CPCCLRG4001A
Perform Advanced Rigging

Learner Guide

HaloNT
halont.edu.au info@halont.edu.au 1300 HALONT (1300 425 668)

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REVIEW LOG

Version Number	Date Updated	Details of Updates
Version 4	Released January, 2012	
Version 4A	May 2014	▸ Updated competencies.
Version 4H	Updated October, 2014	▸ Course code updated.
Version 5	Released February, 2015	▸ Major review to reflect new logbooks ▸ Remove practical activities from activity book ▸ Add Trainee declaration
Version 5.1	Updated March, 2015	▸ Updated front and back cover art

MODULE BASIS

This module is based on the unit of competency CPCCLRG4001A Licence To Perform Rigging Advanced Level.

1.1 INTRODUCTION

This training course is based on the National High Risk Licence Unit of Competence **CPCCLRG4001A: Licence to Perform Rigging Advanced Level.**

The National Standard for Licensing Persons Performing High Risk Work aims to facilitate the operation of a nationally uniform, competency-based licensing system for persons performing certain types of high risk work.

The National Standard recognises the importance of quality training as an underpinning principle in providing skilled workers, and that the most effective form of training is a combination of informal and formal training methods. It requires training and assessment to be undertaken by a Registered Training Organisation (RTO).

1.1.1 COURSE OVERVIEW

Throughout these materials you will learn about:

- Planning out your work.
- Selecting and inspecting equipment.
- Setting up for the rigging task.
- Erecting and dismantling structures and plant.

1.1.2 WHAT TYPES OF WORK CAN YOU DO WITH A RIGGING ADVANCED LEVEL LICENCE?

A person with an advanced rigging high risk work licence is allowed to complete the following range of tasks:

- Erection of flying foxes.
- Erection of cableways.
- Erection of gin poles.
- Erection of shear legs and tripods.
- Erection of guyed derricks and structures.
- Erection of suspended and fabricated hung scaffolds.

1.1.3 HIGH RISK WORK AND WHS LEGISLATION

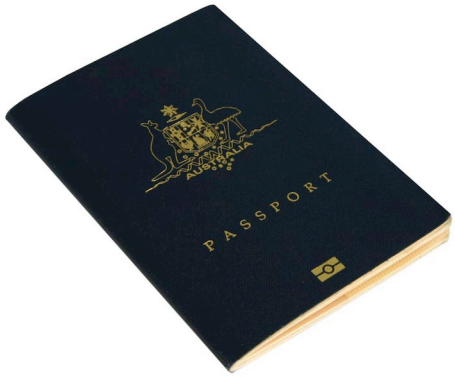
Any person who is undertaking training for a High Risk Work (HRW) licence according to the Work Health & Safety (WHS) regulations must be currently enrolled in a course of HRW training and being supervised at the workplace by a person with a current HRW licence for the work.

As a person under training you are learning everything you need to know to ensure that you are going to be working safely and efficiently.

Once you have completed your training and have been assessed, you will be able to make your application for a high risk work licence.

1.1.4 MAKING THE APPLICATION

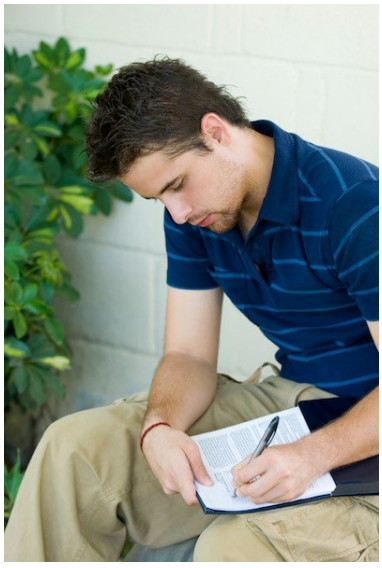
Under the requirements of Work Health & Safety (WHS) legislation all applicants for High Risk Work (HRW) licences must provide the following information:



- Their name.
- Evidence of identity (e.g. driver's licence, passport).
- A passport-sized photograph of themselves (to be used on the HRW photo licence).
- A copy of the statement of attainment/certification that they have successfully completed and been assessed for the relevant unit of competency for the HRW licence they are applying for.

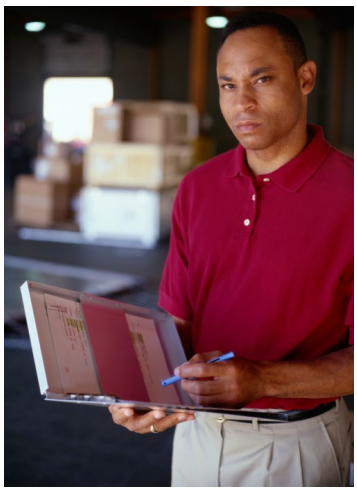
Under no circumstances can any applicant provide false or misleading information. Applicants are expected to make the following declarations:

- That they do not currently hold an equivalent HRW licence granted under corresponding WHS law by another WHS regulator.
- Any details of convictions or of being found guilty of any offence under the WHS Act or the WHS regulations in any jurisdiction in Australia.
- Whether or not they have ever entered into an enforceable undertaking under the WHS Act or WHS regulations in any jurisdiction in Australia, and providing the details if they have.
- Whether or not they have ever previously had an equivalent HRW licence refused, suspended or cancelled under the WHS Act or the WHS regulations in any jurisdiction in Australia.



The application for a HWR licence must be made within 60 days of receiving a statement of attainment (issued by a RTO) or a notice of satisfactory assessment issued by an assessor.

1.1.5 HIGH RISK WORK LICENCES



The holder of a HRW licence is responsible for taking reasonable care and not adversely affecting the health and safety of other people while performing the HRW.

Failing to work safely when performing high risk work can lead to the licence holder being penalised under WHS regulations:

1. Their licence may be **suspended** or **cancelled**.

OR

2. The regulator may refuse to renew the licence (if the matter is raised at the time of renewal). High risk work licences will need to be renewed **every 5 years**.

Under no circumstances may an employer/PCBU allow a person to conduct high risk work if they are not competent to do so, unless the person is enrolled in a course of HRW training and is supervised at the workplace by a person with a current HRW licence for the work.

If a holder of a high risk work licence is no longer competent to carry out the work they hold a licence for they must stop doing the work and retrain to become fully competent, or return the HRW licence to the WHS regulator.

1.2 PLAN JOB

It is important that you are aware of the requirements relating to your work. Before you begin your tasks ensure that you access the relevant documentation and plan your work.

Requirements relating to your work may include:

- OHS/WHS requirements.
- Duty of care.
- Safe work practices.
- Safe Work Method Statements.

1.2.1 OCCUPATIONAL HEALTH & SAFETY/WORK HEALTH & SAFETY REQUIREMENTS

Occupational Health & Safety/Work Health & Safety (OHS/WHS) is defined as laws and guidelines to help keep your workplace safe.

These laws and guidelines can be broken down into four main types:

Acts	Laws to protect the health, safety and welfare of people at work.
Regulations	Gives more details or information on particular parts of the Act.
Codes of Practice	Are practical instructions on how to meet the terms of the Law.
Australian Standards	Give you the minimum levels of performance or quality for a hazard, work process or product.

1.2.1.1 HARMONISATION OF WORK HEALTH & SAFETY LEGISLATION

In response to industry calls for greater national consistency, the Commonwealth, states and territories have agreed to implement nationally harmonised Work Health & Safety (WHS) legislation to commence on 1 January 2012.

While not all states and territories have actually implemented the model WHS legislation as of the start of 2012, it is important to be aware of these changes, as all states and territories will eventually implement them.

Harmonisation aims to develop consistent, reasonable and effective safety standards and protections for all Australian workers through uniform WHS laws, regulations and codes of practice.

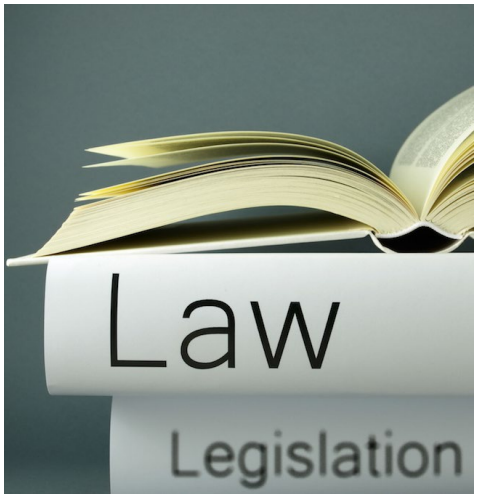
Key Elements Of The Work Health & Safety Legislation

The following key elements of the WHS legislation will impact the way you do your job, and the responsibilities of your workplace:

1. There is a primary duty of care requiring ***persons conducting a business or undertaking (PCBU)*** to ensure, so far as is ***reasonably practicable***, the health and safety of ***workers*** and others who may be affected by the carrying out of work.
2. A requirement that ***officers*** of corporations and unincorporated bodies exercise ***due diligence*** to ensure compliance.
3. ***Workers*** must exercise reasonable care that their acts or omissions do not adversely affect the health and safety of persons at a workplace.

The legislation also outlines requirements for:

- The reporting requirements for notifiable incidents.
- Licences, permits and registrations (e.g. for persons engaged in high risk work or users of certain plant or substances).
- Provision for worker consultation, participation and representation at the workplace.
- Provision for the resolution of health and safety issues.
- Protection against discrimination.



Many specific details relating to WHS will be negotiated within the workplace in accordance with the legislation.

It is important that you speak with your Health & Safety representative or supervisor for more information on how these elements will effect your day-to-day operations, or if you have any concerns relating to health and safety.

A list of common WHS terms and their definitions can be found in Appendix 1A.

It is important that you are familiar with the OHS/WHS laws that exist in your state or territory.

The following OHS/WHS legislative requirements will affect the way that you work:

- Duty of Care.
- Australian Standards.
- Industry OHS/WHS Standards and Guidelines.
- Health & Safety representatives, committees and supervisors.

- Job Safety Analysis (JSA) and Safe Work Method Statements (SWMS).
- Licences, Tickets or Certificates of Competency.
- National safety standards.
- OHS/WHS and Welfare Acts and regulations.
- Safety Codes of Practice.

Talk to your OHS/WHS officer or representative if you have any questions about OHS/WHS legislation.

1.2.2 DUTY OF CARE

All personnel/workers have a legal responsibility under duty of care to do everything reasonably practicable to protect others from harm by complying with safe work practices.

This includes activities that require licences, tickets or certificates of competency or any other relevant state and territory OHS/WHS requirements.

This includes:

- Employers/PCBUs and self-employed persons.
- Persons in control of the workplace.
- Supervisors.
- Designers.
- Manufacturers.
- Suppliers.
- Workers.
- Inspectors.

1.2.3 SAFE WORK PRACTICES

Safe work practices are methods that must be implemented to make sure a job is carried out as safely as possible.

Safe work practices include:

- Day to day observation of OHS/WHS policies and procedures.
- Emergency procedures.
- Risk management.
- Use of basic fire-fighting equipment.

Safe work practices are governed by legislative requirements and workplace procedures.

Safe work practices relate to:

- Drugs and alcohol at work.
- Access to site amenities, such as drinking water and toilets.
- General requirements for the safe use of plant and equipment.
- General requirements for the use of personal protective equipment and clothing.
- Smoking in designated areas.
- Housekeeping to ensure a clean, tidy and safe work area.
- Preventing bullying and harassment.
- Storage and removal of debris.

Safe work practices should be referred to, and documented, when completing Safe Work Method Statements as a guideline for how to carry out a task safely.

1.2.4 SAFE WORK METHOD STATEMENTS

A Safe Work Method Statement (SWMS) details how specific hazards and risks, related to the task being completed, will be managed and is developed by the employer/PCBU for their employees/workers.

SWMS fulfill a number of objectives:

- They outline a safe method of work for a specific job.
- They provide an induction document that workers must read and understand before starting the job.
- They assist in meeting legal responsibilities for the risk management process, hazard identification, risk assessment and risk control.
- They assist in effectively coordinating the work, the materials required, the time required and the people involved to achieve a safe and efficient outcome.
- They are a quality assurance tool.

To complete a SWMS:

1. Break the job down into logical steps taking into consideration what is required to be achieved by the task.
2. Against each step, identify the workplace hazards in this activity i.e. the ways that a person (or plant) could be injured or harmed (or damaged) during each step.
3. Decide on measures required to mitigate hazards. i.e. what could be done to make the job safer and prevent the injuries or harm that may occur.
4. Identify roles and responsibilities for actions and outcomes to make sure risk/ hazard controls are carried out and supervision of the process occurs.
5. Ensure the SWMS is fully understood by all workers prior to commencing the task.

A SWMS must be prepared in consultation with those people who will be doing the job.

The Safe Work Method Statement must be available for inspection at any given time. It must also be reviewed each year and amended if necessary.

Safe Work Method Statements may also be referred to as Safe Work Procedures (SWP) or Job Safety Analysis (JSA).

1.2.5 ASSESS THE TASK

Before you start any work or planning, look to see what the task actually is.

- Does the task require lifting or moving of materials?
- Will you be assembling or disassembling plant or equipment?
- What equipment will you need and is it available?
- What is the weather doing and is it safe to carry out the work?

All of these factors will introduce different hazards and requirements to the work.

1.2.6 GATHER SITE INFORMATION

Planning the job before you start is an important step in any high risk work.

Site information such as local conditions (access and egress) or work method statements will help in determining how the job is performed.

A site-specific Job Safety Analysis (JSA) or Safe Work Method Statement (SWMS) or other site-specific documentation should be reviewed to make sure the work is carried out according to workplace procedures.

If there are any task plans or schedules available, you should also make sure you are familiar with them. Structural plans will also need to be referred to throughout the job planning.

1.2.7 FORCES AND LOADS

A 'load' is any type of force exerted on an object. It is important to understand the relevant forces and loads that are associated with the rigging work you will be doing.

Forces and loads apply to structures, equipment and plant such as:

- Gin poles.
- Flying foxes.
- Shear legs.
- Cable ways.
- Guyed derricks.
- Suspended scaffolds.
- Fabricated hung scaffolds.
- Other structures.

Forces and loads can be divided up into the following types:

Dead load:	The weight of a crane, hoist or scaffold before it is carrying a load.
Static load:	Any load that does not change in size, weight or position over time (does not move or change).
Dynamic load:	These include loads that are moving or changing. This includes: ▸ **Live load**: The load being lifted by a crane or hoist. ▸ **Wind load**: The total force exerted by the wind on a structure or part of a structure. See **AS 2550** for more information on wind loads.

1.3 RISK MANAGEMENT

Risk management is the process of reducing or managing the risks when working with a hazard or in a hazardous situation and should take into consideration the context of the organisation and worksite.

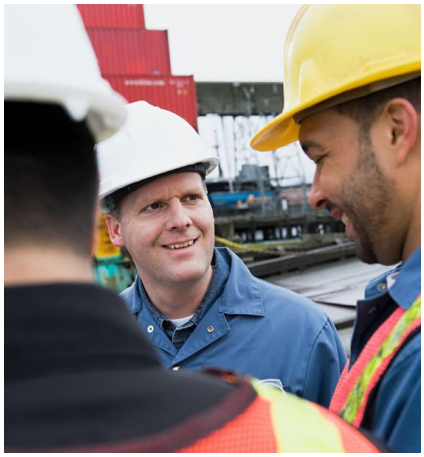
Risk management must be conducted in accordance with:

- Legislative, organisational and site requirements/procedures.
- Australian Standards (AS/NZS ISO 31000:2009).
- Codes of Practice.
- Employment and workplace relations legislation.
- Equal employment opportunity and disability legislation.

Risk management is made up of the following stages:

Consultation and communicating with others, as well as monitoring and review, should be planned for and carried out at every stage of the risk management process.

1.3.1 CONSULTATION AND COMMUNICATING WITH OTHERS



Communication and consulting with others is an important part of the risk management process and should take place at all stages.

Identifying risks and hazards and coming up with ways of controlling them includes talking to the people with knowledge of the situation, or who are directly affected by any action you may take.

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

Make sure you talk to the right people. They will be able to give you the best information to safely carry out your work. This can include:

- Safety officers who can tell you about:
  - Site-specific hazards.
  - Site-specific hazard controls.
  - Site policies.
- Engineers who know about:
  - Plans and drawings.
  - Load bearings (of ground and suspended surfaces).
  - Purpose of installations.
  - Suitability of the roof.
  - The correct anchorage to be used.

- Supervisors who can provide you with guidance for:
  - Job specifics.
  - Local, job and site knowledge.
  - Information relating to contractors.
- Colleagues.
- Managers who are authorised to take responsibility for the workplace or operations.

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

1.3.2 RISK/HAZARD IDENTIFICATION

HAZARDS CREATE RISK. CHECK FOR HAZARDS.

A **RISK** is the chance of a hazard hurting you or somebody else or causing some damage.

A **HAZARD** is the thing or situation that causes injury, harm or damage.

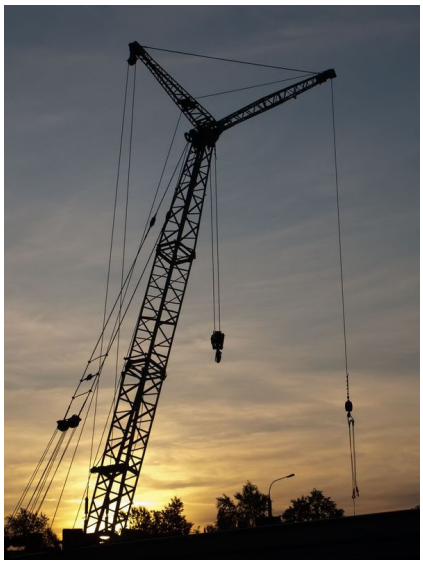
If you can remove or at least control a **HAZARD** you can reduce the **RISK** involved.

Before conducting a risk assessment at a worksite, check to see what systems and procedures are in place as they may affect the outcomes of the risk assessment.

It is important that suitably knowledgeable personnel/workers are involved in the risk identification process.

Common workplace hazards include:

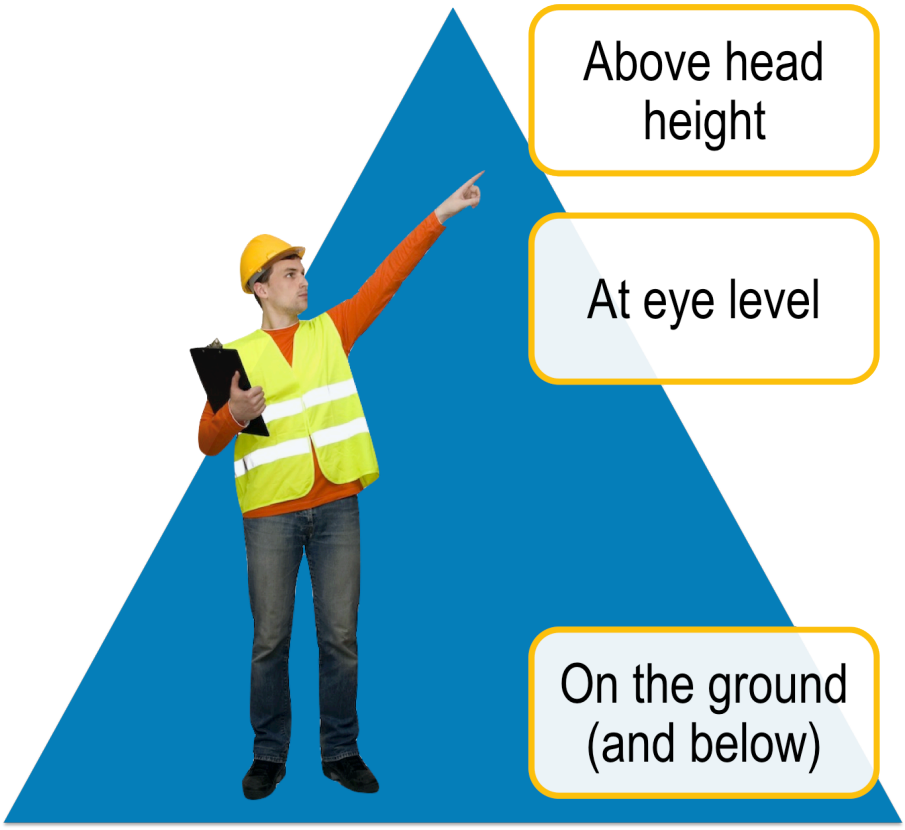
- **Ground conditions:**
  - Non-weight bearing surfaces.
  - Soil conditions (e.g. recently filled trenches).
  - Recent excavations.
  - Underground services.
- **Overhead hazards:**
  - Electric/Power lines.
  - Overhead service lines.
  - Bridges.



- **Poor lighting.**
- **Surrounding structures:**
  - Buildings.
  - Obstructions.
  - Facilities.
  - Trees.
- **Traffic:**
  - Pedestrians.
  - Personnel/workers.
  - Vehicles.
  - Mobile plant.

- **Weather:**
  - Wind.
  - Lightning.
  - Rain.
- **Other site-specific hazards:**
  - Dangerous materials.

When identifying hazards always remember to check:



Make a note of any hazard you identify in the area. Remember, a hazard can also be a situation so keep an eye on how the people around you are working too.

Each task/procedure/function needs to be evaluated for risks, as well as the work area where the work is being carried out.

You should also check records of injuries and incidents, safety tags and talk to other workers.

Material Safety Data Sheets (MSDS) can be useful tools in identifying potential hazards so make sure you check the MSDS documents for your site.

Talk to other workers, your manager, supervisor, team leader or health & safety representative to find out if the risk has already been addressed, and what techniques are available to you to resolve it.

If you find that there is no documentation or guideline in place to resolve an identified risk, you need to assess the risk and identify a feasible course of action to deal with it.

It is important that all records, policies and procedures are kept up to date so that the most relevant information is available and used.

