

# SWMS – Civil inspections and maintenance work on culverts.

Issue date: 04/10/07  
Review date: 04/10/10

<b>SWMS number:</b> <b>SMS-06-SW-0770</b>	<b>SWMS Name:</b> Civil inspections and minor maintenance work on culverts.			<b>SWMS Team:</b> Livio Radman Dragan Sukara Wal Bailey Mick Meehan
<b>Custodian (Position):</b> Business Systems Officer, Illawarra Region. Peter Sharpe.	<b>Assumptions:</b> Fine weather and daylight hours. Staff have had Regional Induction. Staff briefed in SWMS: Civil inspections and maintenance in the danger zone of the railway track. Staff briefed in SWMS: Civil inspections and maintenance on the Right of Way, outside the danger zone of the railway track.			<b>Content reviewed by Technical expert (SME) and RailCorp safety professional</b> (position including Div/Group)
<b>Approving Authority (Position):</b> General Manager, Infrastructure Maintenance.	<b>Plant/Equipment/Tools:</b> <ul style="list-style-type: none"><li>Structures Inspection tools.</li><li>Structures maintenance tools.</li><li>Mobile off track plant.</li><li>CCTV</li><li>Ropes and harnesses.</li></ul>	<b>Records/Reporting:</b> <ul style="list-style-type: none"><li>Applicable inspection report form and previous inspection report.</li><li>Production report.</li></ul>	<b>Permits/licences required:</b> <ul style="list-style-type: none"><li>Confined Spaces certificate as required.</li><li>Industrial Rope Access II as required.</li><li>Minor Plant operator competency as required.</li><li>Electrical permit holder QEL as required.</li></ul>	
<b>Applicable Standards, Codes of Practice and guidance:</b> <ul style="list-style-type: none"><li>WorkCover Code of Practice, for the storage and handling of Dangerous Goods, 2005.</li><li>National Code of Practice for Manual Handling NOHSC:2005 (1990).</li><li>WorkCover Code of Practice: Moving plant on construction sites.</li><li>WorkCover Code of Practice: Noise Management, and Protection of hearing at work.</li><li>WorkCover Guide: Safe working at heights.</li></ul>	<b>Inspection requirements</b> <ul style="list-style-type: none"><li>Electrical equipment has current test tag.</li><li>Daily plant check list.</li><li>Daily harness check.</li><li>Industrial ropes and harnesses current certification tag.</li></ul>	<b>Service schedule:</b> See attached Service Schedule listing.	<b>Training/Qualifications required:</b> <ul style="list-style-type: none"><li>Applicable competency for the task being carried out. Obtained from the Railcorp Infrastructure Engineering Manuals, TMC 110 Structures Service Schedules.</li><li>Railcorp Infrastructure Engineering Manuals Structures Manuals – TMC 300, 301, 302</li></ul>	<b>PPE required:</b> <ul style="list-style-type: none"><li>Steel Cap Boots</li><li>Steel cap gum boots as required.</li><li>Safety Glasses</li><li>Long sleeve shirt as required.</li><li>Long pants as required.</li><li>High visibility vest</li><li>Hard Hat</li><li>Gloves as required.</li><li>Spats as required.</li><li>Chaps as required</li><li>Confined space PPE kit as required.</li><li>Face shield as required</li><li>Welding goggles as required.</li><li>Dust mask, respirator as required.</li><li>Disposable overalls as required.</li><li>Broad brimmed Hat as required.</li><li>Ear protection as required.</li></ul>
		<b>MIMS or METRE Ref:</b> See attached MIMS standard job listing.		

