Plant Hazard Identification and Risk Assessment

Issue date 25.05.2022
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Plant information

Plant item:	Line Pump	**Plant identification details (asset/plant no.):**	
Project:			
Competency required to operate the plant:	Competency for Line Pump		
List all legislation, codes of practice and Australian Standards applicable to this item of plant:			
Concrete Pumping Code of Practice 2019 AS 1418.4.2004 Part 15: Concrete placing equipment QLD Work Health and Safety Act 2011 QLD Work Health and Safety Regulation 2011 AS 2550.15 Managing Risks of Plant in the Workplace COP 2021			
List other documentation relevant to this plant reviewed during this assessment? ie SWMS, SOPs, Manufacturer's Handbook.	SWMS Concrete Pumping – Manufacturer Handbook Pump Operations		

Kaboom Concrete Pumping
4/747 Pumicestone Road
Caboolture QLD 4510
Phone: 0450 511 115
Email: manager.kaboom@gmail.com

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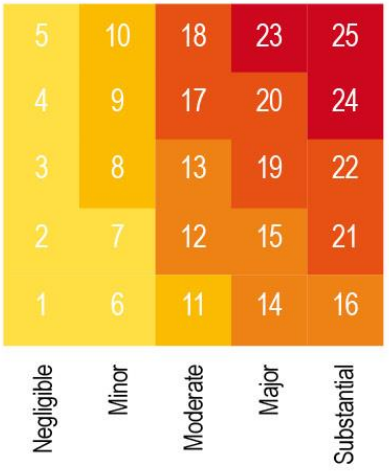
Assessment conducted by: Names and positions	Tim Lane Director	Date:	26-May-2022

The following risk ranking criteria are used to assess the level of risk for the various aspects involved in a design. Higher risks require increased levels of control.

Consequence		Safety
Substantial	Cannot achieve key team or major program milestone, > x days	Class 1 (Fatal Incident)
Major	Major slip in key milestone or critical path impacted; X-X Days Slip	Class 1 (Permanent Injury)
Moderate	Major slip in key milestone; not able to meet needed date, X-X Days Slip	Class 2 (Lost Injury Time)
Minor	Additional resources/re-planning required to meet need/key date, X-X Days Slip	Class 3 (Minor injury, medical treatment required)
Negligible	Minimal or no key impact on dates, X-X Days Slip	Class 3 (Slight injury First Aid)

Risk	Probability	
	Almost Certain	Threat can be expected to occur. 75%-99%
	Likely	Threat will quite commonly occur. 50%-75%
	Possible	Threat may occur occasionally. 25%-50%
	Unlikely	Threat could infrequently occur. 10%-25%
	Rare	Threat may occur in exceptional circumstance. 0%-10%

Extreme Threat
Very High Threat
High Threat
Moderate Threat
Low Threat



Note: Existing Safety, Health and Environmental Work Method Statements (SHEWMS) etc are to be reviewed along with other control measures relating to the plant. If the assessment identifies that a SHEWMS, SOP etc is not fit for the purpose, note this as a corrective action required in the **Additional Controls** section.

Maintenance and repair assessment (*Complete this section for assessment of* ***Major Maintenance and repair*** *activities only – Minor maintenance, inspection and casual access by the operator to included in operational assessment)*

Maintenance/repair being assessed:	Yes		
No. of employees working on (or likely to be working on) plant:	2	**Estimate of duration of activity:**	1 Day

Type of activity:	**Scheduled frequency.**	**By whom**	**Location of maintenance:**
☒ Scheduled.	Daily	Operator	☒ On site – Off Site ☐
	Weekly	Operator/Fitter	☒ On site – Off Site ☐
	Three monthly	Fitter	☒ On site – Off Site ☐
	Yearly	Assessor	☐ On site – Off Site ☒
	Six Yearly	Registered Professional Engineer	☐ On site – Off Site ☒

