



# CONCRETE PUMPING RISK ASSESSMENT

## IMPORTANT NOTICE / HEALTH RISK WARNING

**ANY PERSON AT RISK MUST BE NOTIFIED OF THE DANGERS DETAILED BELOW BEFORE STARTING ANY CONCRETE PUMPING WORK**

The mobile truck mounted concrete pump is designed to convey concrete from the machine's delivery hopper to a point designated by the hirer. This is achieved via a hydraulically powered pump, through pipe sections attached to an articulated boom, to a suspended flexible rubber delivery hose, solid "tremmie" pipe or via a steel pipeline laid on the ground or fixed vertically.

**Terms of Hire** - Shayler Concrete Pumping Ltd supplies equipment subject to CPA Model Conditions for the Hiring of Plant (2021) in conjunction with Supplementary Conditions for Concrete Pumping. Copies can be found on our website [www.shaylerconcretepumping.co.uk](http://www.shaylerconcretepumping.co.uk). Hirers should insure against any liabilities that might be incurred, including damage caused when the pump is being operated in confined spaces.

**Data Sheets** - detailing pump dimensions, outrigger loadings / positioning, boom type / reach and pumping delivery pressures / volume outputs are available upon request or via our website [www.shaylerconcretepumping.co.uk](http://www.shaylerconcretepumping.co.uk).

**Training** - All our Concrete Pump Operators (CPO's) are fully trained and hold (or are working towards) a current CPCS card for concrete pumping operations.

**British Standard BS 8476:2007 "Code of Practice for the Safe Use of Concrete Pumps"** is recommended to hirers and interested parties as a reference document detailing the general minimum requirements in respect of the operation of concrete pumping equipment. Copies of the standard are available from [www.bsi-global.com](http://www.bsi-global.com).

	Hazard(s) Identified	Party Affected	RISK			Control Measures	By Whom	By When	Residual Risk		
			S	L	R				S	L	R
CONCRETE PUMP SET UP / FOLD DOWN	Collapse or settlement of pump due to ground conditions / overturning of pump, or collapse of boom due to insufficient stability	S, O, T & C	5	3	H	<ul style="list-style-type: none"> <li>Ensure ground conditions at set up are adequate for load of pump.</li> <li>Provide sufficient support (timbers, steel sheets) as required and ensure there is adequate space around the pump for the full deployment of outriggers.</li> <li>Ensure outriggers are extended to appropriate position. Sole plates are provided for placement below outrigger feet to support the pump.</li> </ul>	C, S, O	Prior to and during works	5	2	M
	Crush or impact by boom, or struck by placing hose, during set up or during "off the boom" placement of concrete	S, O, T & C	4	3	M	<ul style="list-style-type: none"> <li>CPO to operate via remote control unit from a position of safety.</li> <li>Hirer to ensure sufficient set up space and adequate light levels to ensure safe pump set up.</li> <li>Ensure personnel remain clear of area and any operative controlling the position of the placing hose should hold it at arm's length.</li> <li>Person(s) shall be nominated to converse with and signal the CPO for minor boom positioning.</li> </ul>	C, S, O	During works	4	2	M
	Contact with overhead cables	S, O, T & C	5	3	H	<ul style="list-style-type: none"> <li>As above, plus;</li> <li>Industry guidance specifies the minimum safe working distance from electric cables is 6m, this includes the fully extended boom radius. Exceptions may apply and closer distances may be permitted where controls are provided, however, they must be managed by a Written Safe System of Work. Where set up cannot be clear of overhead cables, consideration should be given to the provision of a ground level pipeline.</li> </ul>	C, S, O	Prior if within 6m and during works	5	2	M
	Vehicle Movements (reversing) – crushing or trapping of persons when moving pump to work in position	S	3	3	M	<ul style="list-style-type: none"> <li>Keep site personnel out of reversing area.</li> <li>A competent Traffic Marshall should direct the moving vehicle and look out for anyone in the danger area.</li> <li>Vehicles fitted with reversing sirens and amber flashing lights should have these engaged. High visibility clothing must be worn and do not back truck on out of view of mixer driver who will be reversing using mirrors.</li> </ul>	C, S, O	During works	3	2	L
	Back injury due to moving ground pipes	O, S	2	3	L	<ul style="list-style-type: none"> <li>Use of ropes and good manual handling practices to be adopted</li> </ul>	O, S	During works	2	2	L

