INTEGRAL SKILLS

BRIDGE AND GANTRY CRANE

TLILIC0006 Licence to operate a bridge and gantry crane

RIIHAN305D Operate a gantry or overhead crane

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MODIFICATION HISTORY

Version	Date	Nature of Amendment
1	13 Feb 20	Creation

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1.1 Introduction

This training course is based on the units of competency **TLILIC0006 Licence to Operate a Bridge and Gantry Crane (HRWL)** RIIHAN305D Operate a gantry or overhead crane**.**

You will learn about:

- Planning the job.
- Selecting and inspecting equipment.
- Preparing the site and equipment.
- Performing the task.
- Shutting down the job.

1.1.1 What is a Bridge and Gantry Crane?

Bridge Crane – A bridge beam, mounted at each end to an end carriage, capable of travelling along elevated runways and having one or more hoisting mechanisms arranged to traverse across the bridge.

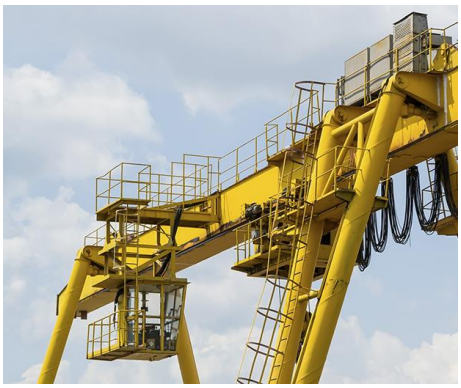
Gantry Crane – A bridge beam, supported at each end by legs mounted on end carriages, capable of travelling on runways on supported surfaces or deck levels, whether fixed or not and which has a crab with one or more hoisting units arranged to travel across the bridge.

This unit includes the use of a bridge and gantry crane that is:

- Controlled from a permanent cabin or control station on the crane.

OR

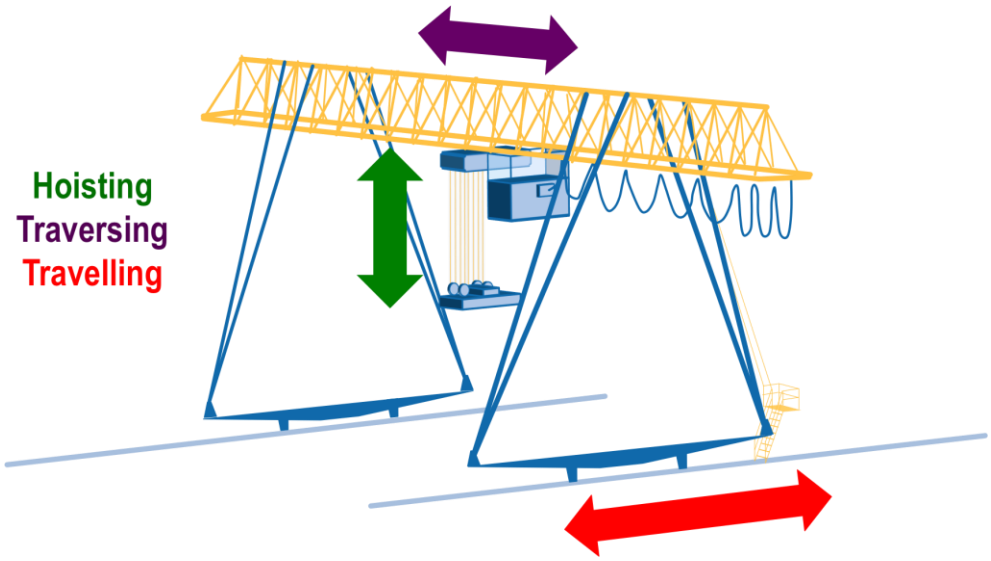
- Remotely controlled and having more than 3 powered operations.



1.1.2 Crane Movements

Common crane movements that you may use when shifting loads with a bridge and gantry crane include:

- **Hoisting** – The raising and lowering of the hook block using the hoist rope.
- **Traversing** – Moving the hoisting mechanism along the bridge.
- **Travelling** – The movement of the crane along the runway. Load swing can be reduced by travelling at a minimum speed and using gentle acceleration and braking.



Other crane movements may include:

- **Rotating** – A function that allows you to control the rotation of the load.
- **Pitch and Yaw** – Load movements that may be available depending on the crane in use.

1.1.3 High Risk Work Licence Requirements

Once you pass your assessment you will have **60 days** to apply for your licence.

You must renew your licence within 12 months of its expiry otherwise:

- Your licence can't be renewed.
- You need to repeat the course and re-apply for your licence.
- You need to enrol in the course again and be supervised by somebody who has a current licence for the same class.

You can still do high risk work without a licence as long as:

- You are enrolled in a high risk course for the class, and
- You are being supervised by somebody who has a licence for the same class.

Any licensed worker must take reasonable steps to make sure the way they work does not impact on the safety of themselves or any other worker. This is their legal duty of care.

Failing to work safely can result in the health and safety regulator:

- Suspending or cancelling your licence.
- Refusing to renew your licence.
- Ordering that you are reassessed to ensure you are competent.

Your employer might ask you for evidence that you have a high risk licence before you start any high risk work. You can show them:

- Your licence.
- Proof from the training company that you have passed your assessment.
- Proof that you are currently completing a course for high risk work.

A Bridge and Gantry Crane HRW Licence is required to operate a bridge or gantry crane that is:

- controlled from a permanent cabin or control station on the crane, or
- remotely controlled with more than three powered operations.

1.2 Working Safely

You must follow all safety rules and instructions when performing any work. If you are not sure about what you should do, ask your boss or supervisor. They will tell you what you need to do and how to do it in a safe way.

1.2.1 Health and Safety Rules

Every workplace has to follow laws and rules to keep everyone safe. There are 4 main types:

Legislation	Explanation
Acts	These are laws that you have to follow.
Regulations	These explain what the law means.
Codes of Practice	These are instructions on how to follow the law, based on industry standards.
Australian Standards	These tell you what the minimum requirement is for a job, product or hazard.

Some states use OHS laws, and other states use WHS laws. They both talk about the same thing, but use different words or names for people. If you have any questions about safety rules you should talk to your boss or supervisor.

1.2.2 How to Keep Everyone Safe

WHS law says that all companies and workers need to keep themselves and other people safe while they work. This is called a **duty of care**.

To keep yourself and other workers safe you need to:

- Follow your work instructions.
- Follow all workplace rules.
- Make sure all equipment is safe to use.
- Carry out your work safely.
- Report any problems.

If you think something is dangerous tell your boss or supervisor as soon as possible.

Your worksite will also have instructions for working safely including:

- Emergency procedures, including using fire fighting equipment, first aid and evacuation.
- Handling hazardous materials.
- Safe operating procedures.
- Personal protective equipment and clothing.
- Safe use of tools and equipment.

Duty of care involves:

- Employers and self-employed persons.
- Persons in control of the workplace.
- Supervisors.
- Designers.
- Manufacturers.
- Suppliers.
- Workers.
- Inspectors, including WHS inspectors.

If you do not work safely when carrying out high risk licence work the WHS regulator can:

- Suspend you licence.
- Cancel your licence.

The regulator might also refuse the renewal of your licence or you could be required to pass the assessment again to prove that you are competent.

Talk to your WHS representative or supervisor if you have any questions about legislative requirements relating to your work.

1.3 Planning for the Work

There will be specific requirements and things to consider when you plan for the particular task you will be completing.

You should think about:

- Communications (safe and adequate).
- Location of the task.
- Access and egress, both to the site and for the specific task.
- Permits and/or licences required for the task.
- Specifics of the task. This may include:
  - Requirements for tag lines.
  - Requirements for using a dogman or rigger.
- Equipment required for the task.
- Availability of equipment.
- Capability/capacity of the crane.
- Load configuration and conditions, weight, size of the load, slinging arrangements, load balance, load security (loose loads).
- Safe work procedures.
- The distance and speed of travel.
- Issues specific to the site or workplace.

1.4 Identify and Control Hazards

Before you start work, you need to check for any hazards or dangers in the area. If you find a hazard or danger you need to do something to control it. This will help to make the workplace safer.

Part of your job is to look around to see if you can find any hazards before you start any work.

A **hazard** is the thing or situation with the potential to cause injury, harm or damage.

When you start checking for hazards, make sure you look everywhere. A good way to do this is to check:

- **Up high** above your head.
- All around you **at eye level**.
- **Down low** on the ground (and also think about what is under the ground).

Some common workplace hazards related to bridge and gantry crane operations include:

- Overhead obstructions, such as service or power lines.
- Bad weather conditions, such as strong winds, lightning or storms.
- Insufficient lighting/lack of illumination.
- Vehicle traffic.
- Plant and equipment.
- Pedestrians and workers.
- Buildings, facilities and other surrounding structures.
- Obstructions.
- Specific hazards, such as dangerous materials.
- Possible issues with ground stability, including slopes.

1.4.1 Consulting with Other Workers about Hazards and Risks

Controlling a hazard can be a team effort and it's important that everybody knows what they need to do and how or if they need to change their work process to suit.

Make sure you talk to the right people. This can include:

- Safety officers.
- Workplace or site engineers (where applicable).
- Supervisors.
- Colleagues.
- Managers who are authorised to take responsibility for the workplace or operations.

It is also important to communicate with other personnel and safety officers before starting on a worksite to ensure that any workplace policies or site-specific procedures are followed.

These people may also be able to identify or have information about specific workplace or site hazards and ground conditions.

1.4.2 Assess Risks

Once you have identified the hazards on site or related to the work you will be doing you may be required to assess their risk level.

Risk levels are worked out by looking at 2 factors:

Consequence	How bad will it be if the hazard causes harm?
Likelihood	What is the chance of the hazard causing harm?

You can use a table like the one shown here to work out the risk level:

	Consequence				
Likelihood	**1. Insignificant**	**2. Minor** First Aid Required	**3. Moderate** Medical Attention and Time Off Work	**4. Major** Long Term Illness or Serious Injury	**5. Catastrophic** Kill or Cause Permanent Disability or Illness
1. Rare	Low	Low	Moderate	Moderate	Moderate
2. Unlikely	Low	Low	Moderate	Moderate	High
3. Possible	Low	Moderate	High	High	Extreme
4. Likely	Moderate	Moderate	High	High	Extreme
5. Almost Certain	Moderate	High	High	Extreme	Extreme

For example, a hazard that has a **Major** consequence and is **Almost Certain** to occur has a risk level of **Extreme**.

