

# Installation of Drainage Bond

Issue date: 27/02/08

Review date: 21/02/11

<b>SWMS number:</b> <b>SMS-06-SW-1117</b>	<b>SWMS Name:</b> <b>Electrolysis Installation of Drainage Bond</b>			<b>SWMS Team:</b> Emilio Carreto, Paul Greenwood, Craig Pearson, Cynthia Lee
<b>Custodian (Position):</b> Electrolysis Engineer	<b>Assumptions:</b>  Task undertaken in good weather and in daylight.. Work is carried out inside rail corridor but outside danger zone including near a boundary fence line. Excavation hole is between 500 to 600 mm in depth and 300mm in width for mast installation.			
<b>Approving Authority (Position):</b> Manager Network Inspection	<b>Plant/Equipment/Tools:</b> 1.Phone 2.Tools-pick, crowbar, shovel, spanners, cutters, piers 3.New Bond Box and Rail Post 4.Multimeter 5.Retractable Barrier Bar	<b>Records/Reporting:</b> <ul style="list-style-type: none"><li>• All searches results- Telstra cables, Gas &amp; Fuel pipelines, water pipes, Sewer pipes</li><li>• Report from Electrical Mains Search</li><li>• SMS-06-FM-0774 Worksite Protection Plan</li><li>• SMS-06-FM-0375 Excavation Work Plan (optional)</li><li>• Contractors SWMS for digging</li></ul>	<b>Permits/licences required:</b> Electrolysis Tester Certificate	<b>Content reviewed by</b> <b>Technical expert (SME) and RailCorp safety professional (position including Div/Group)</b>  Maurizio Di Bartolomeo, Manager Network Monitoring
<b>Applicable Standards, Codes of Practice and guidance:</b>  1.Rail Network Rules & Procedures 2.Electrolysis Services Procedures R77P03 3.Electrolysis From Stray DC Current EP 1230 00 01SP 4.National Code of Practice: Manual Handling 5.WorkCover Health & Safety Guide on Plant 6.National Standard for Plant 7.WorkCover Code of Practice Work in Hot & Cold Environments 8.SSMS-06-EN-0573 Work on Low Voltage Distribution	<b>Inspection requirements</b>  SMS-06-FM-0085 Plant and Equipment Inspection and Maintenance  SMS-06-FM-0375 Excavation Planning Checklist	<b>Service schedule:</b> Electrolysis Engineer  <b>MIMS or METRE Ref:</b> N/A	<b>Training/Qualifications required:</b> 1.RISI Rail Industry Safety Induction 2.Rail Safety Protection Officer Class 1 3.Electrical Safety Awareness 4.ACA NSW Authorised Tester Certificate	<b>PPE required:</b> <ul style="list-style-type: none"><li>• Safety Boots,</li><li>• High Visibility Vests,</li><li>• Hard Hat,</li><li>• PPE for Electrical Work SMS-06-SW0538</li><li>• Protective UV Glasses,</li><li>• Leather rigger gloves</li><li>• Insulated Gloves</li></ul> PPE Guide SMS-06-GD-0323

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1	Organise a search for underground services with dial before you dig and METRO – Mains, review excavation work plan for hole (500-600mm in depth and 300mm in width) from contractor	Low risk – inside office	C-	Check for reports from Metro Mains Search Ensure SMS-06-FM-0375 Excavation Planning Checklist is done	D	Electrolysis Engineer	Search results from Engineer Mains before work
2	Organise access to the worksite to discuss installation requirements with the Customer	Miscommunication	C+	Ensure every one contacted understand the requirement by asking questions and with interaction	D	Electrolysis Engineer	Electrolysis Services Procedures R77P03  Electrolysis From Stray DC Current EP 1230 00 01SP
3	Manual loading and unloading of materials to vehicle	Muscular stress	C+	Ensure all personnel are trained in manual handling techniques and use correct tools Deploy job rotation to avoid constant exposure Use other personnel to “share the load” Use trolley to load and unload items	D	“	SMS-06-0001 Guide to Manual Handling

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4	On arrival receive worksite briefing and induction from protection staff	trips & falls from rough uneven ground	C+	Wear appropriate footwear – safety boots Ensure the worksite is clear of debris Position tools, equipment and materials in a safe place clear of walkways, refuges and vehicular access routes Identify slippery surfaces, wet locations, grease pots etc within the worksite Avoid carrying loads on steep embankments Avoid steep slope Share or minimise loads Walk slowly and purposefully through areas of high risk	D	Electrolysis Technician Protection Officer	SMS-06-GD-0323 PPE PPE for Electrical Work SMS-06-SW0538 SMS-06-FM-0163 Pre-work Briefing SMS-06-FM-0774 Worksite Protection Plan
		Muscular strain		Ensure all personnel are trained in manual handling techniques and use correct tools Deploy job rotation to avoid constant exposure Use other personnel to "share the load"			SMS-06-GD-0001 Guide to Manual Handling

