT	C %	Mn %	Si %	P %	S %	Cu %	Ni %	Cr %	Mo %	Al %	V %	Nb %	Ti %	Sn %	Ca %	N %	B %	H %	Ceq1 % (D)	Ceq2 % (D)	Pcm % (D)
SA516GR60 12,60 - 50,00 MIN		0,85	0,15																		
SA516GR60 12,60 - 50,00 MAX	0,23	1,20	0,40	0,035	0,035																
1SF846	0,14	1,06	0,26	0,011	0,002	0,030	0,020	0,030	0,00	0,039	0,000	0,000	0,000	0,000	0,0000	0,0050	0,0000	0,0003	0,32	0,33	0,21
1SF906	0,16	1,10	0,21	0,010	0,001	0,030	0,020	0,020	0,00	0,043	0,000	0,000	0,000	0,000	0,0000	0,0060	0,0000	0,0003	0,34	0,35	0,22
1SF910	0,16	1,10	0,23	0,011	0,001	0,030	0,020	0,030	0,00	0,039	0,000	0,000	0,000	0,000	0,0000	0,0060	0,0000	0,0003	0,34	0,35	0,23

			PROVA DI TRAZIONE / TENSILE TEST									PROVA DI RESILIENZA / IMPACT TEST - CHARPY V-NOTCH TEST						PROVA DI PIEGA / BEND TEST				PROVA DI DUREZZA / HARDNESS TEST				PROVA DI STRIZIONE Z% TEST	
CAMPIONE / SAMPLE	SPESSORE LAMIERA / PLATE THICKNESS	POSIZIONE (1) / LOCATION	POSIZIONE (2) / LOCATION	DIREZIONE (3) / ORIENTATION	TEMPERATURA [°C] / TEST TEMPERATURE	ReH [Mpa] / YIELD STRENGTH	Rm [Mpa] / TENSILE STRENGTH	ReH/Rm	A% / ELONGATION	Rp 0,2 [Mpa] / PROOF STRENGTH	FORMA PROVINO (4) / SHAPE OF TEST PIECE	LARGHEZZA [mm] / WIDTH	DIREZIONE (3) / ORIENTATION	TEMPERATURA [°C] / TEST TEMPERATURE	POSIZIONE (2) / LOCATION	SINGOLI VALORI [J] / INDIVIDUAL VALUES	MEDIA [J] / MEAN VALUE	DIREZIONE (3) / ORIENTATION	MANDRINO [mm] / MANDREL	ANGOLO [°] / ANGLE	ESITO (5) / RESULT	POSIZIONE [S] (2) / LOCATION	METODO / TEST METHOD	SINGOLI VALORI / INDIVIDUAL VALUES	MEDIA / MEAN VALUE	Z% SINGOLI VALORI / INDIVIDUAL VALUES	Z% VALORE MEDIO / MEAN VALUE
SA516GR60 0,00 - 20,00 MIN							415		[illegible]																		
SA516GR60 0,00 - 20,00 MAX							550		[illegible]																		
SA516GR60 0,00 - 25,00 MIN													L	-51		18	[illegible]										
ZD026	20,00	1	P	T	20		476		29,2	302		10,0000	T	-20	P	121 114 117	117										

1/2

C00 CAMPIONE / SAMPLE	SPESSORE LAMIERA / PLATE THICKNESS	D01 POSIZIONE (1) / LOCATION	C01 POSIZIONE (2) / LOCATION	C02 DIREZIONE (3) / ORIENTATION	C03 TEMPERATURA [°C] / TEST TEMPERATURE	C11 ReH [MPa] / YIELD STRENGTH	C12 Rm [MPa] / TENSILE STRENGTH	ReH/Rm	C13 A5% / ELONGATION	C14 Rp 0,2 [MPa] / PROOF STRENGTH	C10 FORMA PROVINO (4) / SHAPE OF TEST PIECE	C41 LARGHEZZA [mm] / WIDTH	C02 DIREZIONE (3) / ORIENTATION	C03 TEMPERATURA [°C] / TEST TEMPERATURE	C01 POSIZIONE (2) / LOCATION	C42 SINGOLI VALORI (J) / INDIVIDUAL VALUES	C43 MEDIA (J) / MEAN VALUE	C02 DIREZIONE (3) / ORIENTATION	C34 MANDRINO [mm] / MANDREL	C37 ANGOLO [°] / ANGLE	C50 ESITO (5) / RESULT	C01 POSIZIONE (5)(2) / LOCATION	C30 METODO / TEST METHOD	C31 SINGOLI VALORI / INDIVIDUAL VALUES	C32 MEDIA / MEAN VALUE	C33 2% SINGOLI VALORI / 2% INDIVIDUAL VALUES	C34 2% VALORE MEDIO / 2% MEAN VALUE
			PROVA DI TRAZIONE / TENSILE TEST									PROVA DI RESILIENZA / IMPACT TEST - CHARPY V-NOTCH TEST						PROVA DI PIEGA / BEND TEST				PROVA DI DUREZZA / HARDNESS TEST				PROVA DI STRIZIONE 2% TEST	
ZF969	20,00	2	P	T	20		500		36,3	319		10,0000	T	-20	P	140 145 116	133										
ZF970	20,00	1	P	T	20		475		35,8	308		10,0000	T	-20	P	181 190 129	167										
ZF996	20,00	1	P	T	20		480		31,7	344		10,0000	T	-20	P	157 170 90	139										

C10
ASME SA-370 FIG. 3 AND FIG. 10 (FIG. 11 b 5x10mm)

D02-D50 CONTROLLO ULTRASONORO / ULTRASONIC EXAMINATION

D02 APPARECCHIATURA / EQUIPMENT	D03 N° SERIE / SERIAL NO	D04 CONDIZIONI SUPERFICIALI / SURFACE CONDITIONS	D05 ACCOPPIANTE / COUPLANT	D06 MODALITÀ OPERATIVE / PROCEDURE	D07 TARATURA / CALIBRATION
GILARDONI RDG450	RDG450-450+140156TC	GREZZO DI LAMINAZIONE / AS ROLLED	ACQUA / WATER	IN ACCORDO ALLA SPECIFICA / ACCORDING TO SPECIFICATION	IN ACCORDO ALLA SPECIFICA / ACCORDING TO SPECIFICATION

D07 LAMIERA / PLATE	D08 SONDE / PROBES	D09 DIAMETRO / DIAMETER MM	D10 FREQUENZA / FREQUENCE MHZ	D11 ANGOLO / ANGLE °	D12 NORMA DI RIFERIMENTO / STANDARD SPECIFICATION	D13 CLASSE DI ACCETTABILITÀ / ACCEPTANCE SPECIFICATIONS	D14 ESITO / RESULT	D15 INDICAZIONI / INDICATIONS	D16 RETICOLO / RETICLE	D17 BORDI / EDGES
1SF9100401A	BDD20/4	mm 20	4 MHz	0		EN10160 CL. S1 E1	OK	NESSUNA / NO INDICATIONS FOUND	mm 200x200	50
1SF9100401B	BDD20/4	mm 20	4 MHz	0		EN10160 CL. S1 E1	OK	NESSUNA / NO INDICATIONS FOUND	mm 200x200	50
1SF9100402B	BDD20/4	mm 20	4 MHz	0		EN10160 CL. S1 E1	OK	NESSUNA / NO INDICATIONS FOUND	mm 200x200	50
1SF9060101B	BDD20/4	mm 20	4 MHz	0		EN10160 CL. S1 E1	OK	NESSUNA / NO INDICATIONS FOUND	mm 200x200	50
1SF8460801B	BDD20/4	mm 20	4 MHz	0		EN10160 CL. S1 E1	OK	NESSUNA / NO INDICATIONS FOUND	mm 200x200	50

D18 NOTE / REMARKS	D19 ENTE ISPETTIVO / INSPECTOR	D20 FIRMA / SIGNATURE
		METINVEST TRAMETAL S.p.a F.ANDRIAN III Liv. SNT-TC-1A

Z01

ITEM	TOLLERANZA DI SPESSORE / TOLERANCE ON THICKNESS	TOLLERANZE DI LARGHEZZA / TOLERANCE ON WIDTH	TOLLERANZE DI LUNGHEZZA / TOLERANCE ON LENGTH	CONDIZIONI SUPERFICIALI / SURFACE FINISH	PLANARITÀ / FLATNESS
1	EN 10029 CL.B	EN 10029	EN 10029	EN 10163/2 CL B2	EN 10029 CL. N

CERTIFICHIAMO che le lamiere elencate sono conformi alla prescrizione dell'ordine, che i controlli della marcatura, dell'aspetto superficiale e dimensionale hanno dato esito positivo.
WE CERTIFY that the above mentioned plates are consistent with the order prescriptions: marking, inspection and measurement without objection.

Z04
Z07

	Z03 ENTE COLLAUDO / INSPECTION BODY	Z02
PRODUCED FROM CONTINOUS CAST SLAB AND HAVE A MINIMUN REDUCTION RATIO OF 3 TO 1. ACCORDING TO ASME II PART A ED. 2007 + ADD. 2009b. FULLY KILLED, FINE GRAIN STEEL. Value of Mn maximun in derogation permitted up to 1.50%	TIMBRO DELL'ISPETTORE / STAMP OF THE INSPECTION REPRESENTATIVE	METINVEST TRAMETAL S.p.a. M. Carrara CQ Resp.le

2/2

Item (5/3)

CERTIFICATO DI CONTROLLO 3.1 / INSPECTION CERTIFICATE 3.1 - EN 10204:2004

METINVEST

Metinvest Trametal spa

Società per azioni con socio unico - soggetta a direzione e coordinamento di Metinvest B.V.
STABILIMENTO: 33058 S. GIORGIO DI NOGARO (UD) VIA E. FERMI, 44
TEL. 0431/629989 (RIC. AUT.) - FAX 0431/629985 (RIC. AUT.)
SEDE LEGALE: 16121 GENOVA - VIA XII OTTOBRE, 3 - 6° PIANO
Capitale sociale € 300.120.000,00 I.V. - R.E.A. Genova n. 437720
C.F., P. Iva e Iscr. Reg. Imp. Genova n. 05956630965

(A) PROCESSO DI ELABORAZIONE / STEELMAKING PROCESS: E = ELECTRIC ; BO = BASIC OXYGEN
(B) STATO DI FORNITURA / DELIVERY CONDITION: AR = GREZZO DI LAMINAZIONE / AS ROLLED ;
N* = LAMINAZIONE A TEMPERATURA CONTROLLATA / NORMALIZING ROLLING ;
N = NORMALIZZATO / NORMALIZED at 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR;
R = RICOTTO / ANNEALED;
N+R = NORMALIZZATO + RINVENUTO / NORMALIZED + ANNEALED
(C) TRATTAMENTO TERMICO DEL CAMPIONE / HEAT TREATMENT OF SAMPLE:
N = 910°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
R = 650°C, 1,5 min/mm ; ARIA CALMA / STILL AIR
(D) Ceq_1 = C + Mn/6 ; Ceq_2 = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15 ;
Pcm = C + Si/30 + (Mn + Cu + Cr)/20 + Ni/50 + Mo/15 + V/10 + B*5
(1) POSIZIONE / LOCATION: 1 = TESTA / TOP ; 2 = PIEDE / BOTTOM
(2) POSIZIONE / LOCATION: C = CUORE / 1/2 THICKNESS ; P = PELLE / SURFACE ; D = 1/4 SPESSORE / THICKNESS
(3) DIREZIONE / DIRECTION: L = LONGITUDINALE / LONGITUDINAL ; T = TRASVERSALE / TRANSVERSE
(4) FORMA DEL PROVINO / SHAPE OF TEST PIECE: P = PRISMATICO / PRISMATIC ; C = CILINDRICO / CYLINDRICAL
(5) ESITO PROVA DI PIEGA / RESULT: OK = COMPLYING ; NO = NOT COMPLYING

TO - 14 - 149

N° Certificato / Certificate no.	Data / Date
256822	12/03/2012
N° Ordine Trametal / Works order	**N° Ordine cliente / Customer's order**
31105563	229354
DDT	del / date
31205163	08/03/2012
Pratica / File no.	
del / date	

Cliente / Customer

CHARLATTE RESERVOIRS 11789

17, RUE PAUL ALBERT
89400 MIGENNES **(FRANCE)**

CONTROLE QUALITE CHARLATTE

Prodotto / Product: Lamiere / Hot rolled plates
Qualità / Steel grade: SA516GR70
Normativa / Specification: ASME

Marcatura di prodotto / Marking of the product
LAMIERA/ORDINE/N° INFORNAMENTO/DIMENSIONI/QUALITÀ/MARCHIO DEL PRODUTTORE
PLATE/ORDER/INTERNAL N°/DIMENSIONS/STEEL GRADE/MANUFACTURER'S MARK

MFLLS000008 Q-1

ITEM	LAMIERA PLATE	N° INFORN. INTERNAL NUMBER	DIMENSIONI DIMENSIONS [mm]	PESO TEORICO THEORICAL WEIGHT [t]	LOTTO BATCH NO.	PROCESSO ELAB. STEELMAKING PROCESS (A)	STATO FORNITURA LAMIERA DELIVERY CONDITION (B)	CAMPIONE SAMPLE	TRATT. CAMPIONE HEAT TREATMENT (C)	CAMPIONE PWHT SAMPLE	TEMPERATURA INIZIO BEGINNING TEMPERATURE °C	VELOCITA' RISCALDO HEATING RATE C/h	TEMPERATURA TRATTAMENTO TEMPERATURE TREATMENT °C	PERMANENZA Min HOLDING TIME	VELOCITA' RAFFREDDAMENTO COOLING RATE °C/h	TEMPERATURA FINE END TEMPERATURE °C	N° CICLI / CYCLES	CAMPIONE Q+T SAMPLE	TEMPERATURA (Q) TEMPERATURE °C	PERMANENZA (Q) HOLDING TIME Min	RAFFREDDAMENTO COOLING	TEMPERATURA (T) TEMPERATURE °C	PERMANENZA (T) HOLDING TIME Min	RAFFREDDAMENTO COOLING
1	1TL4360301A	895772	14.00X3000X12000	3,96	312419	BO	N*	ZA246																

C71/C92 COMPOSIZIONE CHIMICA DI COLATA / HEAT CHEMICAL ANALYSIS

COLATA HEAT	C %	Mn %	Si %	P %	S %	Cu %	Ni %	Cr %	Mo %	Al %	V %	Nb %	Ti %	Sn %	Ca %	N %	B %	H %	Ceq1 % (D)	Ceq2 % (D)	Pcm % (D)
SA51670LTV Min 12.60 - 50.00		0,85	0,15																		
SA51670LTV Max 12.60 - 50.00	0,28	1,20	0,40	0,035	0,035																
1TL436	0,16	1,48	0,27	0,015	0,008	0,030	0,020	0,030	0,00	0,037	0,000	0,000	0,000	0,000	0,0000	0,0060	0,0000	0,0004	0,41	0,42	0,25

