



CPCCLDG3001 Licence to perform dogging

Student Guide



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Welcome

Welcome to **CPCCLDG3001 Licence to perform dogging**.

Information provided may help to ensure your safety.



This unit

This unit specifies the skills and knowledge required to safely perform dogging work. Dogging consists of the application of slinging techniques to move a load, including the selection and inspection of lifting gear, and the directing of a plant operator in the movement of a load when the load is out of sight of the operator.

Dogging work is conducted in the construction industry and other industries where loads are lifted and moved using cranes or hoists.

Completion of the general construction induction training program, specified in the Safe Work Australia model Code of Practice: Construction Work, is required by anyone carrying out construction work. Achievement of [CPCWHS1001](#) Prepare to work safely in the construction industry meets this requirement.

Competence in this unit does not in itself result in a licence. A licence is obtained after competence is assessed under applicable Commonwealth, state or territory work health and safety (WHS) regulations.

Elements covered in this unit are:

1. Plan task
2. Select and inspect equipment
3. Set up task
4. Perform task
5. Pack up and clean up



WHS Law

Legislation is law passed by Parliament.

It governs many areas, including health and safety at work.

It can be national, or relevant to individual states and territories.

You need to know the WHS legislation that covers your job and workplace.

You are required by law to comply with them.

You need to understand how WHS Acts, regulations, codes and standards affect your work, job and workplace.



Acts & Regulations

Acts - Are law. They describe how to provide health and safety in the workplace



The Work Health and Safety Act 2011 QLD

The Act is the cornerstone of legislative and administrative measures to improve occupational health and safety

Regulations - are made under the Act. They set out the practical steps to follow to comply with the Act.

Mining Health and Safety (QLD)

Mining Health and Safety Act / Regulations are specific to state or territory.

Example

- WHS requirements for mining are regulated through:
- Work Health and Safety Act 2011 (QLD)
- Work Health and Safety Regulation 2011 (QLD)
- Mining and Quarrying Safety and Health Act 1999
- Mining and Quarrying Safety and Health Regulation 2017
- Coal Mining Safety and Health Act 1999
- Coal Mining Safety and Health Regulation 2017

Work Health and Safety Regulations

The Work Health and Safety Regulations are made under the Work Health and Safety Act.

The Regulations:

- Detail what is required to support the duties in the Act
- Specify the way some duties must be carried out
- Set the procedural and administrative requirements of the Act, such as licences for specific activities and record keeping

Codes of practice

Codes of practice are the practical guides that help workplaces comply with their legal duties under the model WHS Act and regulations.

These guides help workplaces to comply with their legal duties under the model WHS Act and regulations.

Australian Standards

Australian Standards – Standards are voluntary documents that set out specifications, procedures and guidelines that aim to ensure products, services, and systems are safe, consistent, and reliable.

On their own, standards are voluntary. There is no requirement for the public to comply with standards.

However, State and Commonwealth governments often refer to Australian Standards® (AS) or joint Australian/New Zealand Standards (AS/NZS) in their legislation.

When this happens, these standards can become mandatory.

The safest way to carry out the work activity is to read, understand and follow your:

- Safe work method statements
- Codes of practice

Safety Note

Characters used for illustration may not be wearing a helmet.

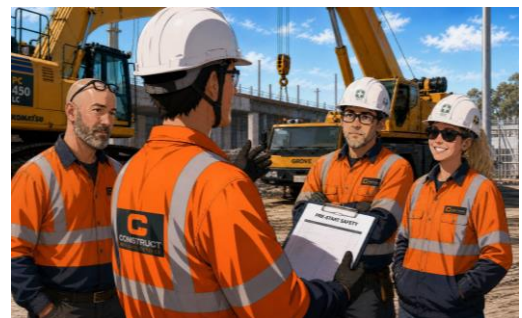
Note: Because dogging work takes place around overhead hazards and heavy machinery, **wearing a helmet is a mandatory** safety requirement **under Work Health and Safety (WHS) regulations**.

You **must wear** a safety helmet (**hard hat**) **when performing dogging work** in Australia.

Hazards

Talk to others about workplace hazards prior to working:

- Safety officer
- Supervisor
- Engineer
- Health and safety representative
- Other personnel



Consulting about workplace hazards

Speaking with other persons about workplace hazards before working will help you to:

- Identify any workplace-specific hazards or ground conditions
- Ensure workplace policies and or procedures are followed
- Identify hazards and controls



Plan and prepare

Other than hazards you should plan for

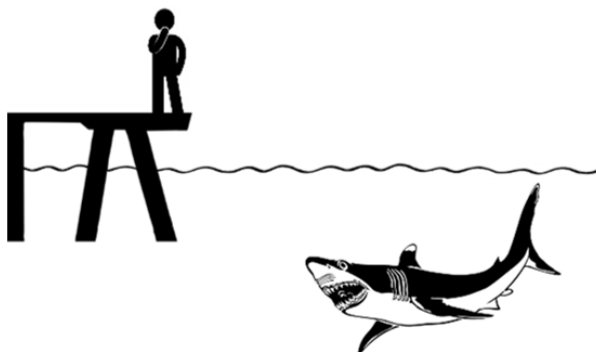
- Permits and Licences
- Location of task
- Characteristics of load
- Access and Egress
- Communications
- Equipment required and availability



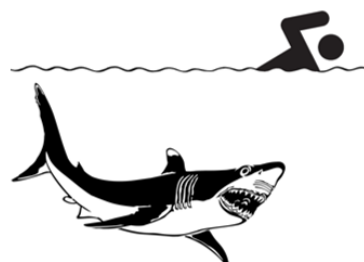
Hazard vs Risk

A Hazard is something that has the potential to harm you.

A source of potential harm or a situation with the potential to cause loss.



A Risk is the possibility of harm (death, injury, or illness) from exposure to a hazard



Dogging work

Types of work that a licensed dogger can perform

- Application of slinging techniques
- Load estimation
- Selection of lifting gear
- Inspection of lifting gear
- Directing the plant operator when the load is out of view



New or unknown dogging activities

An employer must provide **training, supervision, instruction and or information** before you can perform new or unknown dogging activities.



