

Member Safety Alert - Lifting with Slings

Civil Contractors Federation (TAS) would just like to take this opportunity to remind industry that you need to have provisions in place to maintain a safe work environment and minimise the inherent and any residual risk to all workers.

As members are aware a fatal incident occurred on a Hobart building site recently. Workplace Standards is investigating the incident, and while the cause of the incident is not yet known, preliminary reports have suggested that the beam may have come free of the webbing sling as it was being positioned.

The following is provided as guidance for industry:

1. Ensure all Safe Work Method Statements and Risk Assessments are developed in consultation, reviewed and communicated to all workers involved to ensure all hazards are controlled and to make sure that effective risk management processes are in place.
2. All plant and equipment on site should be inspected to ensure acceptable minimum controls are in place.
3. Earthmoving equipment can only be used as a lifting device in the event: where burst protection valves are fitted to critical hydraulic cylinders where the machine has a rated capacity of one tonne or more, the load is within the machine's rated capacity, only attachments identified on the load chart are used, loads are suspended from the manufacturer's designated lifting point, the lifting point is closed eye and not attached to quick hitch or buckets and the safety pins are in place at all times during operation.
4. To ensure the safety of the sling, the sling must be selected by a person who holds a High Risk licence for dogging or greater, e.g. rigging.
5. All slings should be inspected prior to use by a competent. At least every three months, slings should be inspected by a competent person and records maintained that details purchase date, inspection date where the sling was introduced into service and any general details of the service.
6. Any Lifting item associated with Cranes should be tested by an approved method at least annually and records maintained.
7. The inspection must be documented and any damaged equipment must be recorded and replaced/repared and /or destroyed.

Lifting gear

Lifting gear should be checked before and after use, and inspected regularly to determine whether it is suitable to keep using. Checks should include that:

- The lifting gear is tagged and all relevant information listed, e.g. relevant information for a chain sling includes grade of chain, rated capacity, manufacturer, chain size and any relevant Australian Standard marking
- Lifting hooks are provided with operable safety latches where appropriate
- Shackles used as terminal fittings are prevented from unscrewing, e.g. mousing or similar
- Lifting eyes and inserts are compatible
- Lifting slings are not damaged, e.g. excessive wear, damaged strands, cracks, deformation or severe corrosion

- The sling is appropriate for load being lifted, including adequate capacity and protection from sharp edges
- If the lifting equipment is damaged and sent for repairs it should be tested as per **Chain Slings-Grade T Part 2: Care and Use - AS 3775.2 2004**

Reference materials;

- **Flat synthetic-webbing slings - AS 1353.2-1997**
- **Flat synthetic-round slings - AS 4497.2-1997**
- **Lifting Devices - Section 15 - Maintenance, Inspection and Repair - AS 4991-2004**
- **Chain Slings-Grade T Part 2: Care and Use - AS 3775.2 2004**
- **Wire Rope Slings - Sect 10; Inspection of Slings - AS1666.2 – 2009**
- **Industrial fall-arrest systems and devices - AS/NZS 1891.4:2009**
- **Wedge type Sockets - AS 2740 – 2001**
- **Shackles - AS 2741 – 2002**
- **Tilt Up Concrete Construction (Swift Lifts & Edge Lifters) - AS 3850 – 2003**

Or contact Bullivants on 03 63312077 for their comprehensive fact sheet and or other enquiries.

The following is an excerpt from the DRAFT Cranes Code of Practice being developed by Safe Work Australia and is provided for information.

S48 - "All lifting gear, including slings, hooks and material boxes, should be periodically inspected for damage and wear by a competent person and inspection records kept. How often lifting gear should be inspected depends on how much it is used and how heavy the loads are being lifted but should generally not exceed 12 months. The period between inspections of synthetic slings and fibre rope slings should not exceed 3 months.

Where synthetic slings are used, protective sleeves and corner pieces should be used for all loads. Although the edges of the load may not appear sharp, the sling may be damaged when it is placed under tension.

All lifting gear should be tagged to identify the date of the lifting gear's last inspection. Documented maintenance records for the lifting gear should be available at the workplace."

1.1 Use of other mobile plant as a mobile crane

Other mobile plant may be used as a mobile crane to lift or lower freely suspended loads, that is the load is not pinned to the boom or on tynes but is suspended from the boom by means of a chain or wire rope sling. Mobile plant that is sometimes used in this way includes backhoes, front-end loaders, excavators, forklifts, and telescopic handlers. This is also known as 'telehandlers' and 'multi-purpose tool carriers'. When other mobile plant is used as a mobile crane, the level of safety produced, including stability of the plant under its' potential load conditions provided by the lifting set-up, should be at least equal to that when a mobile crane is use.

Further guidance on using other plant as a mobile crane is provided in **Appendix F**.

APPENDIX F – USING OTHER PLANT AS A MOBILE CRANE

Competency of operators

All operators of mobile plant must receive training to use the particular equipment they will operate. When the mobile plant is used as a mobile crane, the operator of the mobile plant may require more training and competencies. In some circumstances, the operator of the mobile plant may also need to hold the appropriate mobile crane licence class.

Rated capacity of other mobile plant

The rated capacity of other mobile plant is the maximum mass that may be handled at the maximum lift point radius, or reach, for each lift point, without the strength and stability requirements being exceeded.

When determining the allowable load to be lifted, the mass of any attachments, for example buckets or quick-hitch, should be deducted, unless the rated capacity chart allows otherwise.