- All concrete pumping/placing equipment is to be given a visual inspection and functional test - in accordance with the manufacturer's instructions and recommendations, and AS 2550.15 *Cranes - Safe use - Concrete placing equipment* –
  - Daily inspections: Check oil level in hydraulic tank. Grease the foot step and collar bearing of the boom slewing gear (only in first week).
  - Weekly: Check opening pressure of the relief valve.
  - Monthly: Grease bearings of operating devices. Check all mounting bolts for tightness. Grease links on boom, slewing gear and cylinder.
  - Every three months: Change oil in hydraulic tank.
- Any repairs or replacements should only be carried out by trained and competent personnel in accordance with the manufacturer's instructions.
- All concrete placing booms, pumps and related equipment are to be inspected once a year by an assessor, to confirm that the equipment is suitable for continued service, in accordance with the manufacturer's specifications, and AS 2550.15 *Cranes - Safe use - Concrete placing equipment*
- All items of concrete placing equipment should undergo a major inspection to make sure the concrete placing equipment is in a safe working condition in accordance with AS 2550.15 *Cranes - Safe use - Concrete placing equipment*
- These inspections should include a strip down of all high stress areas, including the boom, slew ring and outriggers.
- The inspection should be conducted by a registered professional engineer, whose area of competence includes the type of work being undertaken. All inspections should be noted in the appropriate log book.
- All concrete placing equipment should be assessed for service and continued use when six years from the date of manufacture has elapsed and at each six year period thereafter.

☒ Unscheduled.	Fitter/Mechanic	☒ On site – Off Site ☒

Competency requirements for maintenance: ***(eg electrical, welding, etc)***	All inspections maintenance and repairs shall be carried out by a Competent person. QLD Concrete Pump Code of Practice 2005 (a) Daily, Weekly, three monthly inspection shall be carried out by a competent person (concrete pump operator or fitter). (b) Yearly and or six yearly to be completed by a professional engineer including the provision of a detailed report. (c) A competent person inspecting welding on a concrete pump must have suitable knowledge and experience in the inspection and testing of welds, including knowledge of non-destructive testing methods, and AS/NZS 1554: Structural steel welding. (d) A competent person inspecting hydraulic systems and circuitry on the crane should have suitable knowledge and experience in the inspection and testing of hydraulic systems. (e) A competent person inspecting electrical systems, including the ability to read circuit diagrams and understand relevant technical standards. This person **must be a qualified and licensed electrician** where the voltage of the electrical system is greater than 50 volts alternating current or 115 volts direct current, and **(f)** A competent person carrying out non-destructive testing on concrete pumps components should have suitable knowledge and experience in non destructive testing methods. This person must be accredited by the **National Association of Testing Authorities (NATA).** (g) All repairs and alterations are to be certified either by an engineer or the boom manufacturer as complying with AS1418.15.		
References ***(Australian Standards, maintenance manuals etc):***	AS 2550.15-1994 Cranes – Safe Use Part 15: Concrete Placing Equipment Concrete Pumping Code of Practice 2005 Powercrete Australia Technical Data AS 1418.1 Cranes, hoists and winches, Part 1: General requirements AS 1418.4 Tower Cranes AS 3990 Mechanical equipment – Steelwork AS 1170.2 Wind Loads AS 1418.15 Concrete Placing Equipment AS/NZS 3000 Electrical Installations Concrete Pumps Procedure		
Identified energy sources:	15kW 3 phase 380-415 volts	**State method of isolation:**	As per Qld Electricals Procedures
Other permit to work required?	☐ Yes ☒ No	**If Yes, which permits:**	

Hazard identification and risk assessment during operations and/or maintenance activities

Section 1	Put an **X** if the hazard does apply to the plant. Leave blank if the hazard does not apply to the plant.	**Section 4**	Then indicate the **Consequence**, **Likelihood** and **Risk Rating**.
Section 2	Write where on the plant the hazard exists.	**Section 5**	Write the existing Controls and relevant Comments relating to additional controls required
Section 3	Indicate when the exposure is likely to occur? During Operations **(O),** Maintenance **(M)** or Both **(B)**.	**Section 6**	Indicate the residual risk taking into account controls being implemented after considering applicable legislation, Codes, Standards, etc.