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1. Rare	Low	Low	Moderate	Moderate	Moderate
2. Unlikely	Low	Low	Moderate	Moderate	High
3. Possible	Low	Moderate	High	High	Extreme
4. Likely	Moderate	Moderate	High	High	Extreme
5. Almost Certain	Moderate	High	High	**Extreme**	Extreme

The risk level will help you to work out what kind of action needs to be taken, and how soon you need to act.

The table below is an example of a site risk policy:

Risk Level	Action
Extreme	**This is an unacceptable risk level** The task, process or activity **must not proceed**.
High	**This is an unacceptable risk level** The proposed activity can only proceed, provided that: **1.** The risk level has been reduced to as low as reasonably practicable using the hierarchy of risk controls. **2.** The risk controls must include those identified in legislation, Australian Standards, Codes of Practice etc. **3.** The risk assessment has been reviewed and approved by the Supervisor. **4.** A Safe Working Procedure or Work Method Statement has been prepared. The supervisor must review and document the effectiveness of the implemented risk controls.
Moderate	**This is an unacceptable risk level** The proposed activity can only proceed, provided that: **1.** The risk level has been reduced to as low as reasonably practicable using the hierarchy of risk controls. **2.** The risk assessment has been reviewed and approved by the Supervisor. **3.** A Safe Working Procedure or Work Method Statement has been prepared.
Low	The proposed task or process needs to be managed by documented routine procedures, which must include application of the hierarchy of controls.

The action you take will depend on:

- The organisation's policies.
- The worksite's procedures.
- Relevant laws and regulations.

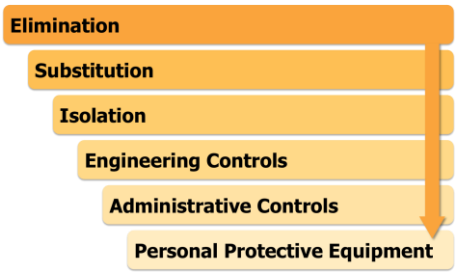
1.4.3 Control Hazards

The best way to control hazards is to use the Hierarchy of Hazard Control. The Hierarchy of Hazard Control is the name given to a range of control methods used to eliminate or control hazards and risks in the workplace.

You start at the top of the list and see if you can take away (eliminate) the hazard or danger.

If you can't take it away you move down the list to see if you can swap it for something safer (substitution).

Keep working through the list until you find something that controls that hazard or danger.



This table shows you the 6 different types of controls in order from best to worst:

Hierarchy Level	Action
1. Elimination	Completely remove the hazard. This is the best kind of hazard control.
2. Substitution	Swap a dangerous work method or situation for one that is less dangerous.
3. Isolation	Isolate or restrict access to the hazard.
4. Engineering Controls	Use equipment to lower the risk level.
5. Administrative Controls	Site rules and policies attempt to control a hazard.
6. Personal Protective Equipment	The least effective control. Use PPE while you carry out your work.

Hazard control measures need to be put in place before you start your work, or as soon as you see a hazard while you are doing your work. Hazard controls can sometimes be listed in your work instructions or you can ask your boss or supervisor for help.

Talk to the other workers in the area to make sure they are aware of the control measures you have put in place.

Once a hazard control is in place you will need to check to make sure it is working well to control the hazard or danger.

Talk to your supervisor or safety officer if you are not sure if it is safe enough to carry out your work. If you think the hazard is still too dangerous you should not try to do the work.

1.4.3.1 Personal Protective Equipment

Personal Protective Equipment (PPE) is clothing and equipment designed to lower the chance of you being hurt on the job. It is required to enter most work sites.

As a minimum, a person involved in crane operations must wear PPE such as:

- A safety helmet (hard hat).
- Safety boots/footwear.
- High-visibility clothing.

Other PPE includes:

- Gloves.
- Safety goggles/glasses.
- Reflective vest.
- Relevant breathing apparatus.
- Hearing protection.
- Skin and sun protection.
- Any other items required by the site.

All safety equipment such as PPE should be selected and inspected while the work is being planned and before any work is started.

Make sure any PPE you are wearing is in safe working condition and is suitable for the job.

If you find any item of PPE that is not in a serviceable condition, tag it and remove it from service. Report the fault to your supervisor who will organise the repair or replacement of the PPE.

1.4.4 Apply Hazard Control Measures

Hazards controls need to be applied before any work is started, or as soon as a hazard is identified if it is identified during crane operations.

Hazard controls may include:

- Safety tags on electrical switches/isolators.
- Insulated power lines.
- Pedestrian and traffic controls and barricades.
- A safety observer used inside an exclusion zone.
- Disconnected power.
- Adequate illumination/lighting.
- Traffic barricades and controls.
- Movement of obstructions.
- Personal protective equipment (PPE).

Other or different controls may be specified in your work instructions or site procedures.

1.4.4.1 Lighting the Work Area

If the crane work is being carried out at night or in a darkened area, there must be adequate lighting in place for the work.

The entire work area must be sufficiently lit up to ensure the work can be carried out safely.

1.4.4.2 Working near Pedestrians, Workers and Vehicles or Mobile Plant

The following hazard control measures can be used to protect pedestrians, workers and vehicles or mobile plant while the crane is in operation:

- Pedestrian and vehicle exclusion zones.
- Warning signs.
- Protective barriers.
- Flashing hazards lights.
- Traffic control (e.g. a flag person).
- Gantries.
- Hoardings.
- Scaffolding.

1.5 Check the Path of Movement

When planning your work check the path of movement for the crane and load for any obstructions. This is to make sure that you have identified all hazards in the path of movement and put effective control measures in place.

When checking the path of movement think about:

- The size (dimensions and mass) of the load.
- The suitability of the pickup and landing sites.
- Communication arrangements with the dogger (if this is applicable).
- Preventing pedestrians and workers accessing the pathway.
- Any obstructions, including:
  - Equipment.
  - Materials.
  - Other vehicles, plant and people.
  - Building and other structures.
  - Overhead power lines.
- Load swing.

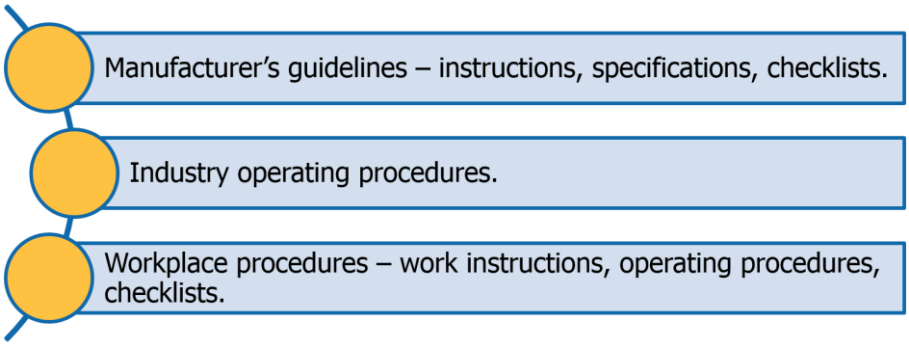
Always decide on the path of movement for a load during your planning, before you move the load.

1.6 Communications

As a crane operator you need to be able to communicate effectively with those around you while you work. This may include workers such as doggers and riggers.

It is important that you are able to understand all the instructions necessary to use all relevant equipment safely.

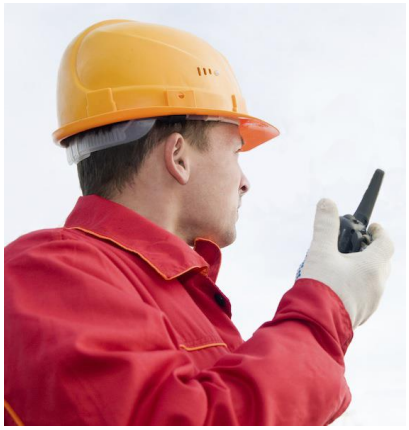
These can include:



Select appropriate communication methods while planning and preparing for crane operations, before work is started.

Communication methods may take the form of:

- Verbal and non-verbal language.
- Listening.
- Questioning to confirm understanding.
- Written instructions.
- Signage.
- Making and interpreting hand signals.
- Whistle, bells or buzzer signals.
- Appropriate worksite procedures.



Choosing the most appropriate communication method for the job will depend on the specific circumstances you may encounter during operations.

For instance, if the crane operator remains constantly in view of the person dogging the load then hand signals would be an effective communication method. If however the load is not always going to be in sight of the crane operator then whistle signals could be employed.

Fixed channel two-way radios can be used when they are going to prove more effective than other methods.

They are particularly useful when the operator is out of view of the load and whistle signals could not be heard or would prove confusing due to other crane operations in the area.

1.6.1 Following Communication Signals

You will often be communicating with the person directing the crane, most likely a licences dogger or rigger. To direct you they will use one of the following communication methods:

- Hand signals.
- Whistle signals.
- Two-way radios (fixed channel).
- Verbal communication.