1.3.2.1 WORKING NEAR ELECTRIC/POWER LINES

Operating near electric/power lines can be extremely dangerous.

It is very important that you are aware of the safe operating distances for different types of electric/power lines and the steps you must take if the task requires you to work closer than these prescribed distances.

Generally, if you are required to work closer than the prescribed safe work distance you must:

- Contact the relevant local electrical authority for exemption.
- Have the electric/power lines shut off (or insulated if this is not possible). If the electric/power lines are being insulated, the insulation must extend at least 5 metres past each end of any scaffolds.
- Use a spotter (depending on local regulations).

Distances vary depending on the voltage of the electric/power lines. You should refer to the local electrical authority for information and advice to determine the voltage of electric/power lines in your work area.

If you are required to use a tagline near electric/power lines you MUST make sure it is a non-conductive rope.

SA / TAS / ACT (AS2550.1)

In South Australia, Tasmania and the ACT, equipment must not be closer than the following distances to electric/power lines:

Electric/Power Line Type	Distance
Distribution lines up to and including 133kV (usually poles)	6.4m or 3.0m with a qualified 'spotter'
Transmission lines greater than 133kV (towers)	10m or 8m with a qualified 'spotter'

A 'spotter' is a competent person who watches and guides plant and equipment around electric/power lines. Check with each state authority for their spotter requirements.

VIC

In Victoria the *Framework for Undertaking Work Near Overhead and Underground Assets* states that equipment must not be closer than the following distances to electric/power lines:

Electric/Power Line Type	Distance
Distribution lines up to and including 66kV (power poles)	6.4m or 3.0m with a qualified 'spotter'
Transmission lines greater than 66kV (towers)	10m or 8m with a qualified 'spotter'

NSW

In New South Wales, equipment operation may not be any closer than the following distances to electric/power lines:

Electric/Power Line Type	Distance
Up to 132kV	3.0m
132kV up to 330kV	6.0m
more than 330kV	8.0m

To work closer than these distances requires authority from the relevant electrical authority and adherence to cl.64(2)(e) of the regulations.

QLD

The Queensland *Electrical Safety Regulation* breaks down the distances in detail. Exclusion zones are broken down not only by size of electric/power line but also by the competency level of the operator. This means that the requirements should be clarified with the electrical authority before work commences even if the distance appears to be outside the zones.

The Code of Practice gives the following minimum distances as guidance:

Electric/Power Line Type	Distance
Up to 132kV	3.0m
132kV up to 330kV	6.0m
330kV to 500kV	8.0m

WA

In Western Australia this falls under *Regulation 3.64* from the *OSH Regulations* and states the following as the minimum distances:

Electric/Power Line Type	Distance
Less than 33kV	3.0m
Over 33kV	6.0m
Over 133kV	8.0m

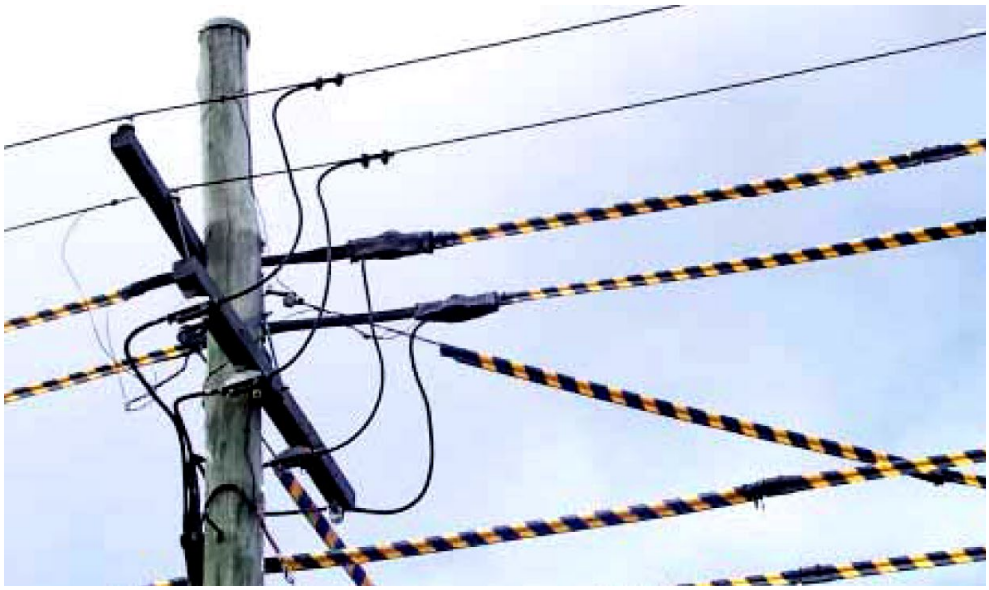
NT

In the Northern Territory safe electric/power line working distances falls under the *Electricity Reform (Safety and Technical) Regulations*. *Table 2, Schedule 3* gives the following minimum distances:

Electric/Power Line Type	Distance
Up to 33kV	1.5m
Above 33kV to 132kV	3.0m
Above 132kV to 275kV	4.0m
Above 275kV to 330kV	6.0m
Above 330kV to 500kV	8.0m

TIGER TAILS

Tiger tails are used as a visual aid to identify the location of overhead electric/power lines. It is important to note that tiger tails **DO NOT** insulate the electric/power lines so exclusion zones and safe operating distances must still be maintained, even when tiger tails are present.



1.3.2.2 TASK-RELATED HAZARDS

There may be other factors that you need to consider when planning out the task that are not necessarily site hazards, but hazards relating to the way the task is carried out.

When planning out the task, some things you may consider are:

- Site-specific issues.
- Safe and adequate communications.
- Access and egress to/from work area.
- Location of the task.
- Specific information required to complete the task, such as:
  - Job or task requirements.
  - Priorities and job sequencing.
  - Site rules and regulations.
  - Safe Work Method Statements (SWMS), Job Safety Analysis (JSA) and other hazard identification procedures such as 'Take-5'.
- Permits and procedures required for the task.
- Equipment required for the task and it's availability.
- Capability/capacity of cranes and associated rigging equipment.

An example of this is if you were required to set up a flying fox to shift loads. This task would require you to consider any hazards in the proposed path of movement of the load. Hazards that are specific to this situation could include:

- **Obstructions** – Anything that the load could come into contact with during it's movement.
- **Overhead electric/power lines** – These are a very serious hazard and may require specific control measures or re-planning of the task.
- **Pedestrians** – Any workers, personnel or site visitors must be kept away from, and made aware of the path of movement of loads.
- **Surrounding structures** – Make sure there is nothing too close to the path of movement. Consider the effect of the wind on the load during movement as well.

1.3.3 RISK ASSESSMENT

A Risk Assessment involves completing a Risk Analysis and a Risk Evaluation.

By assessing the likelihood and consequence of the risk you are able to understand the situation better and respond in an appropriate way.

1.3.3.1 RISK ANALYSIS

Risk analysis involves considering what are the causes and sources of risks and comprises 3 factors:

Consequence	What would be the outcome of the event occurring? How severe would the outcome be?
Likelihood	What is the chance of the event/consequence occurring? Has the event happened before? Is it likely to happen again?
Risk Level	The combined result of likelihood and consequence.

Using a table similar to the one shown here you can analyse how high the risk level is:

LIKELIHOOD	CONSEQUENCE				
	Insignificant	**Minor** First Aid Required	**Moderate** Medical Attention and Time Off Work	**Major** Long Term Illness or Serious Injury	**Severe** Kill or Cause Permanent Disability or Illness
Almost Certain	**M**	**H**	**H**	**VH**	**VH**
Likely	**M**	**M**	**H**	**H**	**VH**
Possible	**L**	**M**	**H**	**H**	**VH**
Unlikely	**L**	**L**	**M**	**M**	**H**
Rare	**L**	**L**	**M**	**M**	**M**

1.3.3.2 RISK EVALUATION

Risk evaluation is based upon the outcomes and results of the risk analysis.

Risk evaluation involves making decisions about which risks need to be treated and the order in which they should be treated. It should take into consideration the context of the risks in relation to:

- The organisation.
- The worksite.
- The relevant laws.
- Regulations.
- Other policies, procedures and requirements.

Using a table similar to the one shown you can evaluate how soon you should act to remove or control the hazard to achieve an acceptable level of risk:

RISK LEVEL	ACTION
VERY HIGH	Act immediately: The proposed task or process activity must not proceed. Steps must be taken to lower the risk level to as low as reasonably practicable using the hierarchy of risk controls.
HIGH	Act today: 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 Safe Work Method has been prepared. 5. The supervisor must review and document the effectiveness of the implemented risk controls.
MEDIUM	Act this week: The proposed task or process can 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 Safe Work Method has been prepared.
LOW	Act this month: Managed by local documented routine procedures, which must include application of the hierarchy of controls.

Any task with a risk level that is Very High is absolutely unacceptable to carry out. Steps must be taken to reduce the risk level

1.3.4 RISK TREATMENT

Once risks have been identified, analysed and evaluated, risk treatment options need to be considered and applied.

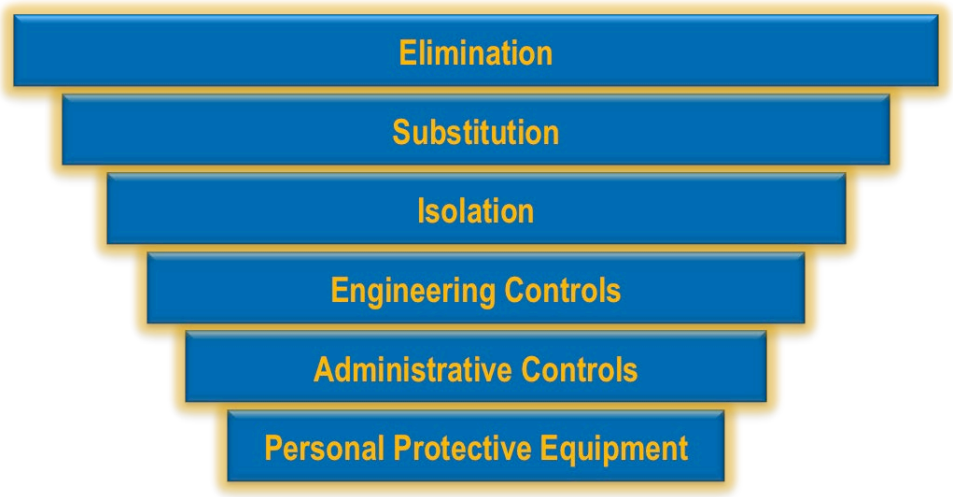
Risk treatment involves selecting one or more options to modify a risk and then implementing the selected option/s.

Risk treatments should be recorded in a risk treatment plan.

Once an option has been implemented it may be referred to as a risk control.

1.3.4.1 CONSIDER HAZARD/RISK CONTROL STRATEGY OPTIONS

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. The Hierarchy has 6 levels:



It is important to understand what each level in the Hierarchy stands for and how they can be implemented into your work.

Level	Description	Example
1. Elimination	Completely remove the hazard. This is the best kind of hazard control.	Setting up equipment a safe distance from excavations, trenches, buildings and structures.
2. Substitution	Swap a dangerous work method or situation for one that is less dangerous.	Applying safety distances and spotters when working near electric/power lines.
3. Isolation	Isolate, segregate or restrict access to the hazard.	Pedestrian, personnel and vehicle exclusion zones including barriers.
4. Engineering Controls	Use equipment to lower the risk level.	Installing temporary lighting in the work area to increase visibility.
5. Administrative Controls/ Safe Work Practices	Site rules and policies attempt to control a hazard.	Use of a lift plan or safe work method statement to plan for and conduct tasks.
6. Personal Protective Equipment (PPE)	The least effective control. PPE should be used in addition to other hazard control techniques. Use PPE while you carry out your work. This should be selected at the planning stage of your work, and checked before starting the job.	Hard hats, steel capped boots and hi-vis clothing are used during all tasks.

It is important to consider all of the options available when deciding on the best course of action.

Not all options are feasible or possible under some circumstances.

You may need to use a number of control strategies in conjunction to reduce the risk level to an acceptable level.

The risk treatment plan should clearly identify the order in which to implement the individual risk treatments.

1.3.4.2 PERSONAL PROTECTIVE EQUIPMENT USED DURING RIGGING WORK

Riggers often have to wear helmets, gloves, eye protection, face masks and respirators, and steel-capped boots to protect themselves from injury.

It is the responsibility of your employer/PCBU to provide the necessary protective equipment. It is the responsibility of riggers to wear and use the equipment properly, when and where necessary.

Safety helmets with chin straps must be worn wherever there is a risk of objects falling from above and on any worksite where the hard hat sign is displayed.

Riggers should wear close fitting pigskin gloves to protect hands from:

- Heat and abrasion.
- Molten metal.
- Sharp edges.

Wear eye protection if you are likely to be exposed to:

- Physical damage.
- Chemical damage.
- Radiation damage.

Riggers should wear respiratory protective devices if exposed to:

- Toxic gases and vapours.
- Irritating dusts, such as silica.

Hearing protection must be worn where there are high volumes of noise such as trucks and equipment.

Riggers should be careful to choose footwear that is comfortable, gives maximum grip and provides protection from pinching, jamming and crushing.

To prevent permanent damage caused by ultra violet rays always wear a hat, long sleeves, long trousers and use sun block cream when working outside.

It is important to wear the appropriate high visibility clothing to make sure other operators know where you are.

1.3.4.3 IMPLEMENTING THE CONTROL STRATEGY

Control strategies need to be implemented before starting the task, or as soon as a hazard is identified during operation.

Consult with other workers and management to ensure the implementation is done correctly and does not have a negative bearing on other trades, procedures or workers.

Once the risk control measure is in place you will need to review the level of risk to determine if more needs to be done to lower the risk level.

The acceptable level of risk is determined by an organisation's policy, goals and objectives towards safety.

Talk to your supervisor or health & safety representative if you are not sure about whether or not the risk has been reduced enough to carry out the work.

If you determine the risk to be at an unacceptable level, the work must not be carried out until the situation can be reviewed by an authorised person.

1.3.5 MONITORING AND REVIEWING THE RISK MANAGEMENT PROCESS

Monitoring and review are an important part of the risk management process and should be planned for at every stage.

Monitoring and review involves regular surveillance and checking and responsibilities concerning it should be clearly defined.

The risk treatment plan should be complete and adhere to workplace policies and procedures. The risk treatment plans should be discussed with appropriate personnel/workers and included within the management process of the organisation.

Monitoring and review should:

- Be used to detect any changes, including changes to risks, which may require revision of treatments, or the emergence of new risks.
- Ensure that treatments and controls are effective and efficient.
- Aim to improve risk assessment through obtaining further information.
- Be used to analyse events and changes that have occurred through the implementation of the process and any lessons that may be learned from this.

It is important that monitoring and review results are recorded and reported according to organisational policies and procedures.

1.3.6 REPORTING AND RECORD KEEPING

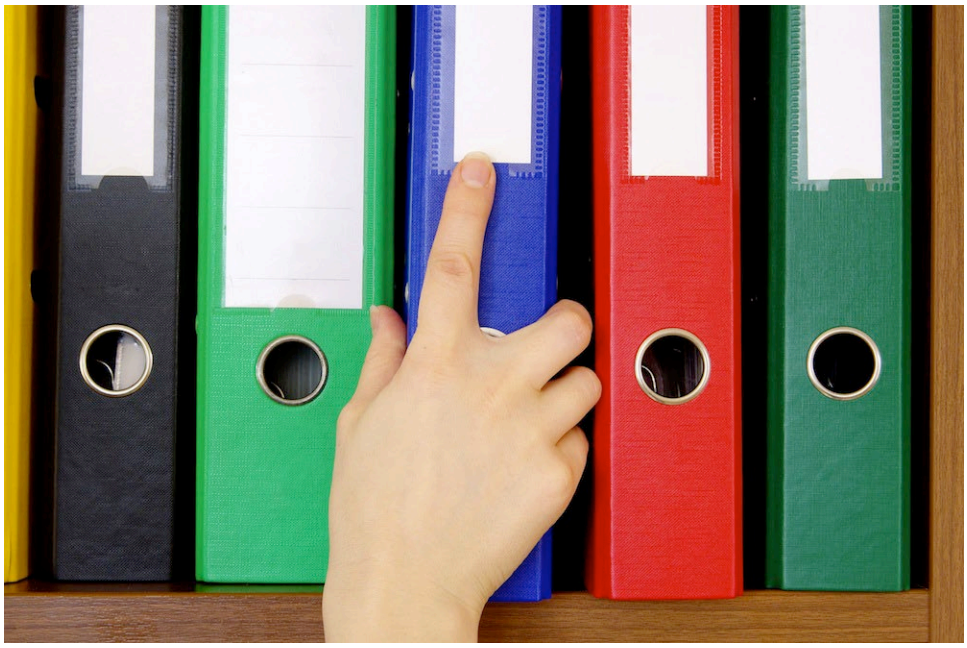
Make sure you record any action you've taken and talk to your supervisor and OHS/WHS officer about the control strategies in place.

Reports and records could include:

- Risk Assessment Reports.
- Incident Reports.
- Job Safety Analysis.
- Safe Work Method Statements.

Keeping records is important as they can help ensure that any risk management activities are traceable.

Records also provide a basis for improving methods and tools in the risk management process, as well as improving the overall process.



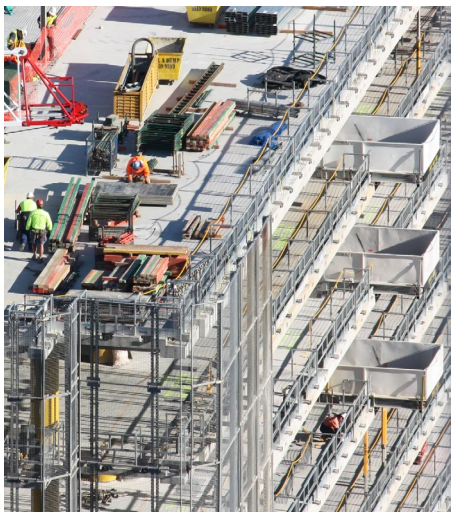
1.4 IDENTIFY EQUIPMENT REQUIREMENTS

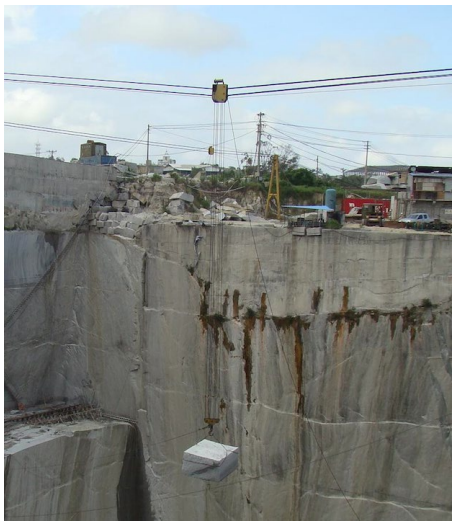
Once you have worked out exactly what the job requirements are you can begin to decide on the equipment you will use to do the work.

Riggers may use, or work with, any of the following equipment to carry out their job:

Plant & Associated Equipment:

- Scaffolds (including suspended and fabricated hung scaffolds at an advanced rigging level).
- Elevating work platforms.
- Stages.
- Personnel boxes/workboxes.
- Cantilevered crane loading platforms.
- Hoists and mast climbing equipment.
- Safety screens and shutters.
- Powered winches.
- Gin poles.
- Flying foxes.
- Cable ways.
- Shear legs.
- Tripods.
- Guyed derricks.





Cranes including:

- Non-slewing cranes.
- Mobile slewing cranes.
- Vehicle loading cranes.
- Tower cranes.
- Self-erecting tower cranes.
- Portal boom cranes.
- Derrick cranes.
- Bridge and gantry cranes.

Tools & Lifting Equipment:

- Fibre ropes.
- Flexible Steel Wire Rope (FSWR).
- Chains.
- Rigging screws.
- Anchors.
- Levels.
- Eyebolts.
- Beam clamps.
- Load equalising gear.
- Rope grips.
- Lifting clutches (swift lifts).
- Turnbuckles.
- Wire and synthetic slings.
- Sheaves.
- Spreader bars.
- Lifting beams.
- Shackles.
- Chain blocks.
- Tirfors.
- Plate clamps.
- Levers.
- Chain motors.
- Jacks.
- Lever-action winches.
- Skates.
- Girder trolleys.
- Wedges.
- Rollers.
- Bolts.
- Braces.
- Spanners.
- Podgers.

1.4.1 SAFETY EQUIPMENT

Depending on the requirements of the job, you may need to use safety equipment to reduce the risk to an acceptable level.

Safety equipment includes:

- Safety harnesses.
- Lanyards.
- Energy absorbers.
- Inertia reels.
- Static safety lines.
- Safety nets.

All safety equipment should be selected at the planning stage.

1.4.1.1 SAFETY HARNESSES

In most cases when working at heights a full body harness should be worn.

Harnesses must be correctly fitted in accordance with the manufacturer's instructions to ensure effectiveness.

Workers should connect the fall-arrest line to the attachment point on their harness (dorsal attachment point in the middle of the back, or the chest connection) that will provide the best protection for the situation in which it is being used.

Safety harnesses must meet the requirements of AS/NZS 1891 Industrial fall-arrest systems and devices.

1.4.1.2 LANYARDS & ENERGY ABSORBERS

There should be a minimum of slack in the fall-arrest lanyard between you and the anchor point, which should be as high as the equipment permits.

The length of the lanyard should restrict the fall distance to a maximum of 2 metres before the fall-arrest system takes effect.

Avoid work above the anchor point, as this will increase the free fall distance in the event of a fall, resulting in higher forces on the body and greater likelihood of the lanyard snagging on obstructions.

