

Culvert Extension And Renewal

Issue date: 15/10/10
Review date: 14/07/13

SWMS number: SMS-06-SW-0983	SWMS Name: Culvert Extension And Renewal			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) GM Civil Services and SEQ Coordinator Asset Management, Commercial Renewals.
Approver (Position): Civil Electrical Works Manager Infrastructure Renewals	Plant/Equipment/Tools: <ul style="list-style-type: none"> • Crane, Lifting Equipment, Excavator, Backhoe, Trolley, Bogie, Dumper, HiRail Excavator • No-Spill Fuel Cans, Spill response Kit, Watercart, Fire Extinguishers • Barricades, Demarcation Fencing, Signs, Markers, Safety Tape, Plywood, Steel Plates, Shoring • Mattock, Handsaw, Rope, Pigs Foot, Sledge Hammer, Clip Pullers, Rigging Tools, Podger, Pelican Pick • Oxy / Acetylene Welding Gear • Concrete, Culverts, Sealing Products, Ballast Retaining Panels, Ballast 	Records/Reporting: <ul style="list-style-type: none"> • Worksite Protection Plan • Pre-work Brief • Site Specific Management Plan • Electrical Test Tags • Electrical Permits • Hot Work Permit • Fire Brigade • Daily Plant Checklist • Environmental Protection Plan • Services Search 	Permits/licences required: <ul style="list-style-type: none"> • Electrical Permit Holder • Plant Operators Certificate 	PPE required: <ul style="list-style-type: none"> • Safety Boots • High Visibility Vests • Hardhats • Protective Clothing • Safety Glasses And as specified below. <ul style="list-style-type: none"> • Fall Arrest Devices • Dust Mask • Barrier Cream • Gloves • During all Site Works a FIRST AIDER MUST be Present
Applicable Standards, Codes of Practice and guidance: <ul style="list-style-type: none"> • OH&S Act 2000 • OH&S Regulation 2001 • SMS and Network Rules • Rail Safety Regulation 2003 • RailCorp Safety Policy • RailCorp Network Rules & Procedures • RailCorp Safety Management System. • MSDS for all chemicals and hazardous Substances used on site • Working near Overhead Power Lines • National Code of Practice for Manual Handling [NOHSC:2005] • EC14 – Guide to Electrical Workers' Safety Equipment • WorkCover NSW Plant Guide • WorkCover Code of Practice Excavation 2000 	Inspection requirements Nil	Service schedule: Nil	Training/Qualification required: <ul style="list-style-type: none"> • Construction Industry Induction • Track Safety Awareness or RISI (Rail Industry Safety Induction) And as specified below. <ul style="list-style-type: none"> • Oxy / Acetylene Welders Certificate/Ticket 	