Washout of pump	S, C, O	1	3	L	<ul style="list-style-type: none"> <li>The hirer / site management shall provide adequate wash out facilities for concrete residues.</li> <li>The CPO to only wash out in areas defined and authorised by site management. If there is no suitable area wash out can be taken away but this is an extra charge and should be agreed at the time of booking.</li> </ul>	S, C, O	Prior to and after works	1	2	L
Collapse of placing boom due to failure of hydraulics or structural failure of pump / boom	O, S, T	5	2	M	<ul style="list-style-type: none"> <li>All hydraulic rams are fitted with lock valves to limit movement should failure occur. All pumps undergo a boom test (which is certificated) and are also inspected as part of the regular servicing schedule.</li> </ul>	M	Prior to works	5	1	L
Contact with pump moving parts	O, S	3	2	L	<ul style="list-style-type: none"> <li>All moving parts on the concrete pump are fully guarded, ensure the CPO has carried out his required daily / weekly checks</li> <li>No personnel other than the CPO may operate the pump or climb onto the pump deck.</li> </ul>	O, S	During works	3	1	L
Concrete splashing into eyes from the end hose / Concrete burns to hands and feet	S	2	4	M	<ul style="list-style-type: none"> <li>Full PPE to be worn inc, helmet, goggles, gloves, safety wellingtons and barrier cream must be worn</li> </ul>	M, S, O	During works	2	2	L
Potential injury to persons and property damage due to concrete spillage / splatter (predominantly from upper floors)	S, T	2	3	L	<ul style="list-style-type: none"> <li>Ensure that the pour area has adequate protection to contain any concrete spray or spillage.</li> </ul>	C, S	Prior to works	2	2	L
High pressure concrete and aggregate going into eyes, face or any exposed skin due to standing or working in front of end hose, or opening up pipe joints when pumping	S, T	4	2	M	<ul style="list-style-type: none"> <li>Under no circumstances should any unauthorised personnel attempt to open the pipeline. All unnecessary personnel including the general public should be kept well away from the concreting area inc lower floors and staircases. Until concrete is flowing smoothly out of the end of the delivery hose, or when a blockage occurs in the boom pipeline, all personnel should remain clear of the delivery hose and placing boom. Concrete Gang should wear a safety helmet, safety footwear, impervious gloves / gauntlets, high impact goggles and high visibility clothing. Also see Blockages section below</li> </ul>	C, S	During works	3	2	L
Broken limbs, severe injury caused by whiplash of placing hoses.	S	4	3	H	<ul style="list-style-type: none"> <li>Do not kink placing hoses in the ground line.</li> <li>Do not attempt to pump very old concrete or concrete other than a pump mix.</li> <li>The danger zone is the area around the end hose in which it can strike out. The diameter of the zone is twice the length of the end hose.</li> </ul>	O, S, C	During works	3	2	L
Injury from splash due to blow back from concrete pump hopper	O, S, T	2	3	L	<ul style="list-style-type: none"> <li>Keep hopper full and inform mixer driver of risk.</li> <li>Full PPE to be worn.</li> </ul>	M, O	Prior to and during	2	2	L
Working at height (upon pump deck)	C, S	3	3	M	<ul style="list-style-type: none"> <li>Access shall be restricted to "short duration" no hirer personnel shall be permitted to access the pump deck unless express permission is given by the CPO.</li> </ul>					
Potential blockages at start or restart of pump, use of suspended hose "off the boom" resulting in hose whipping into danger area	S	5	3	H	<ul style="list-style-type: none"> <li>Only "single ended" hoses shall be used – double / steel collared ended hoses shall not be used "off the boom".</li> <li>The CPO shall request that all persons remain clear (a radial distance of at least twice the length of the hose) of the suspended hose at each start or restart of pump and until "smooth flow" has been achieved. Also see Blockages section below</li> <li>Full PPE to be worn.</li> </ul>	C, S	During works	4	2	M
Bursting of pipelines / hoses under pressure	S, C, T	3	3	M	<ul style="list-style-type: none"> <li>Only pipes, hoses, clips of sufficient safety rating shall be used. Wear and damage shall be monitored by the CPO and checked during scheduled services. Excessively damaged / worn components shall be withdrawn. Also see Blockages section below</li> </ul>	M, O	Regular Maintenance	3	2	L
Forceful ejection of air / concrete from the end of the pipeline. Air sucked into line and compressed	S	3	3	M	<ul style="list-style-type: none"> <li>Pipe jointing seals shall be clean and in good order. Concrete level in the pump hopper must be maintained at the required level, where the CPO is required to position himself remote of the pump appoint a competent persons to monitor deliveries and hopper level (to ensure air is not pumped into the pipe system).</li> </ul>	O, S	During works	3	2	L
Pressurised concrete release – dismantling of line	O, S	3	3	M	CPO to ensure pipeline is depressurised before freeing jointing clips, hirer personnel must not uncouple pipes without the express permission of the CPO.	O, S	During works	3	2	L

