Learner Guide

Earthmoving Course

RIIMPO317F Conduct Roller Operations

Learner Guide

National Courses Pty Ltd

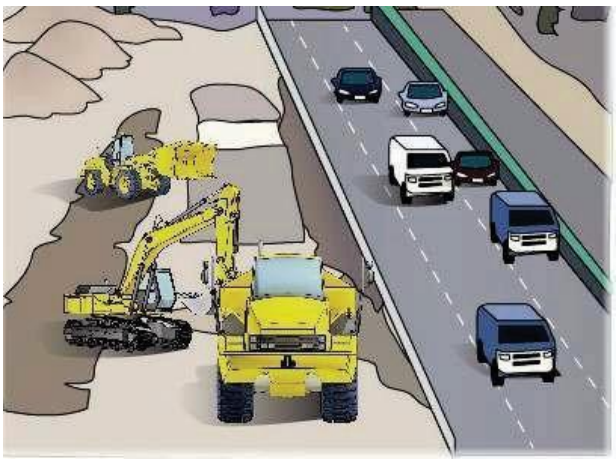
1.1 Introduction

A roller is also called a compactor. It's a machine with a rotating cylinder (drum) attached to smooth or compact the ground. Some rollers are towed as an attachment to another kind of machine and some have their own engine. There are roller attachments available for other machines, such as excavators, skid-steer loaders, dozers and front-end loaders. Some rollers can articulate (have joints or jointed segments) and some cannot.
Rollers are made of compact material. They do it in four different ways.

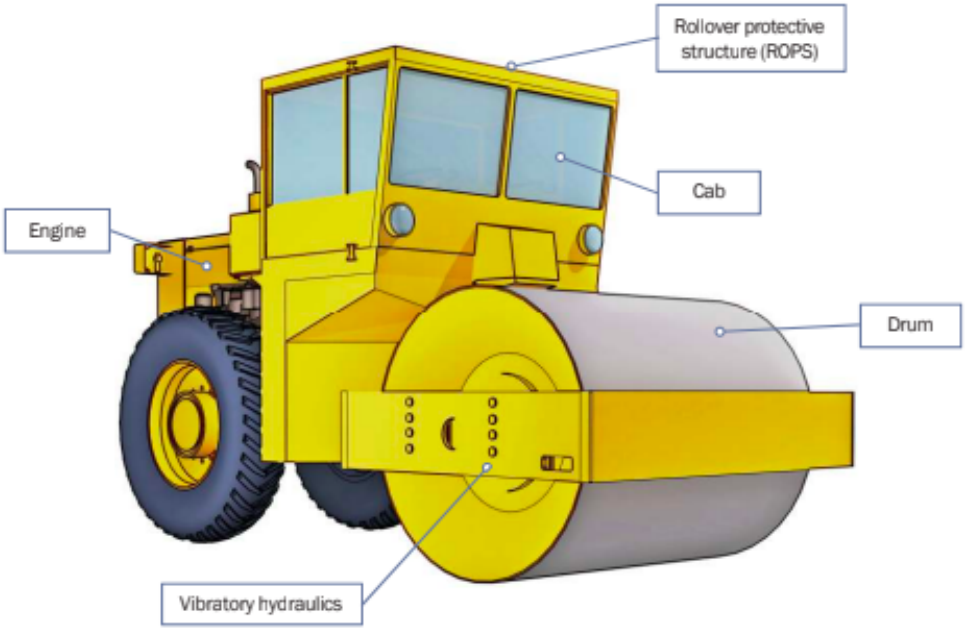
- Kneading
- Impact
- Vibration
- Using the weight of the roller only.

What industries do you use a roller in?

- Civil construction



An example of a roller



1.1.1 Types of Rollers/Compactors

1.1.1.2 Self Propelled Rollers

These rollers have their own engine, steering and drive system. There are many types available to do a range of different tasks. For example:

Two sets of rubber tyres and a plain steel roller drum	Two sets of rubber tyres and a sheepsfoot steel roller drum
	

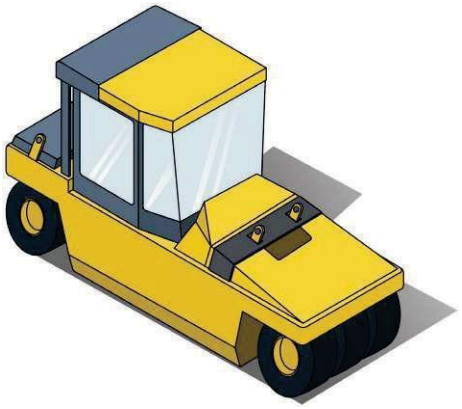
Multi wheel and steel drum

Two sheepsfoot steel drums

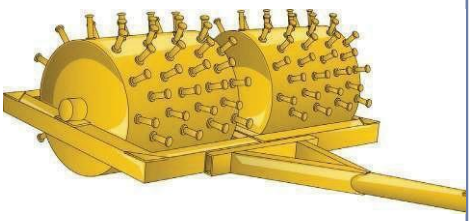
Two plain steel drums

Four wheel (steel drum) articulated roller with dozer blade

Multi wheeled rubber tyred rollers



1.1.1.2 Towed Rollers

Single plain drum roller	Single sheepsfoot drum roller
	

Combination towed rollers

There are also many types of combination towed type rollers such as:

- Multi wheeled on single axle and single steel drum towed combination roller
- Multi wheeled on single axle and single sheepsfoot drum towed combination roller
- Multi wheeled on two axle and single steel drum towed combination roller
- Multi wheeled two axle and single sheepsfoot drum towed combination roller.

1.1.2 Machine Guidance Systems

Self-propelled single drum, padfoot or smooth drum rollers may be fitted with a 3D GPS guidance system. These systems can give site managers the ability to make sure that large cut and fill or other earthworks areas are properly compacted by making the correct number of passes.

GPS and machine control systems allow operators to map the path of the compactor to see if they have been over the work are 5, 10, 15 times making sure site standards and quality requirements are met. This means the area won't be over or under compacted, and at the same time the operator does not have to remember the number of passes they've made. Benefits of the guidance system can include: • Maximising fuel efficiency (using less fuel) • Preventing over or under compaction • Increasing productivity • Ensuring uniform compaction across the work area. 	Asphalt rollers may also have heat temperature sensors on the drum so that the asphalt temperature is being recorded as it is being compacted. This system can be combined with the 3D GPS system, allowing you to map the temperature of the mat as it is laid down, along with number of passes specified. This gives a precise record of the asphalt compaction process and any "cold spots" that may have occurred. If a machine guidance system is fitted to your roller you must make sure you have been properly instructed and trained in its use. Always refer to operator's manuals and workplace policies and procedures. 

1.1.3 **Who** Has D**uty of** Care**?**

You have a duty of care. So does anyone who has something to do with the worksite. Duty of care applies to:

Employers/persons conducting a business or undertaking (PCBU). This includes managers, manufacturers/suppliers, importers, designers, inspectors, etc. 	Workers. This includes employees, contractors and sub-contractors, employees of labour hire companies, outworkers, volunteers, etc. 

1.1.3.1 Worker's Duty of Care

As a worker you must take care of your own health and safety – and the health and safety of others at the workplace. You must not put your own or other people's health and safety at risk.

Never work where you believe a hazard is a serious risk to your health and safety. You must also:

do your best to follow reasonable health and safety instructions from your boss (PCBU)

follow workplace health and safety policies and procedures

do not work where you believe a hazard would be a serious risk to your health and safety.

1.1.3.2 PCBU/Employer's Duty of Care

The PCBU must:

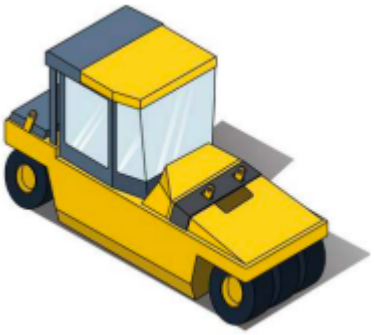
- Provide a safe workplace
- Train workers and make sure they know what to do on the job
- Try to get rid of risks, or find ways to minimise risks
- Tell workers about any hazards or risks. Workers must know what to do in an emergency.
- Have a workplace safety plan. For example, workers should be trained in the use of fire fighting equipment and first aid equipment.

Penalties

If you are PCBU/employer or a worker, the government can fine you or imprison you for failing your duty of care.

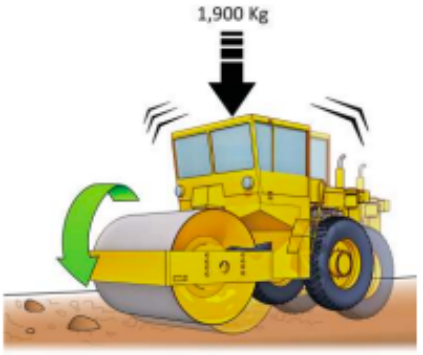
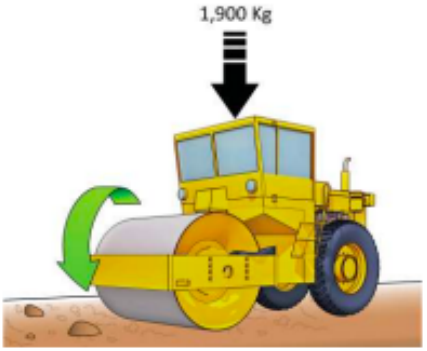
What kinds of rollers are there?

Multi-rubber-tyred roller



Sheeped foot or padded roller

A roller can be self-propelled, towed or attached to another kind of machine such as a loader. Towed rollers include grid rollers and sheepsfoot rollers.

Vibrating roller	
Static/smooth roller	

1.2 General Information

1.2.1 The Basics of Road Construction

A surveyor will stake out the site according to the site plan. The stakes mark where the road will go and any drains or pits, which will help to drain water away from the road area.	An excavator or dozer removes the trees, shrubs and other plants and levels the area. Some trees may be protected with padding or fencing.
	

Sometimes contractors may use a borrow pit (also called a sand box). A borrow pit is an area where soil, sand or gravel (material) is dug out to be used in another area. Sometimes the borrow pit will become the drains, or water catchment areas at the end of the work.

The excavator or dozer may use material from the borrow pit to build up low areas in the road. They may also build up diversion blocks. Diversion blocks divert water away from the road and into drains.

As the operator shapes the ground, they will usually create drainage at the sides of the road area. They will also make sure there is enough fall (scope) on the road so that water drains away from the road.

Drains are installed to help take water away from the worksite.

A front end loader or dozer shapes the road base. This helps smooth out the surface ready for grading.

A water truck may wet down the ground. This helps the soil to bond.

The grader grades the road to produce a much smoother surface.

A roller or compactor then compacts the road. This breaks up lumps and smooths the surface out.

A site supervisor or roller operator tests the compaction. Sometimes they will use a deflectometer or penetrometer. Some rollers/compactors can test the compaction as they drive.

Many layers of the ground material are built up. This is called the subgrade. Each layer is compacted and tested.

Trucks then deliver subbase. Haul trucks or tip trucks
sometimes tip the subbase, and front end loaders spread it.

A water truck may spray water on the subbase to help the soil bond. This makes the particles stick together and make it compact better.

Several layers of subbase are laid. The subbase is compacted and tested.

Once the subbase is at the right thickness and is compacted properly, trucks deliver the course road base. The road base is built up in many layers. Water trucks may wet down the road base if it helps the roller/compactor compact the base.

When the road base is thick enough, and is compacted properly, the road is finished.

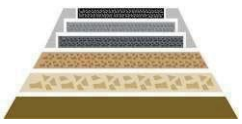
If asphalt is being laid, more layers will go on top of the road base. There will be an asphalt base course, then a binder course, and finally, a surface course.

Finally the planting, erosion control and drainage work is completed.

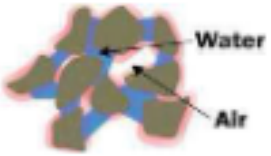
1.2.2 Principles of Soil Technology for Civil Works

One of the most important jobs you will do, as a machine operator, is to help lay foundations. Foundations are the base for roads, railway lines, swimming pools and buildings. If you do not have a solid foundation, you cannot build something solid on top of it.

When soil is firmly compacted it has an increased density, this provides a stronger foundation to build on.

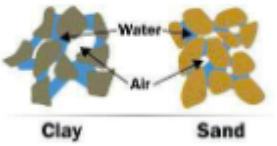


In civil construction, moisture content means how much water is in a soil, rock, aggregate or road base. Moisture is very important in earthmoving. Moisture affects the weight of soils. It makes soils swell, and it also affects the handling properties of the soil. Handling properties means how easy or hard it is to work with that soil.



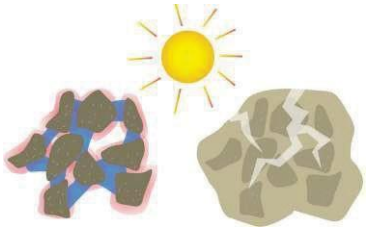
The amount of water in soil affects its viscosity. Viscosity is how thick the soil is. For example dry loose soil has a low viscosityand is easy to work with. Wet muddy soil has a higher viscosity and can be more difficult to work with.

All soils usually contain moisture. How much moisture the soil has depends on many things. The weather, drainage, and the soil's ability to hold water all affect the moisture in a soil. Retention properties mean how much water a soil can hold. Different soils can hold different amounts of water. Sometimes you can treat a soil to change its moisture content. To do this you mix a chemical with the soil.



Different types of soils can cause problems with foundations. Wet, boggy soil can cause foundations to sink. That is why it is important to make sure water can run or drain from the site. It is also important that the foundation is built up to the right level. You can sometimes treat wet boggy soil with lime. Lime helps dry out the soil, and helps it 'clump' together.

Clay soils can also cause problems under foundations. This is because clay attracts water. When this happens, the clay expands and swells. Later, when it is hot and sunny, the water dries up and the clay cracks.



Over time, this swelling (expanding) and cracking (while shrinking) can warp your foundations. This can cause cracks and potholes in roads, cracked walls or ceilings in buildings, or swimming pools to crack and leak.

You can treat clay soils with chemicals that stop clay from attracting water. Once you treat the clay, you can compact it. This makes a much better foundation that won't swell and crack as much.

Before you use any chemicals, you must make sure they are safe. Check the safety data sheet (SDS) to find out how to safely use, store and handle the chemical. Check the site's environmental management plan. If you are not sure about using a chemical, talk to your site supervisor.

1.2.3 Earthmoving Site Hazards

1.2.3.1 Checking for Underground Services

You should always check where services are before you start work. You may phone 'Dial before you digon 1100'. You may look at the site plan or talk to your supervisor. You may need to look at the location of pits and meters to get an idea of where the services run. You may need to check with the local council or service company. You may even need to get underground detection equipment.

If you hit a service line, contact the provider immediately. You may

need to organise to get the service disconnected while a qualified person fixes the problem.

You can sometimes tell there are services below by the types of ground. Some services are surrounded by a different type of soil, rock or sand. You may notice that the soil is looser, or does not match the soil around where you are digging. There may be a line of tape alerting you to the services.
If you suspect there are services underground, stop working. Check the ground. You may need to excavate the area by hand, or dig in another area.

1.2.4 Operating Techniques

1.2.4.1 Building A Stockpile

A stockpile is a pile of material (soil, sand, rock, etc) that you use for earthmoving work. You must choose a good location for your stockpile. If you choose the wrong location, your stockpile could get washed away or become dirty (mixed with other materials).

If you can, choose an area of well drained, firm level ground. 	You should set up drainage so that rainwater does not cause the stockpile to wash away or slide. 
Make sure the stockpile is close to the area you are working. You don't want to drive too far to work with the stockpile. 	Make sure you have clear access to the stockpile. 
Clear the area of any rubbish or debris, so it doesn't get mixed in the stockpile. 	When you fill out a stockpile, start by filling the area closest to the back of the stockpile area. 

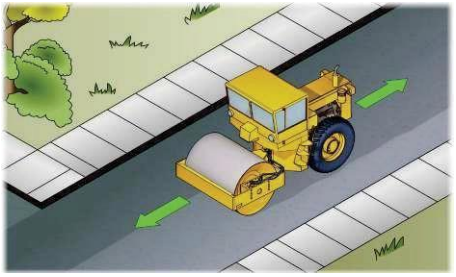
Don't work too close to the edge of the stockpile as it could give way. 	Keep filling out the stockpile one row at a time or by dozing material to the correct position on the stockpile. 

1.2.4.2 Taking from A Stockpile

When you take from a stockpile, try and work neatly. 	Take from the top, working down in layers. 	Do not undercut the stockpile. It might collapse on you. 
You may need to maintain the stockpile by neatening it up. 	To do this, you push material up that has been spread out. Keep the loadingarea clean and level. 	

1.2.5 Costing A Job

Arranging times for other contractors, the time taken to do a job and the costs of fuel are some things you may need to know or do as a roller operator.



