WORKSAFE
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HEALTH & SAFETY AT WORK ACT · HSWA

TECHNICAL BULLETIN

January 2020

Drill rigs

This technical bulletin is aimed at PCBUs and workers who use drill rigs.

Background

WorkSafe New Zealand were recently notified of a serious incident involving the use of a drill rig, causing harm. A worker had been using a crawler mounted drill rig to drill blast holes in a quarry for approximately 1.5 hours, when the drill mast broke away from the boom and fell towards the control panel, striking the operator. It was established that the pivot pin which connects the boom to the mast had failed, most likely due to fatigue failure of the weld.

Drill rigs

Drill rigs are commonly used in construction, mining and quarrying applications for drilling blast holes. They are large, heavy and generally slow moving units. They are complex machines and their operation requires a high level of knowledge and skill.

The safe use of a rig is heavily dependent on competent operators and a high standard of maintenance.

Types of drill rigs commonly used

- Crawler mounted drill rigs – with either an enclosed operators cab or an open-air operation position (side or rear). Refer to Figures 1 and 2.
- Truck mounted drill rigs. Refer to Figure 3.

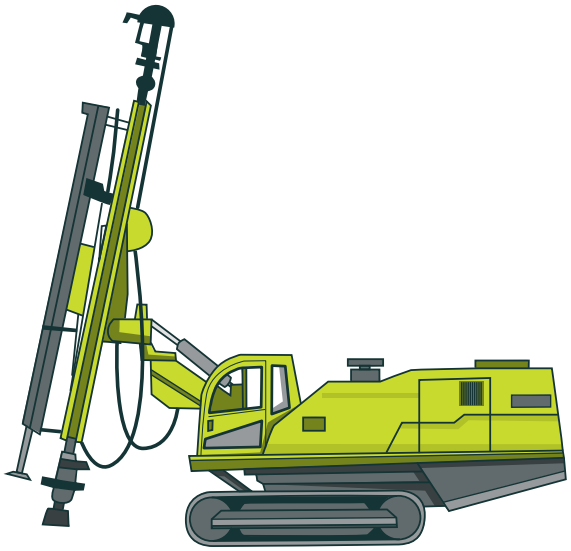

FIGURE 1: Crawler mounted drill rig with operators cab

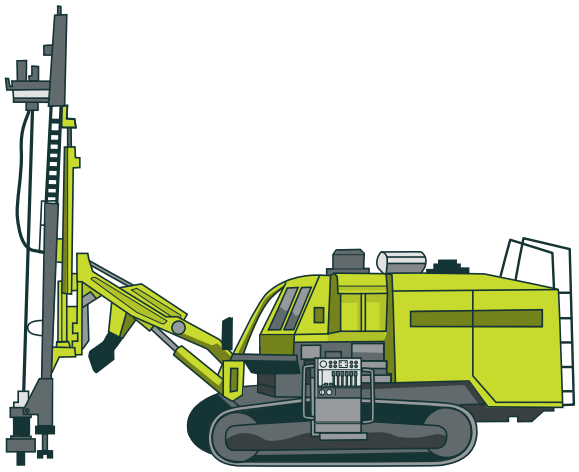

FIGURE 2: Crawler mounted drill rig with side mounted operating platform

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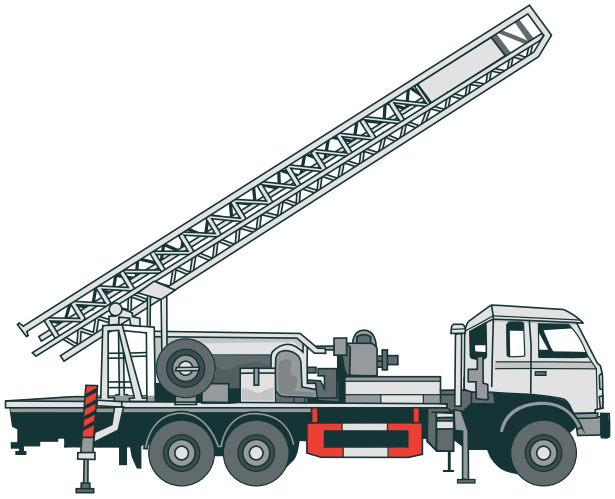

FIGURE 3: Truck mounted drill rig

Risks associated with the use of drill rigs

- Cab operated drill rigs offer protection to the operator through use of a protective structure and positioning of the operating area. The side operated drill rigs do not offer this protection to the operator.
- Permanent hearing loss can result from inadequate noise management.
- Moving a rig with a raised mast may cause crushing injuries or death through failure of fatigued mast components.
- Drill rigs may tip over if used on uneven or unstable ground, or if it makes contact with overhead structures such as bridges.
- Contact with powerlines can result in electrocution and the destruction of the rig by fire.
- Loose clothing or uncovered long hair can become caught in rotating or moving machinery, resulting in serious injuries.
- Manual handling of heavy equipment can cause musculoskeletal injuries.
- Pneumatic and hydraulic hoses can be damaged, causing uncontrolled movements of heavy components.
- Dust and other airborne contaminates associated with the drilling process may cause long term health effects if not adequately managed.
- There may be slip or trip hazards associated with ground conditions through mounting and dismounting the rig.
- Drilling into previous holes containing unexploded charges or intersecting pockets of dangerous contaminates of gas.

Controls

PCBUs and operators of drill rigs should:

- Undertake thorough commissioning checks prior to putting the drill rig into operation. If the drill rig has been purchased second-hand, the PCBU should ensure that any known wear points on the machine or historic failures are thoroughly checked. Some components such as the mast pivot pin may need further inspection, given the difficulty in visually inspecting these components.
- Ensure appropriate training is provided to drill rig operators. Only authorised and competent operators should operate and move drill rigs.
- Ensure maintainers are adequately trained to carry out any servicing or maintenance in accordance with original equipment manufacturer (OEM) maintenance strategies and guidelines.
- Develop or implement maintenance strategies as specified by the OEM for drill rigs, including specific attention to known failure areas or components.
- Risk assess the operating area of the drill rig, and ensure demarcation barriers are in place. This will prevent other vehicle and pedestrian traffic inadvertently being put at risk within the operational zone.
- Ensure the mast is lowered into a horizontal position when moving the drill rig (tramming), which will significantly reduce the loading and fatigue of the pivot pin.
- Display warning signage illustrating hazardous areas associated with the drill rig.
- Carry out risk assessment prior to use of the drill rig to identify hazards.
- Carry out thorough pre start checks.
- Use fit-for-purpose tools and establish a safe operating procedure for removal and fitment of the drill strings.
- Ensure rotating and moving parts are guarded in accordance with applicable ASNZS standards.

For more information

Our website has further guidance on overlapping duties and risk management:

Quick guide

Overlapping duties

Website

worksafe.govt.nz/managing-health-and-safety/managing-risks

Good practice guidelines

Health and safety at opencast mines and quarries