Duty of Care requirements

Duty of care examples

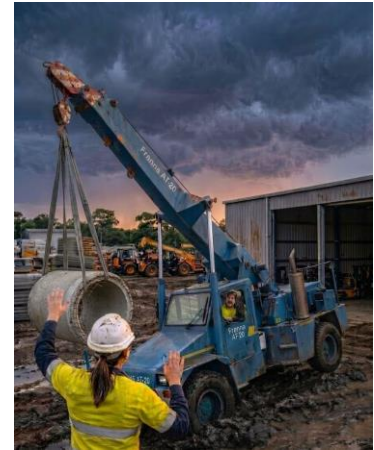
- Take reasonable care for own health and safety
- Take reasonable care for the health and safety of others who may be affected by your actions
- Cooperate with OHS/WHs requirements
- Do not interfere or misuse anything provided in a workplace for WHs/OHS



Work health and safety regulator

If a person is not conducting high-risk work safely the regulator can

- Suspend the licence
- Cancel the licence
- Refuse to renew the licence
- Order to undergo re-assessment



Health and safety

Employers have an obligation to ensure the health and safety of all workers by

- Providing and maintaining safe plant and equipment
- Providing and maintaining a work environment without risks to health and safety
- Providing adequate facilities
- Providing and maintaining safe work systems and or procedures



Obtain workplace safety information

Use documents to obtain workplace safety information

- Legislation and regulations
- Relevant Australian standards
- OHS/WHS policy
- Codes of practice
- Safe Work Method Statements (SWMS) or Job Safety Analysis (JSA)



Details on the safe use of slings

Information that will supply details on the safe use and care of slings could include:

- Australian Standards
- Manufacturer specifications



Australian Standards (AS)

Australian Standards provide the benchmark legal and safety framework for industry compliance. They outline the general requirements for design, testing, use, and ultimate disposal of different sling types.

Key applicable standards include:

- Synthetic Slings: AS 1353.2 covers the care and use of flat synthetic webbing slings.
- AS 4497 dictates rules for synthetic fibre round slings.
- Wire Rope Slings: AS 1666.2 explicitly focuses on the care and use of wire rope.
- Chain Slings: AS 3775.2 addresses the care and use of alloy chain slings for lifting purposes.

What information do they supply?

- **Mandatory Inspection Intervals:** Outlines how frequently a competent professional must inspect the rigging gear (e.g., periodic inspections at least every 3 to 6 months).
- **Standard Discard Criteria:** Broadly defines universal trigger points for destroying a sling, such as a maximum percentage of wire rope diameter loss, or the presence of unexplained lumps in round slings.
- **Testing and Safety Factors:** Establishes the standard engineering Safety Factor (e.g., 7:1 for common polyester round slings relative to their Working Load Limit).

Manufacturer Specifications

While Australian Standards give you the overarching rules, Manufacturer Specifications provide the exact, granular limitations of the specific piece of equipment you are holding.

What information do they supply?

- **Working Load Limit (WLL) & Hitch Configurations:** Details how the sling behaves under different configurations (e.g., vertical lift vs. a choke hitch vs. a basket hitch). The WLL decreases significantly depending on the angle of the lift.
- **Material Limitations & Environmental Restrictions:** Outlines exact tolerances regarding temperature extremes and chemical exposure (e.g., whether a synthetic sling can withstand specific acids, or the exact heat threshold before a chain sling loses its structural integrity).
- **Specific Retirement & Maintenance Criteria:** Provides explicit guidelines on cleaning instructions (e.g., avoiding high-pressure washers on synthetic fibres).
 - Details the specific dimensional wear tolerances (e.g., exact caliper measurements for chain link stretch) allowed before the item must be retired.

Consider and plan for hazards

- Structures (e.g., scaffold, bridges or buildings)
- Poor weather (e.g., wind, or lightening)
- Plant and equipment
- Underground services
- Electric lines
- Vehicle traffic
- Personnel or pedestrian



Fall prevention & fall arrest equipment

Fall-prevention and fall arrest equipment is required at **2m or higher**.



Risk controls and equipment

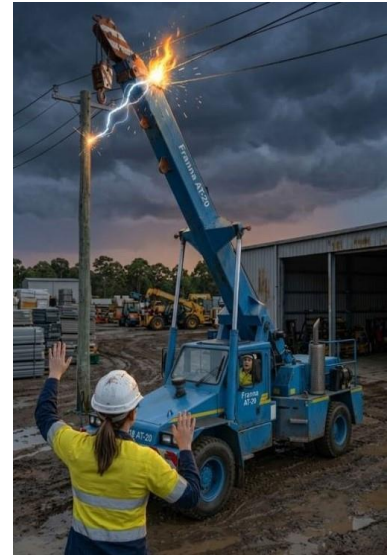
Use risk controls and equipment to prevent access to vehicles or pedestrians to the work area:

- Exclusion zones / traffic control
- Traffic or pedestrian barriers
- Signs / lights
- Traffic management plan

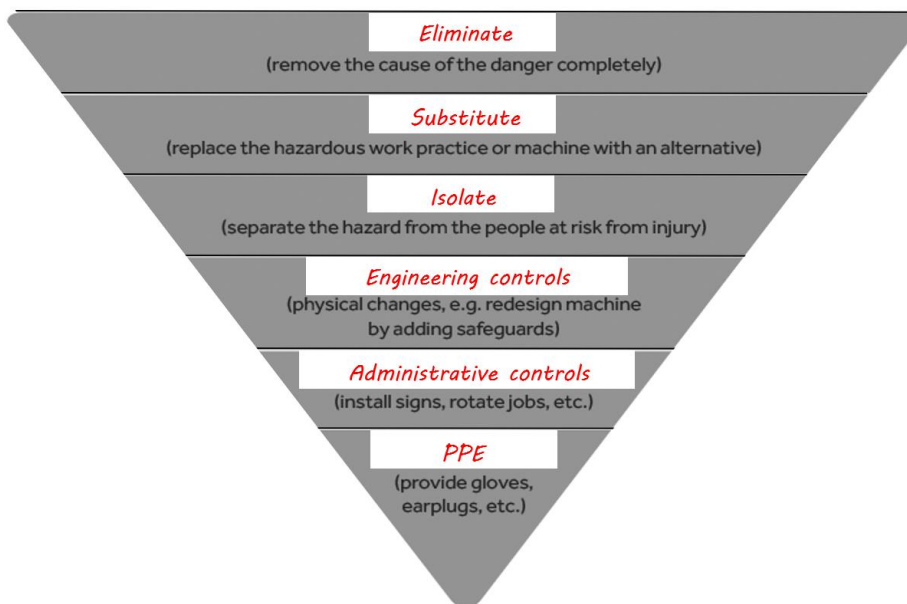


Respond to unsafe incident or event

- Stop work
- Assess the situation
- Resolve issue if possible
- Get advice and assistance where required
- Report the incident to relevant authority and according to workplace procedures



Hierarchy of hazard controls



Minimum safe operating distances

Minimum safe distances you must maintain when working near electric lines.