You have to cost a job. Using the following information:

Calculate the cost of fuel needed to complete the job.

- Your roller drum has a working width of 2.46 metres
- The overlap specified in the work instruction is 0.5 metres
- It will take nine (9) passes to compact the road to the specification
- The roller uses 12.2 litres of diesel per hour at $1.59 per litre
- The road you have to roll is 11.08 metres wide
- The road you have to roll is 162 metres long
- Your travel speed is 2.5 km/h

1. What is the effective width of the roller? Effective width of the drum

= 2.46 m - 0.5 m

= 1.96 metres

2. How many passes will you need to make to cover the road once?

(Round up to the next whole number.)

Road width
Effective Width
11.08
1.96

= 5.6 passes rounded up

= 6 passes

3. How long will it take you to make one complete pass over the road?

(Round the answer up to the next whole minute.)

(a) Convert kilometres per hour to metres per hour.

(1000 metres = 1 kilometre)

2.5 kms × 1000 = 2500 m/hr

3. (b) Convert metres per hour to metres perminute.

(Round the answer up to the next whole minute.)

(1 hour = 60 minutes)

2500 = 41.66m/hr
60

3. (c) Round the answer up to the next whole minute.

41.66 rounded up = 42 metres/minute
Length of road
metres/minute

16 2
42

= 3.85 minutes rounded up

= 4 minutes/pass

4. How long will it take to make 1 pass over the whole road?

Passes × Minutes/pass

6 × 4 = 24 minutes to cover the road once

5. How long will it take to complete the road compaction to specifications?

Time to cover the road once x Passes to compact to specification

24 x 19 = 216 minutes

Or 3.6 hours (3 hours 36 minutes)

6. What is the fuel cost for the job?

Fuel/hour x Total hours x $/litre

12.2 x 3.6 x $1.59 = $69.84

2.1 Plan and Prepare for Work

2.1.1 Work Health & Safety Legislative Requirements

'Laws to keep your workplace safe'
WHS/OHS requirements are outlined in Acts, Regulations, Codes of Practice and Australian Standards.

WHS/OHS Acts
'WHS/OHS Acts' are laws that explain how to improve health and safety in the workplace.
For example: Model National WHS Act, June 2011.
WHS has the same meaning as OHS in this document.

Regulations
'Regulations' explain specific parts of the Act.
For example: Part 4.3 – Confined spaces, Part 4.4 – Falls.

Codes of Practice/Compliance Codes
'Codes of Practice' are practical guidelines on how to comply with (meet the rules of) legislation.
For example: HAZARDOUS MANUAL TASKS Code of Practice, 23rd December 2011.

Australian Standards
'Australian Standards' are work guidelines that set the minimum accepted performance or quality for a specific hazard, process or product.
For example: AS 2550 – Cranes, hoists and winches – safe use set.

What are quality requirements?

The quality requirements tell you the standards you must meet when doing earthmoving work. They tell you what you need to do and how to do it to satisfy the customer. You may need to follow Codes of Practice, regulations, national standards etc.


Slab Foundation Preparation.
Quality & Specification check list.

√	Job stage	Checked by
	Correct area pegged out	
	Vegetation removed	
	Top soil removed and stockpiled	
	Slab size pegged out in correct location	
	Slab size pegged out to correct size	
	Level marker in place	
	Site leveled to pegs	
	Crushed rock is correct size as per specification	
	Slab area boxed to correct height of floor	
	Crush rock is the correct height as specified	
	Boxing pegs at correct spacing and depth	
	Crushed rock is level to specification	
	Crushed rock covers the specified area	
	Crushed rock compaction meets specification	
	Compacted crushed rock base is at the specified height	
	Slab preparation meets specification and ready for concrete contractor	
	Contractor notified ____/____/____ @ _____AM / PM	

What kinds of information do you need before starting work?

- Plans – Drawings and sketches that tell you what you need to do
- Specifications – rules and details about the job
- Operational details – how you will do the job
- Quality requirements of the job – the standards you are expected to meet.

When planning your job, why do you need to know what other people are doing on site?

- To make sure you will not get in the way of other jobs being done
- To make sure you know what others are doing near where you must work.

What are some examples of documentation you should read before doing earthmoving work?

- Health and Safety Acts and Regulations
- Codes of Practice
- Standards (Eg: AS 2958 Earthmoving machinery)
- Manufacturer's specifications
- Operator's manuals
- Site requirements and procedures
- Work or quality requirements
- Drawings and sketches of the work to be done
- Company policies and procedures for Employment and workplace relations, Equal opportunity and disability.

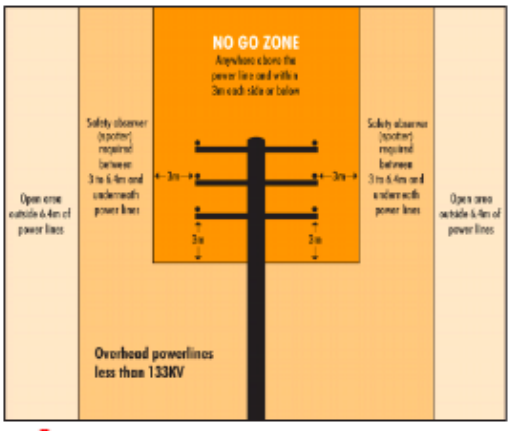
Why should you check the operator's manual for your equipment before using it?

The operator's manual tells you how to operate your machine. The manual also tells you about maintenance (how to keep your machine operating well).

What do codes of practice explain?

Codes of practice are practical guidelines on how to comply or follow the rules in legislation/laws.
For example:
A traffic management code of practice will tell you all the rules a traffic controller must follow. For example, a traffic controller must have a zero percent blood/ alcohol concentration/ reading while performing traffic control duties.

What do Australian Standards explain?



Australian Standards are work guidelines that set the minimum accepted performance or quality for a specific hazard process or product.
For example:
A2250.1-2011 - Powerline distances
This standard tell you the distances you can safely work near powerlines on poles and towers.

Who can you ask about underground services on the worksite?

You can:

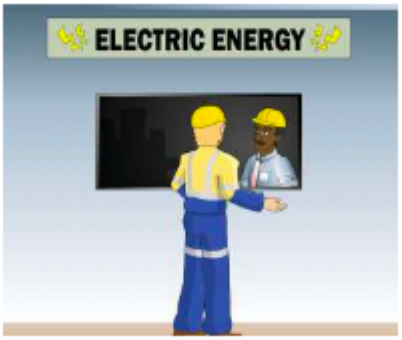
Ask your site supervisor 	Call 'Dial Before You Dig' on 1100 as a guide to services location only. Ask a specialist consultant to check the site. DIAL BEFORE YOU DIG www.1100.com.au
Ask the local supply authority (for example, the electricity, gas or water company).	Check the council maps for the site

Job safety and environment analysis (JSEA)/Safe work method statement (SWMS) 123456

1. ACTIVITY/TASK INFORMATION AND LOCATION	
Location/Project:	123 Belmaine Highway, Roseville
Activity or Task Description:	Load spoil from excavation right hand turn lane
Competency/Qualification needed to do work safely:	All operators have current tickets

2. HAZARD IDENTIFICATION

Location/Area Hazards		Rate	Work/Task Hazards		Rate	Work/Task Hazards		Rate
Area			**Visibility and hearing**			**Plant/machinery**		
Entry or exit is difficult			Poor lighting			Plant or Machinery	X	8
Engulfment/entrapment			Poor visibility			Tools/equipment		
Work at heights			Bright lights/UV			Traffic	X	8
Confined space			High noise levels	X	7	Pedestrians		
Remote location			Communication difficulties			Railway		
Rescue could be difficult			**Services**			Pneumatics		
Temperature extremes			Multiple electrical feeds			Process lines		
Hazardous/Toxic substances (attach MSDS)			Electrical hazards - LV			Suspended loads		
			Electrical hazards - HV			**Slips/trips/falls**		
Gasses/oxygen/chemicals			Overhead power	X	8	Slips/trip hazard		
Poisonous gas/es			UG services (gas, power, water)			Fall hazard		
Explosive/flamable gas			**Hazardous/toxic substances**			**Other**		
Oxygen levels (high or low)			Pressurised fluids			Sharp materials		
Inhalable dusts/fibres			Gas cylinders			Confined space		
Hazardous/toxic substances (attach MSDS)			Flammable materials			Work at heights		
			Toxic materials			Welding/Grinding		
Exposure			Acids/solvents			Manual handling		
Heat/Cold			Other chemicals			Using ladders		
Sunlight/ Radiation	X	4	Inhalable dusts/fibres			Using EWPs		



2.1.2 Job Safety and Environment Analysis (JSEA) or Safe Work Method Statement (SWMS)

These forms help you plan for the work you will do. It is very important you fill these out before you start work. They help you work out the tools, equipment and PPE you need to do the job safely. All workplaces should have these types of forms.

Example:

3. PPE		4. ACCESS/EQUIPMENT/ISOLATION		5. ENVIRONMENTAL		
Hands, feet and body		**Access equipment**		**Environmental Hazards**	✓x	**Rate**
Gloves: (type).....	X	Scaffold		Air pollution (dust, fumes)	X	5
Safety boots	X	Ladders		Noise (plant and equipment)	X	5
Long sleeves/pants	X	EWP		Spills to drains/waterways		
High visibility vest/clothing	X			Spills to ground	X	5
Head and face				Soil erosion		
Safety glasses/sun glasses	X	**Static plant/equipment:**		Hazard to flora/fauna		
Full face shield				Other:		
Hearing protection	X					
Hard hat	X	**Mobile plant/equipment:**				
Dust gas mask		Excavators, Loaders,	X			
Breathing apparatus		Trucks, Machine	X			
Welding face shield		**Safety/emergency equipment:**				
Fall protection and access						
Safety harness						
Fall protection equipment						
Fall arrest equipment		**Isolation and warnings**				
Other:		Barricades	X			
		Group isolation				
		Personal locks or lock out tags				
		Warning signs	X			
		Area lighting				
		Other:				
		Traffic controllers	X			

Risk Rating Table: *Use the following table to rate the risk.*
• 1-2 = Low • 3-4 = Medium
• 5-6 High • 7-8 Extreme

Likelihood: (How likely is it to occur)	Consequences: Catastrophic	Major	Moderate	Minor
Almost Certain	8	7	6	5
Likely	7	6	5	4
Possible	6	5	4	3
Unlikely	5	4	3	2
Rare	4	3	2	1

6. PERMITS (Attach and record number)					
Hot work		Excavation		Hazardous work	
~~Access to work area~~		High voltage	N/A	Confined space	

Job safety and environment analysis (JSEA)/Safe work method statement (SWMS) 123456

7. JOB STEPS, HAZARDS AND CONTROLS

Step (No.)	Job Step (Describe each step)	Hazard/Environmental Issue	Risk Rating (Before control)	Control	Risk Rating (after control)
1	Set up traffic control	Traffic in busy intersection	8	Barriers and flag person supplied by ABC Traffic	1
		Noise of traffic and plant	7	Hearing protection must be worn at all times.	1
		Sunlight	4	Long sleeve pants, tops, hard hats with visor and sunglasses	1
2	Unload excavator from float	Excavator sliding on ramps	5	Pedestrian exclusion zones 1.5 x excav. height. Operator wear seat belt.	3
3	Excavate turn lane	Powerlines overhead	8	Power will be isolated. This must be confirmed before starting	1
4	Load tip truck	Location of tip truck and drivers while loading.	8	Traffic controllers will direct drivers where to safely park. Drivers must remain in truck while being loaded.	1
5	Load excavator on float				
		Dust and noise	5	Noise restrictions limit work to between 9am-5pm. Water truck available to reduce dust if needed.	2
		Spills to ground	5	Pre-op checks on excavator before work. Spills kit on site if needed.	2

8. CONSULTATION AND WORKER OFF

By putting my signature below I confirm that I have attended a briefing and understand and will comply with all environmental and safety issues, as described in this JSEA/SWMS. I have reviewed and will comply with all necessary paperwork including permits, MSDS, isolation plants etc.

Name	Signature	Date	Name	Signature	Date
Dick Osborne	Dick Osborne	2/4			
Leon Boracs	Leon Boracs	2/4			
Sal Boncero	Sal Boncero	2/4			
Noel Scarbo	Noel Scarbo	2/4			

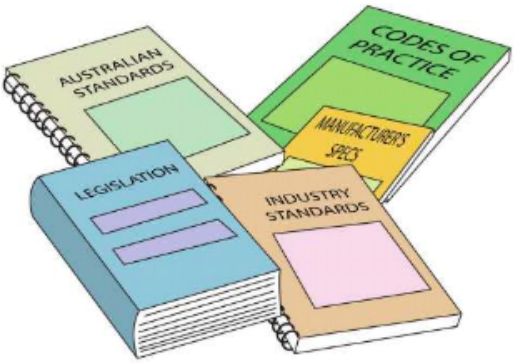
9. FINAL APPROVAL/SIGN OFF

	Name	Signature	Date
Approved by:	Mark Alabaster	Mark Alabaster	2/4/15
Approved by:	Duncan Morton	Duncan Morton	2/4/15
Customer/Client	N/A		

Roller Gu

What are the National Work Health (WHS) and Occupational Health and Safety (OHS) Acts about?

The Acts explain how to keep your workplace safe and healthy. They explain what you need to do to meet your duty of care. For example:
You must make sure you do earthmoving work in a way that won't put yourself or others at risk. You must use earthmoving equipment according to instructions.



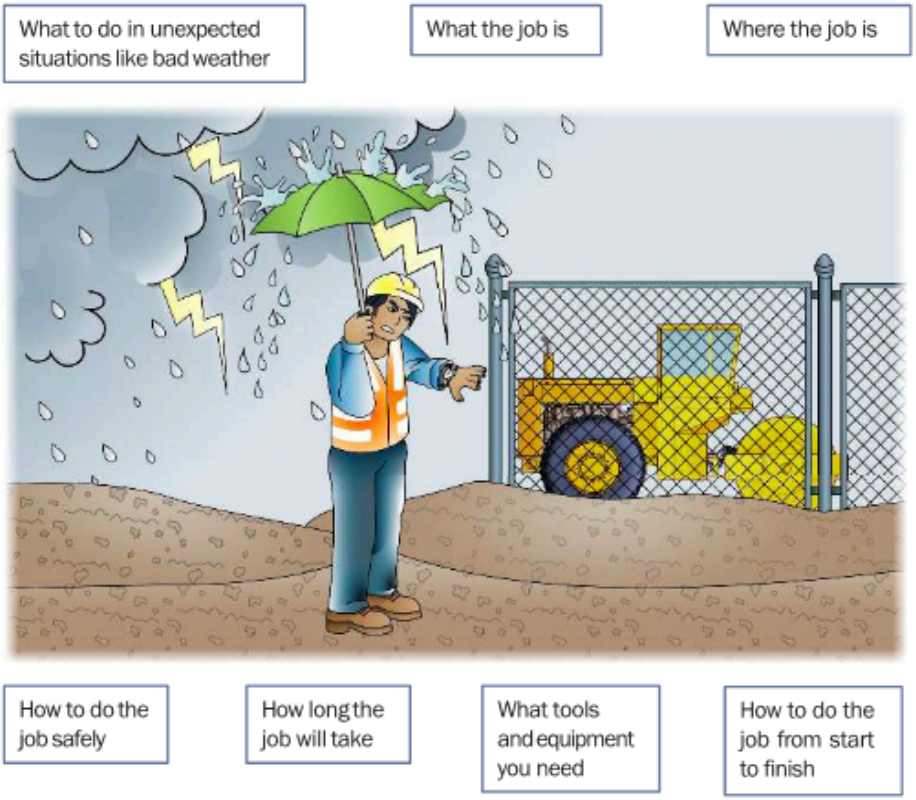
Note: Check your state requirements as Acts may vary from state to state

2.1.3 Where to Find WHS Information

You can check these websites for more information about workplace health and safety. The National WHS Act started in some states/territories on January 1, 2012.

What do the job's work instructions explain?

