

SLINGWORK IN A VERTICAL SHAFT
256616

SLING MATERIAL INTO AND REMOVE SLUNG MATERIAL FROM A SHAFT
Explain specific requirements pertaining to the slinging of material into a shaft

Logbook entries include but not limited to the following:

Type of material to be transported
Quantity of material to be transported
Destination
Specific travelling speed
Type of material to be transported
Quantity of material to be transported
Destination
Specific traveling speed
Time
Date
What's going to be done
Signature and driver countersign

Logbooks includes but not limited to the following:

- Shaft report book.
- Driver logbook.

The manager, engineer or mine overseer may grant permission in writing for persons to travel with material if such material is not likely to endanger persons travelling in the conveyance; and the manager shall cause a list to be kept of the material which is regularly conveyed in the shaft for which permission has been granted.

Ensure that all persons authorised to give signals for the raising and lowering of persons are conversant with the material mentioned in the list and make a copy of the list readily available to all persons concerned.

The manager, engineer or mine overseer may authorise the following persons to travel in a shaft with material or explosives prohibited if such travelling is necessary for the efficient carrying out of their duties; such as, but not limited to the following: -

- Onsetter and their gangs,
- Persons engaged in sinking operations,
- Persons conducting an examination, effecting repairs or doing other work in the shaft, and
- Persons are required to ensure the safe passage through the shaft of material, which cannot be conveyed inside a conveyance.

Any warning for a special instruction given and the time such warning was given involving the safety of persons to the winding engine driver, such entry shall be signed by the person giving the instruction and shall be countersigned by the winding engine driver.

Practical procedures

Adhered to the following notices and documents displayed on the bank: -

Site specific requirements for the shaft will apply to prevent hazardous conditions which may endanger persons and property damage.

A notice approved by the manager will be posted for the type and quantities of material to be slung.

The correct slings without any visual defects must be selected as per site specific requirement.

The person in immediate charge must inform the onsetter of the procedures to be followed, the exact number and amount of material per trip to be slung.

The banksman will instruct the onsetter to travel to the required destination in preparation to receive the slung material.

All required tools and equipment must be lowered to the onsetter destination before slinging material.

Other winding operations in the shaft must be stopped in accordance with the site specific requirements, when slinging material into or removing slung material from a shaft conveyance.

The person in immediate charge must: -

Make pre-arrangements with the driver and enter the arrangements in the driver's logbook.

Sign the entry made in the driver logbook and the driver must countersign.
Check that the material complies with the approved material list for the shaft,
Check that no tools, equipment or other materials are either in or on the material to be slung. (*These objects may accidentally fall down the shaft when the material is raised into the shaft*).
Check that all gates and conveyance doors are closed.
Instruct the assistants to open the shaft steel work on the bank to the shaft entrance. (*Gantries*)
Store equipment not required for the slinging operation,
Position the safety devices on the bank.
Select the correct slings accordance with the site specific requirements.
Examine the condition of all equipment to be used. (*Safe and fit for purpose*).
Examine all safety harnesses for visible defects.
Transmit signals to the driver to position the conveyance to be able to reach the cage slings underneath the conveyance.
Transmit a signal to stop the driver on the required position.
Interchange the mark signal when required with the driver.
Transmit the clutching signal, underground destination signal, and a clear signal to the driver when required.

Clutching will only be required when both conveyances are use simultaneously to sling material.

The driver will clutch according to the site specific requirements for slinging operations.

The person in immediate charge must: -

Receive the clutching completed signal from the driver.
Interchange signals “persons about to have access to the conveyance for a purpose other than travelling” with the driver.
Check that the robot indication is green.
Instruct the assistants to secure their lifelines in accordance with site specific requirements.
Instruct the assistants to use the correct tools to pull out the conveyance slings from underneath the conveyance.
Transmit a signal to the driver to lower slowly and instruct the assistants to pull the slings towards the bank.
Transmit a signal to stop the conveyance as required above the bank landing.
Interchange the signal “conveyance is clear of all persons who have had access to it for a purpose other than traveling” with the driver.
Interchange a signal with the driver; “raising or lowering of mineral in trucks or of material about to commence”
Receive a signal from the driver “persons may have access to conveyance for the purpose of loading or unloading”
Check that the robot indication is green.
Instruct the assistants to open the required safety devices on the bank area and move the slung material into position.
Instruct the assistants to connect and secure the cage slings in accordance with site specific requirements to the slung-material.
Examine the connections made between the material slings and conveyance slings.
Instruct the assistants to secure the “winch rope” to the bottom end of the slung material.
Instruct the assistants to move clear of the slung material and to position themselves correctly to assist when required.
Instruct the winch operator to take-up the slack in the “winch rope” connected to the slung material.
Transmit a signal to the driver to raise slowly, and the winch operator to control to slung material.