# SWMS – Civil inspections and maintenance work on culverts.

Issue date: 04/10/07  
Review date: 04/10/10

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.	Accessing or egressing the culvert.	Slips, trips, falls, and fall from heights from accessing culvert via steep embankment or culvert basin where constructed path is not available.	B+	Conduct on site risk assessment, and identify hazards to be avoided. Stay safe distance from drops, eg cutting edges, culverts etc. Use ropes and tie off point as required. Correct footwear.	B-	Worksite supervisor Team member	SMS-06-GD-0240. Working at heights. SWI: Fall Arrest Systems (all). SWI: Fixed ladders. SWI: Abseiling. SMS -06-SW-0527. Safety footwear.
		UV exposure.	B+	Apply 30 plus, sunscreen at required intervals, after referring to MSDS. Wear long sleeve shirt if required. Wear broad brim hat if required.	C+	Team Member.	SMS-06-SW-0537. Sunscreen.
		Contact with toxins from spiders, wasps, etc.	C+	Inspect before commencing work. Wear appropriate PPE, long pants and shirt as required, safety glasses, gloves etc.	C+	Team Member.	SMS-06-SW-0530. Protective gloves. SMS-06-SW-0529. Eye protection.
		Cuts, abrasions, allergic reactions from vegetation.	B+	Wear appropriate PPE, long pants and shirt as required, safety glasses, gloves etc. Have path cleared through vegetation prior to inspection as required.	B-	Team Member.	SMS-06-SW-0529. Eye protection. SMS-06-SW-0530. Protective gloves.
		Needle stick injury.	B-	Identify possible needle stick locations. Wear gloves. Dispose of needles with needle stick kit.	C+	Worksite supervisor.	SWI: Needle stick kit. SMS-06-SW-0530. Protective gloves.
		Carrying tools and equipment to culvert.	B+	Instruction in correct lifting techniques.	B-	Worksite supervisor.	SMS-06-GD-0001. Guide to Manual Handling.
2.	Load/unload equipment from truck.	Manual handling.	C+	Correct manual handling techniques. Team Lifts. Use mechanical aids as required.	C-	Team Member	SMS-06-GD-0001. Guide to Manual Handling.
		Contact with sharp objects.	C+	Remove or blunt if possible. Wear gloves.	C-	Team Member.	SMS-06-SW-0530. Protective gloves.

# SWMS – Civil inspections and maintenance work on culverts.

Issue date: 04/10/07  
Review date: 04/10/10

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)
		Crush injury.	B-	Correct manual handling techniques. Team lifts. Orderly loading of truck. Use mechanical lifting device where possible. Stay clear of moving equipment such as tail gate loaders and lifting devices.	C+	Team Member	SMS-06-GD-0001. Guide to Manual Handling.
		Incorrect loading of truck resulting in roll over, equipment/plant/tools coming of vehicle.	B+	All equipment/plant and tools to be secured. Balanced loading of truck.	B-	Worksite supervisor Truck driver.	
		Electric shock from overhead power lines or wiring.	B+	Staff to have been trained in Electrical Awareness or RISI. Maintain Electrical clearances. Obtain Electrical Isolation permit prior to commencing work if required.	B-	Team Member.	SMS-06-GD-0268. Working around electrical infrastructure.
		Slips, trips, falls and fall from heights.	B+	Correct manual handling techniques. Team lifts. Orderly loading of truck. Get on and off truck using steps provided.	B-	Worksite supervisor Team member	SMS-06-GD-0001. Guide to Manual Handling.
3.	Cutting of path through vegetation with brush hook.	All hazards from step 1.		All controls from step 1.		Worksite supervisor Team member	
		Cuts and abrasions.	B+	Wear appropriate PPE, long pants and shirt as required, safety glasses, gloves etc.	B-	Team Member.	SMS-06-SW-0529. Eye protection. SMS-06-SW-0530. Protective gloves.
		Injury to others from swinging brush hook.	C+	Other team members to remain clear of brush hook user.	C-	Team Member.	
4.	Accessing or egressing culvert via insitu access ladder on culvert head wall or in drop sump, or by portable	Manual handling when removing drop sump grate.	B+	Instruction in correct lifting techniques. Use mechanical lifting device where possible.	B-	Worksite supervisor.	SMS-06-GD-0001. Guide to Manual Handling.