To reduce injuries caused by a fall, energy absorbers should be used as part of the lanyard.

1.4.1.3 INERTIA REELS

Inertia reels provide a worker with a relatively free range of movement or extra reach compared to a lanyard, with the added safety feature of being able to lock in the event of a fall, arresting the descent of the worker.

Inertia reels should not be used in the following situations:

- While working on a sloped surface (e.g. a steeply pitched roof) or any other surface where a fall may not be a quick vertical one.
- Locked as a constant support for a worker during normal work.
- In conjunction with a lanyard.

Inertia reels must comply with AS 1891.3 Fall arrest devices.

1.4.1.4 STATIC SAFETY LINES

Static lines are horizontal or substantially horizontal lines to which a lanyard may be attached and which is designed to arrest a free fall.

These provide a suitable anchor point for a fall-arrest system, while still allowing a limited range of movement along the path of the line.

1.4.1.5 SAFETY NETS

Industrial safety nets are sometimes used as an effective means of fall protection for those working at heights where it is not practicable to provide scaffolds or temporary guard railings.

When combined with overlay nets of finer mesh size, they can also be used to contain falling debris.

Safety nets may be installed where there is a risk of tools, equipment and materials falling from a height on other workers, plant, machinery, structures or pedestrians.

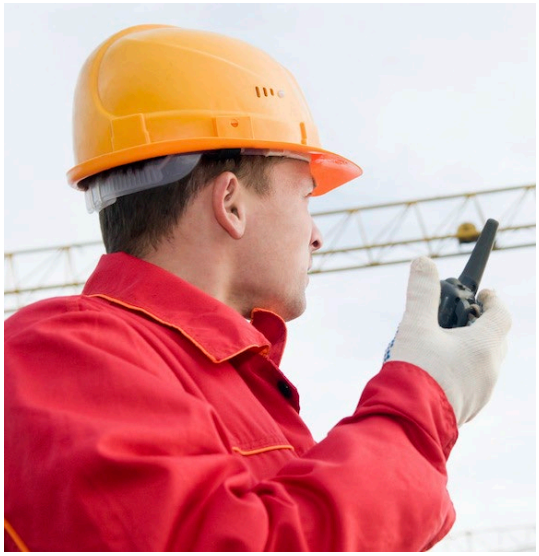
1.5 IDENTIFY COMMUNICATION METHODS

As a rigger you need to be able to communicate with those around you while you work, and you need to be able to understand task and equipment instructions. These can include:

- Manufacturer's guidelines (instructions, specifications, checklists).
- Industry operating procedures.
- Workplace procedures (work instructions, operating procedures, checklists).

Workplace communications may take the form of:

- Verbal and non-verbal language.
- Written instructions.
- Signage.
- Hand signals.
- Whistle or buzzer signals.
- Listening.
- Questioning to confirm understanding, and appropriate worksite protocol.
- Fixed channel two-way radio.
- Toolbox meetings.



Talk to the appropriate personnel/workers (e.g. supervisors, colleagues or managers) to discuss the best methods for communication while you are still at the planning stage of the job.

DO NOT use a mobile phone to talk to the crane operator while conducting rigging work.

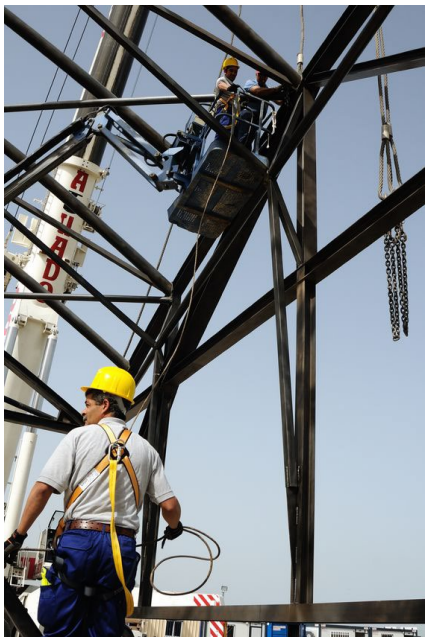
2.1 SELECT AND INSPECT EQUIPMENT

Your selection of rigging and associated equipment will depend on a number of factors. Make sure the equipment you are using is suitable for the type of job and the shape, size, weight and requirements of any loads.

The selection of equipment also includes any cranes, hoists, plant or scaffold required to carry out the job.

2.1.1 SELECTION OF RIGGING EQUIPMENT

Once you have clearly identified the work that needs to be completed you will need to select appropriate rigging equipment.



It is important that you consider how you will:

- Complete the tasks (tools, plant, equipment and materials required).
- Position materials and equipment safely.
- Access the task.
- Ensure the safety of all personnel/workers during and after the work has been completed.
- Ensure the security of all equipment during and after the work has been completed.

There is a wide range of equipment that is designed for specific tasks and that are often used in rigging operations. These can include:

Chain Blocks

Chain blocks are a geared portable appliance used for hoisting a load suspended on a chain.

Lever Blocks/Lever-Action Winches

Lever blocks are a geared portable appliance incorporating a load chain, which is operated by a lever handle.

Chain Motor

A chain motor is a mechanical device used for lifting heavy loads, objects and equipment. It has a large electric motor with a gearbox and chain drive.

When it has been attached to an overhead hang point the heavy gauge chain and hook can be used to raise and lower loads.

Rollers

Rollers can be used where the loads are bulky or heavy, and there is no room to lift the load into position by crane.

Types of rollers include:

- Steel scaffold tube for light loads.
- Solid steel bar for heavy loads.
- Timber rollers or logs for ‘bush jobs’.

Jacks

A jack is a geared mechanical device which is placed under a load to raise or lower it.

Skates

Skates are a method of moving heavy loads with a set of small rollers fixed into a solid frame which are set in bearings and run very freely. They are built to hold a specific safe working load which should not be exceeded.

Wedges

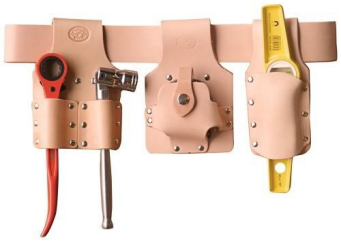
Steel wedges are used to pack under steel columns on the concrete base to ensure the column is plumb.

Girder Trolleys

Girder trolleys are attached to the lower flange of a steel girder to provide a means of moving loads along the length of the girder. They may also be used to allow a fabricated hung scaffold to travel sideways.

Hand Tools

Hand tools are used throughout different rigging tasks. These can include spanners, podgers, levers, levels, bolts and braces.



Rigging Screws / Turnbuckles

An enclosed device with an anchorage point and a threaded rod in each end.

Used to tension an FSWR or to provide fine adjustment to a sling assembly.

Hooks, Shackles, Eyebolts & Slings

Hooks, shackles and eyebolts are used to connect the crane or hoist with the lifting gear and the load.

Always make sure that all hooks, shackles and eyebolts are rated for the work and are not damaged or worn beyond acceptable levels.

Slings may be FSWR, chain or synthetic. All slings should have rating labels or tags.

Make sure that all slings are in safe working order before you use them.

Lifting Clutches (Swift Lifts)

Lifting clutches are used to lift concrete slabs and beams.

The lifting clutch is connected to an anchor embedded in the concrete.

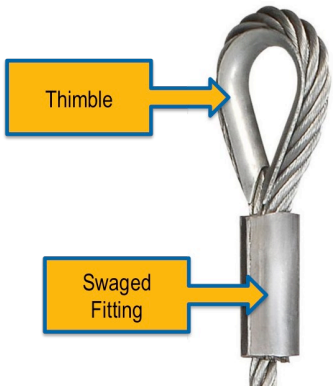
Slings can then be attached to the lifting clutch with hooks.

Flexible Steel Wire Rope (FSWR)

A rope constructed of steel wires and strands laid around a central core. These are used for:

- Linking a load to a hoist mechanism.
- Termination of static lines.
- Guys/stays for gin poles and guy derricks.
- Hoist ropes on suspended scaffolds.
- Supports for fabricated hung scaffolds.

Wire Rope Anchors & Terminations



Anchors are used to secure FSWR to various pieces of equipment. Rope terminations are used to protect the FSWR during dogging and rigging tasks. These commonly include:

- Hambone wedge sockets.
- Splices with thimbles and swage fittings.
- Turnbuckles and rigging screws.

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 are stamped or embossed on the chain at least every metre, or every 20 links, whichever is less.

Bulldog / Rope Grips

Rope grips (sometimes called bulldog grips) are a wire rope grip consisting of a U-bolt, two nuts and a saddle.

Beam Clamps

Beam clamps are used to attach slings that are supporting a fabricated hung scaffold to a steel beam (RSJ).

Tensioning Equipment (Tirfor)

FSWR needs to be adequately tensioned in various tasks carried out in advanced rigging operations.

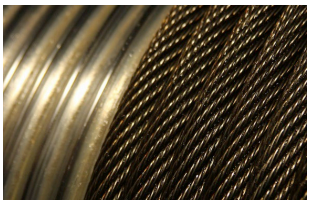
Equipment such as a tirfor can be used to tension wire rope guys/stays.

Sheaves

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

Drums

Drums are the pulling mechanism which rotates, hauls in and stores surplus wire.



Purchases

Purchases are a series of sheaves reeved up to form a mechanical advantage in the flexible steel wire rope.

Equalising Gear

Sheaves and lifting beams can be used to equalise a load (evenly spread or distribute the load). This is useful when conducting multiple crane/hoist lifts or working with tilt panels.

2.1.2 SELECT ASSOCIATED PLANT AND EQUIPMENT

Depending on the type of rigging task, there are a number of associated types of plant and equipment that you may use.

These include:

- Load shifting equipment.
- Materials handling equipment.
- Work positioning equipment.

2.1.2.1 LOAD SHIFTING EQUIPMENT

Tower Cranes

A boom or jib is mounted on a tower structure.

Self-Erecting Tower Cranes

A tower crane where the tower structure and boom/jib elements are not disassembled into component structures and can be transported between sites as a complete unit. The erection and dismantling processes are an inherent part of the crane's function.

Portal Boom Cranes

The boom/jib is mounted on a portal frame, which is supported on runways along which the crane may travel.

Mobile Cranes (Slewing)

A crane capable of travelling over a supported surface without the need for fixed runways. Relies only on gravity for stability.

Non-Slewing Mobile Cranes

A mobile crane incorporating a boom/jib that does not slew.

Vehicle Loading Cranes

A vehicle-mounted crane. Principal purpose of loading and loading the vehicle.

Bridge Cranes

Consists of a bridge beam or beams that are mounted to end carriages at each end. Capable of travelling along elevated runways and has one or more hoisting mechanisms arranged to traverse across the bridge.

Gantry Cranes

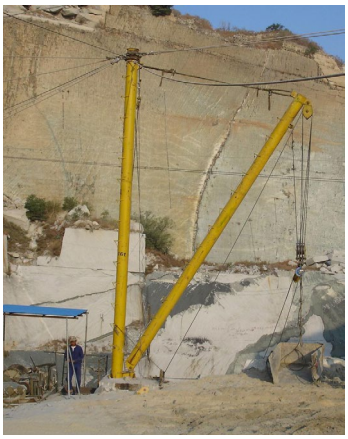
Consists of a bridge beam supported at each end by legs mounted on carriage ends. Gantry cranes are capable of travelling on supporting surfaces or deck levels, whether fixed or not, and has a crab with one or more hoisting units arranged to travel across the bridge.

Derrick Cranes

Has a slewing strut-boom with its boom pivoted at the base of a mast which is either guyed (guy-derrick) or held by backstays (stiff-leg derrick) and which is capable of luffing under load.

Gin Poles

A gin pole is an apparatus with a vertical pole or derrick that has been guyed or stayed. It is usually fitted with a purchase for lifting loads. A gin pole has limited forward or sideways movement.



Guyed Derricks

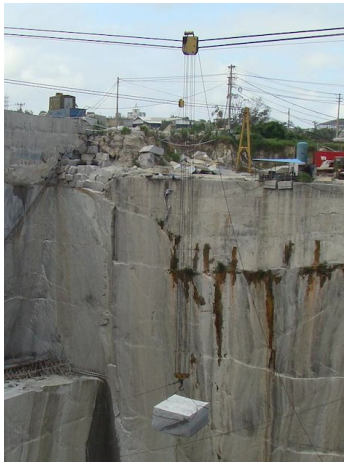
Guy derricks are constructed of steel lattice, tubular steel or timber and are used to lift loads.

Shear Legs

A shear leg has two poles forming an A-frame with a height three times the length of the base and is used for lifting a load.

Flying Foxes

A flying fox is an apparatus with a cable suspended between two poles and a trolley or 'fox' which runs on the cable and is used to raise, lower and transport loads.



Cable Way/Span Ropes

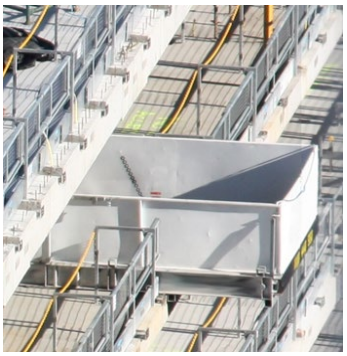
A cable way/span rope is a line that crosses an open space between two high points that a load traverses (travels along).

Powered Winches

Winches are used with gin poles, guy derricks, flying foxes and span ropes to lift and shift materials using a series of sheaves.

2.1.2.2 MATERIALS HANDLING EQUIPMENT

During rigging operations you may also work with or need to erect/install:



Cantilevered Crane Loading Platforms

Cantilevered Crane Loading Platforms (CCLPs) are used to place loads with a crane into work areas high up off the ground.

Perimeter Safety Screens & Shutters

Perimeter safety screens and shutters are designed to prevent personnel/workers and any debris, tools or materials falling from a height.

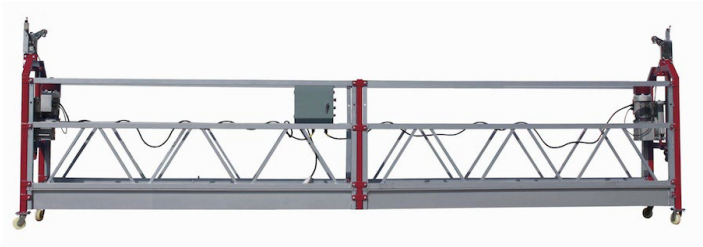
Materials Hoists

Materials hoists run up and down the outside of a tower using a wire rope hoisting system for raising and lowering the platform.

2.1.2.3 WORK POSITIONING EQUIPMENT

Fabricated Hung Scaffolds

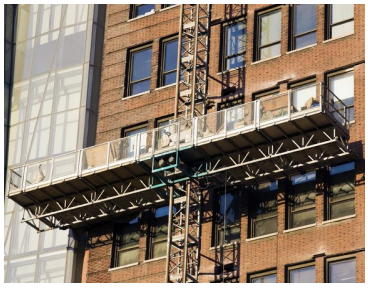
Fabricated hung scaffolds are purpose built temporary structures that are attached to a permanent structure (such as a building or transmission tower) to support a working platform for personnel/workers, tools and materials. Hung scaffolds are not capable of being raised or lowered while in use.



Suspended Scaffolds

A suspended scaffold has a suspended platform that can be raised and lowered during normal use. It is generally suspended from temporary overhead supports by flexible steel wire ropes to which scaffolding hoists are fixed. All equipment that makes up a suspended scaffold system will need to be selected based on the task. This includes selecting:

1. A **cradle** that fits the personnel/workers and equipment required to carry out the task.
2. A **hoist** mechanism that is capable of lifting and lowering the cradle.
3. A **suspension rig/needle** assembly that is appropriate for the job.

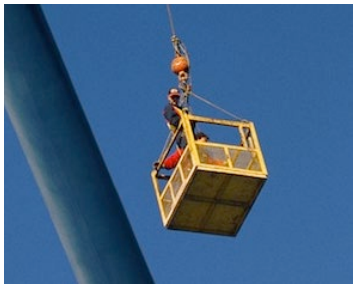


Mast Climbers

Mast climbers are made up of work platforms that are raised and lowered along 1 or more masts using a hoist mechanism.

Elevating Work Platforms

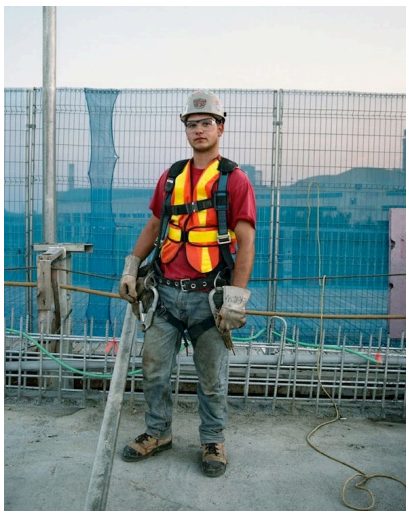
Elevating Work Platforms (EWPs) are available in a variety of types and sizes such as boom type, scissor lifts and vertical mast.



Personnel Work Boxes

Personnel boxes or workboxes are used to lift workers with a crane. Crane-lifted workboxes are often suitable for very high work or isolated parts of the project where it is difficult or impractical to provide scaffolds or EWPs.

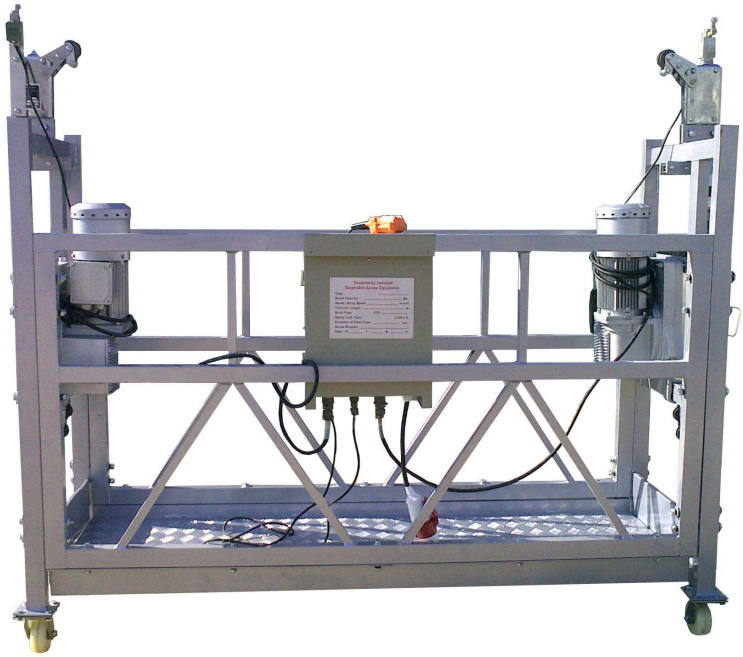
2.1.3 INSPECTION OF ASSOCIATED PLANT AND EQUIPMENT



ALL rigging and associated equipment must be inspected before use.

Rigging equipment, such as scaffolds and plant, needs to be inspected by a competent and licenced person before they are used.

Plant and equipment, such as scaffolding, elevating work platforms, mast climbers or cranes, needs to be checked daily before use to make sure all items are working properly. These checks need to be completed by a person licenced to operate that equipment. All other rigging equipment (where applicable) needs to be inspected before any work is carried out.



2.2 INSPECT SAFETY EQUIPMENT

All safety equipment needs to be inspected for serviceability before you start the rigging work.

Safety equipment includes:

- Safety harness.
- Energy absorber.
- Lanyard.
- Inertia reel.
- Static safety lines.
- Safety nets.

All harnesses and appropriate attachments need to be inspected in accordance with AS 1891.

2.2.1 INSPECT FALL-ARREST HARNESS

A fall-arrest harness must be inspected before use. Common defects that will condemn a safety harness from use are:

- Fraying.
- Splitting.
- Any obvious signs of damage to any part of the harness.

Shown here are some examples of things you need to check the harness for:

Component	Condition/fault to be checked
Webbing	▸ Cuts or tears. ▸ Abrasion damage. ▸ Excessive stretching. ▸ Damage due to contact with heat, corrosives or solvents. ▸ Deterioration due to rotting, mildew, or ultraviolet exposure.
Snap Hooks	▸ Distortion of hook or latch. ▸ Cracks or forging folds. ▸ Wear at swivels and latch pivot pin. ▸ Open rollers. ▸ Free movement of the latch over its full travel. ▸ Broken, weak or misplaced latch springs (compare if possible with a new snap hook). ▸ Free from dirt or other obstructions, e.g. rust.
D-rings	▸ Excessive 'vertical' movement of the straight portion of the D-ring at its attachment point of the belt, so that the corners between the straight and curved sections of the D become completely exposed. **NOTE:** Excessive vertical movements of the D-ring in its mounting can allow the nose of larger snap hooks to become lodged behind the straight portion of the D, in which position the snap hook can often accidently 'roll out' of the D under load. ▸ Cracks, especially at the intersection of the straight and curved portions. ▸ Distortion or other physical damage of the D-ring. ▸ Excessive loss of cross-section due to wear.
Buckles and adjusters	▸ Distortion or other physical damage. ▸ Cracks and forging laps where applicable. ▸ Bent tongues. ▸ Open rollers.
Stitching	▸ Broken, cut or worn threads. ▸ Damage or weakening of threads due to contact with heat, corrosives, solvents or mildew.