QLD

Up to 132KV = 3m

132kv to 330kv = 6m

More than 330kv = 8m

NT

50v to 1000v = 3m

1000v to 33000v = 3m

33000v to 66000v = 4m

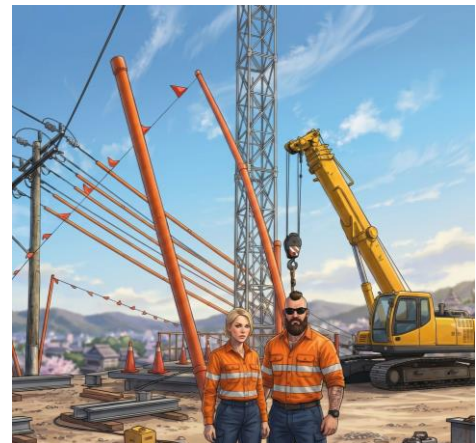
66000v to 132000v = 5m



Identify the location of power lines

Visual signs can help you to identify the location of power lines on your worksite:

- Safety warning/danger signs
- Power line marker balls
- Tiger tails



Power lines

If you need to work closer than the prescribed safe operating distances for power lines:

- Contact the relevant authority for an access permit
- Ask to have the power disconnected or appropriately insulated by contacting the relevant supply authority
- Use a qualified safety observer (spotter) and observe legislation within your state or territory



Risk and control

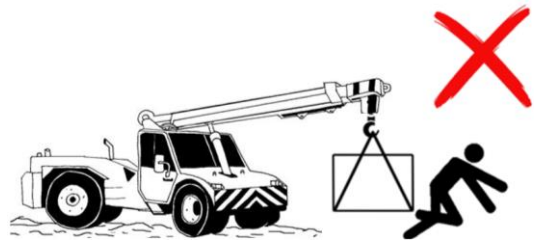
Person near the structure of a crane during operations

Risk

Person may be *struck or crushed by load or crane during movement*

Control

Exclusion zones to ensure personnel are clear of hazardous zones



Safe operations

Never raise or lower the load over people.

It may cause an **unsafe serious risk, injury, or death if load falls.**



Operating in low light

Before performing dogging activities in a low light environment, you must have **adequate lighting** over the whole work area to ensure safety.



Check your risk controls

Always apply risk control measures *before starting any work and as soon as a hazard is identified during a task.*



Inspect safety equipment

Always inspect safety equipment including personal protective equipment ***before and after any work.***



Planning the load path

When planning the load path for a stationary slewing crane, consider:

- Boom radius
- Boom length
- Obstructions
- Overhead electric lines
- Preventing persons from accessing load pathway
- Spotter



Responsibility

A Dogman is responsible for ***determining load weight***, and ***informing the crane operator of the load weight***



Determine load weight

Methods to determine load weight

- Weighbridge notes
- Estimate by calculation
- Weigh the load
- Marked on load



Planning to lift a live load

A changing centre of gravity is the primary consideration when planning to lift a live load.

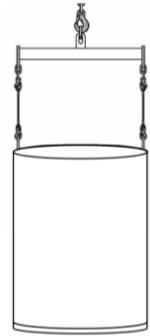


Calculating load weight

Load Material	Approximate Weight per m ³	Load Material	Approximate Weight per m ³
Aluminium	2700kg / m ³	Granite	2600kg / m ³
Bricks	4000kg / 1000	Gypsum	2300kg / m ³
Bronze	8500kg / m ³	Iron, ore	5400kg / m ³
Cast Iron	7200kg / m ³	Lead	11200kg / m ³
Cement (25 bags)	1000kg	Steel	7850kg / m ³
Clay	1900kg / m ³	Poly Pipe	970kg / m ³
Coal	864kg / m ³	Timber (hardwood)	1100kg / m ³
Concrete	2400kg / m ³	Timber (soft)	600kg / m ³
Copper	9000kg / m ³	Water	1000kg / m ³
Earth	1900kg / m ³		1L = 1kg

Drum lift

- A drum must be lifted using two vertical flexible steel wire ropes (FSWR) connected to a spreader bar
- The weight of the load is **1500kg**, this is evenly distributed between the lifting points



Calculate the minimum Working Load Limit necessary for each vertical sling leg?

$$1500\text{kg} \div 2 = 750\text{kg}$$

Working Load Limit for each sling is 750kg or 0.75 tonne

Using the load chart provided, what is the minimum diameter sling required when the slings are directly loaded?

Working Load Limit for each sling is 750kg or 0.75 tonne

Closest tonne 0.85 tonne

The minimum diameter sling needed is 10mm

WIRE ROPE SLINGS LOAD CHART

Manufactured to AS1666 SAFETY FACTOR OF 5



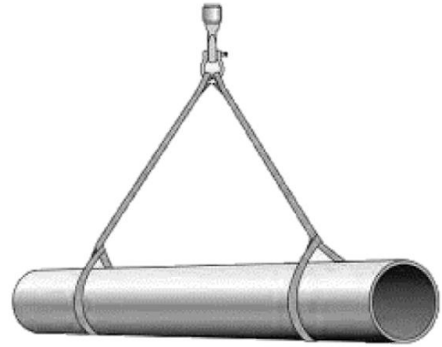
METHOD OF LOADING		DIRECT LOAD	CHOKE HITCH		BASKET HITCH								DIRECT LOADED	CHOKE HITCH					
			ROUND LOAD	RECT. LOAD	ROUND LOAD				OTHER THAN ROUND LOAD					ROUND LOAD	OTHER THAN ROUND LOAD				
ROPE																			
	NOM. DIA mm																		
INCLUDED ANGLE		-	-	-	0°	60°	90°	120°	0°	60°	90°	120°	0-60°	90°	120°	0-45°	0-60°	0-45°	0-60°
WORKING LOAD LIMIT IN TONNES																			
WORKING LOAD LIMIT (Tonnes) UNDER GENERAL USE WITH 1570 GRADE WIRE AND FIBRE CORE WITH FERRULE-SECURED EYES																			
8	0.55	0.41	0.27	1.09	0.94	0.77	0.55	0.55	0.48	0.39	0.27	0.94	0.77	0.55	0.71	0.71	0.48	0.48	
9	0.69	0.52	0.34	1.38	1.19	0.97	0.69	0.69	0.60	0.49	0.34	1.19	0.97	0.69	0.90	0.90	0.60	0.60	
10	0.85	0.64	0.43	1.70	1.47	1.20	0.85	0.85	0.74	0.61	0.43	1.47	1.20	0.85	1.11	1.11	0.74	0.74	
11	1.03	0.77	0.52	2.1	1.78	1.45	1.03	1.03	0.90	0.73	0.52	1.78	1.45	1.03	1.34	1.34	0.90	0.90	
12	1.23	0.92	0.61	2.5	2.1	1.73	1.23	1.23	1.07	0.87	0.61	2.1	1.73	1.23	1.59	1.59	1.07	1.07	
13	1.44	1.08	0.72	2.9	2.5	2.0	1.44	1.44	1.25	1.02	0.72	2.5	2.0	1.44	1.87	1.87	1.25	1.25	
14	1.67	1.25	0.83	3.3	2.9	2.4	1.67	1.67	1.45	1.19	0.83	2.9	2.4	1.67	2.2	2.2	1.45	1.45	
16	2.2	1.64	1.09	4.4	3.8	3.1	2.2	2.2	1.90	1.55	1.09	3.8	3.1	2.2	2.8	2.8	1.90	1.90	
18	2.8	2.1	1.38	5.5	4.8	3.9	2.8	2.8	2.4	1.97	1.38	4.8	3.9	2.8	3.6	3.6	2.4	2.4	
20	3.4	2.6	1.70	6.8	5.9	4.8	3.4	3.4	3.0	2.4	1.70	5.9	4.8	3.4	4.4	4.4	3.0	3.0	
22	4.1	3.1	2.1	8.3	7.1	5.8	4.1	4.1	3.6	2.9	2.1	7.1	5.8	4.1	5.4	5.4	3.6	3.6	
24	4.9	3.7	2.5	9.8	8.5	6.9	4.9	4.9	4.3	3.5	2.5	8.5	6.9	4.9	6.4	6.4	4.3	4.3	
26	5.8	4.3	2.9	11.5	10.0	8.1	5.8	5.8	5.0	4.1	2.9	10.0	8.1	5.8	7.5	7.5	5.0	5.0	
28	6.7	5.0	3.3	13.4	11.6	9.4	6.7	6.7	5.8	4.7	3.3	11.6	9.4	6.7	8.7	8.7	5.8	5.8	
32	8.7	6.5	4.4	17.4	15.1	12.3	8.7	8.7	7.6	6.2	4.4	15.1	12.3	8.7	11.3	11.3	7.6	7.6	