Work instructions explain:

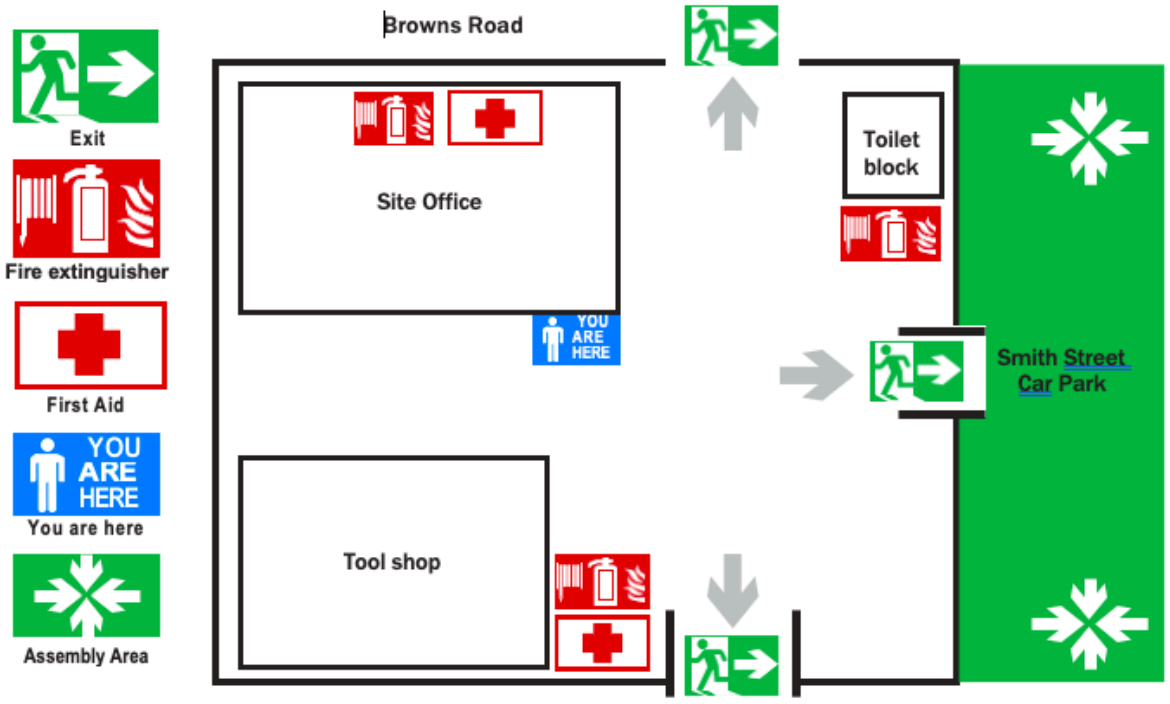


2.1.4 Safety Plan

The safety plan may tell you things like:

- How to use tools and equipment safely
- How hazards and risks need to be controlled
- Emergency procedures
- Emergency exits and assembly areas
- What PPE to wear
- Safe areas to park machinery.

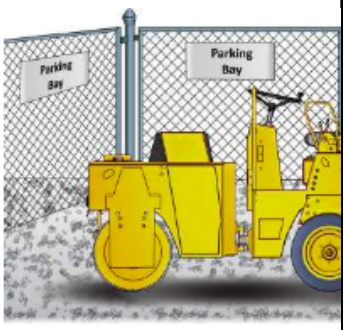
2.1.4.1 Site Evacuation Plan (Example)



What does the safety plan tell you?

The safety plan tells you how the worksite intends to meet all the safety rules. It tells you:

What personal protective equipment (PPE) to wear

How to use tools, plant and equipment safely 	Emergency procedures and exits 
How to park safely and where to park 	How to control hazards and risks 

2.1.4 Risks of Using A Roller Near Infrastructure

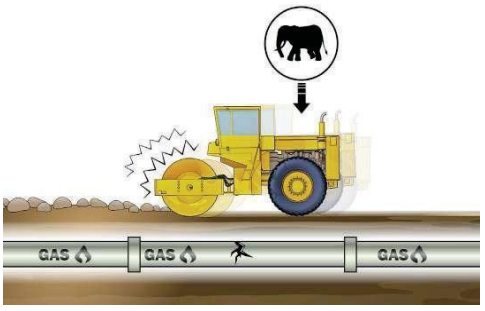
A roller passing over, beside or near underground infrastructure can cause damage, this damage may not be immediately visible and not cause a problem until sometime after the job is complete.

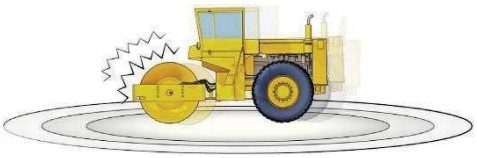
An example is the cracking of a water pipe which leaks and the water erodes away the soil supporting a road or foot path causing a cave in.

The vibrating effect of a roller greatly increases the tremor in the soil surrounding the roller drum.

The ground tremor can damage underground services such as water and gas pipes and can cause collapsing of trenches etc.

Ask the site engineer about the distance you should keep your roller away from services when using the vibrating system.





Place markers such as pegs, cones or barriers at a safe distance from the underground services. This will help remind you of the services.

2.1.5 First Aid and Emergencies

Employers should make sure there are trained first aiders and first aid kits available.
The employer should make sure:

- The first aid kits are checked, maintained and kept in a clean dry place.
- There are clear signs indicating the location of first aid kits.
- They have recorded and displayed the numbers and location for emergency services (or local doctors or hospitals).

2.1.5.1 Reporting Incidents

As a PCBU, employer or self-employed person you must report serious incidents to the SafeWork authority in your state. You must give a written report within 48 hours if any of the following happen on a site you are controlling:

A death	An injury that requires medical treatment	Exposure to a substance that requires treatment	Other injuries or health issues caused from a workplace incident.
			

The authorities may send an inspector to come and examine the site. You must leave the site as it is, unless you need to; protect people, help an injured worker, make the site safe, or stop other incidents happening. The inspector will tell you when you can continue working normally.

What equipment should be on site to deal with an emergency?

Telephone 	Fire extinguishers 
First aid kit 	Incident reporting form 

2.1.6 Disposing of Environmentally Sensitive Fluid

There are times when you will need to dispose of environmentally sensitive fluids. You may have to deal with oil spills or chemical spills.

There are disposal companies who remove used oil, oily water and emulsions, waste grease, filters, rags, brake fluids and coolants.

Oil is a good example of an environmentally sensitive substance that needs to be disposed of properly.

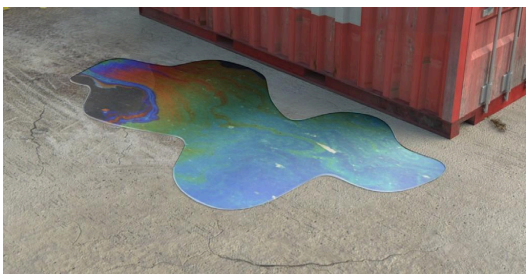
The damage oil and chemicals can do

If oil ends up in landfill, it will slowly leach into surrounding land and underground water.
Storm water and sewage, polluted by oil, can cause long term damage to coastal and marine habitats and ecosystems, seabirds, mammals, fisheries and people.

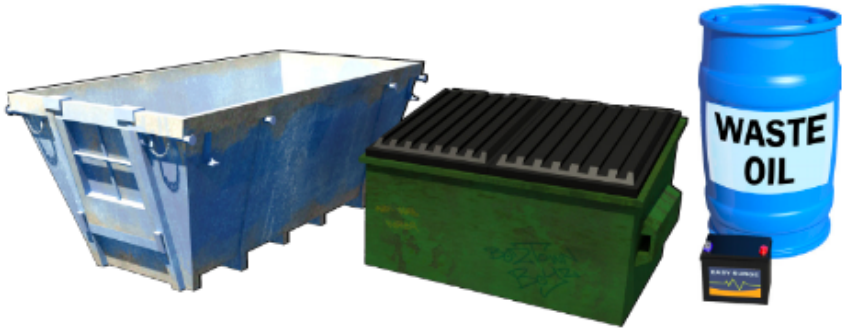
2.1.7 Environmental Management Plan (EMP)

The Environmental management plan (EMP) tells you important things about the environment at the worksite. It explains how the work you are doing could damage the environment. The possibility that you will cause this damage is called the environmental risk.

The EMP tells you what you must do so you do not damage the environment. It tells you how to work in a way that reduces damage to the environment.



The EMP also tells you how the worksite meets all environmental protection laws and what to do with waste.



2.1.7.1 Example of an Environmental Management Plan

Company Details:	EGA Earthworks – 19 Chandler Road, Boronia. Vic. 3155.			
Work description:	Soil removal			
Date	12/12/2015		**Contact**	Dick Osborne – 0455 555 555
Environmental concerns for the site		**Risk Level**	**Risk likelihood**	**Protection measures**
Excessive noise generation associated with the construction and operation of support infrastructure. Public nuisance /complaints.		Minor	Possible	Work on site to be carried out between 7:00am and 6:00pm.
Vegetation loss leading to increased runoff during wet periods.		Moderate	Almost certain	Use cut off drains to direct water away from area being worked on. Put silt cloth barrier on high side of trench. Put straw bales in trench to filter water.
Mud on surrounding roads near entry and exit points.		Moderate	Possible	Use rumble grids and wash wheels of vehicles leaving site.
Dust generation due to removal of top soil.		Moderate	Likely	Use water carts to keep soil moist.
Combustion products from exhaust pipes. Air emissions.		Moderate	Likely	Check that catalytic converters fitted to machinery.
Damage to remaining trees on site.		Moderate	Possible	Use temporary fencing and/or safety mesh to isolate trees from surrounding work.
Approved by:	TJ Crossbow		**Signed:**	TJ Crossbow

2.1.7.2 Working an Environmental Management Plan

When preparing an Environmental management plan (EMP) there are three things you must decide:

1. How serious is the environmental risk?
2. How likely is it to happen?
3. How can you control the risk?

How can you control the environmental risk?

Here are some examples of environmental risks and the controls that could be used. They can be written into an environmental management plan.

Example 1

Risk : Soil and clay spread on residential streets.

Cause : Not cleaning wheels of vehicles leaving the worksite.

Control : Wash wheels or use rumble grids or put gravel at exit points.

Example 2

Risk : Noise.

Cause : Engine noise from heavy machinery.

Control : Work on site to be carried out between 7 am and 6 pm.

Example 3

Risk : Loss of topsoil.

Cause : Driving across a paddock or over vegetation.

Control : Go around the paddock even if it increases the time the job takes.

How serious is the environmental risk?

You can use the following table to rate how serious the environmental risks are.

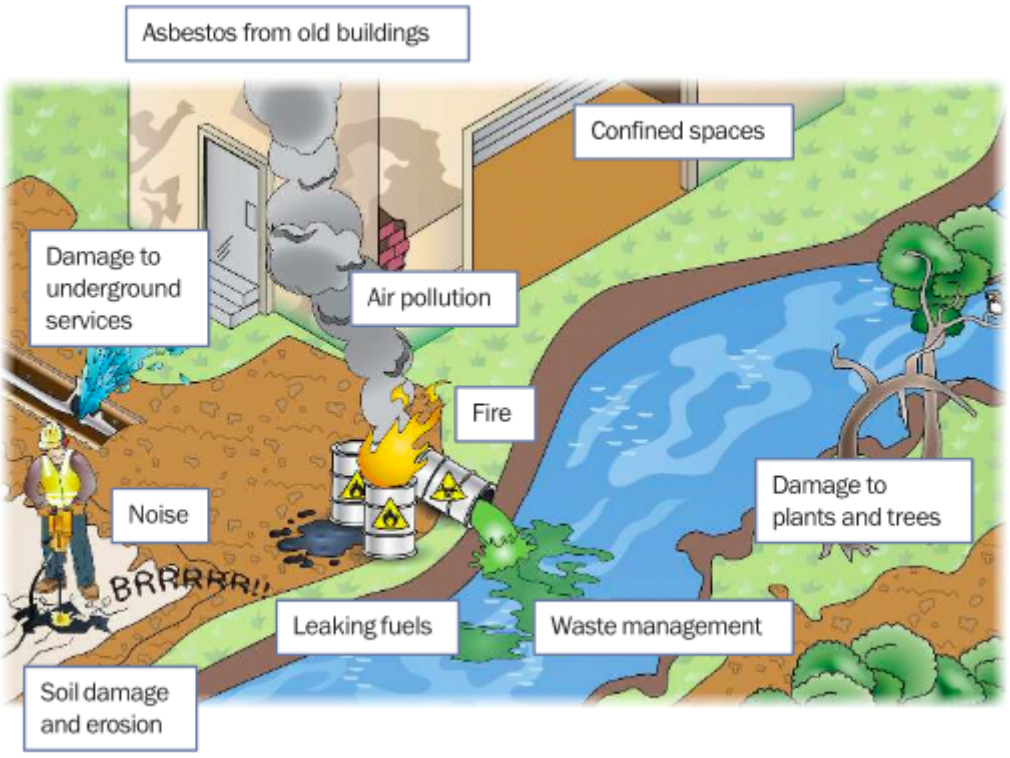
Level	Rating	Examples of impact on the environment
1	**Catastrophic**	**Death, injury or illness to humans or animals. Destruction of a heritage site. Toxic release into waterway and groundwater.**
2	**Major**	**Release leading to measurable change to storm water quality. Soil contamination over a wide area. Damage to a heritage site.**
3	**Moderate**	**Short term minor change to ecosystems. On site release that is contained with little contamination. Localised, short-term change in storm water quality.**
4	**Minor**	**On-site release immediately contained. Isolated complaints from the community.**
5	**Insignificant**	**Impact on the environment is too small to measure.**

How likely is the environmental risk?

You can use the following table to rate how likely it is that an environmental incident may happen.

Level	Rating	Examples of impact on the environment
A	**Almost certain**	**Environmental concerns that you expect will happen.**
B	**Likely**	**Environmental problem that has happened in the past and is likely to happen again.**
C	**Possible**	**Environmental concern that has sometimes been a concern and may happen.**
D	**Unlikely**	**Environmental concern that has sometimes been a concern but is not expected to happen.**
E	**Rare**	**Environmental issues that are very unlikely to happen.**

What environmental challenges should you be careful of when working?



Why should you check the noise laws for your state/territory before starting work?

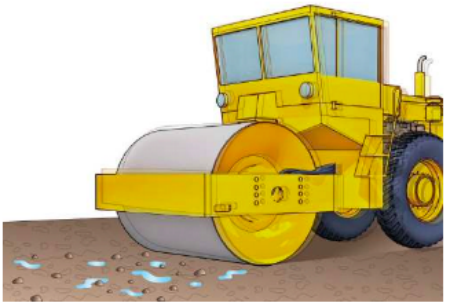
Because there are rules about how early or late you can work.

What kinds of PPE might you wear when using a roller?

Hard hat 	Ear muffs 	Safety glasses/googles 
Gloves 	Safety vest 	Boots that covers the whole foot 

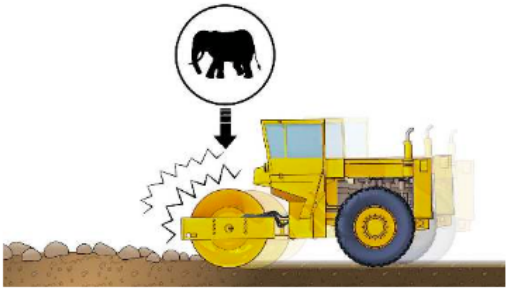
How does a vibrating roller work?

A vibrating roller shakes up materials and takes away air and water. Vibration makes the materials hit each other and break up, compacting the material and filling in gaps.



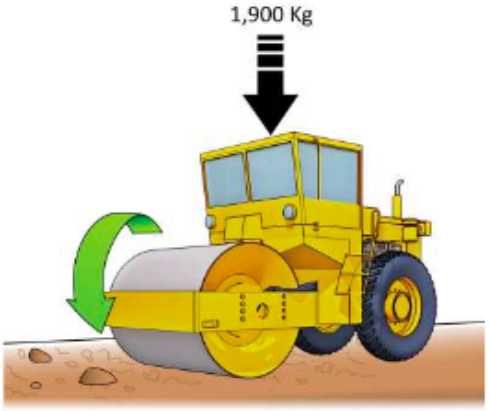
How does a vibrating roller compact soil and material?

The vibrating roller uses its weight and the vibrations of the roller drum to increase the compaction of the material.



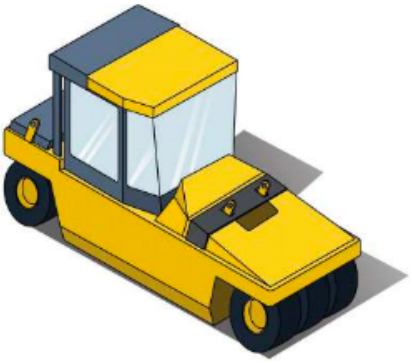
How does a static roller compact soil and material?

The static roller uses its weight and the rolling action of the drum or wheels.



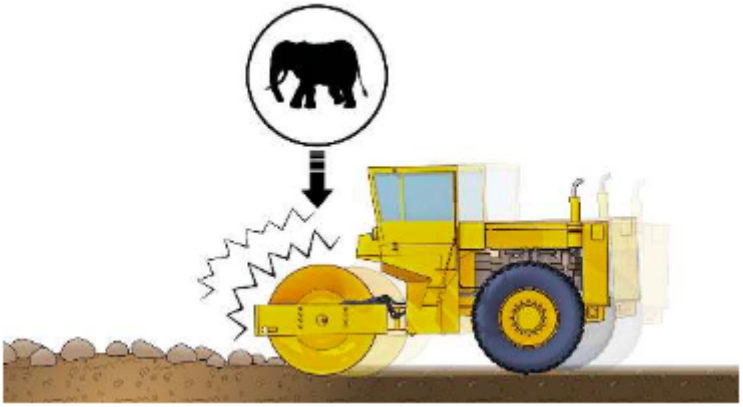
How does a multi-rubber- tyred roller compact soil and material?

