

National Occupational Standards

Sector: Building and Construction

Occupation: Mobile Crane Operator

MQF Level: 4

Units:

- MCO401: Contribute to health and safety requirements in the workplace
- MCO402: Check the mobile crane, keep maintenance records, and schedule maintenance of the mobile crane
- MCO403: Draw and prepare a lift plan
- MCO404: Setting up and demounting a mobile crane
- MCO405: Carry out a lifting operation using a mobile crane

MCO401: Contribute to health and safety requirements in the workplace

This unit lists the knowledge and skills required by a person holding this position to contribute to carrying out safe work activities in compliance with health and safety activities.

Upon completion of this unit the persons carrying out this work will possess the necessary knowledge and skills to follow health and safety procedures which ensure that their actions do not create health and safety risks to self or to others.

Performance Criteria

The candidate must have the necessary knowledge and skills to supervise and ensure that:

1. Safe working practices in accordance with the workplace health and safety regulations are followed.
2. Potential hazards associated with own work practices and the workplace are reported in accordance with organisational procedures are identified.
3. Correct procedures in the event of hazards or injury or ill health are followed.
4. Work practices with supplied information to contribute to a healthy, safe, and secure working environment are carried out are complied with.

Required Knowledge

The Level 4 Mobile Crane Operator must know, demonstrate, and explain:

1. The roles and responsibilities under the Health and Safety Act as amended by Act XXVII of 2000 or any subsequent current legislation.
2. The health concerns associated with the workplace and safe practices when carrying out work activities.
3. The importance of co-operating with their employer on matters related to health and safety to safeguard their own wellbeing and that of others affected by their work activities.
4. The organisational policies regarding legislation and guidance which need to be complied with.
5. The potential hazards in the workplace such as electricity and other utility services, contaminants, hazardous and non-hazardous substances, waste materials, working at height, work equipment, access equipment, obstructions, fire risks, manual handling, proximity, third party hazards, and changing weather conditions.
6. The importance of being aware and alert to the presence of hazards on site and other work areas.
7. The effect of any toxic or hazardous substances detected on site and what precautions need to be taken.

8. The risks to health within a construction environment- substances hazardous to health, drugs, and alcohol.
9. The importance of correct storage of combustibles and chemicals on site.
10. The arrangements to follow regulations regarding security on site and in the workplace e.g., storage of materials, components, tools, plant, and equipment.
11. The importance of working around mobile plant and equipment on site- keeping safe distances away from working machinery.
12. The security arrangements and procedures that should be observed and followed when working on site.
13. The procedures for dealing with accidents and emergencies associated with the workplace and environment.
14. The importance of reporting accidents and near misses to superiors.
15. Personal responsibility for behaviour of health, safety and welfare on site and the consideration of others.

Required Skills

The Level 4 Mobile Crane Operator must be able to:

1. Comply with their individual duties and legal obligations under the Health and Safety Act XXVII of 2000 or any subsequent current legislation.
2. Work according to health and safety regulations and other relevant regulations that apply to the work requirements.
3. Comply with safe working practices in accordance with organisational procedures.
4. Recognise any hazards and hazardous materials associated with workplace activities and how changing circumstances could increase those hazards.
5. Report any hazards and risks and changing circumstances to superiors in accordance with organisational procedures.
6. Report near misses and accidents to superiors.
7. Recognise emergency situations and report them in accordance with organisational requirements.
8. Identify and use the provided Personal Protective Equipment (PPE) and Respiratory Equipment (RPE) when necessary to carry out work duties.
9. Comply with organisational procedures for safely working around mobile plant and Equipment.
10. Assist in carrying out work activities to protect work areas from damage.

11. Demonstrate good personal behaviour for workplace health safety and welfare.

MCO402: Check the mobile crane, keep maintenance records, and schedule maintenance of the mobile crane

This unit lists the knowledge and skills required by a person holding this position to contribute to the carrying out of the daily walk around check, keep maintenance records and schedule maintenance of the mobile crane.

Upon completion of this unit the persons carrying out this work will possess the necessary knowledge and skills to carry out a daily walk around check which will then ensure that the mobile crane to be operated in this lift is free from any visible defects.

Performance criteria

The candidate must have the necessary knowledge and skills to supervise and ensure that:

1. The general operations of the mobile crane are known of.
2. Any faults in the mobile crane are identified.
3. The correct procedure to report any faults or defects are followed.
4. There is assistance in rectifying any faults.
5. The mobile crane is in proper working order prior to using it is certified.
6. The mobile crane instructions manual is read and understood.
7. Legal obligations about mobile crane certification and testing are known of.
8. The mobile crane maintenance schedule is checked.
9. Maintenance records are kept.
10. The schedule maintenance of the mobile crane is planned.
11. Parts required for maintenance are ordered.