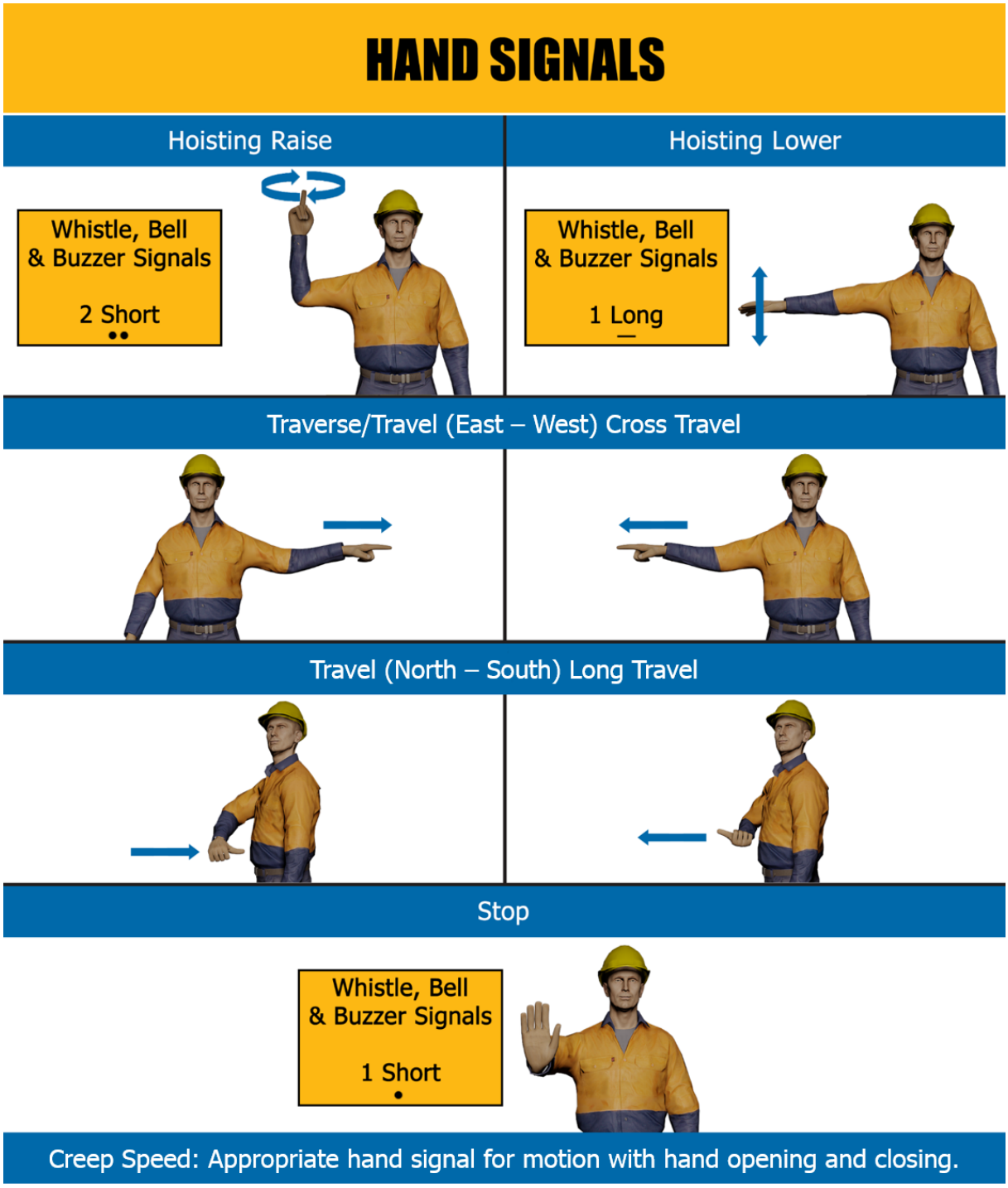
Verbal communication will be used particularly when planning the move or discussing the work.

The method of communicating should be chosen when planning the work.

Some cranes may have additional movements or functions. It is important that a series of hand/whistle signals is decided on before you start to move the crane.

If at any point you are unsure of the directions being given to you, stop all crane motions and confirm the instructions with the person giving them (dogger, spotter or observer).

Shown here are the signals used in Australia for directing bridge and gantry cranes:



Other signals that may be used are:

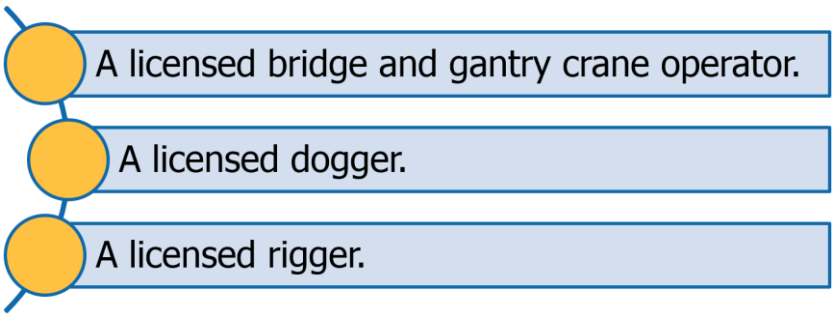
- Rotate.
- Lower.

Discuss with the person directing the load what signals will be used for these movements BEFORE the job is started.

2.1 Assess the Load

Part of putting together a job plan includes assessing the load. Different types of loads will have different requirements for safe lifting.

Anyone who holds a high risk work licence in any of the following classes can be responsible for finding out the weight of the load:



As well as being responsible for estimating the weight of a load, the bridge and gantry crane operator is also responsible for communicating with the dogger or rigger and providing them with appropriate information such as the capacity of the crane and the operations that are to be carried out.

You can determine the weight of a load in a number of ways. These include:

- The weight may be marked on the delivery docket (consignment note) or on a weighbridge certificate.
- Checking the load itself. The weight may be marked on the load or the packaging it arrives in.
- Weighing the load.
- Estimating the weight of the load through appropriate calculations.

By identifying the weight of the load you will be able to properly assess whether or not the crane will be able to shift the load and the limitations of operation for the crane.

It is extremely dangerous to attempt to lift a load of unknown weight. You could cause structural damage to the crane and damage to the lifting gear and load.

2.1.1 Common Load Weights

The table below lists the weights of common loads:

Material	Weight
Aluminium	2.7t per cubic metre
Bricks (1000 bricks)	4.0t per
Bronze	8.5t per cubic metre
Cast Iron	7.2t per cubic metre
Cement (25 bags)	1.0t
Clay	1.9t per cubic metre
Coal	864kg per cubic metre
Concrete / Cement	2.4t per cubic metre
Copper	9.0t per cubic metre
Earth	1.9t per cubic metre

Material	Weight
Granite	2.6t per cubic metre
Gypsum	2.3t per cubic metre
Iron, ore	5.4t per cubic metre
Lead	11.2t per cubic metre
Mild Steel	7.85t per cubic metre
Poly Pipe	1.1t per cubic metre
Timber (hardwood)	1.1t per cubic metre
Timber (soft)	0.6t per cubic metre
Water	1.0t per cubic metre

2.1.2 Determine the Weight of the Load

In most cases loads aren't always a perfect cubic metre and you will need to find the volume of the load before determining the weight:

Step 1 – Determine Load Volume

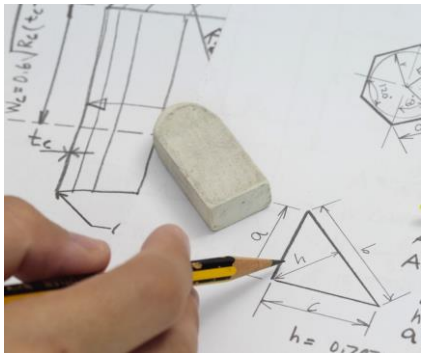
For Square/Rectangle loads use the formula:
Volume = Length x Width x Height
For Round/Circular loads use the formula:
Volume = Radius x Radius x π x H

Step 2 – Determine Load Weight

Multiply the load volume by the density of the load material using the formula:
Weight = Volume x Density

Example 1

Using the above formula and table we can work out the weight of most loads.



What is the weight of a rectangular block of solid concrete measuring 3.5m long, 0.8m wide and 0.6m high?
We know that a cubic metre of concrete weighs 2.4 tonnes (2400k).

Step 1 – Volume

Volume = Length x Width x Height
= 3.5m x 0.8m x 0.6m
= **1.68m^3**

Step 2 – Weight of the Block

Weight = Volume x Density
= 1.68m^3 x 2.4t/m^3
= **4.032t**

Therefore, the total load weighs **4.032 tonnes** or **4032 kg**.

Example 2

We can use this process to work out more complex weights. For example we can work out a load with the following characteristics:

Material	Aluminium Sheets
Number of Sheets	20
Length	5m
Width	2m
Height	30 mm (or 0.03m)

The first step is to work out how much each sheet weighs:

Step 1 – Volume

Volume = Length x Width x Height
= 5m x 2m x 0.03m
= **0.3m^3**

Step 2 – Weight of Each Sheet

Weight = Volume x Density
= 0.3m^3 x 2.7t/m^3
= **0.81t**

Once we know how much each sheet weighs individually we can work out how much the total weight of the load will be. This is done by multiplying the number of sheets by the weight of each sheet:

Total Load Weight = Number of Sheets x Weight of Each Sheet
= 20 x 0.81t
= **16.2t**

Therefore, the total load weighs **16.2 tonnes** or **16200 kg**.

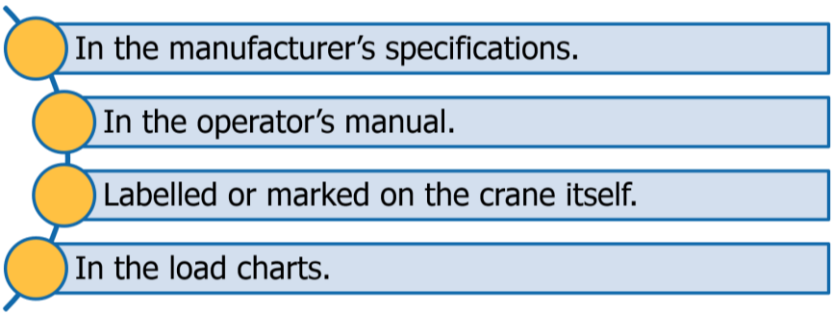
2.2 Choose the Right Crane

Part of planning a job is to check that the crane will be able to shift the load safely. This means you need to check the capability and limitations of the bridge and gantry crane. The maximum weight of a load is not allowed to exceed the rated capacity (maximum working load limit (WLL)) of the crane.

When checking that the crane is appropriate for the job it is important to take into account:

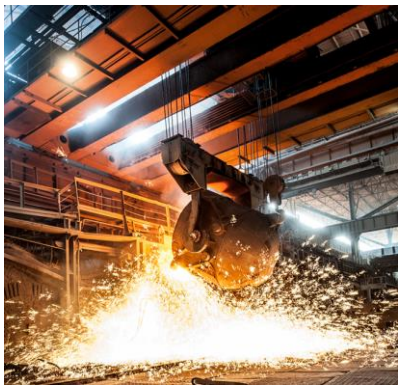
- Environmental conditions you are going to work under (e.g. weather conditions).
- Access and egress.
- Number and frequency of lifts.
- Weights and dimensions of loads.
- Site procedures for the movement of loads.