2.2.2 INSPECT INERTIA REEL

Shown here are some examples of things you need to check an inertia reel for:

Component	Condition/fault to be checked
Rope (Fully extend rewind drum anchorages)	▸ Cuts. ▸ Abrasions or fraying. ▸ Stretching. ▸ Damage due to contact with heat, corrosives, or solvents. ▸ Excessive dirt or grease impregnation. ▸ With rewind anchorages give a firm pull with the rope fully extended to check that the rope end is securely anchored to the drum.
Anchorage body	***a) Mounting ring:*** ▸ Physical damage or wear, especially at any pivot points. ▸ Cracks, especially in corners. ▸ Mounting security. ***b) Anchorages body proper:*** ▸ Physical damage such as significant dents, distortion, or corrosion. ▸ As far as possible, but without dismantling, check for the entry of foreign bodies such as small stones. ▸ Loose or missing screws, nuts or similar objects (external check only). ▸ Position of the clutch compression indicator button (fitted only to rewind drums with steel rope).
Locking mechanisms and rope guides	▸ Check externally visible rope guides for excessive wear or ridging. ▸ Check that the rope-locking mechanism locks and holds securely when the rope is given a sharp tug. ▸ Ensure that the rope runs freely through the anchorage with no tendency to stick or bind, and that on rewind drum anchorages the rope rewinds completely without loss of tension.
Hardware	▸ Examine the condition and locking action of any associated snap hooks or links.

2.3 REPORT ALL DEFECTS AND ISOLATE FAULTY EQUIPMENT

If you identify any equipment that is defective, damaged or faulty you must not use it. The equipment needs to be isolated from use to stop anybody from accidentally using it and the defect needs to be reported to an authorised person.

Make sure you complete any isolation procedures as required.

This may include tagging or locking out equipment and completing fault reports or other documentation.

Faulty lifting equipment may need to be labelled and rejected, destroyed or returned to the manufacturer for repair (depending on the type and severity of the fault).

2.4 SELECT AND CHECK COMMUNICATION EQUIPMENT

It is important that the two-way system provides clear signals without any interference on the channel.

Make sure all equipment is working properly and that you can communicate with the crane or hoist operator clearly **BEFORE** you start the job.

Do not use any communication equipment that is not consistently working properly. Check that there is no interference on the channel.

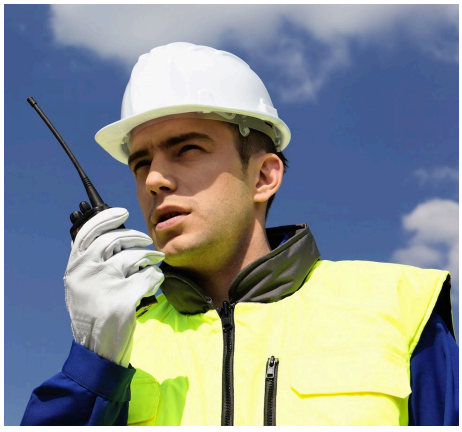
The two types of two-way radio are conventional and trunked.

2.4.1 CONVENTIONAL RADIO

Great care must be taken when allocating frequencies/channels to make sure that there are no other operators using the same frequency in the area.

Interference on your frequency can be a safety hazard. Stop work until the radio is checked or a new frequency selected and allocated.

2.4.2 TRUNKED RADIO



Trunked radio is a computer-controlled two-way system that locks other radio users out of your selected frequency.

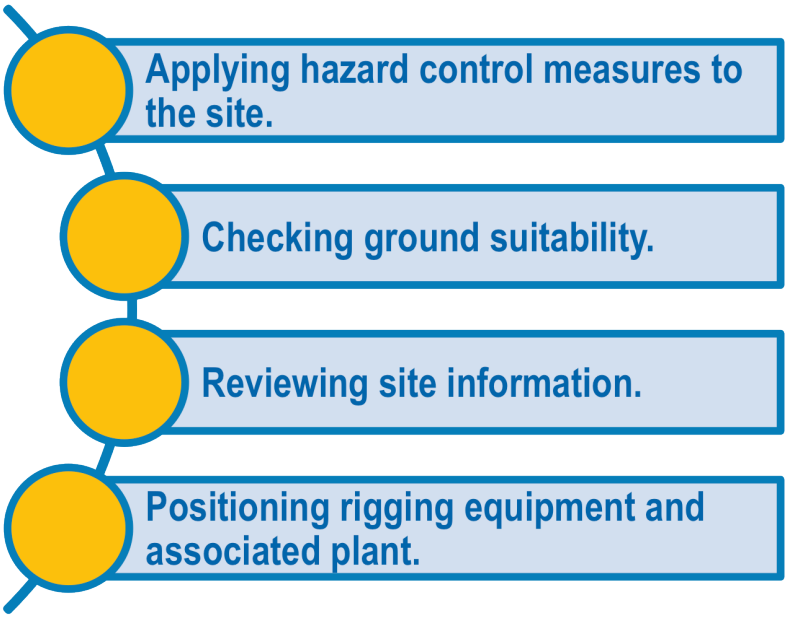
With trunked radio it is possible to have several separate groups on one site communicating by radio without interfering with each other.

Trunked radio is recommended for large sites.

3.1 SET UP FOR THE TASK

You need to make sure everything is set up correctly so that you can carry out the rigging work safely and efficiently. Planning and preparation are essential to conducting the work safely and on schedule.

This includes:



3.1.1 APPLY HAZARD CONTROL MEASURES

Part of preparing the site includes setting up any hazard controls.

This might include:

- Setting up barricades to keep traffic and pedestrians outside of the work area.
- Setting up extra lighting or safety shutters/screens.
- Having electric/power lines insulated or disconnected.

Some hazards are caused by the work being done so you may need to move obstructions such as equipment, materials or debris, or install trench covers if working near excavations.

Always wear the required Personal Protective Equipment (PPE) for the job.

Make sure that any control measures are consistent with workplace and safety standards.

If you are unsure what the required PPE is, check with your OHS/WHS officer or supervisor.

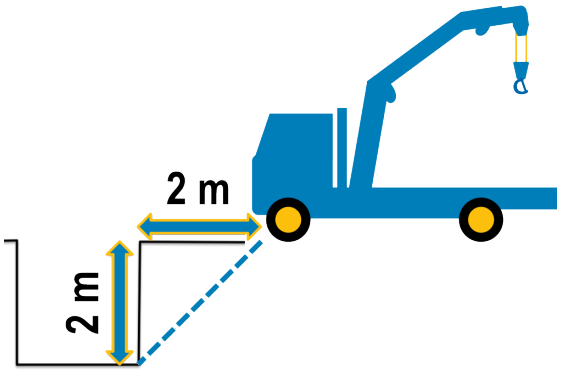
3.1.2 CHECK GROUND SUITABILITY

Before setting up any equipment or plant you need to make sure the ground will support the weight of the equipment and load.

All rigging tasks need to be carried out on a firm surface that is going to be able to support any structures or the completion of the task.

The plant could become unstable during operation if the ground is rough, uneven or soft.

Backfilled trenches may not have compacted completely and are dangerous to set up the equipment on.



All equipment must be set up following the 1:1 ratio.

This is where plant and equipment is set up at least 1m away from an excavation (or recently filled trench) for every 1m of depth.

For example, you would set up equipment at least 3m away from a 3m deep excavation.

This is a guide only – a competent person must check the stability of the ground before any equipment is set up.

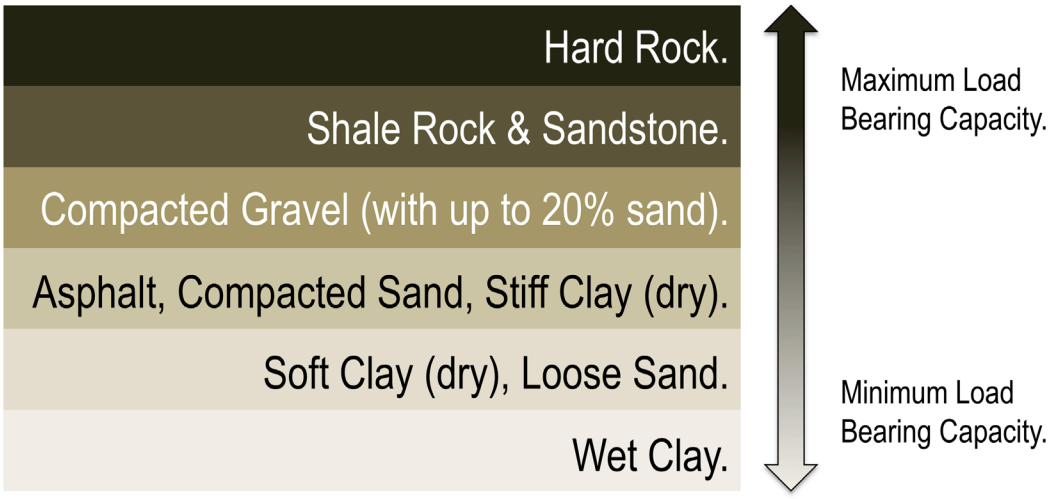
Check to make sure there are no underground services running through the area where you plan to set up the plant.

The pressure of the equipment could cause damage to the underground services/pipes/cables.

You may need to use packing or mats under the outriggers to make the equipment stable on soft ground.

You will need to establish the ground stability by referring to a soil report from an engineer.

Different ground and soil types have different load bearing pressures depending on how firm or dense they are:



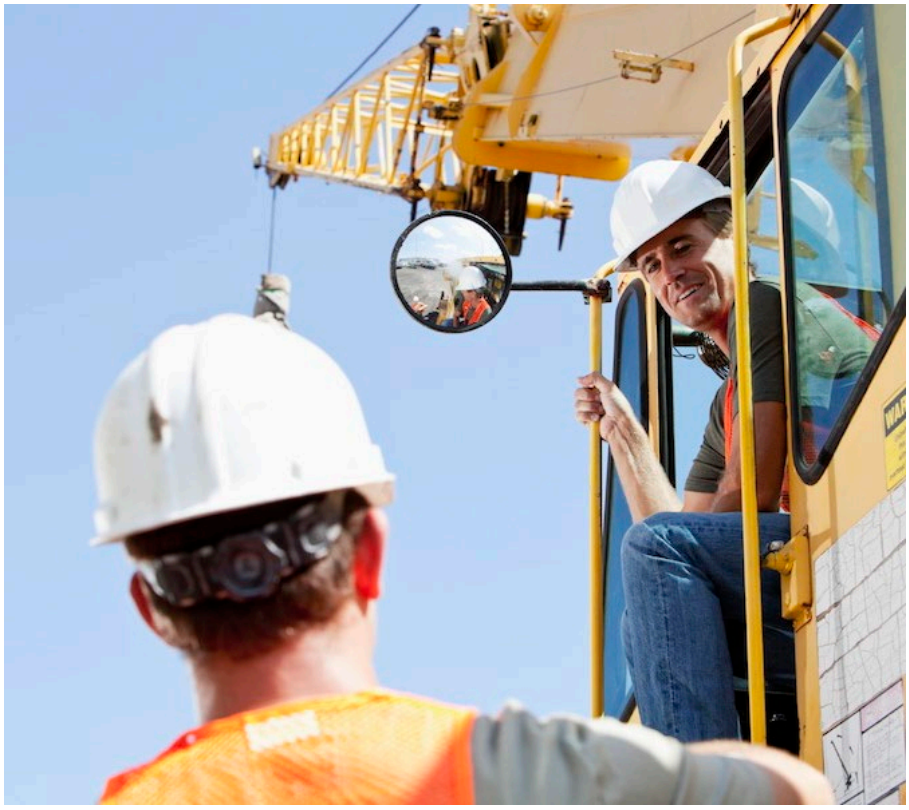
You must also check the load bearing limits of suspended concrete floors, building roofs and landings if loads or pieces of equipment are going to be resting on them.

3.1.3 REVIEW SITE INFORMATION

Talk to other associated personnel/workers such as doggers, other riggers and crane operators to review the site information and make sure you have properly selected and set up the equipment needed to carry out the job safely.

All work must be in keeping with safety standards and workplace rules to ensure the safety of all workers.

All structures and associated plant that are being erected as part of the rigging work need to be carried out according to procedures and site information.



3.1.4 DETERMINE FORCES AND LOADS

You also need to determine all forces and loads associated with the erecting, operation and dismantling of structures and associated plant to make sure rigging equipment is set up correctly.

This includes working out the weights of plant and equipment, and the additional weight of loads as they are moved around the site.

You will also need to consider wind loads if you are working on a particularly windy day.

Check the manufacturer's specifications for all plant and equipment to locate their wind rating.

It is extremely dangerous to operate some equipment in high winds, especially when shifting loads.

Once these forces and loads have been determined you are able to make sure that:

1. Any cranes or hoists are configured correctly.
2. Lifting equipment and/or load locations (e.g. ground, scaffolds or suspended floors) are capable of handling the load.
3. All associated plant and equipment is capable and appropriate for completing the task.

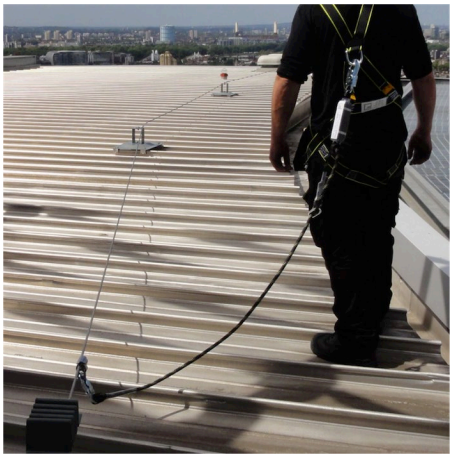
3.1.5 FIT SAFETY EQUIPMENT

All safety equipment needs to be fitted before starting the rigging work.

You need to make sure it is appropriate for the task and that it fits you correctly.

Never begin a rigging task without the appropriate safety equipment.

Safety systems (such as static lines, work positioning systems and fall-arrest systems) and some plant and equipment (such as elevating work platforms and crane-lifted personnel boxes/workboxes) require the use of a full body fall-arrest harness and installed anchor points.



Static lines, fall-arrest and work-positioning systems make use of anchors to keep the system secure.

The forces that the anchors are capable of holding are dependent on the manufacturer's design specifications and installation instructions.

Always make sure the system that you are connecting to is capable of supporting your weight, especially when more than one person is attached to a single anchor point.

Safety equipment also includes personal protective equipment (PPE). Always make sure you are wearing the correct PPE for the task and worksite.

As well as a fall-arrest harness at a minimum this would generally include:

- Hard hat/safety helmet.
- Safety gloves.
- Steel-capped work boots.
- High-visibility clothing.

Check for signage on site or talk to a manager or supervisor if you are unsure of the PPE requirements for the site.

3.1.6 POSITION PLANT AND EQUIPMENT

Any equipment and plant that you will be using throughout the rigging work needs to be correctly and safely positioned.

It also includes coordinating resources so that you have everything that you need in or close to the work area. This will allow you to erect, install or disassemble plant and equipment without having to continuously leave the work area, or disrupt operations that may be taking place elsewhere on the worksite.

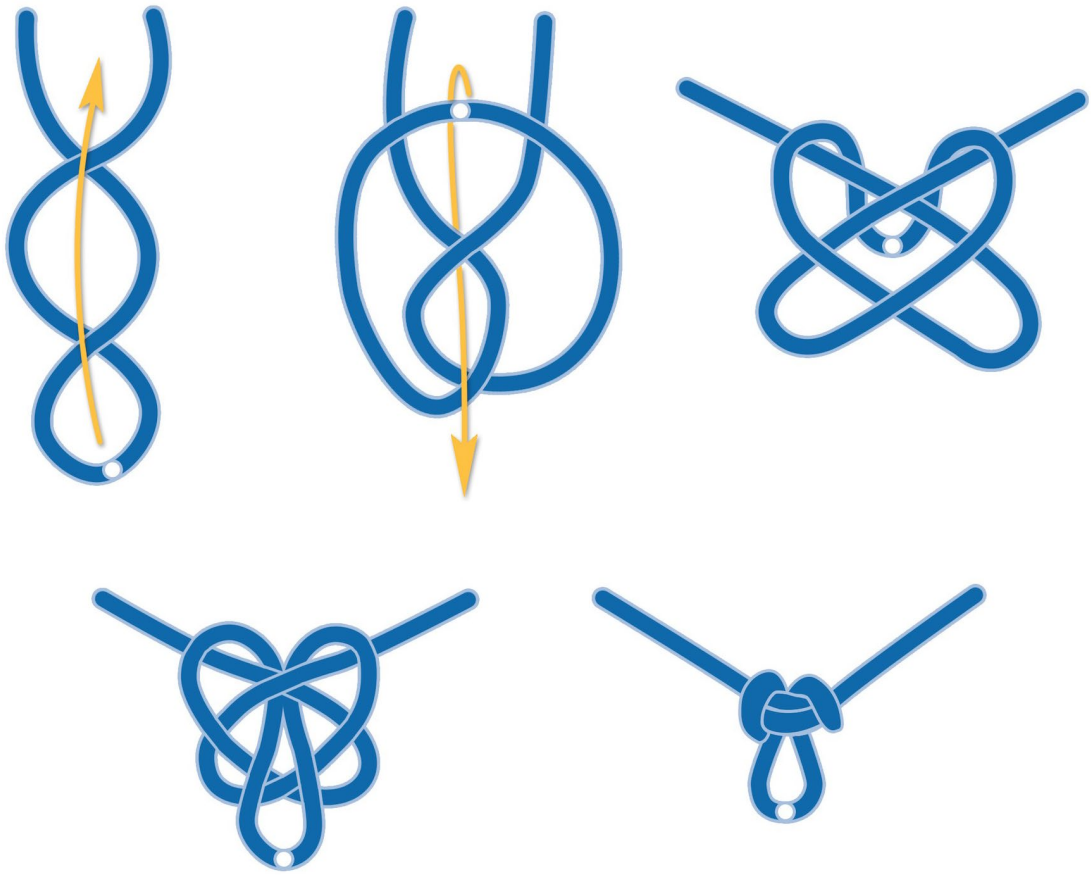
3.1.7 ADVANCED RIGGING TEMPORARY CONNECTIONS

The following are some of the temporary connections that you may use during any advanced rigging:

- Alpine hitch.
- Bosun chair hitch.
- Prusik hitch.
- Figure eight knot.
- Any knot, bend or hitch from basic level rigging.

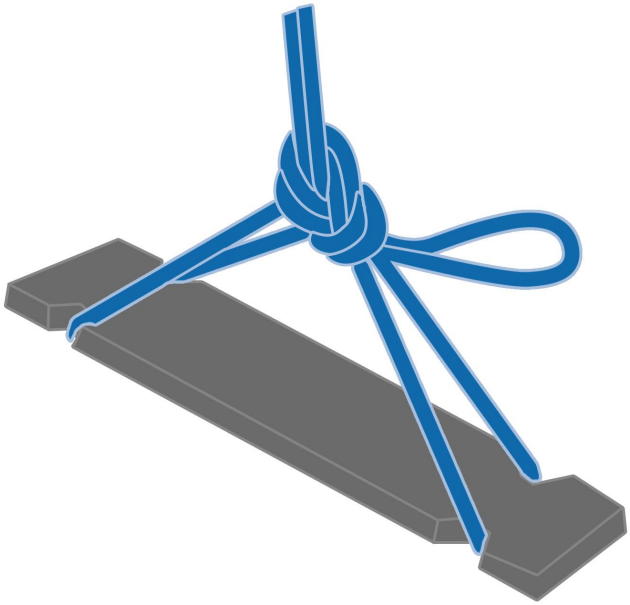
3.1.7.1 ALPINE HITCH

An example of an alpine hitch:

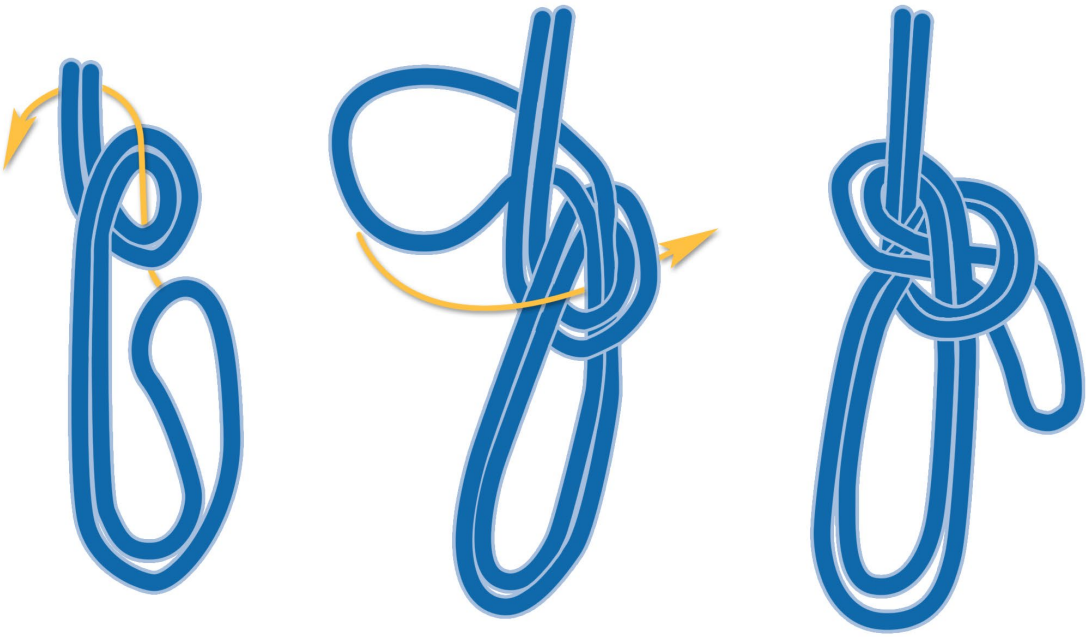


3.1.7.2 BOSUN CHAIR HITCH

A bosun chair can either have the workers legs through the ropes or have the ropes inserted through the two leg loops on a notched board. The loop formed as the running end to make the double bowline will still provide a back support, and the rolling hitch can still be used to lower the bosun chair.