Culvert Extension And Renewal

Issue date: 15/10/10
Review date: 14/07/13

Number	Step	Hazard or human error (Safety/Environmental hazards identified, including physical environment, human errors, plant and equipment)	Risk ranking before controls	Control (to be implemented to eliminate or reduce the risk to the lowest practicable level)	Risk ranking after controls	Responsibility	Job step to be completed in accordance with (name associated documentation)	
1	Track access	Trains Running	A	Track Possession	D	Team Leaders Work Group Leaders All Staff Worksite Protection Officer, PPO	SSMP, Pre work Briefing SMS-06-FM-0163 Network Rules and Procedures	
		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 Leaders Work Group Leaders 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 Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225	
		Slips falls or contact with oil/fuel spillage	C-	Plant to be inspected daily. Use correct methods for filling machinery. Spill response kits on-site.	D	Team Leaders Work Group Leaders All Staff Ticketed operator all staff	SSMP, Pre work Briefing SMS-06-FM-0163 ENVIRONMENTAL PROTECTION PLAN Plant SMS-06-PR-0225	
2	Install environmental protection	Contact with services	B+	Locate services prior to starting work. mark services with paint, use qualified plant operators, hand digging in close proximity to services under supervision by appropriate services representative. Care to be exercised. Service searches to be on site and signed off.	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225 Electrical Equipment SMS-06-GD-0268	
		Muscle strain	B-	Correct manual handling procedures. "back-safe" training. Plant to move heavy and/or bulky items. As per Risk assessment.	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Manual Handling SMS-06-GD-0001	
WARNING		<p><u>The Following Precautions are to be undertaken for when using Hot Works as in Activity 3 during Total Fire Bans:</u></p> <ul style="list-style-type: none"> • An Hot Works Permit must be Issued before Work tasks are to be Performed • The Welder or other person in control of the Worksite must take reasonable care to inspect the workplace to identify Potential Fire Hazards <ul style="list-style-type: none"> • All Fire Hazards are to be removed Prior to commencing Welding Tasks • Fire Fighting Equipment must be on Hand at the Worksite e.g. Watercart, Knapsacks, Fire Extinguishers <ul style="list-style-type: none"> • (Hot Works in Progress) Warning Signs are to be placed at Appropriate locations 						
Hot Work SMS-06-PR-0329								
3	Removal of rail	Struck by rail fastener	C+	Follow correct procedure for removing rail fasteners. Wear safety glasses	D	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163	

Culvert Extension And Renewal

Issue date: 15/10/10
Review date: 14/07/13

Number	Step	Hazard or human error (Safety/Environmental hazards identified, including physical environment, human errors, plant and equipment)	Risk ranking before controls	Control (to be implemented to eliminate or reduce the risk to the lowest practicable level)	Risk ranking after controls	Responsibility	Job step to be completed in accordance with (name associated documentation)
		Muscle strain	B-	Correct manual handling procedures. "back-safe" training. Plant to move heavy and/or bulky items. As per Risk assessment.	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Manual Handling SMS-06-GD-0001
		Struck by machine	B+	Make sure minimum personnel are around plant and remain in clear view of operators	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225
		Burns from cutting equipment and hot work	C+	Wear gloves long sleeve shirts, long pants , spats, goggles or face shield as appropriate	D	Ticketed cutter/ welder	SSMP, Pre work Briefing SMS-06-FM-0163 MSDS PPE- SMS-06-GD-0323
4	Excavation	Struck by moving plant	B+	Make sure minimum personnel are around plant and remain in clear view of operators	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225
		Plant roll-over/collapse	B+	Plant fitted with roll-over-protection. SWL of machinery not to be exceeded	C-	Team Leaders Work Group Leaders All Staff Ticketed operator	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225 Excavation & Earthworks SMS-06-GD-0378
		Contact with underground services	B+	Locate services prior to starting work. Mark services with paint, use qualified plant operators, hand dig or use vacuum excavation unit when in Close proximity to services. Service searches to be on site and signed off.	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225 Electrical Equipment SMS-06-GD-0268
		Hearing damage from plant	C+	Use hydraulic equipment. have silencers fitted to machinery. Use ear protection in close proximity to machine	D	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
		Hit by moving plant	B+	Hard hats must be worn implement exclusion zone, use plant spotter if required	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
		Fall in excavation	B+	Be aware. Excavation to be barricaded to prevent workers falling in. Cover if possible	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Excavation & Earthworks SMS-06-GD-0378