The multi-rubber-tyred roller uses its weight and rolling action to knead the surface.



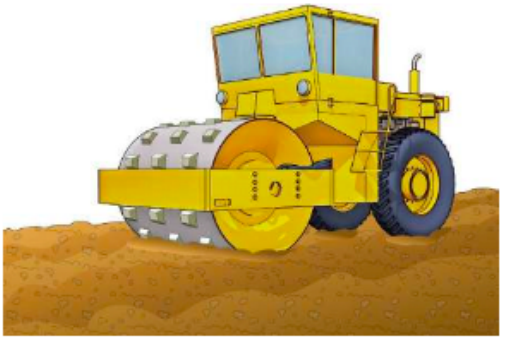
What advantage does the vibrating roller have?

The vibrating roller uses a vibrator so it can compact to a deeper level.



You need to compact loose gravel for the base for a road. Why would you use a roller with sheepsfoot pads attached?

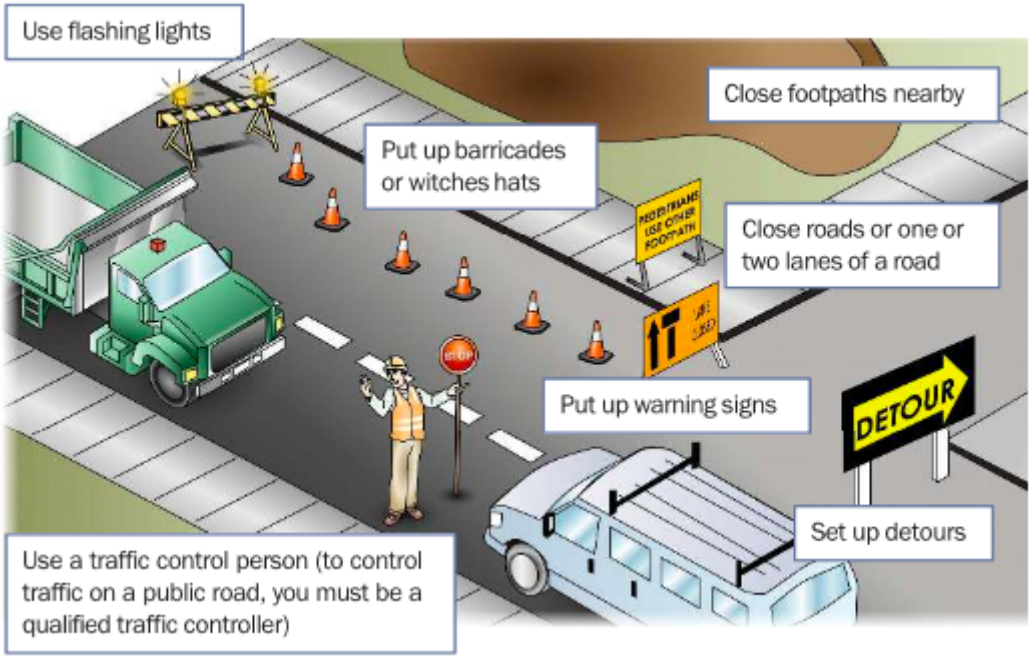
1. Sheepsfoot rollers are most effective in compacting clay soils.
2. Subsequent passes compacting the middle and upper portions
3. As the soil is compacted the feet do not penetrate as deeply as the initial pass.



3.1 Identify and Control Hazards

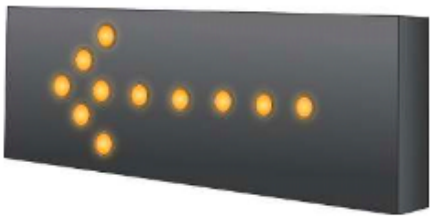
What can you do to control traffic in and around a worksite?

You can:



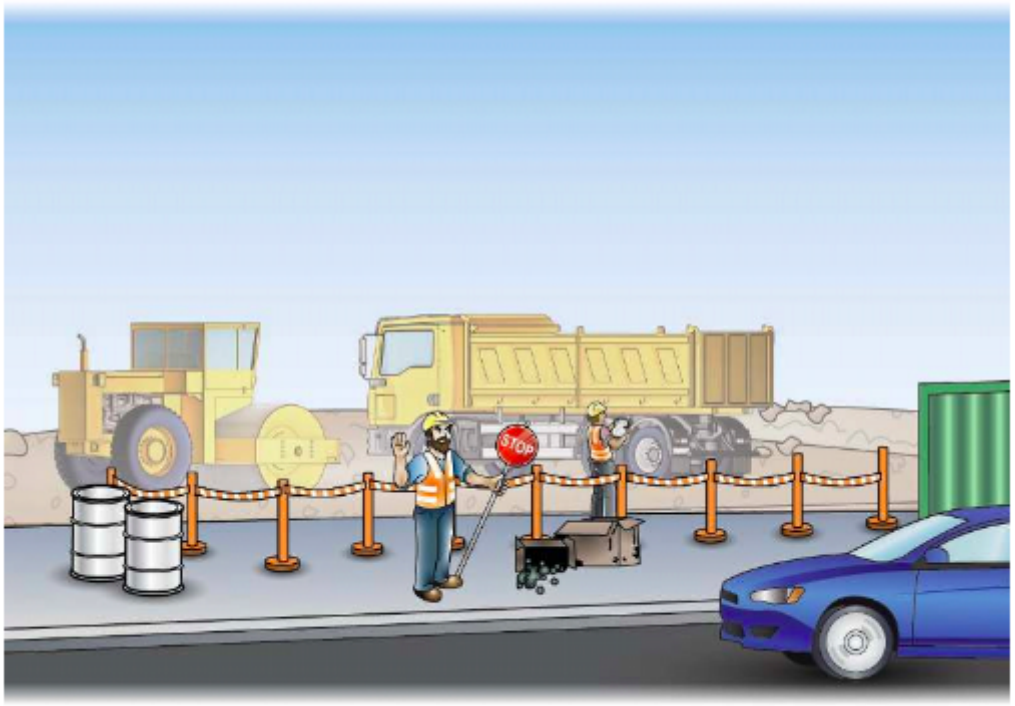
What signs may be used in a traffic control plan?

Speed limit signs	Warning signs

	
Arrow boards 	Portable traffic signals 

What does the traffic management plan (TMP) tell you?

It tells you how to control vehicles in and around the worksite. It helps keep the site safe for you and others. You may require a traffic control licence in your state or territory.



Where do you put up warning signs?

Near underground services	Near dangerous places

<table>
<tr>
<td> 
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<tr>
<td>In places you need to control traffic
 
</td>
<td>On the site fencing
 
</td>
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</table>

What is the aim of a traffic control plan?

The aim of a traffic control plan is to maintain a safe flow of traffic around the work area.

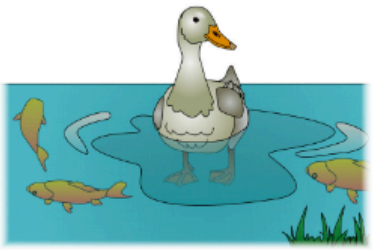
3.1.1 Earthmoving Hazards and Risks

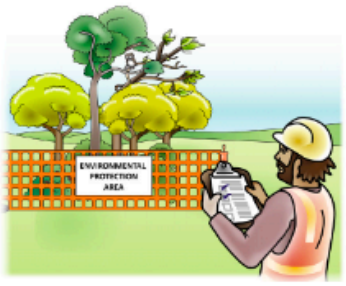
The most common hazards and risks with earthmoving work are:

Falls from plant or machinery 	Traffic and other mobile plant 	Overhead or underground power 
Underground gas lines 	Water and sewage piping 	Rollovers 
Noise 	Dust 	Manual handling 
Contaminated soil 	Falling into trenches or excavations 	UV rays (radiation) from working in the sun 

What does the environmental management plan (EMP) tell you?

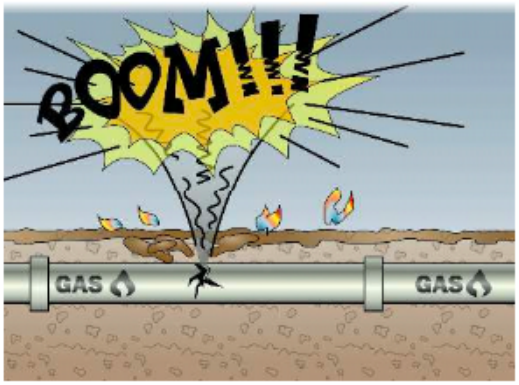
The EMP tells you:

Possible risks to the environment on the worksite 	How to work in a way that reduces damage to the environment 

How the worksite meets all environmental protection laws	Who is responsible for each part of the environmental management plan (EMP)
	

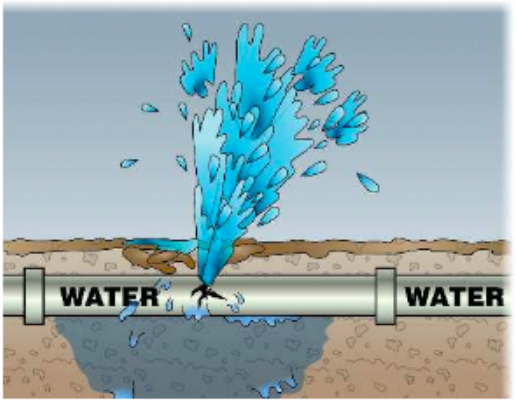
What could happen if you damage an underground gas line?

You could cause a gas leak, and maybe an explosion.



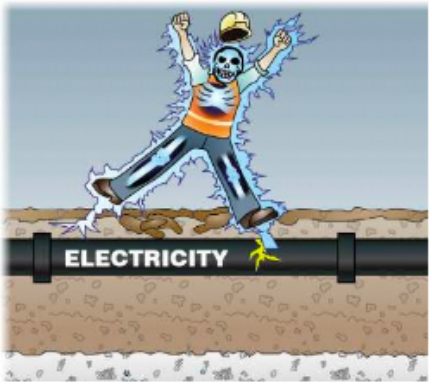
What could happen if you damage an underground water pipe?

You could cause a water leak, and the water could be polluted. Surrounding soil can be eroded causing a cavity which could collapse either immediately or in the future.



What is the danger if you damage an underground electrical cable?

There is a risk of an electric shock.



Who do you talk to if you damage an underground cable, gas line or other service?

You must tell your supervisor. Your supervisor will tell the relevant authority.

What equipment may be used in a traffic control plan?

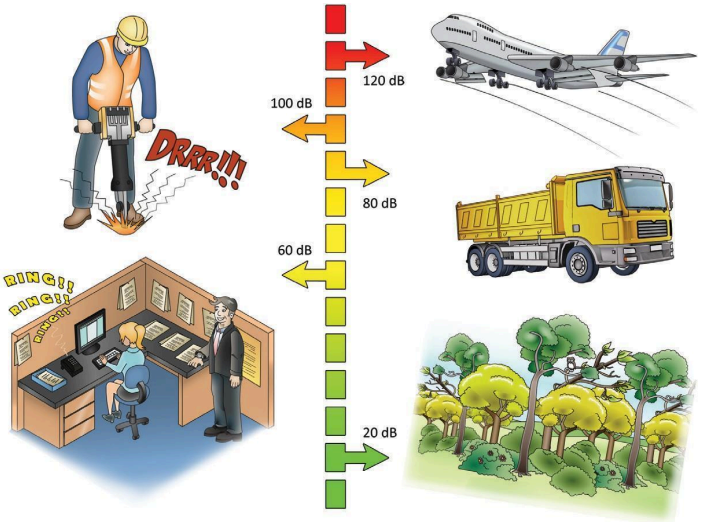
Stop/slow bats 	High visibility vests 	Radios 
Barricades 	Cones 	Bollards 

3.1.2 Decibel Levels of Common Sounds

You must wear hearing protection when operating heavy equipment. This is important because 8 hours of noise at 85 db (decibels), or noise levels of 140 db even briefly can permanently damage your hearing.

Hearing loss is:

- Slow
- Painless
- irreversible.



Here are some examples of levels of noise in different environments.

- A forest has about 20 db of noise
- In an office there might be around 60 db
- Standing outside a truck generates about 80 db
- A jackhammer generates around 100 db
- A jet taking off generates about 120 db

3.1.7 Chemicals and Solvents

Chemicals should always have a label, so that you can easily tell what you are working with. They should be stored in a safe place where nobody may accidentally come in contact with them.

Always check the safety data sheet (SDS) before handling any chemicals.

An employer must provide an SDS to a person using chemicals in the workplace. They must make sure the person using the chemical knows how to read and understand the SDS.

If you are not sure about a chemical, put the chemicals in a safe, isolated area and talk to your supervisor.

3.1.8 Fatigue

Fatigue is an acute, ongoing state of tiredness that leads to mental or physical exhaustion and prevents people from functioning normally. It is more than feeling tired and drowsy, it is a physical condition that can occur when a person's physical or mental limits are reached.

Fatigue can happen because of work or lifestyle related factors. Fatigue is a significant hazard and can lead to poor concentration, slow reaction times and increased mistakes.

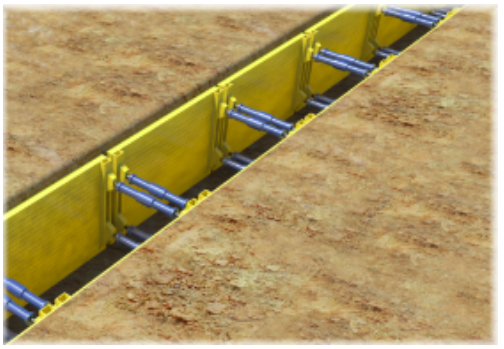
Work related factors	Lifestyle related factors
• Working time • Scheduling and planning (for example: rosters, length and timing of shifts) • Inadequate rest breaks • Lengthy periods of time being awake • Insufficient recovery time between shifts • Payment incentives that may lead to working longer shifts • Environmental conditions (for example: climate, light, noise) • Type of work being undertaken (for example: physically or mentally demanding) • Work demands placed on the person (for example: time frames, deadlines) • The organisation's culture • The person's role within the organisation.	• Inadequate or poor quality of sleep due to sleep disorders • Social life • Family responsibilities • Other employment • Travel time • Health and wellbeing (for example: nutrition and diet, exercise, pain, illness).

3.1.9 Safety around Trenches

There is a risk that a person could fall into an open trench or excavation on a worksite. People working in trenches are at risk of being crushed or trapped if the trench caves in. You must try to reduce this risk. Isolation is a good way to reduce the risk. You could put up para-webbing, barriers or temporary fencing. You may put trench shields with guard rails.

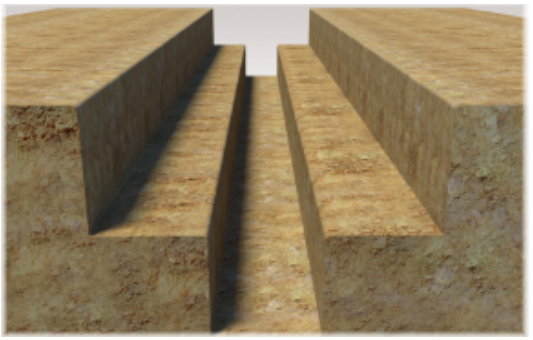
3.1.9.1 Trench Shields and Shoring

If a trench is 1.5 metres deep or more you must use trench shields or shoring. You should use trench shields that have approved lifting points. The shields weight must be permanently marked on the shield. If the shield does not have its weight marked, it must be rigged by a licenced dogger or rigger. The shoring must meet Australian Standard 4744: Steel shoring and trench lining equipment. It must also come with an instruction manual. You should secure a ladder for workers to get in and out of the trench.



3.1.9.2 Benching

Benching is where you cut levels in the soil to reduce the fall risk. For example, instead of having a single 2 metre trench, this area is excavated in two (2) levels. The first level is a 1 metre drop and is 3 metres wide. The second level is 1 metre × 1 metre.



3.1.9.3 Battering

Battering is where the edges of a trench are 'tapered' back on a gentle slope. Battering means that instead of a straight drop off, you have a more gentle slope. In this example, the drop off has been 'battered' back so the fall hazard is reduced. Benching and battering reduce both the fall risk and the risk of collapse.

3.1.10 Confined Space

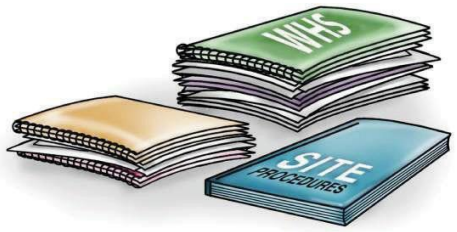
A confined space is an enclosed or partially enclosed area. It is an area that was not designed for people to go into. It may have no natural or mechanical ventilation. There are also hazards (such as a gas or flammable substance) that makes it dangerous.

