

Drainage In Tunnels

Issue date: 15/10/10
Review date: 14/04/13

SWMS number: SMS-06-SW-1082	SWMS Name: Drainage In Tunnels	SWMS Team: Civil Construction Review Team	
Custodian (Position): Services Manager Civil	Assumptions: Site specific risks are addressed and assessed in pre- work briefing	Content reviewed by Technical expert (SME) and RailCorp safety professional (position including Div/Group) Services Manager Civil and Safety facilitator, Safety Support Services Division	
Approver (Position): Civil Electrical Works Manager Infrastructure Renewals	Plant/Equipment/Tools: <ul style="list-style-type: none"> • Crane, Excavator, Backhoe, Vibrating Shaft, Drive Unit, Trolley, Plant fitted with Catalytic Converters, Grinding Heads, Signs, Markers, Barricades, Silt Fencing, Hay Bales, Bungs, Plywood, Safety Tape, Steel Plates, Shoring • Star Picket Rammer, Hammer, , Shovel, Rake, Scree • Watercart • No-Spill Fuel Cans, Spill Response Kit • Oxygen Monitors, Electric Fans • Concrete "V" Drain, Concrete, Concrete Base, Blue Metal 	Records/Reporting: <ul style="list-style-type: none"> • Worksite Protection Plan • Pre-work Brief • Site Specific Management Plan • Electrical Test Tags • Site layout documented • Services searches • Electrical Permits • Environmental Protection Plan • Confined Space Checklist • Daily Plant Checklist • RailCorp Limits of Exposure Document 09 • Worksite Traffic Management Plan • Site Induction 	Permits/licences required: <ul style="list-style-type: none"> • Confined Spaces Certificate • Electrical Permit Holder • Protection Officer P.O 3-4 • Workcover Licence • Track Certification Certificate
Applicable Standards, Codes of Practice and guidance: <ul style="list-style-type: none"> • OH&S Act 2000 • OH&S Regulation 2001 • Rail Safety Regulation 2003 • RailCorp Network Rules & Procedures • RailCorp Safety Management System. • MSDS for all chemicals and hazardous Substances used on site • Working near Overhead Power Lines • EC14 – Guide to Electrical Workers Safety Equipment • National Code of Practice for Manual Handling [NOHSC:2005] • AS 2550.5-2002 Cranes, hoists and winches - Safe use - Mobile cranes • AS 2958.0 2000 Earth Moving Machinery • WorkCover NSW Plant Guide • HB 213:2003 Guidelines for Safe Working in a Confined Space • AS/NZS 2865:2001 Safe Working in a Confined Space 	Inspection requirements Nil	Service schedule: Nil	PPE required: <ul style="list-style-type: none"> • Safety Boots • High Visibility Vests • Hardhats • Protective Clothing • Safety Glasses <p>And as specified below.</p> <ul style="list-style-type: none"> • Barrier Cream • Type 1 Respirators, P.2 • Ear Muffs, Ear Plugs • Gloves • During all Site Works a FIRST AIDER MUST be Present Training/Qualification required: <ul style="list-style-type: none"> • Construction Industry Induction • RISI (Rail Industry Safety Induction)

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1	Track access	Damage to Infrastructure By Machines	B-	Have a Spotter Walk With Plant	D	Plant Operator, Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163,Plant SMS-06-PR-0225
		Contact with live o/h wires	A	Maintain regulated clearances on wires at all times. Isolate power when in side Safe approach distance (SAD).	C+	Qualified Permit Holder QEL29/MEI61 Team Leader Work Group Leader All Staff	Electrical equipment SMS-06-GD-0268 Electrical permits SMS-06-EN-0577
		Personnel struck by machinery	B+	Define work areas, ticketed operators. Exercise due care	C+	Team Leader Work Group Leader All Staff	Electrical equipment SMS-06-GD-0268 Plant SMS-06-PR-0225
		Hearing damage from plant/noise pollution	C+	Use hydraulic equipment, have silencers fitted to machinery. use PPE use ear protection in close proximity to machine	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
		Dust and fumes	B-	Keep clear of work.. Water down material. Wear type 1 respirator if required	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Hazardous Substances SMS-06-GD-0199
		Slip fall or contact with oil/fuel spillage	C-	Plant to be inspected daily. Use correct methods for filling machinery. Spill response kits on-site.	D	Ticketed operator Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Environmental Protection Plan
2	Grinding / Rock-Break in Trench	Struck by plant	B+	Briefing. Hard hats must be worn .keep clear if machines operating, all mobile plant and machinery shall have a flashing or rotating light visible from the front and rear of the plant. Use signage and plant spotters	C+	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
		Hearing damage general	C+	Use PPE, earmuffs	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
		Dust/air pollution	B-	Keep clear of work. Wear type 1 respirators. Water down material.	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Hazardous Substances SMS-06-GD-0199