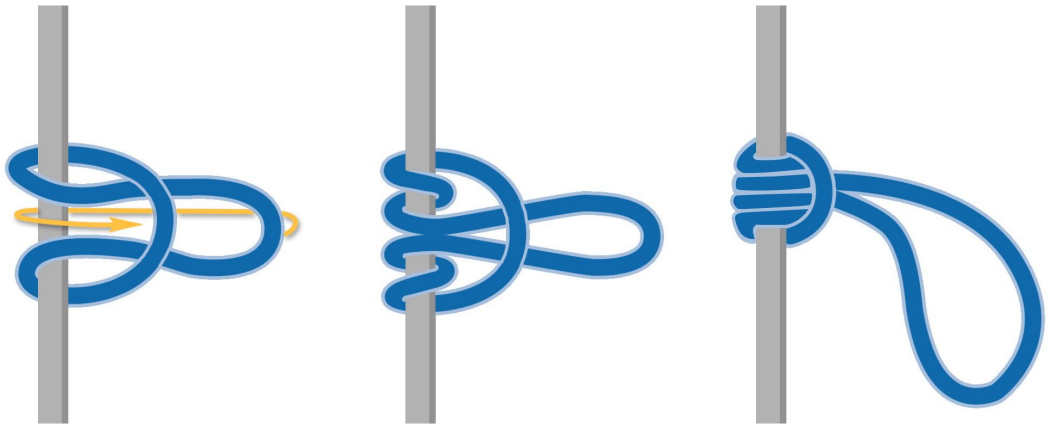


A double bowline can be tied as shown below:



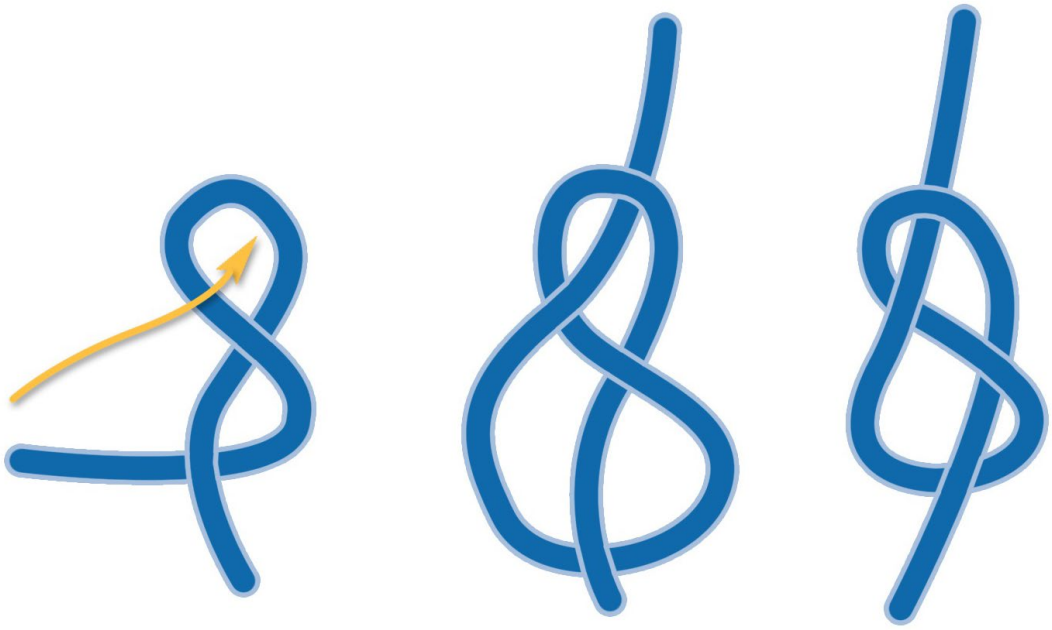
3.1.7.3 PRUSIK HITCH

Example of a Prusik hitch:



3.1.7.4 FIGURE EIGHT KNOT

Example of a figure eight knot:



3.2 ERECT ASSOCIATED PLANT

All associated plant being erected as part of the rigging work, must be carried out according to procedures and site information. All work must be in keeping with safety standards and workplace rules to ensure the safety of all workers.

Coordination with other personnel during all advanced rigging operations is vital to the safe completion of tasks. Clear and effective communication needs to be maintained throughout the planning, preparation and execution of tasks. If at any time you are not sure about your specific responsibilities talk to the other personnel/workers or your supervisor to confirm the details of the task.

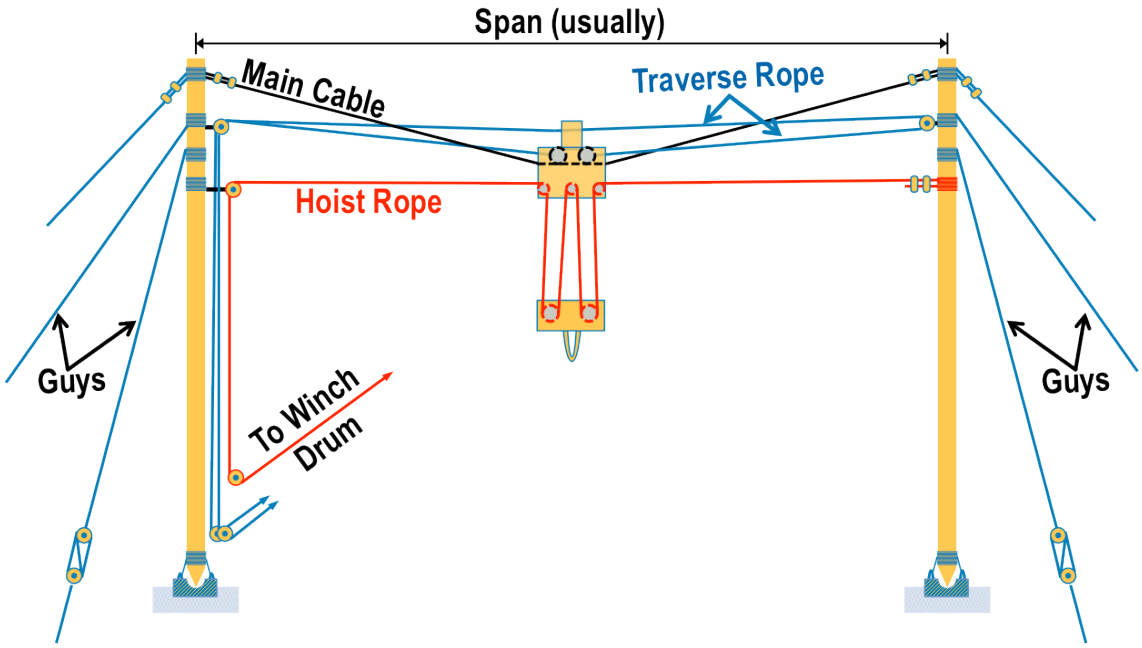
Communication equipment should be appropriate to the situation and may be necessary due to distances between personnel/workers who are coordinating on the same task.

3.2.1 FLYING FOXES & CABLE WAYS (SPAN ROPES)

Flying foxes and cable ways (or span ropes) are used to traverse a load, using cables supported by temporary or permanent structures.

3.2.1.1 FLYING FOXES

A flying fox is an apparatus with a cable suspended between two poles and a trolley or 'fox' which runs on the cable and is used to raise, lower and transport loads.



When installing a flying fox:	
Fix a 'traverse' rope or reeve the hoisting rope to keep the fox in the correct position. The endless control or traverse rope may be left out of the construction of the flying fox only on the advice of an engineer.	☐
Make sure the fox has four or more wheels so that as the main cable bends under the weight of the load the force is spread over an adequate length.	☐
The diameter of the wheels should be eight times the diameter of the main cable.	☐
When the unloaded fox is at half span the sag of the main cable can be about 1/20 or 5% of the span.	☐
The tension in the main cable under the maximum working load should never reach more than 1/6 of the breaking strength of the cable.	☐
If the span is less than 200m the hook block should be heavy enough to overcome the pull of the ropes whilst being lowered.	☐
If the span is more than 200m then carriers will need to be fitted. Carriers are steel links or loops that support the hoisting rope from the main cable. If carriers are not used then the hoisting rope will sag and interfere with the control of the lifting hook. The carriers have a wheel running on the main cable. As the fox travels along the main cable it leaves behind a carrier where needed to support the hoist rope. An overhead 'button rope' is used to unship and locate carriers from the fox. As the fox runs back over the carriers they are collected up again.	☐
Preventer ropes should be clamped to operating ropes by properly constructed double-seated clamps. **DO NOT** use bulldog grips.	☐
When using poles at each end of the flying fox a maximum slope of 1:5 from the vertical is allowable.	☐

3.2.1.2 CABLE WAYS/SPAN ROPES

A cable way/span rope is a line that crosses an open space between two high points.

Cable ways/span ropes should have a safety factor of at least 6 for reeving ropes, to allow for sharp rope bends at anchorages and at the point where the load is attached.

Make sure the cable way/span rope is securely anchored at both ends, the purchase is in the right place and that all the connections have been made correctly.

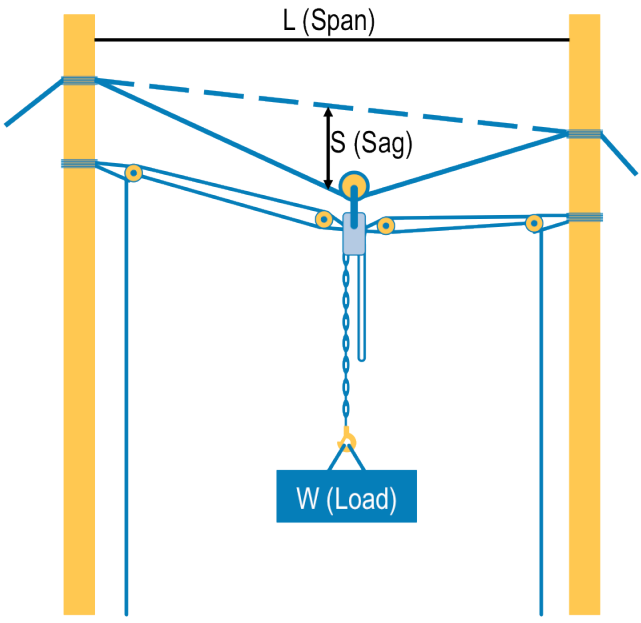
The rope will have less tension the more it sags. For this reason the sag should never be less than 5% of the length of span.

No parts of the cable way/span rope should be overloaded at any time.

Beam edges should be adequately packed to protect the ropes.

Sheaves should be at least 10 times the diameter of the span rope.

Running control lines should lead as close to line of span as possible.

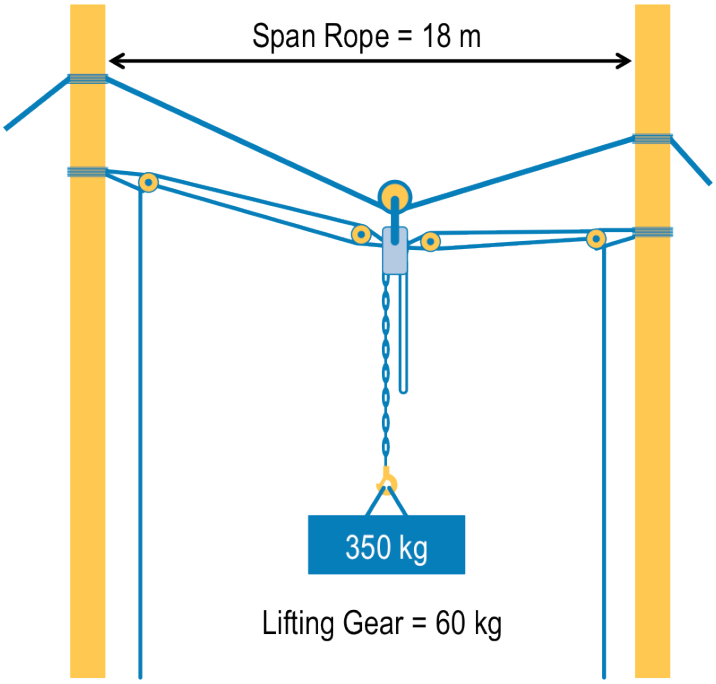


3.2.1.3 CALCULATIONS FOR FLYING FOXES AND CABLE WAYS

When erecting flying foxes or cable ways/span ropes you will need to calculate a number of items to help make sure the equipment is safe to use.

For example:

An 18m cable way/span rope is fixed between 2 beams. The load to be lifted is 350kg and the weight of the lifting gear is 60kg.

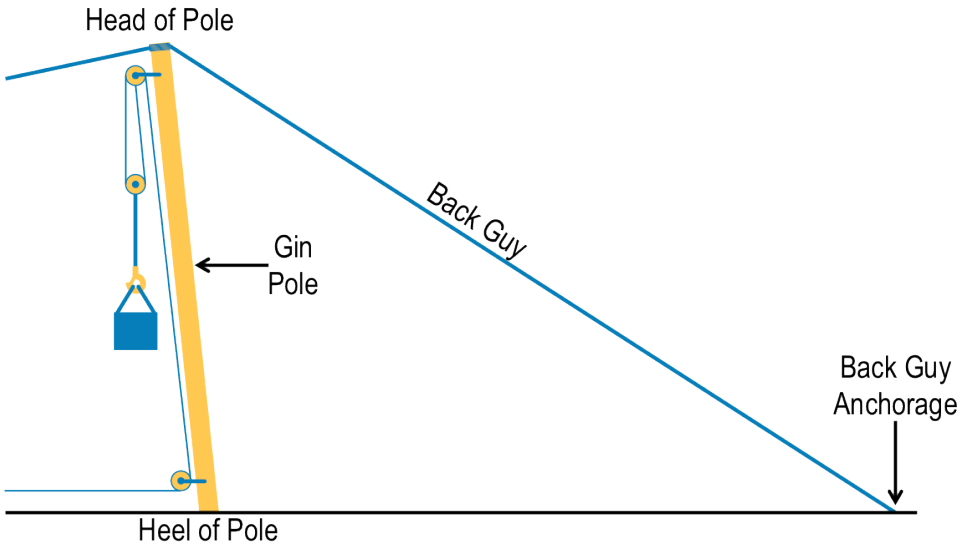


For this configuration you will need to work out the following:

Item	Calculation	Example
Total load (W).	W = Weight of load + Weight of lifting gear.	W = 350kg + 60kg W = 410kg
Maximum allowable sag in main cable (S).	S = Span (L) ÷ 20	S = 18m ÷ 20 S = 0.9m or 900mm
Tension in the cable way/span rope.	Tension = (W x L) ÷ (4 x S) Alternative Formula: Tension = W x 5	Tension = (410kg x 18m) ÷ (4 x 0.9m) Tension = 7380kg ÷ 3.6m Tension = 2050kg
Minimum diameter of FSWR for main cable.	FSWR diameter = √ (Tension ÷ 8)	FSWR diameter = √ (2050 ÷ 8) FSWR diameter = √ 256.25 FSWR diameter = 16mm

3.2.2 GIN POLES

A gin pole is an apparatus with a vertical pole or derrick that has been guyed or stayed. It is usually fitted with a purchase for lifting loads. A gin pole has limited forward or sideways movement.

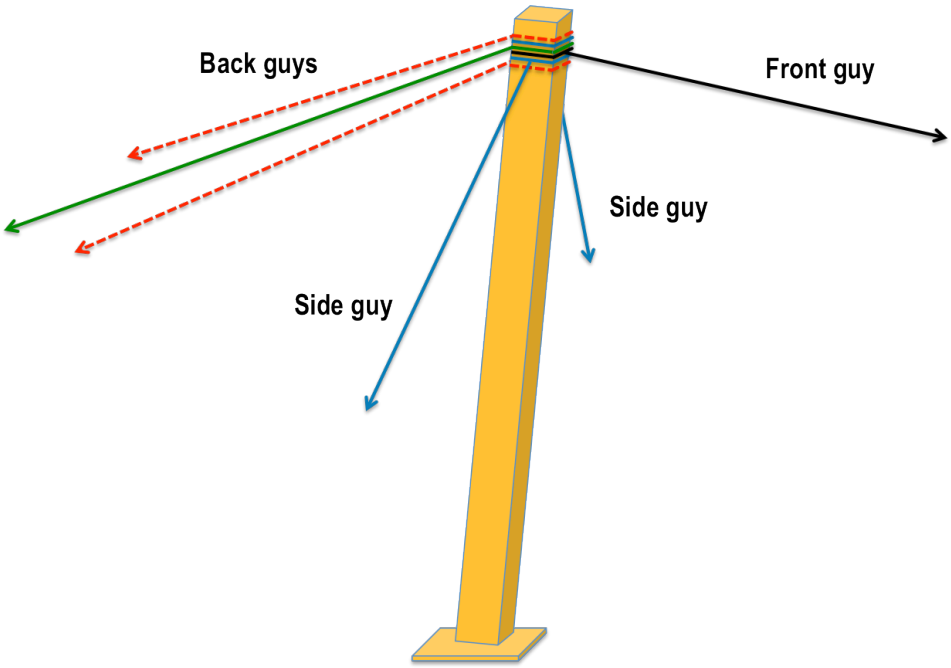


When setting up a gin pole:

- A solid bar is fitted near the top of a timber beam.
- Single/twin reversed head slings are reeved around the mast above this bar.
- Protect the edges of the pole with corner battens.
- Secure a bolster below the bar to stop the headlock from binding into the pole.
- Shackle the headslings into the headlock of the purchase.

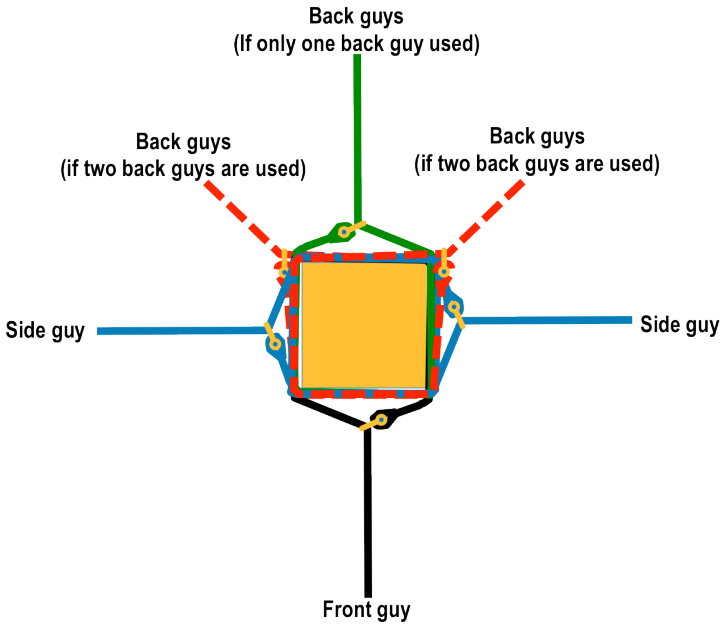
The pole should be fitted with a minimum of 4 guy ropes: one at the front, one on each side and one at the back.

An additional guy rope may be required at the back for the purpose of tracking so that one rope can be used as a lazy guy when shifting the position of the other ropes.



Equalise the load if more than one back guy is used. All guys or stays should be packed or lagged if they are to run over sharp edges or connected to columns or piers.

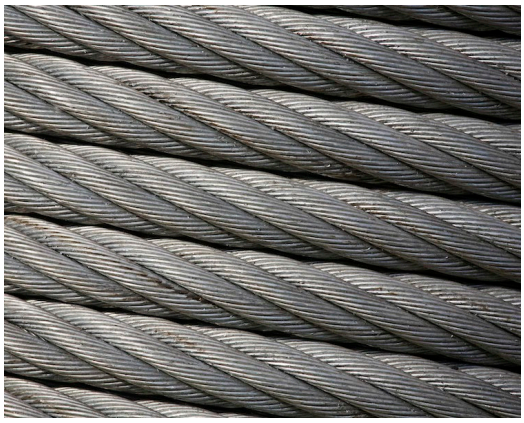
Stays and guys should have an eye splice at the top end so they can be shackled in position. A rope yarn seizing can be fitted to prevent slackening.

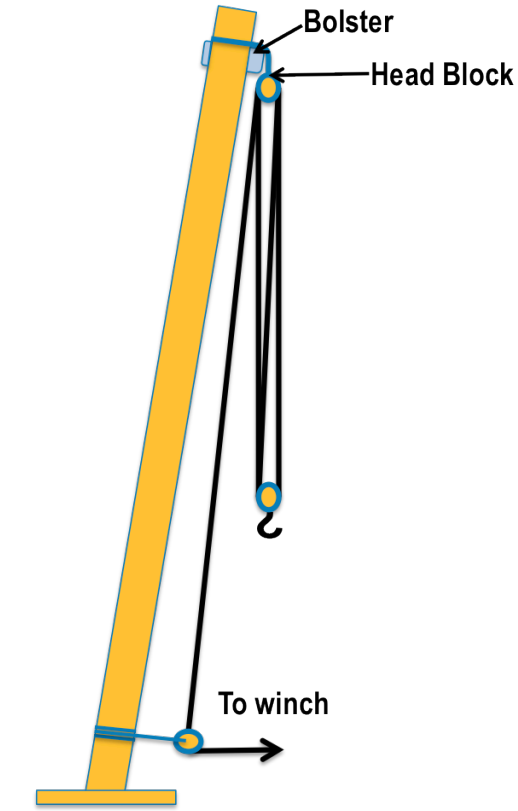


Wire ropes used as guys or stays must be no less than 6x19 construction. They should have a breaking tensile strength of not less than 1570 Grade.

Make sure the guys can take the weight of the load.

For example – if you are erecting a gin pole where the distance from the back guy anchorage to the heel of the pole is equal to 1.5 times the height of the pole then the load in the guy should be 1/8 of the total load. If the backstay anchorage is less than 1.5 times that height of the pole an engineer will need to determine the size of the pole and guy.





Note: Guys/stays omitted for clarity

A single block and gantline can be fitted to the pole's head so a bosun chair can be used to access in case adjustment and greasing is needed.