CAMPIONE SAMPLE	SPESSORE LAMIERA PLATE THICKNESS	POSIZIONE LOCATION (1)	PROVA DI TRAZIONE TENSILE TEST: POSIZIONE LOCATION (2)	DIREZIONE ORIENTATION (3)	TEMPERATURA TEST TEMPERATURE [°C]	ReH YIELD STRENGTH [Mpa]	Rm TENSILE STRENGTH [Mpa]	ReH/Rm	A5" ELONGATION	Rp 0.2 PROOF STRENGTH [Mpa]	FORMA PROVINO SHAPE OF TEST PIECE (4)	PROVA DI RESILIENZA IMPACT TEST - CHARPY V-NOTCH TEST: LARGHEZZA WIDTH [mm]	DIREZIONE ORIENTATION (3)	TEMPERATURA TEST TEMPERATURE [°C]	POSIZIONE LOCATION (2)	SINGOLI VALORI INDIVIDUAL VALUES [J]	MEDIA MEAN VALUE [J]	PROVA DI PIEGA BEND TEST: DIREZIONE ORIENTATION (3)	MANDRINO MANDREL [mm]	ANGOLO ANGLE [°]	ESITO RESULT (5)	PROVA DI DUREZZA HARDNESS TEST: POSIZIONE LOCATION (2)	METODO TEST METHOD	SINGOLI VALORI INDIVIDUAL VALUES	MEDIA MEAN VALUE	PROVA DI STRIZIONE Z% TEST: Z% SINGOLI VALORI Z% INDIVIDUAL VALUES	Z% VALORE MEDIO Z% MEAN VALUE
SA51670LTV Min 0.00 - 20.00					20		485		21,0																		
SA51670LTV Max 0.00 - 20.00					20		620																				
SA51670LTV Min 0.00 - 25.00													L	-46		20	0										
ZA246	14,00	2	P	T	20		543		32,4	363	P	10,00	T	-20	P	84 81 101	89										

C10
ASME SA-370 FIG. 3 AND FIG. 10 (FIG. 11 b 5x10mm)

D02-D50 CONTROLLO ULTRASONORO / ULTRASONIC EXAMINATION

D02 APPARECCHIATURA EQUIPMENT	D03 N° SERIE SERIAL NO	D04 CONDIZIONI SUPERFICIALI SURFACE CONDITIONS	D05 ACCOPPIANTE COUPLANT	D06 MODALITÀ OPERATIVE PROCEDURE	D07 TARATURA CALIBRATION
GILARDONI RDG450	RDG450-450-140156TC	GREZZO DI LAMINAZIONE AS ROLLED	ACQUA WATER	IN ACCORDO ALLA SPECIFICA ACCORDING TO SPECIFICATION	IN ACCORDO ALLA SPECIFICA ACCORDING TO SPECIFICATION

B07 LAMIERA PLATE	D08 SONDE PROBE	D09 DIAMETRO DIAMETER MM	D10 FREQUENZA FREQUENCE MHZ	D11 ANGOLO Angle °	D12 NORMA DI RIFERIMENTO STANDARD SPECIFICATION	D13 CLASSE DI ACCETTABILITÀ ACCEPTANCE SPECIFICATIONS	D14 ESITO RESULT	D15 INDICAZIONI INDICATIONS	D16 RETICOLO RETICLE	D17 BORDI EDGES
1TL4360301A	BDD20/4	mm 20	4 MHz	0	EN10160 CL. S1 E1		OK	NO INDICATIONS FOUND	mm 200x200	50

D18 NOTE REMARKS	D19 ENTE ISPETTIVO INSPECTOR	D20 FIRMA SIGNATURE
		METINVEST TRAMETAL S.p.a F.ANDRIAN III Liv. SNT-TC-1A

Z01

ITEM	TOLLERANZA DI SPESSORE TOLERANCE ON THICKNESS	TOLLERANZE DI LARGHEZZA TOLERANCE ON WIDTH	TOLLERANZE DI LUNGHEZZA TOLERANCE ON LENGTH	CONDIZIONI SUPERFICIALI SURFACE FINISH	PLANARITÀ FLATNESS
1 MFLLS000008-SA516GR70-ITEM 12	EN 10029 CL.C	EN 10029	EN 10029	EN 10163/2 CL B2	EN 10029 CL. N

CERTIFICHIAMO che le lamiere elencate sono conformi alla prescrizione dell'ordine, che i controlli della marcatura, dell'aspetto superficiale e dimensionale hanno dato esito positivo.
WE CERTIFY that the above mentioned plates are consistent with the order prescriptions: marking, inspection and measurement without objection.

Z06

Z07	Z03 ENTE COLLAUDO / INSPECTION BODY	Z02
PRODUCED FROM CONTINOUS CAST SLAB AND HAVE A MINIMUN REDUCTION RATIO OF 3 TO 1. ACCORDING TO ASME II PART A ED. 2010. FULLY KILLED, FINE GRAIN STEEL. Value of Mn maximun in derogation permitted up to 1.50% Plates acc. to PED 97/23/EC	TIMBRO DELL'ISPETTORE STAMP OF THE INSPECTION REPRESENTATIVE	METINVEST TRAMETAL S.p.a. F. Andrian Lab. Test Resp.le

Order N° 31105563 - Customer Order N° 229354 - DDT N° 31205163 - Certificate N° 256822 - 2 / 2

CONTROLE

INSPECTION FILE

CHARLATTE
RESERVOIRS
FAYAT GROUP
17 Rue PAUL BERT 89400 MIGENNES
Tel : 03.86.92.30.00 Fax : 03.86.92.30.01
Email : reservoir@charlattereservoirs.fayat.com
Site : http://www.charlatte.fr

SUMMARY OF OPERATION METHODS FOR THE WELDING OF ACCESSORIES

AQ 0245-06 GB	Page1/1
n° :	23000KU7
à	
n° Drawing :	KU007M00000

Certification of non destructive controls inspectors

regarding the AS1210 and AS4458

Items and ref. of weldings according to drawing annexed to the descriptive sheet	Visual control date of TR Name of the inspector : Mr CARON, Mr LAFORGE Mr BERTRAND, Mr RAPPENEAU		TR kept by	Radiography date of TR Name of the inspector : Mr LAFORGE	TR kept by
Longitu. welds	certified on :	11/12/2012	CHARLATTE	certified on 11/12/2012	CHARLATTE
Circular welds	certified on :	11/12/2012		certified on 11/12/2012	
Connection welds	certified on :	11/12/2012			
Flange welds	certified on :	11/12/2012			

The undersigned, Ste CHARLATTE S.A. , manufacturer, certify that for the here above mentionned pressure vessel, the non destructive controls in regarding the AS1210, AS4458
Their qualification is subjected to a certification for the operations of non destructive control which have been entrusted to them in accordance with the french norm NFEN 473 and ASME, SNCT.

These inspectors and certification are hereafter mentionned :

Name ot the inspector	Nature of the non destructive control	Level	Delivered certification	
Mr LAFORGE	RADIOGRAPHY	COFREND II	The : 21/04/2005 valid. until. : 21/04/2015	PAR COMITE CIFM Card n° : BF2-002549
Mr CARON	LIQUID PENETRANT	COFREND II	The : 08/09/2010 valid. until. : 08/092015	PAR COMITE CIFM Card n° : BF2-013761

DESTRUCTIVE CONTROLS

MIGENNES, The : 11/12/2012

Macrography Coef 0.7 Mr RAPPENEAU, Mr CARON Mr LAFORGE, Mr PIACENTINI	TR kept by	Coefficient : 0.85 Date of the TR. Laboratory of the MECASEM		TR kept by
PV N°: K12/143	CHARLATTE	PV N° :	OS/11/1133	CHARLATTE

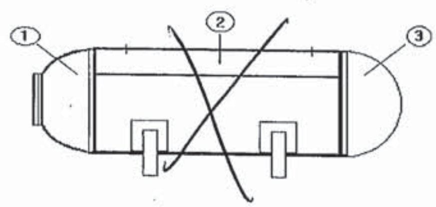
MANUFACTURER:	Charlatte Reservoirs, 89400 Migennes, France		
IMPORTER:	OLAER AUSTRALIA PTY LTD		
EQUIPMENT TITLE:	EUV	DESIGN TEMPERATURE:	0-60 degC
EQUIPMENT No.:	23000 KU7	CORROSION ALLOWANCE:	2mm
SERIAL NUMBER:	23000 KU7	DESIGN PRESSURE:	1600 kPa
REGISTRATION No.:		HYDRO. TEST PRESSURE:	2400 kPa
DESIGN CODE:	AS1210-2A	DATE OF HYDRO. TEST:	11 DEC. 2012
HAZARD LEVEL:	AS4343 - B	SHELL/HEAD THICKNESS:	22.2 mm / 19.25 mm
VOLUME:	23000L	WEIGHT EMPTY/FULL:	12213 kg / 35213 kg
PRE-CHARGE:			

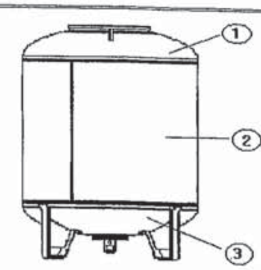
CHARLATTE RESERVOIRS FAYAT GROUP	PROCES VERBAL CONTRÔLE DE MESURE D'ÉPAISSEUR THICKNESS CONTROL CERTIFICATE	N° AQ 0058-05 PAGE: 1 / 1

CLIENT: Customer	*OLAER AUSTRALIA PTY LTD*	AFFAIRE: Job reference	/
N° PLAN: Drawing Nr	*KU007M00000*	N° CDE: Order Nr	/ 012492
N° AR : AR Nr	*8900*		

MATERIEL UTILISE MATERIAL USED			
→	SOFRANEL type 26 MG	précision de l'ordre de ± 0.01 mm	FD48
	SOFRANEL type 26 MG	precision about ± 0.01 mm (until 5 mm)	FD48
	SONATEST T CAGE	précision de l'ordre de ± 0.02 mm (jusqu'à 5)	FD32
	SONATEST T CAGE	precision about ± 0.02 mm (until 5 mm)	FD32

POINT DE CONTROLE:
CONTROL POINT





	1 FOND BRIDE DE VISITE END CAP/MANHOLE	2 VIROLE SHELL	3 FOND OPPOSE OPPOSITE END CAP
	Épaisseur mini adoptée : **19.25**	Épaisseur mini adoptée : **22.2**	Épaisseur mini adoptée : **19.25**
RESERVOIR N° VESSEL Nr **23000KU7**	Épaisseur relevée : 22,64 22,78 23,57 24,14 22,21	Épaisseur relevée : 25,99 25,71 25,24 25,51 25,44	Épaisseur relevée : 23,77 22,16 22,45 22,58 22,63
RESERVOIR N° VESSEL Nr /	Épaisseur relevée :	Épaisseur relevée :	Épaisseur relevée :
RESERVOIR N° VESSEL Nr /	Épaisseur relevée :	Épaisseur relevée :	Épaisseur relevée :
RESERVOIR N° VESSEL Nr /	Épaisseur relevée :	Épaisseur relevée :	Épaisseur relevée :

A MIGENNES LE:
In MIGENNES the: 11/12/2012

LE CONTROLEUR:
The Inspector:

CHARLATTE RESERVOIRS FAYAT GROUP

PROCES VERBAL DE CONTRÔLE VISUEL ET D'ESSAIS HYDRAULIQUE

VISUAL AND HYDRAULIC TESTING CONTROL REPORT

N° AQ 0059-13

PAGE : 1 / 1

CLIENT: Customer	OLAER AUSTRALIA PTY LTD	N° AR : AR Nr	8900
N° PLAN: Drawing Nr	KU007M00000	N° TYPE: Vessel drawing NR	/
N° RESERVOIR: Pressing vessel Nr	23000KU7	N° CATEGORIE: Category NR	I V
		QUANTITE: Quantity	1
PS: Service pressure	16 b psi	PT: Test pressure	24 b psi
MANOMETRE DE TEST: Test Manometer	FC 340	TS: Working temperature	0 °C à 60 °C / °F à °F
MANOMETRE DE POMPE : Pressure gauge of pump :	FC 314	Température de l'eau : ambiante ~20°C / ~68°F Temperature of water: ambient ~20°C / ~68°F	20°
DATE DU TEST: Date of TEST	11/12/2012	DUREE DU TEST EN PRESSION : 30 ' test pressure during : 30 '	30'

suivant directive Européenne 97/23/C E et décret 99.1046 du 13/12/1999
regarding European Directive 97/23/E C and decree 99.1046 of th 13/12/1999

suivant ASME according to ASME — AS1210 ←

SPECIFICATION: SPECIFICATION: FI 0012

MATERIAUX UTILISES: MATERIAL USED — Virole / Shell : P 265 GH - SA516 GR60, P 295 GH - SA516 GR70 — Fonds / End : P 265 GH - SA516 GR60, P 295 GH - SA516 GR70

CONTROLES VISUELS Visueal check	OBSERVATIONS Observations	REP Soudeur Welder's mark	DATE Date
Soudure longitudinale Longitudinal welding	OK	B	11/12/12
Soudures circulaires Circular welding	OK	D	
Soudure brides Flanged welding	OK	O - T	
Soudure piquages Socket welding	OK	T	
Contrôle intérieur Internal check	OK		
Contrôle extérieur Exterior check	OK		

CONCLUSION: Conclusion

MATEREL ACCEPTE
Accepted material

~~MATERIEL REFUSE~~
~~Rejected material~~ voir feuille de non conformité see no-conformity check list

A MIGENNES LE: In MIGENNES the: 11/12/2012

LE CONTROLEUR: The Inspector

CHARLATTE RESERVOIRS FAYAT GROUP

PROCES VERBAL DE CONTROLE DIMENSIONNEL ET DE CONFORMITE
DIMENSIONAL CONTROL SHEET AND CONFORMITY

N° AQ 0064-05

Page : 1 / 1

CLIENT : *Customer*	**OLAER AUSTRALIA PTY LTD**	AFFAIRE : *Job reference*	/
N° PLAN : *Drawing Nr*	**KU007M00000**	N° CDE : *Order Nr*	/ 012 492
N° AR : *AR Nr*	**8900**	Dimensions en millimétres *Dimension in millimetre*	

Vertical	COTES THEORIQUES *THEORITICAL DIMENSION*	COTES TEL QUE CONSTRUIT AS BUILT RESERVOIR *PRESSURE VESSEL* N° **23000KU7**	RESERVOIR *PRESSURE VESSEL* N° /	RESERVOIR *PRESSURE VESSEL* N° /	RESERVOIR *PRESSURE VESSEL* N° /
Hauteur hors tout *Overall height*	**6199±100**	6215			
Longueur Hors tout *Overall lenght*	/	/			
Hauteur sous réservoir *Length under pressure vessel*	**900±5**	905			
Hauteur sortie/sol *Outlet / ground height*	**150**	154			
Entraxe des pieds *Distance between feet*	**2040 X 2040** 300 **8Ø26**	2040 2040 8ϕ26 – 300 –			
Entraxe des sorties *Distance between outlets*	**75 / 75 / 3200** **150 / 1800 / 1800**	75 / 80 / 3200 155 / 1800 / 1800			
Ø sortie d'eau *Ø water outlet*	**DN450PN16** **20Ø30/Ø585**	DN450 PN16 20x30x585			
Longueur de la virole	**4000**	4010			
Rotonditée *Roundness*	/	/			
Accessoires (niveau, etc...) *Accessories (level, jauge...)*	Rehausse 750 **Vanne et mano déportés**	754 oui			
Etanchéité (air) *Airtightness*	/	OK			
Conformité à l'A.R. *Conformity to the A.R.*	/	OK			