Information you need to know relating to the capabilities of the bridge and gantry crane, and to safely conduct lifting operations, can be found:



Load charts or crane charts contain details of the crane and the information you need to properly calculate the crane's capacity in any given configuration. This information includes:

- Weight of the hook block.
- Winch line pull in tonnes or kilograms.
- Rated capacity – also called the working load limit (WWL).



Once you have confirmed the Rated Capacity of the crane you will be able to work out whether the crane can safely lift the weight of the load. You will need to subtract the mass of any lifting gear from the rated capacity. This could include:

- Hook block.
- Spreader beams.
- Ladles.
- Kibbles.
- Lifting slings.

It is important to take into account the forces and loads placed on the crane and the load when conducting operations. This may include:

Dynamic Forces	Caused by forces acting on the movements of the crane and load.
Wind Loads	Caused by the effect of the wind acting on the crane or load.

Check that the crane hook has an adequate rated capacity (working load limit) for the loads that are to be lifted. You can find the rated capacity of a hook stamped or marked on the hook itself.

2.3 Crane and Equipment Checks

Before using a bridge and gantry crane or item of equipment you will need to inspect it and check that it is in safe working order and is suitable for the task.

The crane operator has the responsibility for inspecting the crane itself.

Routine checks include:

Pre-Start Checks	Visual checks done before the crane is started up.
Operational Checks	Checks made after the crane is started up.

Turn on the isolation switch before carrying out an inspection of the crane.

If you find a danger/safety tag attached to the crane or an item of equipment while carrying out an inspection you must leave it in place.

The only people who are allowed to remove the tag is:

- The person who put it there.

Or

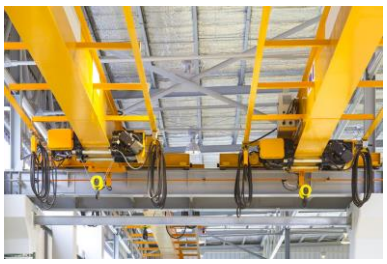
- A person authorised to remove it according to workplace safety procedures.

Do not remove the tag or use the crane or equipment, unless you have been authorised to do so.

2.3.1 Pre-Start Checks

Pre-start checks make sure the crane is safe to use. Routine pre-start checks should be carried out according to procedures including:

- The manufacturer's guidelines. This may include a range of instructions and specifications, including the operator's manual or appropriate checklists.
- Industry operating procedures.
- Workplace procedures, instructions, operating procedures and checklists.



Routine pre-start checks of the crane include:

- Visual inspection of the bridge and gantry crane to check the beams and crane structure.
- Mains isolation switch – check that there are no danger tags attached to it and that the electrical boxes/doors are closed.
- Electrical collector wires.
- Lifting hook.
- Storm brakes (if fitted).
- Hoist limit switches.
- Collector basket/buzz bars/bus bars (if visible).
- Isolator panels/circuit breakers.
- Hoist rope (FSWR).
- Sheaves.
- Anchorages – serviceable and in good condition.
- Winch drum – serviceable and in good condition.
- Signs/signage and labels (or notices) are present, correct and legible.
- No obstructions in the path of travel.
- No obstructions visible on the beams.
- Safety chains or gates are in place at exits and in working order.
- Lifting equipment.
- Pendant control – strainer wires are secure and serviceable.

The first action of the pre-start checks process is to switch on the isolation switch.

2.3.1.1 Boom and Superstructure Checks

The boom and superstructure of the crane must be checked to ensure there are no defects that would make the crane unsafe to use.

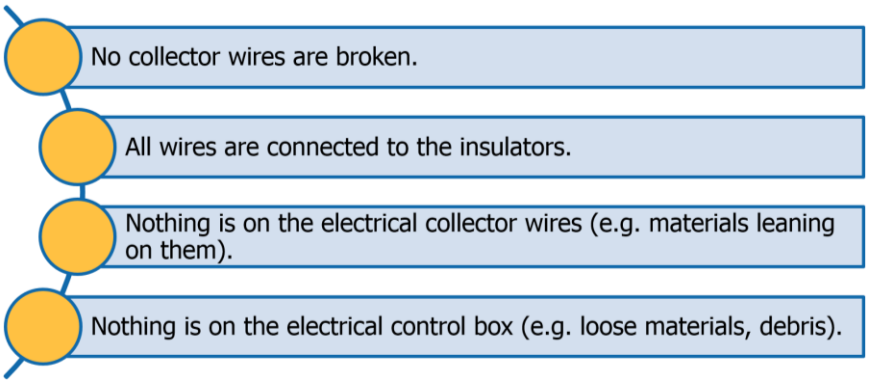
Boom defects to check for include:

- Cracks – particularly in the boom, superstructure or welds.
- Bends or twists in the bridge and gantry or superstructure.
- Flaking paint.
- Loose bolts.
- Rust visible on the joints or welds.

2.3.1.2 Electric Collector Wires and Electrical Control Box Checks

Make sure that the electric collector wires (also called bus bars) and the electrical control box are checked and inspected to ensure they are safe for use.

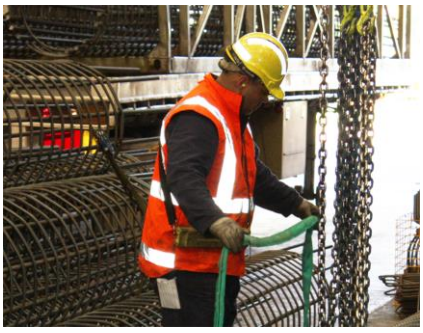
Inspect the electric collector wires and the electrical control box to make sure that:



2.3.1.3 Inspecting Lifting Equipment

Lifting equipment (e.g. shackles, slings) should be inspected before AND after each use, and following any recommendations from the manufacturer.

Any item of lifting equipment that shows signs of wear of 10% or more is **not** safe to use.



Only someone with one of the following types of high risk work licences is responsible for inspection lifting equipment for bridge and gantry crane work:

- A dogger.
- A rigger.
- A bridge and gantry crane operator.

Only a person with a one of these licences can decide if the lifting equipment is safe to use and suitable for the task it is to be used for.

It is important that any piece of faulty equipment is removed from service to prevent the risk of the equipment being used.

Chains

Lifting chains and chain slings are marked with different letters. These letters tell you what grade the chain is:

- **Grade 30 (L)** = 30(L) or 30 or 3. This is the minimum grade chain used for safe lifting of loads.
- **Grade 40** = M or 40 or 4 or 04 (High tensile chain).
- **Grade 50** = P or 50 or 5 or 05.
- **Grade 60** = S or 60 or 6 or 06.
- **Grade 80** = T (Higher tensile/High grade Herc-Alloy chain used extensively for all load lifting uses).
- **Grade 100** = V (Very high tensile chain – Usually pink in colour).

The following types of chains **MUST NOT** be used for lifting a load:

- Wrought iron chain.
- Grade 75 (transport lashing chain).
- Proof coil chain.
- Approved grade chains under allowable diameter.
- Mild steel chain.

Lifting chain is proof-tested short link chain. The barrel of short link chain requires a greater force to bend, provides greater strength, reduces the tendency to twist and provides better reeving performance.

Grade markings or letters denoting the grade are stamped or embossed on the chain at least every metre or every 20 links, whichever is less.

Grade 80 (T) chain is the minimum grade of chain that can be used for general load lifting uses, such as wrapping and reeving.

Inspection Criteria for Chains

You must check any chains carefully before using them. The checklist below outlines what you are looking for. If a chain shows any of these then it is unsuitable for use.

Possible chain defects:	
Missing rated capacity tag.	Twists and/or kinks and/or knots.
Cracks in link welds, spot-welding.	Stretching.
Exposure to excessive heat.	Locked or movement restricted.
Pitting.	Severe/excessive rust or corrosion.
Gouged/cut/crushed more than 10% of original link diameter.	
Excessive wear on chain (over 10% wear in link diameter).	

If any of these are present then the chain **MUST NOT BE USED!**

Chain slings should be made up to AS 3775 *Chain slings–Grade T* or the manufacturer's recommendations. When ordering parts for chain slings, ensure that they comply with the appropriate Standard.

The manufacturer's tag must be fixed on all chain slings. The tag must detail the rated capacity of the sling under all conditions and configurations of use.

If you cannot find a legible manufacturer's tag the chain sling should be taken out of service, in line with safe work procedures.

Synthetic Slings

Flat webbing and round synthetic slings are used for lifting where it is necessary to protect the load from damage and for protection from electrical hazards.

They are made from nylon, polyester, polypropylene or aramid polyamide. Each sling must be labelled with their rated capacity.

Ensure that synthetic web slings are not twisted when being used to support or lift loads, as this will decrease the rated capacity of the sling.

Inspection Criteria for Synthetic Slings

You must check any synthetic slings carefully before using them. The checklist below outlines what you are looking for.

Possible synthetic sling defects:	
Missing or illegible Rated Capacity tag.	Damage to stitching.
Stretched or damaged sleeve.	Cuts, tears or contusions in outer sleeve.
Broken fibres/strands (internal wear).	Damage from temperature or sunlight exposure.
Internal or external wear, burns or abrasions.	
Damage from chemical exposure (including alkaline or acidic substances or solvents).	
Damage to eyes, terminal attachments or end fittings.	

If you are using sling shorteners you must ensure they do not have more than 10% wear. More than 10% wear condemns them for use and they must not be used.

Flexible Steel Wire Rope

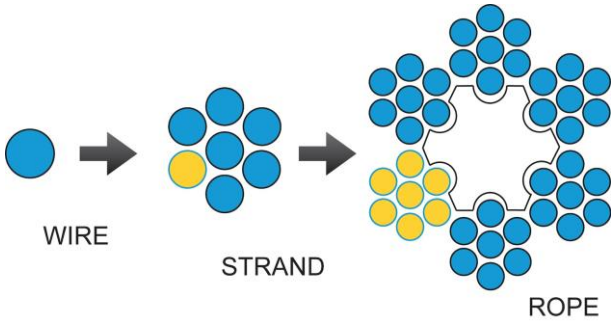
There are two principle grades of flexible steel wire rope (FSWR):

- **Grade 1570** – This rope is galvanised in appearance and usually has a fibre core.
- **Grade 1770** – This rope is blackish in appearance and usually has an independent wire core.