Lift a cast iron pipe

- Two synthetic slings are used to lift cast iron pipe
- The angle between slings is 60 degrees
- Pipe weight is 104kg per lineal metre
- The pipe length is 6.5m

What is the total pipe weight?

6.5 X 104kg = 676kg or 0.676tonne



Using the pipe weight, what sling is the minimum required?

- Choked at 60 degrees
- Pipe weight of 676kg or 0.676tonne
- Closest tonne 1.3 tonne
- The minimum sling size needed is 1 tonne

For educational purposes only																																																																									
		L = LOAD FACTOR			L = 1.0			L = 0.8			L = 2.0			L = 1.7			L = 1.4			L = 1.0			L = 1.7			L = 1.38																																															
Colour	W.L.L	VERTICAL	CHOKE	BASKET	60°	90°	120°	60°	60°																																																																
	Tonnes	W.L.L Tonnes	W.L.L Tonnes	W.L.L Tonnes	W.L.L Tonnes	W.L.L Tonnes	W.L.L Tonnes	W.L.L Tonnes	W.L.L Tonnes																																																																
Violet	1.0	1.0	0.8	2.0	1.7	1.4	1.0	1.7	1.3																																																																
Green	2.0	2.0	1.6	4.0	3.4	2.8	2.0	3.4	2.7																																																																
Yellow	3.0	3.0	2.4	6.0	5.1	4.2	3.0	5.1	4.1																																																																

Lift steel beam

- A steel beam must be lifted two chain legs and by using a double wrapped choke hitch method
- The included angle between slings is **60 degrees**
- The beam is **270 kg per lineal metre**
- The length of the beam is **10m**



Part A: Calculate the weight of the 10m beam

10 X 270 kg = 2700kg or 2.7 tonne

Part B:

Using the sling chart, choose the minimum diameter chain size needed to safely lift the load?

Reeved slings 60 degrees

Beam weight 2700kg

Closest tonne 4.1t

Answer 10mm chain

➤ Maximum Working Load Limit (WLL) in tonnes

Chain Size (mm)	Single leg slings			2, 3, or 4 leg slings			
	Straight Sling	Adjustable Sling *	Reeved Sling	Straight Sling 60°	Straight Sling 90°	Straight Sling 120°	Reeved Sling 60° max
6.0	1.1	1.1	0.8	1.9	1.6	1.1	1.5
7.1	1.6	1.6	1.2	2.8	2.3	1.6	2.1
8.0	2.0	2.0	1.5	3.5	2.8	2.0	2.6
10.0	3.2	3.2	2.4	5.5	4.5	3.2	4.1
13.0	5.3	5.3	4.0	9.2	7.5	5.3	6.9
16.0	8.0	8.0	6.0	13.8	11.3	8.0	10.4
20.0	12.5	12.5	9.4	21.6	17.6	12.5	16.3
22.0	15.0	15.0	11.3	26.0	21.2	15.0	19.5
26.0	21.2	21.2	15.9	36.7	29.9	21.2	27.6
32.0	31.5	31.5	23.6	54.5	44.4	31.5	41.0

For reeved, basket slings and engineered lifts, please consult AS 3775 Part 1 or 2, accordingly.

 Indicates that WLL applies to both 'rectangular' and 'circular' load.

 Indicates nip angle, which must not exceed 120° degrees.

The “Big Boot”

A roadside tourist attraction known as “the Big Boot” requires an oversized boot to be lifted into a display position, where it will be visible from the Bruce Highway.



- The oversized prop boot will be lifted with a four-leg sling arrangement as shown in the picture below
- The boot has defined engineered lifting points (lugs)
- The slings used are 20mm 80 grade chain with non-derating shorteners
- The position of the lifting lugs and an uneven load will require that 2 legs of the sling are shortened
- Shortened legs are at 30 degrees to the vertical, the other two legs are at 45 degrees to the vertical