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		needle stick	C+	Check worksite before commencing work Do not place hands where they cannot be clearly seen Do not remove ballast by hand Never pick up needles by hand – use tongs if necessary to remove needles and place into yellow sharp container carried in work truck Follow instruction SMS-06-SW-0405 Handling Sharps	D	"	SMS-06-SW-0405 Handling Sharps
		Snake bite, insect bites and stings	C+	Identify locations of high risk - long grass; near culverts and dams; under rocks, sleepers, rail logs and burrows Wear gloves where appropriate walk "heavily"	D	"	
		UV exposure, glare	C+	Wear long sleeve cotton shirt and long cotton trousers Use sunscreen and replace regularly protective UV glasses	D	"	SMS-06-SW-0537 Sunscreen SMS-06-GD-0323 PPE PPE for Electrical Work SMS-06-SW0538

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		Exposure to hot and cold weather	C+	<p>Ensure personnel are trained in the signs and symptoms of heat stress such as dark yellow urine, fatigue, dehydration, cramps, nausea, rapid breathing</p> <p>Wear long sleeve cotton shirt and long cotton trousers</p> <p>Drink water at regular intervals</p> <p>Schedule heavy work outside the hottest part of the day</p> <p>Utilise shade where possible</p> <p>Take regular breaks</p> <p>Pace yourself through work activities</p>	D	Electrolysis Technician	<p>WorkCover Code of Practice Work in Hot &amp; Cold Environments</p> <p>PPE for Electrical Work SMS-06-SW0538</p>
5	Set up worksite on safe place (off track)	Strike by other Vehicle	A	<p>Worksite Protection Plan</p> <p>Protection provided relevant Network Rules / Procedure</p> <p>Interface with other workgroups</p> <p>Use retractable barrier bar when off track</p>	C+	Electrolysis Engineer	<p>SMS-06-FM-0163 Pre-Work Briefing</p> <p>SMS-06-FM-0774 Worksite Protection Plan</p>
		Hazards as Step 4	C+	Controls as Step 4	D	Electrolysis Engineer	As step 4
6	Excavate hole 500-600mm in depth to stand up post for bond box – by contractor	Contact with Electricity / gas pipes from damaged cables  Flooding from burst water pipe	B+	Ensure ALL Searches have been undertaken by the Mains Engineer include: power, gas, water, signals cables and lines	C+	Electrolysis Engineer  Mains Engineer  Contractor	<p>SMS-06-FM-0375 Excavation Planning Checklist</p> <p>Search results from Engineer Mains before work</p>

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	Repetitive digging-muscle strain	C+	PPE – Leather Rigger Gloves Correct use of shovel/tools Rest break, team work	D	Contractor	SMS-06-GD-0001 Guide to Manual Handling	
	Eye with foreign bodies	C+	General Purpose Goggles	D	"	SMS-06-GD-0323 PPE	
	Slips, trips and fall into pits	C+	Wear appropriate footwear – safety boots Ensure the worksite is clear of debris Position tools, equipment and materials in a safe place clear of walkways, refuges and vehicular access routes Identify slippery surfaces, wet locations, grease pots etc within the worksite Avoid carrying loads on steep embankments Avoid steep slopes Share or minimise loads Walk slowly and purposefully through areas of high risk Demarcation line around site and signage set up	D	Electrolysis Engineer Electrolysis Technician Protection Officer Contractor	SMS-06-GD-0323 PPE SMS-06-GD-0001 Guide to Manual Handling  SMS-06-GD-0378 Excavation and EarthWorks	
	Hazards as Step 4	C+	Controls as Step 4	D	"	"	

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7	Install bond box	Contact with sharp objects, Caught between objects	C+	Ensure ALL Searches have been undertaken by the Mains Engineer include: power, gas, water, signals cables and lines Timely pace work in planning stage	D	Electrolysis Engineer Electrolysis Technician Protection Officer Contractor	SMS-06-GD-0323 PPE PPE for Electrical Work SMS-06-SW0538
		Hit by flying object,	C+	Use Leather Riggers Gloves Use Hard hat Wear medium impact glasses	D	"	"
		Infection from contaminated water	C+	Search to Sewer pipe Use Disposable overall	D	"	"
		Hazards as Step 4 to 6	C+	Controls as Step 4 to 6	D	"	As step 4 to 6
8	Temporarily close the hole in the fence if the installation will take more than one day	Intruder can go inside the premises	C+	Temporarily cover the hole in the fence and put sign of "Intruders will be prosecuted"	D	"	
		Contact with sharp objects	C+	PPE – safety boots, insulated gloves	D	"	SMS-06-GD-0323 PPE
9	When near a Boundary Fence Line – installation of new fence panels by contractor with Electrolysis Engineer's approval	Poor housekeeping from Contractor	C+	Ensure contractor or Program Manager Civil working according to their SWMS for the job. Check at the end of the job	D	"	Contractor's SWMS/SWI Specification of Contract
10	Organise and terminate rail and underground structure leads (All leads are insulated)	Minor electrical shock	C+	Ensure Searches have been undertaken by the Mains Engineer on power PPE inspection prior to work start – insulated gloves and safety boots Ensure minimum clearance of 25mm distance between bond box and hands	C-	Mains Engineer Electrolysis Engineer Electrolysis technician	SMS-06-EN-0573 Work on the Low Voltage Distribution system