SECTION 1 Hazard category and examples	**SECTION 2** Where on this plant does this hazard exist?	**SECTION 3** Exposure during O M or B?	**Section 4**			**SECTION 5** Controls and comments	**SECTION 6** Residual Risk		
			Consequence	**Likelihood**	**Risk Rating**		**Consequence**	**Likelihood**	**Risk Rating**
Entanglement - Yes ☒ No ☐ Can anyone's hair, clothing, gloves, necktie, jewellery, rags and other materials become entangled with moving parts of plant, or materials in motion?									
☒ Arms, hands, fingers, or upper body ☒ Legs, feet, or lower body ☒ Hair, clothing, or jewellery ☐ Isolation of energy source ☐ Cleaning brushes	Hopper	B	Major	Likely	Very High Threat 20	• Hopper grate is to be down at all times while pump is in operation. Grate should only be lifted when the pump is isolated inoperable for cleaning.	Major	Rare	High Threat 14
						• At no time should personnel access the inside of the hopper during pumping operations. All operators and line hands must be trained in the pump isolation process prior to accessing the hopper.	Major	Unlikely	High Threat 15
						• Ensure all boom pump operators are ticketed and deemed competent.	Major	Unlikely	High Threat 15
						• All concrete line hands or any other personnel involved in the mobilisation operation or cleaning of the boom pump understand the hazards involved, especially the hopper.	Major	Unlikely	High Threat 15
Crushing - Yes ☒ No ☐ Can anyone be crushed due to falling, uncontrolled or unexpected movement of plant or its load, lack of capacity to slow, stop or immobilise the plant, tipping or rolling over, parts of plant collapsing, contact with moving parts during testing, inspection, maintenance, cleaning or repair, thrown off, under or trapped between plant and materials or fixed structures?									

☒ Materials falling or being ejected from working area. ☐ Uncontrolled movement of loads. ☐ Nip points. ☐ Inability to slow, stop or immobilise plant. ☐ Isolation of energy sources. ☐ In-running rollers/gear sets. ☒ Plant tipping or rolling over. ☐ Parts of plant closing or collapsing. ☐ Trapping between plant and materials or fixed structures. ☐ Failure resulting in loss of contents or load. ☒ Falling objects. ☒ Load falling/moving due to power loss or plant failure. ☐ Other (please specify)	Boom Section	B	Substantial	Likely	Extreme Threat 24	• Satellite Pump to be installed to engineer specifications and manufacturer's recommendations. Maximum load from the boom in operation is: • Boom Movement: 258kNm (static) • Movement from counterweight side: 40kNm • Slewing torque: 23.6 kNm • Total weight: 7800kg	Substantial	Rare	High Threat 16
						• Ensure all boom pump operators and line hands are deemed competent and understand the elements of operation where risk of crushing can occur.	Substantial	Rare	High Threat 16
						• If maintenance is to be performed on the boom rams or out riggers a process of isolation must be implemented, performed and documented prior to prevent the risk of crush injuries. • When leaving the placing boom unattended, the operator must secure it against unauthorised use.	Substantial	Rare	High Threat 16
						• During normal operations access must be restricted to boom rams or any other point where crush injury can occur.	Substantial	Rare	High Threat 16

Cutting/ Stabbing/ Puncturing - Yes ☒ No ☐
Can anyone be cut, stabbed or punctured by coming in contact with moving plant or parts, sharp or flying objects, work pieces ejected, work pieces disintegrated or other factors not mentioned?

☐ Contact with sharp parts. ☒ Contact with flying parts or work pieces. ☒ Parts or work pieces breaking (disintegrating) ☐ Work pieces ejected ☐ Movement of plant or components ☐ Isolation of energy sources ☒ Body or body parts caught between moving components ☐ Other (please specify)	Boom Sections and delivery hose	O	Major	Possible	Very High Threat 19	• Ensure all personnel are kept clear of line hose when substances/materials are pushed through at high pressure. Use spotters and exclusion zones when necessary.	Major	Unlikely	High Threat 15
						• Aim line hose away from work groups when cleaning pump and boom lines. (Use ball catcher where possible). Use spotters and exclusion zones when necessary.	Major	Unlikely	High Threat 15
						• Personnel directly involved in the pumping, pouring or cleaning of boom pump lines must be made aware of the risks and controls for preventing injury from expelling substances/materials at high pressure.	Major	Unlikely	High Threat 15
						• If chemicals are used as an additive to concrete or for cleaning lines they must be identified and MSDS sheets kept on hand with the appropriate storage, handling, PPE and first aid information.	Major	Unlikely	High Threat 15
Shearing - Yes☒ No☐ Can anyone's body parts be cut off between two parts of the plant and a work piece or structure?									
☒ Body or body parts caught between moving components ☐ Isolation of energy sources ☐ Body or body parts shear when passing structure.	Hydraulic motors, diesel engine. During normal operation.	B	Major	Possible	Very High Threat 19	• During initial assessment of boom pump ensure all guarding is in place to prevent any sheared part can contact with personnel.	Major	Rare	High Threat 14
						• If maintenance is to be performed on the boom pump motors or engines a process of isolation must be implemented, performed and documented prior to prevent access to moving parts.	Major	Unlikely	High Threat 15
						• Hopper grates must not be raised to allow access to moving parts unless a separate risk assessment has been undertaken and controls put in place to prevent contact with moving parts.	Major	Rare	High Threar 14

Striking - Yes☒ No☐
Can anyone be struck by moving objects due to plant or surfaces of the plant, or material handled by plant operation?