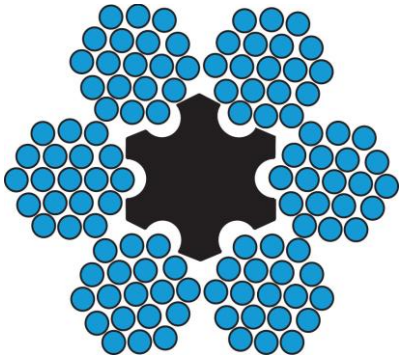
The smallest diameter of FSWR that can be used for lifting purposes is 6mm.

The maximum temperature exposure for fibre core FSWR is not to exceed 95°C.

FSWR is constructed of wires and strands laid around a central core.



In the example below there are 19 wires to the strand and 6 strands around the core making up the rope:



It is important not to confuse wires and strands. If a strand is broken, the rope is unusable. A single broken wire in a sling is not as important unless broken immediately below a metal fitting or anchorage.

Inspection Criteria for FSWR

You must check any FSWR carefully before using it. The checklist below outlines what you are looking for. If a FSWR shows any of these then it is unsuitable for dogging.

Possible FSWR defects:	
Missing or illegible rated capacity tag.	Abrasion or wear.
Bird-caging (strands loosened from proper tight lay).	Stretched or overloaded FSWR.
Kinking or fractures from bending or reeving.	Knotted FSWR.
More than 10% wear in the rope diameter.	Core collapse.
Crushed/damaged strands.	High stranding.
Splice, ferrule, eye or thimble damage.	High temperature exposure.
Serious corrosion (indicated by loose and springy wires).	
Excessive number of broken wires. (Not to exceed 10% of the total number of wires in the FSWR over a distance of not more than one rope lay – where one rope lay is approximately 8 x the diameter of the FSWR). E.g. 10mm diameter. 6/19 FSWR – 6 x 9 = 114 wires 114/10 = 11.4 = 11 wires 11 Broken wires over a distance of 8 x 10mm = 80mm	

If any of these are present then the FSWR **MUST NOT BE USED!**

Shackles

A shackle is a portable link, used for joining various pieces of lifting equipment. The two main shapes for load lifting are the 'dee' and 'bow' shackles.

Almost all shackles are made of round bar and have circular eyes. The pin of the common shackle screws directly into one eye and should preferably have a collar.

In some shackles, the pins pass clear through both eyes and are secured by a split pin forelock (i.e. split flat cotter pin) or nut and split pin.

If you are using a shackle to support multiple slings ensure that you use a bow shackle. Always use the correct size of shackle pin. Do not use a nut and bolt in place of the proper shackle pin. A bolt that does not fit tightly is likely to bend and break.

Shackles must have their rated capacity stamped on the shackle (not on the pin).

Bow Shackle

Dee Shackle

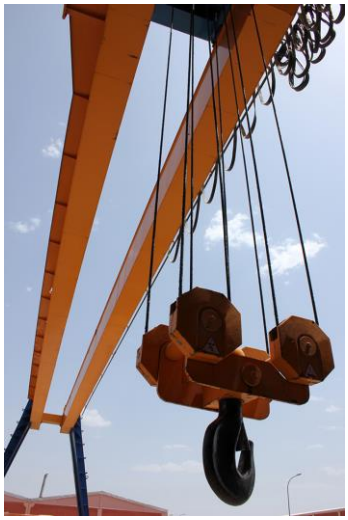
Inspection Criteria for Shackles

If a shackle shows any of these defects then it is unsuitable for use:

Possible shackle defects:	
Missing or illegible rated capacity.	Bent or warped.
Cracks and chips.	Stretched, bent, defective or wrong pin.
Wear of 10% or more.	Pin won't screw in or the retaining pin is missing.

2.3.1.4 Lifting Hook

Make sure the lifting hook has the rated capacity stamped or marked on it. The hook should be fitted with a safety latch.



Inspect the lifting hook for damage or excessive wear. Defects that would render a lifting hook unusable include:

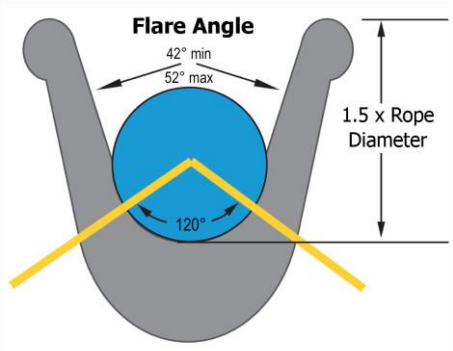
- Cuts or gouges of more than 10%.
- Bill is stretched more than 5%.
- Cracks or twisting in the hook.
- Exposure to excessive heat.
- Missing safety latch.
- Hook swivel for visible damage.
- Rated capacity not marked.

2.3.1.5 Sheaves

Sheaves lead the rope over the head of cranes and hoists and are used in pulley systems to gain a mechanical advantage.

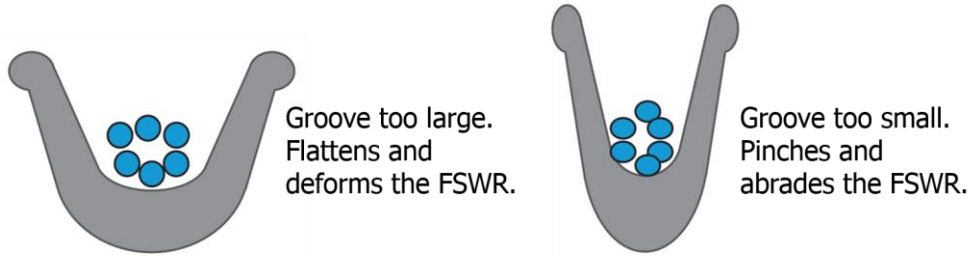
Make sure that the Flexible Steel Wire Rope (FSWR) sits neatly in the base of the sheave groove. The amount of FSWR sitting in the groove should be either one third (1/3), 120° or as per manufacturer's specifications.

The groove depth of a sheave should not be less than 1.5 times the diameter of the FSWR (or in accordance with manufacturer's specifications).



Correct Groove

If the grooves are too large then the rope will be flattened and deformed. If the grooves are too small the rope will be pinched and abraded. Any damage to the FSWR may lead to its failure.



Inspect the sheaves for damage or excessive wear. Defects that would make a sheave unusable include:

- Sheave is twisted or deformed out of shape.
- Excessive wear in the groove.
- Damage (e.g. cracks) in the flange.
- Worn sheave or hinge pins.
- Damage to the cheek plates or the cheek plate wall/partition is too far or too close from the sheave.

2.3.1.6 Drums

The drum is the pulling mechanism that rotates, hauls in and stores surplus wire.

The braking mechanism is connected to either the drum or the gearing. The drum or gearing is joined to the drive mechanism.

Drums are measured from the centre to the inside of the flange. A drum that measures 1m from flange to flange is therefore a 0.5m drum.

The rope should lie neatly on the drum and not be bunched up.

When the hook block is at its lowest possible point there should still be a minimum of two full turns on the drum (or as per manufacturer's specifications).

When the drum has been wound to its maximum turns the flange must still extend 2 rope diameters above the outer layer of the rope.

The hoist rope must be anchored to the drum with a fixed mechanical anchorage such as:

- A socket and wedge.

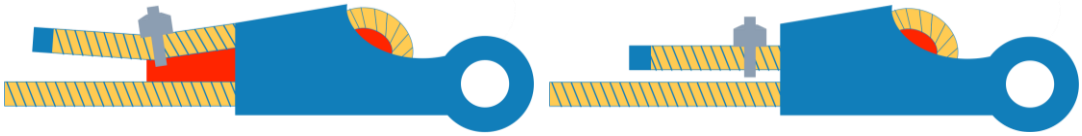
Or

- A clamp and bolts.

2.3.1.7 Wedge Sockets

A wedge socket is used to securely hold the tail of a hoist wire rope. A minimum of 200mm of tail on the dead end of the rope should project from the wedge socket.

A bulldog clamp should be applied to the dead end of the rope below the socket, using one of the below methods:



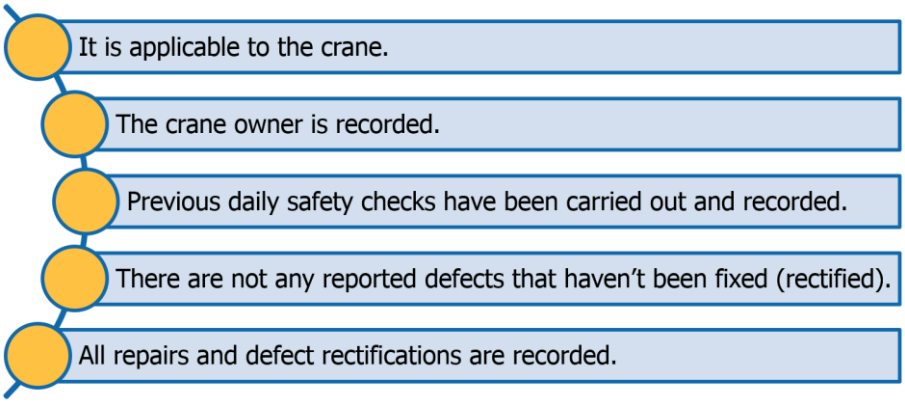
2.3.1.8 Check the Crane Logbook

The crane logbook is used to record information about the crane operation, servicing and repairs, the daily safety checks that are completed and to report defects and whether the defects have been rectified.

The crane logbook may also be called the:

- Service book or service logbook.
- Logbook.
- History record.

You should check the logbook to make sure:

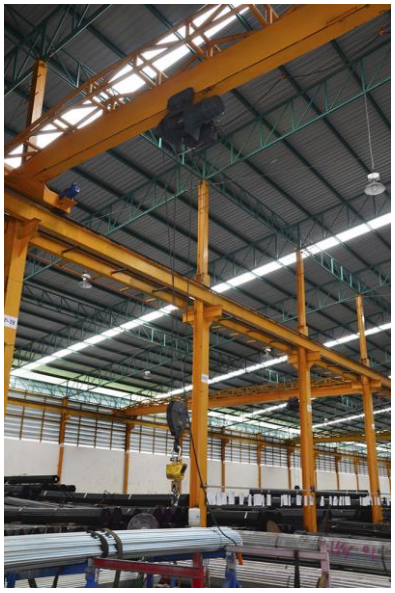


All defects must be recorded in the crane logbook, along with any action taken to return the crane to service.

