BC Crane Safety

Crane Certification and Licensing Authority

Crane Mechanic

(Limited Scope, Non-Commercial Lift)

Competency Checklist and Employer Sign-off

The competencies in this document are from the Mobile Crane Operator Standard and retain the same numbering as the standard.

Disclaimer

This document is provided for the benefit of both the employer and the employee. It is not intended as an all-inclusive list of tasks to be trained for, nor is it intended to be a list of tasks that must be trained for. It is intended as a checklist that can be used as applicable to the given workplace, equipment, operating circumstances, and training requirements of the employee and employer concerned.

CRANE MECHANIC

Date _____

BC Crane Safety Number _____

Name _____

Signature _____

EMPLOYER

Date _____

Company Name _____

Company Address _____

Name of Signing Authority _____

Signing Authority Signature _____

A SAFETY

A1 Comply with WorkSafeBC Occupational Health and Safety Regulations (OHSR)

Objectives

To be competent in this area, the individual must be able to interpret and comply with WorkSafeBC Occupational Health and Safety Regulation (OHSR) pertaining to cranes.

Learning Tasks	**Demonstrated knowledge of ✓**
1. Adhere to the regulations that apply to the operation of cranes in a workplace	
• Safe operating practices	
• Safely landed and supported loads	
• Controls attended while load is suspended	

A SAFETY

A4 Be aware of power line hazards and high voltage equipment

Objectives

To be competent in this area, the individual must be able to operate a crane around high voltage equipment in accordance with Occupational Health and Safety Regulations, utility regulations, and other government legislation.

Learning Tasks	**Demonstrated knowledge of ✓**
1. Operate in proximity of electrical sources	
• High voltage signage	
• Safe limits of approach to overhead conductors	
• Voltage determination	
• Risk factors when working near power lines (wind, load size/profile)	

A SAFETY

A5 Practice effective worksite communications

Objectives

To be competent in this area, the individual must be able to communicate with other personnel in accordance with Occupational Health and Safety Regulations.

Learning Tasks	**Demonstrated knowledge of ✓**
1. Interpret basic workplace documents	
• Basic written communications	
○ Equipment logbooks	
○ Written reports	
2. Demonstrate and interpret standard hand signals used during crane operations	
• Identification and interpretation	
• Hand signals given in a clear and concise manner	
• Requirements of the signal person	

C SYSTEMS AND COMPONENTS

C5 Understand crane components and attachments

Objectives

To be competent in this area, the individual must be able to identify crane components and attachments for cranes, explain their purpose, and describe defects and malfunctions.

Learning Tasks	**Demonstrated knowledge of ✓**
1. Understand crane attachments	
• Attachments	
○ Boom extensions/jibs	
○ Hook block	
○ Overhaul ball/downhaul weight	
○ Capacity of attachments	

C SYSTEMS AND COMPONENTS

C6 Understand the functions of safety components, devices, and aids

Objectives

To be competent in this area, the individual must be able to identify safety components, devices, and aids for cranes, explain their purpose, and describe defects and malfunctions.

Learning Tasks	**Demonstrated knowledge of ✓**
1. Understand safety components, devices, and aids	
• Component, devices, and aids	
○ Overload Prevention Systems (load monitoring and indicating systems)	
○ Anti-two block devices	
○ Boom length indicator	
○ Boom angle indicator	
○ Operating controls	
○ Rated capacity indication	
• On-board crane operator aids	
○ Load charts	
○ Manufacturers' manuals	
○ Equipment logbook	
• Defects or malfunctions	
○ Overload Prevention Systems (load monitoring and indicating systems)	
○ Anti-two block devices	
○ Boom length indicator	
○ Boom angle indicator	
○ Operating controls	
• Safety device malfunction	
○ Logbook entry	
○ Suspension of crane operation if necessary	

D WIRE ROPE AND RIGGING

D1 Specify types of wire rope and their uses

Objectives

To be competent in this area, the individual must be able to identify various types of wire rope used in crane operations.