Gases in the atmosphere such as LPG, which are heavier than air, may enter spaces like trenches, underground tanks or pits displacing oxygen.
When you drive a petrol, gas, or diesel machine into a space like this you create a hazard. The exhaust gasses can fill the space. Dangerous gases like carbon monoxide can build up in the area. You can't smell all the dangerous gasses or fumes. You might breathe in a dangerous gas and not even know it. The gas could make you unconscious or even kill you.

You must be trained to work in a confined space, you must also have a permit. The permit makes sure you have thought about all hazards and controls, including a rescue plan, and that you have a team there to help you in case something goes wrong. You must get your permit approved by a supervisor.
If you are going to work a machine in a confined space, you might need a catalytic converter installed. A catalytic converter takes out harmful gasses (like hydrocarbons, carbon monoxide and nitrogen oxides) and turns them into harmless gasses (like carbon dioxide, water and oxygen).

3.1.11 Worksite requirements

Examples of documents and training your employer should provide include:



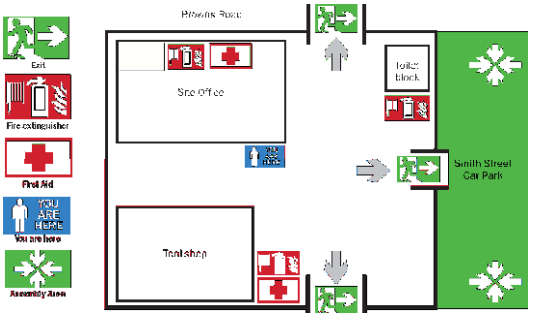
- Safety plan for the site
- Emergency procedures, for example a site evacuation plan
- Environmental management plan for the job.

2.1.2.1 Emergency Evacuation Plan

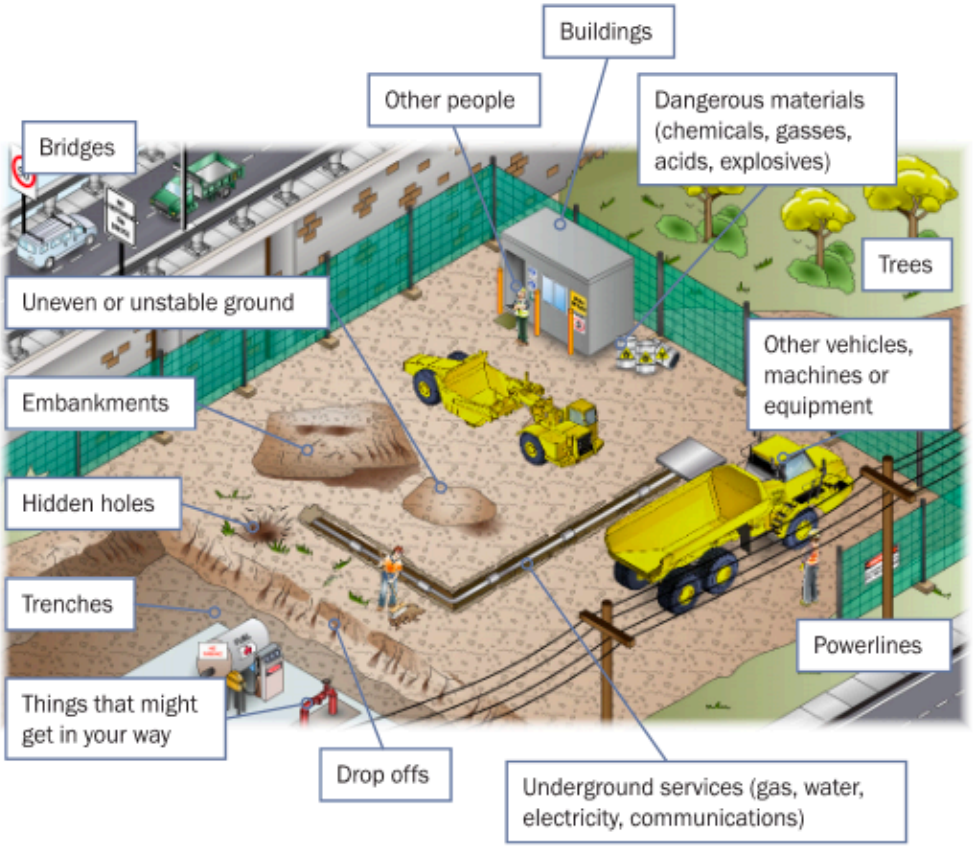
Many worksites have an emergency evacuation plan which is displayed on the noticeboard.

You should make sure you know how to interpret this plan.

For example, start by looking for a 'You are here' sticker on the plan drawing. Note how nearby areas are shown on the plan. Then work out where the emergency exit is – on the plan and in real life.



What are some hazards you must look for before starting work?



What is the danger when pumping up a flat tyre on a split rim wheel?

The locking rim could fly off and hit you. You could be injured or killed.

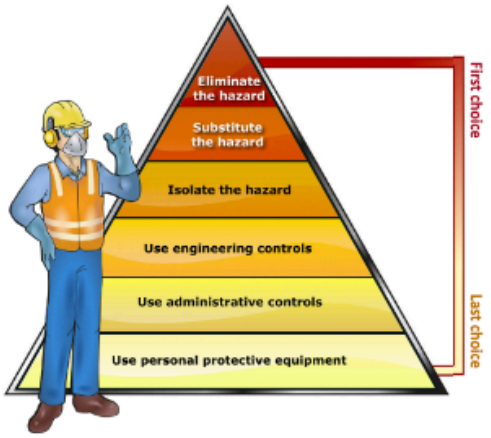
WARNING:
This job may need to be done by an authorised fitter.
Check with your supervisor.

How can you pump up the flat tyre on a split rim wheel safely?

Never stand in front of the wheel. Pump up the wheel in a cage if you can.

The hierarchy of hazard control is a list of controls you can use to lower the danger from a hazard on the worksite. What are the six (6) levels in the hierarchy of hazard control from the first choice to the last choice?

1. **Elimination:** If possible, remove (take away) the hazard.
2. **Substitution:** Use a safer method if you can't remove the hazard.
3. **Isolation:** Stop access to the hazardous (dangerous) area.

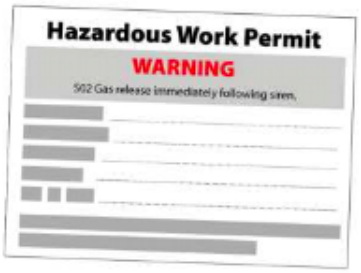


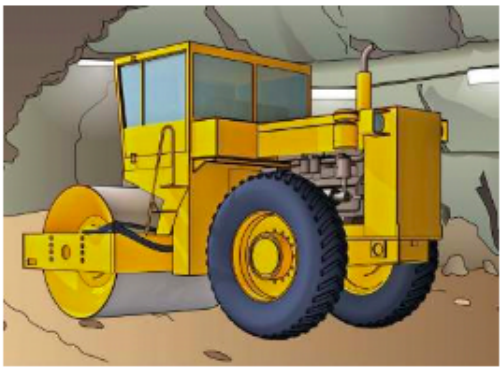
4. **Engineering Control Measures:** Change the tools, equipment or environment to make it safer.
5. **Administrative Practices:** Reduce the time the worker is exposed to the hazards by using training, job rotation, the timing of jobs, etc.
6. **Personal Protective Equipment (PPE):** Use PPE as your **last line** of defence.

Memory aid: **E**very **S**aturday **I** **E**at **A** **P**ie

You will work in a hazardous area, for example, a confined space. What type of permit might you need to get?

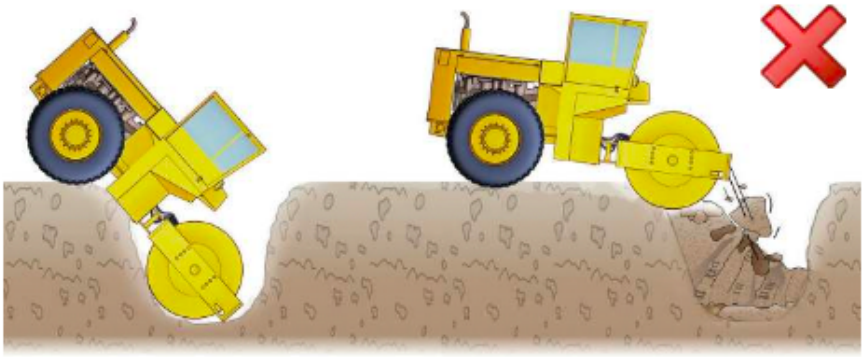
You might need to get a hazardous work permit.





What is the danger of using the roller near a trench or excavation?

The roller might tip over and fall into the trench, or the edge of the trench might cave in.



There is a trench near a pedestrian footpath. How can you stop people falling into the trench?

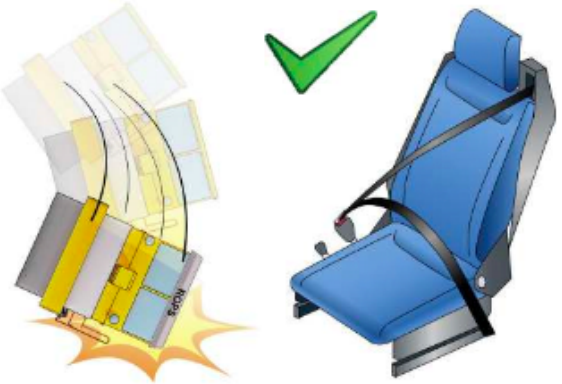
Put up barricades, guard rails or fencing. Use signs to warn people of the danger.

When do you wear respiration gear such as a mask?

When the area is dusty or polluted.

Which safety devices protect you if the roller tips over?

The rollover protective structure (ROPS) and the seat belt. Always wear the seat belt when using a roller!



What is the danger of working when it is dark or difficult to see?

It's harder to see hazards. In the dark it is harder to tell distances. 	Provide lighting if needed. 

What safety device keeps you in the seat?

The seatbelt.

Are you allowed to carry a passenger on the roller?

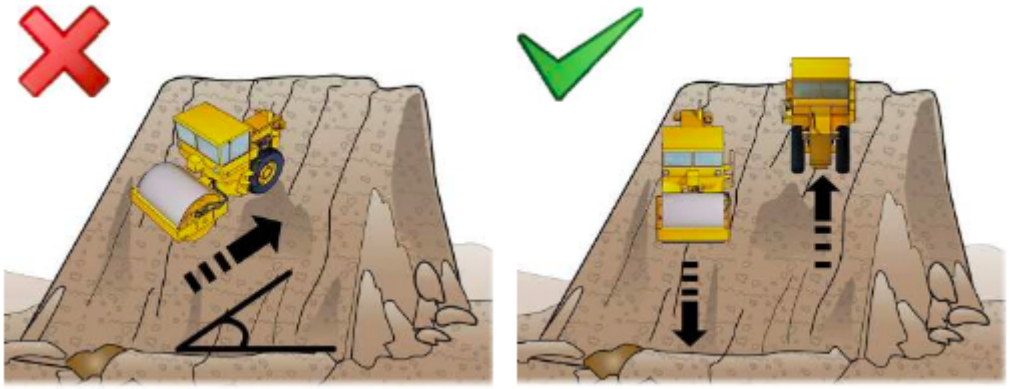
No, never. They could fall and be squashed by the roller.

How do you safely get in and out of the roller's cabin?

Always use three (3) points of contact facing the machine. For example, use two hands and one foot or two feet and one hand.

Which way should you travel when driving on sloping ground?

Go straight up or down the hill, not at an angle.



A hydraulic hose starts to leak fluid. What do you do?

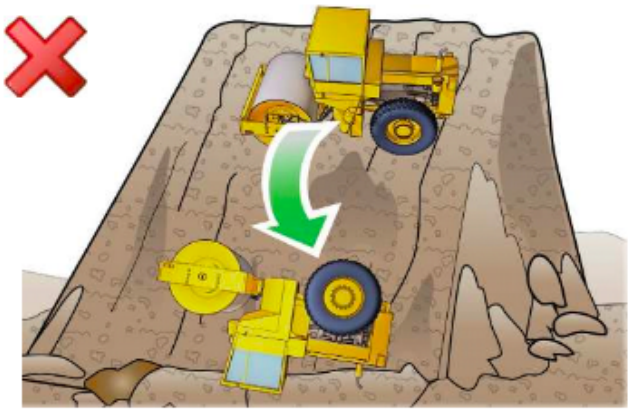
1. Stop working 	2. Remove the key 
3. Tag out the machine 	4. Report to your supervisor. Have the hose replaced. 

How does hot asphalt change the tyre pressure?

It increases tyre pressure.

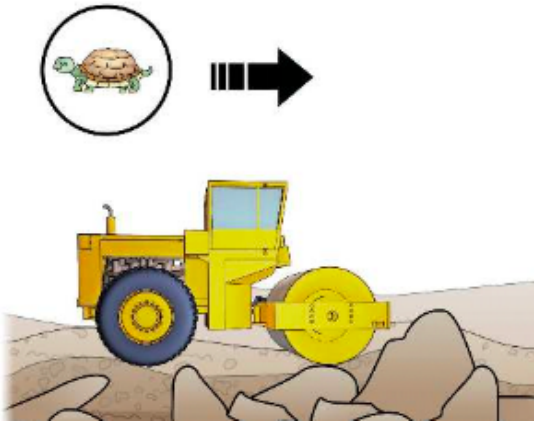
What is the danger of driving a roller sideways along a slope or hill?

The roller might tip over.



You need to travel over a rocky or bumpy surface. What speed do you drive at?

Drive slowly to keep the roller stable.

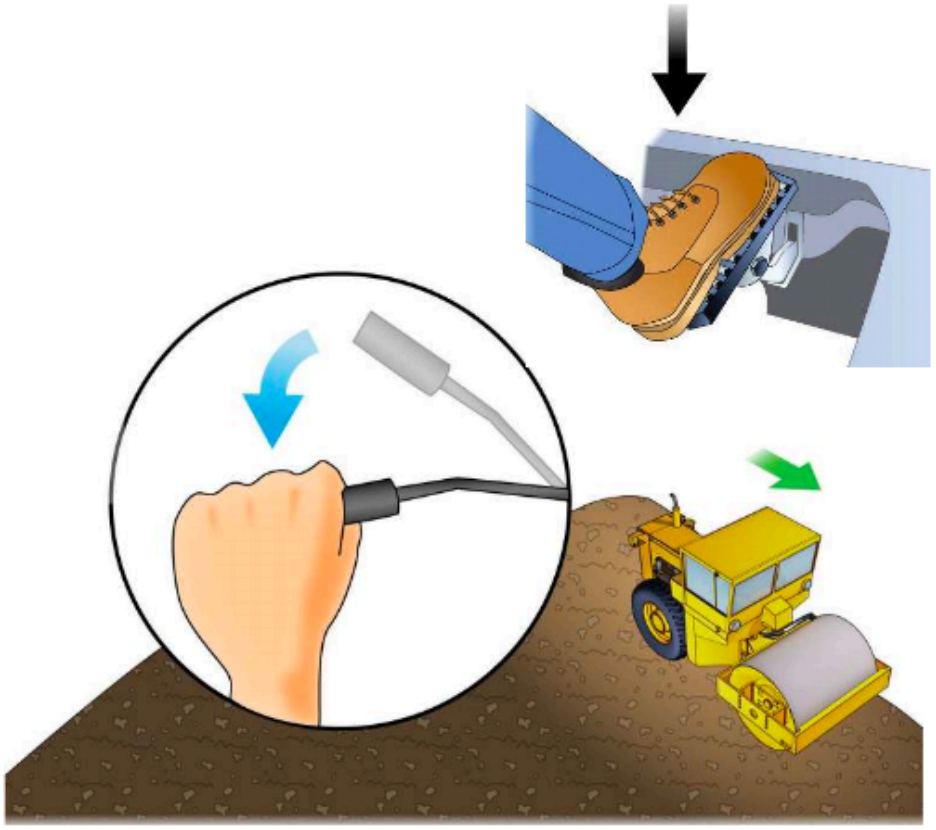


What is the risk when changing gears while you're driving the roller up a slope?

If you miss the gear the brakes may not be able to hold the roller. You may lose control.