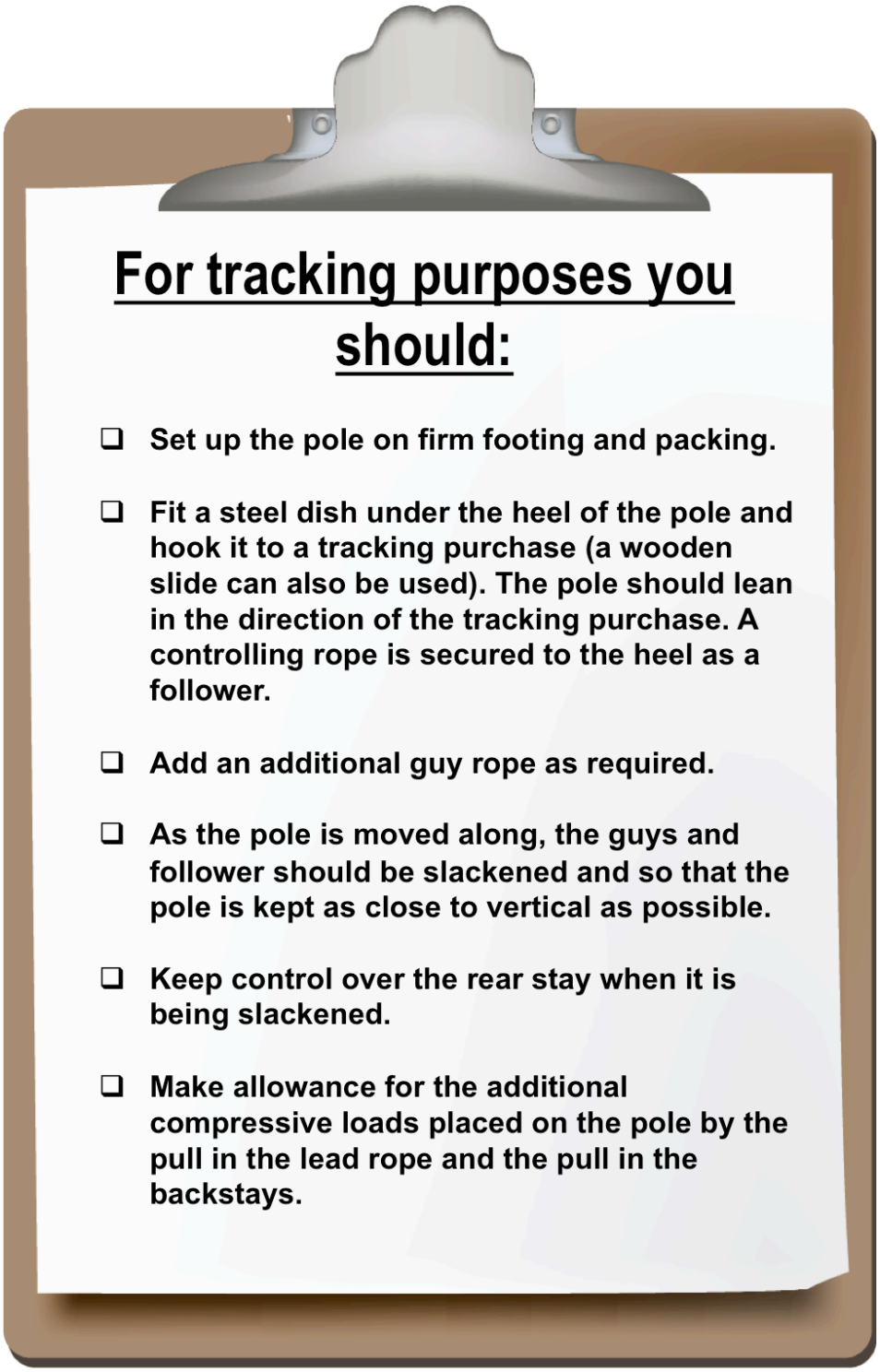
The lead from the top block of the main purchase is taken through a lead block, which is shackled to a sling rove around the heel of the pole.

Heel lashings are used to secure the pole into position with at least one of these lashings opposite the direction of pull on the lead rope.

A front heel lashing should be fitted if the pole is to be leaned forward. A side heel lashing (with the guy opposite the lean taking the strain) should be fitted if the gin pole is to be leaned sideways.

The maximum forward lean of a gin pole is 1:10 measured from the vertical.

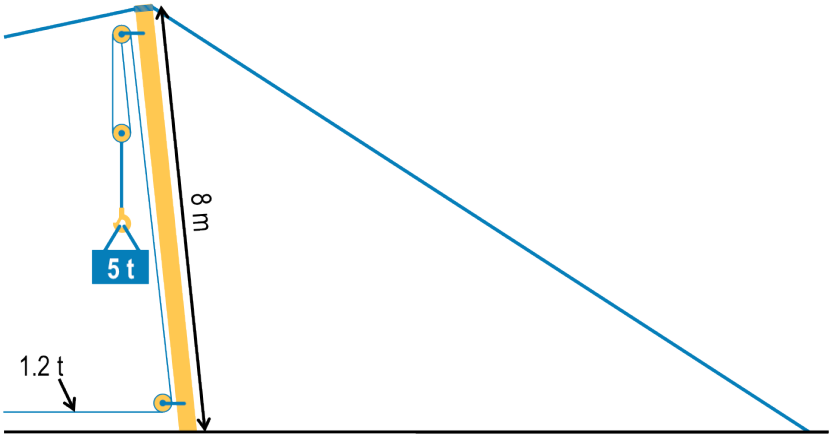
A butt joint secured with steel or timber splice plates and bolts is used to splice gin poles or masts together. Use angle reinforcement when using separate plain steel plates. Engineer calculations should be obtained when splicing steel lattice frame poles.



3.2.2.1 LIFTING A LOAD WITH A GIN POLE

An 8m gin pole has been set up for the purpose of lifting a load using a powered lift.

The weight of the load is 5t and the load in the load rope is 1.2t.



For this configuration you will need to work out the following:

Item	Calculation		Example
Minimum distance between the heel (base) of the pole and the back guy anchor.	Minimum distance = pole length x 1.5		Minimum distance = 8m x 1.5 Minimum distance = 12m
Maximum allowable lean on the pole.	Maximum lean = pole length ÷ 10		Maximum lean = 8m ÷ 10 Maximum lean = 800mm
Total head load (THL).	THL = Total load + Load on lead rope (lead load)		THL = Total load + Load on lead rope THL = 5t + 1.2t THL = 6.2t
Compression load on gin pole.	Powered Lift:	Compression = THL x 1.125	Compression = THL x 1.125 Compression = 6.2t x 1.125 Compression = 6.975t
	**Hand Powered Lift:*	*Compression = THL x 1.428*	*Compression = THL x 1.428* *Compression = 6.2t x 1.428* *Compression = 8.854t*
Tension in the back guy.	Powered Lift:	Tension = Compression load ÷ 8	Tension = Compression load ÷ 8 Tension = 6975kg ÷ 8 Tension = 871.87kg
	**Hand Powered Lift:*	*Tension = Compression load ÷ 7*	*Tension = Compression load ÷ 7* *Tension = 8854kg ÷ 7* *Tension = 1.265t*
Minimum diameter of FSWR for back guy.	FSWR diameter = √ (Tension ÷ 8)		FSWR diameter = √ (Tension ÷ 8) FSWR diameter = √ 108.98 FSWR diameter = 10.44mm rounded up to 11mm

*Note: Formulas have also been included for hand powered lifts.

3.2.3 GUY DERRICKS

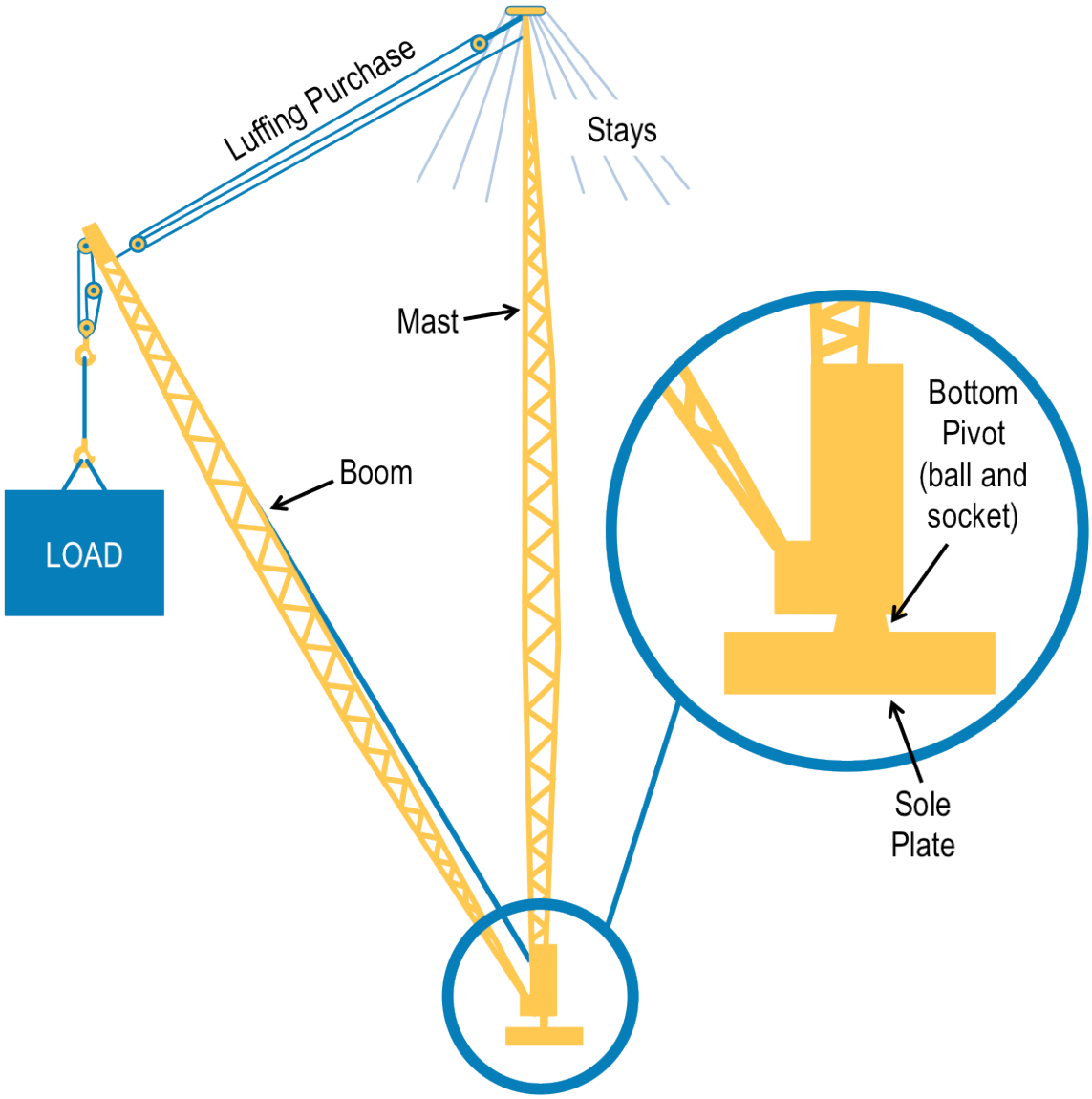
Guy derricks are constructed of steel lattice, tubular steel or timber.

The mast of a guy derrick is rotated on a ball and socket footing. This should be safely anchored to stop it moving.

A guy pendant and rope tackle should be fitted to each side of the derrick to control its movement.

A bullwheel and power winch can be fitted to allow slewing.

A swivel can be fitted to the mast head with a spider so the stays can be secured and the derrick and mast can revolve as one unit.



Usually either 6 or 8 guys are fixed at equal angles to plumb the mast. These stays should be rigidly anchored and continually kept taut. This may be achieved by coordinating with other personnel/workers to get all of the guy ropes in position and tightened in an appropriate sequence to help ensure stability of the mast and guy derrick structure.

Turnbuckles should be fitted to allow for adjustment (i.e. to take up the slack). The turnbuckles should be locked to prevent slackening. The mast should not exceed a 1:10 forward lean from the vertical.

The stays should be anchored at a distance one and a half times the height of the mast from the footing. They should be of adequate strength, kept taut and kept clear of all obstructions.

Do not use single base bulldog grips on the stays.

The number of parts in the purchase is determined by the hook load. The lead and hoist rope lead is taken to the base of the mast to the lead sheaves and then to the winch.

The heel of the mast should be set up on a support that is strong enough to support the mast load as well as the weight of mast and derrick with side thrust.

A **marine type derrick** is similar to a guyed derrick but uses part of a building structure instead of the guyed mast.

When constructing a marine type derrick make sure that:	
The heel of the derrick is secured to the base with a goose-neck swivel which is then clamped to a column. The goose-neck swivel should be secured against movement.	☐
The luffing tackle is positively secured to an anchorage attached to the structure.	☐
The lifting purchase is able to support the hook loads.	☐
The boom head is protected.	☐
Shackles have been moused.	☐
Lead blocks have been hung up.	☐
Guys, pendants and tackles are secured.	☐

3.2.4 SHEAR LEGS

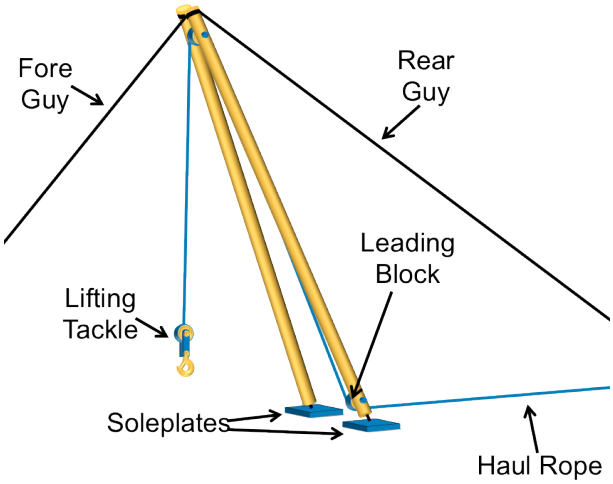
A shear leg has two timber poles forming an A-frame with a height three times the length of the base.

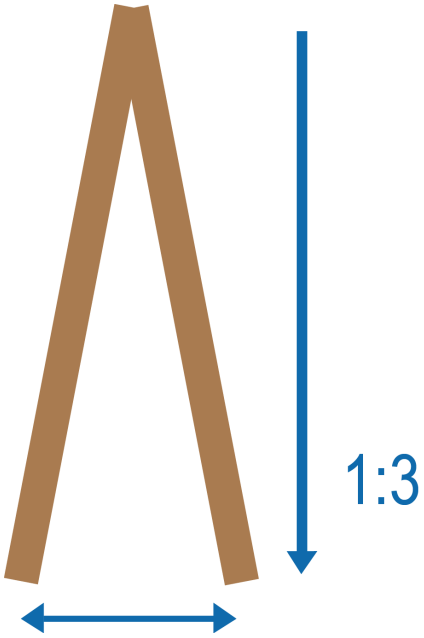
Where the poles cross at the top there should be between 600mm to 1m projecting beyond the cross which can be bolted or lashed.

The headsling is hung over the cross with one eye on each side. The two eyes are shackled together and attached to the top block of the purchase.

The lead from the top block of the purchase is taken through a lead block to the winch.

The heels of the legs should have adequate footings (e.g. soleplates) or a rope fitted between the heels to prevent spreading. Heel lashings will need to be secured in both directions with at least one of them opposite to the direction of pull on the lead rope.





One front guy and one back guy should be fitted.

The angle of tilt must not exceed 15° from the vertical.

Heel tackle must be adequately secured to prevent kicking.

The maximum forward lean should be 1:3 measured from the vertical.

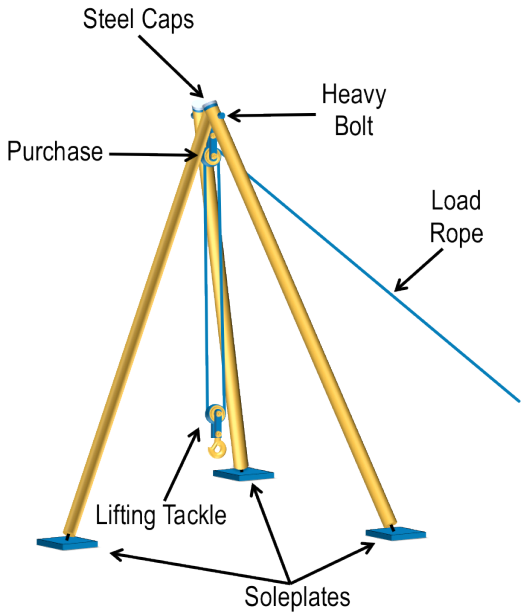
The distance from the heels to the anchorage of the back guy should not be less than 1.5 x the length of the legs.

Wire ropes used for back guys should be at least 6x19 construction with a tensile strength of at least 1570Mpa.

If more than one guy is used the loads will need to be equalised.

If loads larger than 5 tonnes are to be lifted using shear legs, an engineer will need to design the guys and connection.

3.2.5 TRIPODS



Tripods are used for shifting loads (e.g. placing pipes into trenches). They are more effective than a single derrick or gin pole of similar size and can raise loads up to three times more weight.

Two legs in the form of an A-frame are splayed at the top and the third leg placed between. A heavy bolt is fitted right through the three legs at the top. A purchase or chain block is hooked into a U-shackle and suspended from the bolt.

The timbers should be kept from splitting under the load by the placement of steel caps above or stitch bolts below the main bolt.

When setting up a tripod make sure that:

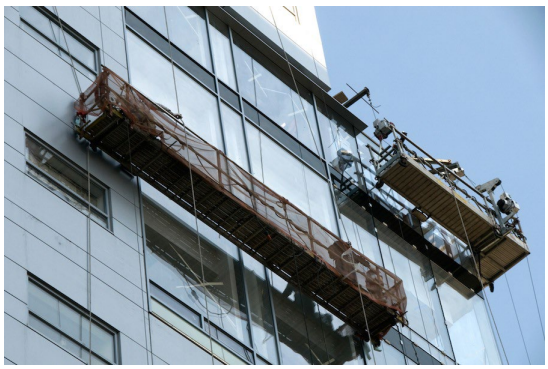
- All three legs have a similar angle to each other, not more than 30° from the vertical.
- The load that is to be lifted is placed directly under the lifting tackle. Pulling sideways on a suspended load can overturn a tripod.
- The ground beneath the tripod is secure and that the feet are adequately packed.
- Heel rope spans are secured between all three legs.

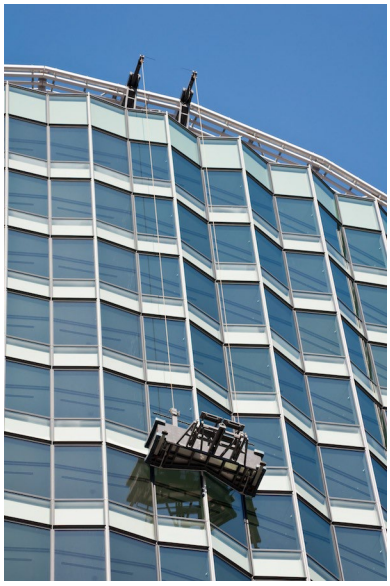
3.2.6 SUSPENDED SCAFFOLDS

A suspended scaffold has a platform that is supported by temporary supporting structures, and can be raised and lowered using flexible steel wire rope hoists. These are often associated with window washers.

Suspended scaffolds include:

- Swing stages.
- Double rope suspended platforms.
- Work cages.
- Bosun chairs.





Suspended scaffolds may be used for short term work on the sides of tall buildings or structures where access by other means is limited by the height of the work being carried out.

Where access to the scaffold is not from the ground, or a protected landing, a safety harness and lanyards attached to a suitable anchorage must be used to access the scaffold cradle/platform safely.

The building or structure to which the suspended scaffold is to be mounted must be able to support the scaffold as well as all loads placed upon it (e.g. dead loads, live loads, wind loads).

The supporting structure should be assessed by a competent person such as an engineer, before the suspended scaffold is erected.

