



# HAZARD PROFILE

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Developed for concrete frame  
construction trades to assist emergency  
and fire preparedness planning

**30th July 2018**

**Introduction:**

This Hazard Profile was developed with the assistance of three X two-hour Focus Group meetings. The construction industry trades represented in each focus group comprised a mix of formwork; steel reinforcement; structural steel; concrete; stressing and electrical.

Led by a Facilitator each Focus Group met to discuss and identify work, health and safety hazards and risks related to concrete frame construction trades. Specifically, each Focus Group identified those activities or conditions related to each trade that could cause an incident significant enough to trigger an emergency response and potential for an evacuation of a construction project. Focus Group participants were also tasked with identifying preventative (high level) control measures to eliminate or minimise the risk event.

**Objective:**

The Work Health & Safety Regulation (R43) requires persons conducting a business or undertaking (PCBU) to prepare, maintain and implement emergency planning. It follows, that for a PCBU to adequately plan for an emergency it must identify possible (credible) scenarios based on the type and nature of the work activities undertaken and their location.

The objective of the Focus Group meetings and related Hazard Profile was the development of a working document, which can inform trade specific planning for emergency response including fire preparedness, for concrete framed construction trades. By including the information provided in the Hazard Profile within a trade specific procedure, safe work method statement or other planning or work activity document, the emergency information can be used to instruct workers in implementing emergency response actions, if such a risk event occurred.

**Acknowledgements:**

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- BKH Contractors Group Pty Ltd
- BSA Limited
- Courtly Reo Pty Limited
- De Martin & Gasparini Pty Limited
- Erect Safe Scaffolding
- Lendlease Building Pty Limited
- S&L Steel Pty Ltd
- SRG Limited
- Stowe Australia Pty Limited
- Wideform Constructions Pty Ltd

Trade	Job Task	Hazard	Risk Event (that could trigger emergency scenario)	Preventative + Mitigating Control Measures
<b>Formwork</b>	Formwork erection	Working at heights	Falls from height	<ul style="list-style-type: none"> <li>• Design certification of formwork system</li> <li>• Engineering review/ approval of formwork system</li> <li>• Sequenced installation of the formwork</li> <li>• Edge protection</li> <li>• Catch deck</li> </ul>
			Fall of materials	<ul style="list-style-type: none"> <li>• Design certification of formwork system</li> <li>• Engineering review/ approval of formwork system</li> <li>• Edge protection (screen/containment)</li> <li>• Penetration protection</li> </ul>
			Collapse of formwork structure	<ul style="list-style-type: none"> <li>• Design certification of formwork system</li> <li>• Engineering review/ approval of formwork system</li> <li>• Sequenced installation of the formwork incl. bracing/ props</li> <li>• Dedicated crane load landing areas – Engineer Approved</li> </ul>
		Lifting and landing of crane formwork loads	Fall of materials	<ul style="list-style-type: none"> <li>• Correct slinging and lifting methods</li> <li>• Competent Dogman controlled load</li> <li>• Lifting gear inspection</li> <li>• Lift travel path and landing area excluded</li> <li>• Dedicated crane load landing area – Engineer</li> <li>• Crane load is within deck design capacity</li> <li>• Exclusion zone below landing area</li> </ul>
		Use of mobile elevating work platforms	Plant impact collapse of structure	<ul style="list-style-type: none"> <li>• Design certified sequence of installation</li> <li>• Paths of access for the EWP</li> </ul>

Trade	Job Task	Hazard	Risk Event (that could trigger emergency scenario)	Preventative + Mitigating Control Measures
				<ul style="list-style-type: none"> <li>Sequenced installation of the formwork incl. bracing/ propping</li> </ul>
			Inadvertent plant movement – crush	<ul style="list-style-type: none"> <li>Control lever protection</li> <li>Operator competence</li> </ul>
		Penetrations/holes/ deep beams in formwork deck/ walls	Fall from height	<ul style="list-style-type: none"> <li>Vertical and horizontal covers load bearing to design specification</li> <li>Mesh cover (primary) protection cast into slab</li> <li>Plywood cover (secondary) protection mechanically fixed.</li> </ul>
	Installing supporting Structural Steel Beams / Needles (Universal Beams)	Working at heights	Fall from height	<ul style="list-style-type: none"> <li>Design certification of formwork structural support system</li> <li>Engineering review/ approval</li> <li>Sequenced installation of the supports / needles</li> <li>Edge protection / fall prevention strategy</li> </ul>
			Fall of Materials	<ul style="list-style-type: none"> <li>Design certification of formwork structural support system</li> <li>Engineering review/ approval</li> <li>Sequenced installation of the supports / needles</li> </ul>
	Stripping formwork	Working at heights	Fall from height	<ul style="list-style-type: none"> <li>Design certification of formwork system</li> <li>Engineering review/ approval of formwork system</li> <li>Sequenced stripping of the formwork</li> <li>Edge protection</li> <li>Work platform (min 2 planks)</li> <li>Catch deck</li> </ul>
			Fall of materials	<ul style="list-style-type: none"> <li>Approved stripping sequence</li> <li>Exclusion zone below</li> </ul>
		Unauthorised tampering of structural elements	Collapse of formwork Structure	<ul style="list-style-type: none"> <li>Pre-pour inspection of formwork</li> </ul>