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		Oil/fuel spillage	C-	Plant to be inspected daily. Use correct methods for filling machinery. Spill response kits on-site.	D	Team Leader Work Group Leader All Staff Ticketed operator	SSMP, Pre work Briefing SMS-06-FM-0163 Environmental Protection Plan
		Damage to rail infrastructure	B+	Vigilance/cover to protect. Report damage.	C+	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163
		Object in eye	C-	Protective eye-wear must be worn	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
3	Excavation of trenches	Hearing damage from plant/noise pollution	C+	Use hydraulic equipment. have silencers fitted to machinery .use PPE use ear protection in close proximity to machine	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
		Oil/fuel spillage	C-	Plant to be inspected daily. Use correct methods for filling machinery. Spill response kits on-site.	D	Ticketed operator Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Environmental Protection Plan
		Fall in excavation	B+	Be aware. Excavation to be barricaded to prevent workers falling in. Cover if possible	C+	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Excavation & Earthworks SMS-06-GD-0378
		Excavation collapse	B+	Shoring, keep plant and employees clear of edges.	C+	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Excavation & Earthworks SMS-06-GD-0378
		Personal injuries	C-	Briefing additional PPE as necessary	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163
4	Placing Terra Firma	Cuts	C-	Use Gloves and Any Other Required PPE	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
5	Concrete base	Concrete on skin	C-	Protective clothing. Barrier cream. MSDS	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 MSDS

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		Concrete in eyes	C-	Protective eye-wear must be worn	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
6	Placing pipes	Muscle strain	B-	Correct manual handling procedures. "back-safe" training. Machinery to move heavy and/or bulky items.	C+	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Manual Handling SMS-06-GD-0001
		Struck by pipe	B+	Vigilance during drainage works	C+	Team Leader Work Group Leader All Staff	SSMP, pre work briefing SMS-06-FM-0163 Plant SMS-06-PR-0225
7	Placing of blue metal	Dust	B-	Keep clear of work. Wear type 1 respirators. Water down material.	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Hazardous Substances SMS-06-GD-0199
		Struck by load	B+	Make sure minimum personnel are around plant and remain in clear view of operators	C+	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225
		Object in eye	C-	Protective eye-wear must be worn	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
8	Placing No Fines Concrete	Concrete on skin	C-	Protective clothing. Barrier cream. MSDS	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 MSDS
		Concrete in eyes	C-	Protective eye-wear must be worn	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
		Muscle strain	B-	Correct manual handling procedures. "back-safe" training. Plant to move heavy and/or bulky items. As per Risk assessment.	C+	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Manual Handling SMS-06-GD-0001
9	Placing concrete "v" drain and finishing	Vibration / muscle strain	B-	Use appropriate size for task. Rotate usage.	C+	Team Leader Work Group Leader All Staff Competent person	SSMP, pre work briefing SMS-06-FM-0163 RailCorp: limits of exposure document 09

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		Concrete on skin	C-	Protective clothing. Barrier cream. MSDS	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 MSDS
		Concrete in eyes	C-	Protective eye-wear must be worn	D	Team Leader Work Group Leader All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323

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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

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RailCorp Level 2 Risk Matrix - Regional & Local (Workplace)		Likelihood/Frequency							Definition for Use - Regional & Local level (Workplace) Used for workplace hazards and safety risks that do not consider the whole of the network. Indicatively this matrix is appropriate for use where the hazards under consideration are up to 10% of the total network exposure. This includes regional and local workplace risk assessments. 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. 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. To score the risk, follow the steps: 1. Identify the magnitude of the credible consequence if the risk were to occur. If applicable, risks should be considered in terms of the safety (this matrix), commercial and environmental impact (using other matrices). 2. Identify the likelihood of this level of consequence occurring. (This is done after considering the effectiveness of the current controls in place) 3. Score the risk using the combination of likelihood and consequence ranking. Note: Where there are a range of credible consequences which may lead to a different level of risks and/or where the controls may be different. It may be useful to score the risk more than once.
		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	
		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	
			F1	F2	F3	F4	F5	F6	
Consequence			Incredible	Improbable	Remote	Occasional	Probable	Frequent	
>10 Fatalities	C6	Disastrous	B-	B+	A	A	A	A	
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-	