OBSERVATIONS
OBSERVATIONS

A MIGENNES LE : *In MIGENNES the :* 11/12/2012

LE CONTROLEUR : *The Inspector :*

CHARLATTE CONTROLE

CHARLATTE RESERVOIRS FAYAT GROUP	PROCES VERBAL CONTRÔLE DE MESURE D'EPAISSEUR DE PEINTURE	N° AQ 0066-07
	PAINT THICKNESS TEST REPORT	PAGE: 1 / 1

CLIENT: Customer — *OLAER AUSTRALIA PTY LTD*

AFFAIRE: Job reference — /

N° PLAN: Drawing Nr — *KU007M00000*

N° CDE: Order Nr — / 012492

N° AR : AR Nr — *8900*

MATERIEL UTILISE POUR: MATERIAL USED FOR

1) Mesure du film humide: Measure of humid film — Jauge de NORDSON / NORDSON gauge
2) Mesure du film sec: Measure of dry film — Appareil de mesure d'épaisseur de peinture SOFRANEL Elcometer 456 n° FD063 / Measuring instrument SOFRANEL Elcometer 456 n° FD063
3) Mesure d'ambiance / Measure of humidity — Appareil de mesure de taux d'humidité relative (Hygrométrie) et mesure de température, THERMO-HYGROMETRE HANNA réf: HI 8564 n° FD030 / Measuring instrument of relative degree of moisture (Hygrometry) and temperature measuring THERMO-HYGROMETER HANNA réf: HI 8564 n° FD030

Mesures en micron — **Measurements in micron**

PROTECTION INTERIEURE : epaisseur mini :
INTERNAL PAINT : mini thickness : ***ep total : 400µ***

PROTECTION EXTERIEURE : epaisseur mini :
EXTERNAL PAINT : mini thickness : ***ep total : 300µ RAL 7038***

RESERVOIR Nr / PRESSURE VESSEL Nr		Nombre de points / Number of points	Mini	Maxi	Moyenne / Average
23000KU7	EPAISSEUR INTERIEURE : INTERNAL THICKNESS :	63	408 µ	1132 µ	557 µ
	EPAISSEUR EXTERIEURE : EXTERNAL THICKNESS :	82	308 µ	1147 µ	538 µ
/	EPAISSEUR INTERIEURE : INTERNAL THICKNESS :				
	EPAISSEUR EXTERIEURE : EXTERNAL THICKNESS :				
/	EPAISSEUR INTERIEURE : INTERNAL THICKNESS :				
	EPAISSEUR EXTERIEURE : EXTERNAL THICKNESS :				
/	EPAISSEUR INTERIEURE : INTERNAL THICKNESS :				
	EPAISSEUR EXTERIEURE : EXTERNAL THICKNESS :				

A MIGENNES LE: In MIGENNES the: 18/12/2012

LE CONTROLEUR: The Inspector:

CONTROLE CHARLATTE

CHARLATTE RESERVOIRS FAYAT GROUP

PROCES VERBAL CONTRÔLE DE MESURE DE RUGOSITE Ra
ROUGHNESS MEASUREMENT TEST REPORT

N° AQ 0069-04

PAGE: 11

CLIENT: Customer — OLAER AUSTRALIA PTY LTD

AFFAIRE: Job reference — /

N° PLAN: Drawing Nr — KU007M00000

N° CDE: Order Nr — / 012 492

N° AR : AR Nr — 8900

MATERIEL UTILISE
MATERIAL USED

* Appareil de contrôle de rugosité SODEXIM 330 SURTRONIC 10 type 112/1540
  Roughness measuring equipement SODEXIM 330 SURTRONIC 10 type 112/1540
* Plage de mesure: 0.1μ à 40 μm
  Measuring margin: 0.1μ to 40 μm
* Précision 5% de la valeur affichée + 0.1 μm
  Precision 5% of the value + 0.1 μm

RESERVOIR N° PRESSURE VESSEL Nr	FOND bride de visite END CAP/MANHOLE		VIROLE SHELL		FOND OPPOSE OPPOSITE END CAP	
	int.	ext.	int.	ext.	int.	ext.
23000KU7	10,6μ	8,2μ	9,8μ	7,7μ	8,3μ	6,9μ

A MIGENNES LE:
In MIGENNES the: 17/11/2011

LE CONTROLEUR:
The Inspector:

CHARLATTE RÉSERVOIRS
FAYAT GROUP
17 Rue PAUL BERT 89400 MIGENNES
Tel : 03.86.92.30.00 Fax : 03.86.92.30.01
E-mail : reservoir@charlattereservoirs.fayat.com
Site : www.charlatte.fr

RAPPORT DE CONTRÔLE NON DESTRUCTIF PAR RESSUAGE
DYE PENETRANT EXAMINATION TEST REPORT

AQ 0376-00

PAGE : 1 / 1

CLIENT : / Customer: **OLAER AUSTRALIA PTY LTD**

AFFAIRE : / Job référence: /

N° PLAN : / Drawing Nr: **KU007M00000**

N° COMMANDE : / Order Nr: 1012492

N° AR : / AR Nr: **8900**

RÉSERVOIR N° : / Pressure vessel Nr: **23000KU7**

PARAMÈTRE D'EXAMEN suivant procédure FI0273 / PARAMETERS Of EXAMINATION of the procedure FI0273

CONDITION D'EXÉCUTION : / Conditions of execution: CODAP [ ] AS1210 : AS4037 section 8 [X]

MATÉRIAUX : / Materials: **SA516GR70**

ÉPAISSEUR : / Thickness:

ÉTAT DE SURFACE : / Surface quality: **GROSS**

TEMPÉRATURE : / Temperature: **21°** THERMOMÈTRE LASER n° FD061 / THERMOMETER LASER n° FD061

ÉCLAIRAGE : / Lightning: **1200 Lux** LUXMÈTRE CA811 CHAUVIN-ARNOUX n° FD078 / LUXMETRE CA811 CHAUVIN-ARNOUX n° FD078

PRODUITS UTILISES ET PROCÉDÉ OPERATOIR / USED PRODUCTS AND PROCESS OPERATOIR

SOLVANT : / Solvent — Marque / Mark: **MARKER** — Type: **MR85** — Lot nr / Lot Nr: **85107/A** — Date de péremption / Expiry date: **21/12/14**

APPLICATION : / Application: **SPRAYING** — TEMPS DE SÉCHAGE : / Time of drying: **15 mn**

PÉNÉTRANT : / Impressor — Marque / Mark: **MARKER** — Type: **MR311** — Lot nr / Lot Nr: **311/1000/A** — Date de péremption / Expiry date: **01/2015**

APPLICATION : / Application: **SPRAYING** — TEMPS D'IMPRÉGNATION : / Time of impregnation: **10 mn**

NETTOYAGE / Cleaning: **WATER** — TEMPS DE SÉCHAGE : / Time of drying: **10 mn**

RÉVÉLATEUR : / Developer — Marque / Mark: **MARKER** — Type: **MR70** — Lot nr / Lot Nr: **70/1019/A** — Date de péremption / Expiry date: **05/2015**

APPLICATION : / Application: **SPRAYING** — TEMPS DE RÉVÉLATION / Time of revelation: **10 mn** — TEMPS D'INTERPRÉTATION : / Time of interpretation: **30 mn**

NETTOYAGE FINAL / Final cleaning: **WATER**

RÉSULTATS OBTENUS / RESULTS

[ ] CONFORME / *CONFORM* [ ] NON-CONFORME / *NOT CONFORM*

Control of welding support plate , leg and lifting lug

Without defect outside of the criterium

Results are in conformity with the specification FI0273

A MIGENNES le : / In MIGENNES the: 11/12/2012

LE CONTRÔLEUR : / Examination personnel: **LAFORGE Alain ASNT lv2 PT**, **CARON Gérard ASNT lv2 PT**

CONTROLE QUALITE CHARLATTE

CHARLATTE RESERVOIRS FAYAT GROUP

PROCES VERBAL DE CONTRÔLE RADIOGRAPHIQUE
RADIOGRAPHIC INSPECTION REPORT

N° AQ 0108-11 FR/GB

PAGE: 1 / 2

CLIENTS: Customer	OLAER AUSTRALIA PTY LTD	AFFAIRE: Job reference	PROJECT CARDNO
N° PLAN: drawing Nr	KU007M00000	N° CDE: Order Nr	012492
N° AR: AR Nr	8900	N° PV: Report Nr	23000KU7

Détails sur le matériel
Details on checked material

MATERIEL: Checked material	TANK	N°: Number	23000KU7
MATERIAU: Materiel	SA516GR60	DIMENSION: Dimension	Ø 2500 x 4000
MODE DE SOUDAGE: Welding procedure	SAW	SOUDEUR: Welder	longitudinale / Longitudinal : B circulaire / Circular : D sortie / Flange : /

Croquis en annexe: Drawing in appendix — OUI Yes [X] — NON No [ ]

Examen radiographique suivant fiche d'instruction FI0014
Radiographic Examination Procedure FI0014

CONDITION D'EXECUTION: Conditions of execution — CODAP [ ] — ASME sec.V [ ] — AS 1210 [X] — CLASSE OU COEFF: Class or coefficient: 0.85 (10%)

SOURCE DE RAYONNEMENT: Radiation source (s) — DESIGNATION DE L'APPAREIL: Apparatus designation: ERESCO 60 MF — Dimensions, foyer ou radioélément : Source size : 1,5 X 1,5 mm

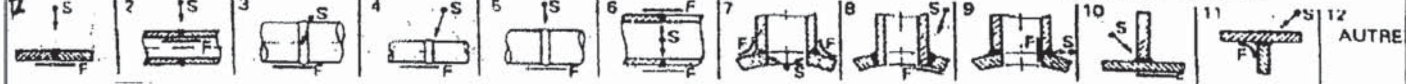
RX X rays [X] — I max: Max. current 3.2 mA — V max: Max. voltage 275 kV

Classification film : Classification film — ISO = GIII — EN 584-1 = C5 — ASTM E 1815-96 = Class II — Format film : Format film 10 x 40 — Traitement radiogramme: Film processing [X] Manuel Manual

Caractéristiques des films, écrans renforçateurs, filtres et IQI utilisés - conditions de prises de vues
Characteristics of film, intensifying screens, filters and IQI's - Operating conditions

Repère pièce / soudure Workpiece mark / Weld mark	SOUDURE LONGITUDINALE Longitunal welding			SOUDURE CIRCULAIRE Circular welding			SOUDURE DE SORTIE Flange welding		
	TYPE Type	SIMPLE FILM Single film	DOUBLE FILM Double film	TYPE Type	SIMPLE FILM Single film	DOUBLE FILM Double film	TYPE Type	SIMPLE FILM Single film	DOUBLE FILM Double film
FILM Film	KODAK AA400	X	-	KODAK AA400	X	-	-	-	-
POSITION DE PRISE DE VUE Positionning of source and film			1			2			-
NOMBRE DE PRISE DE VUE Number of exposures			6			9			-
NOMBRE DE FILM PAR PRISE DE VUE Number films per shot			1			1			-
EPAISSEUR FILTRE ANTERIEUR (mm) Thickness of front filter			-			-			-
EPAISSEUR DES ECRANS (mm) Thickness of screens	ANTERIEUR Front: 0.027	INTERMEDIAIRE Intermediate: -	POSTERIEUR Back: 0.027	ANTERIEUR Front: 0.027	INTERMEDIAIRE Intermediate: -	POSTERIEUR Back: 0.027	ANTERIEUR Front: -	INTERMEDIAIRE Intermediate: -	POSTERIEUR Back: -
EPAISSEUR BLOCAGE RADIODIFFUSION Thickness of backscattering barrier			2			2			-
INDICATEUR QUAL. IMAGE Image quality	NORME Norme: ASTM	TYPE Type: 1B11	POSITION Position: S	NORME Norme: ASTM	TYPE Type: 1B11	POSITION Position: S	NORME Norme: -	TYPE Type: -	POSITION Position: -
EPAISSEUR. TRAVERSEE (mm) Thickness object			25			25			-
DISTANCE OBJET / FILM (mm) Object film distance			27			27			-
DISTANCE SOURCE / FILM (mm) Source film distance			727			727			-
DISTANCE SOURCE / OBJET (mm) Source object distance			700			700			-
TENSION (KV) Voltage (KV)			220			220			-
INTENSITE (ma) Current (ma)			4.0			4.0			-
TEMPS D'EXPOSITION Exposure time			1.9			2.5			-

1: Positions de prises de vues / Positionning of source and film — 2 S: Coté source / S: Source side — F: Côté film / F: Film side



Tous les repères sont en simple exposition exepté repere 5 qui est en double exposition / All items are single exposure expt item 5 is in double exposure

Examen radiographique éxécuté par / Radiographic tester

NOM / Name	LAFORGE A. ASNT level II X ray
DATE / Date	11-12-2012
SIGNATURE	LA — CONTROLE QUALITE CHARLATTE

CHARLATTE RESERVOIRS FAYAT GROUP	PROCES VERBAL DE CONTRÔLE RADIOGRAPHIQUE *RADIOGRAPHIC INSPECTION REPORT*	N° AQ 0108-11 FR/GB PAGE: 2 / 2

INTERPRETATIONS DE RADIOGRAMMES: **23000KU7**
Interpretation of radographs following

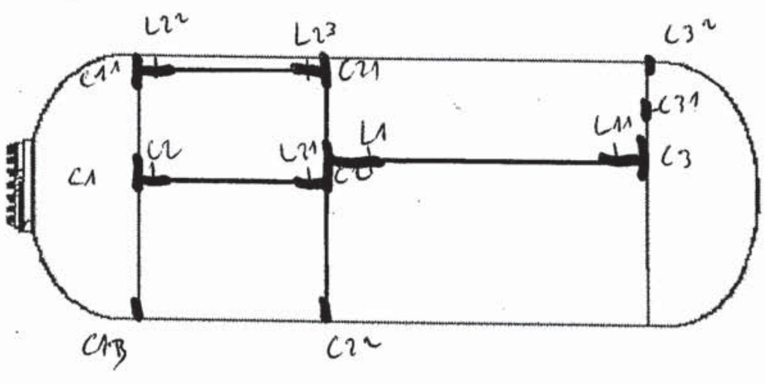
RESULTATS: ☒ Conforme / Conform ☐ Non-conforme / Not Conform
Results