The person in immediate charge must: -

Transmit a signal to stop the driver when the slung material is in the shaft.
Receive a signal from the driver “persons may have access to conveyance for the purpose of loading or unloading”
Check that the robot indication is green.
Instruct the assistants to steady the slung material underneath the conveyance.
Instruct the assistants to disconnect the air “winch rope” from the bottom end of the slung material.
Instruct the assistants to close the shaft gate, and remove equipment and tools from the bank area.
Instruct the assistants to close the shaft steel work on the bank to the shaft entrance. (*Gantries*)

Instruct the assistants to secure all safety devices in the safe position to the shaft entrance.
 Transmit a signal to the driver to lower the conveyance slowly to the bank position.
 Check that the slung material is positioned correctly underneath the conveyance.
 While lowering, check to ensure a safe passage through the shaft of the material underneath the conveyance.
 Transmit a signal to stop the conveyance at the bank.
 Receive a signal from the driver “persons may have access to conveyance for the purpose of loading or unloading”
 Interchange the onsetter destination signals with the driver.
 Transmit the signal to the driver to lower the conveyance. (*Lower at the pre-determined speed entered in the driver logbook*).
 Remain at the lock bell to check that the slung material is not obstructed when lowered down the shaft and remove the lock bell key from the bell box.

The driver will lower the conveyance to the signalled destination.

Material is lowered and **disconnected** from the conveyance in accordance with legal, site-specific and operational requirements.

The person in immediate charge must: -

Transmit a signal to the driver with the conveyance in position to connect the air winch rope to the bottom end of the slung material.
 Interchange the material signal with the driver.
 Receive a signal from the driver for “persons to have access to the conveyance for the purpose of loading or un-loading material”.
 Check that the robot indication is green.
 Request the assistants to secure their lifelines to the steelwork on the shaft station.
 Instruct the assistants to open the shaft gate and secure the top deck platforms in the open position.
 Instruct the assistants to prepare the shaft station area to lower the slung material.
 Instruct the assistants to secure the required equipment to the bottom end of the slung material.
 Instruct the assistants to move clear of the station area for the slung material about to be lowered.
 Transmit a signal to lower the conveyance slowly with the slung material.
 Transmit the signal to stop the driver when sufficient slack is obtained on the conveyance slings connected to the slung material.
 Receive a signal from the driver for “persons to have access to disconnect the sling equipment”.
 Check that the robot indication is green.
 Instruct the assistants to detach the slung material from the conveyance slings.
 Follow site specific procedures to secure the conveyance slings underneath the conveyance.
 Instruct the assistants to close and secure the shaft gates and top deck platforms.
 Instruct the assistants to detach their lifelines from the shaft steelwork.
 Instruct the assistants to remove and store all tools and equipment.
 Instruct the assistants to move the slung material to the designated area clear of the shaft entrance.
 Instruct the assistants to stand clear from the shaft entrance.
 Transmit the clear signal on the lock bell system.
 Remain at the lock bell until the conveyance is clear of the station landing.
 Remove the lock bell key from the lock bell box.

Checks that the Onsetter and banksman need to do before slinging a bogey

- Phone the Banksman and tell him you are going to sling
- Check the station for loose material
- Check the slings on the bogey
- Check the swivel pin on the bogey
- Check the 16mm safety pin chain below the bogey
- Check the locking pins on top of the bogey
- Check the loose material inside the pipes
- Check the air winch
- Check the safety belts and sala block
- Chained Together
- Railworthy
- Material are not mixed

Checkson Slings

Rust

Kinks
Broken wires
Expiry date

Colour code

Checks on a Winch

Bolts and nuts
Bolts & Nuts
Brakes
Oil (Gearbox)
Winch Rope
Start/stop buttons
Make sure that the rigger has cleared the bogey
Make sure all other winding has stopped

The onsetter must lower a bogey, loaded with rails from 67 level to 73 level, the onsetter is on 70 level.

In short the procedure is as follows:

1. Clutch correctly.
2. Onsetter goes to 67 level.
3. Onsetter sling bogey to banksman.
4. Onsetter goes to 73 level.
5. Banksman sling bogey to onsetter at 73 level.

Lowering long material or equipment in a shaft.(Slinging)

There are two methods of lowering long material or equipment in a Vertical shaft.

One method is to place the long material in the cage with one end resting on the bottom deck, and the other end of the material protruding through the top of the cage and tied together to the winder rope.