To ensure the stability of the mobile plant, the rated capacity of the plant should not be greater than:

- 75% of tipping load in the stationary mode
- 66% of tipping load in the pick-and-carry mode
- 50% of tipping load for articulated wheel loaders and tool carriers.

Rated capacity limiters

A rated capacity limiter prevents overloading of the plant by stopping all relevant functions when an overload is detected. Rated capacity means the maximum load that may be attached and handled and may not include the weight of the hook block, falls of rope, slings and rigging hardware. The load to be raised should include the weight of all lifting appliances that are not permanently attached to the plant.

Load chart

The load chart for the mobile plant should identify each lift point location and the corresponding rated capacity for each position. The appropriate load chart should be fixed inside the operator's cab and show the following information:

- Manufacturer's name and model
- Boom and dipper arm identification and length, particularly where different boom configurations may be used
- Track width, where this is variable
- Deductions for attachments, e.g. bucket or quick-hitch devices, so that the net allowable load to be lifted can be determined
- One of the following:
 - the rated load at the least stable position
 - where variable load rating is provided for, means to clearly determine the load position according to the rated capacity chart.

Lifting points on earthmoving plant

Lifting attachments on earthmoving plant are sometimes supplied by the plant manufacturer. If this is not the case, the attachments should be designed by an engineer. Lifting attachments often consist of a welded assembly that fits onto the end of the dipper arm when the bucket is removed. All lifting points on earthmoving plant should form a closed eye, to which a load rated shackle may be attached.

A static strength test at 200% of the rated capacity of each lift point should be carried out. The lift points should not show any permanent deformation after testing. The test may be performed with the component dismantled from the machine—this should be done if application of the test load could result in damage to the earthmoving plant.

Hooks should not be used on the dipper arm or other attachments of earthmoving plant because the load may become unintentionally disengaged as the arm rotates. This can even occur when the hook is fitted with a latch, because the latch may be damaged, for example with a mobile crane, the hook hangs vertical, with an excavator, the lifting point rotates.

When lifting lugs are welded to attachments or other parts of the earthmoving plant, the material specifications for the two different components are to be compatible for welding and the appropriate welding procedures should be followed.

The attachment of lifting lugs to buckets is strongly discouraged for the following reasons:

- Application of the lifted load to the outside of the bucket can load the pins and linkages in a way other than the designer intended.
- It is easier for the operator to unintentionally overload the plant by not allowing for the dead weight of the bucket or because the bucket has earth stuck to the inside.

- The lifting chain or sling can be damaged when a bucket is fitted because it may pass over the front edge of the bucket.
- Lifting lugs on buckets may be damaged when the bucket is used for digging activities.

Quick-hitches

A quick-hitch is a latching device that enables attachments to be rapidly connected to the dipper arm or boom end of the plant. While the device saves time and effort, a number of fatalities have occurred in Australia when excavator attachments have fallen off the quick-hitch due to loss of hydraulic pressure.

Locking pins are generally used on quick-hitches to ensure the attachment is correctly engaged and remains locked in position on the dipper arm. All quick-hitch devices should be fitted with a locking pin unless the following can be ensured:

- A system is provided to ensure the quick-hitch device is fully engaged on the bucket or other attachment. Note: the system should not rely on the operator carrying out a visual check on the quick-hitch attachment from the operator's cabin.
- Where the quick-hitch latching device relies on stored energy, for example hydraulic fluid pressure or a spring, to be activated, the latching device should be designed so that it remains engaged in the event of failure of the source of stored energy, for example drop in hydraulic pressure or spring breakage.
- Any factors that will affect the reliability of the latching device are listed in the quick-hitch manufacturer's instruction manual, including that any contaminants in the hydraulic fluid do not exceed limits specified by the manufacturer of the pilot-operated check valve, or other equivalent device. Evidence demonstrating these conditions are being met must be kept with the earthmoving plant, for example in the plant's logbook.

Burst protection and rated lifting capacities

Burst protection should be fitted on all earthmoving plant used as a crane, where the rated capacity exceeds 1 tonne. The burst protection is to be fitted to both the boom and dipper arm of the plant. Burst protection should comply with the performance requirements of *ISO 8643: Earthmoving machinery – Hydraulic excavator and backhoe loader boom-lowering control device – Requirements and tests*.

The following extra conditions should be applied:

- The maximum rated capacity is to be according to the manufacturer's specifications for the plant.
- Single rated capacity: Unless the excavator is fully compliant with design requirements of a mobile crane the lifting capacity of the plant at its maximum lifting radius is the rated capacity and is to be marked on the boom or dipper arm. The rated capacity should then be strictly observed at all times, irrespective of the radius of the load. Information should be available on site to confirm that the rated capacity marked on the unit is the same as that specified by the manufacturer.
- Variable rated capacities: Where the plant has variable lifting capacities it should be fully compliant with the design requirements for mobile cranes. The manufacturer's rated capacity chart or load chart is to be fixed to the inside of the operator's cabin. For plant with variable rated capacity, the lifting capacity at minimum radius is to be used to decide whether burst protection is required.
- Burst protection device should not be provided with the ability for the operator to switch the device off.
- Where the rated capacity of the plant is 1 tonne or less and the decision is made not to fit burst protection, the plant should not be used to lift loads near workers.

Earthmoving plant owners should seek advice on fitting of burst protection from original plant manufacturers, to help avoid fitting faulty or unsafe systems.

For more information on safety requirements please contact a specialist in this area or for any other enquiries please contact the CCF TAS Branch on (03) 62484697.