Acceptance criteria used to interpret the RT results - AS4037 section 8

Repére élément examiné *Checked element mark*	Repere film *Film mark*	Densité *Density*	Qualité d'image obtenue *Ulage quality*	Flou géomét. *Geometric distortion*	Code défaut *Defect code*	Code résultat *Results code*	OBSERVATIONS *Remarks*
C3	B114	3,00	W6	0,09	/	C	/
$C3^1$	B115	2,95	W6	0,09	/	C	/
$C3^2$	B116	2,80	W7	0,09	/	C	DF
L1	B121	2,50	W7	0,09	/	C	/
$L1^1$	B122	2,30	W7	0,09	/	C	/
C2	B119	3,70	W6	0,09	/	C	/
$C2^1$	B120	2,80	W7	0,09	/	C	/
$C2^2$	B119	2,80	W7	0,09	/	C	/
L2	B117	2,15	W7	0,09	/	C	/
$L2^1$	B118	2,10	W7	0,09	/	C	/
$L2^2$	B141	2,30	W7	0,09	/	C	/
$L2^3$	B142	2,25	W7	0,09	/	C	DF
C1	B123	3,40	W7	0,09	/	C	/
$C1^2$	B124	3,55	W6	0,09	/	C	/
$C1^B$	B124	3,05	W7	0,09	/	C	/

CODE *Code*	NATURE DES DEFAUTS *Type of defects*	
FL	Fissure longitudinale	*longitudinal crack*
FT	Fissure transversale	*transverse crack*
SS	Soufflure sphéroïdale	*sphirical porasity*
NID	Nid de soufflures	*clustered porosity*
SAC	Soufflures alignées ou chapelet	*linear porosity*
SA	Soufflure allongée	*elongated cavity*
SV	Soufflure vermiculaire	*worm hole*
RT	Retassure	*strinkage cavity*
INC	Inclusion de laitier ou flux	*stag flux unclusion*
INCM	Inclusion métallique	*metallic inclusion*
MF	Manque de fusion	*lack of fusion*
MP	Manque de pénétration	*lack of penetration*
CA	Caniveau	*shrinkage*
MOR	Morsure	*local undercut*
DA	Défaut d'aspect	*defect look*
DF	Défaut de film ou dévelop,	*film or develop, defect*

CODE *Code*	RESULTATS *Result code*	
C	Conforme	*conform*
NC	Non conforme	*not conform*



Examen radiographique interprété par
Radiographic interpreter

NOM / Name :	**LAFORGE A. ASNT level II X ray**
DATE / Date :	11 12 2012
SIGNATURE :	CONTROLE QUALITE CHARLATTE

NOTICE ET PLAN

NOTE AND DRAWING

CHARLATTE RESERVOIRS FAYAT GROUP	TECHNICAL SPECIFICATION	Assurance Qualité
	TITLE:	IDENTIFICATION
	GENERAL COMMISSIONING AND MAINTENANCE INSTRUCTIONS FOR HYDROCHOC BLADDER VESSELS SPECIAL FOR WASTE WATER	SPT 0163-07-GB
		Page 1/1

For tanks subject to Directive 97/23/EC and to the implementation decree dated 13 December 1999 (or to ASME).
The aim of these instructions is to draw the attention of installers, operators, project managers and other users to some basic precautions to be observed :

I Security and legislation

This tank, manufactured according to the European Directive DESP 97/23 CE (or to ASME) is under the rules of pressure gas apparatus. **Check that a safety device (compliant with directive 97/23 CE and ASME) is providing protection against any pressure that exceed the maximum service pressure level. We recommend installing this safety device on the pipe as close as possible to the pump.**

- Never dismantle or open a vessel under pressure without previously having drained the air and the water completely.
- Never stay in front of the manhole while opening it.
- Internal pressure must be zero before any dismantling.

II Installation Configuration

Surge bladder vessel for waste water should preferably be installed on line with the pipe. Due to space, civil engineering or other reasons, they can be installed if necessary : either off line with an elbow, or at the end of the pipe in the pumping station.
The network on which the vessel is connected has to enable to isolation, dismantling and draining. The gate and drain valves are part of the design of the installation.

CAUTION : ***this vessel has been temporaly pre-inflated at 0.5 b in our factory.***
The commissioning of this material has to be realized. Reajust the precharge value according to the following instructions.

III Selection of the vessel pre-charge value

For the precharge value, please see our study (see the label next the manufacter plate if a study has been done by our departments).
In all cases, never exceed 4 bars relative in order not to damage the bladder. Please follow the pre charge as follow :

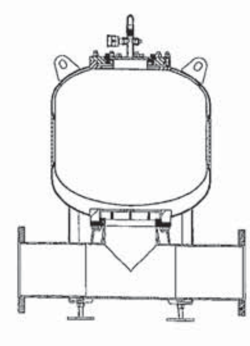
If the precharge value exceeds atmospheric pressure

1. Isolate the vessel from the network.
2. Open the drain valve of the line between the vessel and the isolation valve. (In the absence of a drain, please unbolt the connecting flange of the vessel) to evacuate the air which is between the bladder and the shell of the vessel in order to make a correct precharge.
3. Inject the air through the precharge valve situated at the top of the vessel (4 bar at the maximum).
4. Control that the sockets, the valves and plugs situated on the vessel are airtight with soapy water.
5. Put the vessel at the static pressure of the network.
6. When the vessel is at static balance (the manometer is stationary).
7. Control again all airtightnesses at service pressure.
8. In case of leak, drain completely the air from the vessel ; repair the seals and start again the commissioning from the beginning.

If the preharge value is equal to the amospheric pressure

The case of a precharge at atmospheric pressure is a particular type of tuning.
The volume of compressed air in the vessel corresponds exactly to its capacity when the gas is reduced to atmospheric pressure.
The stages N°2 to 6 are aimed at ensuring that the total volume of the vessel is full of air at atmospheric pressure when the bladder, inflated against the wall of the vessel is completely full.
Stage N°5 is essential : after having pushed the inflated bladder against the wall of the vessel (stage N°4), you must prevent the air from getting in while the pressure is being reduced (stage 6) because the bladder is likely at this moment to fold naturally.

1. Isolate the vessel from the network if the connection is already carried out.
2. Open the water drain or loosen the connection of the vessel from the connection pipe, and leave it open until stage N°5.
3. Connect a compressor, nitrogen or compressed air bottle to the charge valve.
4. Introduce compressed gas up to 4 bars and check with soapy water the airtightness on the gas side of the device; **In case of leakages, drain completely the air from the vessel ; repair the seals and start again the commissioning from the beginning.**
5. When the air tightness is checked, tighten the flange of the device if it has been loosened since the stage N°2 or simply close the drain opened since stage N°2.
6. Reduce the gas pressure to 0 bar to regulate the precharge at atmospheric pressure.
7. Open the drain again or loosen the device again.
8. Open very slowly and partially the connection with the network in order that the water under static conditions comes into the connection pipe and the vessel. The open drain or loosened flange must evacuate air then water.
9. Close the drain or tighten the flange that was open since the stage N°7.
10. Open completely the connection with the network, which was partially open since stage N°8.
11. During the first hours, after the commissioning, check the airtightness of the gas side of the vessel while the system is in operation at dynamic pressure. **In case of leakages, drain completely the air from the vessel ; repair the seals and start again the commissioning from the beginning.**



For any further information, please contact our After Sales Department.
CHARLATTE 17, Rue Paul Bert 89400 MIGENNES tel 03 86 92 30 14 fax 03 86 92 30 01
All our documents are available on our website www.charlatte.fr

CHARLATTE RESERVOIRS FAYAT GROUP	TECHNICAL SPECIFICATION	Quality Assurance
	TITLE: **BLADDER CHANGE INSTRUCTIONS** **Interchangeable range**	REF **SPT 0212-03-GB**
		Page 1 /1

REMOVING THE BLADDER

MATING FLANGE SYSTEM

- Unscrew the bladder's retaining nuts (No. 5).
- Push the bolts exposed back towards the inside of the tank (No. 6), taking care not to damage the thread.
- Pull the tank's bladder out through the inspection hole.
- Locate the mating flange's position inside the bladder (No. 7)
- Take the two parts of the mating flange out from inside the bladder and refit them in the new bladder.

STRAINER SYSTEM

- Unscrew the bolts (No. 13).
- Remove the outlet (No. 12), as well as the strainer (No. 11).
- Remove the bladder's flange (No. 10) from its housing and push it back towards the inside of the tank.
- Remove the manometer and the manometer brake (No. 16) and undo the bladder's locking ring (No. 15) (Vertical models only).
- Remove the bladder via the inspection hole.

FITTING A NEW BLADDER

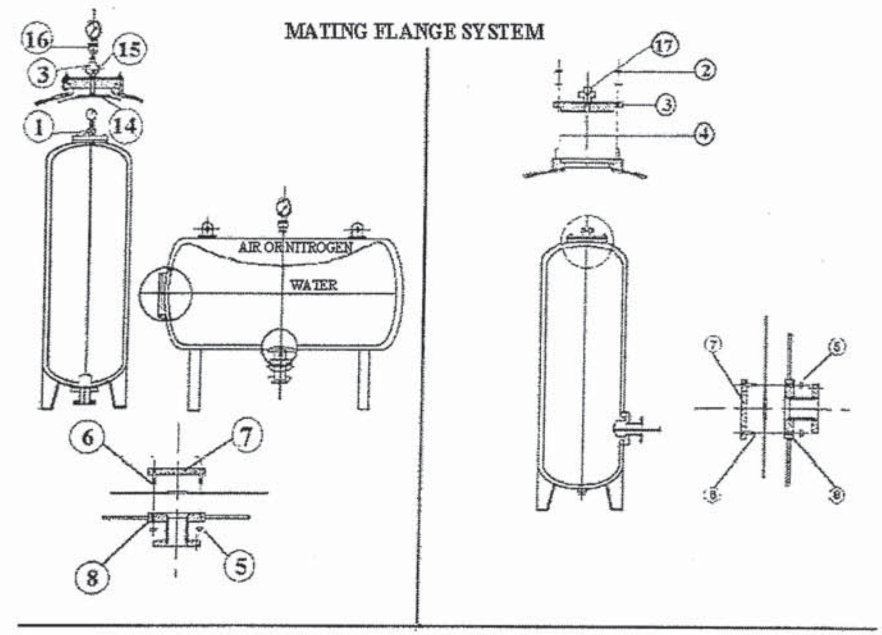
NB: Before fitting a new bladder, you must ensure that the inside lining is in good condition (redo it where necessary).
Make sure there are no foreign objects remaining inside the tank that would pose a risk of damaging the bladder.

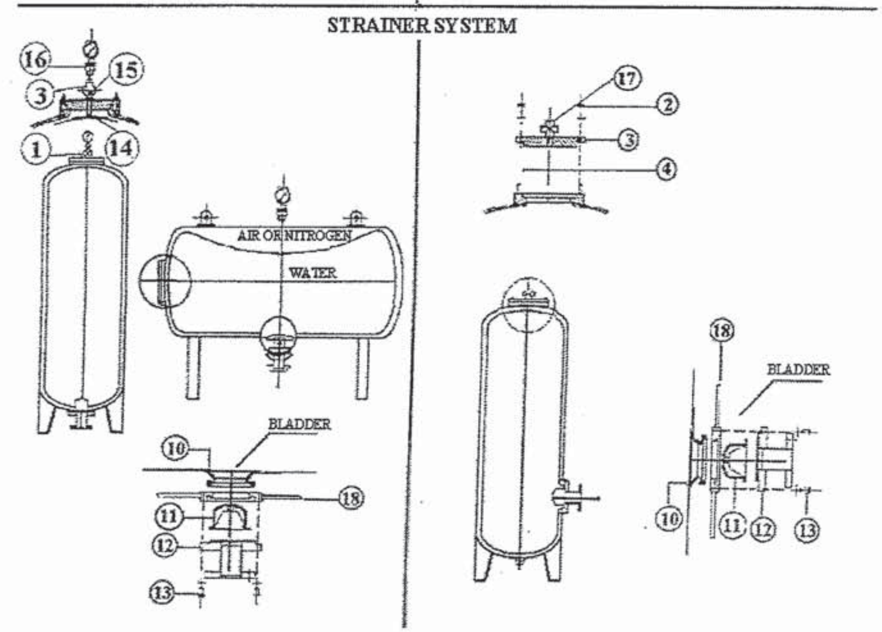
MATING FLANGE SYSTEM

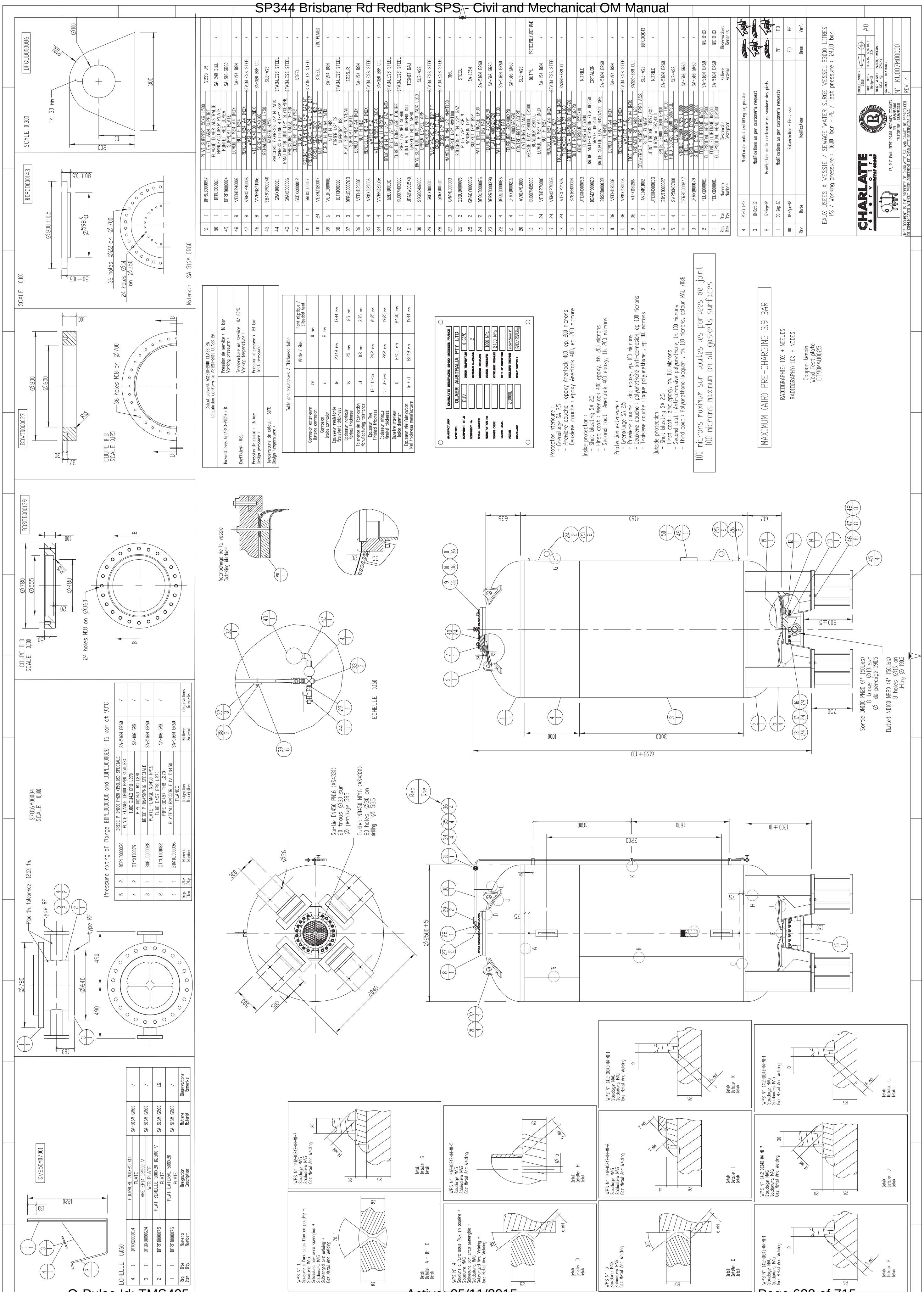
- Place the bladder inside the tank and insert the bolts into the flange holes (No. 8).
- Put the bladder's retaining nuts back on and tighten them up. (Preferably, new nuts should be used – sealing/locking nuts).
- Put the inspection hole cover back on once you have fitted a new seal (No. 4) and tighten up the nuts.
- Carry out the commissioning procedure once again: pre-inflate the bladder to the value calculated, check it is watertight, then fill with water at operating pressure and check the watertightness again. EVEN THE SLIGHTEST LEAK MUST BE STOPPED. (Use a foaming agent or soapy water.)