As the crane operator you must record all crane defects in the logbook (crane operator's logbook) and according to any other workplace procedures.

Do not start up the crane if previously reported defects have not been fixed.

2.3.1.9 Check Signage and Labels



As well as the crane logbook, check that all signs, labels and decals are present and readable. This information will allow you to work out:

- The capacity and capabilities of the crane.
- How to operate the crane safely.

Inspect the bridge and gantry crane to make sure that all appropriate signs and labels are present and that they can be easily viewed and are not damaged or illegible.

Signs and labels you would check for include:

- Crane data plates/labels.
- Load charts.
- Crane decals.
- Control labels.

Signs, labels and load charts will help you to evaluate the capacity and capabilities of the crane.

2.3.2 Safely Access the Crane

Cabin-operated cranes must be accessed safely using any ladders, steps, footholds or grab rails provided. Always face the crane when mounting or climbing down. Do not stretch or twist your body when accessing the crane.

Climb into the cabin safely using 3 points of contact at all times. This means having 2 hands and 1 foot or 2 feet and 1 hand in contact with the ladder or guardrails at all times. Make sure all points of contact are free from slipping or tripping hazards (e.g. grease or debris).

2.3.3 Locate and Identify Controls

Before starting up the bridge and gantry crane and carrying out operational checks, it is important that you are familiar with the location of various controls and their functions.

Controls may include:

- Long travel levers.
- Cross travel levers.
- Hoisting and lowering levers.
- Rotating hook levers (where applicable).

Make sure all control labels are present and legible.

If you are using a remote-operated bridge and gantry crane you may have a different range of control buttons or levers.

Ensure that you make yourself familiar with these prior to operation.

2.4 Start the Crane

Start the bridge and gantry crane according to the manufacturer's start-up procedure.

If you hear any abnormal noises after you have started the crane you will need to shut the crane down. Put a tag on the crane and report the noise to the appropriate person.

2.5 Conduct Post-Start Checks

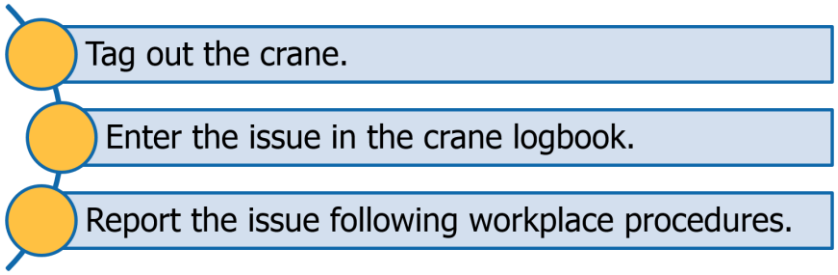
Once the crane is started you need to complete the post-start checks. These checks make sure that the bridge and gantry crane is safe and functioning correctly by testing the crane functions, all of the controls and the crane movements to their full capacity.

Post-start checks include:

- Checking that all hazard controls are in place before work begins.
- Testing all crane movements and controls to the full extent of their capability.
- Checking the cabin isolation switch is off and that it does not have any danger tags attached to it.
- Checking brakes are working correctly.
- Checking communication equipment and systems.
- Checking that you have a clear view from the operating position across all work zones. This will ensure that your view is not obscured when carrying out operations.
- Checking the limit switches and two block limit.
- Checking warning lights, systems and devices.
- Inputting data into the crane's computer (if applicable) and making sure that it is accurate.

You must test the full range of the crane's movements to make sure that it is functioning properly and therefore that it is safe to use.

If the crane doesn't function to the full range of motions:



2.5.1 Check Crane Safety Devices

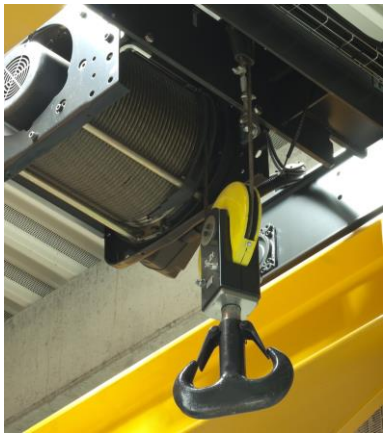
Check all safety devices on the bridge and gantry crane including:

- Horns/sirens.
- Audible and visual motion devices.
- Operator restraint devices (where applicable).
- Lights.
- Two-block/double block system.

The load mass indicator should be calibrated every six months (or in accordance with the manufacturer's specifications).

You can test the accuracy of the load mass indicator by selecting a load that you already know the weight of, lifting it and testing the result on the indicator against the known weight of the load. Always follow the manufacturer's specifications for testing the load mass indicator.

2.5.1.1 Hoist Limit Switch



Make sure that the hoist limit switch is checked and fully functioning before operating the crane. If a hoist limit is exceeded it can cause:

- Two-blocking (also called double blocking).
- The hook/block assembly being dragged into the head sheaves, causing damage.

Checking the hoist limit switch (also referred to as the upper limit switch, cut-out switch or two-block limit) may involve slowly raising the hook block until the limit switch is tripped.

The crane you are operating may also be fitted with a **Lower Hoist Limit** switch. Checking this may involve lowering the hook block until one turn of rope is left on the hoist drum. This should activate the lower limit switch if it is fitted.

Always check the crane specifications to see what switches are fitted and the specific testing procedures to follow.

Two-blocking can result in the following:

- Flexible Steel Wire Rope (FSWR) can break.
- The load can drop.
- The sheave can be damaged.
- The crane can be structurally damaged.

2.6 Check Communication Equipment

Make sure all communication equipment is in good working order and is not defective. Do not use faulty equipment.

Inspect all communication equipment before you start your work to make sure that it is working correctly and that effective communication can be established and maintained at all times.

Communication equipment used in bridge and gantry crane operations may include:

- Whistles
- Bells.
- Buzzers.
- Two-way radios, usually fixed channel.

Where radio communication equipment is used, the transmitting frequencies of the equipment must be selected to prevent interference to or from other radio equipment being used in the vicinity of the crane.

2.7 Report and Record Equipment Faults

You can use an inspection checklist/logbook to record all checks carried out and all defects identified.

If you find any faults or signs of defects on the crane or the crane cannot function to the full range of its movements, you must:

1. Tag out the crane to isolate it from use.
2. Report the defect following procedures.
3. Do not use the crane until the fault or defect has been fixed (rectified).
4. Record the fault in the crane logbook.

Report any evidence of tampering or interference with the crane to your supervisor or other responsible person.

DO NOT use the crane or equipment until it has been fixed and returned to service.

3.1 Prepare for Lifting

Once the crane and associated equipment has been checked and has been determined to be safe for use you should make sure you have made the following considerations so that the lifts can be safely carried out:

Weights and Sizes of Loads
Accurately measured or determined.

Access and Egress
To the crane, for load movement and pick-up and landing areas.

Obstructions and Hazards
Have been assessed and removed or managed according to the hierarchy of hazard control.

Capacity of the Crane
Has been confirmed and appropriate to loads to be lifted.

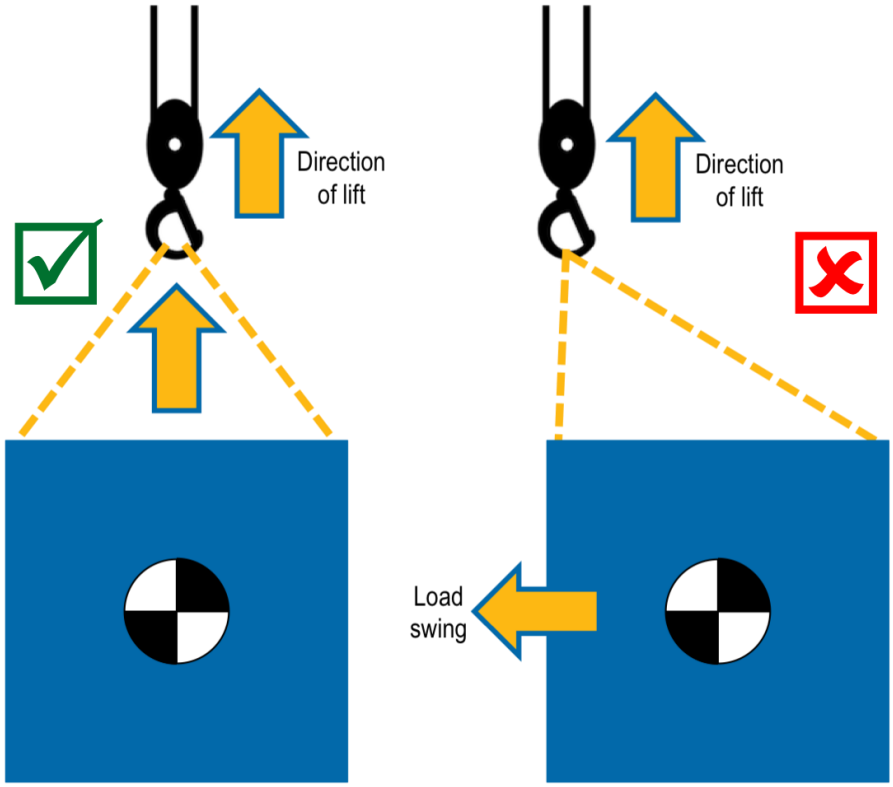
Mobility
Crane movements, both of the hoist and carriage, work properly and to the full range of motions.

3.1.1 Position the Hoist Block

The hoist block should be positioned above the centre of gravity of the load before lifting operations are commenced. This will help to prevent the load from swinging out of control or being dragged or snigged when it is moved.

Dragging or snigging the load can cause the crane to overload or damage the crane, the load or lifting equipment.

Get the dogger or rigger to guide you to make sure the hoist block is positioned correctly above the load if you are operating the bridge and gantry crane from the cabin.



3.1.2 Attach and Secure Lifting Equipment

Once the hoist block is in position the load will need to be attached to the crane hook using the appropriate equipment and procedures.