Pipeline cleaning with compressed air – pressurised release / ejection of sponge ball / concrete / water / air	O	2	3	L	A demarcated and access restricted area shall be provided at the end of the pipeline that is to be air cleansed.	O, S	During works	2	2	L
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The above information has been provided to assist hirers, customers and site management in identifying and controlling the significant risks associated with concrete pumping operations. If you need more help or advice please call us on 01235 851523

<u>Blockages – Why do they occur?</u>	<u>Risk Reduction / Control</u>	(SCP) = Shayler Concrete Pumping, (H) = Hirer & (SM) Site Management
Segregation of concrete / aggregates as it is pressurised through the pipeline with the primer / grout	It shall be ensured that the appropriate grout mix is used Maximum pipeline and delivery hose length shall be considered – grouting may be more successful in shorter sections	(SCP) (SCP) (H)
Inappropriate concrete mix design or consistency – not suitable for pumping	Only concrete that is of “pump mix design” and appropriate quality should be specified for delivery to the pump	(H) or (SM)
Hardening of the concrete in boom / pipeline from standing too long (usually when awaiting delivery of fresh concrete )	CPO shall circulate or move the concrete in the hopper / boom / pipeline Deliveries shall be time managed and planned appropriately	(SCP) (H) or (SM)
Flexible placing hose become kinked	The hose should never become kinked, it should be suspended vertically when used “off the boom” or kept straight if used at the end of pipelines	(H) or (SM)
Foreign objects delivered from visiting mixer drums	The quality of the concrete should be monitored	All
<b>NOTE: WHERE THE CONCRETE IS BELIEVED TO BE POOR OR UN PUMPABLE, OR WHERE FRESH CONCRETE HAS NOT ARRIVED IN TIME AND THE CONCRETE IN THE BOOM / PIPELINE IS BECOMING TOO HARD, THE CPO MAY HAVE TO REJECT THE LOAD, OR CLEAR THE CONCRETE FROM THE PUMP. THE HIRER SHALL BE INFORMED IF THIS IS LIKELY TO OCCUR</b>		
<u>Blockages – Reacting To</u>		
Where possible the CPO will stop the pump action and reverse the pumping direction (this may free the blockage). Before the CPO restarts the pumping action, he should ensure all persons retreat to a safe distance away from the boom / pipeline. Should the blockage persist, the CPO will stop the pump, depressurise the line and investigate the location of the blockage before taking appropriate action (ie disconnecting pipework to locate and remove the blockage).		
A momentary blockage may occur that frees immediately this is often accompanied by increased engine / pump revs and noise. The CPO shall endeavour <i>where possible</i> to warn persons in the vicinity to stand clear. However the release is likely to cause the delivery hose and/or boom to move or “kick” before the pump action can be stopped.		

Key Matrix	<u>Party</u>	<u>S = Severity</u>	<u>L = Likelihood</u>	<u>R = Risk = S x L</u>
	M = Management S = Site Personnel O = Operative T = Third Party C = Customer	1 = Trivial Injury/ies 2 = Minor Injury/ies 3 = Major Injury/ies to one person 4 = Major Injury/ies to several people 5 = Death	1 = Improbable Occurrence 2 = Remote Occurrence 3 = Possible Occurrence 4 = Probable Occurrence 5 = Likely Occurrence	15 – 25 = High Risk 8 – 12 = Medium Risk 1 – 6 = Low Risk