STRAINER SYSTEM

- Place the replacement bladder inside the tank via the inspection hole.
- Using the cord, fit the ring (No. 14) into the central hole in the cover (No. 3). Place the locking ring (No. 15) in the bladder's ring (Vertical models only).
- Put the inspection hole cover back on once you have fitted a new seal.
- Tighten up the nuts (No. 2)
- Fit the manometer brake and the manometer (No. 16) back onto the cross (No. 17) (Vertical models only).
- Put the flange (No. 10) back into its housing (No. 18), after having cleaned the latter, if necessary.
- Place the strainer back on (No. 11).
- Fit the water outlet (No. 12) and tighten up the screws (No. 13).
- Carry out the commissioning procedure once again as outlined above.






EAUX USEES A VESSIE / SEWAGE WATER SURGE VESSEL 23000 LITRES
PS / Working pressure : 16,00 bar - PE / Test pressure : 24,00 bar
N° KU007M00000
CHARLATTE
MAXIMUM (AIR) PRE-CHARGING 3.9 BAR
100 microns maximum sur toutes les portees de joint
100 microns maximum on all gaskets surfaces
Pressure rating of flange BOPLD000030 and BOPLD000028 : 16 bar at 93°C
ECHELLE 0,150

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OPERATION, INSTALLATION AND MAINTENANCE MANUAL

PROJECT NAME:	Cardno
SUPPLIER:	Olaer Australia Pty Ltd
MANUFACTURER:	Charlatte Reservoirs - France
OLAER CONTACT:	Sven Geboers
VESSEL TYPE:	EUV Surge Vessel

OLAER Australia Pty Ltd | 13 Boola Place | Cromer | NSW 2099 | Australia | www.olaer.com.au
| Tel:+61 2 9981 6888 | Fax : +61 2 9981 6144 | info@olaer.com.au

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Contents

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1. General notes

1.1. General

- Bladder Surge Vessels can also be referred to as Gas Accumulators, Bladder Surge Tanks & Air Chambers.
- The Surge Vessel contains gas (dry nitrogen or compressed air) and liquid under pressure.
- Type of vessel used for your project: EUV Surge Vessel
- EUV vessels are pre-inflated to 0.5 bar to prevent them from damaging during transport.

1.2. Technical data

1.2.1. Vessel

• External Vessel Diameter:	2500 mm
• OAL:	6199 mm
• Outlet Opening:	DN 450
• Flange:	DN 450 PN16 AS4331
• Design/Hydrostatic Test Pressure:	1600 kPag / 2400 kPag
• Design Code:	AS1210-2A
• Vessel Volume:	23000L
• Hazard Level:	B
• Design Temp:	0 to +60 degC
• Pre-charge Value:	tba Barg
• Pre-charge Medium:	Dry Nitrogen Gas or compressed air

WARNING: Nitrogen or compressed air must be used as a pre-charge medium. Do not use alternate gases.

1.3. Bladder

• Type:	Reinforced waste water bladder
• Model No:	23000KU7
• Max Pre-charge Pressure:	4 Barg
• Design Life:	Up to 12 years, dependent on avoidance of adverse operating conditions (refer Principles of Operation)

1.4. Internal Coating

• Shot Blast SA 2.5	
• 1st coat:	Amerlock 400 epoxy th. 200 µm
• 2nd coat:	Amerlock 400 epoxy th. 200 µm

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1.5. **External Coating**

- Sand Blast SA 2.5
- Primer: Zinc Epoxy th. 100 μm
- 2nd coat: Anti-corrosive polyurethane th.100 μm
- 3rd coat: polyurethane laquer th. 100 μm RAL 7038
- Total Thickness: 300 μm

2. Safety procedures (OH&S)

IMPORTANT

- Safety goggles must be worn when charging and discharging nitrogen.
- The surge vessel is a pressure vessel containing water and compressed gas.
- Never disassemble or open a vessel before ensuring vessel is completely drained of water and gas.
- Comply with the nitrogen charging and venting procedures reference doc: BOC Gas Cylinder Users' Manual: "Safe under Pressure" to avoid the risk of asphyxiation.
- Never stay in front of the inspection opening / manhole while opening it.
- Ensure that a Job Safety Analysis is completed before commencing any work on or in the vessel.
- Ensure that the vessel is depressurized before commencing any work on the vessel.
- DO NOT PERFORM HYDROSTATIC TESTING WITH SURGE VESSEL INLINE. SURGE VESSELS HAVE STORED ENERGY.

3. Storage and Handeling

3.1. Vessel

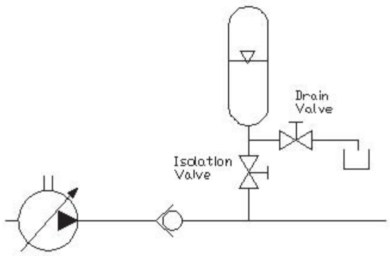
- To protect the bladder do not leave the vessel in the sun without any water in it.
- Only hoist vessels when they are empty. Use the lifting eyes to move the vessels.
- Do not attempt to move the surge vessel when it is full of water and/or nitrogen.
- It is recommended that if elastomeric parts are stored for more than 5 years they are discarded and replaced.

4. Transport procedures

Before transporting these vessels; please ensure that:

- The vessels are completely drained from water – i.e. empty
- The vessels have been discharged from Nitrogen (or compressed Air)
- The vessels are safely secured on the transporting truck – i.e. chained and tied down
- The vessels are placed and taken off the transporting truck using the lifting eyes/lugs only

5. Installation procedures

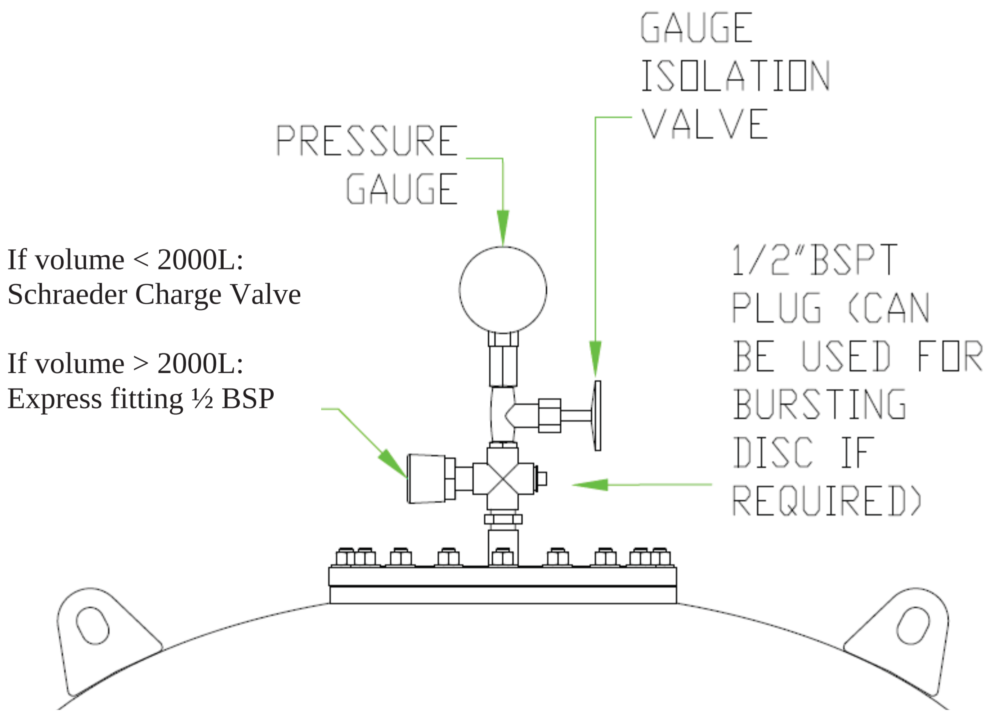


Circuit diagram: Power Failure / Pump trip

- Protection against power failure / pump trip: Surge vessel must be installed downstream of the pump check valve as close to the check valve as possible.
- Protection against valve closure: Surge vessel must be installed as close as possible to the valve causing the transient event. This often isn't practical and surge vessel must be installed far from the valve. With this configuration transient will travel to the surge vessel before it is dampened.
- Install an isolation valve between the network and the vessel as there must be a way to isolate the vessel.
- Install a drain valve between the isolation valve and the outlet of the vessel. Vessel volume should be taken into consideration while selecting the diameter of the drain valve. Vessel outlet can have an extra connection that can be used as drain.
- Foundation must be able to support the weight of the full vessel.
- Installation location must be such that all parts of the vessel are accessible and that entry inside the vessel is possible. With vertical vessels allow room above so that bladder can be taken out for future maintenance.
- The vessel should be connected in a way that vibrations from other equipment will not affect it.
- Attachments must not cause any stress to the vessel.
- Measuring equipment should be installed with the vessels. Vessels should have a pressure gauge as minimum.
- The vessel should be bolted down securely (forces during overpressure situation should be considered).
- If required earth the vessel.
- If vessels are in a corrosive environment special paint needs to be applied.
- System must be equipped with a pressure relief device which will ensure that design pressure will not be exceeded.
- Note on equipping a vessel with a PRV: overpressure can only come from the system. If the relief valve is fitted onto the vessel it can only be with a reduced size orifice and could never relieve the full system flow. This can make fitting of the vessel with a PRV obsolete. Code permits this if there is a PRV somewhere else in the system.
- If PRV is fitted note that this should only be done at the water side of the vessel. No PRV should be fitted on the gas side.

6. Pressure Gauge

- Vessels are normally supplied with a cross, charge valve, pressure gauge and isolation valve.
- Items should be assembled as per below sketch.
- Air leaks are likely to occur on the threaded connections so ensure that threads will seal.



7. Commissioning procedures

7.1. Special tools required:

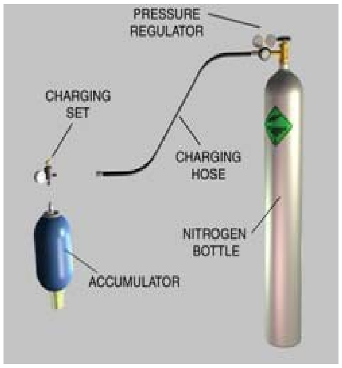
- A roll of Duct tape (approx 5cm wide)
- Water Spray bottle and soap (detergent) – to detect for AIR leaks
- A set of spanners to check and tighten manhole bolts, water outlet bolts and pipe fittings (10mm – 35mm)
- A hoist/lift/ladder to check the connections on top of the vessel
- A nitrogen regulator to control the pre-charge process of Nitrogen into the Surge Vessel. A 16 Bar Nitrogen regulator will be fine. BOC can supply this. Just confirm it is a NITROGEN regulator, no other regulator will work (e.g. Oxygen etc) – they look very similar.

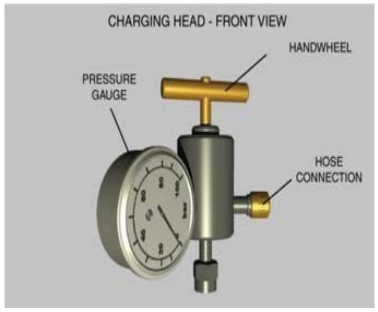
7.2. Commissioning

In order to make the vessel operational it needs to be pre-charged with nitrogen or compressed air. This procedure must be carried out on site. This commissioning procedure assumes that the vessel is already installed in the system. Pumps are isolated during commissioning.

- Ensure that the pump piping and pipeline are filled and under the full pipeline static head.
- Isolate the vessel from the system using the Isolation valve.
- Open the Drain valve located between the vessel and isolation valve. Water and Gas need to be completely drained before the next step. Drain valve stays open until charging is finished.
- Introduce gas until the pre-charge pressure has been reached, using vessel pressure gauge to check. For charging accumulator using nitrogen gas bottles, regulator and charging kit follow instructions below:
    a) Ensure that regulator is fitted to the gas bottle before connection. Low pressure side of the regulator should be no more than 10Bar for accurate charging.
    b) Attach charging set to accumulator gas valve assembly (do not over tighten).
    c) Attach hose between the regulator and charging set.
    d) After ensuring that regulator is closed, back off handle on gas regulator until loose.
    e) Ensure gas bleed valve on the charging set is closed.
    f) Screw handwheel clockwise to open the gas valve. Do not screw knob down tight.
    g) Open nitrogen cylinder valve, pressure should register on the inlet (high pressure) side of the regulator.
    h) Turn the handle on gas regulator until outlet pressure on left hand gauge is slightly higher then required pre-charge pressure. When pressure on the charging set and regulator outlet gauge are equal, close nitrogen cylinder valve.
    i) Turn charging set handwheel anti-clockwise to seal the gas valve.

j) FINE ADJUSTMENT - Crack bleed valve on the charging set (not shown) to exhaust gas from charging hose and remove hose from charging set.
k) FINE ADJUSTMENT - Close bleed valve, turn handwheel clockwise to open gas valve. Do not screw knob down tight. Crack bleed valve to vent down to required pre-charge pressure. Close bleed valve.
l) Turn handwheel anti-clockwise to reseal gas valve, crack bleed valve and remove charging set from accumulator.
m) Connect the gas valve protection cap.





n) Record the pre-charge value and temperature – this value will be used for future maintenance.
o) Ensure that there are no gas leaks (check water inlet and all gas-side piping and fitting connections, including the gas charging connection and level gauge equipment). Use soapy water. In case there is a leak, drain all the gas from the vessel, fix the leak and commence commission procedure again.
p) Partially open the Isolating valve.
q) Close Drain valve when water starts coming out of it.
r) Fully opened the Isolation valve.
s) Check for gas leaks using the soap test on all gas-side joints.
t) The surge vessel is now operational.