Culvert Extension And Renewal

Issue date: 15/10/10
Review date: 14/07/13

Number	Step	Hazard or human error (Safety/Environmental hazards identified, including physical environment, human errors, plant and equipment)	Risk ranking before controls	Control (to be implemented to eliminate or reduce the risk to the lowest practicable level)	Risk ranking after controls	Responsibility	Job step to be completed in accordance with (name associated documentation)
		Excavation collapse	B+	Shoring, benching, keep plant and employees clear of edges.	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Excavation & Earthworks SMS-06-GD-0378
5	Concrete culvert base	Struck by boom / concrete truck	B+	Implement exclusion zones. Use ticketed operators.	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225
		Skin irritations	C-	Read MSDS. Use protective clothing, barrier cream if required.	D	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 MSDS
		Concrete in eyes	B-	Protective eye-wear must be worn. Have water on site to wash out eyes. Follow MSDS.	C-	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 MSDS PPE- SMS-06-GD-0323
6	Material transfer	Hit by unstable loads	B+	Ensure materials are secured during transit. Don't exceed safe working load of plant.	C+	Ticketed operator	SSMP Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225
		Muscle strain	B-	Correct manual handling procedures. "back-safe" training. Plant to move heavy and/or bulky items. As per Risk assessment.	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Manual Handling SMS-06-GD-0001
		Dust and fumes	B-	Implement exclusion zone. Water down material/ roadways. Wear dust mask if required	D	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Hazardous Substances SMS-06-GD-0199
		Slip or 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	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Environmental Protection Plan
		Failure of lifting equipment from overloading	B+	Competent operators to assess loads carefully prior to lifting equipment to be properly maintained and marked	C+	Team Leaders Work Group Leaders All Staff Workcover Ticketed Operator/Dogman SMS-11-GD-0243	SSMP, Pre work Briefing SMS-06-FM-0163 Lifting Equipment SMS-16-FM-0089 Plant SMS-06-PR-0225

Culvert Extension And Renewal

Issue date: 15/10/10
Review date: 14/07/13

Number	Step	Hazard or human error (Safety/Environmental hazards identified, including physical environment, human errors, plant and equipment)	Risk ranking before controls	Control (to be Implemented to eliminate or reduce the risk to the lowest practicable level)	RISK ranking after controls	Responsibility	Job step to be completed In accordance with (name associated documentation)
7	Placement of culverts	Fall in excavation	B+	Implement exclusion zones. Excavation to be barricaded when left open after staff leave site. Keep plant clear of soft edges	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Excavation & Earthworks SMS-06-GD-0378
		Excavation collapse	B+	Use shoring or benching where required, keep plant and employees clear of edge.	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Excavation & Earthworks SMS-06-GD-0378
		Struck by suspended load	B+	Have exclusion zones in place. Use ticketed dogman and crane operator	C+	Team Leaders Work Group Leaders All Staff Workcover Ticketed Operator/Dogman SMS-11-GD-0243	SSMP, Pre work Briefing SMS-06-FM-0163 Lifting Equipment SMS-16-FM-0089
		Contact with live o/h wiring or other services	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 Leaders Work Group Leaders All Staff	Electrical equipment sms-06-gd-0268 Electrical permits sms-06-en-0577
8	Placement of retaining/wing walls	Struck by load	B+	Make sure only trained dogman is near plant and remains in clear view of operators	C+	Team Leaders Work Group Leaders All Staff Workcover Ticketed Operator/Dogman SMS-11-GD-0243	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225
		Crushed fingers	B-	Keep hands clear when positioning	C-	Team Leaders Work Group Leaders All Staff Competent person	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
9	Installation of drainage	Dust and fumes	B-	Keep clear of work if not required. Wear dust mask if required. Water down material.	D	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Hazardous Substances SMS-06-GD-0199
		Struck by load	B+	All workers clear of trench when backfilling.	C+	Team Leaders Work Group Leaders 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 Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323

