7.1 General

Prior to carrying out any lifting operation a pocket pre-lift assessment (MAC-MEC-FRM-016) shall be carried out and the lift category determined.

A risk assessment for the determined category of lift must be completed taking into consideration:

- Assessment of load
- Selection of Equipment
- Environmental considerations
- Task execution

7.1.2 Selection of equipment

All aspects of equipment selection shall be considered including, but not limited to;

- Is the type of crane / lifting equipment the best suited for the task? Have limitations been considered?
- Lifting plant and equipment shall not be used outside its rated WLL, including any applicable de-rating factors. (Note: Sling and capacity calculators available for reference in MAC-STE-GDE-016 and https://www.doggingandrigging.nsw.gov.au/calculators)
- Lifting equipment shall not be used if its WLL cannot be established.
- All lifting plant or equipment must be inspected prior to use and after use and documented as required.
- Complete a pre use inspection checklist for all plant including Mobile cranes, Vehicle hoist, VLC and EOTC.
- Any lifting equipment not fitted with a current inspection tag must be tagged ‘out of service’ and removed from use until inspected by a competent person.
- Any lifting plant or equipment found to be defective either before or after use must be tagged ‘out of service’ and removed from use.
- Do not sling over sharp edges, if required to lift over edges ensure adequate protection is in place to protect the lifting equipment. To protect fibre round slings against cutting or localised damage, loads that have corners with a radius of less than three times the compressed thickness of the sling shall be provided with cut protection.
- Do not tie knots in slings.
- No sling is to be used if in the included angle exceeds 120 degrees. (60 degrees is the preferred angle)
- Where multi-leg chain slings are used, do not add any more WLL to a sling after 2 legs (this is because only 2 legs will be taking the majority of the load).
- Towing equipment shall not be used for lifting
- The lifting plant operation manual and pre use inspection book shall be kept in the vehicle cabin for use by the operator.
- The travel path must be clear of obstacles including any which may impact the crane, lifting equipment or load.
- Where a crane is supporting a secured or fixed load, the stored energy must be considered.
- Environmental conditions must be suitable e.g. good lighting, low wind (or within cranes maximum wind speed for lift), no rain, firm and even flat level ground clear of any underground services or backfilled excavations.
- The rated capacity and lift curve charts shall be included in the documentation and be situated in the cabin of all lifting plant at all times to allow reference by the operator. The charts shall be provided in English.
- If stillage is required (e.g. transporting scaffolding), an inspection is required prior to using. Load to be within
- the WLL and adequate tie-downs used for securing load.
- Transportation aides to be considered (e.g. GRIPP seal kits, tool bags, tethering kits etc.) when transporting
- equipment from an elevated position (e.g. overhead crane walkways)
- Each load should be attached through positive attachment methods (e.g. designated lifting lugs), where possible. Non-positive lifting attachments include chain/slings relying on friction, magnet lifters, vacuum lifters and plate clamps. Where teams are regularly lifting specific loads without designated lifting points, development and use of a work instruction should be considered. (Note: alloy chains should use a double wrap choke hitch to reduce the chance of slippage. Loads lifted with magnets should not be rotated where the centre of gravity is not underneath the crane hook. Spiral wound pipes should not have welded on lifting points due to the risk of de-spiralling the thin walled pipe).
- If using air lifting bags, the following best practices should be followed:
- Place air lifting bags on firm support to ensure stability before inflation.
- When using multiple air lifting bags, use bags from the same manufacturer and of the same type, and never stack more than the recommended amount.
- Place a metal plate or fibreglass board between stacked air lifting bags to distribute the load evenly.
- Control inflation and deflation of air lifting bags from a safe distance with a controller and independent air hoses for each bag.
- Never exceed the specified working pressure or lifting capacity.
- Do not work under a load that is only supported by air lifting bags.
- Secure any components on the load to prevent unplanned movement.

- In the event of lifting plant or equipment is ‘shock’ loaded the plant or equipment must be removed from service and inspected by a competent person before returning to service only if it remains fit for service.

8.5 Use of lifting lugs, eyes bolts and jigs

8.5.1 Lifting lugs

Lifting lugs or attachments are not to be used if they:

- Are not clearly marked with WLL or not documented as a lifting point in any OEM or supplier documented procedure with WLL. For MAC Information can be located in the machine safety file,
- It is bent or damaged,
- If the load exceeds the WLL of the lug, or
- The lug is a legacy item that is unmarked and has not been approved for use by a competent person.

8.5.2 Temporary lifting lugs

All temporary lifting lugs either installed off site or on site shall comply with AS 4991 with the exception of painting. All temporary lifting lugs shall be removed as soon as the lift for which they were installed has been completed.

8.5.3 Eyebolts

Eyebolts are only to be used under the following conditions:

- They are clearly marked with the rated WLL,
- Clean and uncontaminated,
- Full thread engagement for female eyebolts,
- Are screwed fully down to the face of the lifted load using only light force. It should not be possible to enter a 0.04mm feeler gauge at any position between the collar of the eyebolt and the seating,
- Used only on a flat surface that is greater in width than the collar,
- Used only as directed in eyebolt chart / specification,
- Used only when the weight of lift is known,
- Aligned to the sling, shackle or chain, i.e. do not pull across the eye. Alignment may require the use of a shim washer between 50% and 100% of the pitch of the threaded shank, and
- Used only with an individual sling or chain leg attached to each eyebolt. A single sling or chain cannot be used through 2 or more eyebolts.
- Caution needs to be taken when lifting a load from a single eyebolt as the load can spin, unscrewing the eyebolt. It is recommended to mouse the eyebolt.
- Do not insert a hook into an eyebolt, use a shackle, unless it is large enough to for correct fitment of the hook.

8.5.4 Lifting jigs

Specifically made lifting jigs can only be used when the design has been verified by a competent person. The lifting jig is to be clearly marked to identify its purpose.

9.1 Lifting equipment

9.1.1 General

All lifting equipment used at MAC shall comply with relevant Australian Standards.

Equipment that does not have manufacturer’s identification or is not labelled with a WLL shall not be used.

Custom Manufactured or special purpose lifting equipment shall have the manufacturer or designer identified and relevant standards that the equipment complies with clearly labelled on the equipment.

9.1.2 Periodic inspections

All lifting equipment shall be inspected every three (3) months by a competent inspector.

All new equipment must have a periodic inspection prior to its first use and added to the lifting equipment register.

A colour coded tag shall be attached to each item of serviceable lifting equipment to indicate the validity period for the inspection.

All lifting equipment belonging to contractors operating at MAC should have the same colour tag attached for any given validity period. Where this is not the case the alternative periods or colours are used, each tag shall have the inspection validity period clearly labelled on it. Where the validity period is not clearly labelled the lifting register must be kept with the equipment as reference.

MAC shall use the inspection validity periods and tag colours detailed in Table 6.

The inspection validity period and associated colours shall be displayed in all workshops and locations where equipment is often used.

Periodic inspections for the next validity period performed within the last month of the current validity period will be considered valid for both validity periods.

▪ **January to March**	▪ **RED**
▪ **April to June**	▪ **GREEN**
▪ **July to September**	▪ **BLUE**
▪ **October to December**	▪ **YELLOW**

Table 6 – Lifting Equipment Colour Codes

Document Reference - MAC-STE-STD-148