Learning Tasks	Demonstrated knowledge of ✓
1. List various types of wire rope	
• Conventional construction wire rope	
• Anti-rotational wire rope	
• Types of cable construction	
• Slings	
• Duty cycle wire rope	
• Hoist line	
• Trolley line	
2. State the characteristics of each type of wire rope	
• Working Load Limit (WLL) of wire rope	
• Design factors	
3. State the uses of each type of wire rope	
• Slings	
• Duty cycle wire rope	
• Boom hoist line	
• Load hoist line	

D WIRE ROPE AND RIGGING

D2 Follow wire rope installation procedures

Objectives

To be competent in this area, the individual must be able to ensure that the wire rope is installed in accordance with manufacturers' recommendations.

Learning Tasks	Demonstrated knowledge of ✓
1. Inspect wire ropes in accordance with manufacturer's recommendations and WorkSafeBC regulations	
• Inspection and examination procedure	
○ Lubrication	
○ Excessive wear	
○ Bird caging	
○ Kinking	
○ Flattening	
○ Proper spooling	
○ Broken wires	
○ Distortion	
• Rejection criteria for damaged or defective rope according to WorkSafeBC regulations and manufacturer's specifications	
• Recording and reporting process for the inspection of defects and deficiencies	
○ Inspection recording in logbook	
○ Documentation of defects in logbook	
○ Requirements for reporting defects to supervisory personnel	
2. Install wire rope on a winch and reeve hook blocks according to manufacturer's instructions	
• Procedure for installing wire rope on a winch	
• Wire rope system components	
○ Winches	
○ Hook block/overhaul ball	
○ Sheaves	
○ Wedge socket assemblies	
• Procedure for reeving hook blocks	

Learning Tasks	Demonstrated knowledge of ✓
3. Inspect hook blocks/overhaul balls	
• Rejection criteria according to WorkSafeBC regulations and as per manufacturer's specifications	
• Removal from service if repair is not allowed	
• Requirements for reporting defects to appropriate personnel	
4. Maintain wire rope	
• Manufacturer's specifications	
○ Wire rope cutting and seizing	
• Wire rope maintenance recording in the logbook within the regulated timeframe (tower crane)	

D WIRE ROPE AND RIGGING

D3 Inspect slings and rigging hardware

Objectives

To be competent in this area, the individual must be able to inspect slings and rigging hardware in accordance with manufacturers' recommendations and WorkSafeBC regulations.

Learning Tasks	Demonstrated knowledge of ✓
1. Inspect slings and rigging hardware	
• Manufacturer's manuals and WorkSafeBC regulations	
• Excessive wear	
• Damage	
• Cracks	
• Missing safety clips	
• Broken wires	
• Labelling	
• Rejection criteria according to WorkSafeBC regulations and as per manufacturer's specifications	
• Removal from service if repair is not allowed	
• Requirements for reporting defects to appropriate personnel	

D WIRE ROPE AND RIGGING

D4 Specify types of slings, rigging hardware, and their uses

Objectives

To be competent in this area, the individual must be able to use slings and rigging hardware in the workplace.

Learning Tasks	**Demonstrated knowledge of ✓**
1. Use slings and rigging hardware	
• Slings	
○ Wire rope	
○ Chain (grades of steel required for lifting)	
○ Synthetic web slings	
○ Synthetic round slings	
• Hardware	
○ Hooks	
○ Shackles	
○ Eyebolts	
• Hitch configurations	
○ Vertical	
○ Choker	
○ Basket	
○ Bridle	
• Specific information from manufacturer's and rigging manuals	

D WIRE ROPE AND RIGGING

D5 Use rigging techniques

Objectives

To be competent in this area, the individual must be able to assemble appropriate rigging for a load in accordance with manufacturers' recommendations.

Learning Tasks	**Demonstrated knowledge of ✓**
1. Assemble appropriate rigging for a given load and ensure the load can be lifted safely	
• Selection of appropriate slings and rigging hardware	
○ Load weight determination	
○ Interpretation of rigging capacity charts	
○ Use of correct hitch configuration	
○ Working Load Limit (WLL) calculations of slings and rigging hardware	
○ Reduction of WLL when using slings and rigging hardware at an angle	

E LIFT PLANNING

E1 Follow site assessment procedures

Objectives

To be competent in this area, the individual must be able to inspect a job site to ensure a safe and efficient operation in accordance with a pre-lift plan.