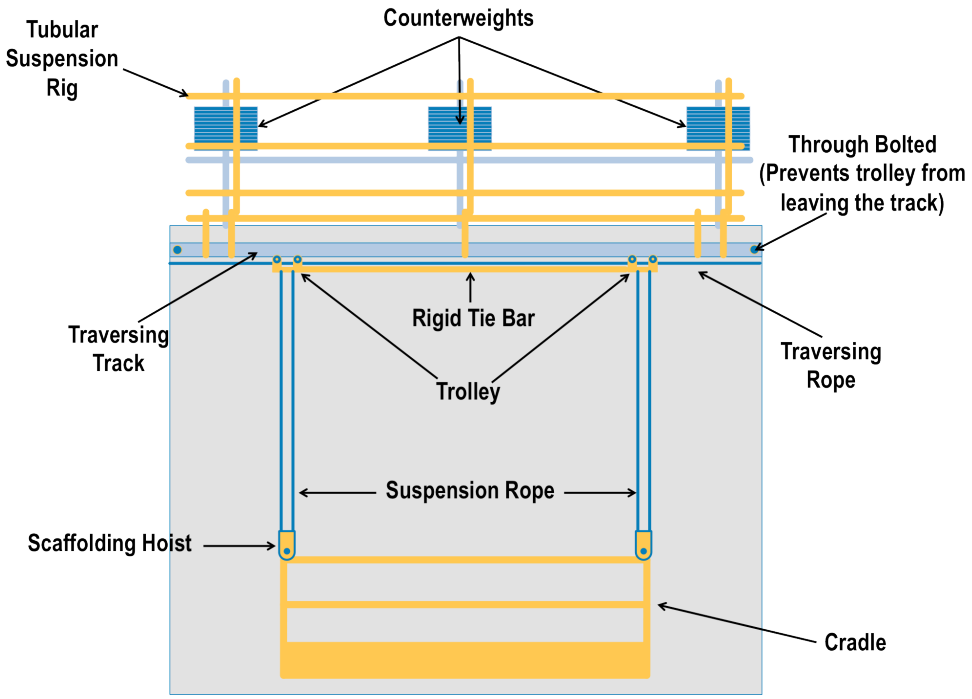
All suspended scaffolds and suspension rigs must meet the relevant compliance requirements including:

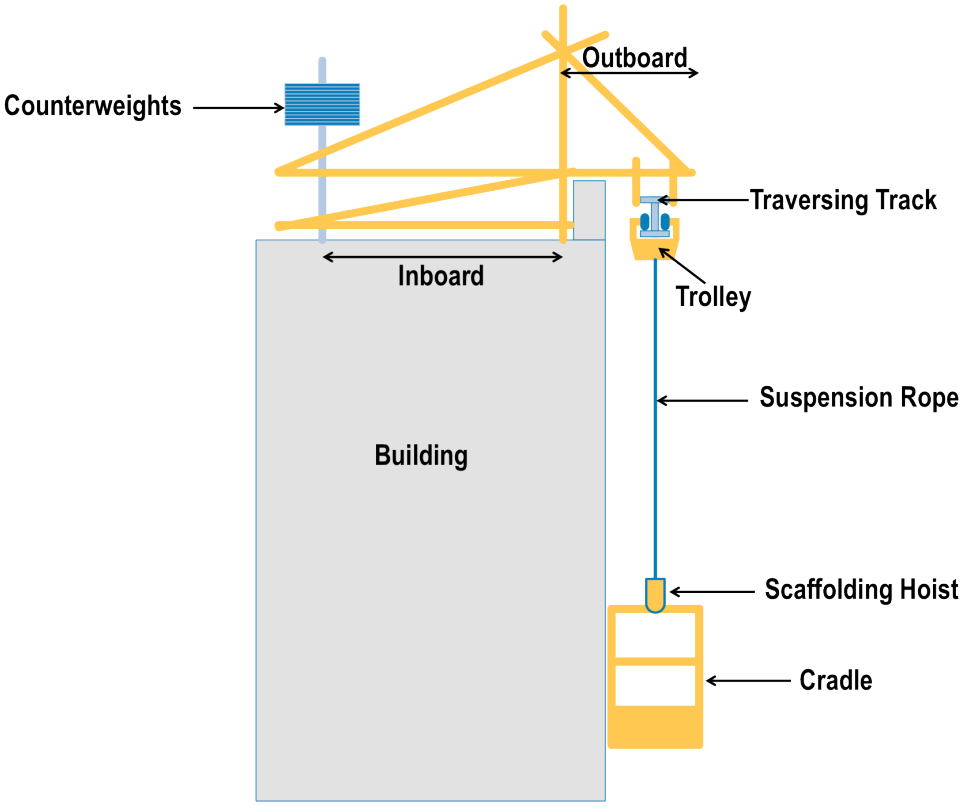
- Engineering specifications.
- Manufacturer's specifications.
- AS1576.4 Suspended scaffolding.

These compliance requirements are relevant when erecting or altering an existing scaffold.

3.2.6.1 SWING STAGES

A swing stage provides a suspended work platform for multiple personnel/workers that is able to be raised and lowered using manual, pneumatic or electric hoists. A swing stage may be made up of the following components:





Cradle

All scaffold cradles must meet some basic safety and construction requirements. The cradle width requirements for different scaffolds are:

Scaffold Type	Minimum Cradle Width	Maximum Cradle Width
Double Rope Suspended Scaffold	900mm	1.7m
Swing Stage	450mm	900mm
Suspended Work Cage	750mm	1.5m

Other requirements include:

Item	Requirements

Cradle	▸ Should be fitted with:
	  › Guardrails.
	  › Mid-rails.
	  › Toe-boards.
	▸ Working deck safely secured to prevent movement
	▸ Slip resistant with adequate drainage holes.
	▸ Free from trip hazards.
	▸ Up to a 3° degree slope in all directions is allowable in the scaffold platform, unless otherwise specifically designed.
	▸ Access between levels of a multi-tiered cradle should be fitted with:
	  › Protective mesh.
	  › Hinged trapdoors or sliding hatches.
	  › If there is no access between levels then the scaffold should be able to be operated from any level.
	▸ The stabilising sheave above the platform of a work cage should be at a height of at least 2 metres.

Protection and Safety	▸ Netting, if fitted to prevent materials falling from the cradle, should:
	  › Be constructed of galvanised wire mesh, at least 1.5mm thick.
	  › Have wires spaced at least 20mm apart.
	  › Be fixed between the toe-board and guardrail on all sides.
	▸ Overhead protection may need to be installed above a cradle if there is a likelihood of debris falling onto the scaffold.

Item	Requirements

Control Boxes	▸ Should be fully enclosed, lockable and protected from shock or environmental damage.
	▸ Should be attached to the inside of the guardrails away from the working face.
	▸ They should be removable so they can be secured safely when not in use.
	▸ Should be fitted with:
	  › Socket outlets for hoists.
	  › A power on light indicator.
	  › An emergency stop button.

Working Load Limit (WLL)	▸ Should be displayed on a sign inside the cradle. › Articulated and multi-tiered cradles should have the WLL displayed in each bay. ▸ Always make sure that all materials are evenly distributed across the cradle.

Hoists

Requirements for hoists which should be checked for include:

Item	Requirements
Protective Devices	▸ Most hoists should have built-in or independently mounted protection devices to act as an emergency brake in the event that the suspension rope is broken. ▸ A double rope suspension scaffold does not need a protective device for each scaffold

Load Limiter	▸ Electric hoist should be fitted with:
	  › Load limiting device to stop the hoist damaging the suspension rope or toppling the suspension rig, if the scaffold becomes jammed.
	▸ Electrically powered suspension scaffold must be fitted with:
	  › Load limiting device with a maximum setting of 1.25 x the WLL of the hoist or 125%.

Data Plates	▸ All scaffolding hoists should have legible data plates with the following information:
	  › Serial number.
	  › Type/model identification.
	  › Name/identification mark of the manufacturer.
	  › Rated capacity (WLL).
	  › Size, maximum length, grade and construction of Flexible Steel Wire Rope (FSWR) (where applicable).
	  › The type of hoist mechanism used.
	  › Reeving and power supply requirements (where applicable).

Scaffolding hoists should be designed, manufactured and tested in accordance with the Australian Standard AS 1418.2 – Scaffolding Hoists.

Always make sure a purpose-made weatherproof cover is fitted to all scaffold hoists to prevent contamination of the working mechanisms.

Suspension And Secondary Ropes

It is important that all suspension and secondary ropes must meet the requirements of the scaffold. These include:

Item	Requirements
Rope Arrangement and Requirements	▸ Suspension and secondary ropes should be the correct size and construction for the hoist or protective device used. They should have a swaged and thimble eye at one end. ▸ There should be at least 1m of spare rope when a climber-type scaffolding hoist is at its lowest point. Excess rope should be protected from damage by coiling and tying or by being placed around a rope winder. ▸ At least 3 turns of rope should remain on the drum when a drum-type scaffolding hoist is at its lowest point. The drum flange should extend 2 rope diameters beyond the built up rope on a fully-loaded drum-type scaffolding hoist. ▸ When replacing the FSWR on a climber hoist it is important that the same FSWR construction and size are used to help prevent the FSWR from being seriously damaged as it runs over the sheaves.
Working Load Limit of Suspension Rope	▸ The rope tension on a shackle supporting a suspension rope should be no more than 80% of the shackles Working Load Limit (WLL). ▸ The rope tension on a choked sling supporting a suspension rope should be no more than 40% of the slings Working Load Limit (WLL). ▸ Do not use bulldog grips to terminate a suspension rope as they can cause damage to the rope.
Secondary Wire	▸ Secondary wire ropes should be attached to the suspension rigging independent of the main suspension rope.

Suspension Rigs

You should ensure that the suspension rig is adequate for the scaffold. Requirements you should check for include:

Item	Requirements

Suspension Rig	▸ Must remain rigid and stable under working conditions
	▸ The design should take into account all forces and load (e.g. wind loads).
	▸ A reveal propped needle suspension rig:
	  › Should have at least two rows of uprights fixed with ledgers and transoms as well as longitudinal, transverse and plan bracing systems.
	  › Needles can be fixed onto or under the reveal props.
	  › Close fitting U-heads may be used with rolled steel joists or universal beams.

Needle or Supporting Beam	▸ Should always be mounted with the greater vertical dimension. ▸ The outboard end of a needle should never be lower than the inboard end. ▸ A beam spanning between only two supports should always be horizontal.
Anchors	▸ If anchorage bolts are used they should be kept from loosening (e.g. with lock nuts). ▸ Do not use friction or chemical insert anchors on needles. ▸ Through bolts, props or bracket bolts are recommended for fixing the rig/needle in place.
Props	▸ If using props, they should be installed to the top of the needle and to the underside of the floor above. ▸ You must make sure that the props are correctly fixed to stop any movement or dislodgement: › Have a competent person (such as an engineer) check that the floor is able to withstand the force of the props and scaffold.

Counterweights and Tracks and Trolleys

Ensure all counterweights, tracks and trolleys must meet the following requirements:

Item	Requirements
Counterweights	▸ Only use counterweight specially designed, manufactured and approved for the erection of suspended scaffolds. ▸ The counterweight should be secured directly on the needle or innermost support in such a way that they cannot be removed or displaced without the use of tools. This will help to prevent the counterweights from slipping from the scaffold or being removed by accident. ▸ Counterweights should not be used to stabilise a needle attached to two or more suspension ropes. ▸ Do not counterweight a needle with bags of sand or containers of liquid. ▸ Do not fix the inboard end of a needle with friction anchors.
Tracks And Trolleys	▸ Traversing tracks are hung beneath needles or supported by beams. The ends should be fitted with through bolted stops to stop trolleys running off the track. ▸ The trolley supporting a suspension rope should have a Working Load Limit (WLL) of at least 500 kg. ▸ A spacer tie or spreader bar can be used to stop two trolleys from spreading (moving apart) while supporting a swing stage. ▸ Trolleys supporting a double rope suspended scaffold should be rigidly connected with plan braced to stop twisting. ▸ Ropes used for horizontal movement of a suspended scaffold should be a minimum 12mm diameter fibre rope.

3.2.6.2 BOSUN CHAIR

A bosun chair provides support for a single worker, as well as a means to raise and lower the 'chair' to get in position for the work to be completed.

When installing a bosun chair:

- An adequate exclusion zone should be setup under the chair to protect people below.
- The controls/emergency descent system should be in a position that the operator can reach.
- Lateral restraints should be installed if the chair may be subjected to movement (e.g. wind).

3.2.6.3 CALCULATIONS FOR SUSPENDED SCAFFOLDS

Calculating maximum rope tension for an electric hoist:

$$\text{Rope Tension} = (\text{Rated Capacity in kg} \times 1.25) + \left(\frac{\text{DL per 100m (kg)}}{2}\right)$$

Where DL = Dead Load.

NOTE: AS 1576 Clause 4.5 Load-Limiting Device states that electrically powered scaffolding hoists shall have a device to limit the lifting capacity of the hoist to a maximum 1.25 times the rating of such hoist. And Clause 4.7 Rope Tension states that rope tension for electrically powered scaffolding hoists is the summation of the load which is limited by the load limiting device, the gravitational load of the suspension rope and the tensioning weight.

Calculating maximum rope tension for a manual hoist:

$$\text{Rope Tension} = \left(\frac{\text{DL per 100m (kg)}}{2}\right) + \text{DL of hoist} + \left(\frac{\text{Weight of Cradle}}{\text{Number of Needles}}\right) + \text{WLL of Cradle}$$

Where DL = Dead Load.

Calculating rope minimum guaranteed breaking load for an electric hoist:

Minimum Guaranteed Breaking Load = WLL x 10

Calculating rope minimum guaranteed breaking load for a manual hoist:

Minimum Guaranteed Breaking Load = WLL x 7

NOTE: AS 1418 Clause 5.4.2 Ropes and reeved systems states that the safety factor of the wire rope based on the minimum breaking load shall be not less than:

- 7 for hand-operated scaffolding hoists.
- 10 for power-operated scaffolding hoists.

Calculating counterweight requirements for needle stability:

$$\text{Number of Counterweights} = \frac{3 \times \text{Rope Tension (kg)} \times \text{Outboard Length (mm)}}{\text{Inboard Length (mm)} \times \text{Mass of Counterweight (kg)}}$$

The tables below outline how these calculations can be used when erecting different types/configurations of suspended scaffolds.

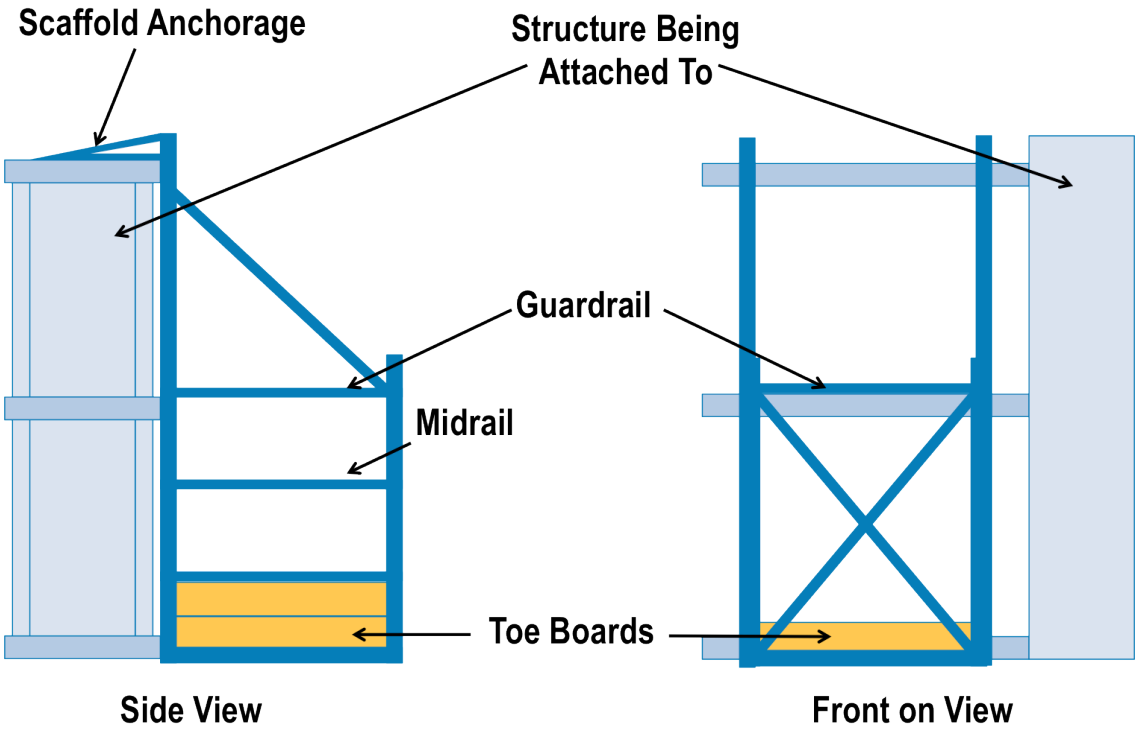
Hoist Type	Needle Type	Cradles		
		Type: Individual cradle **No. of needles**: 2 **Supported by**: 2 suspension ropes, 2 scaffolding hoists (1 each per needle) **Cradle dead load**: 100kg **Cradle WLL**: 250kg	**Type**: Work cage **No. of needles**: 1 **Supported by**: 1 suspension rope, 1 scaffolding hoist **Work cage dead load**: 75kg **Work cage WLL**: 200kg	Type: Bosun's chair No. of needles: 1 Supported by: 1 suspension rope, 1 scaffolding hoist Seat dead load: 15kg Seat WLL: 150kg
Type: Electric hoist Rated WLL: 750kg Suspension rope dead load: 36kg/100m Load limiting device set at maximum allowable overload	Needle 1 Outboard: 0.75m Inboard: 4m	Maximum rope tension: **955.5kg** Rope's minimum guaranteed breaking load: **7500kg** Number of 25kg counterweights required at the inboard end of the needle: **22 counterweights**	Maximum rope tension: **955.5kg** Rope's minimum guaranteed breaking load: **7500kg** Number of 25kg counterweights required at the inboard end of the needle: **22 counterweights**	Maximum rope tension: **955.5kg** Rope's minimum guaranteed breaking load: **7500kg** Number of 25kg counterweights required at the inboard end of the needle: **22 counterweights**
	Needle 2 Outboard: 0.5m Inboard: 3m	Maximum rope tension: **955.5kg** Rope's minimum guaranteed breaking load: **7500kg** Number of 25kg counterweights required at the inboard end of the needle: **20 counterweights**	Maximum rope tension: **955.5kg** Rope's minimum guaranteed breaking load: **7500kg** Number of 25kg counterweights required at the inboard end of the needle: **20 counterweights**	Maximum rope tension: **955.5kg** Rope's minimum guaranteed breaking load: **7500kg** Number of 25kg counterweights required at the inboard end of the needle: **20 counterweights**

Hoist Type	Needle Type	Cradles		
		Type: Individual cradle **No of needles**: 2 **Supported by**: 2 suspension ropes, 2 scaffolding hoists (1 each per needle) **Cradle dead load**: 100kg **Cradle WLL**: 250kg	**Type**: Work cage **No of needles**: 1 **Supported by**: 1 suspension rope, 1 scaffolding hoist **Work cage dead load**: 75kg **Work cage WLL**: 200kg	Type: Bosun's chair No. of needles: 1 Supported by: 1 suspension rope, 1 scaffolding hoist Seat dead load: 15kg Seat WLL: 150kg
Type: Manual Dead load: 35kg Rated WLL: 350kg Suspension rope dead load: 26kg/100m	Needle 1 Outboard: 0.75m Inboard: 4m	Maximum rope tension: **348kg** Rope's minimum guaranteed breaking load: **2450kg** Number of 25kg counterweights required at the inboard end of the needle: **8 counterweights**	Maximum rope tension: **323kg** Rope's minimum guaranteed breaking load: **2450kg** Number of 25kg counterweights required at the inboard end of the needle: **8 counterweights**	Maximum rope tension: **213kg** Rope's minimum guaranteed breaking load: **2450kg** Number of 25kg counterweights required at the inboard end of the needle: **5 counterweights**
	Needle 2 Outboard: 0.5m Inboard: 3m	Maximum rope tension: **348kg** Rope's minimum guaranteed breaking load: **2450kg** Number of 25kg counterweights required at the inboard end of the needle: **7 counterweights**	Maximum rope tension: **323kg** Rope's minimum guaranteed breaking load: **2450kg** Number of 25kg counterweights required at the inboard end of the needle: **7 counterweights**	Maximum rope tension: **213kg** Rope's minimum guaranteed breaking load: **2450kg** Number of 25kg counterweights required at the inboard end of the needle: **5 counterweights**

3.2.7 FABRICATED HUNG SCAFFOLDS

Fabricated hung scaffolds are purpose built temporary structures that are attached to a permanent structure (such as a building or transmission tower) to support a working platform for personnel/workers, tools and materials. Hung scaffolds are not capable of being raised or lowered while in use.

Hung scaffolds are usually positioned in a static location, but depending on the work being conducted, may be hung from girder trolleys or mobile suspension rigs so they have limited horizontal (sideways) movement.



Hung scaffolds may be constructed using tube and coupler components, however this must be carried out by a person holding an advanced level scaffolding licence.

3.2.7.1 HUNG SCAFFOLD SIZE AND DUTY

Scaffolds have different size requirements and Working Load Limits (WLL) according to their duty:

Duty	Minimum Working Platform Width	Maximum Load Allowed On Platform
Light Duty	450mm	225kg per bay or 2.2 kN
Medium Duty	900mm	450kg per bay or 4.4 kN
Heavy Duty	1000mm	675kg per bay or 6.6 kN

Any scaffold platform that is being used by workers/personnel with hand tools required clear access of 450mm.

Any scaffold platform that is being used by workers/personnel with materials placed on the platform requires clear access of 675mm.

It is assumed that the standards supporting each bay are capable of supporting 1/3 of the live load.

3.2.7.2 HUNG SCAFFOLD STRUCTURE REQUIREMENTS

All hung scaffolds must meet some basic safety and construction requirements. The following table outlines the minimum requirements for hung scaffolds:

Item	Requirements
Working Platform	▶ The platform of a fabricated hung scaffold should be horizontal (unless specially designed to include a sloping surface). The platform should consist of a secured, even slip resistant surface.
Edge Protection	▶ Required where a person could fall more than 2m. ▶ Scaffold tube, purpose designed component or hardwood may be used for a guardrail. Fibre rope, flexible steel wire rope (FSWR) and chain must never be used as a guardrail. ▶ Guardrail should be positioned between 900mm and 1100mm from the work platform surface. ▶ Toeboards must extend at least 150mm above the surface of the working platform. ▶ Midrails, infill, brick guards or mesh must be positioned between the toeboard and the guardrail.
Supports	▶ Chain or FSWR may be used to support the hung scaffold. The maximum allowable load is 1/6 of the minimum rated breaking strain of the chain or FSWR. ▶ The Working Load Limit (WLL) of FSWR can be estimated using the formula: ▶ Diameter squared x 7.5
Access	▶ Single industrial grade ladders may be used to access working platforms. Domestic grade or extension ladders must not be used. ▶ Ladder access should be fixed in a position between 6:1 and 4:1 vertical to horizontal. ▶ The minimum height that a portable access ladder must extend above the landing is 900mm.
Positioning	▶ Rigid tie bars and plan bracing may be used to prevent girder trolleys from moving out of alignment. This will help the standards to remain vertical. ▶ Girders are required to have through-bolted stops to prevent the trolley from overrunning or running off the end of the girder.