7.2.1. Precharging notes

- Pre-charge value must be calculated as a part of the hydraulic study (surge analysis).
- Pre-charge value must not exceed 4 Barg.
- Water needs to be introduced immediately after vessel is pre-charged.
- For Gas Cylinder Safety refer to “Safe under pressure manual (BOC)” and for Gas Cylinder transportation refer to “Transport of Gas Cylinder (BOC)” (both manuals attached).
- The gas regulator must be installed immediately after the gas outlet. The gas regulator is used to control the gas flow from the bottles into the surge vessel. Normally gas bottles are at 160Bar; using a regulator will ensure that the surge vessel cannot be exposed to a pressure greater than the regulator set pressure.
- Safety goggles must be worn.
- Ear muffs must be worn if noise level during charging is excessive.

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CAUTION

In order for the vessel to operate correctly, gas tightness must be ensured. This is why care must be taken in completing the installation and pre-charging. Any leaks must be detected and rectified during initial commissioning. Sometimes leaks might not be obvious and the pressure in the vessel needs to be checked soon after pre-charging (within one or two hours). Threaded connections are a possible location for leaks.

REMEMBER

Check that all nuts and bolts are tightly fastened
Check that vessel is gas tight
Fill with water slowly
Don’t exceed recommended pre-charge values
Any questions contact charlie@olaer.com.au

8. Dismantling & assembly procedures

8.1. Dismantling

8.1.1. Temporary Pump Shutdown with Surge Vessel On-line

NOTE: As the pumps are shut down it is important to know that the surge vessel discharges water into the system until the steady state balance is obtained.
Ensure that there is water inside the vessel when the system is shut down. This is important because if the vessel is completely drained the bladder will be pressed against the inlet/outlet grill. Prolonged contact can cause the bladder to fail.
In the event that either the isolating valve or the bypass valve leaks causing loss of water from the vessel initiating a low level alarm, the nitrogen will need to be discharged to prevent damage to the bladder (please see Safety Procedures OH&S section 2).

8.1.2. Isolation and Decommissioning of Surge Vessel

- Ensure that pumps are stopped
- Isolate the vessel from the system using the isolation valve.
- Discharge the nitrogen completely (this can be done using the charging set. WARNING: Potential for asphyxiation.
- Safety goggles must be worn.
- Ear muffs must be worn because of high noise level during discharge at high pressure.
- Do not stand in the path of the nitrogen discharge. Ensure that the area is well ventilated.
- Drain the vessel completely by opening the drain valve.

8.1.3. Emergency Shutdown

- Emergency shutdown of the surge vessel may be required due to loss of nitrogen, water leak or damage to the vessel.
- Ensure that the vessel is isolated from the system.
- Evaluate whether it is safe to approach the vessel and determine protective measures required, considering the nature of the fault or damage, before venting and draining.
- Discharge the nitrogen and drain the vessel (please see Safety Procedures OH&S section 2)

8.2. Assembly

Please refer to Section 4 and 6 – Installation and Commissioning Procedures.

9. OPERATION & MAINTENANCE PROCEDURES

9.1. Principles of operation

A bladder surge vessel has the same function with regard to surge control as the traditional compressor vessel. The objective of this pneumatic solution is to simplify the method of regulation. In a similar way to a vessel controlled by compressors, a pre-charge pressure is calculated to give the required elasticity to push the water into the system following a pump shut down or power cut.

The nitrogen pre-charge mass has been determined to provide a water level in the vessel suitable for the range of operating conditions and ambient temperatures. The volume and pressure of the nitrogen varies with ambient temperature. Therefore the pre-charge pressure appropriate for the ambient temperature at the time of charging must be selected to ensure that the level is suitable for the complete range of ambient temperatures.

Once the vessel has been commissioned and the correct pre-charge has been introduced, the vessel will operate automatically, emptying when called upon and refilling with the return waves until naturally finding its steady state balance.

Vessel should be sized by way of a surge analysis to protect against positive pressure rise and against vacuum due to transient event (power failure OR valve closure), and carrying out surge tests during commissioning. During sizing of the surge vessel care must be taken that maximum pre-charge pressure for the bladder is not exceeded and that when vessel is fully discharged there is 20% safety volume remaining.

9.2. Operation

9.2.1. Before starting:

Ensure that the vessel has been commissioned as per procedure in this manual.
Ensure that there are no gas leaks.

9.2.2. Starting:

Ensure that the surge vessel has been commissioned in accordance with the procedure in this manual.
Ensure that the surge vessel has been filled with water and connected to be pipeline in accordance with the procedure in this manual.

9.2.3. Continuous operation

No operator input is required for continuous operation.

9.2.4. Shutdown

9.2.4.1. Temporary Pump Shutdown with Surge Vessel On-line

NOTE: As the pumps are shut down it is important to know that the surge vessel discharges water into the system until the steady state balance is obtained.
Ensure that there is water inside the vessel when the system is shut down. This is important because if the vessel is completely drained the bladder will be pressed against the inlet/outlet grill. Prolonged contact can cause the bladder to fail.

In the event that either the isolating valve or the bypass valve leaks causing loss of water from the vessel initiating a low level alarm, the nitrogen will need to be discharged to prevent damage to the bladder (please see Safety Procedures OH&S section 2).

9.2.4.2. Isolation and Decommissioning of Surge Vessel

- Ensure that pumps are stopped
- Isolate the vessel from the system using the isolation valve.
- Discharge the nitrogen completely (this can be done using the charging set. WARNING: Potential for asphyxiation.
- Safety goggles must be worn.
- Ear muffs must be worn because of high noise level during discharge at high pressure.
- Do not stand in the path of the nitrogen discharge. Ensure that the area is well ventilated.
- Drain the vessel completely by opening the drain valve.

9.2.4.3. Emergency Shutdown

- Emergency shutdown of the surge vessel may be required due to loss of nitrogen, water leak or damage to the vessel.
- Ensure that the vessel is isolated from the system.
- Evaluate whether it is safe to approach the vessel and determine protective measures required, considering the nature of the fault or damage, before venting and draining.
- Discharge the nitrogen and drain the vessel (please see Safety Procedures OH&S section 2).

9.3. Maintenance

9.3.1. Vessel

1. Every 3 months (If NO monitoring equipment is installed)
2. Check the Pre-charge value using the pressure gauge.
3. Check for leaks on all gas side connections using soapy water.
4. If gas pressure is 5% below set pre-charge value vessel needs to be re-commissioned and care shall be taken that vessel is gastight and the bladder is not damaged or has not deteriorated.

9.3.2. Notes on checking pre-charge pressure

1. Pressure gauge:
2. Pumps must be switched off
3. Vessel Isolated & Drained
4. Take the reading and compare to previous value keeping temperature in mind
5. If pre-charge pressure is reduced by more than 5% vessel should be decommissioned.
6. Get the vessel back on line ASAP.

9.3.3. Pressure Vessel Inspections

- Charlatte surge vessels are subject to pressure vessel inspections in accordance with AS/NZS3788. Surge vessel can be classified as a gas accumulator for inspection purposes. This has to be confirmed with the pressure vessel inspector. Your pressure vessel inspector will consider following:

- The vessel is kept corrosion free externally.
- The water is contained inside the vessel and the gas is contained inside the bladder
- The internal inspection schedule is arranged so that an internal inspection with bladder replacement will be undertaken within the specified design life of the bladder. The design life is specified in the General Notes section 1.
- The integrity of the shell internal coating is to be inspected to ensure that it is maintained, as a secondary protection in case moisture comes in contact with the vessel wall.
- Internal inspections to ensure that all seals are in good working condition.
- Inspection and maintenance procedures to stipulate that care is to be taken to ensure that no foreign material is left inside the vessel and that care is taken not to damage the internal lining or bladder.
- Shell thickness to be checked against the drawing using a thickness tester during external inspections. This is achieved by using an ultrasonic thickness gauge.
- Below is the section of AS3788 that shows nominal yearly inspection periods:

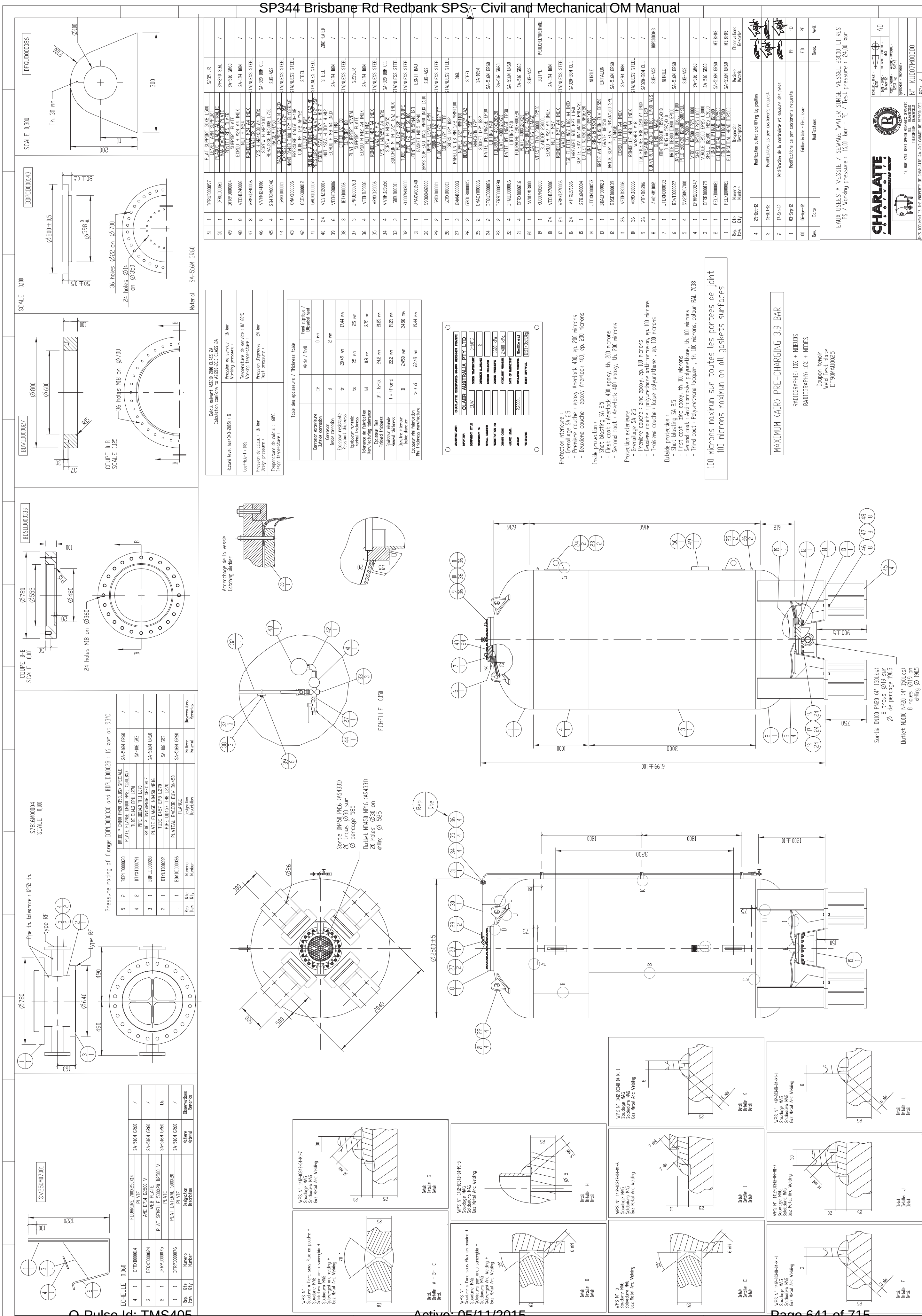
Pressure Equipment	Commissioning Inspection Required?	First Yearly Inspection Required?	External Inspection	Nominal Internal Inspection	Extended Internal Inspection
10.1 Accumulators with non-corrosive, non-toxic and non flammable contents					
PV > 200 MPaL	Y	Y	2	12	12

For corrosive fluids nominal internal inspection is reduced to every 4 years. Actual pressure vessel inspection periods will depend purely on the pressure vessel inspector. However, following factors will affect the decision.

- Vessel kept corrosion free externally.
- Explanation that shell has internal coating.

During the inspection ensure that all seals are in good working condition. During the internal inspection ensure that no foreign material is left inside the vessel. Check that internal lining is in good condition.

10. General mechanical drawings



11. Protective divices & Interlock diagrams & alarm values

11.1. Alarms

- Low level can cause the vessel to be completely evacuated of water, causing a vacuum in the pipeline that can damage the vessel bladder and cause damage to the cement lining of the pipeline.

- High level and resulting over-pressurization can cause leakage of joints, and yielding or rupture of the vessel or connecting piping.

High pressure alarm: Equal to the piping design pressure and slightly less than the vessel design pressure. Possible causes of initiating this alarm include: loss of nitrogen combined with a surge event (although this event should be prevented by a high level alarm), or rapid valve closure while the high lift pumps are operating.

High level alarm: Possible causes of initiating this alarm include: loss of nitrogen due to leakage of vessel connections or damage to the bladder, or rapid valve closure (also resulting in high pressure)?

Low pressure alarm: Possible causes of initiating this alarm include: a surge event, or leakage of water while the vessel is isolated and the pipeline is drained. A surge event will most likely be caused by loss of power to the high lift pumps. The alarm will stop the pumps, to protect against any other unforeseen cause of surge. The cause of the surge should be ascertained and rectified before re-starting the pumps.

Low level alarm: Possible causes of initiating this alarm are the same as for the low pressure alarm, but with the addition of exceeding the correct pre-charge pressure.

