

AINTREE Concrete Pumping – Risk Assessment

The mobile truck-mounted concrete pump is designed to convey concrete from visiting truck-mixers to a point designated by the hirer. This is achieved via a hydraulically powered pump, through pipe sections attached upon 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.

AINTREE CONCRETE PUMPING supplies equipment subject to CPA Model Conditions for the Hiring of Plant (2011) in conjunction with the Supplementary Conditions for Concrete Pumping. The hirer should insure against any liabilities that might be incurred, including damage caused when the pump is being operated in confined spaces

'**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 The CPA

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Risk	Aintree Control Measures	Hirers Considerations & Control Measures	Risk level
collapse or settlement of pump due to ground conditions/ inadequate ground bearing	Sole plates are provided for placement below outrigger feet to support the pumps outriggers/ reduce surface damage these are designed for use on firm, level standing The Machines Maximum possible loading is displayed on its outriggers	Provide sufficient extra support (timbers, steel sheets, etc) as required It is the responsibility of the hirer to ensure ground conditions at set-up position are adequate for the imposed load of pump	LOW
overturning of pump/ collapse of boom due to insufficient stability	The concrete pump operator shall ensure that outriggers are extended to the appropriate position	Ensure adequate space is available for the pump, and for the full deployment of its outriggers	LOW
structural failure of pump/ boom	All pumps undergo an annual thorough examination (which is certificated), and are also inspected as part of the regular servicing schedule (approx 10 week intervals)	-	LOW
collapse of placing boom due to failure of hydraulics	All hydraulic rams are fitted with lock valves to limit movement should failure occur	-	LOW
vehicle movements (reversing) - crushing or trapping of persons when moving pump to work position on site	All AINTREE mobile concrete pumps are fitted with a warning 'Bleeper' which is activated when reverse gear is selected. AINTREE mobile concrete pumps are fitted with appropriate visibility aids (mirrors, CCTV) subject to age/ vehicle size	Provide a competent person to act as a banksman during reverse movements Limit access for persons to area of vehicle movement	MEDIUM

vehicle movements (reversing) - crushing/ trapping of persons by visiting concrete mixer trucks	Where possible, the concrete pump operator will direct the mixer truck during the reversing maneuver onto the concrete pump	Provide a competent banksman to direct concrete mixers trucks (especially when the concrete pump operator is required to operate the boom/ pump at a distance from the machine)	MEDIUM
contact with overhead electricity cables	AINTREE follow industry guidance, which specifies that the minimum distance that any part of the mobile pump including the fully extended boom is permitted to be, relative to overhead electric distribution lines, is 6 metres. <i>(Exceptions may apply , and closer distances may be permitted where engineered controls are provided, however these must be managed by a written safe system of work)</i>	Ensure that the proposed pump set up location is such that neither the pump nor the boom can make contact with overhead cables Where set-up location cannot be clear of overhead cables, consideration should be given to the provision of a ground level pipeline to convey the concrete	MEDIUM
crush or impact by boom, or struck by placing hose, during initial or subsequent positioning, or during 'off the boom' placement of concrete	Every pump is provided with a remote control unit (RCU) allowing the CPO to operate the pump/ boom from a position of safety/ improved visibility The CPO shall visually monitor the unfolding/ folding, and positioning of the boom, and ensure no person is placed at risk by any movements The CPO shall ensure that during movement to position, the placing hose is not allowed to swing in the vicinity of any person	Provide sufficient set-up space, and height for unfolding/ folding/ moving the boom Ensure persons remain clear during boom and hose movements Operatives controlling the position of the placing hose should hold it at arms length. Person(s) shall be nominated to converse with and signal the CPO, for minor boom positioning during concrete placement Ensure adequate luminance and visibility is available where the boom has to be unfolded/ folded/ moved during the hours of darkness or in low light environments	MEDIUM
contact with moving pump components	All moving components upon the concrete pump are fully guarded either by virtue of its manufacture, by mechanical guard, or by automatic interlock systems	-	LOW
injury to persons in vicinity of pumping operation	The CPO shall follow the local site rules as advised during induction	Demarcate area of pump operation Limit access to persons, especially below boom, or in vicinity of pipeline or placing hose Wear Appropriate PPE	LOW
pipeline cleaning with compressed air - pressurised release/ ejection of sponge ball/ concrete/ water/ air	The CPO has a specific written procedure for this operation Other personnel shall only be involved under his strict direction	A demarcated and access restricted area shall be provided at the end of the pipeline that is to be air cleansed	LOW
pressurised concrete release - dismantling of a pipeline	The CPO shall ensure that the pipeline is de-pressurised before freeing any jointing clips	Employees of the hirer must NOT uncouple pipes without express permission of the CPO	LOW
forceful ejection of air/ concrete from end of pipeline - air sucked into line and compressed	Pipe jointing seals shall be clean and in good order concrete level in the pumps hopper must be maintained at the required level– newer pumps have level sensors as standard	(Where the CPO is required to position himself remote from the pump) appoint a competent person to monitor deliveries and hopper concrete level (to ensure air is not pumped into the pipe system)	LOW

