**Checklist - planning the safe set-up and operation of mobile cranes**

A mobile crane is capable of travelling over a supporting surface relying only on gravity for stability. There are three general types:

* hydraulic boom cranes
* lattice boom cranes including crawler cranes
* non-slewing (pick-and-carry) cranes.

Mobile crane operation can present a risk of injury to people from the following:

* Structural failure. This includes the failure of any crane component, such as the boom, jib, hydraulic rams or wire rope. A mobile crane may suffer structural failure if the crane has been overloaded in the structural area of its load chart, and can occur without warning.
* Overturning. This can occur if the crane has been overloaded in the stability area of its load chart. Contributing factors may include ground conditions, failure to use or fully extend outriggers or stabilisers, failure to level the crane, rapid slewing and wind conditions.
* Contact or collision with other plant and structures. This can occur when sufficient clearances are not maintained between the mobile crane and other plant and structures, such as other cranes, buildings and overhead powerlines.
* Falling objects. This can occur during erecting and dismantling activities, and by the way loads are secured during lifting operations. Falling objects are a risk to workers and members of the public.

**Why is planning important?**

Planning is the first step in ensuring that work is done safely. Planning for mobile crane operations should start as early as possible and involve consultation with everyone engaged in the work. Good planning involves:

* selecting the right crane(s)
* planning, scheduling and coordinating work
* crane siting and setup
* operating the crane safely, including shut down.

Effective planning will help identify ways to protect people who are:

* erecting and dismantling cranes
* directly involved in the lifting operation, such as the crane operator and dogger
* performing other activities at the workplace
* in areas adjacent to a crane, including public areas.

**How to use this checklist**

This checklist can be used to assist with the set up and operation of mobile cranes at construction workplaces. The assessment can be led by a principal contractor, Person Conducting a Business or Undertaking (PCBU), mobile crane operator, dogger or health and safety representative (HSR) and should be done in consultation, coordination and cooperation with everyone involved. For example, a representative from the principal contractor might assemble a group of relevant people from the site to discuss each item and coordinate the actions required for any **‘no’** responses.

The *Work Health and Safety Act 2011* requires a PCBU to consult, so far as is reasonably practicable, with workers who are likely to be directly affected by a health and safety matter and with other duty-holders at the same workplace. The items in the checklist are based on the[*Mobile crane Code of Practice 2006*](https://www.worksafe.qld.gov.au/__data/assets/pdf_file/0008/58175/mobile-crane-cop-2006.pdf) which should be referred to for further guidance. Records of completed checklists can be kept to monitor and review items at a later date.

|  |
| --- |
| **Part one – site details** |
| **Date of assessment:** |  |
| **Assessment completed by:** |  |
| **Name of principal contractor or PCBU:** |  |
| **Site location:** |  |
| **Name of crane owner:** |  |
| **Crane item/rego number:** |  |
| **Make, model and year of manufacture:** |  |
| **Type of crane:** |  |

|  |  |  |
| --- | --- | --- |
| **Section** | **Item** | **Response and comments** |
| **Part two – selecting the right plant** |
| Crane type | 1. Is the type of crane suitable for the lifting work that needs to be performed?

Consider:* the kind of loads to be lifted (e.g. weights, dimensions, lift heights/radii)
* the frequency and duration the plant will be used
* the type of lifting and placements required
* workplace conditions (e.g. ground conditions, ease of access, proximity of other plant and structures, public areas).
 | □ Yes □ NoComments: |
| Registration | 1. Is the crane registered with Workplace Health and Safety Queensland?

Mobile cranes with a rated capacity of greater than 10 tonne must be registered. | □ Yes □ No □ N/AComments: |
| Inspections and maintenance | 1. Has the operator carried out a documented pre-operational inspection on the crane prior to starting the day’s work?

This should cover, but not be limited to:* all relevant items indicated in the operations manual
* operating and emergency controls
* brakes
* safety switches and interlocks, including limiting and indicating devices
* a visual inspection of the structure
* wire ropes.
 | □ Yes □ NoComments: |
| 1. Is an inspection report available as evidence that the annual inspection has been carried out in accordance with the manufacturer’s specifications?
 | □ Yes □ NoComments: |
| 1. If the crane is ten years or older, is the major inspection certificate available for inspection?
 | □ Yes □ No □ N/AComments: |
| Crane manuals and markings | 1. Is the *crane operator manual* and *crane load chart* written in English? Do they use metric units and are they available to the crane operator at all times (i.e. kept in the cabin)?
 | □ Yes □ NoComments: |
| 1. Does the crane and its lifting components have all required markings? Do all operator controls indicate their function and operation?
 | □ Yes □ NoComments: |
| Licencing and training | 1. Do workers involved hold the required high-risk work licence to perform the work?
	* crane operator
	* dogger/rigger.
 | □ Yes □ NoComments: |
| 1. Has the crane operator received documented familiarisation training on the make and model of crane they are operating?