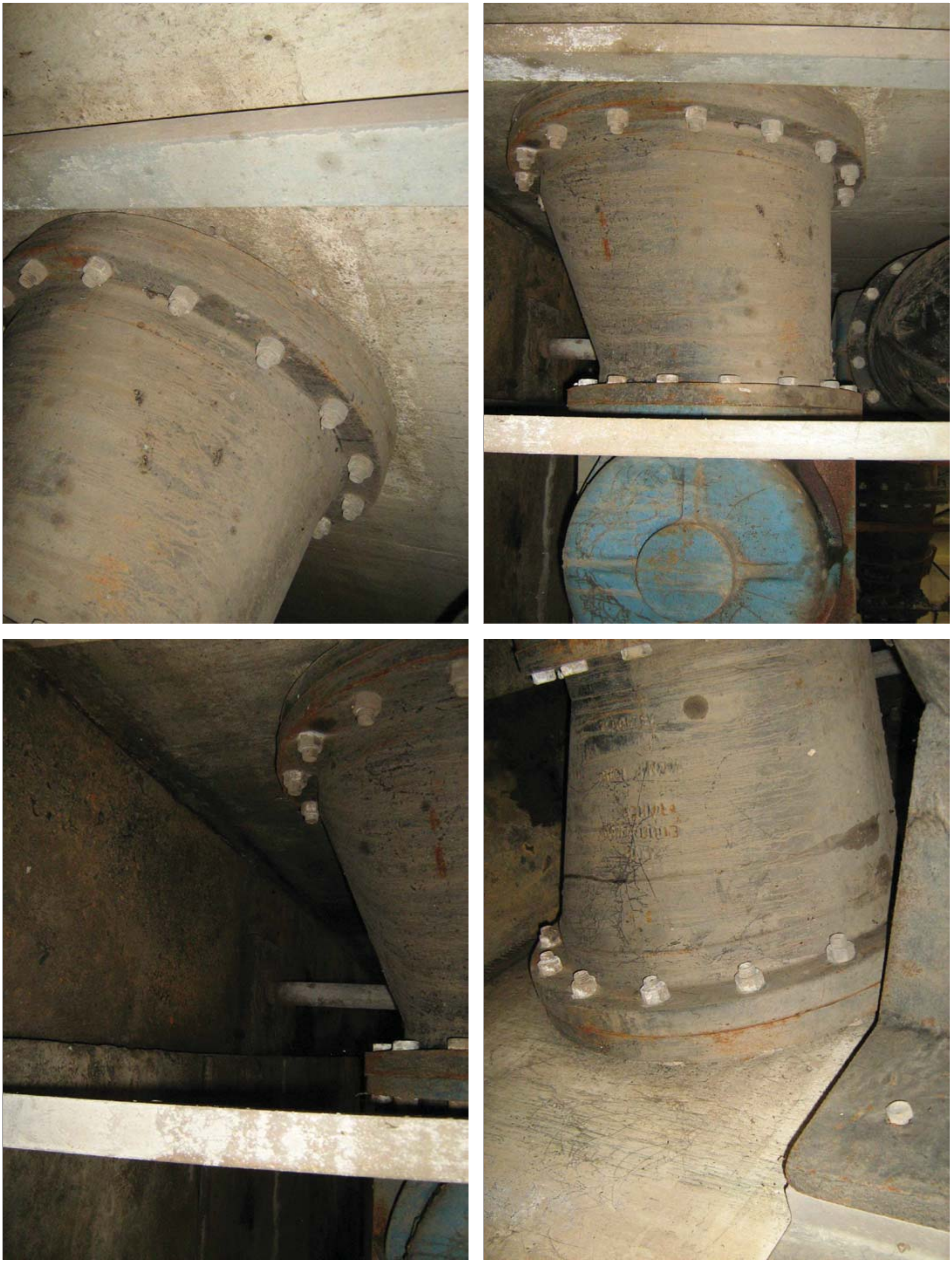
The Professional Choice

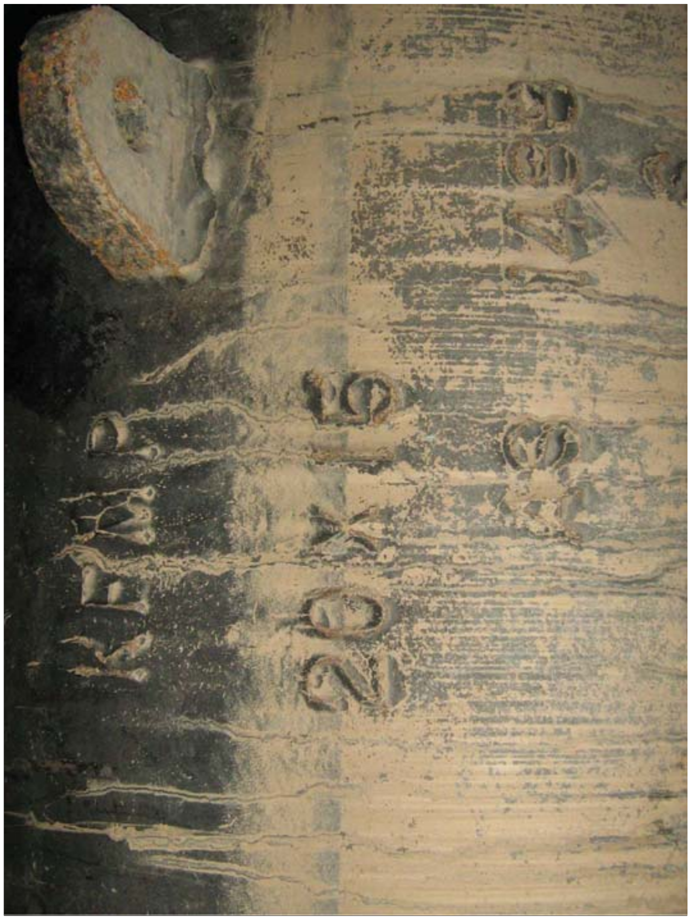
APPENDIX I

Gas cylinders

No Gas cylinders required.

11. Photos



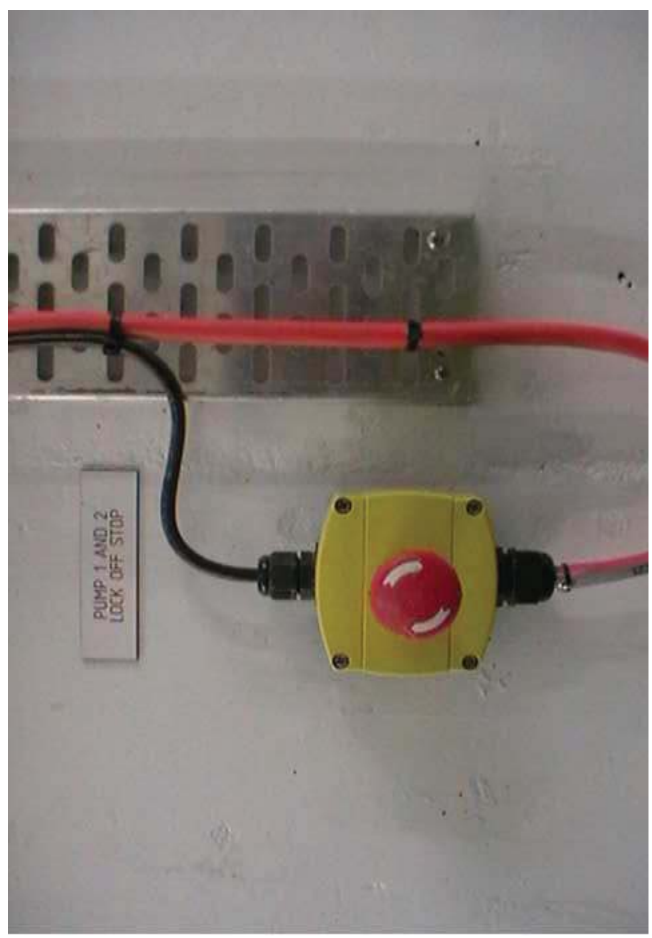



DANGER
CONFINED SPACE
ENTRY BY PERMIT ONLY


PRINCIPAL CONTRACTOR
J. & P. RICHARDSON INDUSTRIES PTY. LTD.
ELECTRICAL CONTRACTORS & ENGINEERS
IF SITE IS UNATTENDED, CALL SUPERVISOR, ALL HOURS
DANGER
CONSTRUCTION SITE
THE FOLLOWING PROTECTIVE EQUIPMENT MUST BE WORN BEYOND THIS POINT


1300 659 669


VEOLIA
1300 659 669


PUMP 1 AND 2
LOCK OFF STOP


QUEENSLAND
UrbanUtilities
Six Mile Creek
Sewage Pump Station
For all enquiries phone 13 26 57

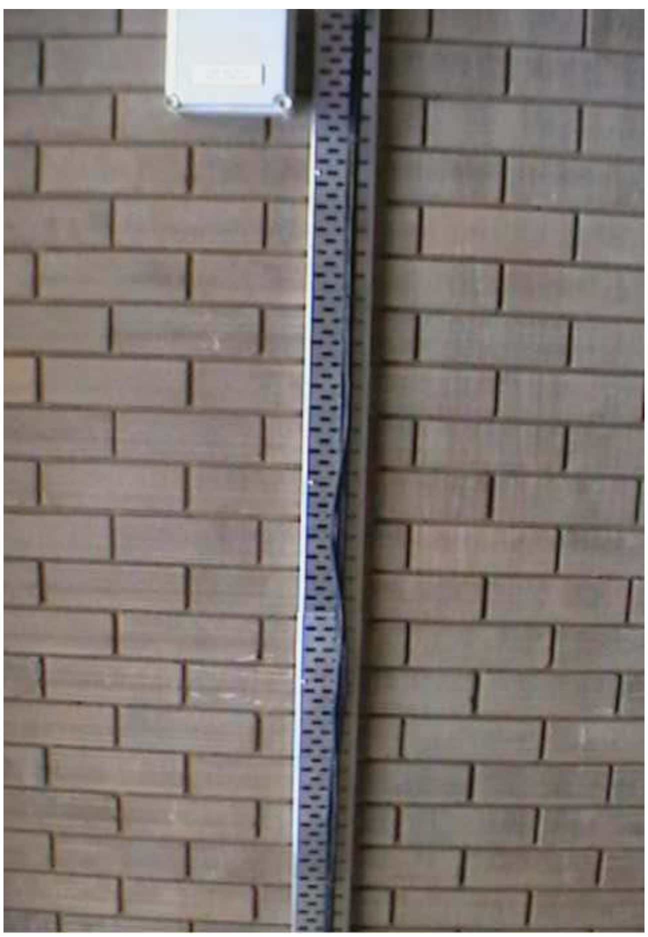

QUEENSLAND
UrbanUtilities
Six Mile Creek
Sewage Pump Station
For all enquiries phone 13 26 57