Culvert Extension And Renewal

Issue date: 15/10/10
Review date: 14/07/13

Number	Step	Hazard or human error (Safety/Environmental hazards identified, including physical environment, human errors, plant and equipment)	Risk ranking before controls	Control (to be implemented to eliminate or reduce the risk to the lowest practicable level)	Risk ranking after controls	Responsibility	Job step to be completed in accordance with (name associated documentation)
		Muscle strain	B-	Correct manual handling procedures. "back-safe" training. Plant to move heavy and/or bulky items. As per Risk assessment.	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Manual Handling SMS-06-GD-0001
10	Seal culvert joins	Irritation/burns from contact with sealing products	B-	Apply as per manufacturers instructions. Check ventilation is adequate. Use PPE recommended in MSDS.	C-	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 , MSDS Hazardous Substances SMS-06-GD-0199
11	Backfill and compact	Dust and fumes	B-	Keep staff not required clear. Water down material. Use a dust mask if necessary	D	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Hazardous Substances SMS-06-GD-0199
		Struck by machine or load	B+	Make sure minimum personnel are around plant and remain in clear view of operators	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225
12	Installation of ballast retaining panels	Struck by load	B+	Make sure minimum personnel are around plant and remain in clear view of operators	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225
		Crushed fingers	B-	Use qualified dogman and tag lines. Implement an exclusion zone	C-	Team Leaders Work Group Leaders All Staff Workcover Ticketed Operator/Dogman SMS-11-GD-0243	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
13	Reinstate track and ballast profile	Contact with services	B+	Locate services prior to starting work. Mark services with paint, use qualified plant operators, hand dig or use vacuum excavation unit when in Close proximity to services. Service searches to be on site and signed off	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225 Electrical Equipment SMS-06-GD-0268
		Struck by machine	B+	Implement exclusion zone around working plant	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225
		Struck by flying object	C=	Protective eye-wear must be worn	D	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323

Culvert Extension And Renewal

Issue date: 15/10/10
Review date: 14/07/13

Number	Step	Hazard or human error (Safety/Environmental hazards identified, including physical environment, human errors, plant and equipment)	Risk ranking before controls	Control (to be implemented to eliminate or reduce the risk to the lowest practicable level)	Risk ranking after controls	Responsibility	Job step to be completed in accordance with (name associated documentation)
14	Tamping	Struck by machine	B+	Make sure minimum personnel are around plant and remain in clear view of operators	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 Plant SMS-06-PR-0225
		Struck by flying object	C-	Protective eye-wear must be worn	D	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163 PPE- SMS-06-GD-0323
		Damage to rail infrastructure	B+	Mark position of services with high visibility paint.	C+	Team Leaders Work Group Leaders All Staff	SSMP, Pre work Briefing SMS-06-FM-0163
15	Welding Tracks	Welding Flash	B-	Designated Welding Area, Eye Protection to be worn	C-	Team Leaders Work Group Leaders All Staff Qualified Person (Welding Ticket)	SSMP, Pre work Briefing SMS-06-FM-0163, PPE-SMS-06-GD-0323
		Burns	B-	Appropriate PPE (Welding Mask, Welding Gloves, Welding Apron)	C-	Team Leaders Work Group Leaders All Staff Qualified (Welding Ticket)	SSMP, Pre work Briefing SMS-06-FM-0163, PPE-SMS-06-GD-0323

Culvert Extension And Renewal

Issue date: 15/10/10
Review date: 14/07/13

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

RailCorp Level 2 Risk Matrix - Regional & Local (Workplace)			Likelihood/Frequency							<u>Definition for Use - Regional & Local level (Workplace)</u>	
			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		
Consequence			F1	F2	F3	F4	F5	F6			
Incredible	Improbable	Remote	Occasional	Probable	Frequent						
>10 Fatalities	C6	Disastrous	B-	B+	A	A	A	A	A		
2-10 Fatalities	C5	Catastrophic	C+	B-	B+	A	A	A	A		
1 Fatality (2-10 Major Injuries)	C4	Critical	C-	C+	B-	B+	A	A	A		
1 Major Injury	C3	Major	D	C-	C+	B-	B+	B+	A		
1 or more Minor Injuries	C2	Minor	D	D	C-	C+	B-	B-	B+		
First aid treatment, or illness/injury not requiring treatment	C1	Negligible	D	D	D	C-	C+	C+	B-		