Refer to Appendix 4 of the *Mobile Crane Code of Practice 2006* for familiarisation training checklist templates. | □ Yes □ NoComments: |
| 1. Did the induction training provided to workers (e.g. operator, dogger, workers in vicinity of the crane) specifically cover what to do in the event of an emergency involving the mobile crane, and identify people with specific emergency roles?
 | □ Yes □ NoComments: |
| **Part three - planning, scheduling and coordinating the work** |
| Planning the work | 1. Has a safe work method statement (SWMS) been prepared for high-risk construction work that:
* describes the high-risk construction work to be undertaken
* sets out the steps required to perform the work
* identifies associated hazards
* describes the control measures to be used?
 | □ Yes □ NoComments: |
| 1. Does the SWMS follow the hierarchy of controls to prioritise higher-level control measures and not rely solely on administrative controls?
 | □ Yes □ NoComments: |
| 1. Have workers been consulted in the development of the SWMS by:
* providing input in to the content of the SWMS
* demonstrating that they understand the content of the SWMS.
 | □ Yes □ NoComments: |
| 1. Is there a system in place for monitoring compliance with the SWMS (e.g. task observation, periodic SWMS review)?
 | □ Yes □ NoComments: |
| 1. Do documented lifting procedures:
* define responsibilities
* approach the crane lift in a logical, systematic way?

Comprehensive documented lifting procedures are required in a number of situations involving complex or heavy lifts and should also be prepared for non-routine lifts. | □ Yes □ No □ N/AComments: |
| Determining the crane crew | 1. Has an assessment of the size and complexity of the lifts been done to work out the crane crew required? This will determine:
* the number of operators and doggers required.
* whether a trained safety observer is required for maintaining electrical exclusion zones.
 | □ Yes □ NoComments: |
| Traffic management | 1. Is the crane kept a safe distance from pedestrians when it’s moving around the site (i.e. is there a traffic management plan)?
* Does the traffic management plan include the set up and pack up of the crane.
 | □ Yes □ NoComments: |
| 1. If the crane is operating on or near roads, are there measures in place to control the movement of traffic safely around the crane?

For more information on requirements for traffic control, refer to Part 3 of *the Manual of Uniform Traffic Control Devices* (MUTCD) prescribed by the Department of Transport and Main Roads. | □ Yes □ No □ N/AComments: |
| **Part four - plant siting and setup** |
| Proximity to plant, structures and public areas | 1. Is the crane positioned so that the risk of injury from collision with other plant or structures is minimised? Consider:
* overhead electrical lines and other services
* nearby structures
* other cranes or high obstructions, including those on adjacent workplaces (e.g. concrete placement booms)
* other mobile equipment moving within the crane working area, including traffic on or near public roads.
 | □ Yes □ NoComments: |
| 1. Is the crane positioned so that lifting loads over public areas (e.g. footpaths, roads, railways, waterways, buildings) is avoided as much as possible?
 | □ Yes □ NoComments: |
| Exclusion zones | 1. Have appropriate exclusion zones been established around the crane?

Exclusion zones should be established to:* prevent the crane contacting overhead electrical lines
* prevent people working around the area, particularly if they don’t need to be there
* prevent other plant and vehicle traffic from entering the area
* avoid lifting loads over areas where people are present (e.g. workers performing other tasks).
 | □ Yes □ NoComments: |
| 1. Have all relevant workers been informed and understand where exclusion zones are established?
 | □ Yes □ NoComments: |
| Ground conditions | 1. Have factors been considered that will affect the ability of the ground to provide adequate support? This would include, but not be limited to:
* the presence of water
* the type of ground (e.g. clay, sand, rock or a mixture of these)
* backfilled ground
* cavities or penetrations in the ground that have been covered but still exist
* continued operation of the crane in one location.
 | □ Yes □ NoComments: |
| 1. Is certification available from a competent person (e.g. geotechnical engineer, structural engineer, marine surveyor) that the surface has adequate bearing capacity to support the crane in the following situations?
* Lifting bridge beams or tilt-up panels.
* Heavy lifts where the load is 50 tonnes or more.
* Where the crane is set up on a suspended slab.
* Vessel-mounted cranes (e.g. barges, pontoons).
 | □ Yes □ No □ N/AComments: |
| 1. If the crane is set up near excavations, is the crane a suitable distance from the excavation?
* For compact ground, the distance of any part of the crane support timbers from the excavation should be at least equal to the depth of the excavation.
* For loose or backfilled ground, the distance of any part of the crane support timbers from the excavation should be at least twice the depth of the excavation.
 | □ Yes □ No □ N/AComments: |
| 1. Is the ground regularly inspected to ensure that continuous operation of the crane has not compressed the ground to the extent that further operation of the crane will be unsafe?
 | □ Yes □ NoComments: |
| Crane set upand pack up | 1. Is there manufacturer’s procedures available of the initial set up and pack up of the crane.
* The procedures should clearly outline the sequence of steps to safely set up the crane for operation and the reverse sequence for pack up of the crane.
 | □ Yes □ NoComments: |
| 1. Are the timbers or pads used correct for the type of crane and are they set up properly?