Required Knowledge

The Level 4 Mobile Crane Operator must know, demonstrate, and explain:

1. The effect of defects on the proper operations of the mobile crane.
2. Organisational procedures in filling of the daily walk around check sheet.
3. How to coordinate with his assistant during the daily walkaround check.
4. The proper function of the crane structure, booms, outriggers, slewing table, sheave and hook block, wire ropes, motors, and brakes.

5. How to interpret Fluid level gauges, pressure gauges and labels attached to the mobile crane.
6. Knowledge about the crane sensors and about the function of load moment indicators and crane instrumentation.
7. How to report any defects in the mobile crane.
8. How to read and understand the mobile crane instruction manuals.
9. The expiry date of mobile crane certification from the warranted mechanical engineer.
10. How to check mobile crane maintenance schedule and report for maintenance as required.
11. How to read hydraulic and pneumatic lines drawings and electrical wiring diagrams.
12. How to order spare/replacement parts.
13. How to keep an updated maintenance record.
14. How the control system works, understand alarms.

Required Skills

The Level 4 Mobile Crane Operator must be able to:

1. Select and use the correct PPE during the walk around check.
2. Carry out a daily walk around check.
3. Access and open/close lids and caps to check fluid levels.
4. Open and close hatches to check for any faults.
5. Climb safely onto the crane structure.
6. Check the functionality of all levers and controls and report any malfunction.
7. Check the functionality of safety switches and sensory equipment.
8. Understand the control panel of the mobile crane.
9. Understand maintenance schedules and plan and schedule maintenance.
10. Order spare/replacement parts using correct part numbers.
11. Read and interpret hydraulic and pneumatic lines drawings.
12. Read and interpret electrical wiring diagrams.
13. Carry out preliminary fault finding.

MCO403: Draw and prepare a lift plan

A lift plan is to be planned prior to every lift; the lift plan should include all the required details to carry out the lift safely.

Upon completion of this unit the mobile crane operator should be able to draw up a lift plan. The mobile crane operator should possess the required knowledge and skills to implement this lift plan.

Performance criteria

The candidate must have the necessary knowledge and skills to supervise and ensure that:

1. Potential hazards for this lift are identified.
2. A risk assessment is done and that the mitigated risks are drawn.
3. The lift plan to the assistant is briefed and explained.
4. The right lifting tackle to be utilised for this lift is prepared.
5. The siting of the mobile crane from trenches is kept away.
6. The siting of the mobile crane from high voltage lines is kept away.
7. A lift plan for heavy and complex lifts is made.

Required Knowledge

The Level 4 Mobile Crane Operator must know, demonstrate, and explain:

1. That all risks should be mitigated in a risk assessment.
2. How to take mitigation measures how to reduce or eliminate the risk of an accident.
3. The range and the lift capacity of this mobile crane.
4. The load weight to be lifted, load height and operating radius.
5. How to understand the compression strength of the terrain where the crane outriggers are to be set and calculate the area of supporting blocks beneath them.
6. How to calculate the required reeving system.
7. How to calculate the requires counterweights.
8. How to calculate the distance to keep away the siting of the mobile crane from trenches.
9. How to calculate the distance to keep away the siting of the mobile crane from high voltage lines.
10. The windspeed limit when the operation should be halted.
11. How to identify which areas require cordoning to keep public away.
12. How to apply for the necessary permits to set up a mobile crane on a public road.
13. How to draw and later implement the lift plan for heavy and complex lifts, taking into consideration all the required factors.

14. How to plan a multiple crane lift.
15. The effect of a mobile crane stability when working on a barge.

Required Skills

The Level 4 Mobile Crane Operator must be able to:

1. Look for hazards nearby the area where the mobile crane is to be set up.
2. Draw up a risk assessment.
3. Understand load capacity charts.
4. Calculate the load to be lifted and range and check where it fits in the mobile crane load capacity chart.
5. Prepare a lift plan for that load/situation, including multiple or complex lifts.
6. Implement the lift plan.
7. Calculate the area of supporting blocks beneath the outrigger pads.
8. Calculate the distance to be kept away from the crane siting to trenches.
9. Calculate the distance to be kept away from the crane siting to high voltage lines.

MCO404: Setting up and demounting a mobile crane

This unit lists the knowledge and skills required by a person holding this position to contribute to setting out and demounting a mobile crane on site.

Upon completion of this unit the mobile crane operator carrying out this work will possess the necessary knowledge and skills to setting up and dismantling of the mobile crane on site, the mobile crane operator should be able to set up and demount the mobile crane in the appropriate way so as it can carry out the lift safely.

