



Date: 12 Aug 2011



**All Owners of Jack-In Piling Machines
 Authorised Examiners (Lifting Equipment)
 All Piling Contractors, and
 Other Interested Parties**

SAFETY CIRCULAR ON THE USE OF HYDRAULIC JACK-IN PILING (“JIP”) MACHINES

In June 2011, a worker was crushed to death by counterweights which had accidentally toppled over from a Hydraulic Jack-in-Piling (“JIP”) Machine. Investigations revealed that the counterweights were not secured to the piling machine. This circular serves as a reminder to duty-holders of their statutory duties under the Workplace Safety and Health Act (WSH Act) with regards to ensuring safe use of such machines at workplaces. It also highlights the other common workplace hazards associated with the safe use of such JIP machines.

Registration of Hydraulic Jack-in-Piling Machines as Lifting Machines

2. The Ministry noted that some of these JIP Machines used at worksites were not registered as Lifting Machines with the Ministry. The WSH Act Section 4(1) defines “lifting machine” to include – (a) any crane, crab, winch, teagle, runway, transporter, piling frame or piling machine. Since the JIP machine is used to install piles for foundation work, it is classified as a piling machine. It follows that such JIP machines are deemed as a statutory lifting machine under the said Act.

3. Hence, under Regulation 21(1) and 21(3) of the WSH (General Provisions) Regulations, an occupier has to ensure that the JIP Machine used in the workplace has to be registered with the Ministry as a statutory lifting machine and thoroughly examined by an Authorised Examiner at least once every year.

4. In addition, Regulation 21(15) of the WSH (General Provisions) Regulations imposes duty on the Authorised Examiner to issue and sign a certificate, in a form determined by the Commissioner, of the result of the examination conducted on the JIP Machine. For the purposes of this requirement, Authorised Examiners are reminded to use the form stipulated by the Commissioner provided for in the eServices of the Ministry’s webpage, i.e. Lifting Equipment Class 703, Piling Frame-Hydraulic Piling Machine.

Security of Counterweights to the Machine

5. In most situations, the JIP Machine has counterweights, stacked up to two or more layers, depending on the capacity required for the piling operations. As such, workers face the potential hazards of being crushed by toppling counterweights during its installation, removal of the counterweights and also during its day to day operations and travelling. To prevent such accidents,

Piling Contractors are reminded to implement control measures to ensure that these counterweights are properly stacked and adequately secured at all times. The Ministry noted that there are presently various methods practised by the industry to secure the counterweights to the machines. These include the use of wire ropes, turn-buckles, chains and load binders to secure the counterweights to the machines.

6. It is pertinent to note that that the individual counterweight blocks or plates are to be interlocked between one another through a suitable locking mechanism to ensure that they remain rigidly secured together as an assembly. One example of such interlocking mechanism is through the use of interlocking kinks or nips as shown in Figure 1. In addition to the interlocking mechanism, the entire counterweight assembly shall be further secured by means of suitable tie-in-belts, chain-and-load binder, wire ropes with turn-buckle or other suitable method. Examples of such tie-down methods are given in Figure 2. These methods are to be of adequate strength and capacity for its intended use. Authorised Examiners are to ensure that the counterweights are adequately secured to the machines as part of their routine statutory inspection.

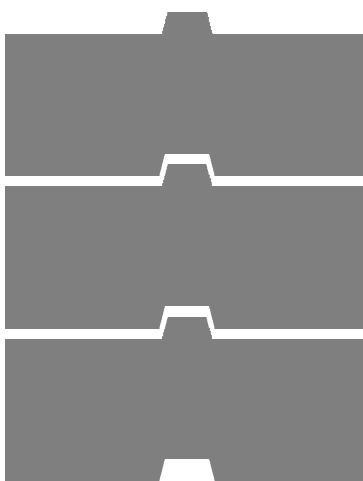


Figure 1 Counterweights with Interlocking kinks between one another

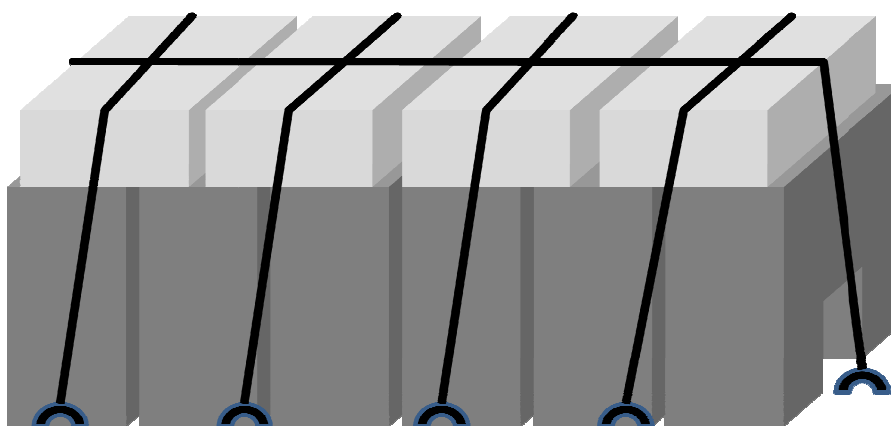


Figure 2 Entire counterweight assembly secured by suitable means

Ground Condition

7. Considering the heavy weight of the JIP machine together with its counterweights, the condition of ground where the machine is sited and operated on is a critical safety issue. Piling Contractors are to ensure that the ground is adequately compacted and levelled and sufficiently firm and stable for the siting, operation, and travelling of the JIP Machine. Piling Contractors are also required to adhere to the JIP Machines Manufacturers' Specifications or Manuals with regards to ground condition limits and requirements. This will include aspects on the safety limits on slope or gradient of ground conditions permitted for the safe operation of the machines. Where such information is not available, Piling Contractors are to seek written clarification from the Manufacturers prior to the use of the JIP Machines.

Working at Height

8. When installing and removing counterweights and fitting the pile to the JIP machine, workers are often required to work at heights. As such, they are susceptible to risks of falling from heights. For safe conduct of work, a proper Fall Protection Plan (FPP) must be established and implemented and appropriate Fall Personal Protection Measures must be provided to the workers.

Risk Assessment

9. Under the Workplace Safety and Health (Risk Management) Regulations, proper Risk Assessments shall be conducted to address the safety and health risks posed to any person whom may be affected by the activities in the workplace. In particular, employers have a duty to provide an effective management and control system for the use and operation of the JIP machines, including the need to develop and implement a safe work procedure (SWP) for the works. More information on Risk Assessment can be found at the Workplace Safety and Health Council (WSHC) website <https://www.wshc.sg>

10. The above procedure is for your immediate compliance.

Yours faithfully,



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