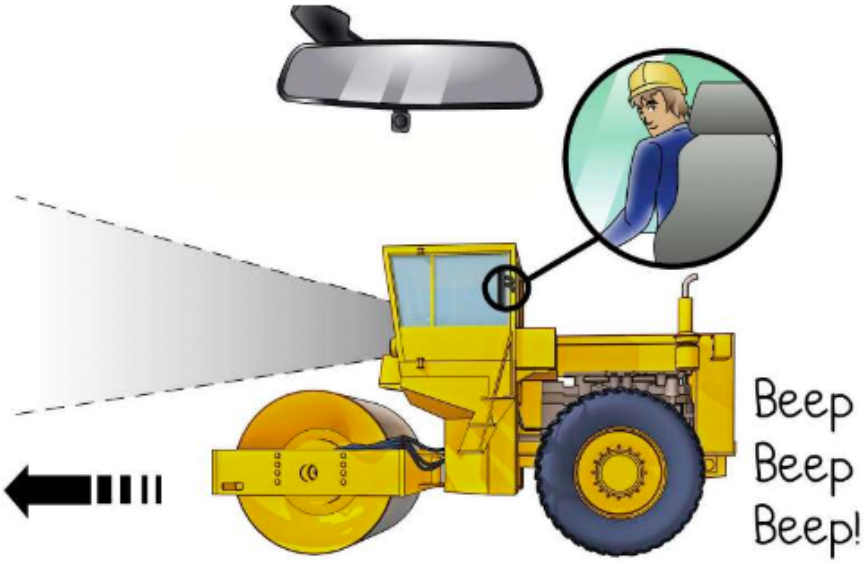
What do you do before you go down a steep slope?

Slow down by using the service brake and select a low gear if the roller has manual transmission.



What do you do before moving a roller which has been stationary?

1. Sound the horn once.
2. Check the way is clear and there is no one near the roller.
3. Make sure the reversing alarm has started before you move.



3.2 Check and Monitor Equipment

3.2.1 Tools and Equipment

Here are some typical tools and equipment you might need. Remember, if your workplace has a policy about what PPE you need to use, you must use it.

Personal protective equipment (PPE)

- Steel cap boots
- High visibility safety vest
- Hearing protection
- Hard hat
- Goggles/glasses
- Gloves
- Dust mask

Hand tools

- Shovel and levels
- Socket sets
- Screwdrivers or wrenches
- Wire brush

Maintenance equipment

- Grease gun
- Tyre pressure gauge

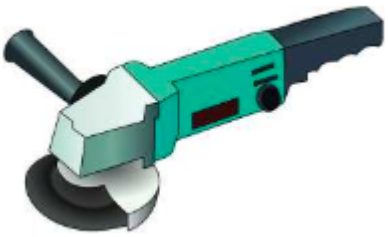
Lifting equipment

- Slings
- Chains
- Shackles

What kinds of tools and equipment might you use when doing earthmoving work?

Jack, chocks and stands. 	Crowbars. 
Hand tools such as spanners, ratchets, wrenches, screwdrivers and hammers. 	Socket set 
Laser level 	Wire brush 
Welder	Punch

Grinder

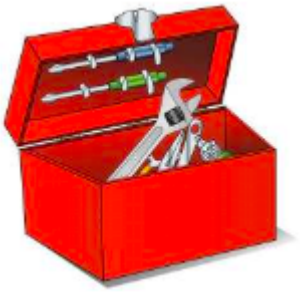


Oxy set

Portable lighting

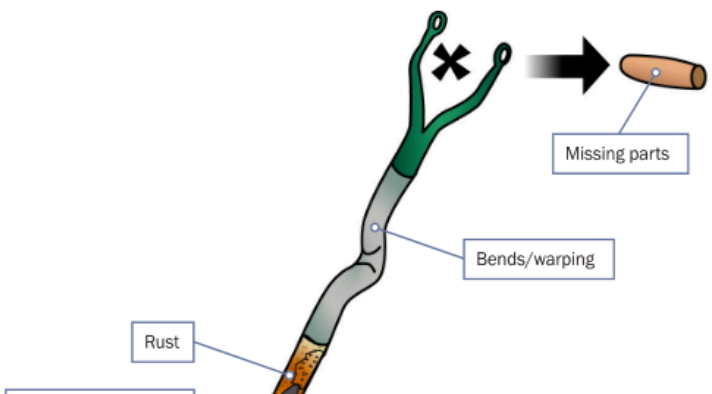
Grease gun

Other hand tools that come with the roller



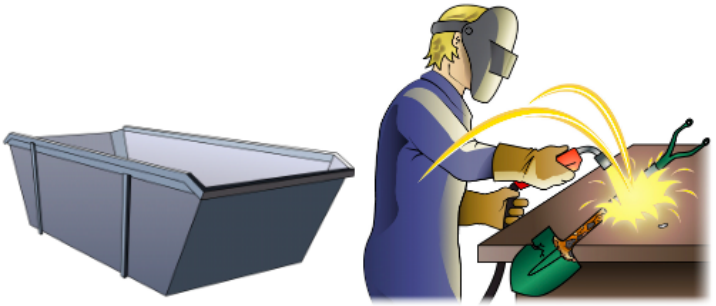
What kinds of faults do you check hand tools for?

You check for:

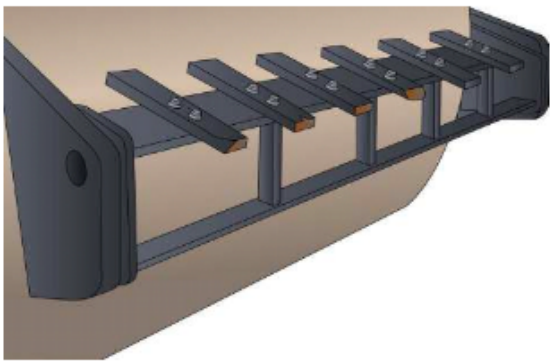


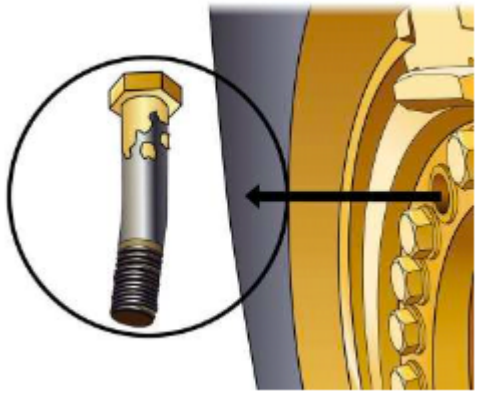
What do you do with faulty hand tools?

If you can, arrange to have them repaired. If that is not possible, tag them as faulty, or put them in the rubbish.



What checks do you do to the roller's structure,moving parts and safety features?

Check the condition of attachments 	
Check for broken or damaged parts	Check damage to the roll over protective structure (ROPS)



What is the first check you do on the machine?

Walk around it and check for obvious problems you can easily see.

You take out the oil dipstick and the oil looks milky. What does this mean?

There may be water leaking into the engine oil. The engine may need repairs.

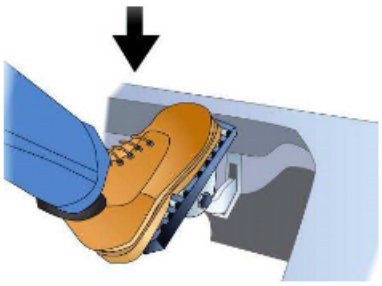
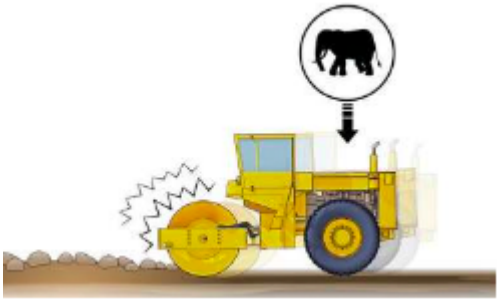
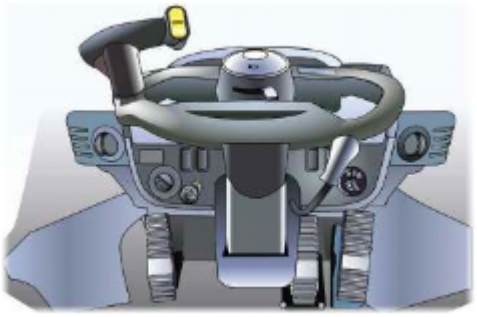
You are using a roller with sheepsfoot pads fitted. One of the bolts which connects the pads has come out. What do you do?

1. Stop using the machine.

2. Tag out the machine.

3. Record the fault in the machine's log book. 	4. Report to your supervisor so it can be fixed. 

What kinds of tests (start-up checks)should you do before using the roller?

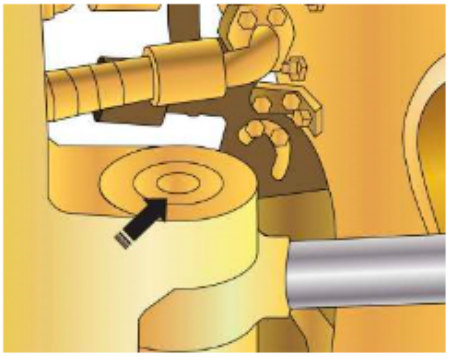
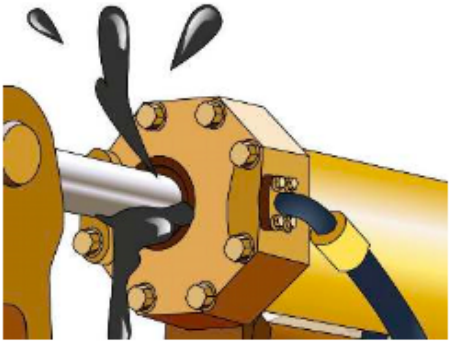
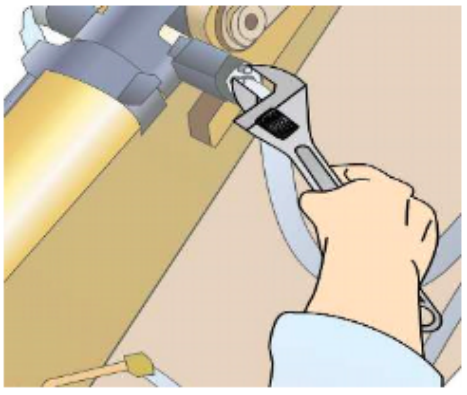
Test the brakes 	Test the roller's functions. For example, the vibrator. (Do this away from under ground services). 
Test the controls in a safe place 	Test the steering in a safe place  Drive the roller a short distance to make sure it's okay 

What do you do if you find a fault while testing the roller?

1. Tag out the ruler. DO NOT USE IT 

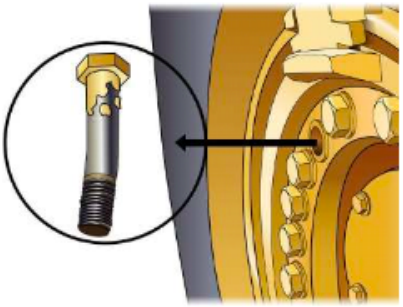
2. Report the fault and arrange to have the roller repaired.

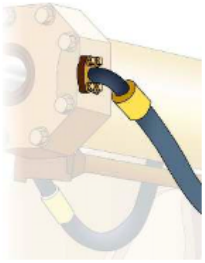
What problems do you check the hydraulic system for?

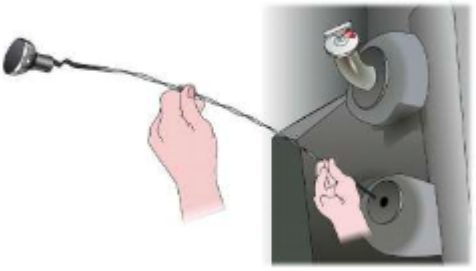
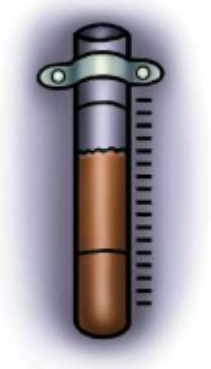
Damaged or bent hydraulic rams 	Leaks 
Cracked, split or bulging hoses 	Loose connections 

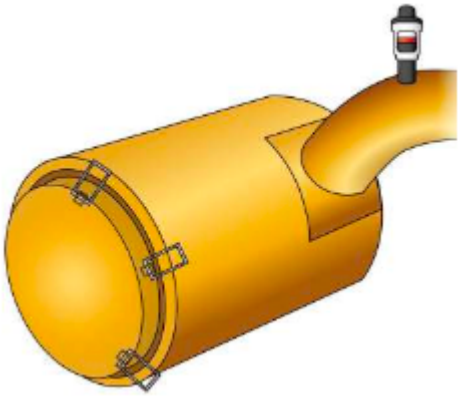
What pre-operational (pre-start) checks do you do before using the roller?

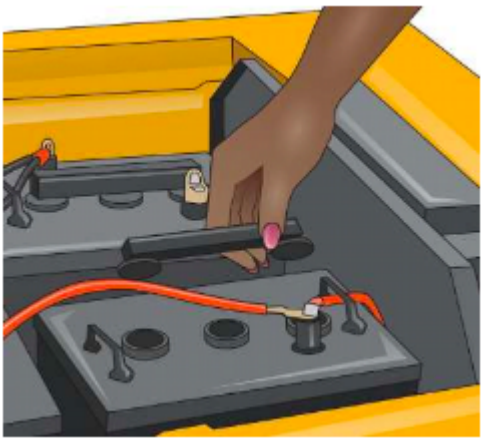
Look for leaks under the machine	Check tyre condition, tyre pressure and wheel nuts.

Check hydraulic systems (including attachments) 	Check the fuel gauge to make sure the roller has enough fuel 	Check power steering fluid 

Check transmission oil 	Check engine oil 
Check hydraulic fluid (brakes and clutch) 	Check engine coolant 
Check air filter	Check battery water level



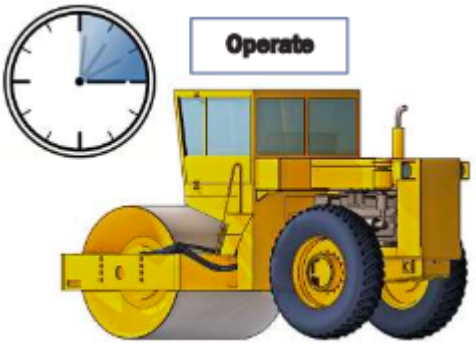


Drain condensation from the air tank (if fitted).

How is a machine returned to work after maintenance or repairs?

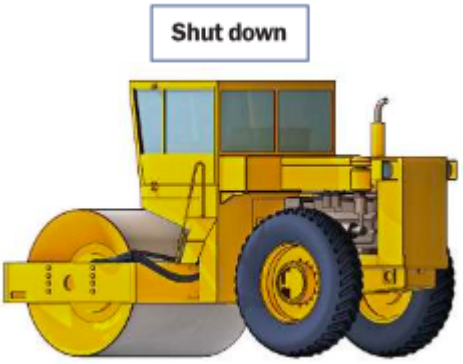
1. Look in the logbook to see what repair or maintenance was done.

2. Operate the machine for a short time (5-15 minutes).



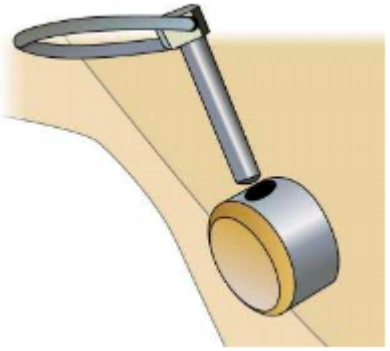
3. Shut down the machine.

4. Walk around and inspect the machine.



5. Check the machine for leaks.

6. Check for loose fittings.



7. Check the machine for any obvious signs of damages or faults

8. Check all controls are working correctly.

9. Report any faults to your supervisor and check if the machine can be used.

10. Record any faults and reports in the logbook.

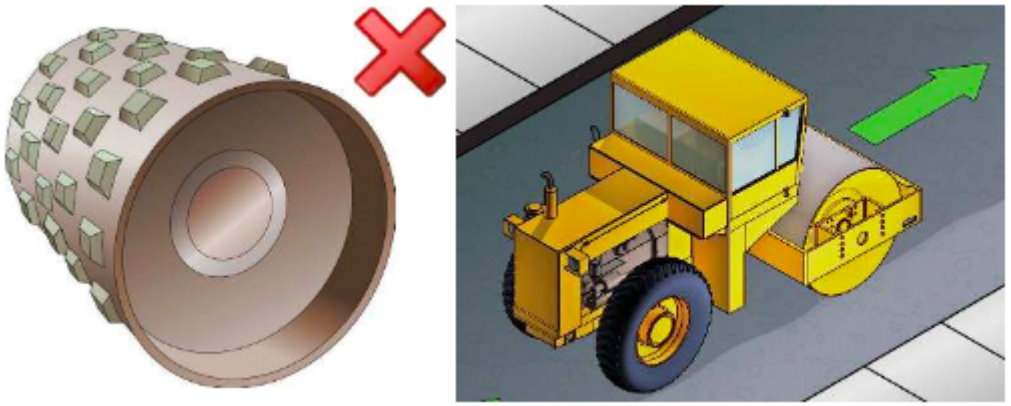
4.1 Operate/Use Equipment

What does a spray bar do?