Trade	Job Task	Hazard	Risk Event (that could trigger emergency scenario)	Preventative + Mitigating Control Measures
	Work in shafts / Jump forms	Working at heights	Fall from height	<ul style="list-style-type: none"> <li>• Design certification of Jump Form System</li> <li>• Engineering review/ approval of Jump Form.</li> <li>• Jump Form intermediate catch deck</li> <li>• Internal scaffold/ working deck</li> </ul>
	Use of electrical equipment	Electricity	Electric shock or electrocution	<ul style="list-style-type: none"> <li>• Electricity supply protected by Residual Current Device</li> <li>• Electrical inspection and testing.</li> </ul>
	Formwork structural modification Jump Form / other	Welding/ Oxy /Acetylene cutting	Fire	<ul style="list-style-type: none"> <li>• Design eliminates modifications during installation</li> <li>• Fire Risers operational (BCA E1.9) with booster as required buildings greater than 12m high and maintained two floors below effective height of the structure.</li> <li>• Fire extinguishers A, B, C type fire and electrical fire located at each required exit</li> <li>• Fire egress routes clearly marked and unobstructed</li> <li>• Permit To Work implemented</li> </ul>
	All tasks	Emergency evacuation	Egress routes obstructed / unknown / not marked	<ul style="list-style-type: none"> <li>• Emergency egress lighting operational</li> <li>• Egress routes clearly marked</li> <li>• Egress routes clear and signposted</li> <li>• Evacuation details outlined Site Induction</li> <li>• Emergency Contact numbers displayed in prominent locations</li> <li>• Evacuation drill carried out maximum yearly intervals</li> </ul>

Trade	Job Task	Hazard	Risk Event (that could trigger emergency scenario)	Preventative + Mitigating Control Measures
<b>Steel reinforcement</b>	Steel reinforcement lifting and landing	Crane steel reinforcement loads on deck	Fall of material	<ul style="list-style-type: none"> <li>• Correct slinging and lifting methods</li> <li>• Competent Dogman controlled load</li> <li>• Lifting gear inspection</li> <li>• Lift travel path and landing area excluded</li> <li>• Exclusion zone below landing area</li> </ul>
			Collapse of formwork structure	<ul style="list-style-type: none"> <li>• Design certification of formwork system</li> <li>• Engineering review/ approval of formwork system before loading</li> <li>• Dedicated crane load landing area – Engineer Approved</li> <li>• Crane load is within formwork deck design capacity</li> <li>• Dedicated crane load landing areas</li> </ul>
	Steel reinforcement placement	Gaps in perimeter containment	Fall of material	<ul style="list-style-type: none"> <li>• Jump Form flaps / barriers to eliminate gaps</li> <li>• Edge protection for multi-storey construction incl. perimeter containment</li> <li>• Penetration protection</li> </ul>
		Working at heights	Falls from height	<ul style="list-style-type: none"> <li>• Design certification of formwork system</li> <li>• Engineering review/ approval of formwork system before loading</li> <li>• Edge protection</li> </ul>
		Work in shafts / Jump forms	Fall from height	<ul style="list-style-type: none"> <li>• Design certification of Jump Form System</li> <li>• Engineering review/ approval of Jump Form.</li> </ul>

Trade	Job Task	Hazard	Risk Event (that could trigger emergency scenario)	Preventative + Mitigating Control Measures
				<ul style="list-style-type: none"> <li>• Jump Form intermediate catch deck</li> <li>• Internal scaffold/ working deck</li> </ul>
		Penetrations/holes/ deep beams in formwork deck/ walls	Fall from height	<ul style="list-style-type: none"> <li>• Vertical and horizontal covers load bearing to design specification</li> <li>• Mesh cover (primary) protection cast into slab</li> <li>• Plywood cover (secondary) protection mechanically fixed.</li> </ul>
	Cutting steel reinforcement	Hot Works	Fire	<ul style="list-style-type: none"> <li>• Design eliminates modifications (cutting)</li> <li>• Use of pneumatic cutting tools to eliminate hot works</li> <li>• Fire risers operational (BCA E1.9) with booster as required buildings greater than 12m high and maintained two floors below effective height of the structure.</li> <li>• Fire extinguishers A, B, C type fire and electrical fire located at each required exit</li> <li>• Fire egress routes clearly marked and unobstructed</li> <li>• Permit To Work implemented</li> </ul>