# SWMS – Civil inspections and maintenance work on culverts.

Issue date: 04/10/07  
Review date: 04/10/10

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)
	ladder.	Culvert and/or drop sump is assessed as a confined space.	B+	Use CCTV for inspection if applicable. Carry out inspection or maintenance as per confined space procedures.	C-	Worksite supervisor.	SWI: CCTV. SMS-06-GD-0035. Confined spaces.
		Fall from heights.	C+	Identify, and avoid identified hazards. Visually inspect ladder rungs before use. Assess condition of each rung whilst descending. Attached climbing according to SWI. Use portable ladder according to SWI.	C-	Team Member.	SMS-06-GD-0240. Working at heights. SWI: Fall Arrest Systems (all). SWI: Fixed ladders.
		Manual handling of ladder.	B+	Instruction in correct lifting techniques. Team Lifts.	B-	Worksite supervisor. Team Member.	SMS-06-GD-0001. Guide to Manual Handling.
5.	Accessing or egressing a culvert with a boat via a waterway.	Slips trips and falls at boat ramp.	B+	Wear non slip footwear.	B-	Worksite supervisor.	SMS-06-GD-0001. Guide to Manual Handling.
		Injuries from boat trailer winch.	C+	SWI: Boat trailer.	C-	Team Member.	SWI: Boat trailer.
		Drowning	B+	Wear life jackets. Obtain weather report for the day. Confirm staff can swim.	C-	Worksite supervisor Team member	SMS-06-GD-0251. Working over water. Life jackets PPE.
6.	Carrying out inspection or maintenance in the culvert.	Carrying tools and equipment to culvert.	B+	Instruction in correct lifting techniques. Team Lifts as required.	B-	Worksite supervisor. Team Member.	SMS-06-GD-0001. Guide to Manual Handling.
		Inadequate lighting.	C+	Provide adequate lighting, and/or use torch.	C-	Worksite supervisor. Team Member.	
		Head injury due to bumping of head.	C+	Wear bump hat as required.	C-	Team member	Head injury due to bumping of head.
		Slips, trips, and falls from wet surfaces and uneven surfaces.	B+	Identify, and avoid identified hazards. Wear correct footwear.	B-	Worksite supervisor Team member	SMS -06-SW-0527. Safety footwear.

# SWMS – Civil inspections and maintenance work on culverts.

Issue date: 04/10/07  
Review date: 04/10/10

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)
		Drowning.	C+	Assess water flow and depth in culvert. Obtain daily weather report prior to work. Use CCTV for inspection as required.	C-	Worksite supervisor.	SWI: CTV.
		Culvert is assessed as a confined space.	B+	Use CCTV for inspection as required. Carry out inspection or maintenance as per confined space procedures.	C-	Worksite supervisor.	SWI: CTV. SMS-06-GD-0035. Confined spaces.
		Manual handling of tools and equipment.	B+	Instruction in correct lifting techniques. Team lifts as required.	B-	Worksite supervisor. Team Member.	SMS-06-GD-0001. Guide to Manual Handling.
		Injuries from tools, materials, assets and equipment.	C+	Wear gloves. Correct use of hand tools.	C-	Team Member.	SWI: Needle stick kit. SMS-06-SW-0530. Protective gloves.
		Contact with toxins from spiders, wasps, etc.	C+	Inspect before commencing work. Wear appropriate PPE, long pants and shirt as required, safety glasses, gloves etc.	C+	Team Member.	SMS-06-SW-0530. Protective gloves. SMS-06-SW-0529. Eye protection.
		Repetitive strain injury to neck and back.	D	Rest periods as required.	D	Worksite supervisor.	
		Falling down spillway or drop sump in culvert.	C+	Identify hazards from local Bridge Examination records or staff. Use portable lighting to identify hazards. Attached climbing according to SWI. Use portable ladder according to SWI.	C-	Worksite supervisor Team member	SMS-06-GD-0240. Working at heights. SWI: Fall Arrest Systems (all). SWI: Fixed ladders.
		Needle stick injury.	B-	Identify possible needle stick locations. Wear gloves. Dispose of needles with needle stick kit.	C+	Worksite supervisor.	SWI: Needle stick kit. SMS-06-SW-0530. Protective gloves.
		Dead animals		SWMS: Removing animals from the corridor. Carry out inspection or maintenance as per confined space procedures.		Worksite supervisor Team member	SWMS: Removing animals from the corridor. SMS-06-GD-0035. Confined spaces.