Water the roller to stop material (such as asphalt) sticking to the roller.

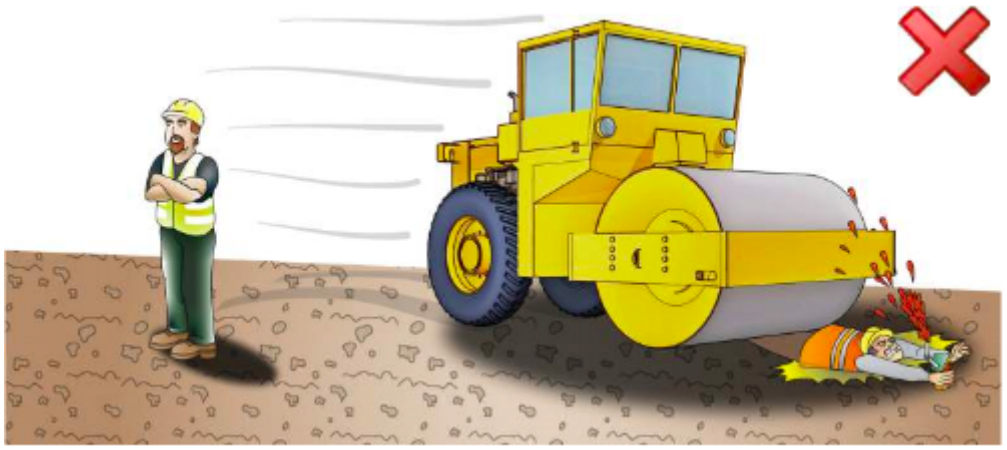
Can you use the sheepsfoot pads on newly laid asphalt?

No. This would damage the finish. You need to use a smooth roller to get the right finish.



Can you leave the roller running when you're not in it?

No, it could roll away and injure someone.



Is it safe to coast the roller downhill?

No. Always keep the roller in gear when going downhill or you may lose control of the roller.

What must you do if you find any fault with the roller?

1.

2. Record the problem in the logbook.

3. Report the problem to a supervisor.

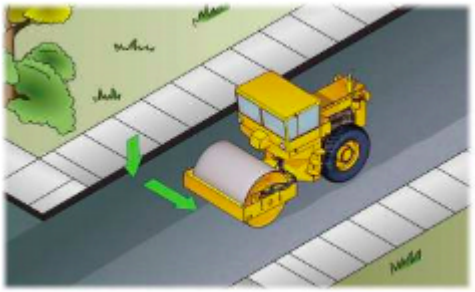
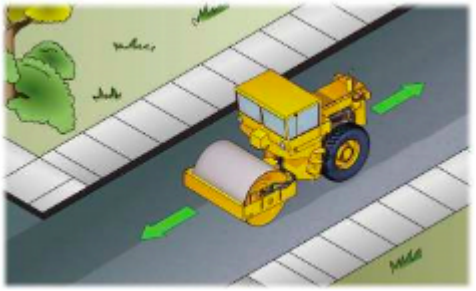
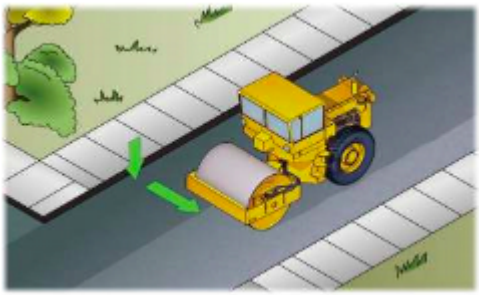
What should you do before you start operating the roller?

Check the area to be rolled is clearly marked. Mark out the work area with pegs if necessary.

How do you stop hot asphalt from sticking to the roller?

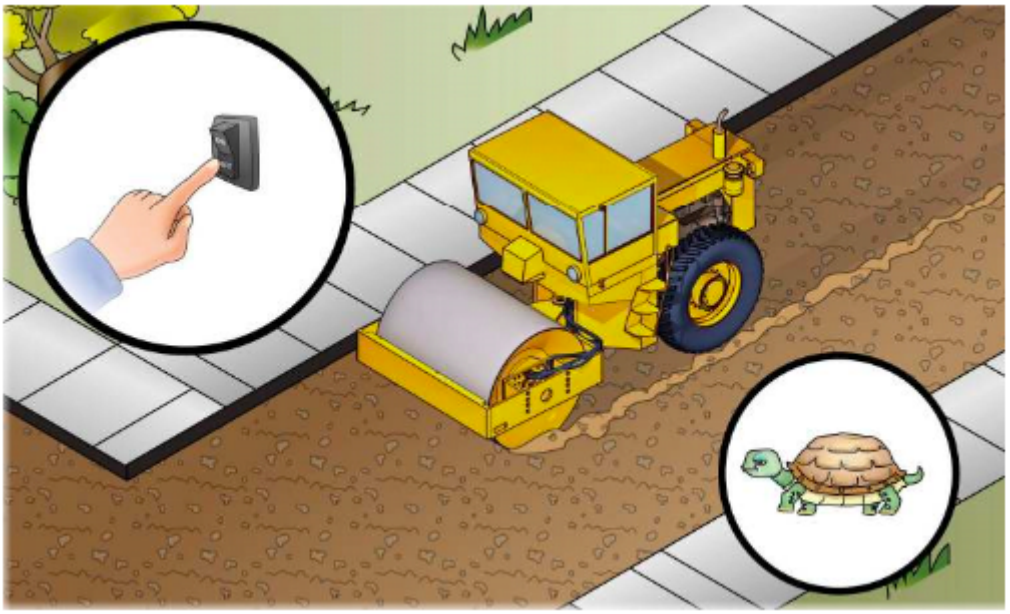
Use water sprinklers, mats or scrapers.

How do you compact a surface using a roller?

Start from the outer or lower edge and move towards the centre of the surface you want to roll.	
Do a forward and reverse pass and overlap on each pass.	
Turn the roller around. Turn the vibrator off. Go back in the opposite direction. When the roller starts to walk out, the surface is properly compacted.	

You will use a vibrating roller. How do you do the first run on the uncompacted soil next to the kerb?

Go slowly and don't use the vibrator.

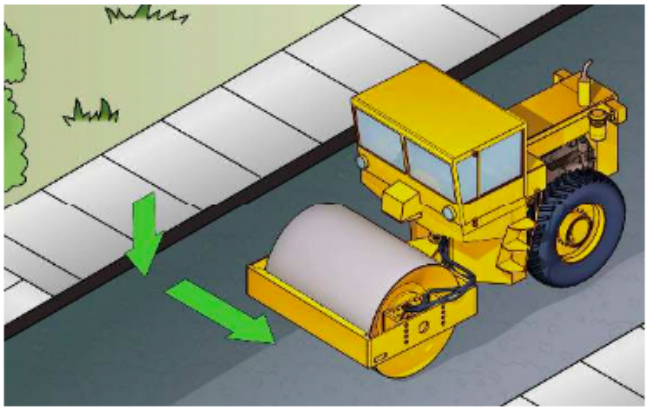


You need to compact the soil on a slope. Which way do you roll?

Straight up and down the slope. Don't roll across it or at any angle as you may tip the roller over.

When you use a roller on a road, where do you start rolling first?

On the kerb side, then move in towards the middle of the road.

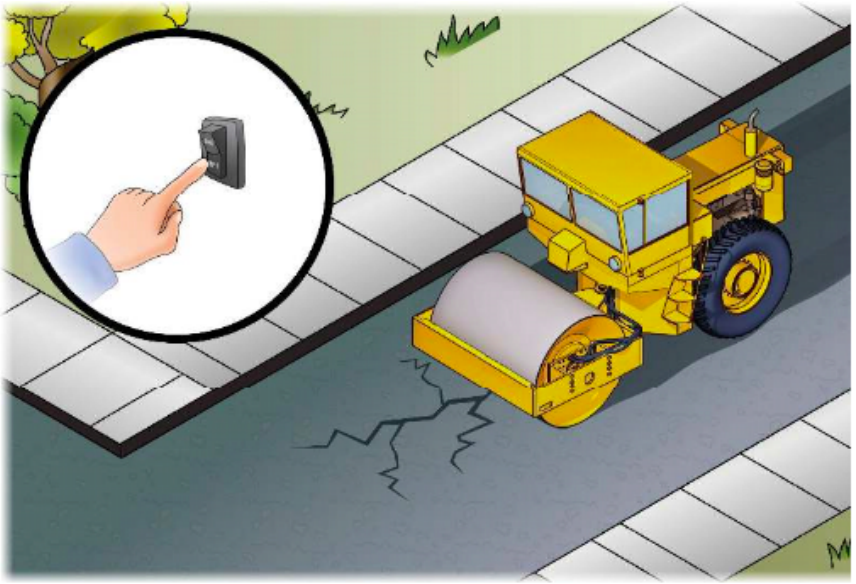


You are rolling soil. What will happen if the soil is very wet?

The water will come to the surface and the soil won't compact properly. Soil may build up on the roller drum or wheels.

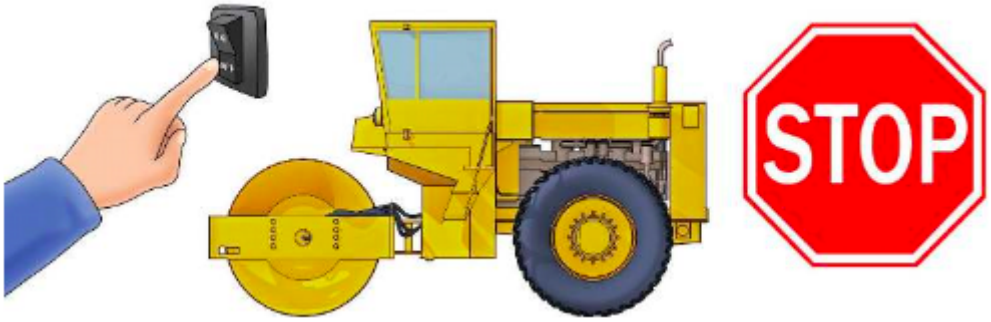
You are using a vibrating roller. The surface you are rolling has cracks. How do you fix the cracks?

Roll the surface again with the vibrator turned off. You might need to get the surface watered.



You are using a vibrating roller. What do you do before stopping?

Turn off the vibrator so it doesn't vibrate in the one spot.



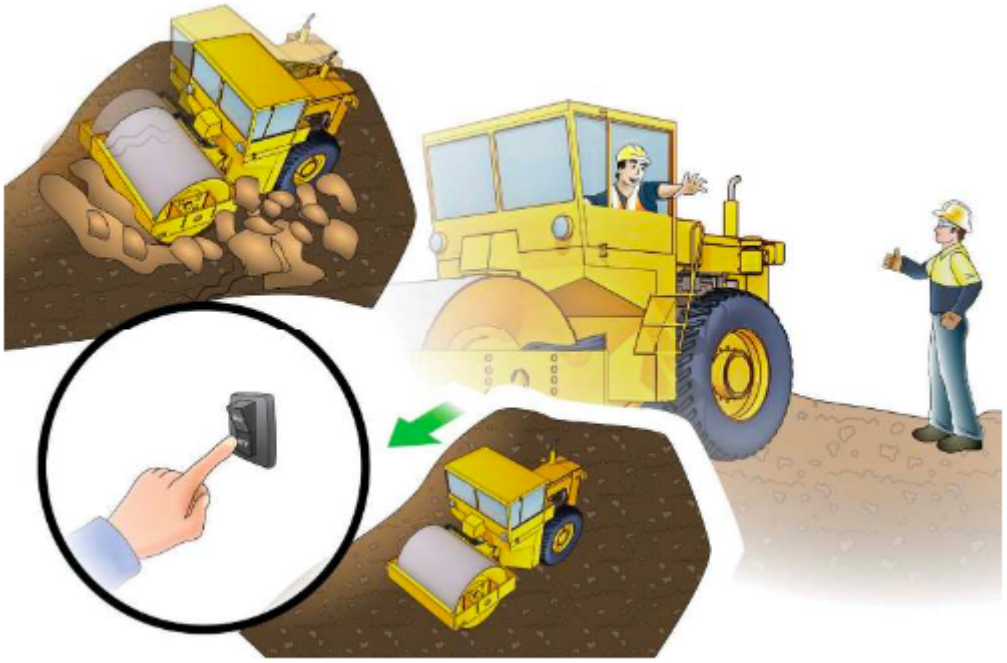
How do you safely cross a ditch?

Drive at an angle towards the ditch. Cross the ditch slowly. Avoid having the roller drum in the ditch as you may not be able to get it out.

You are using a vibrating roller near a bank. The bank starts to slip or break away. What do you do?

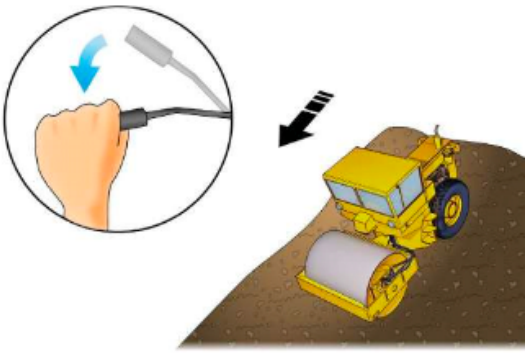
Turn off the vibrator immediately. Idle the engine and then try to move away from slip area. If you can't get out,

ask for help.



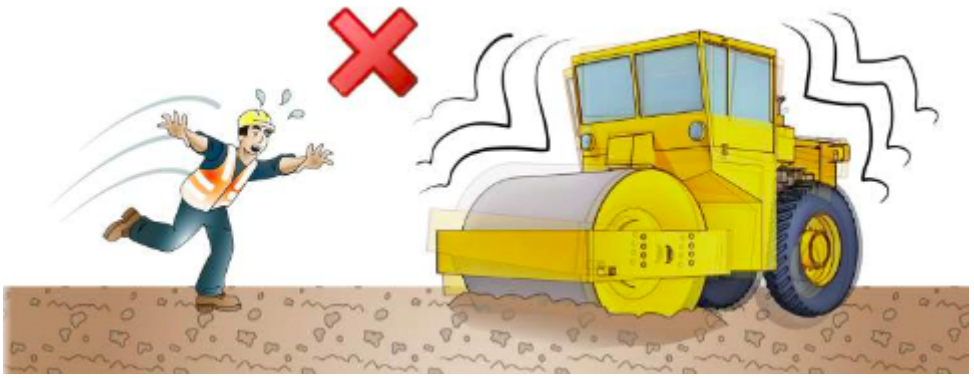
Which gear do you use when travelling down a steep slope?

Use the lowest gear you can.



You have finished using a vibrating roller and leave it vibrating on soil. What will happen?

The roller's vibration will sink it into the soil. Don't leave the vibrator on while you aren't using it.



When rolling, why do you overlap each roll?

Overlap each roll so you do not have any

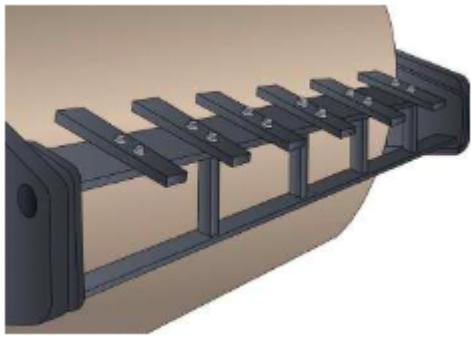
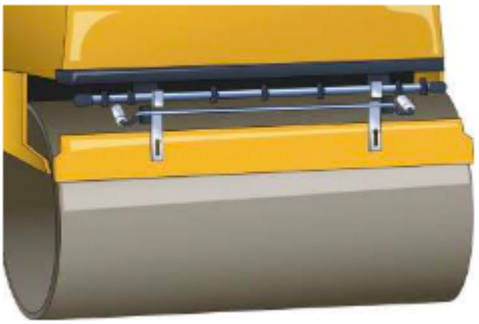
uncompacted surface when you have finished.

You are trying to drive up a hill but the roller won't climb in the gear you chose. What should you do?

Reverse back down the hill, try a lower gear and start again.

How and why do you need to adjust things like:

- **Interchangeable drums**
- **Spray bars**
- **Scraper bars**
- **Wheel/drum booms**
- **Drag booms**
- **Blades?**

These should be adjusted as per manufacturers recommendations and/ or the operators manual. 	They need to be adjusted to keep the roller operating effectively and efficiently. 

You are operating the roller and notice there is asphalt and dirt sticking to the drum and building up. What could be the problem and what should you do?

The scraper bars could be set in the travel position and not the scraping position. Adjust the scraper bars so they are in the correct position to prevent the build up.