Connecting slings to a load is a task that requires specific knowledge and experience and can usually only be performed by a qualified dogger.

However, there are circumstances when a crane operator can sling loads. This may be when there are no decisions that have to be made concerning the selection or inspection of slinging equipment, the selection of slinging techniques or the identification of lift points or the directing of the crane operator in the movement of the load (particularly when the crane operator cannot see the load).

If a sling or any other equipment you are using to sling a load appears to be faulty or have defects you must segregate the affected equipment and attach an Out of Service tag.

3.1.3 Protecting a Load

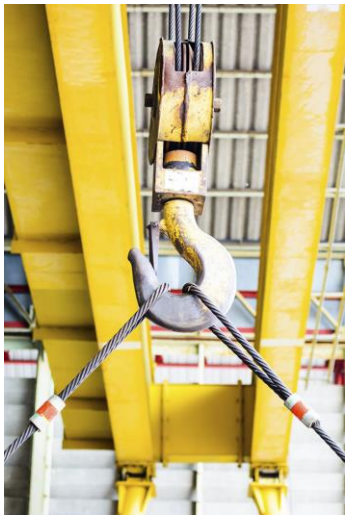
Packing and dunnage can be used to:

- Protect the load.
- Prevent damage to lifting equipment (e.g. sharp edges of the load may cut a sling).
- Allow lifting gear to be attached and removed safely.

To protect the load and lifting equipment you could use:

- Packing.
- Lagging.
- Padding.
- Corner pads.
- Edge protection.

3.2 Conduct a Test Lift



Before moving the load it is important to conduct a test lift. A test lift is performed by raising the load slightly off the lifting plane.

Test lifts can be used to ensure that:

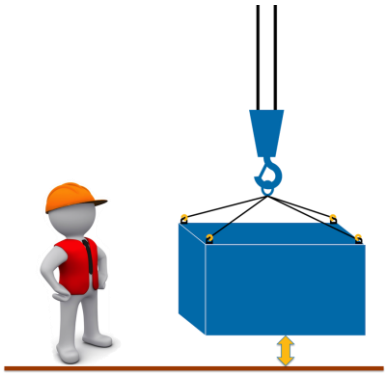
- Near capacity loads do not overload the crane.
- Loads of unusual shape or weight distribution are slung correctly.
- All crane equipment/functions are working properly.
- The load is:
  - Stable.
  - Secure.

Associated personnel such as doggers and riggers will be able to determine if the load is slung correctly by the amount the load moves as it is lifted.

When conducting a test lift it is important to check that there are no obstructions or loose parts under the load and that there is no possibility of the load being dragged or snigged.

Test lifts can also allow you to:

- Make adjustments to the slinging in a safe manner.
- Verify the calculated weight of the load using measuring equipment.



If there are any problems with the lift (e.g. the load is unstable or slung incorrectly) then you should:

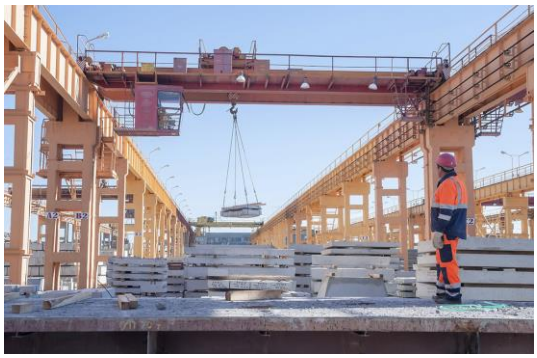
1. Lower the load immediately.
2. Make the necessary adjustments to correct the issue.

Don't continue working until the issues have been addressed and fixed.

3.3 Operate the Bridge and Gantry Crane

Once you are satisfied that the load is ready to be moved safely you can begin lifting operations.

If new or unforeseen hazards appear while operations are being carried out you will need to stop and control them before carrying on with your work.



Follow all appropriate procedures and standards when transferring loads. Make sure all crane movements are controlled and smooth. Quick or jerky movements may cause the load to swing.

Always operate the bridge and gantry crane according to the procedures set out by the manufacturer. Following the manufacturer's specifications will help ensure that the crane is not overloaded or operated in a way that is unsafe.

Do not operate the crane beyond the limits set down in the manufacturer's specifications.

3.3.1 Using Taglines

If associated personnel are involved in the lift, the dogger/rigger may use a tagline to control the load while in motion and assist in safely landing the load.

A tagline should be used whenever the load may be easier to control during the landing of the load.

Only non-conductive ropes should be used as taglines.

If taglines are being used you should consider the following:

- Weather conditions.
- Electrical hazards.
- Changeover of tagline.
- PPE of person holding the tagline.
- Make sure the tagline does not become fouled or caught up on any obstructions.
- Make sure the tagline is at least 16mm in diameter.

3.3.2 Checking Weather Conditions

Keep an eye on the weather conditions around the crane.

Be particularly careful of the effect of wind. The force of wind may cause the following possible hazards:

- The load to swing or spin around.
- Damage to the crane.
- Instability of the crane.

Check the manufacturer's specifications or the crane itself for information related to maximum allowable wind speeds (velocity) for operations.

If wind speeds are getting close to or exceed the allowable limits you will need to lower the load and make it safe.

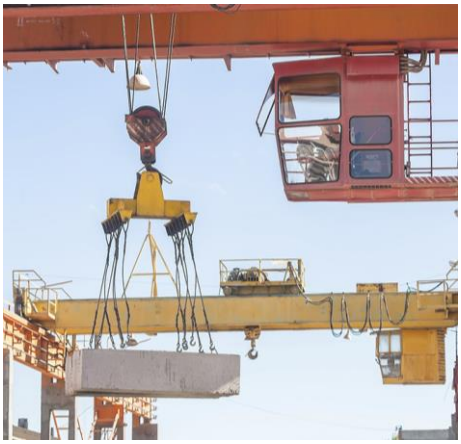
Do not recommence operations until the weather conditions are safe again.

If a severe electrical storm is approaching you should lower the load and pack up the crane. Do not operate the crane during an electrical storm.

3.3.3 Monitoring Load Movement

It is important to continually monitor the movement of the load so that you can identify and control any hazards that may occur while moving a load. You can also make sure the load remains safe, that no workers are put in danger and that the crane remains stable.

Do not lift a load over workers or pedestrians. This would be extremely dangerous and could result in a serious injury or death.



3.3.4 Landing the Load

Land the load at the prepared load destination.

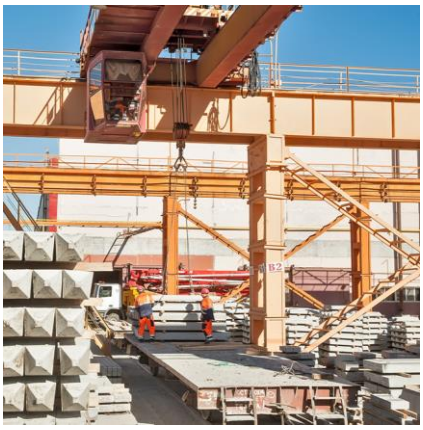
The load destination should be prepared to ensure that the load is stable and secure from movement once it is landed.

If the load is not secure or stable it could move causing damage to the load or injury to workers.

Loads should be landed on blocks or packing (where necessary) to allow the safe removal of the lifting gear.

Round loads should be chocked to prevent the load from rolling or shifting once the lifting gear is removed.

No load should be allowed to remain suspended on the hook if the crane is going to be left unattended. This can create a risk of:



- The load lowering.
- The load swinging.
- The load becoming unstable.

If lowering onto trucks make sure you coordinate and communicate with the driver of the vehicle.

Remove or disconnect the lifting equipment from the load and/or lifting hook according to procedures.

Lifting equipment should be properly stored or prepared for the next task.

3.3.4.1 Landing Loads with Remote Controlled Cranes

If you are operating a remote controlled bridge or gantry crane you should take the following action before you remove the slings from the load:

- Lower the load.
- Disable all of the powered functions of the crane.
- Implement appropriate measures to prevent the crane from being operated while you remove the slings.

3.4 Unplanned and Unsafe Situations

Unplanned or unsafe situations can occur at any time while you are operating a crane. These may include:

- Failure/loss of control (e.g. crane becomes non-responsive).
- Failure of equipment (e.g. hoist system).
- Environmental conditions (e.g. wind, lightning, storms).
- Obstacles and obstructions.
- Unusual or difficult terrains.

If an unsafe incident occurs whilst you are operating a bridge and gantry crane you will need to:

1. Stop work immediately and if it is safe to do so.
2. Assess the problem.
3. Find a solution if possible (resolve the problem).
4. If needed, seek advice and assistance.
5. Report the incident according to procedures.

If the crane breaks down away from the access ladder or platform you will need to follow the workplace specific procedures for raising the alarm and evacuating from the crane.

3.4.1 Respond to Warning Lights, Cut-Outs and Alarms

Keep a look out for warning lights, cut-outs and alarms during crane operations. They may indicate that a defect has occurred.

If you observe these warning signs you will need to:

- Stop the crane.
- Identify the problem.
- Slowly lower the load if it is raised, ensuring it remains under control.
- Tag the crane out.
- Report the problem to the appropriate person.
- Do not use the crane again until the issue has been fixed.
- Fill in the logbook with the details.

3.4.2 Respond to Major Electrical Faults

The crane, its load, or both, can become energised if there is a major electrical fault. This can be very dangerous, as anyone who touches the crane or load could be electrocuted.

If a major electrical fault does occur you should:

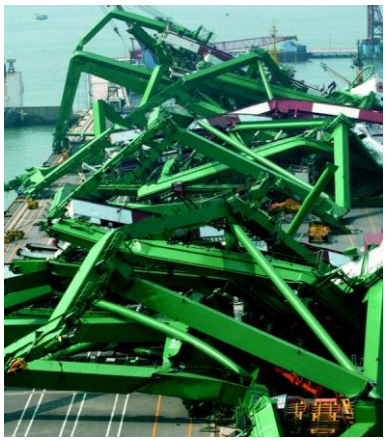
1. Use the emergency stop button.
2. Shut down the mains power supply to the crane.
3. Call for assistance.

Follow all incident reporting and first aid procedures if necessary.

Do not use the crane again until it has been inspected and is deemed ready to be used again.