# SWMS – Civil inspections and maintenance work on culverts.

Issue date: 04/10/07

Review date: 04/10/10

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)
		Injuries from other work activity in the vicinity.	B+	Contact other worksite supervisor before entering worksite and obtain induction before entering.	B-	Worksite supervisor.	
		Electric shock from general electrical wiring.	C-	Staff to have been trained in Electrical Awareness. Maintain Electrical clearances. Obtain Electrical Isolation permit prior to commencing work if required.	C-	Team Manager. Team Member. Worksite Supervisor.	SMS-06-GD-0268. Working around electrical infrastructure.
		Injuries using power tools.	B-	Use applicable SWIs of tools being used.	C+	Worksite supervisor. Team Member.	SWI: Applicable to tool being used.
		Noise from plant and power tools.	C+	Wear hearing protection.	D	Team Member.	SMS-06-GD-0531. Hearing protection.
		Contact with chemicals.	B+	Work in accordance with required MSDS. Eye protection PPE and wear gloves.	C+	Worksite supervisor. Team Member.	MSDS: Applicable to chemical being used. SMS-06-SW-0529. Eye protection. SMS-06-SW-0530. Protective gloves.
		Struck by flying object.	B+	Eye protection PPE. Hard hat as required. Full face shield if required.	B-	Team Member.	SMS-06-SW-0529. Eye protection. SMS-06-SW-0532. Protective helmets.
		Objects falling from height.	B-	Secure loose objects including tools. Defined exclusion zones with bollards and tape, below worksite. Hard hat PPE.	C-	Team Member.	SMS-06-SW-0532. Protective helmets.
		Airborne dust.	C+	Respirator/dust mask PPE.	C-	Team Member.	SMS-06-SW-0535. Respiratory protection.
7.	Pack up worksite.	Material or equipment left on site.	C+	Carry post work inspection.	D	Worksite supervisor.	
		Work incomplete.	C+	Carry post work inspection.	D	Worksite supervisor.	

## SERVICE SCHEDULE LISTING.

Service Schedule Number	Activity Description	Service Schedule Number	Activity Description
SSC 204	Detailed Examination of Culverts and Subways	SSC 231	Special Examination of Structures – when applicable
SSC 205	Mid-Cycle Examination of Culverts and Subways	SSC 232	Structures Assessment – when applicable.

## MIMS STANDARD JOBS LISTING.

Std Job Code	Activity Description	Std Job Code	Activity Description
P31001	DETAILED EXAMINATION OF CULVERT	P00012	EXAMINATION BY BRIDGE EXAMINER
P31002	MID CYCLE INSPECTION OF CULVERT	P00013	SPECIAL INSPECTION OF BRIDGE
P31003	SPECIAL EXAMINATION OF CULVERT	P00014	EXAMINATION BY STEEL BRIDGE EXAMINER
P31004	STEEL BRIDGE EXAM-CULVERT	P00015	INSPECTION BY STRUCTURES INSPECTOR
P31807	CLEAN CULVERT		
P31C01	REPAIR CULVERT		
P31C02	CLEAN CULVERT		

# SWMS – Civil inspections and maintenance work on culverts.

Issue date: 04/10/07  
Review date: 04/10/10

**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



RailCorp Level 2 Risk Matrix - Regional & Local (Workplace)			Likelihood/Frequency						
			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-	

**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 or risks and/or where the controls may be different. It may be useful to score the risk more than once.