☒ Uncontrolled or unexpected movement of plant *(warning sirens req'd?)* ☒ Uncontrolled or unexpected movement of components or material *(warning sirens req'd?)* ☐ Moving objects due to parts or work pieces breaking (disintegrating) ☐ Work materials protruding into travel path of pump ☒ Normal movement of plant ☐ Isolation of energy sources ☐ Other (please specify) _____	Boom and delivery hose	O	Major	Likely	Very High Threat 20	• Prior to pumping concrete, the pump operator, line hand and supervisor to plan boom and pour movements and relay these plans to other workers/work groups to plan task properly.	Major	Unlikely	High Threat 15
						• Line hand to direct pump operator when to move boom or when to push concrete through line.	Major	Unlikely	High Threat 15
						• Ensure all concrete line joiners have safety chains between joins to prevent total separation of pump lines. The chain fitted must be to a manufacturer's standard and applied on every join to prevent loose pipes or hoses striking personnel or plant.	Major	Rare	High Threat 14
	Concrete trucks	O	Major	Likely	Very High Threat 20	• Ensure that traffic arrangements have been reviewed and a traffic management plan for concrete delivery is compiled, installed and monitored.	Major	Unlikely	High Threat 15
						• A spotter must be present to guide concrete delivery trucks onto hopper.	Major	Rare	High Risk 14

Electricity (Shock or burns) Contact - Yes☒ No☐
Can anyone be injured by electrical shock or burnt due to damaged or poorly maintained leads or switches, water near electrical equipment, working near or contact with live electrical conductors, lack of isolation procedures or the factors not mentioned?

☒ Contact via damaged or poorly maintained electrical leads and cables ☐ Overloading of electrical circuits ☐ Isolation of electrical energy sources ☐ Contact with or proximity to live electrical conductors ☐ Contact via damaged electrical control devices ☐ Contact via water entry ☐ Other (please specify) _____	Electrical Control Box	M	Substantial	Possible	Very High Threat 22	Use of mandatory electrical isolation and lock out procedure whilst servicing electrical equipment and at the switchboard – Q Electrical Isolation and lockout procedure	Substantial	Rare	High Risk 16
Explosion/Fire - Yes ☒ No ☐ Can anyone be injured by an explosion of gas, vapours, liquids, dusts or other substances, triggered by plant operation?									
☐ Ignition of flammable atmosphere initiated by the plant ☐ Ignition of flammable atmosphere initiated by material ☒ Ignition of flammable material by the plant ☐ Ignition of flammable material by the process ☐ Other (please specify) Housekeeping	Battery overheats Fuel ignites	B	Minor	Possible	Moderate Threat 8	• Ensure concrete pump is maintained in accordance with manufacture's specifications. • Ensure that there are no naked flames near fuel tanks. • No smoking when refuelling pump.	Minor	Unlikely	Low Threat 7
Slips/ Trips/ Falls - Yes ☒ No ☐ Can anyone using the plant or in the vicinity of the plant, slip, trip or fall due to the working environment or other factors?									

☒ Uneven or slippery work or access surfaces entering or exiting the plant ☐ Housekeeping hazards produced by the plant ☐ Material ejected or falling from the plant ☐ Inadequate work platforms (size, location, fall protection) ☐ Access (ladders, stairs, walkways) to and from the plant ☐ Lack of guardrails or fall protection ☐ Collapse of the supporting structure ☐ Other (please specify) _____	Ground conditions Pouring concrete in wet conditions. Walking over reo.	O	Moderate	Possible	High Threat 13	Ensure access ways are clear. Ensure appropriate footwear is used.	Moderate	Unlikely	High Threat 12
High Pressure Fluid - Yes ☒ No ☐ Can anyone come into contact with fluids under high pressure, due to failure or misuse of the plant?									
☒ Contact with fluids or gas under pressure as part of normal operation ☒ Contact with fluids or gas under pressure due to failure ☐ Contact with fluids or gas under pressure due to misuse	Hydraulic Hoses	B	Moderate	Possible	High Threat 13	Preventative maintenance must be kept up to date on hydraulic motors, components, engine and components. Maintenance to be completed in accordance with manufacture's specifications.	Moderate	Unlikely	High Risk 12