working at height (upon the pump deck)	Access shall be restricted to 'short duration' only (eg, to retrieve a required component, fill the water box, etc) for longer duration tasks (eg, to change a pipe seal, etc.), the use of a harness and restraint lanyard(s) shall be required	No hirer personnel, or other non AINTREE employee shall be permitted to access the pump deck, unless express permission is given by the CPO	LOW
harmful substances - health effects or personal injury	All substances used as part of the pumping process have been COSHH assessed, and briefing provided to those affected (cement/ concrete, grout products, fuels, oils, greases, etc)		LOW
environmental impact - spillage of fuel/ oils - inappropriate wash out facility	A kit is provided in all pumps, to contain/absorb fuel/oil spillage the CPO shall only wash out in areas defined and authorized by site management	Hirer/ site management shall provide adequate wash out facilities for concrete residues, etc.	LOW
Blockages Risks & Control Measures			
Potential blockages at start or restart of the pump – use of suspended hose 'off the boom'.	The CPO shall request that all persons shall remain clear of the suspended hose at each start or restart of the pump. Persons shall only be permitted to approach the suspended hose once 'smooth flow' has been achieved	Ensure ALL persons shall remain clear of the hose at EVERY start or restart of the pump. 'Clear' means a safe position at a radial distance of at least twice the length of the suspended delivery hose – referred to as the 'Danger Zone'	MEDIUM
Bursting of pipelines/ hoses under pressure	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.	-	MEDIUM
Blockages - Why do they occur?		Risk Reduction/ Control - (A) = AINTREE, (H) = Hirer	
Segregation of the concrete/ aggregates as it is pushed through the pipeline with the primer/ grout		It shall be ensured that the appropriate grout mixed is used (A) Maximum pipeline and delivery hose length shall be considered - grouting may be more successful in shorter sections (A), (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).	
Stiffening of the concrete in boom/ pipeline from standing for too long (usually when awaiting delivery of fresh concrete) - water bleeds from concrete/ aggregates separate - incorrect dosage of plasticiser (flash set)		For 'standing concrete' the CPO shall circulate or 'move' the concrete in the hopper/ boom/ pipeline (A) Deliveries shall be time managed and planned appropriately (H)	
The flexible placing hose has become kinked, restricting concrete flow		The flexible delivery hose must never be kinked – it should be suspended vertical when used 'off the boom', or kept 'straight' if used at the end of pipelines (H)	
Foreign objects' delivered from visiting mixer drums		The quality of the delivered concrete shall be monitored (A), (H).	
Inefficient hydraulic pump pressure		The hydraulic pump pressure will be monitored during the pumping operation (A)	

Reacting to - BLOCKAGES			
Where possible, the CPO will stop the pump action (<i>emergency stop buttons are provided on the truck/ pump body, and upon the remote control unit</i> , or reverse the pumping direction. The CPO will ensure all persons retreat to a safe distance away from the boom/ pipeline. The CPO will restart the pump – it is likely that blockage will be freed almost immediately.			
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, removing the blockage).			
A momentary blockage may occur that frees immediately this is often accompanied by increased engine/ pump revs, and noise. The CPO shall 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.			
NOTE: Where the concrete condition is believed to be of poor or un-pumpable quality, or where fresh concrete has not arrived in time, and concrete in the boom/ pipeline is becoming too stiff, the CPO may have to reject the load, or clear the concrete from the pump. The hirer shall be informed of this should it be likely to occur.			
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.			
Site/ Location:		Date:	

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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 anymore help or advice please call Aintree Concrete Pumping on 01474 333616