Loading Factors		1.00	0.75	0.75	1.30	1.73	1.41	1.00	1.30	2.25
Grade	Chain size (mm)	Straight sling or adjustable sling with no deration	Adjustable sling with deration (Note 1)	Reeved sling	Basket sling Max 60°	Straight sling (Note 2)			Reeved sling (Notes 2 and 3)	Basket sling (Notes 2, 3 and 4)
						60°	90°	120°		
Grade V(100)	4	0.63	0.5	0.4	0.8	1.1	0.9	0.63	0.8	1.4
Grade V(100)	5	1	0.8	0.6	1.3	1.7	1.4	1	1.3	2.3
Grade T(80)	6	1.1	0.8	0.8	1.5	1.9	1.6	1.1	1.5	2.5
Grade V(100)	6	1.4	1.1	0.8	1.8	2.4	2.0	1.4	1.8	3.2
Grade T(80)	7	1.5	1.1	1.1	2	2.6	2.1	1.5	2	3.4
Grade V(100)	7	1.9	1.4	1.1	2.5	3.3	2.7	1.9	2.5	4.3
Grade T(80)	8	2	1.5	1.5	2.6	3.5	2.8	2	2.6	4.5
Grade V(100)	8	2.5	1.9	1.4	3.3	4.3	3.5	2.5	3.3	5.6
Grade T(80)	10	3.2	2.4	2.4	4.1	5.5	4.5	3.2	4.1	7.2
Grade V(100)	10	4	3.0	2.3	5.2	6.9	5.6	4	5.2	9.0
Grade T(80)	13	5.3	4.0	4.0	6.9	9.2	7.5	5.3	6.9	11.9
Grade V(100)	13	6.7	5.0	3.8	8.7	11.6	9.4	6.7	8.7	15.1
Grade T(80)	16	8	6.0	6.0	10.4	13.8	11.3	8	10.4	18.0
Grade V(100)	16	10	7.5	5.6	13.0	17.3	14.1	10	13.0	22.5
Grade V(100)	18	12.5	9.4	7.0	16.3	21.6	17.6	12.5	16.3	28.1
Grade T(80)	19	11.2	8.4	8.4	14.6	19.4	15.8	11.2	14.6	25.2
Grade V(100)	19	14	10.5	7.9	18.2	24.2	19.7	14	18.2	31.5
Grade T(80)	20	12.5	9.4	9.4	16.3	21.6	17.6	12.5	16.3	28.1

Part A: Using 20mm slings in this configuration, what is the maximum allowable weight the oversized boot can be?

Grade T (80) chains connected straight

Greater angle from vertical is 45 degrees, therefore included angle is 90 degrees

17.6 tonnes is the maximum weight the oversized prop boot could be

Part B: Could you use 16mm chain for the lift if the oversized prop boot weighed 15,000kg (15 t)?

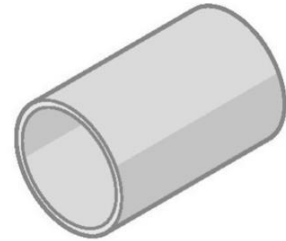
No, chain capacity 11.3t with load weight 15t

Estimate the weight of a HDPE pipe section

Estimate the weight of the following high-density polyethylene pipe (HDPE) pipe section

Details of the hollow pipe

- Wall thickness 100mm
- Length 3.5m
- Outer diameter 2.6m
- Inside diameter 2.4m
- Solid polyethylene has a mass of 970 kg per cubic metre



What is the total weight of the pipe in tonnes?

Answer must be rounded up to nearest tonne

$$0.79 \times 2.6 \times 2.6 \times 3.5 = 18.691$$

$$0.79 \times 2.4 \times 2.4 \times 3.5 = 15.926$$

$$18.691 - 15.926 = 2.765$$

$$2.765 \times 970 \text{ kg} = 2,682.05$$

Answer 2.7 tonnes round up to 3 tonnes

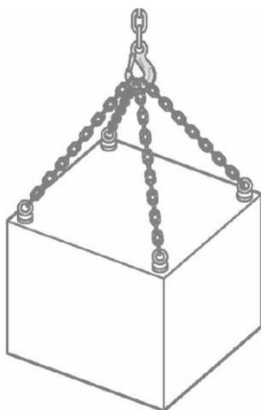
Relocate a container with lifting lugs

The task requires a container with lifting lugs to be relocated

- The angle between diagonally opposite sling legs is 60 degrees
- Grade T (80) chain slings will be used
- The chain diameter is 13mm

Using the sling tag provided, what is the maximum load weight that can be lifted?

The 13mm, grade 80 chain is good for 9.2t or 9200kg when directly attached at a sling angle of 60 degrees



ALLOY SLING GRADE T (80)			
Chain Size	13 mm		
WORKING LOAD LIMIT TONNES			
2,3 or 4 Leg Slings			
Straight	Angle	Reeved	
9.2	60°	6.9	
7.5	90°		
5.3	120°		
Serial NO. ABS			
Date			

Calculate total container load weight

Use the following consignment note to calculate the total container load weight that needs to be lifted

MARKS / UNIT No's Number if applicable	Include Seal	CONSIGNMENT INFORMATION		DIMENSIONS			WEIGHT (KG'S)	
		TYPE OF UNIT / ISO	DESCRIPTION OF GOODS	LENGTH	WIDTH	HEIGHT	GROSS	NETT
44668 2		CTU	SHIPPING CONTAINER	40FT				3450kg
		1	5 x universal beams (119kg/m)	9m				
		2	17 x timber beams (9kg/m)	5.5m				
		3	1 x steel plates (143kg/sqm)	3m	0.5m			

Weight of universal beam $5 \times 9 \times 119 = 5355\text{kg}$

Weight of timber beam $17 \times 9 \times 5.5 = 841.5\text{kg}$

Weight of steel plate $1 \times 3 \times 0.5 \times 143 = 214.5\text{kg}$

Container weight = 3450kg

Total weight $5355 + 841.5 + 214.5 + 3450 = 9861\text{kg}$

Determine lifting or slinging points

Determine the safe lifting or slinging points

- Check lift plan
- Lifting points marked on or constructed on the load
- Calculation by measuring the distance from the center out to slinging points, ensuring
- weight evenly distributed

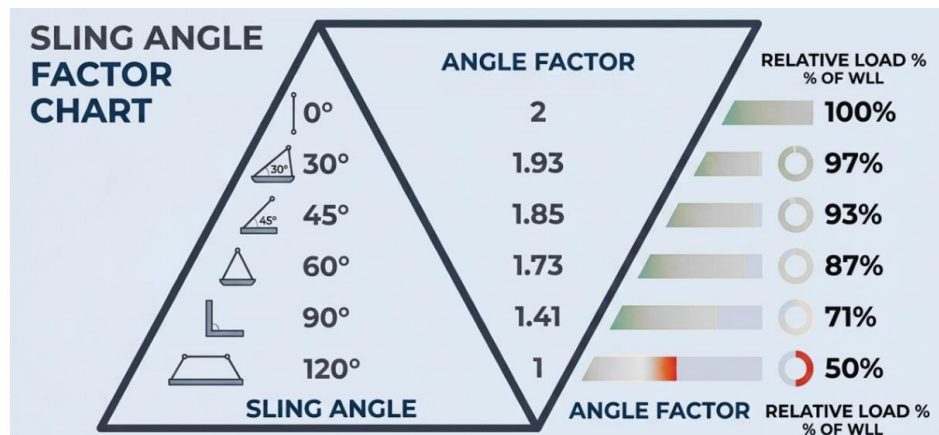


Using eyebolts with a two-legged sling

Correct method of use when using eyebolts with a two-legged sling.