The other method is to sling long material underneath the cage.

1. General rules for sling work.

- The banksman and his helpers are responsible to attach the required slings to the bottom of the cage.
- The banksman will use a platform to cover the shaft compartment, when his helpers attach the slings to the cage, and are secured by safety belts. After fixing the slings, remove the platform and safety belts.
- No other hoisting is permitted when the helpers attach the slings to the cage.
- Before sling work commence, the WED will be warned specially by the banksman, by means of a special signal or an entry in the WED logbook.
- The onsetter and his helpers are not allowed to travel with a cage loaded with long material or equipment in, or underneath the cage.
- The onsetter and his helpers will travel to the destination prior to sling work, and when he has to travel between levels during sling work, he will use the service winder, or the sling cage when it is clear of material.
- Pipes and rails, slung underneath the cage must be securely lashed together.
- Flexible plastic pipes will not be slung underneath the cage, but will be transported inside the cage.
- The total weight of material lowered (slung) will be according to the Inspector of Mines permission for that shaft.
- Check your shaft procedure for the quantities and weight of material that may be slung per trip.

3. SLINGS

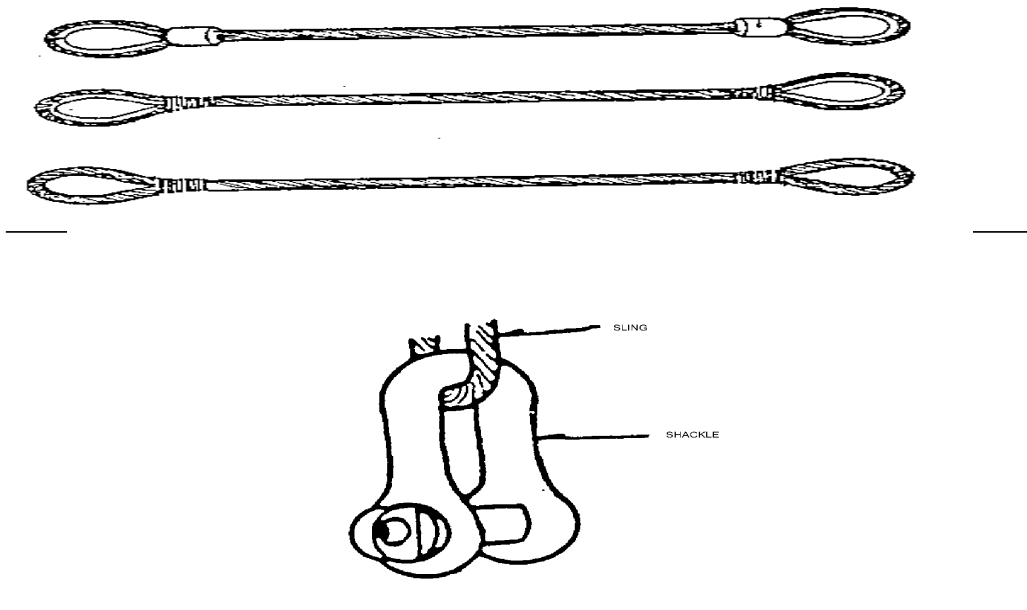
- All slings will be made from flexible galvanised wire rope 6 x 24 ordinary lay, 80/90 tons breaking strain and 10,47 tons breaking load.
- Only 16 mm and 38 mm shackles must be used.
- Slings are classified with an international colour code system.
- Each sling is marked with a different colour, indicating the different thickness of each sling.

- With the colour code system it is easier to select the right sling for the right material.
- Each sling must have an expiry date.
- This date is marked on the thimble; a ring or a round metal tag that is fastens to the sling.
- The date that appears on the sling is the expiry date.
- This date is normally 6 months valid.
- The sling cannot be used after that date.

4. CARE AND MAINTENANCE OF SLINGS AND EQUIPMENT.

- The banksman and the onsetter will visually examine slings and shackles before use, and all slings and equipment will properly be stored in a special storing place on the bank, immediately after use.
 - Slings are normally stored in a vertical hanging position.
 - The banksman will remove all slings from underneath the cage when slinging operations are completed.
 - Whenever slings are transported inside a cage, they will be placed in bags or suitable containers to prevent them from moving out of the cage and fouling shaft equipment.
 - The rigger is responsible for the maintenance and examination of slings, shackles and other equipment.
1. Examine slings weekly and replace them every six months when the rings are annealed.
 2. Replace shackles every six months.
 3. Examine rings weekly and have them annealed every six months.
 4. Record all examinations and replacements in a book, kept in the Section Engineer's office.

Typical slings



5. SLING COLOUR CODE SYSTEM.

Different diameter slings have different breaking strengths, and to make sure that the correct slings are used when slinging the different types of material, check the colour code of slings posted up in the banksman's cabin.

DESCRIPTION	WEIGHT (Kg)
8 Ton battery locomotive without battery	5 000
Hunslet diesel locomotive with Deutz engine	4 200
Hunslet diesel locomotive with Gardner engine	4 500
H and R diesel locomotive	3 500
5 Ton battery locomotive without battery	3 700
Mini substation	3 500
8 Ton locomotive battery (loaded on tray)	2 600
5 Ton locomotive battery (loaded on tray)	1 500

RADIUS OF SLING	COLOUR CODE
8 mm	<i>Orange</i>
9,5 mm	<i>Green</i>
13 mm	<i>White</i>
14 mm	Grey
16 mm	Blue
18 mm	Aluminium
20 mm	Black
22 mm	Red
24 mm	Yellow
26 mm	Brown

On completion of lowering long material to the onsetter, the banksman and the onsetter must interchange the signal 8 pause 8 with the driver. The driver will acknowledge the signal 8 pause 8 to the banksman and the onsetter.

SLINGWORK IN A VERTICAL SHAFT
ANSWER THE FOLLOWING QUESTIONS WITHOUT REFERENCES.
 1. Who is in charge of sling work and describe the entries in w.e.d. logbook?

2. Describe the different ways of sling work?

3. Describe the care and maintenance of slings and equipment?

4. Describe what you understand under the term colour code?

Candidate: _____

SLINGING MATERIAL IN A VERTICAL SHAFT

The driver will be notified by the banksman that long material will be slung below the conveyance. This is done either by a special approved signal or the banksman must make an entry in the driver's logbook.

The driver must: -

Reply to the special signal from the banksman, or countersign the entry made in the driver logbook. The applicable speed for slinging is very important to the driver.

Receive a clear signal 2-2 from the onsetter.

Receive the signal 4-1 from the banksman.

Raise the top conveyance to about 1,5 meters above the bank.

Stop when signalled 1 by the banksman.

Received the mark signal 4-4 from the banksman.

Mark the depth indicator and drum.

Acknowledge the mark signal 4-4 from the banksman.

Received the clutching signal 4-4-4, mark signal and a clear from the banksman.

Test both brakes separately and if satisfactory, unclutch the top conveyance \pm 1,5 meters above the bank.

Position the bottom conveyance \pm 1,5 meters above the underground level.

Clutch in and test both brakes separately if satisfactory.

Reply the clutching completed signal 4-4-4 to the banksman.

The driver clutches in this manner to enable the banksman and onsetter to attach and detach the long material simultaneously.

The driver must: -

Acknowledge the signal 8 from the banksman, pause a few seconds and signal 1 to allow the banksman to attach the long material to the cage slings.

Receive the signal 4-1 from the banksman.
Operate a special switch, or select the man/rock switch to the rock position.
Raise the conveyance slowly and stop on the signal 1 from the banksman
Signal 1 to the banksman.

The signals and movements are necessary to enable the banksman and his helpers to guide the long material into the shaft

On some mines the rock winder must be stopped for safety reasons while pulling in the long material.

The banksman and his helpers will secure and steady the long material.

The driver must: -

Receive the signal 4-2 from the banksman.
Stop when signalled 1 by the banksman.
Release the special switch or select the man/rock switch back to the man position.
Reply to the destination signal from the banksman.
Lower the conveyance to the signalled destination after receiving the signal 2 from the banksman.

Stop on the signal 1 from the onsetter.

Acknowledge the signal 8, pause a few seconds and signal 1 to the onsetter.
The onsetter and his helpers will guide the long material onto the station.

The driver must: -

Receive the signal 4-2 from the onsetter.
Lower the conveyance slowly
Stop on the signal 1 from the onsetter.
While the conveyance is being lowered slowly, the onsetter and his helpers will man handle the long material out of the shaft and lower it onto a flat material car.

The driver must: -

Signal 1 to the onsetter.
Reply to the signal 1 from the banksman.
It is now possible for the banksman to attach and the onsetter to remove the long material from the cage slings.

The driver must: -

Receive the clear signal from the onsetter.
Receive the signal 4-1 from the banksman.
The same procedure, as described above, will now be followed to sling the material to the onsetter. When the last material has been removed from the slings,
The driver must: -
Acknowledge the signal 8-8 from the onsetter.
Receive a clear signal from the onsetter.
Acknowledge the signal 8-8 from the banksman.
The driver will act on any further signals receive from the banksman or onsetter.