

# Perform Survey Work on Bridges

Issue date: 27/02/08

Review date: 21/02/11

<b>SWMS number:</b> SMS-06-SW-1112	<b>SWMS Name:</b> Perform Survey Work on Bridges			<b>SWMS Team:</b> Graeme Gaggin Mick Athorn Richard Plokstys Alex Martinov Terry Wood Robert Thyer David Lang Fab De-Luca Andrew Gell Ray Brookes Michael Aldama Steve Sciglitano
<b>Custodian (Position):</b> Senior Surveyor	<b>Assumptions:</b> <ol style="list-style-type: none"> <li>1. This statement examines the hazards and controls likely to be encountered when performing survey work in tunnels or enclosed spaces (eg culverts or under platform copings). This statement is a supplement to SWMS SMS-06-SW-1110 Perform Survey Work and MUST be used in conjunction with that SWMS which outlines generic risks for performing survey work in any location.</li> <li>2. Job Steps 1 to 4 and 7 to 8 are obtained from SMS-06-SW-1110</li> <li>3. Depending on the type of survey being performed, the sequence of Job Steps 5 &amp; 6 is interchangeable</li> </ol>			
<b>Approving Authority (Position):</b> Principal Surveyor	<b>Plant/Equipment/Tools:</b> <ul style="list-style-type: none"> <li>• Survey equipment, tools materials,</li> <li>• Horn,</li> <li>• Detonators, flags, lamps</li> <li>• Witches' hats (cones)</li> <li>• Barrier tape</li> <li>• Hand drill</li> <li>• Warning time calculator</li> <li>• Signal box contact list</li> <li>• Ladder</li> <li>• EWP</li> <li>• Fall arrest gear</li> </ul>	<b>Records/Reporting:</b> SMS-06-TP-0312 Site-Specific Safety management  SMS-06-FM-0163 Pre-work briefing  SMS-06-FM-0774 Worksite Protection Plan	<b>Permits/licences required:</b> NA	<b>Content reviewed by Technical expert (SME) and RailCorp safety professional</b> (position including Div/Group)
<b>Applicable Standards, Codes of Practice and guidance:</b> <ul style="list-style-type: none"> <li>• SPC 211 Survey Specification</li> <li>• TMC212 Survey Manual</li> <li>• Surveying Act 2002</li> <li>• Surveying (Practice) Amendment Regulation 2006</li> <li>• OHS Regulation 2001 (particularly Clause 56 &amp; 57)</li> <li>• AS1891.4 Industrial Fall Arrest Systems &amp; Devices</li> <li>• AS2550 re EWP</li> <li>• AS1657 Fixed ladders</li> </ul>	<b>Inspection requirements</b> <ul style="list-style-type: none"> <li>• SMS-16-RG-0229 Plant Equipment Inspection Testing Register</li> </ul>	<b>Service schedule:</b> NA  <b>MIMS or METRE Ref:</b> NA	<b>Training/Qualifications required:</b> <ul style="list-style-type: none"> <li>• Rail Safety Induction Certificate</li> <li>• OHS General Induction</li> <li>• Electrical awareness</li> <li>• Surveying Certificate of Competency (Engineering Authority)</li> <li>• Protection Officer Level 1 (min)</li> <li>• Regional Induction</li> </ul>	<b>PPE required:</b> <ul style="list-style-type: none"> <li>• Safety boots,</li> <li>• High visibility vests,</li> <li>• Safety helmet, bump hat</li> <li>• Safety glasses</li> <li>• Gloves</li> </ul>

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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)
5	Marking up for survey	As identified in SWMS Perform Survey Work SWM-06-SW-1110		<ul style="list-style-type: none"> <li>As identified in SMS-06-SW-1110</li> </ul>		Team Leader	SPC 211 Survey Specification TMC212 Survey Manual
5		Fall from height 1. From bridge 2. From abutment	B-	<ul style="list-style-type: none"> <li>Work within platforms and handrails where available</li> <li>Use indirect measurement techniques</li> <li>Stay within the outside running rail where platforms and handrails are not available</li> <li>Use harness and work attached only on worksites where specialist staff are available to supervise the work and control the risk</li> <li>Arrange for use of elevated work platform (EWP) and trained operator to assess and control risk</li> <li>Ensure that all staff working in EWP have harness awareness training</li> </ul>	C-		SMS-06-GD-0241 Fall Arrest Systems SMS-06-GD-0240 Working at Heights SMS-06-SW-0310 Elevating Work Platforms

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5		Trips or falls at same level 1. on transom 2. at bridge approaches, abutments or walkways	C+	<ul style="list-style-type: none"> <li>Use walkways to reach required locations</li> <li>Keep hands free if required to walk on transoms and apply extreme caution</li> <li>Wear safety boots</li> <li>Ensure walkways are free of debris and materials and equipment</li> <li>Be aware of slippery surfaces, the position of the rails and any track side equipment</li> </ul>	C-		
5		Fall from ladder	C+	<ul style="list-style-type: none"> <li>Set up and secure the ladder as per SMS-06-SW-0264</li> <li>Use the ladder as outlined in SMS-06-SW-0264</li> </ul>	D	Team Leader	SMS-06-SW-0264 Portable Ladders, Stepladders and Step Platforms
5		Objects falling from above	C+	<ul style="list-style-type: none"> <li>Wear safety helmet</li> <li>Liaise with any work teams working above to determine the risk and request them to cease work while surveying below</li> <li>Cease work if the team above cannot be stopped and there is potential for falling objects</li> </ul>	D		

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5		Objects falling below from work area	C+	<ul style="list-style-type: none"> <li>Assess potential for injuring other work groups or pedestrians; or damaging property or vehicles</li> <li>Use toeboards / kickboards</li> <li>Segregate or fence off sufficient area below and deploy a lookout or spotter to ensure that the area is not entered</li> <li>Cease work if these controls cannot be implemented or do not adequately manage the risk</li> </ul>	D		
5		High wind can exacerbate all the above hazards	B-	<ul style="list-style-type: none"> <li>Assess potential impact of high wind or wind gusts</li> <li>Cease work if risk cannot be managed</li> </ul>	C-		
6	Collect survey data	As per Job Step 5 above		<ul style="list-style-type: none"> <li>As per Job Step 5 above</li> </ul>		Team Leader	As per Step 5

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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)
		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	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.
			F1	F2	F3	F4	F5	F6	
Consequence		Incredible	Improbable	Remote	Occasional	Probable	Frequent		To score the risk, follow the steps:
>10 Fatalities	C6	Disastrous	B-	B+	A	A	A	A	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).
2-10 Fatalities	C5	Catastrophic	C+	B-	B+	A	A	A	2. Identify the likelihood of this level of consequence occurring. (This is done after considering the effectiveness of the current controls in place)
1 Fatality (2-10 Major Injuries)	C4	Critical	C-	C+	B-	B+	A	A	3. Score the risk using the combination of likelihood and consequence ranking.
1 Major Injury	C3	Major	D	C-	C+	B-	B+	A	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.
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-	