Trade	Job Task	Hazards	Risk Event (that could trigger emergency scenario)	Preventative + Mitigating Control Measures
Stressing	Loading stressing coil onto deck	Crane stressing cable coil onto deck	Fall of material	<ul style="list-style-type: none"> <li>• Correct slinging and lifting methods</li> <li>• Competent Dogman controlled load</li> <li>• Lifting gear inspection</li> <li>• Lift travel path and landing area excluded</li> <li>• Exclusion zone below landing area</li> </ul>
			Collapse of formwork structure	<ul style="list-style-type: none"> <li>• Design certification of formwork system</li> <li>• Engineering review/ approval of formwork system before loading</li> <li>• Dedicated crane load landing area – Engineer Approved</li> <li>• Crane load is within formwork deck design capacity</li> <li>• Dedicated crane load landing areas</li> </ul>
	Stressing Cables	Stressing cables in concrete which has not achieved the designed strength	Structural collapse / localised Failure of concrete structure	<ul style="list-style-type: none"> <li>• Testing of concrete strength</li> <li>• Design certification of concrete</li> <li>• Inspection test plans</li> </ul>
	Stressing cable placement	Working at heights	Falls from height	<ul style="list-style-type: none"> <li>• Engineering review/ approval of formwork system before loading</li> <li>• Edge protection</li> </ul>
		Gaps in perimeter containment	Fall of material	<ul style="list-style-type: none"> <li>• Jump Form flaps / barriers to eliminate gaps</li> <li>• Edge protection for multi-storey construction incl. perimeter containment</li> <li>• Penetration protection</li> </ul>
		Penetrations/holes/ deep beams in formwork deck/ walls	Fall from height	<ul style="list-style-type: none"> <li>• Horizontal penetration covers load bearing to design specification</li> <li>• Mesh cover (primary) protection cast into slab</li> <li>• Plywood cover (secondary) protection mechanically fixed.</li> </ul>
		Stored energy	Sudden release of cable (energy)	<ul style="list-style-type: none"> <li>• Engineers approval</li> <li>• Inspection test plan</li> </ul>



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				<ul style="list-style-type: none"> <li>• Backing board and dead end stressing to prevent cable failure free release</li> </ul>

Trade	Job Task	Hazards	Risk Event (that could trigger emergency scenario)	Preventative + Mitigating Control Measures
<b>Concrete Placement</b>	Pouring Concrete	Loading of concrete onto formwork deck, wall or other elements	Collapse of formwork structure	<ul style="list-style-type: none"> <li>• Design certification of formwork system</li> <li>• Engineering review/ pre-pour inspection of formwork system before pour</li> <li>• Flow rates evenly distributed and not exceeded</li> <li>• Exclusion zone below pour</li> </ul>
			Fall of materials	<ul style="list-style-type: none"> <li>• Edge protection (screen /containment)</li> <li>• Exclusion zone below</li> <li>• Boom pump inspection, maintenance and test records</li> </ul>
		Working at heights	Falls from height	Design certification of formwork system Engineering review/ pre-pour inspection of formwork Edge protection Penetration protection
	Concrete curing	Concrete not achieving the designed strength	Structural collapse / localised failure of concrete structure	<ul style="list-style-type: none"> <li>• Use of water or other additives meets the design strength criteria;</li> <li>• Slump and other tests undertaken to confirm concrete strength</li> </ul>
	Concrete Pumping	Failure of pipeline / joint failure	Struck by violent expulsion of concrete / pipe fixture	<ul style="list-style-type: none"> <li>• Pipe line design for multistorey Engineer Approved</li> <li>• Mix design minimises risk of blockages</li> <li>• Pipe inspection and maintenance program</li> </ul>
	Operating plant	Concrete placing boom	Collapse / overturning / contact with overhead wires	<ul style="list-style-type: none"> <li>• Boom pump inspection, maintenance and test records</li> <li>• Pump set up clear of overhead wires</li> <li>• Pump set up location structurally adequate with no inground pits or other</li> <li>• Exclusion zone around plant and below boom</li> </ul>