Performance criteria

The candidate must have the necessary knowledge and skills to supervise and ensure that:

1. Potential hazards during setting up of the mobile crane are identified.
2. Those hazards in the risk assessment and take mitigation measures how to reduce the effect of those hazards are included.
3. Instructions to the assistant mobile crane operator during the setting up and dismantling of the mobile crane are given.
4. They know how to operate the mobile crane safely.
5. They know how to attach and modify the counterweights configuration.
6. They know how the reeving system is changed.
7. The fly jib is installed or demounted.
8. The correct lifting tackle according to the lift plan is prepared.
9. The required blocks to place underneath the crane outriggers is prepared and placed.
10. The mobile crane according to the lift plan, this also includes complex or heavy lifts is prepared.
11. Multiple lifts are coordinated.

Required Knowledge

The Level 4 Mobile Crane Operator must know, demonstrate, and explain:

1. How to place the required supports underneath the mobile crane outriggers, extend and set up the outriggers appropriately, taking into consideration the terrain where the mobile crane is to be set.
2. That the mobile crane should be kept away from any hazards.
3. How to attach and modify the counterweights configuration.
4. How to change the reeving system.
5. How to install or demount fly jib.
6. That no bystanders or pedestrians should be in the area where the mobile crane is to be set up.

7. That the area should be cordoned adequately so as no persons from the public can access that area.
8. How to operate instruction manuals, labels, and capacity charts.
9. The effect of stability when working on barges.
10. The importance of good coordination during a multiple crane lift also knowing the load share every crane is to lift.
11. The effect of wind speed on the stability of the crane.

Required Skills

The Level 4 Mobile Crane Operator must be able to:

1. Select the appropriate mobile crane siting and away from any hazards.
2. Set up of the outriggers correctly, with the required supports, depending on the terrain.
3. Identify and keep away from any services laid underground.
4. Keep a safe distance from trenches.
5. Identify any hazard that was not identified in the lift plan.
6. Understand the feedback given from his assistant.
7. Install the correct number of counterweights.
8. Alter the reeving system as required.
9. Install a fly gib correctly.
10. Understand hand signals and communicate with a spotter during manoeuvring.
11. Correctly level the mobile crane within 1% inclination.
12. Coordinate multiple crane lifts.
13. Set up a mobile crane keeping the safe distance in the vicinity of trenches.
14. Set up a mobile crane keeping a safe distance in the vicinity of high voltage lines.
15. Set up a mobile crane for complex and heavy lift.
16. Calculate wind speed and operate only below the permissible values.

MCO405: Carry out a lifting operation using a mobile crane

This unit lists the knowledge and skills required by a person holding this position to carry out a safe lift using a mobile crane.

Upon completion of this unit, the mobile crane operator carrying out this work will possess the necessary knowledge and skills to operate a mobile crane.

Performance criteria

The candidate must have the necessary knowledge and skills to supervise and ensure that:

1. Potential hazards during the lifting operation are identified.
2. Mitigation measures how to deal with any hazards are taken.
3. Ownership of the lifting operation, act if any of his subordinates will not follow the correct procedures is taken
4. Any changing parameters during the lifting operation are watched out for.
5. There is effective communication and feedback given to the assistant crane operator during lifting.
6. The mobile crane safely, understand the controls and alarms are operated safely.
7. There is communication with the spotter using hand signals during the mobile crane manoeuvring.
8. There is an understanding of the alarms issued by the onboard mobile crane limiting devices.
9. A safe lifting operation, without exceeding the designed parameters of the mobile crane is carried out.
10. The legal requirements of crane certification are understood.
11. There is coordination with other crane drivers and the assistants.
12. A complex or heavy lift is carried out.
13. The procedure when lifting persons in a cage.

Required Knowledge

The Level 4 Mobile Crane Operator must know, demonstrate, and explain:

1. How to select the right crane for that lifting operation.
2. How to select the appropriate mobile crane siting.
3. The distance to be kept away from high voltage lines.
4. How to set the outriggers and their supports.
5. How to level the mobile crane correctly.
6. How to identify and hazard that was not identified in the lift plan.
7. How to read instruction manuals.

8. That the correct counterweights are installed.
9. That the correct reeving system is being utilised.
10. That the wind speed should be below the recommended safe operational wind speed
11. The lifting operation is in accordance with the mobile crane lifting capability.
12. Understand the functionality of load moment devices and sensory equipment on board the mobile crane.
13. That the suspended load should not be lifted above any person.
14. The proper rules and procedure when lifting persons in a cage.
15. The procedure of carrying out heavy and complex lifts.

Required Skills

The Level 4 Mobile Crane Operator must be able to:

1. Place the correct supports underneath the mobile crane outriggers.
2. Identify any hazard that was not identified in the lift plan.
3. Identify any changes.
4. Operate the mobile crane safely and understand controls.
5. Understand alarms issued by the onboard mobile crane limiting devices.
6. Understand the effect of wind on the mobile crane operation.
7. Understand hand signals of the spotter.
8. Lift persons in a cage.
9. Carry out complex and heavy lifts.