EQUIPMENT
MUST BE WORN


MUST BE WORN

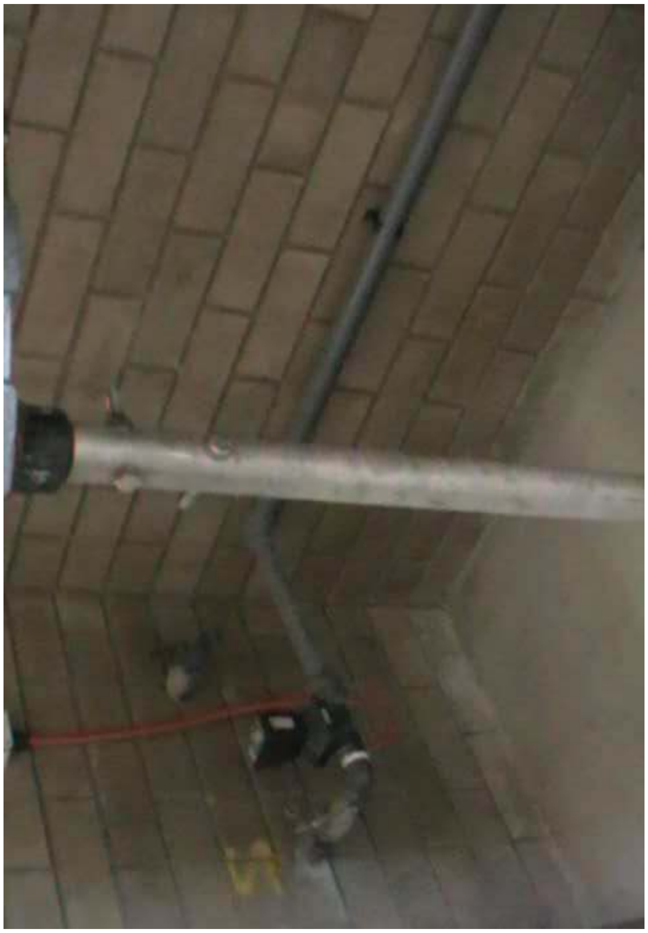

AUSTRALIAN WATER ENGINEERS
SERIAL No: 12085-01
SIZE: 1067x1067
HEAD: 6.0m OFF
TAG No:
YEAR: 2012
WT: 250kg
TURNS:159


WET WELL LEVEL
JUNCTION BOX




WET WELL BIFURCATION VALVE
TURN VALVE 62 TURNS
OPEN-CLOSE

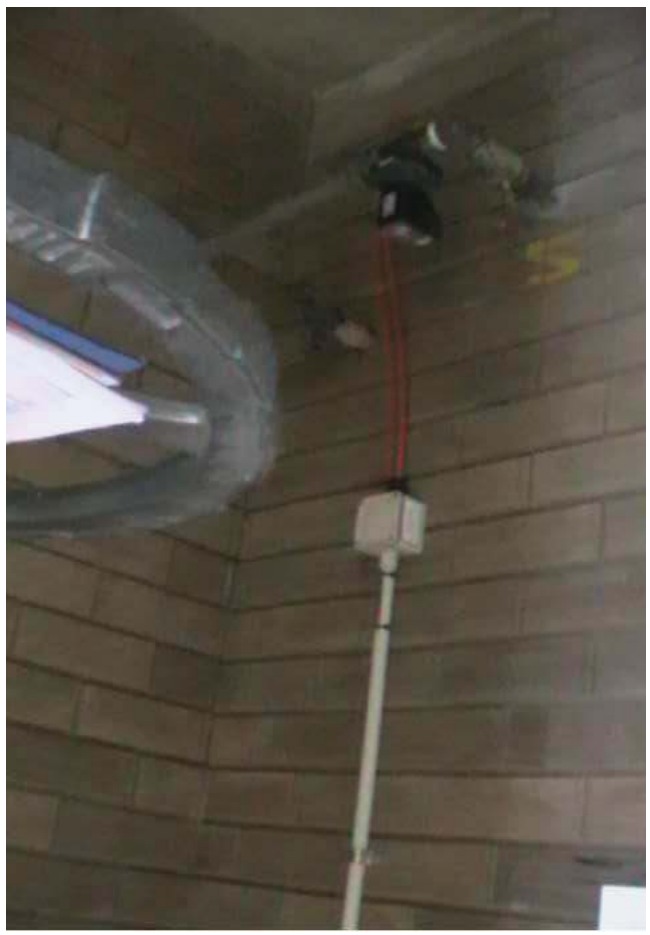

WET WELL BIFURCATION VALVE
TURN VALVE 62 TURNS
OPEN-CLOSE



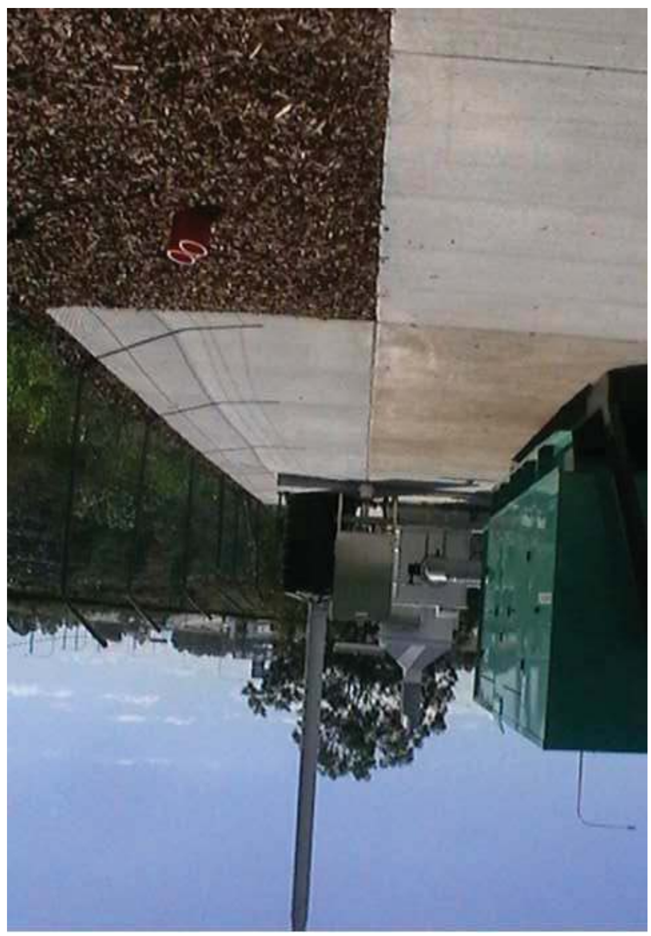


ON
OFF


ON
OFF

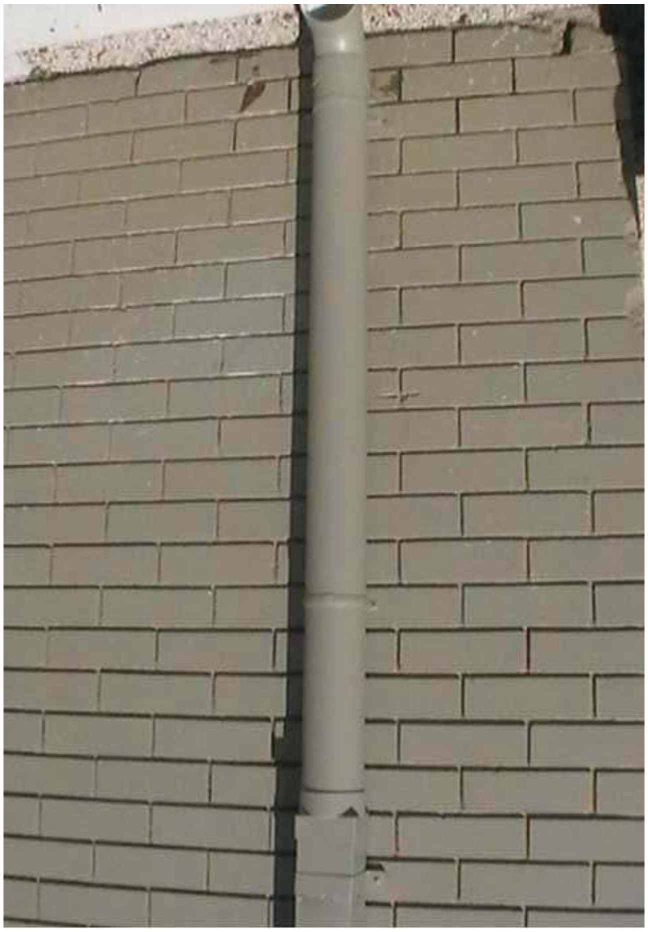



SWL





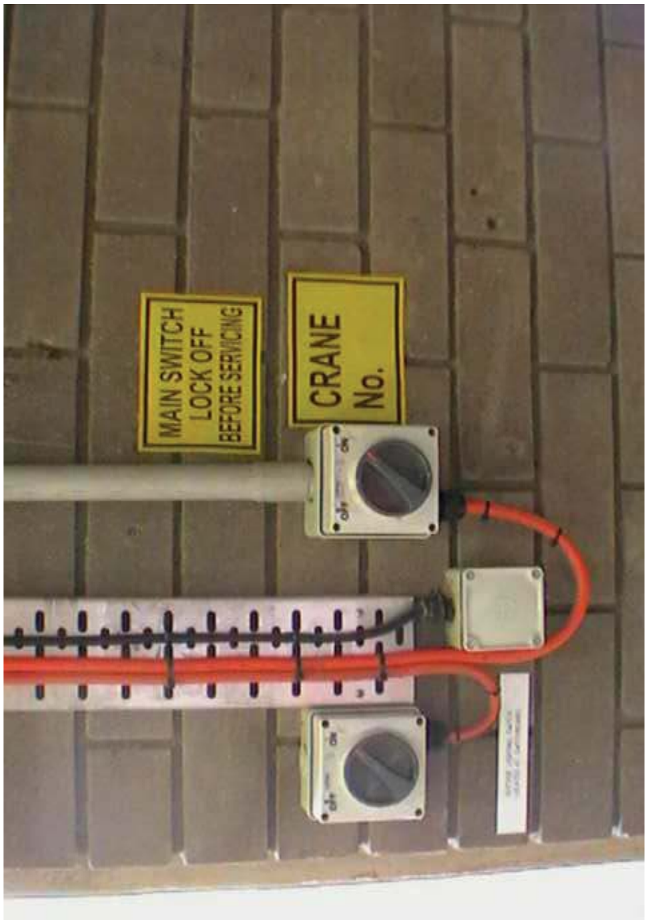


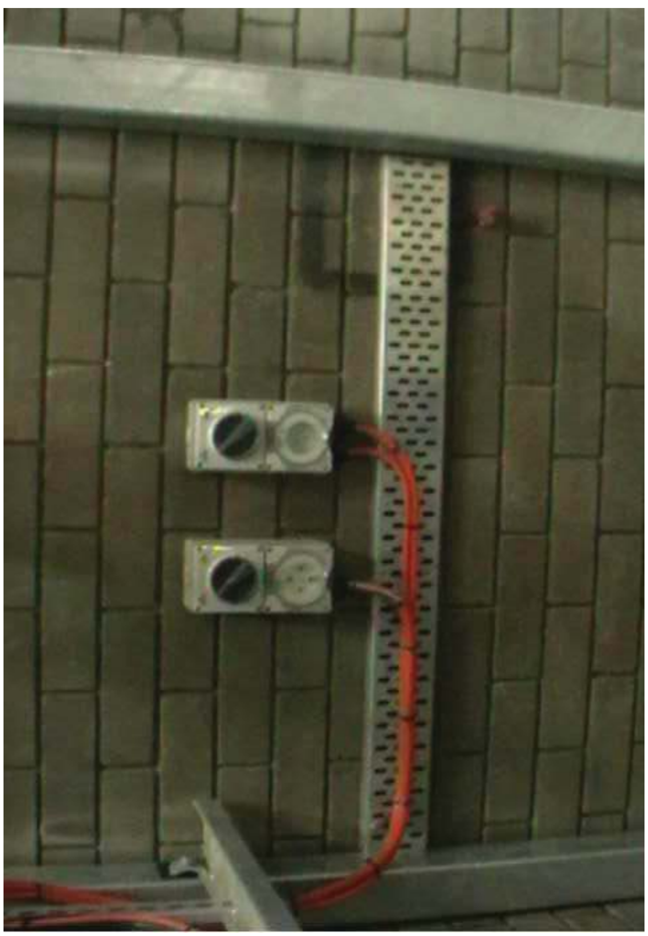


OLAER
CHARLATTE


OLAER
CHARLATTE

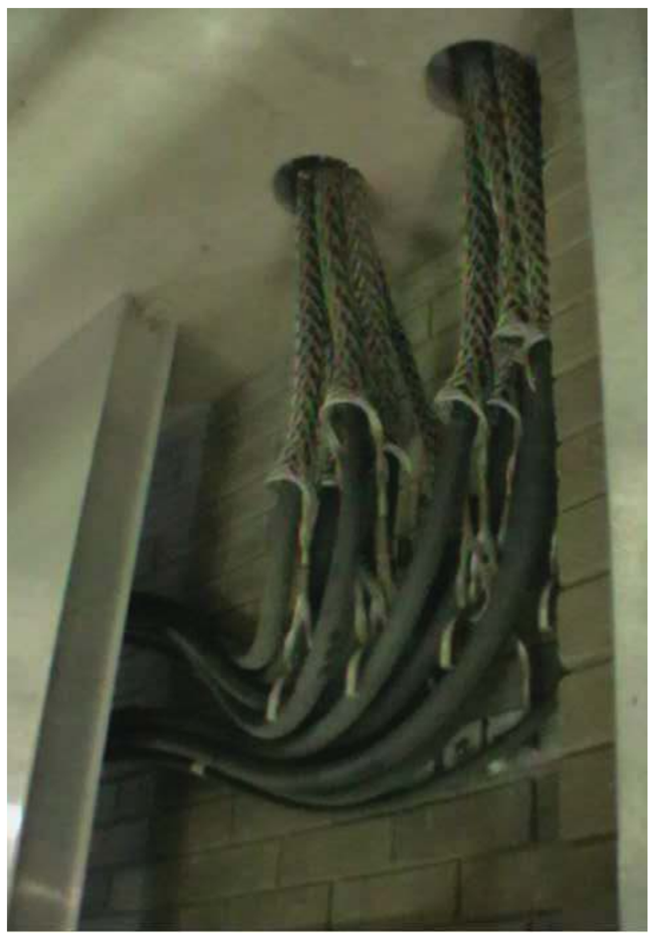

MAIN SWITCH
LOCK OFF
BEFORE SERVICING
CRANE
No.


DRY WELL LIGHTS




DEMAG




DRY WELL VENT FAN





DEMAG
CLASS C3/M3


RATED CAPACITY
4.0 t


ROOF VENT FAN No.1
CAT7


ROOF VENT FAN No.2
CAT7


DRY WELL VENT FAN
CAT7
sprecher+
schuh
NHP


DANGER
CONFINED
SPACE
ENTRY BY PERMIT ONLY





DRY WELL LEVEL
JUNCTION BOX

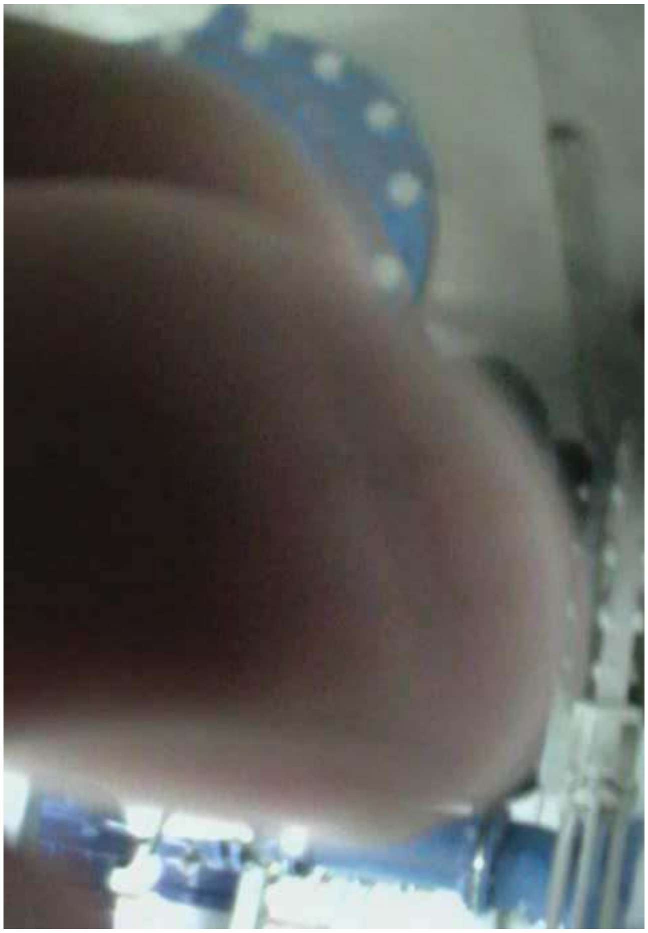




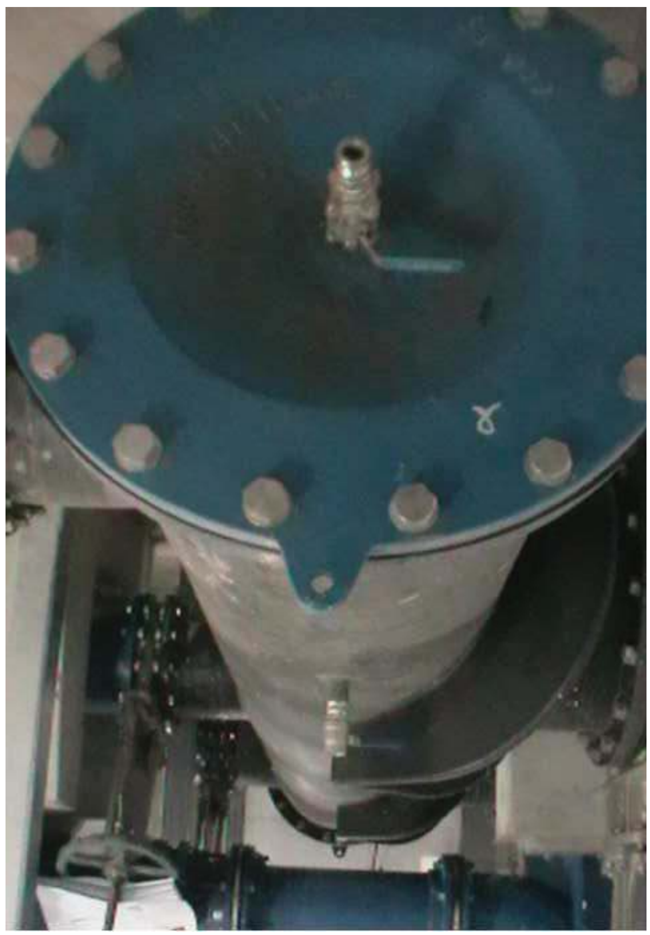


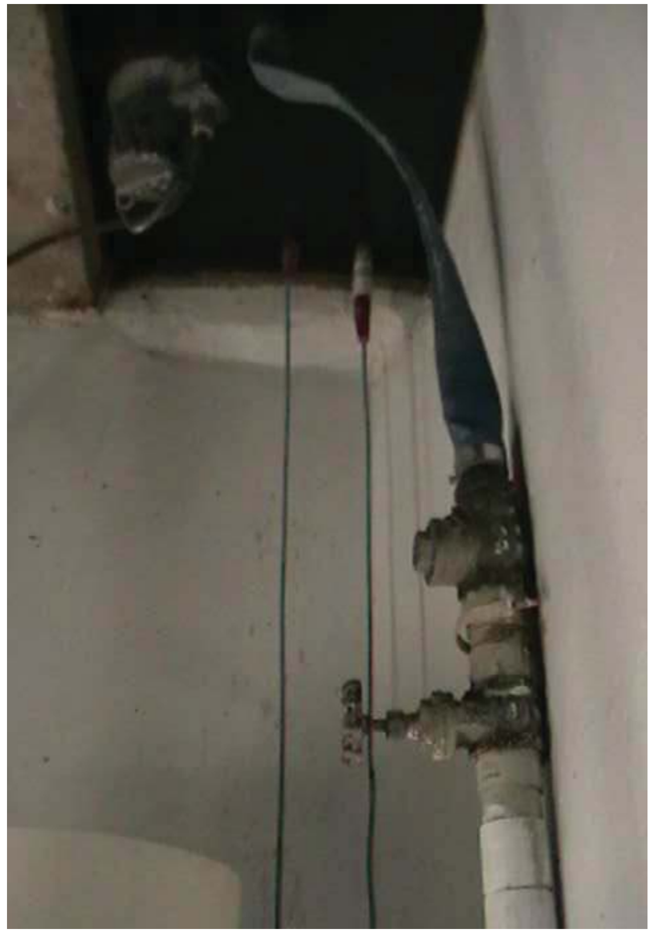











SUMP PUMP LEVEL
JUNCTION BOX