Angle factors



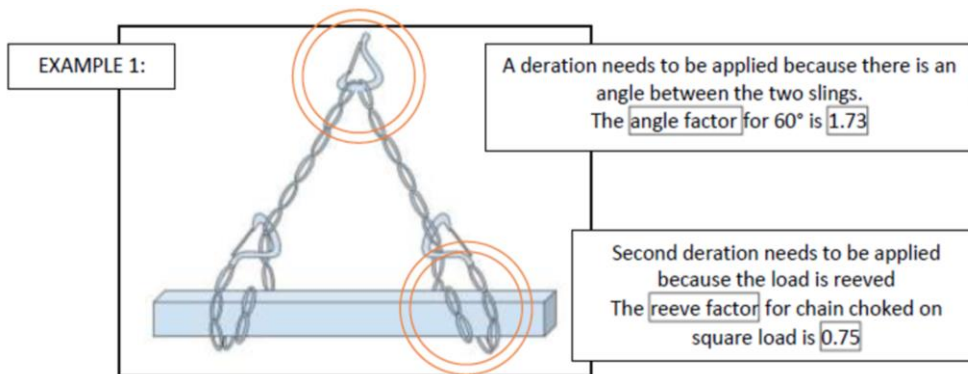
Calculate the load factor

When determining a load factor, you use the formula below:

$$\text{LOAD FACTOR} = \text{ANGLE FACTOR} \times \text{REEVE FACTOR} \quad (\text{LF} = \text{AF} \times \text{RF})$$

Example 1: Angle factor for 60° is 1.73 and the Reeve factor for chain on a square load is 0.75

$$1.73(\text{AF}) \times 0.75(\text{RF}) = 1.29$$



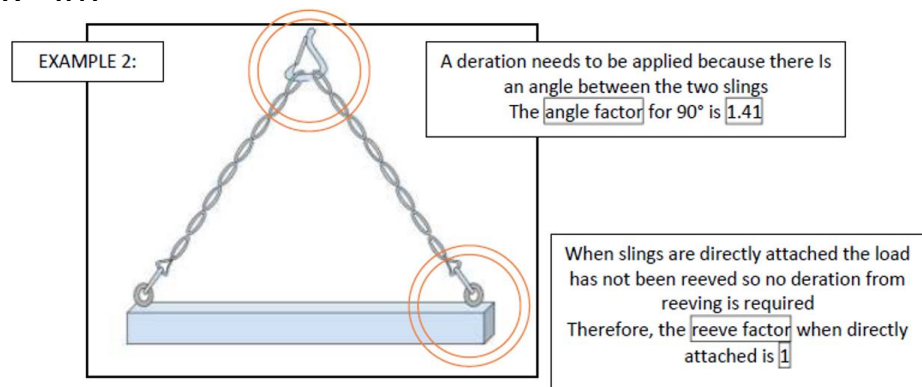
When determining a load factor, you use the formula below:

$$\text{LOAD FACTOR} = \text{ANGLE FACTOR} \times \text{REEVE FACTOR} \quad (\text{LF} = \text{AF} \times \text{RF})$$

- EXAMPLE 2: Angle factor for 90° is 1.41 and any direct load has a Reeve factor of 1

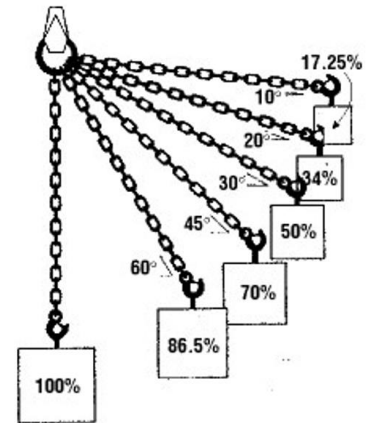
$$1.41(\text{AF}) \times 1(\text{RF}) = 1.41(\text{LF})$$

$$1.41 \times 1 = 1.41 \text{ LOAD FACTOR} = 1.41$$



Sling angle

An increase of sling angle will **decrease the rated capacity** of the sling.



Communication methods

Communication methods a dogger / spotter uses to direct the crane operator

- Hand signals
- Whistles
- Two-way radio



Communication methods cont.

Hand signals when crane operator is in direct view of the dogger

Whistle signal when the load is in sight of the dogger or out of sight of the crane operator

Two-way radio – When the dogger is not always in view of the crane operator.

When whistle signals cannot be heard or confused with other signals (multiple cranes operating).

When more efficient to use.

Emergency procedures

Ensure you understand the emergency procedures for the equipment and site you are operating on

- Attend site induction
- Identify the site emergency procedures and locations of emergency assembly areas
- Identify the site procedure for incident reporting
- Identify emergency shutdown procedures relative to the machine or equipment you are operating



Fall prevention and fall arrest

Types of fall prevention and fall arrest equipment that can be used for work at height

- Static line
- Safety harness
- Safety nets
- Lanyard



Lanyard

A Lanyard must be *as short as possible but long enough to allow you to do the work.*



Check for suitability or defects

Risk controls, fall prevention and fall arrest equipment must be checked for suitability or defect

- Before use
- After use
- According to manufacturer



Personal protective equipment

PPE that could be required for dogging activities

- Safety helmet
- Safety boots
- Safety gloves
- High-visibility clothing
- Safety glasses
- Hearing protection
- Dust / fume mask



High UV exposure

Control the risk associated with high UV exposure

- Wear appropriate clothing for sun protection
- Drink plenty of water
- Take breaks
- Plan to work in lower UV rated times or days if possible



Lifting equipment

- A brick or block cage is used to lift a pallet of bricks
- Plate or lifting clamps are used to lift steel plates
- To lift a gas bottle, use a bottle cage fitted with restraints



Synthetic sling tag information

Types of information displayed on a synthetic sling tag

- Working load limit (WLL)
- Reeve factors
- Angle factors
- Manufacturer
- Conditions of use



Spreader-lifting beam Information

Information must be displayed on a spreader beam

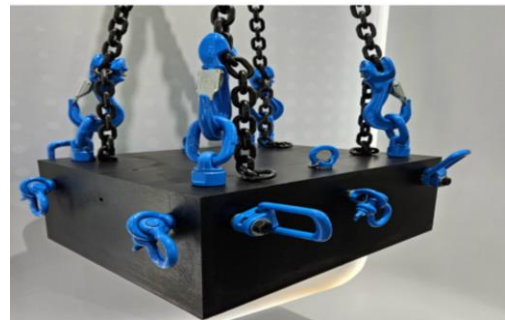
- Tare weight of the beam when greater than 50kg
- Working Load Limit
- Identification of manufacturer
- Serial number



Inspect lifting lugs

Before lifting any loads fitted with lugs

- Visual inspection
- Check Working load Limit is sufficient
- Check engineering certificate



Bow shackle

A **Bow shackle** can be used to lift a load using multiple slings.