☒ Striking due to severed high pressure hoses/couplings ☐ Stored energy in machine systems/accumulators counterweights ☐ Isolation and bleeding of pressure energy sources ☐ Other (please specify)	Pump lines	B	Major	Possible	Very High Threat 19	• Pipes and couplers must be inspected and maintained in accordance with manufacturers specifications. • Pipe line thickness tests to be completed in accordance with the Concrete Pumping Code of Practice and the manufacture's specifications	Major	Unlikely	High Threat 15
Plant rolling over/ through limits - Yes ☒ No ☐ Can this item of plant roll or tip over due to operating over specified working limits?									
☒ Tip over hazard. ☐ Correct qualifications of operator.	Satellite section (Boom)	B	Substantial	Possible	Very High Threat 22	• Satellite Pump to be installed to engineer specifications and manufacturer's recommendations. • Operating wind velocity must not exceed 20m/second (72km/h) • Do not use flat opened boom at wind speed greater than 14m/secod (50km/h) • Recommended max boom reach is 12 meters at wind speeds over 50 km/h.	Substantial	Rare	High Threat 16
Working environment and ergonomics - Yes ☒ No ☐ Can anyone be injured due to seating design, repetitive body movement or posture, excessive effort, poor workplace or plant design causing mental or physical stress, lack of consideration for human behaviour, poor lighting or others factors not mentioned?									

☐ Inadequate lighting levels ☐ Glare from artificial light ☐ Glare from natural light ☐ Placement and identification of controls ☐ Seating design or seating location ☐ Human error or behaviour aspects (Human factors) ☒ Manual handling tasks associated with the plant ☐ Cramped or restricted work spaces (particularly for maintenance ☐ Noise levels ☐ Vibration ☐ Rain or moisture ☐ Radiation (ionising – non ionising) ☐ Biological ☐ Location of plant in the workplace ☒ Other (please specify) Heat and UV radiation	Delivery Hose	O	Moderate	Possible	High Threat 13	Line hands to minimise sudden movements by using hose grab to secure and move hose around concrete pour.	Moderate	Unlikely	High Threat 12
						Ensure that UV protection is supplied and used during pours.	Moderate	Rare	Moderate Threat 11
Other Hazards – Yes ☐ No ☒ Can anyone be injured or suffer ill health from exposure to:									

☐Chemicals ☐Toxic Gases ☐ Vapours ☐Fumes									
Condition and suitability of plant									
☐ Age and condition ☐ Service and maintenance history ☐ Frequency of use (high or low use or inappropriate duty cycle) ☐ Not fit for purpose ☐ Unsuitable accessories/fittings ☐ Inability to apply isolation/lock out devices ☐ Accessories in unsafe condition ☐ Use in arduous environment ☐ Modification from original design ☐ Other (please specify) _____									
System of work relating to the plant									
☐ Emergency procedures relating to the plant ☐ Communication systems associated with plant operation ☐ Communication methods with plant operation									

☐ Use of Permit to Work system ☐ Start up and shut down procedures ☐ Secure against unauthorised use/access ☐ Storage or restoration to service requirements ☐ Other (please specify) _____									
Environmental issues causes failure									
☐ Inclement weather causes issues ☐ Wind fowls cables and snags or breaks cable ☐ Water impairs operation ☐ Wind speed exceeds recommended limit ☐ Other (please specify) _____									

Are all identified risks controlled to as low as reasonably practicable? YES: ☒ or NO: ☐ If No, list **Additional controls** required on next page

Completed by:	Tim Lane	Contact details:	0450 511 115

I have reviewed the Onsite Risk Assessment and have had the opportunity to comment and make changes as I thought necessary.

Name:	Position description:	Signature:	Date:	Company:
				Kaboom Concrete Pumping
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Additional controls:
For each additional control, identify appropriate corrective actions, including priority, timeframes and responsibilities, communicate the requirements to the person responsible and then input the information into the Corrective Action Register.