Learning Tasks	Demonstrated knowledge of ✓
1. Establish the location of the crane	
• Accessibility of site	
• Grade of the site	
• Soil conditions	
• Distance to embankments	
• Where the load is initially located	
• Where the load is to be placed	
• Proximity to other equipment	
• Overhead obstructions	
• Distance to electrical power sources	
• Known underground hazards	
• Environmental conditions	
• Other potential hazards	
2. Determine blocking/mats required for various load-bearing surfaces	
• Proper blocking methods	
• Ground bearing capability	
• Uneven supporting surface	
3. Determine the requirement for communications, signal persons, signallers, traffic control, barriers, grounding and bonding	
• WorkSafeBC regulations	
• Company policy	
• Operating clearance	
• Traffic control	
• Pedestrian traffic	

E LIFT PLANNING

E2 Determine load weights

Objectives

To be competent in this area, the individual must be able to calculate the combined weight of the crane's gross load for a lift.

Learning Tasks	**Demonstrated knowledge of ✓**
1. Calculate/verify load weights	
• Volume of an object	
• Weight of a cubic unit of an object	
• Weight of components	
• Gross weight of a load	

E LIFT PLANNING

E3 Determine crane lifting capacity

Objectives

To be competent in this area, the individual must be able to determine that the lifting capacity of the crane is sufficient when the required configuration is considered.

Learning Tasks	Demonstrated knowledge of ✓
1. Determine sufficient lifting capacity of a crane considering the configuration and attachments required for the lift	
• Selection of appropriate configurations	
○ Radius	
○ Parts of line	
○ Weight of the combined load and rigging	
○ Boom length	
○ Boom angle	
○ Boom and jib combination	
○ Counterweight combination	
○ Quadrants of operation	
○ Deductions from gross capacity	
• Differences between gross capacity and net capacity	
• Differences between gross load and net load	

F CRANE OPERATIONS

F2 Perform a pre-operational inspection

Objectives

To be competent in this area, the individual must be able to safely and efficiently perform a pre-operational inspection in accordance with manufacturers' recommendations and WorkSafeBC regulations.

Learning Tasks	**Demonstrated knowledge of ✓**
1. Perform a pre-operational inspection	
• Inspection procedures	
○ Operator aids in place	
○ WorkSafeBC Occupational Health and Safety Regulation (OHSR) requirements are followed	
○ Manufacturer's specifications are followed	
○ Function test on the operating controls	
○ Safety devices	
○ Post-assembly inspection	
• Verification of operator aids	
○ Load monitoring and indicating system	
○ Boom length indicator (if applicable)	
○ Boom angle indicator	
○ Load radius indication (as part of LMI system)	
○ Anti-two block	
○ Crane manual	
○ Load charts	
• Completion and filing of inspection reports	
○ Equipment logbook	

F CRANE OPERATIONS

F4 Demonstrate hoisting techniques

Objectives

To be competent in this area, the individual must be able to perform hoisting operations in a safe and efficient manner in accordance with the manufacturers' recommendations.

Learning Tasks	**Demonstrated knowledge of ✓**
1. Operate a crane without and with a load	
• Safe operating practices	
○ Crane levelled	
○ Safely landed and supported loads	
○ Controls attended while load is suspended	
○ Travelling on site (if allowed)	
○ Reference to load chart	
2. Maintain control under varying weather conditions	
3. Perform post-operational procedures	
• Load and rigging removal from hook	
• Hook block elevation	
• Safe boom positioning	
• Appropriate/safe location for parking and securing equipment	
• Equipment shutdown	
• Equipment securing requirements	

G TRANSPORTING A CRANE

G2 Prepare a crane for travel

Objectives

To be competent in this area, the individual must be able to prepare a crane for travel in accordance with manufacturers' recommendations and Commercial Transport Regulations.

Learning Tasks	Demonstrated knowledge of ✓
1. Prepare a crane and components for highway travel in accordance with manufacturer's recommendations and the BC Ministry of Transportation – Commercial Transport Regulations	
• Requirements	
○ Flags/lights	
○ Permits	
○ Security of components	
○ Required driver's licence	