Chain grades

Meaning of letters stamped on chain slings

- T = Grade 80
- V = Grade 100



Missing or unreadable sling tag

If the tag on a chain sling is missing or unreadable, **tag out of service as per safe work procedures.**



Twisted synthetic sling

A twisted synthetic web sling should not be used to lift loads.
A twisted sling will reduce the Working Load Limit (WLL),
decrease the rated capacity.



Synthetic slings defects

Inspecting synthetic slings for defects

- Damage to stitching
- Damage to sleeve
- Chemical damage
- Cuts or tears
- No label
- Wear and tear
- Burns



Flexible steel-wire rope defects

- Kinks
- Stretching
- Abrasion
- Crushed
- Knotting
- Corrosion
- Damage to eye



Checking and inspecting equipment

The **person licenced to perform the dogging work** is held responsible for inspecting lifting equipment prior to use.

Inspecting lifting equipment prior to commencing tasks will help to **ensure all equipment is safe to use and suitable for the task.**



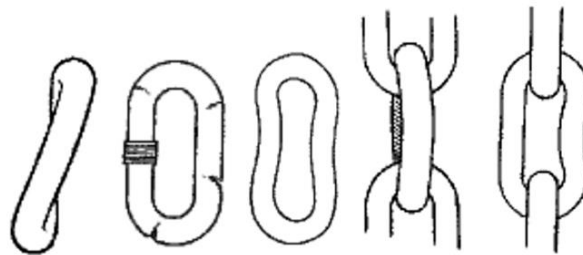
Shackle defects

- Cracked
- Stretch
- Bent or distorted
- Wrong pin or damaged pin



Chains unsafe for lifting

- Twisted
- Cracked
- Stretch
- Kinked
- Knotted
- No rated capacity tags
- Gouged or cut more than 10% of original diameter



Chain shortener



WARNING

Shortening clutches **MUST** be used correctly with the load bearing chain always leading out from the bottom of the clutch.

Communication equipment

Checks should be made on a two-way radio before use

- Visual defects
- Battery charged
- Channel setting
- Volume setting



Communication

Ensure the lift plan, risk controls and impact on other workplace activities are communicated to relevant personnel by

- Involving them in the planning
- Involving them in the risk assessment process
- Establishing and maintain communication throughout the entire lifting operations



Risk controls and safety equipment

Always ensure risk controls, safety equipment and measures have been applied by

- Checking SWMS
- Visually check the operating area

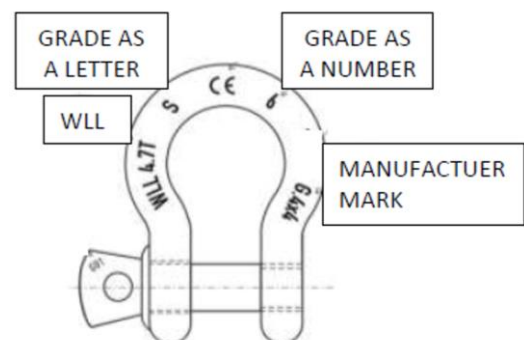


Shackle markings

Information must be clearly and permanently marked on a shackle body

Examples include

- WLL
- Manufacturer's identification
- Quality Grade, as M or 4, or S or 6
- Identification marking to correlate the shackle to the test certificate



Considerations prior to lifting

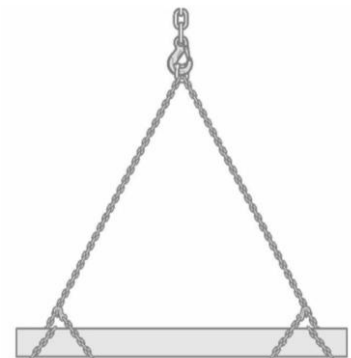
Considerations prior to using two slings to lift a load

- Weight of load
- Slings method
- Reeve factors
- Angle factors
- Size of the load



Ensure the reeves will not slip

Double wrap the reeve or choke to ensure the reeves will not slip, when choking a chain sling around a steel beam at an angle of 60°.



Cantilever crane loading platform

Determine if a cantilever crane loading platform (CCLP) can support the load weight

- Check rated capacity (marked on platform)
- Consult relevant person or authority e.g., engineer or platform manufacturer



Suspended floor

Consult with an engineer before landing a load on a suspended floor **to ensure the floor will be able to support the load.**



Releasing a round load

Chocks on either side should be placed against concrete pipe at the landing area to prevent it from rolling away.



Check the load landing area

Checks should be made to the load landing area

- Ground suitability to ensure stability
- Safe access for removal of lifting gear
- Exclusion zones for pedestrian and or vehicle



Planning for travelling/mobiling

Planning for travelling/mobiling with a load, consider

- Use of a tag line
- Remain in view of the operator during travel
- Ground conditions
- Clear pathway
- Method of communication with crane driver



Secure lifting equipment

Use a Shackle to the Bull ring to secure FSWR slings to the hook of the crane.



Crane hook

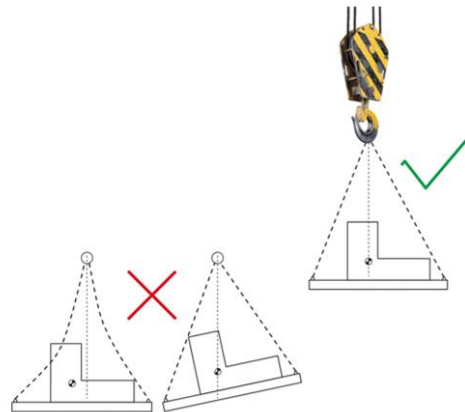
A **safety latch (catch)** should be fitted to a crane hook to stop the slings from coming off.



Position the lifting hook

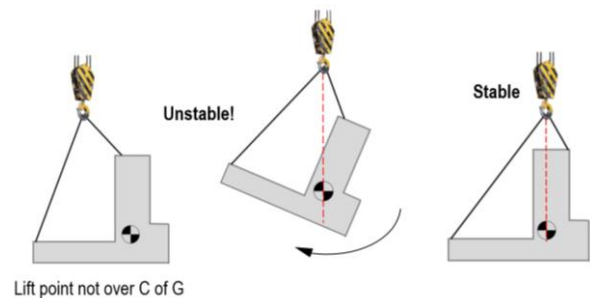
Always position the hook over the load centre of gravity

- To avoid load swing
- To stop the load from being dragged or snigged
- To prevent instability to load and crane



Centre of gravity

Always ensure a load with an irregular centre of gravity has been slung correctly by performing a **test lift**.