3.4.3 Respond to Workplace Emergencies

In any emergency situations you should always follow the procedures for the workplace where the crane is located – different sites or organisations will usually have different procedures based on the specific details and arrangements of the site.



Site emergencies may include:

- Fire (electrical, chemical, gas, mechanical, paper, wood or natural).
- Gas leak.
- Toxic and/or flammable vapours emission.
- Vehicle/machine accident.
- Chemical spill.
- Injury to personnel.
- Structural collapse.

Always communicate with the person dogging the load prior to leaving the crane.

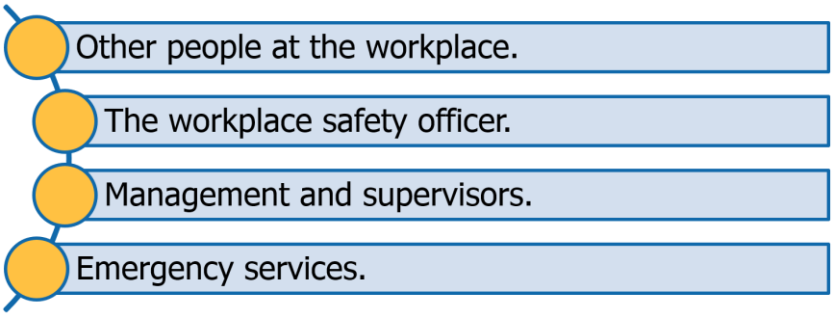
3.4.3.1 Emergency Response

If an emergency situation arises it is essential to communicate the important information. You should communicate:

- That an emergency situation exists.
- The nature of the emergency (e.g. fire, structure collapse).
- Where the emergency is and the unsafe area/s.

3.4.3.2 Reporting an Emergency

There are a number of people that will need to be told about the emergency. These include:



3.4.3.3 Evacuation and Escape Routes

Always make sure you know the evacuation and first aid procedures for the workplace and organisation.

Knowing evacuation and escape routes is particularly important if you are working from a cabin-operated bridge or gantry crane that has multiple access points.

All worksites should have both a primary and secondary escape route. The secondary route will be necessary in the event that the primary one is rendered unsafe.

Once you have used the escape route you should assemble at the designated emergency assembly point.

3.5 Conclude Operations

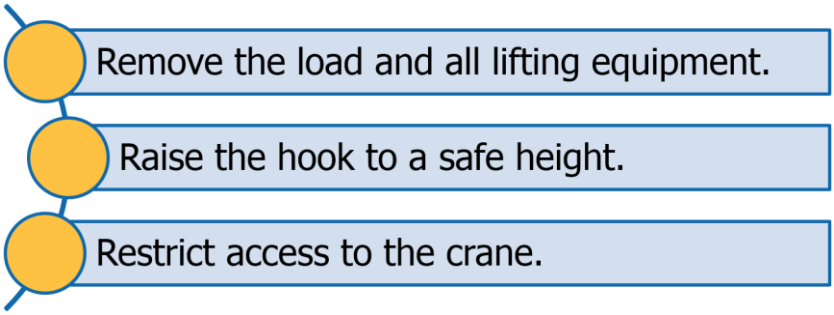
Once the job has been completed you will need to conclude operations in accordance with site procedures and manufacturer's specifications. Generally this will involve:

- Parking the crane.
- Stowing the crane and equipment.
- Shutting down and securing the crane.

Do not leave the crane controls until you have taken the following precautions:

- Made sure the crane is not still carrying a load.
- Raised the crane hook to a safe height.
- All relevant motion locks and brakes have been applied.
- Shut down the crane according to the manufacturer's specifications.
- Secured the crane against unauthorised use or access.

If you are going to leave a bridge and gantry crane unattended overnight you will need to:



3.5.1 Park the Crane and Stow Equipment

Park the crane and stow any equipment you have used according to procedures and the appropriate standard.

Your workplace procedures may outline the position that the crane needs to be left in. For some cranes this may be determined by the location of access ladders, while other cranes may need to be parked in a particular position, such as at the end of the carriage. Always check the procedures for the workplace.

Store all lifting equipment in a clean dry storage cabinet or area and hang them or coil them neatly according to site procedures.

3.5.2 Apply Motion Locks and Brakes

It is important that all relevant motion locks and brakes are applied before shutting the crane down. These could include hoist brakes and storm brakes, but will depend on the type of crane you are operating.

Ensure that all manufacturers' specifications and site safety procedures are followed.

3.5.3 Shut Down and Secure the Crane

Once the crane is in the designated shutdown location, ensure that you follow manufacturer's specifications and site safety procedures.

A typical shutdown procedure may include:

- Retracting and raising the hoist and hook block lifting assembly clear of obstructions.
- Travelling the crane to the park position.
- Making sure the hoist brake is applied (if applicable).
- Making sure all controllers are in neutral (if applicable).
- Removing the key from the control panel (if applicable).
- Making sure the cabin exit/access ladder is in line with the exit/access platform.
- Locking and securing the cabin.
- Isolating power to the crane.
- Isolating the cabin with the main switch.
- Turning off the main isolating switch.
- Applying the storm brakes/clamps (if applicable).
- Removing hazard controls if no longer necessary.

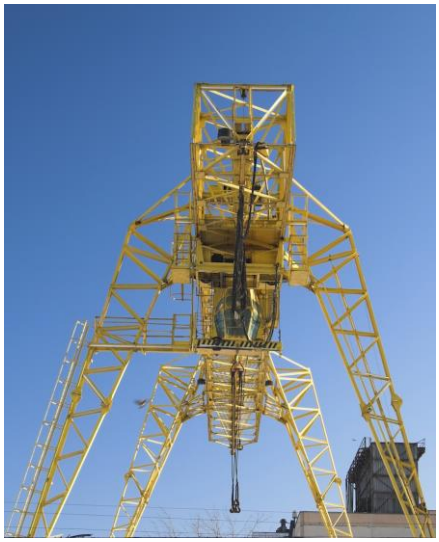
No load should be allowed to remain suspended on the hook if the crane is going to be left unattended.

3.6 Conduct Post-Operational Checks

After completing all shutdown procedures it is important that all post-operational checks are completed.

Carry out all post-operational checks according to the manufacturer's instructions and relevant site procedures.

A routine post-operational check of a bridge and gantry crane may involve:



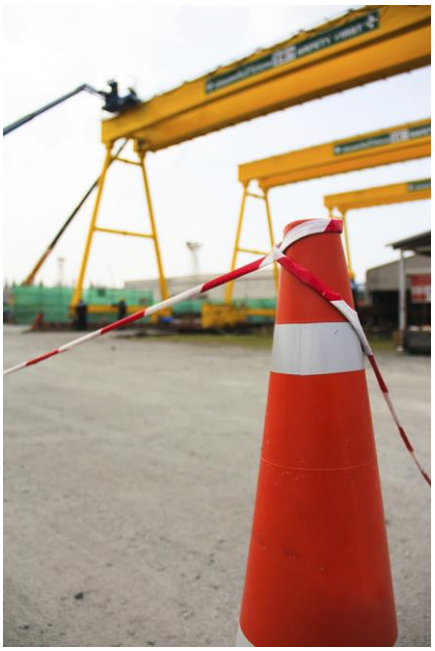
- Checking for any crane damage including:
  - Structural damage.
  - Signs of obvious damage to the crane.
- Checking all fluid levels and for any signs of leaks.
- Making sure loose items are stowed or secured.
- Using load restraints if and when necessary.
- Checking that the hook/lifting assembly has been raised clear of obstructions.
- Any applicable controllers are in neutral.
- Any other checks as specified in the manufacturer's instructions.
- Removing any hazard controls (if any are still in place and if required).

Refer to the service logbook or inspection checklist for a list of items that should be checked on the crane.

Always inspect the crane after you have finished operations so that you can check it for any damage or defects that may have occurred during use.

3.6.1 Remove Hazard Control Measures

Any hazard control measures that are no longer required should be removed from the work area (e.g. removal of temporary fences/barricades or signage).



3.6.2 Record and Report Damage and Defects

Record and report any faults that you find during the post-operational checks for corrective action, or according to workplace procedures. Generally this will involve:

- Isolating the crane or faulty equipment and attaching a danger tag to it.
- Recording the fault as per site procedures (e.g. in the crane logbook or service logbook).
- Reporting the fault to an authorised person for corrective action.

3.6.3 Completing Records

All information related to crane operations should be accurately recorded in the appropriate documents.

Records may include:

- Safe Work Method Statements (SWMS).
- Logbooks.
- Inspection checklists.
- Maintenance records.
- Hazard reports.
- Supply and delivery documents.
- Permits.

Use the approved forms and documents for the workplace and make sure the required documents are completed correctly and on time.

Use clear and concise language so that they can be easily understood. Avoid unnecessary repetition and overly technical terminology. Inaccurate, missing or misleading information can cause delays, hazards or legal issues.

Make sure records are passed on to the appropriate person or filed as required.

3.6.4 Clear Work Area

Clearing / refurbishing the work area and returning it to normal operations also includes:

- Removal of rubbish.
- Disposal of contaminated waste according to site procedures.
- Disposal of any fluids.
- Use of recycling where possible.

Appendix A – Safe Work Method Statement

Bridge and Gantry Crane Inspection Checklist			Date:
Company Name:			Site:
Machine Number:			Operator Name:
Item To Be Checked By Operator:	**✓**	**✗**	**Fault Report**
Beams and crane structure (damage, wear, obstructions)			
Signs and decals, control labels			.....
Hydraulics (lines, rams, connections)			.....
Crane hook, attachments, lifting gear			.....
Drum and wire rope (where applicable)			.....
Collector basket/buzz bars (if visible)			.....
Brakes (storm brake)			.....
All crane controls, emergency stop			.....
Isolation and limit switches			.....
Isolating panels/circuit breakers			.....
Electrical collector wires (no broken wires and insulated properly)			.....
Safety devices (alarm, brakes)			.....
Safety chains/gates (set up and serviceable)			.....
Fire extinguisher (where applicable)			Danger Tag Attached? Yes / No
Communication equipment (where applicable)			
Action Taken To Repair Bridge and Gantry Crane:			
Name:			Date of Repair:
Return To Service Authority By Supervisor			
Comments:			
Supervisor Name:	Signature:		Date: