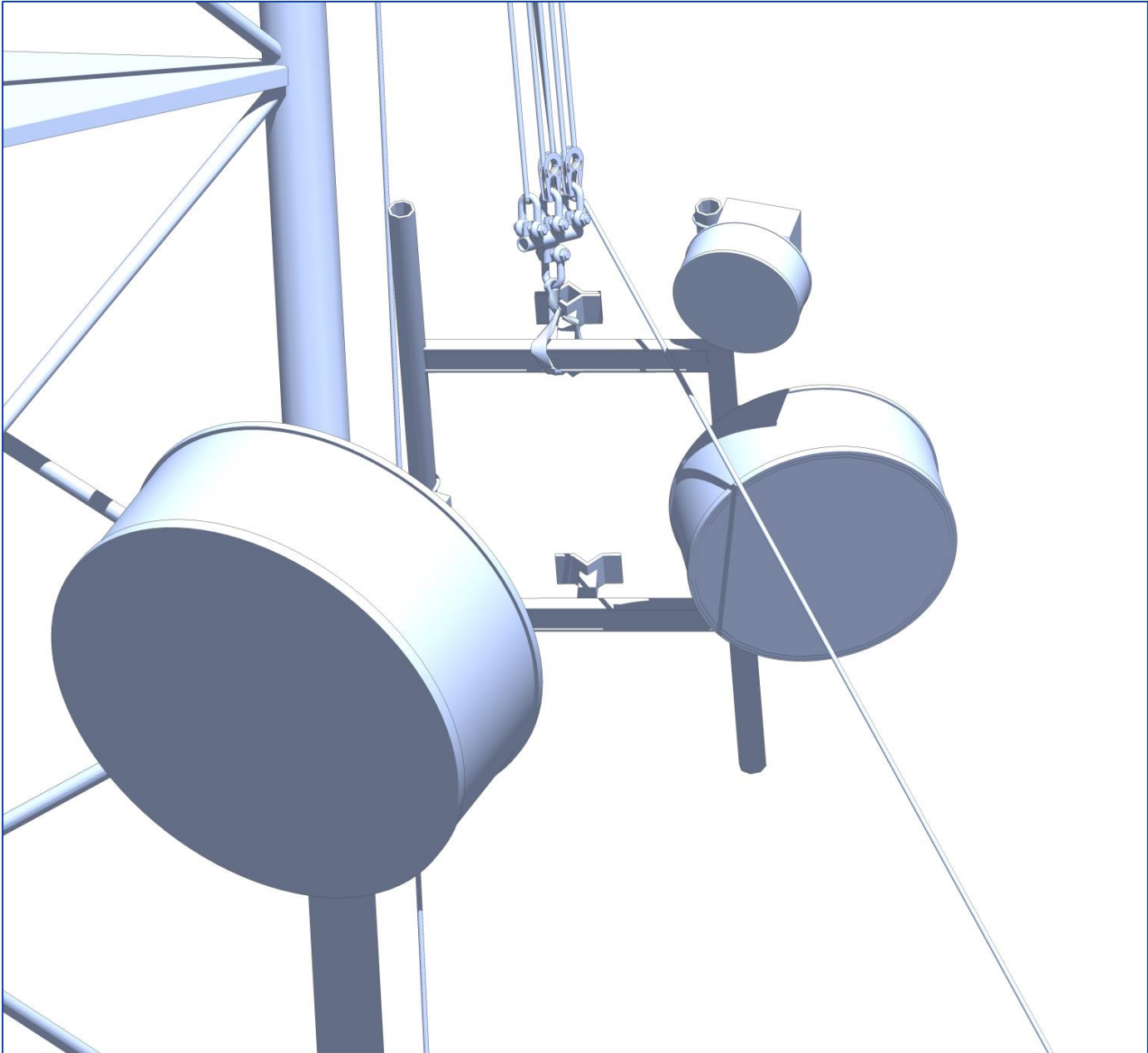


Rigging & Lifting

Standard Operating Procedure (SOP)

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1 Introduction

The SOP is split into sections; each section gives detail on the steps that must be followed for the weight limits that are specified in the two relevant standards; the Global Rigging & Lifting Standard and the Working at Height Standard.





Use the sections that are appropriate for the weight of the equipment being lifted onto the structure in the country, to develop a localized procedure.

The tools to calculate the loads and the steps required to complete the lift are available as Appendices to the SOP; these tools help ensure that the lift is done in a safe and controlled manner.








2 Personal Protective Equipment

Personal Protective Equipment (PPE) and climbing equipment shown in the table below are for all working at height activities; not all equipment will be required for every activity, however, the specifications are non-negotiable.

FALL ARREST PERSONAL PROTECTIVE EQUIPMENT				
No.	Tool Accessories per person	Picture	Equipment to be certified by relevant standards or equivalent	Application
1	Full Body Harness (Front and rear attachment)		EN361:2002 Personal protective equipment against falls from height.	Arrangement of straps, fittings, buckles or other elements suitably designed to support the body and provide attachment points for the shock absorbing lanyard and work positioning lanyard for fall arrest work.
			EN358:1999 Personal protective equipment for work positioning and prevention of falls from height.	
			CE0120	
2	Energy Absorber (Double Y-lanyard)		EN355:2002 Personal protective equipment against falls from height.	Used as the primary safety to arrest the fall of the worker safely whilst minimizing injury.
			CE0120	
3	Work Positioning Lanyard		EN358:1999 Personal protective equipment for work positioning and prevention of falls from height.	Used to allow worker the use of both hands whilst at height.
			CE0120	
4	Climbing Helmet		EN12492:2002 Mountaineering equipment – Helmets for mountaineers	To protect the head against falling objects or from where a person has a pendulum swing.
			CE0120	

FALL ARREST PERSONAL PROTECTIVE EQUIPMENT

No.	Tool Accessories per person	Picture	Equipment to be certified by relevant standards or equivalent	Application
5	Mechanical advantage System Per Work Team (Rescue ratchet)		EN1496:2006 <i>Note: A rescue kit can be assembled using a combination of various work at height equipment</i> EN354:2002 Personal protective equipment against falls from height.	Used to transfer the weight of a fallen person from their fall arrest system to the rescue system.
6	Steel Toe Capped Safety Boots		EN20345:2011 Personal protective equipment - Safety footwear	Protects worker's feet from injury should anything be dropped on them.
7	Hi-Vis Vest /or Jacket		EN471 – High visibility warning clothing.	Makes it easier to see workers which assists in organizing a worksite.
8	Set of Safety Gloves		EN388-2442:2003 Protective gloves against mechanical risks <i>Note: Choose level of protection as per risk assessment.</i>	Protects worker's hands from cuts, pinches and rope burn. No single glove can provide protection for every work situation.
9	Eye Protection Safety spectacles Safety Goggles		EN166:2002 safety specifications for eye protection <i>Note: Choose level of protection as per risk assessment.</i>	Protects workers from foreign objects injuring their eyes



FALL ARREST PERSONAL PROTECTIVE EQUIPMENT				
No.	Tool Accessories per person	Picture	Equipment to be certified by relevant standards or equivalent	Application
10	Hearing Protection		EN352-1:2002 Hearing Protectors <i>Note: Choose level of protection as per risk assessment.</i>	Protects worker's ears from loud noises, especially when working in a noisy area for long periods.
11	Fall Arrest Trolley/Glider		EN353-1:2002 Guided type fall arresters including a rigid anchor line.	Used on a permanent life-line to arrest a worker's fall safely in a very short distance whilst minimizing injury.
12	Fall arrest trolley (Latchways Trolley)			




Table 1

Fall arrest system will vary for each country; the equipment that is used must be in line with the specific country's legislation and the type of structures present on the sites.





3 Lifting Equipment Required

The table highlights items that can be used on different lifting loads; the specifications are non-negotiable. Not every site will need every item.

The manufacturers requirement for the use of lifting equipment must be followed.

Basic Rigging System (3:1 Mechanical Advantage System) (1 – 100Kg Maximum Load)				
No.	Tool Accessories per person	Picture	Equipment to be certified by relevant standards or equivalent	Application
1	Connectors (Locking karabiners)		EN362:1992 Personal protective equipment against falls from height - connectors.	Used to connect various rigging/work at height components to each other or to anchor points.
2	Rope Grab / Backup devices or Type A safety line adjustment device with appropriate lanyard.		EN353-2:2002 Personal protective equipment against falls from height. Part 2 (flexible anchor lines) EN12841:2006 Type A Personal protective equipment – Rope access systems – Rope adjustment devices	Used as a backup device to ensure that the load is suspended safely should the main-line fail.
3	Main-line Low Stretch Kernmantle Rope 10.5mm – 13mm (Length of rope is dependent on the height of the structure and system used)		EN1891:1996 Personal protective equipment for the prevention of falls from height – Low stretch kernmantle ropes	Used to connect the load to the mechanical advantage system which allows it to be lifted and/or lowered.

Basic Rigging System (3:1 Mechanical Advantage System) (1 – 100Kg Maximum Load)

No.	Tool Accessories per person	Picture	Equipment to be certified by relevant standards or equivalent	Application
4	Backup Line Low Stretch Kernmantle Rope 10.5mm – 13mm (Length of rope is dependent on the height of the structure and system used)		EN1891:1996 Personal protective equipment for the prevention of falls from height – Low stretch kernmantle ropes	A secondary rope used to ensure that the load is suspended on the backup line should the main line fail.
5	Tag-line Low Stretch Kernmantle Rope 10.5mm – 13mm (Length of rope is dependent on the height of the structure)		EN1891:1996 Personal protective equipment for the prevention of falls from height – Low stretch kernmantle ropes	Ropes connected to the load to help guide and steady the load during a lift.
6	Anchor Sling - Protective cover recommended		EN566:1997 Mountaineering equipment – Lanyards requirements and test methods EN795:1996 Class B Protection against falls from height – Anchor devices – Requirements and testing.	Used to anchor mechanical advantage systems to a structure. May also be used to sling loads.
7	One-way system		EN12278:2007 Mountaineering equipment - Pulleys - Safety requirements and test methods EN567:2013 Mountaineering equipment. Against falls from height. Rope Clamps	Used as a one-way pulley which allows the worker to lift a load with reduced friction but not to lower it.

Basic Rigging System (3:1 Mechanical Advantage System) (1 – 100Kg Maximum Load)







No.	Tool Accessories per person	Picture	Equipment to be certified by relevant standards or equivalent	Application
8	Two-way system		<p>EN341:2011 Personal fall protection equipment - Descender devices for rescue</p> <p>EN12481 – Type C Personal fall protection equipment – Rope access systems – Rope adjustment devices</p>	<p>Used as a two-way pulley which allows the worker to lift and lower a load.</p> <p>Note: it does however increase the friction in a system.</p>
9	11-13mm Pulley		<p>EN12278:2007 Mountaineering equipment. - Pulleys – Safety requirements and test methods</p>	<p>Used to reduce friction in a mechanical advantage system. May also be used to change the direction a worker needs to pull in, to lift a load.</p>




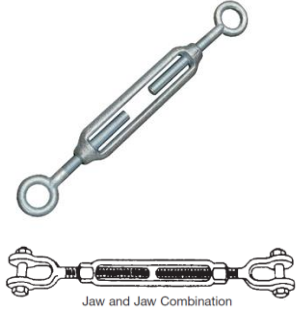
Table 2

Basic rigging system will vary for each country; the equipment that is used must be in line with the specific country's legislation and the type of structures present on site.

Advanced Rigging System (100Kg – 500Kg Maximum Load)

No	Tool Accessories per person	Picture	Equipment to be certified by relevant standards or equivalent	Application
1	Main-line Low Stretch Kernmantle Rope 13mm+ (Length of rope depends on the height of the structure and system used)		Rope requirement must be fit for purpose and safe for use as per winch manufacturer requirements.	Used to connect the load to the mechanical advantage system which allows it to be lifted and/or lowered.
2	Tag-line Nylon (2) Rope 18mm (Length of rope depends on the height of the structure)		ISO 2307 Fiber ropes – The Determination of certain physical and mechanical properties	Ropes connected to the load to help guide and steady the load during a lift. Not to be used to support the weight of the load.
3	16mm Rope Pulley WLL 500kg minimum		EN13157 Machinery Directive for lifting goods and equipment And/or certified by manufacturer to the correct WLL and to what safety factor the specific item is guaranteed to or certified to by the manufacturer	Used to reduce friction in a mechanical advantage system. May also be used to change the direction a worker needs to pull in, to lift a load.
4	Split-pin 2 Tonne safety bow shackles or Safety D-shackles		EN13889:2003 Forged steel shackles for general lifting purposes - Dee shackles and bow shackles.	Used to connect various pieces of equipment to gin poles or slings and/or to each other.

Advanced Rigging System (100Kg – 500Kg Maximum Load)

No	Tool Accessories per person	Picture	Equipment to be certified by relevant standards or equivalent	Application
5	2T WLL Lifting Slings		EN1492-1:2000 Textile Slings	Used to anchor mechanical advantage systems to a structure. May also be used to sling loads. Varies in length from 0.5m to 4m
6	Self-Tailing 500kg WLL Capstan Winch Ensure the winch has the correct components to be fitted to the structure		EN 14492-1:2006 Power Driven Winches. Machinery Directive 2006/42/CE and associated standards and regulations. ISO Standard 4301-1:2016 Crane and lifting appliance classification. <i>NOTE: Test load for the capstan winch is recommended to be 1.5 times lift weight load and tackle</i>	A mechanical device used to aid in lifting heavy loads.
7	3500W (min) Generator Ensure it is safe for use and fit for purpose		ISO 8528 series Generator - alternating current generating sets As national and regional legislation or regulation	Used to power the capstan winch.
8	16mm turnbuckles eye to eye or clevis		BS4429 Certificate of compliance provided by reputable dealer with WLL 750 stated on equipment. Standard Specification for Turnbuckles, Swaged, Welded, Forged Open body rigging screws To DIN 1480 eye to eye.	Used to tension fox lines

Advanced Rigging System (100Kg – 500Kg Maximum Load)



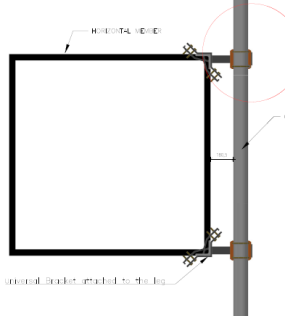
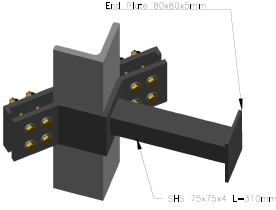
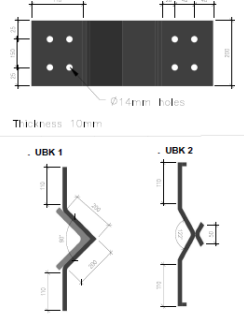
No	Tool Accessories per person	Picture	Equipment to be certified by relevant standards or equivalent	Application
9	4m 4000kg Ratchet straps		Ratchets conform to EN12195-2:2001 safety performance requirements	These are only used for securing loads for delivery of items to and from the site locations, not for lifting purposes.
10	Inner tire tube		N/A	Used to assist in securing the capstan winch on a tubular tower leg. It only protects the structure from scratches and damage and has no loadbearing capability.
11	Gin Pole kit		Fit for purpose and safe for use as per engineer's design and installation requirement.	Uses a pulley on its upper end to lift loads.
12	50mm-150mm Universal standoff bracket		Fit for purpose and safe for use as per engineer's design and installation requirement.	Provides a connection point for universal cross over plate to connect gin pole
13	Universal cross over plate		Fit for purpose and safe for use as per engineer's design and installation requirement.	Allows the gin pole to be connected to the standoff bracket

Table 3



Advanced rigging system will vary for each country; the equipment that is used must be in line with the specific country's legislation and the type of structures present on the sites.

Please note that NOT ALL components in the above list are required for all lifting methods, they need to be identified and fit for purpose by way of the lifting plan requirements.

4 Loads up to 6kg

Work at height MUST always be completed with a minimum of a 2-person Team

The individual climbing the structure must always be FASTENED, either by a fixed fall arrest system or the use of a double lanyard.

A load of up to 6kg can be carried up using any one of the following: -

1. Attached to the person's harness for lifting and climbing (Fig. 4.0)
2. Carried in a backpack (Fig. 4.1)
3. Attached to a Rope & Lifted up (Fig. 4.2)

It is important that the load is attached in a way that does not catch on the structure being climbed.

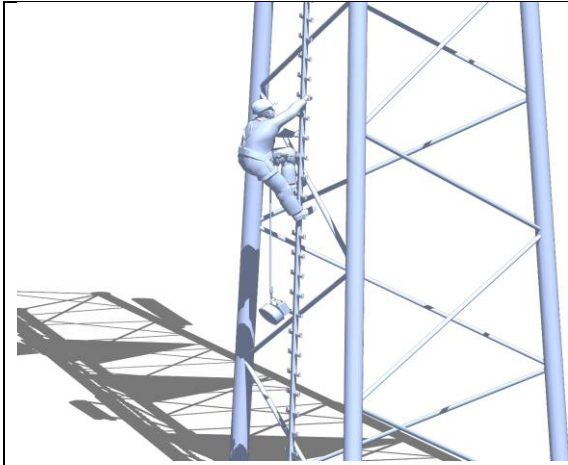
Sequence of work

Lifting Pre-Check:

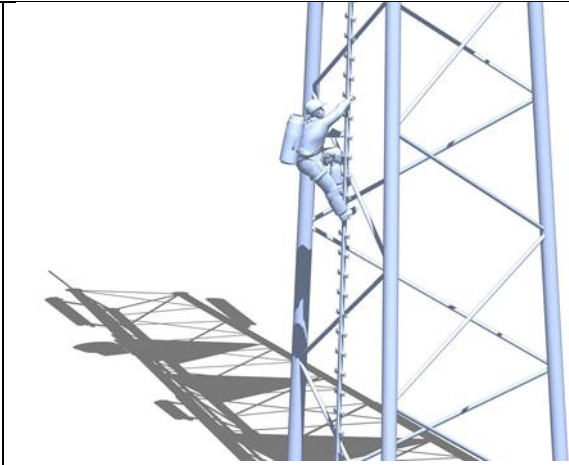
- Check all documentation and complete the toolbox talk / safety brief.
- Check all equipment are in good condition and properly rated (harness, positioning rope double lanyard with shock absorber, sling shackle)
- Check each other's equipment (buddy Check) before anyone climbs

Lifting the Load:

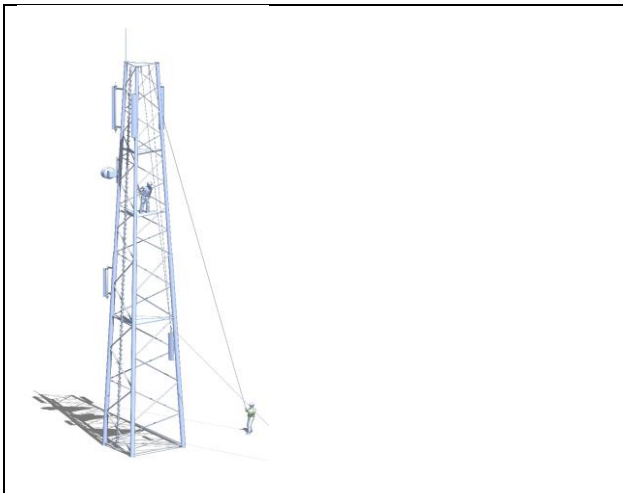
- Plan the route, (rest points and location the load will be lifted to)
- Start ascending tower with the load.
- Once the work position is reached, secure the load in the location planned.
- For 4.2, ascend the tower, with rope and when in position, pull the load up. Should this method be used, a non-return system must be employed to ensure that the load cannot be dropped accidentally.
- There must be minimal friction on the rope.
- During the lifting activities clear communication must be maintained at all times, if no direct voice communication is possible then use radios.
- Ensure a drop zone is in place.



4.0 Attached to the person's harness for lifting and climbing.



4.1 Carried in a backpack



4.2 Attached to a Rope & Lifted up

5 Loads from 6kg to 20kg

3-Person Team

Sequence of work

Lifting Pre-Check:

- Check all documentation and complete the toolbox talk / safety brief.
- Check all equipment (harness, positioning rope double lanyard with shock absorber, sling shackle are in good condition and properly rated.
- Check all equipment has been installed / set up correctly and is secure.
- Check each other's equipment (buddy Check) before anyone climbs
- Ensure a drop zone is in place.

Lifting Ropes Installation:

- Climb with ropes (pulling rope and backup rope), sling, shackle, and pulley to the proposed load end location.
- Set up the sling, shackle, pulley system with "non-return device" on the tower leg above the proposed final location of the load.
- Run the rope through the pulley having both ends of the rope on the ground.
- Set up the backup rope via sling and shackle and have it run down to the ground.
- Fix the rope to the load using securing knots and choke slings where required.
- Set up the attachment sling with carabiner and pulley between the load and pulling rope to use as a flying line in the same time – this system to be used when it is a 2-person team.

**DO NOT ALLOW THE ROPE TO BE LEFT SO THAT IT CAN BE DAMAGED OR WALKED ON.
DO NOT CUT THE ROPE FOR LENGTH TO A SPECIFIC JOB.**

Fly Line Installation (a safety rope controlled on the ground):

- Tie a rope to the bottom of the load.
- As the load is being raised into position, the rope must be pulled taut by a person on the ground.
- The person on the ground must control the load during its ascent keeping it away from all existing equipment.

Lifting the Load:

- During the lifting activities, clear communication must be maintained at all times, if no direct voice communication possible then use radios.
- There must be minimal friction on the rope.
- Flying line or belayer (a safety rope controlled on the ground) should not be pulled too tight to ensure that the lift does not hit other Antennas or the tower.
- Keep all personnel clear from lifting area.
- Check that the condition of the structures and lifting equipment is safe for use and fit for purpose.
- Ensure that all lifting items are connected correctly and in line with the manufacturer specifications and that SWL [safe working loads] are not exceeded.
- Before the main lift, the load should be raised to just above ground and the rigging equipment and load should be checked to ensure that no problems have occurred during the initial movement.

Lowering the Load

When lowering the load, make sure that the following are considered: -

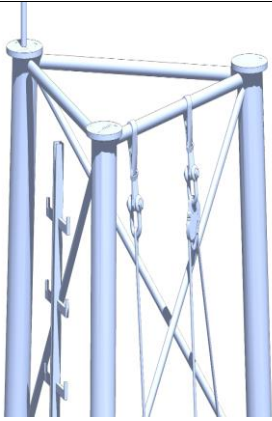
- The position of the lowering device
- The position of the rigger
- The drop-zone is maintained



5.0 Load between 6-20kg must be lifted via 2 men on the ground, one person lifting the load with the 2nd person directing the load from the tower via a flying rope. The 3rd person is FASTENED on the tower waiting for the load to be lifted to the designated location.



5.1 A Lift being done by a 2-person Team where the flying rope is not required, by using shackle sling and pulley between the 2 ends of the rope the load is kept close to the pulling rope acting as a flying rope as well.



5.2 An example of the equipment set up at the top of the tower for lifting the weight. The diagram above reflects the “Backup rope” secured via a sling and shackle and the pulling rope running through a “non-return device” combined with a pulley attached to the tower structure via a sling and shackle.

6 Loads from 20kg to 50kg

4-Person Team

Sequence of work

Lifting Pre-Check:

- Check all documentation and complete the toolbox talk / safety brief.
- Check all equipment (harness, positioning rope double lanyard with shock absorber, sling shackle are in good condition and properly rated.
- Check all equipment has been installed / set up correctly and is secure.
- Check each other's equipment (buddy Check) before anyone climbs
- Ensure a drop zone is in place.

Lifting Ropes Installation:

- Climb with ropes (pulling rope and backup rope), sling, shackle and pulley to the proposed load end location.
- Set up the sling, shackle, pulley system with "non-return device" on the tower leg above the proposed final location of the load.
- Run the rope through the pulley having both ends of the rope on the ground.
- Set up the backup rope via sling and shackle and have it run down to the ground.
- Fix the rope to the load using securing knots and choke slings where required.
- Set up the attachment sling with carabiner and pulley between the load and pulling rope to use as a flying line in the same time – this system to be used when it is a 3-person team.

**DO NOT ALLOW THE ROPE TO BE LEFT SO THAT IT CAN BE DAMAGED OR WALKED ON.
DO NOT CUT THE ROPE FOR LENGTH TO A SPECIFIC JOB.**

Positioning of Load:

- Ensure that the Setup of the load in the lift point area is in line with pulley system.
- Make sure the load is orientated correctly so it is not lifted upside-down.
- Check all equipment is secured, certified and in the correct position and all ropes are taut.

Fly Line Installation (a safety rope controlled on the ground):

- Tie a rope to the bottom of the load.
- As the load is being raised into position, the rope must be pulled taut by a person on the ground.
- The person on the ground must control the load during its ascent keeping it away from all existing equipment.

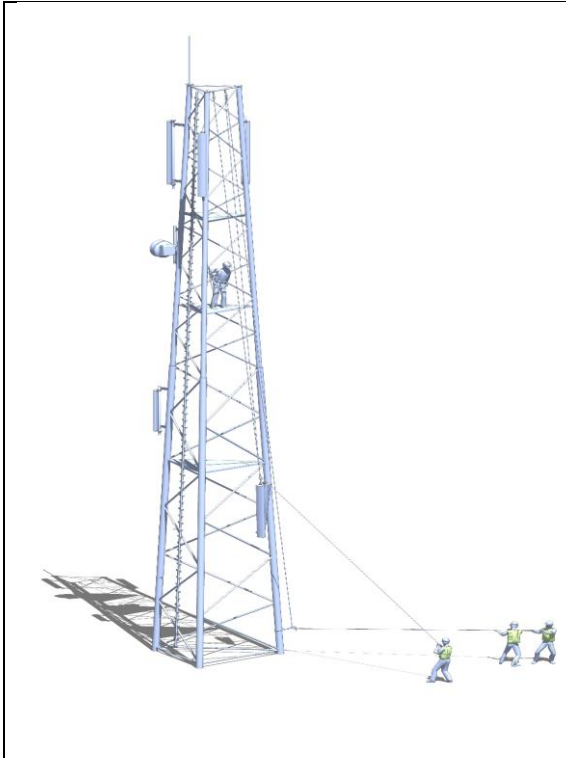
Lifting the Load:

- During the lift, clear communication must be maintained always, if no direct voice communication possible then use radios.
- There must be minimal friction on the rope.
- Flying line or belayer should not be pulled too tight to ensure that the lift does not hit other Antennas or the tower.
- Keep all personnel clear from lifting area.
- Check that the condition of the structures and lifting equipment is safe for use and fit for purpose.
- Ensure that all lifting items are connected correctly and in line with the manufacturer specifications and that SWL (safe working loads) are not exceeded.
- Before the main lift, the load should be raised to just above ground and the rigging equipment and load should be checked to ensure that no problems have occurred during the initial movement.

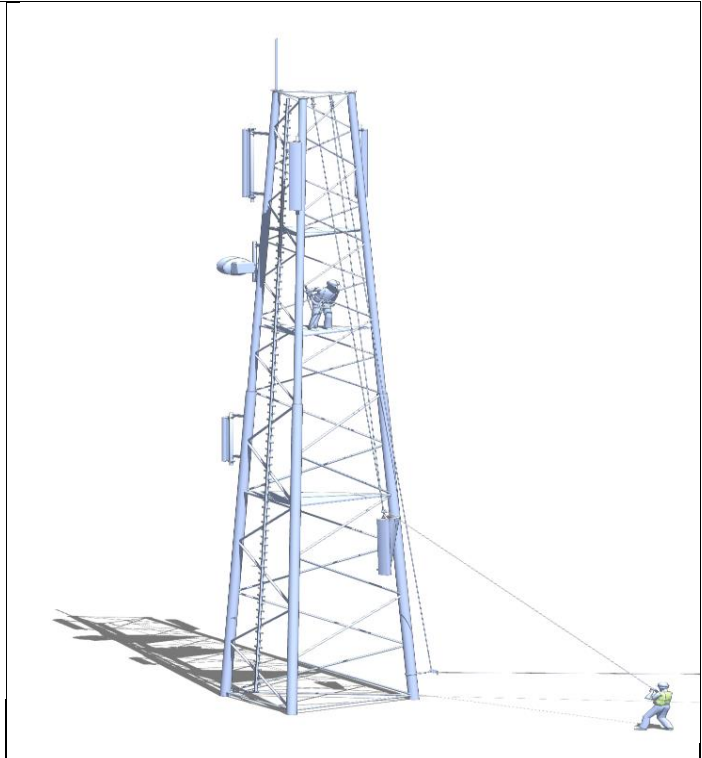
Lowering the Load

When lowering the load, make sure that the following are considered: -

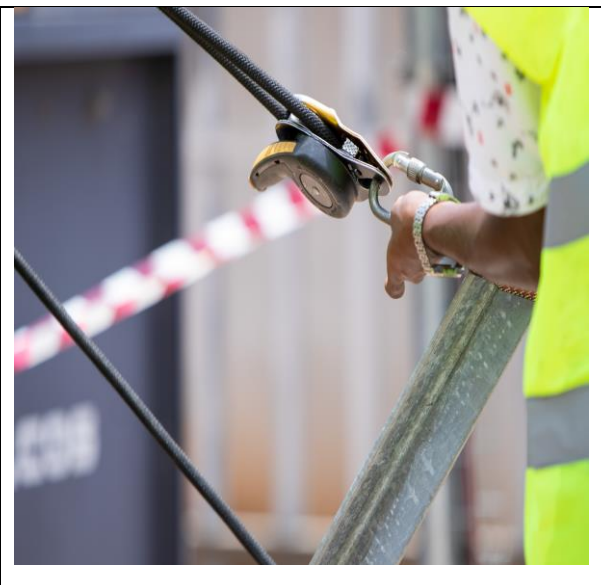
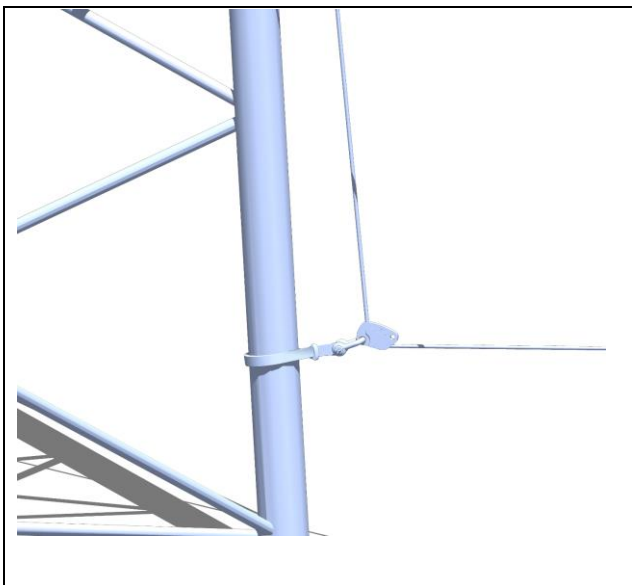
- The position of the lowering device
- The position of the rigger
- The drop-zone is maintained



6.1 Lifts between 20-50kg – 3 men on the ground are required, 2 men lifting the load and the 3rd directing the load away from the tower via the flying rope. The 4th person is on the tower waiting for the load to be lifted to the designated location for fitting it.



6.2 Note this may be able to be completed with a 3-person team if the environment permits this.



6.3 & 6.4: The drawings show a 2nd pulley with a “non-return ” device attached to the bottom tower leg via a sling and shackle, directing the pulling force in line with the tower leg - reducing the load weight for an easier lift.

7 Loads from 50kg to 100kg (Basic Lifting)

Multi-Team Lift

The lift between 50Kg and up to 100Kg can either be completed using the methodology outlined in section 6, multi-team lift or utilize a capstan winch as detailed below

The capstan winch takes complexity out of the process and is more efficient, the sequence below details the process to be followed.

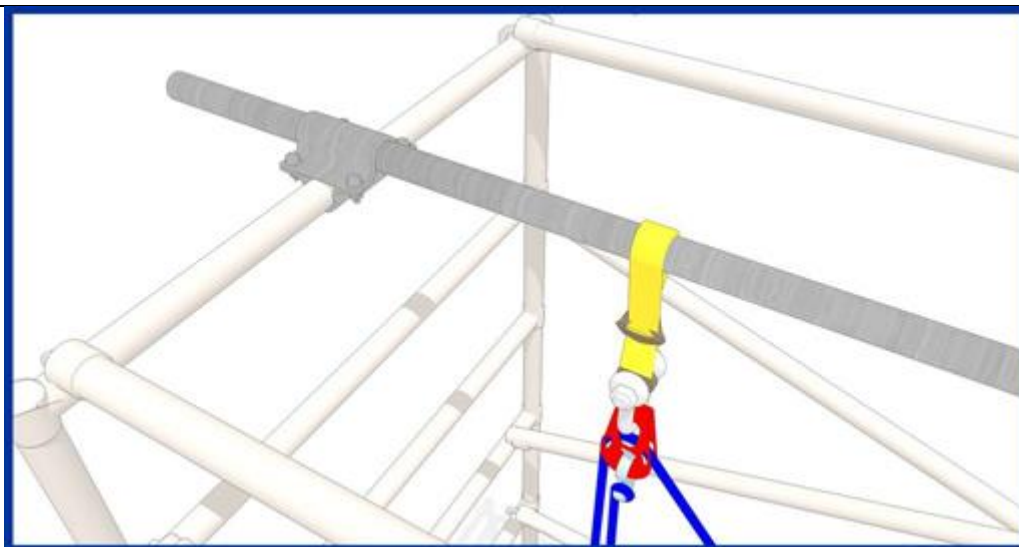
Sequence of work

Lifting Pre-Check:

- Check all documentation and complete the toolbox talk / safety brief.
- Check all equipment (harness, positioning rope double lanyard with shock absorber, sling shackle are in good condition and properly rated.
- Check all equipment has been installed / set up correctly and is secure.
- Check each other's equipment (buddy Check) before anyone climbs
- Ensure a drop zone is in place.

Attaching an Open Round Sling:

- Climb the tower to the planned location of the sling.
- Wrap the sling around the structure at least once to prevent the sling from slipping. (Fig 7.0)
- Attach a connector to both ends of the sling to ensure it remains secure at all times.



7.0 An example of the slinging for “open round sling”.

Attaching a New Gin Pole:

- Climb the tower to the planned location of gin pole with slings, rope, shackles and pulleys; all equipment taken up must be secured to prevent it from dropping.
- Tie a choke knot around the main horizontal and attach a D-shackle and pulley.
- Feed a rope through the pulley and lower it to the bottom of the tower.
- Attach the first section of the gin pole and proceed to hoist it to the planned location.
- Secure each section of gin pole to the tower until all required sections are hoisted up.
- Assemble the gin pole by slotting the male sections into the female sections and temporarily secure with the attached locating screw. Then tighten the 2 jacking pins to fully secure the two sections together.
- Attach the gin pole to either the angular/tubular leg using the universal standoff bracket as seen in the diagrams.
- If attaching to the main horizontals, position the pole as close as possible to the legs as seen in diagrams (in previous sections)

Lifting Ropes Installation:

- Fix the rope to the load using securing knots and choke slings where required.
- Use a draw rope, run the rope through the first pulley attached to the underside of the gin pole.
- Run the rope back down to the first pulley on the load.
- Repeat above steps if there are more than one pulley on the underside of the gin pole (3, 2 or 1).
- Next run the rope finally back down to the base of the tower where the capstan winch has been installed.
- Run the rope around the capstan winch multiple times as seen in the diagram.
- Ensure that the lifting rope is not left slack in any area and ready for lifting.
- Set up the backup rope via sling and shackle and have it run down to the ground.

**DO NOT ALLOW THE ROPE TO BE LEFT SO THAT IT CAN BE DAMAGED OR WALKED ON.
DO NOT CUT THE ROPE FOR LENGTH TO A SPECIFIC JOB.**

Positioning of Load:

- Ensure that the Setup of the load in the lift point area is in line with pulley system.
- Make sure the load is orientated correctly so it is not lifted upside-down.
- Check all equipment is secured, certified and in the correct position and all ropes are taut

Fly Line Installation (a safety rope controlled on the ground):

- Tie a rope to the bottom of the load.
- As the load is being raised into position, the rope must be pulled taut by a person on the ground.
- The person on the ground must control the load during its ascent – keeping it away from all existing equipment and the structure.

Capstan Winch Installation:

- If the tower leg is tubular [CHS], wrap a tire tube around the leg to provide extra grip for the chains on the leg to prevent lateral movement.
- Remove capstan winch from the box and support against the tower leg while it is fixed into position.
- Place chains around the leg and tighten the tension bolt until winch is secured.
- Make sure winch is secured tightly against the tower leg and facing in the direction of the load.

Lifting the Load:

- Check the leg tower structures and installation pulley.
- Check the installation of the pulley at the top of the tower for the secondary rope.
- There must be no friction on the rope during the lift.
- Ensure that all lifting items are connected correctly and in line with the manufacturer specifications and that SWL [safe working loads] are not exceeded.

Lowering the Load

When lowering the load, make sure that the following are considered: -

- The position of the lowering device
- The position of the rigger
- The drop-zone is maintained


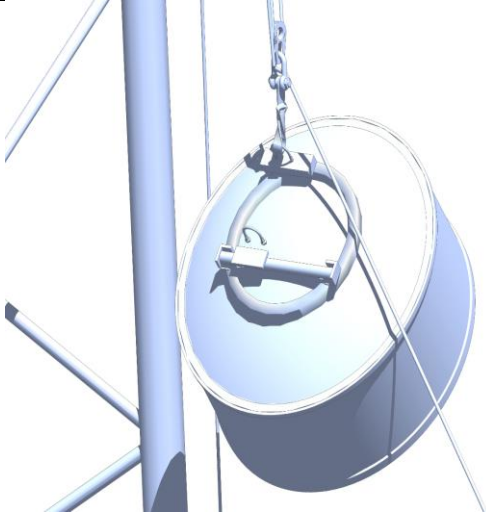
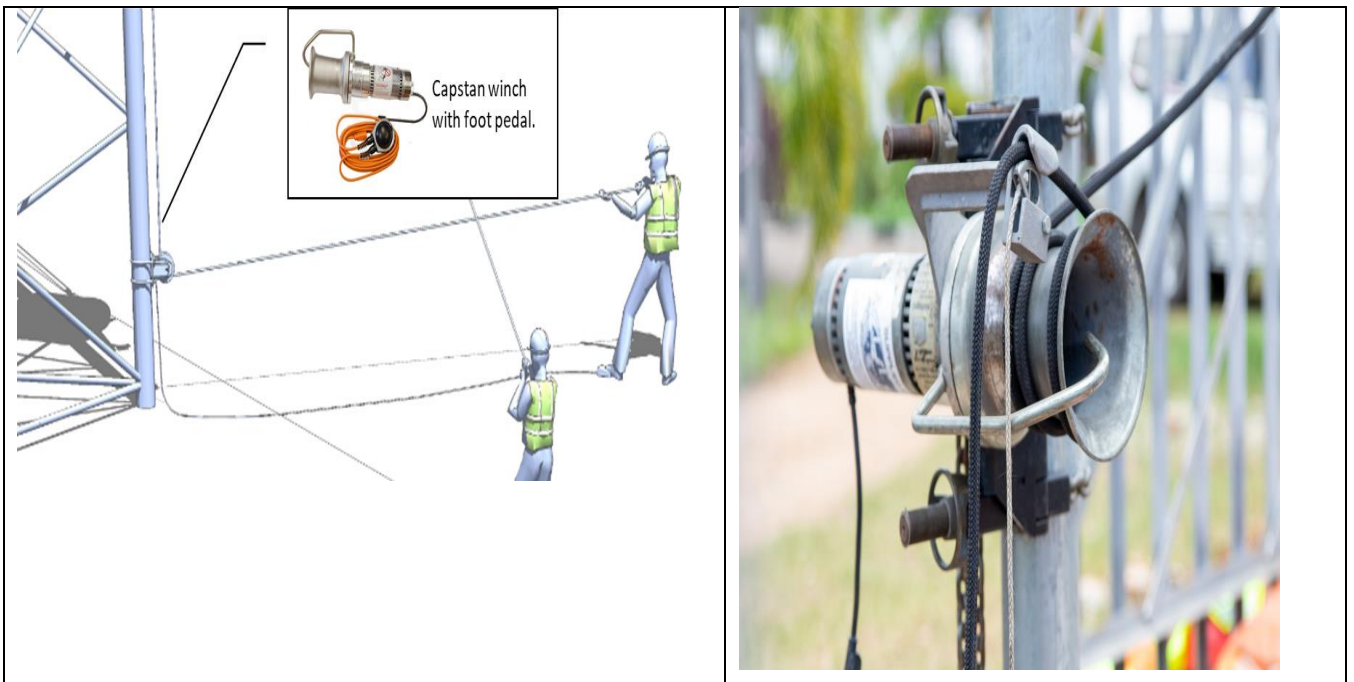
	
<p>7.0 The diagrams show a team lifting a load between 50-100 kg having 2 men on the ground, 1 lifting the load using a capstan winch with the 2nd person directing the load from the tower with a flying rope. The 3rd person is on the tower waiting for the load to be lifted to the location and for fitting it. Note: Image doesn't reflect the number of persons required for the lift this can range from a 3-person team or more. This will be dictated by the lift.</p>	<p>7.1 The Load is attached via a sling shackle and pulley to provide a secured and easier lift.</p>



Figure 7.2 & 7.3 Gin Pole or Derrick (Lifting Beam) must be set up on the top of the tower to accommodate the heavier loads to be lifted. The Gin pole must be installed and secured across the two tower legs and be fitted at the end of it with an eyelet, shackle, and pulley for the pulling rope.



7.4 & 7.5. The Capstan winch with “non-return device” is fitted on the bottom of the tower leg for directing the pulling force in line with the tower leg. The lift is controlled by the person via a foot pedal, attached to the Capstan Winch

8 Loads up to 500kg (Advanced Lifting)

Multi-Team Lift

Sequence of work

Lifting Pre-Check:

- Check all documentation and complete the toolbox talk / safety brief.
- Check all equipment (harness, positioning rope double lanyard with shock absorber, sling shackle are in good condition and properly rated.
- Check everything has been installed / set up correctly and is secure.
- Check each other's equipment (buddy Check) before anyone climbs
- Ensure a drop zone is in place.

Attaching an Open Round Sling:

- Ascend the tower to the planned location of the sling.
- Wrap the sling around the structure at least once to prevent the sling from slipping.
- Connect a shackle to both ends of the sling to ensure it always remains.

Attaching a New Gin Pole:

- Ascend the tower to the planned location of gin pole with slings, rope, shackles, and pulleys.
- Tie a choke knot around the main horizontal and attach a D-shackle and pulley.
- Feed a rope through the pulley and lower it to the bottom of the tower.
- Attach the first section of the gin pole and proceed to hoist it to the planned location.
- Secure each section of gin pole to the tower until all required sections are hoisted up.
- Assemble the gin pole by slotting the male sections into the female sections and temporarily secure with the attached locating screw. Then tighten the 2 jacking pins to fully secure the two sections together.
- Attach the gin pole to either the angular/tubular leg using the universal standoff bracket as seen in the diagrams.
- If attaching to the main horizontals, position the pole as close as possible to the legs as seen in diagrams.

Lifting Ropes Installation:

- Fix the rope to the load using securing knots and choke slings where required.
- Use a draw rope, run the rope through the first pulley attached to the underside of the gin pole.
- Run the rope back down to the first pulley on the load.
- Repeat above steps if there are more than one pulley on the underside of the gin pole (3, 2 or 1).
- Next run the rope finally back down to the base of the tower where the capstan winch has been installed.
- Run the rope around the capstan winch multiple times as seen in the diagram.
- Ensure that the lifting rope is not left slack in any area and ready for lifting.
- Set up the backup rope via sling and shackle and have it run down to the ground.

**DO NOT ALLOW THE ROPE TO BE LEFT SO THAT IT CAN BE DAMAGED OR WALKED ON.
DO NOT CUT THE ROPE FOR LENGTH TO A SPECIFIC JOB.**

Positioning of Load:

- Ensure that the Setup of the load in the lift point area in line with pulley system.
- Make sure the load is orientated correctly so it is not lifted upside-down.
- Check all equipment is secured, certified and in the correct position and all ropes are taut.

Fly Line Installation (a safety rope controlled on the ground):

- Tie a rope to the bottom of the load.
- As the load is being raised into position, the rope must be pulled taut by a person on the ground.
- The person on the ground must control the load during its ascent – keeping it away from all existing equipment.

Capstan Winch Installation:

- If the tower leg is tubular [CHS], wrap tire tube around the leg to provide extra grip for the chains on the leg to prevent lateral movement.
- Remove capstan winch from the box and support against the tower leg while it is fixed into position.
- Place chains around the leg and tighten the tension bolt until winch is secured.
- Make sure winch is secured tightly against the tower leg and facing in the direction of the load.

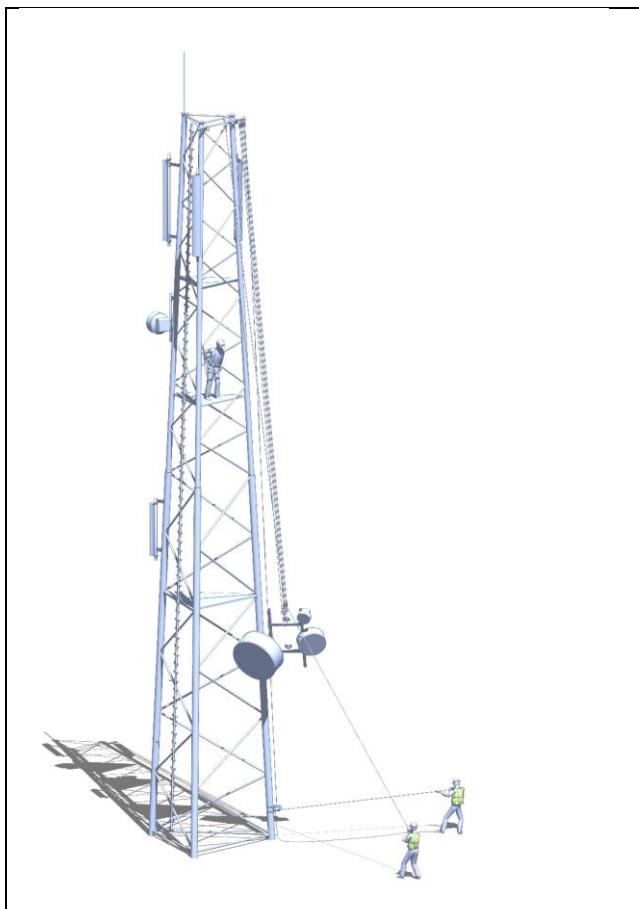
Lifting the Load:

- Check the leg tower structures and installation pulley.
- Check the installation of the pulley at the top of the tower for the secondary rope.
- Make sure the rope does not get friction.
- Follow specific instructions / procedures for attachment of the rigging gear to the max load.

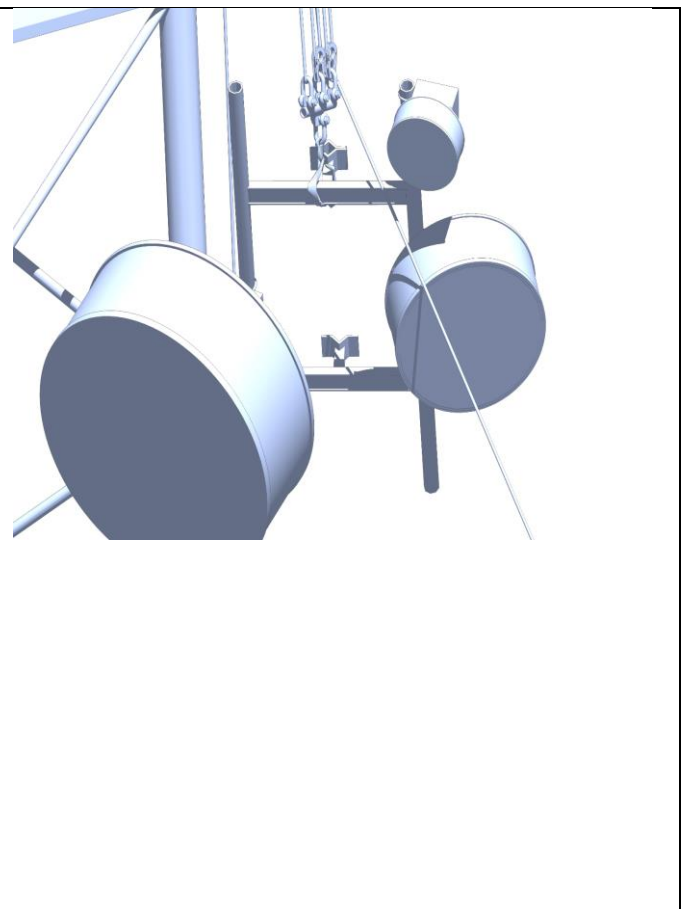
Lowering the Load

When lowering the load, make sure that the following are considered: -

- The position of the lowering device
- The position of the rigger
- The drop-zone is maintained



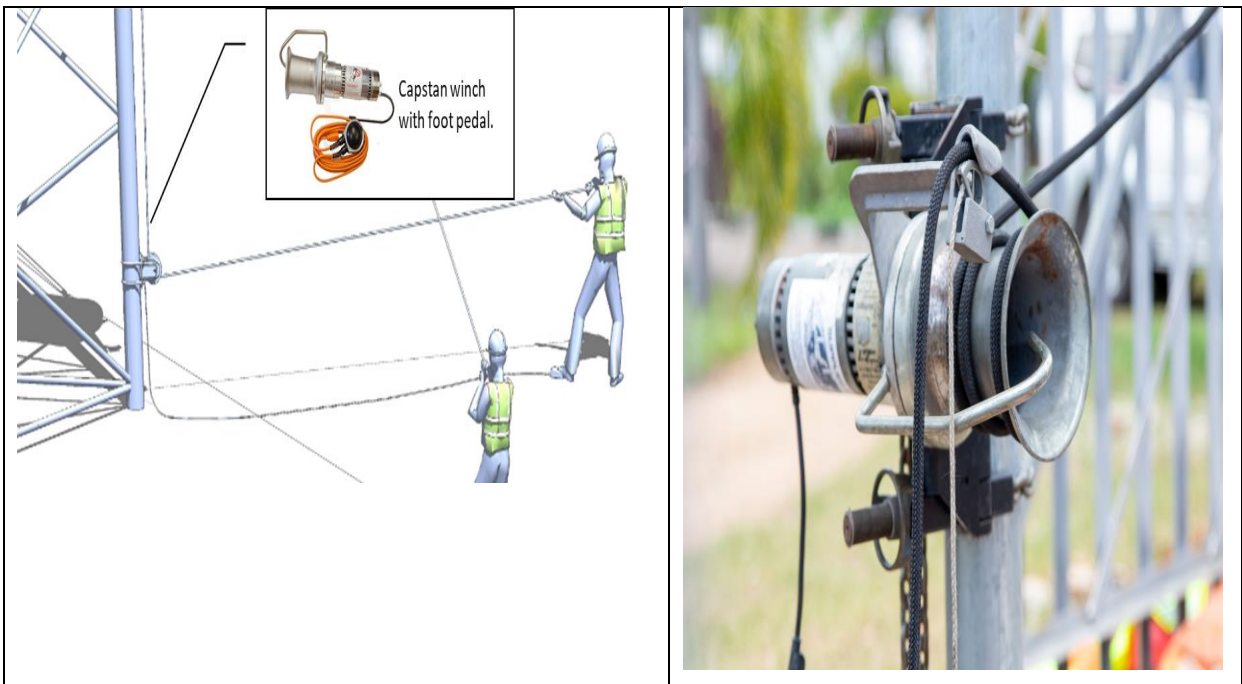
8.0 The diagrams show the process to be used for lifting a load over 100 kg. 2 men are on the ground 1 lifting the load via a capstan winch, the 2nd person directing the load from the tower via a flying rope. A 3rd person is on the tower waiting for the load to be lifted to the designated location for fixing it. **Note: The diagram here shows a 3-person team performing the lifting activities, the number in the team will be dictated by the lift.**



8.1 With multiple pulleys at the load end, using a spreader beam will allow for the pulleys and shackles to avoid clashing with each other and keep the lines clear and not twisted.



Figure 8.2 & 8.3 The Gin Pole or Derrick (Lifting Beam) is to be set up on the top of the tower to accommodate heavier loads to be lifted. The Gin pole must be installed and secured across the two tower legs and be fitted at the end of it with an eyelet, shackle and pulley for the pulling rope.



8.4 and 8.5 A Capstan winch with “non-return device” fitted on the bottom of the tower leg for directing the pulling force in line with the tower leg. The lift is controlled by the person via a foot pedal.

9 Loads more than 500kg

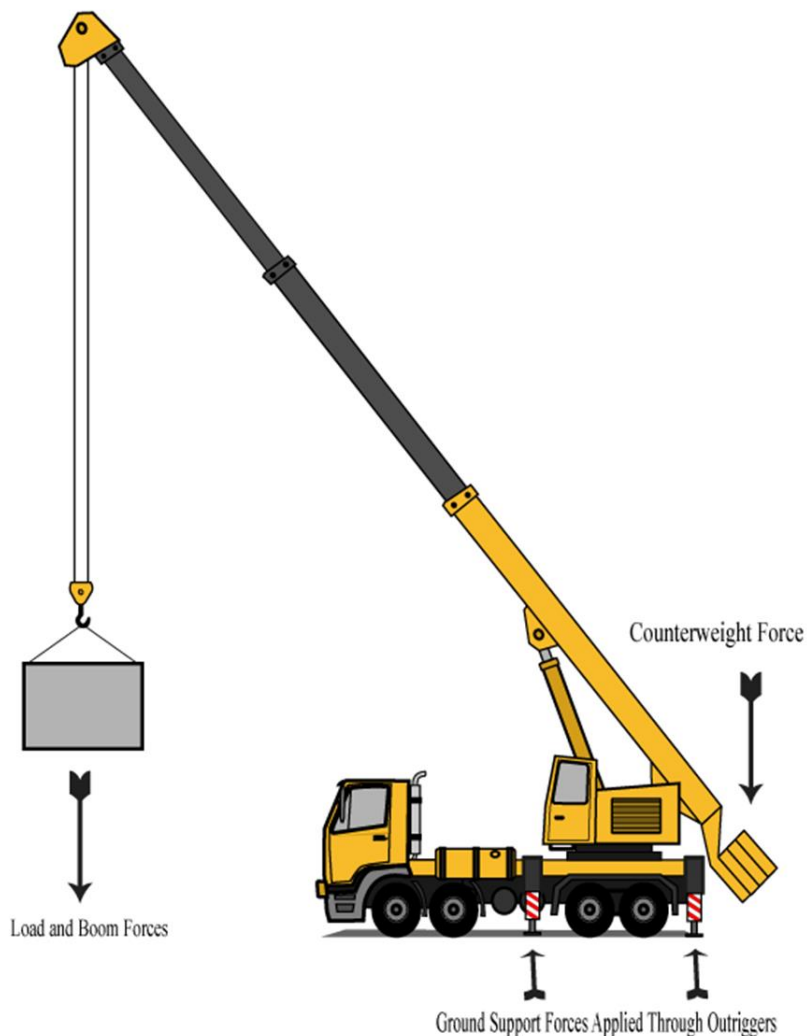
SPECIAL LIFTING ONLY

For any loads being lifted over 500kg in weight, a crane must be used to lift the load to its ultimate location or use specialist lifting equipment and seek the correct advice on how to engage this.

A specialist crane planning organization should be approached to assist with the set up and location of the crane, the load to be lifted and the calculations that are required to ensure safe lifting.

Considerations of location of set up, ground conditions, overhead cables and the protecting of workers and the public must be taken into account

DO NOT ATTEMPT THIS WITHOUT SUPPORT AND ADVICE.



10 Document Reference

- Rigging & Lifting Standard
- Pre- Construction Meeting Doc
- Lifting Calculator
- Pre- works Checklist
- Equipment List
- Equipment Checklist
- Completion Checklist

Ver	Status	Date	Author	Owner	Reviewed by	Reviewed date	Approver	Approval date	Description of changes
1.0	Approved	2018-12-13	Andrew Eadie	Gareth Davies					SOP approved for release.
2.0	Approved	2023-11-13	Sameh Eisa	Sameh Eisa	Rodney Van Wyk	2023-11-20	Paulo Conceicao	2023-11-20	Modifications include document ownership, rebranding, organizational changes and adjusting the Doc ID.