This includes:* under all outrigger feet
* not deformed
* non-excessive cracks on timbers (e.g. cracks are not longer than one quarter of the length of timber)
* not sinking
* non-excessive gaps between timbers
* according to dimensions and materials specified by the crane manufacturer or competent person.
 | □ Yes □ No □ N/AComments: |
| 1. If operating a crane with partially extended outriggers, do the manufacturer's load charts show that this can be done?
 | □ Yes □ No □ N/AComments: |
| 1. If a pick-and-carry crane is working or travelling on sloping ground, have the manufacturer's specifications been adhered to?
 | □ Yes □ No □ N/AComments: |
| Wind conditions | 1. Have wind conditions been considered as to how they may affect the crane's stability?

Consider:* wind speed as measured at the top of the main boom
* maximum wind speed rating specified by the manufacturer
* effect of wind gusts
* other information provided by the manufacturer
* experience and judgement of the operator.

 Note: generally mobile crane manufacturer’s specify a maximum of 10 m/s (36 km/h) | □ Yes □ NoComments: |
| **Part five - operating the plant safely** |
| Communication | 1. Has a reliable method of communication between the crane operator and dogger(s) been implemented to prevent dropped loads and collision with other plant and structures?

Communication can include the use of:* radio communication, including dedicated radio frequency, equipment checks, clear and constant instructions and procedures for loss of signal
* hand signalling
* other methods such as bells, buzzers and whistles.
 | □ Yes □ NoComments: |
| Limiting or indicating devices | 1. Is the mobile crane fitted with following safety functions and indicators in working order?
* Rated capacity limiter to prevent overloading.
* Motion limiting devices to prevent damage to the crane caused by movement outside the designed range of movement.
* Working radius indicator to display the location of the suspended load in relation to the crane.
* Load indicators to measure and display the mass of the load being lifted.
 | □ Yes □ NoComments: |
| Lifting loads | 1. Is all lifting gear of adequate capacity, in good condition and appropriately marked ‘Safe Working Load’ (SWL)?
 | □ Yes □ NoComments: |
| 1. Does the slinging technique used to secure the load ensure the load or any part of it cannot fall? This includes:
* double wrapping and choke hitching
* plastic wrapping of bins
* no basket hitch, unless sling positively restrained from moving along load
* load balanced
* slings or chains are not damaged.
 | □ Yes □ NoComments: |
| Ergonomic issues | 1. Is there a safe means of access to the crane cabin and other frequently accessed areas of the crane?
 | □ Yes □ NoComments: |
| 1. Do windows and windscreens of operator’s cabin allow for clear vision at all times?
 | □ Yes □ NoComments: |
| 1. Do procedures exist to prevent incidents associated with impaired work performance from fatigue? Consider:
* workload
* length of shift
* previous hours and days worked
* time of day or night worked
* driving time required to get to job.
 | □ Yes □ NoComments: |
| Leaving the crane unattended | 1. Before leaving the crane unattended, has it been secured to prevent unauthorised use?

This requires:* removing all loads from the hook
* raising the hook to a position safely clear of other operations
* disabling all powered motions
* removing keys from the crane.
 | □ Yes □ NoComments: |

**What to do next**

If you answered **‘no’** to any of the items during the assessment, further action should be taken. This should start with a discussion with the relevant people on site to gather more information and decide on a course of action. Keeping a record of the completed assessment will help to monitor and review items at a later date.

The items in the checklist are based on the [*Mobile crane Code of Practice 2006*](https://www.worksafe.qld.gov.au/__data/assets/pdf_file/0008/58175/mobile-crane-cop-2006.pdf) which should be referred to for further guidance.