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11	Organise rail and Underground Structure connections	Contact with Electricity Contact with d.c. traction voltage or transient voltage generated. Exposure to potential difference between rail and Bond box, OHW mast or signals troughing	C+	Test with multi-meter  Insulated gloves worn whilst connecting / disconnecting leads  Insulated gloves are checked for valid inspection date and visually inspected and tested for air retention before use.	C-	Signals Engineer Electrolysis Engineer Electrolysis technician	Electrolysis Services Procedures R77P03  Electrolysis From Stray DC Current EP 1230 00 01SP
12	Test for checking Bond is working on site	Minor electrical shock	C+	Insulated gloves and safety boots inspected before use  Avoid simultaneous contact with cables and bond box	C+	Electrolysis technician	"
13	Electrolysis Engineer to inform ETCNSW that DB is ready for approval testing	Unclear communication	C+	Ensure Electrolysis Services Procedures R77P03 is followed	D	Electrolysis Engineer	"
14	Remove equipment & materials from work site	Hazards as Step 4	C+	Controls as Step 4	D	Electrolysis technician	SMS-06-GD-0001 Guide to Manual Handling
15	Proceed to next site or return to Depot	Hazards as step 4	B+	Controls as step 4	D	Electrolysis Technician	RTA Guideline
16	Record details of work performed & close work order	Incorrect recording of work detail	C+	Electrolysis technician and Electrolysis Engineer check Drainage Bond records to verify	D	Electrolysis Engineer Electrolysis technician	Electrolysis Services Procedures R77P03  Electrolysis From Stray DC Current EP 1230 00 01SP

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**NOTE: Each work group or team member must sign off on the SWMS to acknowledge they have been briefed about or instructed in the SWMS**

Team member name (Please print)	Team Member signature	Instructor/ Briefer name	Date	Team member name (Please print)	Team Member signature	Instructor/ Briefer name	Date

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RailCorp Level 2 Risk Matrix - Regional & Local (Workplace)		Likelihood/Frequency							Definition for Use - Regional & Local level (Workplace)
		Event Frequency	Less than once every 1000 years	Once every 100 to 1,000 years	Once every 10 to 100 years	Once every 1 to 10 years	More than once per year up to and including 10 times per year	More than 10 times per year	
		Historical (Likelihood)	Unheard of in the rail industry	Has occurred once or twice in the rail industry	Has occurred many times in the rail industry, but not in NSW	Has occurred once or twice in NSW	Has occurred frequently in NSW	Has occurred frequently at specific locations	
Consequence		Workplace Predictive (Likelihood)	Not expected to occur	May occur only in exceptional circumstances	Could occur at some time but not likely	You would expect it to occur at least once in the next 10 years performing similar activities	You would expect it to occur at least once this year performing similar activities	You would expect it to occur at least once this month performing similar activities	As an example, the Level 2 scale would be used when examining the risk of slips, trips and falls on specific RailCorp platforms within a region or at a particular station, or the risk of fire within a depot.
			F1	F2	F3	F4	F5	F6	
Incredible	Improbable	Remote	Occasional	Probable	Frequent				
>10 Fatalities	C6	Disastrous	B-	B+	A	A	A	A	There are 3 options for descriptors which can be used to determine the frequency category. One set of descriptors is provided for frequency, one for historical likelihood, and one for predictive likelihood in the workplace. Choose the most appropriate.
2-10 Fatalities	C5	Catastrophic	C+	B-	B+	A	A	A	
1 Fatality (2-10 Major Injuries)	C4	Critical	C-	C+	B-	B+	A	A	
1 Major Injury	C3	Major	D	C-	C+	B-	B+	A	
1 or more Minor Injuries	C2	Minor	D	D	C-	C+	B-	B+	
First aid treatment, or illness/injury not requiring treatment	C1	Negligible	D	D	D	C-	C+	B-	