3.2.8 GENERAL SCAFFOLD SAFETY REQUIREMENTS

Any incomplete or unfinished scaffolds need have all access removed if being left unattended overnight.

You must also ensure that adequate isolation methods or barricading is in place to prevent unauthorised access.

Once a scaffold is fully completed and deemed safe to use a handover certificate must be presented.

This handover certificate must be correctly completed once an inspection has taken place, and must be filled out by a competent person.

3.3 INSPECTING THE COMPLETED WORK

Once the rigging work has been completed you will need to inspect the job to make sure everything has been done properly in accordance with task plans and schedules and structural drawings/plans.

Review the work method statement used and make sure all steps have been completed.

3.3.1 INSPECTION OF SCAFFOLDS

Once the scaffold has been erected it will need to be inspected by a competent person for the following:

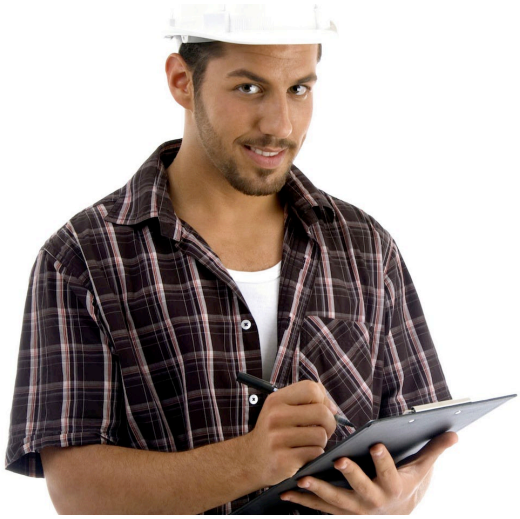
- Stability.
- Edge protection.
- Position of platforms.
- Scaffold matches structural plans/specifications.

Once a scaffold erection, inspection or modification is completed an inspection record needs to be placed on the scaffold.

The inspection record needs to include the following details:	
Location	Unit / plant number followed by area of plant.
Ref. No.	Work Order number.
Date Erected	Date the erection of the scaffold was complete.
Requested by	This should be the Team leader/Plant Area Coordinator etc., requesting the scaffold. (This may be on the Work Order).
Built by	This is the company who built the scaffold.
Name of competent person	Print the name of the competent person/certified scaffolder.
Signature	Signature of competent person/certified scaffolder.
Light Duty 225 kg	**As per AS/NZS 1576.**
Medium Duty 450 kg	
Heavy Duty 675 kg	

3.3.1.1 MODIFYING OR INSPECTING A SCAFFOLD

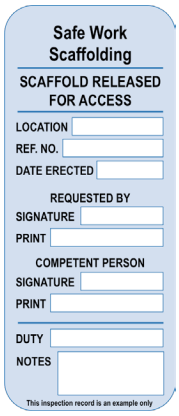
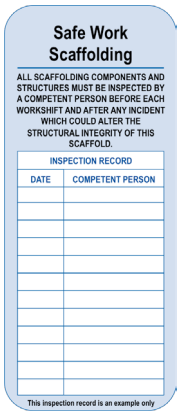
Where practicable, the licensed person who erected the scaffold, and whose name appears on the inspection record, is to be the person to perform scaffold modifications and inspections.



Prior to modifying scaffold:

- Remove the inspection record.
- Replace with a notification inspection record detailing the date and time of the modification or inspection, the name of the person performing the modification or inspection and the reason for the alteration where relevant.

Shown here is an example of an inspection record system of cards:

Inspection Record Card Holder	Inspection Record Front	Inspection Record Back
		

3.3.1.2 COMPLETING A HANDOVER CERTIFICATE

A handover certificate will need to be completed when the scaffold is complete.

It should contain the following information:

- The name of the client that the work has been done for.
- Address of the worksite where the tasks were completed.
- The location of the scaffold in the worksite.
- The type of scaffold that was erected (e.g. hung, suspended).
- The height and length of the scaffold.
- The number of lifts and bays in the scaffold.
- The duty category of the scaffold (e.g. light, medium, heavy, special).
- The type of access available (e.g. ladder).
- Design reference number.
- Date and time of handover.
- Name and signature of the responsible person.

An example of a handover certificate can be found in Appendix 3A.

3.3.2 TIDY THE WORK AREA

Once the work has been completed you need to clean up the work area. Remove any leftover materials and debris created by the task.

Litter and other building debris can cause a tripping hazard for personnel/workers. Make sure all rubbish is collected and disposed of correctly.

Dispose of any debris properly without impacting negatively on the environment. Make sure all materials are collected and removed properly.

Divide up recycling and other waste materials for correct removal and processing.

3.4 INCIDENTS AND EMERGENCY RESPONSE

Emergencies can happen quickly and without warning when work is being done at heights.

If all necessary precautions, hazard control measures and safety equipment have been used then the risk of serious consequences is reduced.

However you should always be prepared to take action in an emergency situation, even if that action is as simple as calling for help.

3.4.1 WHAT IS AN INCIDENT

An incident is:

- An accident resulting in personal injury or damage to property.

OR

- A near miss or dangerous occurrence which does not cause injury but may pose an immediate and significant risk to persons or property, and needs to be reported so that action can be taken to prevent recurrence.

All incidents **MUST** be reported!

3.4.1.1 RESPONDING TO AN INCIDENT

If an unsafe incident or event occurs during rigging operations you should:

- Stop and resolve the issues (if possible).
- Get advice and assistance where required.
- Report the incident in line with state/territory requirements.

3.4.2 WORKPLACE EMERGENCIES

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/workers.
- Structural collapse.

3.4.2.1 GENERAL EMERGENCY RESPONSE

In the case of an emergency:

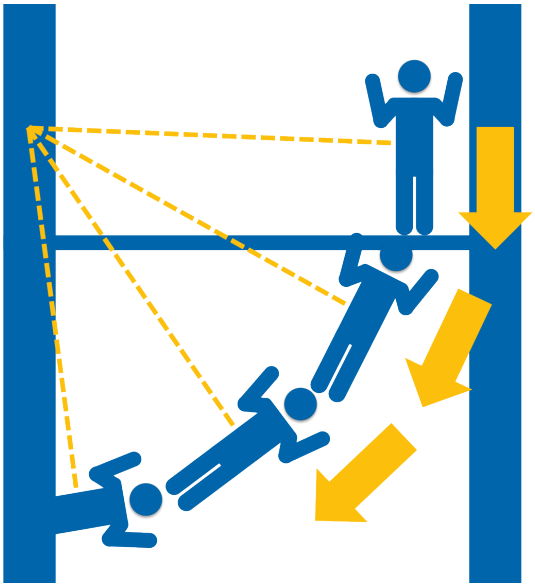
- Remain calm.
- Raise the alarm with your supervisor and/or first aid officer and make sure you inform any personnel/workers of unsafe areas.
- Get help from emergency services (Dial 000 or 112).
- Evacuate if necessary (refer to site emergency plans).

3.4.2.2 GENERAL FIRST AID

First Aid kits must be supplied by your employer/PCBU. The location of these kits should be clearly marked with signage.

In the case of an emergency where somebody requires first aid, notify your supervisor or first aid officer and they will take action.

3.4.3 INCIDENTS RELATING TO THE USE OF FALL-ARREST SYSTEMS



If a worker who is using an individual fall-arrest system falls from an edge, the system may act as a pendulum.

This may result in the worker hitting the ground (called 'swing down') or swinging back into the building or structure (called 'swing back').

These situations may also be referred to as 'the pendulum effect'.

Swing down can occur if the lanyard slides back along the perimeter edge of the roof as a worker falls, until it is vertical.

When this happens, the worker may hit the ground (or lower level), or the lanyard may break from being dragged across the edge of the roof.

3.4.3.1 SUSPENSION INTOLERANCE (SUSPENSION TRAUMA)

Suspension intolerance can occur with a fall-arrest system when a person has an arrested fall and is suspended in an upright, vertical position with the harness straps causing pressure on the leg veins.

The lower legs' capacity to store large amounts of blood reduces the return of blood to the heart, slowing the heart rate, which can cause the person to faint.

This may lead to renal failure and eventually death, depending on a person's susceptibility. This condition may be worsened by heat and dehydration.

3.4.3.2 PREVENTING SUSPENSION INTOLERANCE

The following techniques can be used to help prevent suspension intolerance in a person who is hanging in a fall-arrest harness:

- Never work alone when using a harness as fall protection.
- Wherever possible use a fall-arrest harness that allows the legs to be kept horizontal.
- If possible keep the time a worker spends in suspension after a fall limited to less than five minutes. This can be achieved by providing foothold straps or a way of placing weight on the legs.

If you find yourself in a situation where you are suspended in a fall-arrest harness after a fall attempt the following action:

The quick rescue of a person suspended in a full body harness, as soon as is possible, is vital.

For this reason, workers should be capable of conducting a rescue of a fallen worker and be familiar with onsite rescue equipment and procedures.

If a worker has fallen and is hanging suspended in a safety harness for a prolonged period of time (5 to 30 minutes) it is absolutely vital that first aid procedures are implemented as quickly as possible.

3.4.3.3 FIRST AID FOR SUSPENSION INTOLERANCE

In accordance with Australian Resuscitation Council (ARC) guideline 9.1.5, first aid management of suspension intolerance should be carried out as follows:

1. Call for an ambulance (dial 000 or 112).

2. If unconscious, manage the victim according to basic life support principles. If conscious, rest the victim in a comfortable position, ideally lying down, and provide reassurance.

3. Loosen or remove the harness.

4. Administer oxygen if available.

5. Look for and manage associated injuries in the victim, especially if they have fallen or been electrocuted.

6. Monitor the signs of life at frequent intervals.

Remember, care of the airway takes precedence over any injury.

3.4.4 REPORT ALL HAZARDS, INCIDENTS AND INJURIES

Depending on the nature and severity of the situation you may need to report to:

- Your supervisor.
- Emergency services (e.g. police, ambulance, fire brigade and emergency rescue).
- OHS/WHS regulatory authority (e.g. WorkSafe, WorkCover).

Ask your OHS/WHS representative or supervisor at the site office for the relevant forms and procedures for reporting hazards, incidents and injuries.

3.5 DISMANTLE STRUCTURES AND PLANT AND PACK UP

Once the work has been completed you are able to begin dismantling and packing up any associated plant and structures including scaffolds, elevating work platforms and cranes.

Make sure equipment is dismantled according to the manufacturer's specifications.

Continue to work safely at heights while equipment is dismantled. Work methodically and follow site procedures. Use safety equipment whenever working at heights.

Maintain the stability of all structures and plant during the disassembly process.

Unplanned collapse can result in serious injuries to personnel/workers and damage to equipment and materials.

3.6 CONCLUDE RIGGING OPERATIONS

Once all rigging work is completed and signed off you need to make sure all equipment is made ready for the next task.

This includes:

- Inspecting and storing all rigging and associated equipment.
- Removing and storing hazard control measures/treatments that are no longer required on site.

3.6.1 INSPECT AND STORE ALL RIGGING EQUIPMENT AFTER USE

Inspect all tools and equipment that you have used during the rigging work. This includes:

- Tools.
- Safety devices/systems.
- Plant and equipment.

Isolate any defective equipment. Record the fault and report it to an authorised person in accordance with procedures.

All serviceable equipment should be stored according to procedures and manufacturers' specifications.

3.6.2 REMOVE HAZARD CONTROL MEASURES

Remove all hazard controls that are no longer required and complete any documentation related to the job (work permit sign-off and incident reports).

Advise the appropriate personnel/workers of the completion of the job and carry out any remaining requirements as per site procedures.

APPENDIX 1A – WORK HEALTH & SAFETY COMMON TERMS AND DEFINITIONS

Person Conducting a Business or Undertaking (PCBU)	A 'person conducting a business or undertaking' (PCBU) replaces the term 'employer'. A PCBU includes all employers, sole traders, principal contractors, unincorporated associations, partnerships and franchisees. Volunteer organisations that also employ people will be PCBUs. A PCBU's primary duty of care is to ensure the health and safety of everyone in the workplace, so far as is reasonably practicable.
Officers	An 'Officer' is a person who makes, or participates in making, decisions that affect the whole or a substantial part of a corporation. This includes Health and Safety Representatives (HSR).
Workers	'Worker' replaces the term 'employee'. It is defined broadly to mean a person who carries out work in any capacity for a PCBU. A 'worker' covers employees, contractors, sub-contractors (and their employees), labour hire employees, outworkers, apprentices, trainees, work experience students and volunteers.
Reasonably Practicable	Reasonably Practicable is defined as action that is, or was at a particular time, reasonably able to be done to help ensure health and safety based on the following factors: a) Chances of the hazard or risk occurring (likelihood). b) The degree of harm (consequence). c) The knowledge of persons involved in the situation relating to the hazard or risk and methods of eliminating or controlling it. d) The availability and suitability of ways to eliminate or control the hazard or risk. e) The costs involved in taking action to eliminate or control the hazard or risk including consideration of whether the cost involved is inconsistent to the level of risk.
Due Diligence	The Work Health and Safety Act 2011 (the WHS Act 2011) imposes a specific duty on officers of corporations to exercise due diligence to ensure that the corporation meets its work health and safety obligations. In short, they have a responsibility to ensure that the PCBU is doing everything it should to ensure health and safety. The duty requires officers to be proactive in ensuring that the corporation complies with its duty. Due diligence may be demonstrated through the following courses of action: 1. Acquiring knowledge of health and safety issues. 2. Understanding operations and associated hazards and risks. 3. Ensuring that appropriate resources and processes are used to eliminate or minimise risks to health and safety. 4. Implementing processes for receiving and responding to information about incidents, hazards and risks. 5. Establishing and maintaining compliance processes. 6. Verifying the provision and use of the resources mentioned in 1-5.

APPENDIX 1B – SAFE WORK METHOD STATEMENT

SWMS Name:	SWMS Created By:	Date of Creation:
SWMS Summary:		Last Reviewed Date:

Company/Contractor Details:	Project Details:
Name:	Client:
ABN:	Contact Name:
Address:	Site Address:
Contact Number:	Contact Number:
Email:	Start Date:

How to complete this SWMS:
1. **CONSULT:** Consult with all persons who will be involved in the completion of the work.
2. **LIST:** List each of the steps in the task work being done.
3. **IDENTIFY:** Describe the health and safety hazards and risks arising from each step in the work.
4. **RISK ASSESSMENT:** Review the level of risk associated with each hazard listed.
5. **CONTROL:** Describe how the risks will be controlled, and describe what hazard control measures will be put in place.
6. **RESPONSIBILITY:** Allocate a person to be responsible for the hazard control measure.
7. **REVIEW:** Review the effectiveness of the control measures and apply further hazard control measures as required.

Training/Qualifications Required To Carry Out Work: Are All Workers Adequately Trained And Qualified? Yes / No	PPE Required To Carry Out Work:
Legislation, Australian Standards & Codes Of Practice Relevant To Work (Where Applicable):	Equipment Required To Carry Out Work:
Environmental Statement:	Safety Checks Required Prior To Commencement Of Work:
Coordination With Other Trades:	Permits Required For Commencement Of Work: Have These Permits Been Acquired? Yes / No

Risk Analysis Matrix

Use this table to determine the level of risk associated with an identified hazard.

LIKELIHOOD	CONSEQUENCE				
	Insignificant	**Minor** First Aid Required	**Moderate** Medical Attention and Time Off Work	**Major** Long Term Illness or Serious Injury	**Severe** Kill or Cause Permanent Disability or Illness
Almost Certain	**M**	**H**	**H**	**VH**	**VH**
Likely	**M**	**M**	**H**	**H**	**VH**
Possible	**L**	**M**	**H**	**H**	**VH**
Unlikely	**L**	**L**	**M**	**M**	**H**
Rare	**L**	**L**	**M**	**M**	**M**

RISK LEVEL	ACTION
VERY HIGH	Act immediately: The proposed task or process activity must not proceed. Steps must be taken to lower the risk level to as low as reasonably practicable using the hierarchy of risk controls.
HIGH	Act today: 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 Safe Work Method has been prepared. 5. The supervisor must review and document the effectiveness of the implemented risk controls.
MEDIUM	Act this week: The proposed task or process can 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 Safe Work Method has been prepared.
LOW	Act this month: Managed by local documented routine procedures, which must include application of the hierarchy of controls.

Safe Work Method Statement

Work Step	Associated/Identified Hazards	Risk Level (L, M, H, VH)	Hazard Controls	Revised Risk Level (L, M, H, VH)	Person Responsible
Work your way through each step in the work process, giving a brief description of what is required at each stage.	What hazards can be identified for this step?	What is the risk level?	What hazards controls will be put into place to deal with the identified hazards for this step?	Has the risk been reduced?	Who is responsible for carrying out the work and maintaining the hazard controls?

Work Step	Associated/Identified Hazards	Risk Level (L, M, H, VH)	Hazard Controls	Revised Risk Level (L, M, H, VH)	Person Responsible

Personnel/Workers Signoff

All personnel/workers required to carry out this task need to be listed below.

By signing this SWMS, each person declares that they have carefully read the SWMS and that they understand their responsibilities and requirements to complete the work.

Name (please print)	Position / Qualification	Signature	Date

Senior Management Signoff

Does this SWMS meet the necessary safety requirements? Yes / No

Does this SWMS require review? Yes / No Review Date:

Additional Comments:			
Name:	Position:	Signature:	Date:

APPENDIX 1C – HAZARD REPORT FORM

Company Name:	Form Completed By:	Date of Inspection:
Site:	Address:	Contact Phone Number:

1. Identified Hazard	Hazard Type:
2. Hazard Details	Description of Hazard:

LIKELIHOOD	CONSEQUENCE				
	Insignificant	**Minor** First Aid Required	**Moderate** Medical Attention and Time Off Work	**Major** Long Term Illness or Serious Injury	**Severe** Kill or Cause Permanent Disability or Illness
Almost Certain	**M**	**H**	**H**	**VH**	**VH**
Likely	**M**	**M**	**H**	**H**	**VH**
Possible	**L**	**M**	**H**	**H**	**VH**
Unlikely	**L**	**L**	**M**	**M**	**H**
Rare	**L**	**L**	**M**	**M**	**M**

RISK LEVEL	ACTION
VERY HIGH	Act immediately: The proposed task or process activity must not proceed. Steps must be taken to lower the risk level to as low as reasonably practicable using the hierarchy of risk controls.
HIGH	Act today: 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 control. 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 Safe Work Method has been prepared. 5. The supervisor must review and document the effectiveness of the implemented risk controls.
MEDIUM	Act this week: The proposed task or process can 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 Safe Work Method has been prepared.
LOW	Act this month: Managed by local documented routine procedures, which must include application of the hierarchy of controls.

3. Risk Assessment	Risk Likelihood Level:	Risk Consequence Level:	Risk Level:
	Is there an existing safety system or procedure that deals with this hazard? Yes / No Details:		

4. Control Strategies	Intended Control Strategy (Details and Resources Required)	Tick Box
	Elimination	
	Substitution	
	Isolation	
	Engineering	
	Safe Work Practices	
	PPE	

Is the control strategy feasible? Yes / No

5. Action Plan	Has a plan for the implementation of the control strategy been completed?	
	Have the required resources been obtained?	
	Does the implementation meet the requirements of workplace policies and procedures?	
	What is the intended date of implementation?	_____/_____/_____
	Who is responsible for implementing the control strategy?	
	Date of review of action taken:	_____/_____/_____
6. Review	Date of Review:	_____/_____/_____
	Review completed by:	
	Has the hazard control been successfully implemented?	
	New risk level:	
	Is this risk level acceptable?	
	Further action required?	

APPENDIX 2A – HARNESS INSPECTION CHECKLIST

Fall-Arrest Harness Inspection Checklist	Date:
Company Name:	Site:
Harness ID Number:	Person Performing Inspection:

Item to be checked:	Defects To Check For	✓	✗
Webbing	▸ Cuts or tears. ▸ Abrasion damage. ▸ Excessive stretching. ▸ Damage due to contact with heat, corrosives or solvents. ▸ Deterioration due to rotting, mildew, or ultraviolet exposure.		
Snap Hooks	▸ Distortion of hook or latch. ▸ Cracks or forging folds. ▸ Wear at swivels and latch pivot pin. ▸ Open rollers. ▸ Free movement of the latch over its full travel. ▸ Broken, weak or misplaced latch springs. ▸ Free from dirt or other obstructions, e.g. rust.		
D-Rings	▸ Excessive 'vertical' movement of the straight portion of the D-ring at its attachment point of the belt, so that the corners between the straight and curved sections of the D become completely exposed. ▸ Cracks, especially at the intersection of the straight and curved portions. ▸ Distortion or other physical damage of the D-ring. ▸ Excessive loss of cross-section due to wear.		
Buckles & Adjusters	▸ Distortion or other physical damage. ▸ Cracks and forging laps where applicable. ▸ Bent tongues. ▸ Open rollers.		
Stitching	▸ Broken, cut or worn threads. ▸ Damage or weakening of threads due to contact with heat, corrosives, solvents or mildew.		

Fault Report:

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Harness isolated from service? Yes / No

APPENDIX 3A – SCAFFOLDING HANDOVER CERTIFICATE

Client Name:	**Contact Name:**
Worksite Address:	**Scaffold Location On Site:**
Type Of Scaffold:	**Duty Category (Light, Medium, Heavy, Special):**
Number Of Lifts:	**Number Of Bays:**
Height Of Scaffold:	**Length Of Scaffold:**
Type Of Access	**Design Reference Number:**
Handover Date	**Handover Time:**
Name Of Responsible Person:	**Signature Of Responsible Person:**