

Mobile crane ground stability



Details

On 9 November 2009 a serious near miss involving a 100 tonne mobile crane occurred on a busy construction site. There was potential for multiple fatalities. The crane was being used to lift and position precast concrete panels. The ground beneath one of the crane outriggers collapsed while the crane was lifting a 4 ton panel. The loss of ground stability resulted in the crane outrigger sinking approximately half a metre. Fortunately, the quick placement of extra timbers under the outrigger arm prevented further ground collapse and the panel was able to be lowered without further incident.

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Contributing Factors

An investigation into this incident revealed a number of factors which have contributed to the cause:

- **Change of cranes:** Cranes which had previously been used at the site were not available for use. This resulted in a different crane company being engaged by a sub contractor. Importantly the replacement crane had a different size outrigger footprint
- **Suitability of the ground and prepared outrigger pads:** An assessment of the ground stability (hard stand capability) had taken place and pads had been prepared for the previous cranes. However the pads did not fit the footprint for the replacement crane
- **Communication of the suitability of the ground:** The crane driver was told that the ground was suitable and based his assessment on being told that previously same size cranes had set up in the same area. The sub contracting company communicated to the replacement crane company that other large cranes had been in use in the area but did not communicate that pads had been installed.
- **Identification of outrigger pads:** The installed pads were not easily identifiable and were obscured by surface dirt and loose gravel. As per the photograph, they were later identified with ground marking paint
- **Inadequate outrigger support timbers:** The timbers used by the crane set up crew under the outriggers were inadequate in spreading the load. Subsequently larger timbers were used as shown in the photograph
- **Failure to adequately reassess risk:** No new risk assessment took place after new plant was introduced to the worksite as required by the *Workplace Health and Safety Regulations 1998*. Post the incident, a resubmitted Job Safety Analysis was provided by the crane company. This document included the need to check ground stability.

Recommendations

In order to reduce the risk of possible injury or death from a crane rollover as a result of ground collapse:

- a risk assessment must be conducted prior to the use of any mobile crane which includes a formal assessment of the ground stability. Importantly a new risk assessment must coincide with any change in the plant (crane)
- from the risk assessment process, a competent person must ensure that the loads imposed by the crane can be sustained by the ground or any other means of support. AS2550.1—2002 *Cranes, hoists and winches — Safe use — General requirements*, Section 4.2 deals specifically with this requirement
- operators of mobile cranes must be trained and aware of the requirement to ensure that ground stability has been deemed to be satisfactory prior to commencing to set up the crane
- the set up area and any installed or prepared pads must be clearly marked and identifiable
- clear communication channels between all parties engaged to erect precast concrete panels is paramount. When using cranes to lift precast concrete panels, a detailed erection procedure and checklist that conforms or surpasses AS3850—2003 *Tilt up concrete construction* must be in place. A free checklist is available from the Work Safe Victoria Website. Go to www.worksafe.vic.gov.au and search for “checklist for onsite erection of concrete panels”.

If you would like further information contact Workplace Standards Tasmania on:
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