Load or reeve factor – Choke hitch

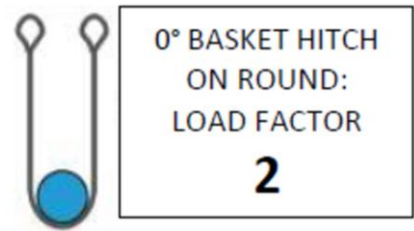
When using chain and/or FSWR slings reeved or choked on a round load, the deration (load) factor is **0.75**. update picture of this factor



CHAIN or
FSWR CHOKED
ON ROUND:
LOAD FACTOR
0.75

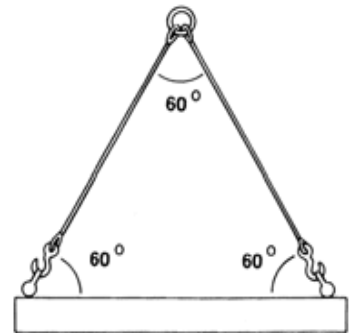
Load or reeve factor - Basket hitch

If using FSWR slings in a 0° basket hitch, and the diameter of the round load is a minimum of 10 times the sling diameter, the reeve factor is **2**.



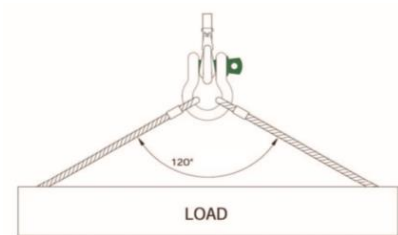
Two leg slings at an angle of 60°

Use an angle factor of **1.73** if directly attaching a load using two leg slings at an angle of 60°.



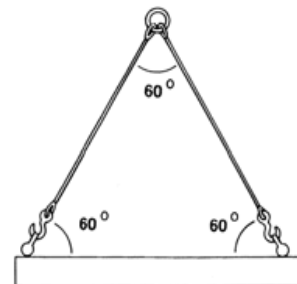
Two leg slings at an angle of 120°

Use an angle factor of **one** if directly attaching a load using two leg slings at an angle of 120°.



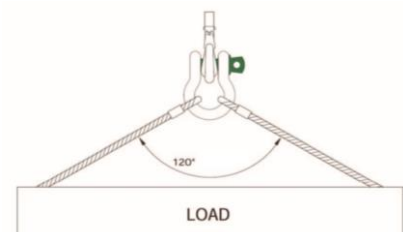
Recommended safe angle

60 degrees is the recommended safe angle between two legs of a sling.



Maximum allowable angle

The maximum allowable angle between two legs of a straight sling lift is **120 degrees, or according to manufacturer specifications.**



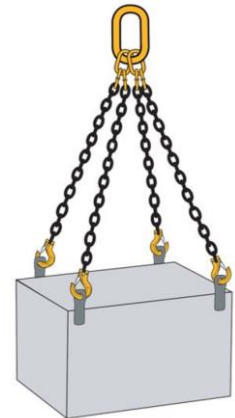
Choked multi-legged chain sling

60 degrees is the maximum allowable angle you can use on a choked multi-legged chain sling



Four-legged sling

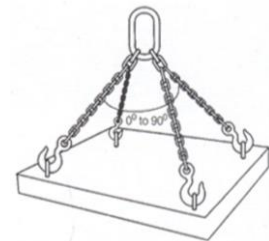
Two legs are calculated to take the weight when a four-legged sling is used to lift a rigid load.



Maximum angle of four-legged sling

Determine the maximum included angle when using a four-legged sling.

The two legs that create the greatest angle, normally the diagonally opposite legs.



Tagline

- A tagline is used to assist in the safe landing and control of a load
- Used when working near overhead powerlines, or at any time where the load may become easier to control during landing



Tagline requirement

A tagline should be made of **dry non-conductive rope and dry natural rope** and be a minimum of **16mm in diameter**.



Temporary rope connections

Temporary rope connections when connecting a tagline to a load.

- Clove hitch
- Rolling hitch
- Single sheet bend
- Bowline



Clove hitch



Rolling hitch



Single sheet bend



Bowline

Hand and whistle signals



Stop

1 short



Hoist up

2-short



Boom up

3-short



Boom down

4-short



Hoist down

1 long



Slew left

1 long 1 short



Slew right

1 long 2-short



Telescope out

1 long 3-short



Telescope in

1 long 4-short

Signals

If you fail to understand a hand or radio signal during a lift

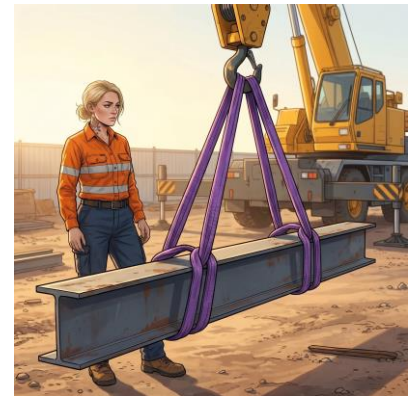
- Stop all crane movements
- Ask for clarification of the last signal



Test lift

Checks should be made during a test lift and prior to moving a load

- Load stability
- Load security
- Crane stability
- Confirm load weight



Crane workbox

A worker can access something by being suspended from a crane at height when using a **workbox that complies with the Australian standards** and when no other reasonable way is possible.

When using a crane workbox, the person communicating with the crane operator should be **in the workbox** at all times.



Lift plan

Directing and moving the load in accordance with lift plan will help to *ensure the crane will not exceed the rated capacity while positioning, moving, or travelling with the load.*



Dunnage

The purpose of placing a load on dunnage or blocks when landing a load:

- To assist safe removal of lifting gear
- Prevent damage to lifting gear
- Protect load



Remove excess materials

Additional or unwanted materials should be removed from the work area as soon as possible

- Hazard prevention
- Safety



Lifting gear or equipment defect

Follow procedure where defects are found with lifting gear or equipment

- Isolate defective equipment
- Label defective equipment
- Report defective equipment



Storage lifting equipment

- Away from direct sunlight
- Away from chemicals
- Away from machinery
- Clean
- Dry
- Well ventilated
- According to manufacturer specifications



Hazard control measures

Hazard control measures such as barriers, signs or safety nets should be removed from the work area, inspected for defect, and stored correctly when no longer needed.



THE END.