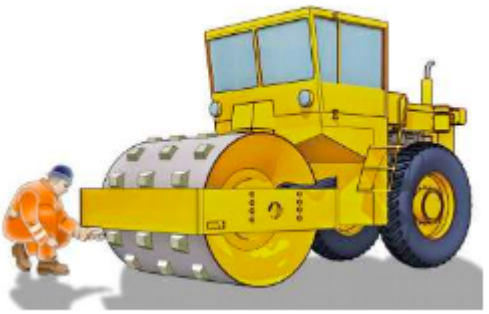
4.1.1 Monitoring systems and alarms

Monitoring systems and alarms help you to know that your roller is operating safely.

The following are examples of symbols that alert you to:

Engine overheating Symbol on gauge. 	**Low engine oil** Symbol on gauge 
Blocked air filter Symbol on gauge. A blocked air filter can lower engine performance. 	Note: A warning light and an alarm may come on depending on how serious the fault is. Always check the operator's manual for information.

You are operating the roller and an alarm or buzzer sounds or a warning light comes on. What do you do?

Stop the machine 	Try to locate and fix the fault if possible 
If the fault can't be fixed, tag the machine and report the problem to a supervisor.	Record the problem in the logbook.

Some of the standard hand signals are shown here. What do these two hand signals mean?

Stop	
Motion	Hand signal
	

Travel and traverse	
Motion	Hand signal
Indicate the direction you want the machine to go	

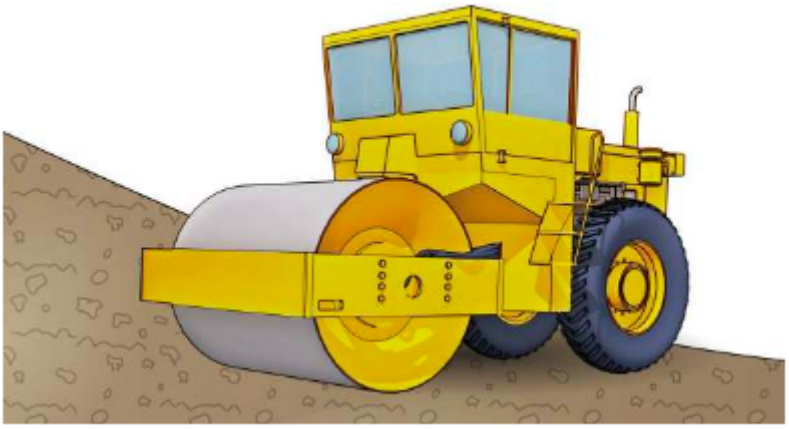
4.2 Shut Down and Store Equipment

What is the best kind of surface to park the roller on?

A firm level surface

If you have to park the roller on a slope, which way do you park it?

Park across the slope so it won't roll away.



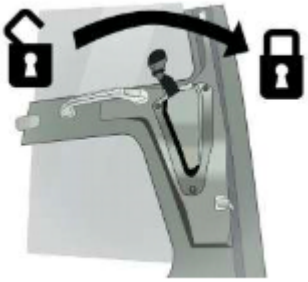
What steps do you take when shutting down the roller at the end of the day?

1. Park the roller on flat ground in a place it won't cause a hazard.	2. Idle the engine before you turn it off. Stop the engine.

3. Pull the parking brake.

4. Remove the keys.

5. Lock at the cabin.

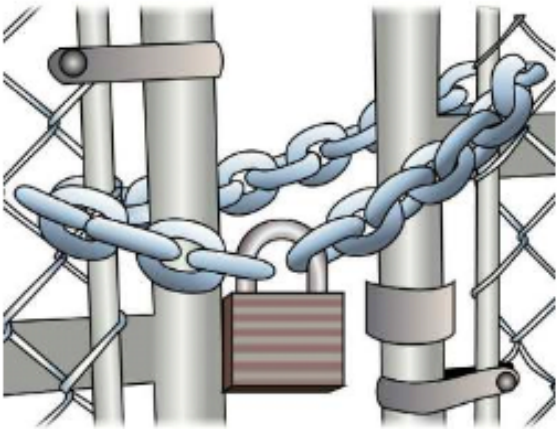


Why should you remove the keys from the roller when leaving it parked?

To stop unauthorised people using the machine.

How do you secure the site to stop unauthorised people getting in and damaging the roller?

Set up fences and barricades. If possible, lock the site.



When do you inspect the roller for damage or faults?

Always test and inspect the roller before you use it. You do this to make sure it's safe to use. You also need to inspect the roller at the end of the day to check for damage that may have happened when you were operating.

What do you do if you find a fault with the roller during the post-operational inspection? For example, you might see a bulge in a hydraulichose.

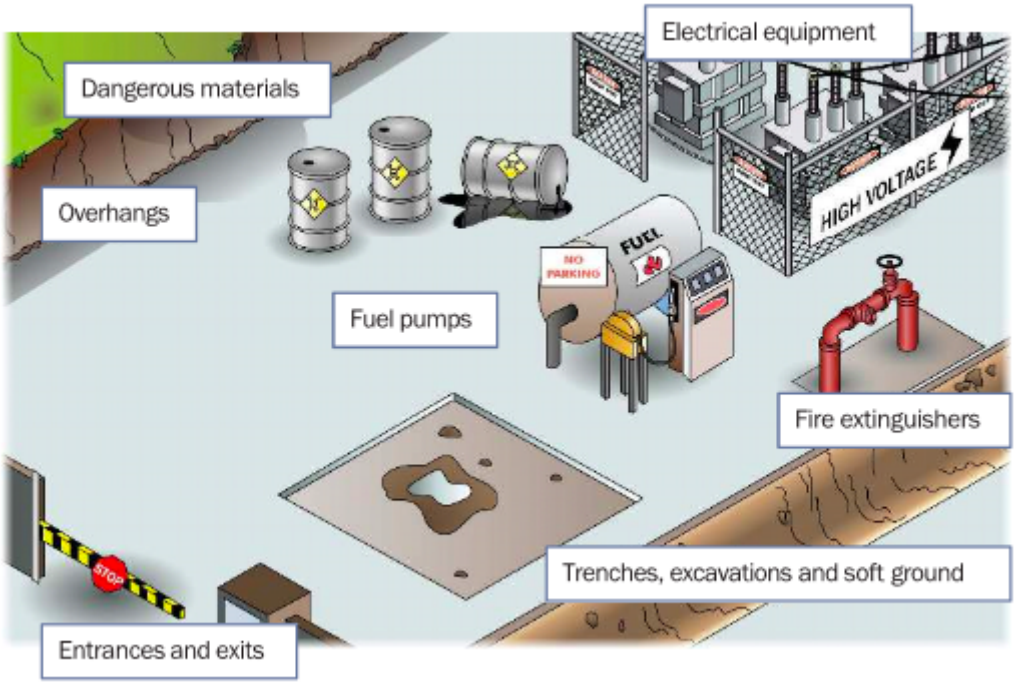
1. Stop using the machine.	2. Tag out the machine

3. Record the fault in the logbook or daily inspection checklist.

4. Try to replace the hose if you can. If you can't, ask an authorised mechanic or your supervisor.

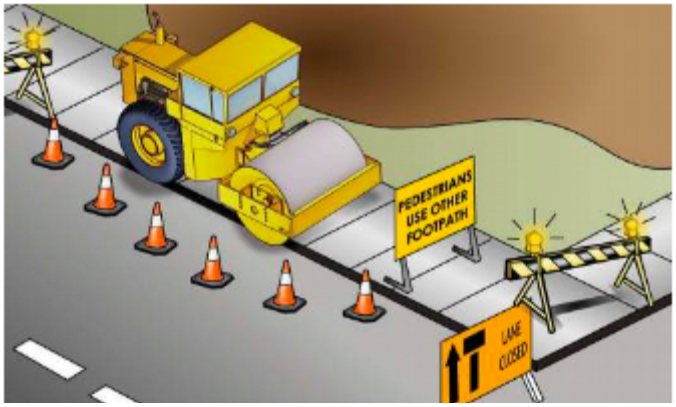
Where would you not park the roller?

Always park in a safe place on firm, level ground. Do not park near:

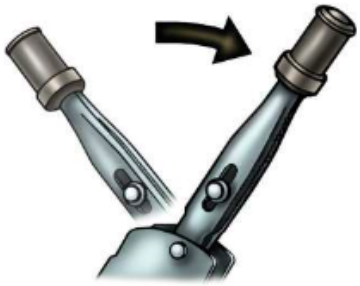


If you need to park the roller near an access way (for example, a footpath) what do you need to do?

Set up a barricade, lights and warning signs.



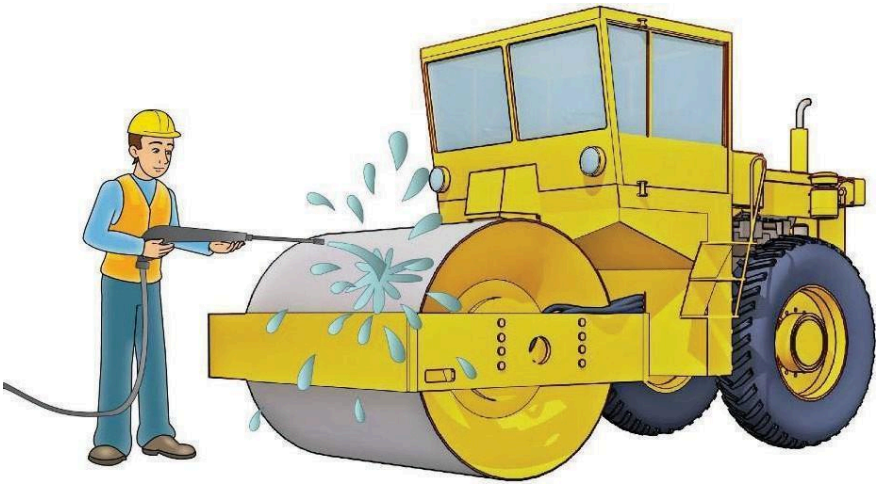
How do you shut down the roller?

Make sure the park brake is on and the control levers are in neutral position. 	Turn off the ignition and remove the key. 

5.1 Maintain Equipment

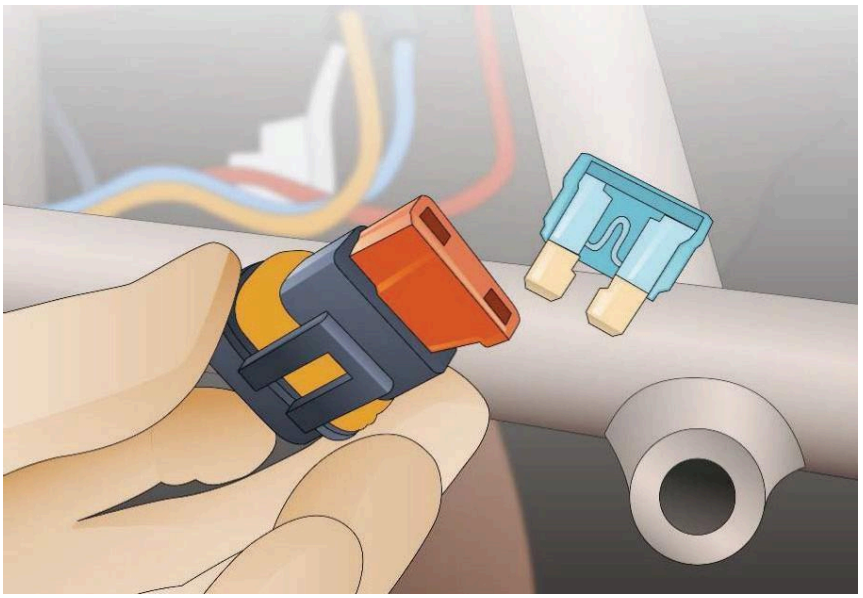
5.1.1 Pressure Clean

You may need to pressure clean the wheels, tyres or attachments before starting maintenance on machine.



5.1.2 Defective Parts

If you notice a defective part, for example, a fuse is blown or not working, you should arrange to have it replaced immediately. You must check the rules for your site and your state or territory. In some states only licenced mechanics are allowed to do any repairs.



How do you prepare the roller for maintenance?

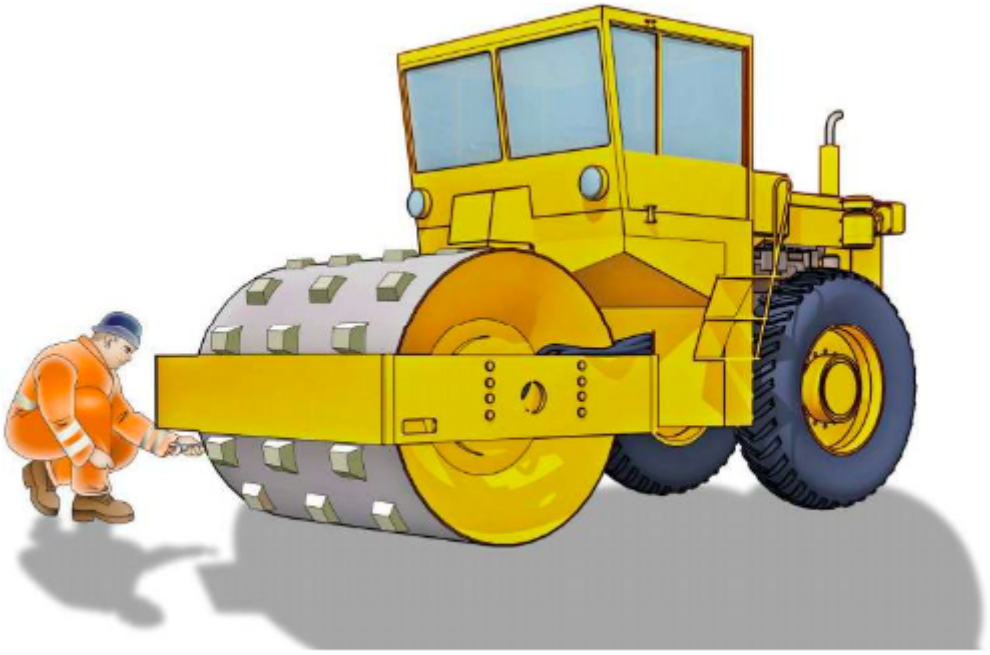
Clean the roller of dust, mud and debris. 	Move the machine to an area suitable for maintenance. 	Check the logbook for reported maintenance or repairs required. 
Make sure the roller cannot move while maintenance is being done. 	Fit the steering lock to stop the machine from steering unexpectedly. 	Complete any workplace documents needed to request repairs or supplies. 

What do you have to clean on the roller?

Clean the windows and cabin 	Clean the attachment 

Who is allowed to fit and remove attachments (such as sheepsfoot pads) to a roller?

Only a competent person who has been trained to do the job.

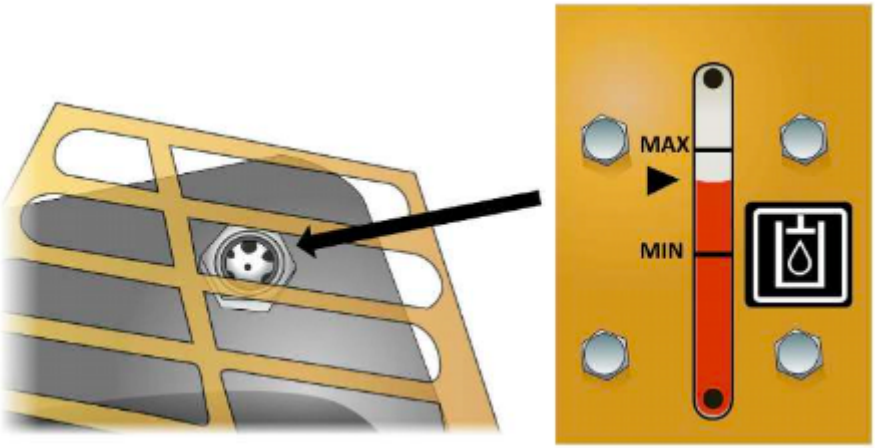


You need to take off the radiator cap to check the level. How do you take off the cap?

Wait until the radiator has cooled. Use hand protection and undo the radiator cap slowly to release pressure. If you release it too quickly the pressurised coolant may spray out.

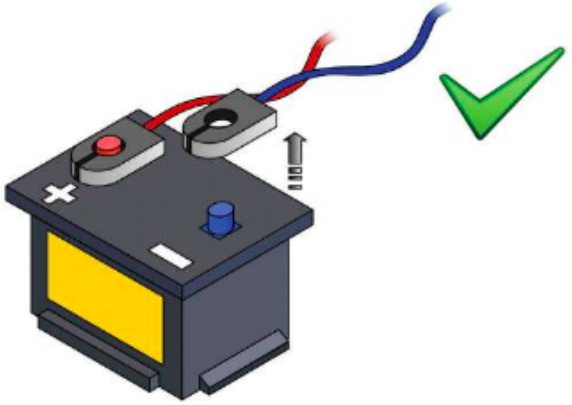
You're refilling the hydraulic storage tank. Why should you leave some space in the top?

Leaving some space in the top gives the hydraulic fluid room to expand when it heats up.



You want to change the battery. Which cable do you disconnect first, positive or negative?

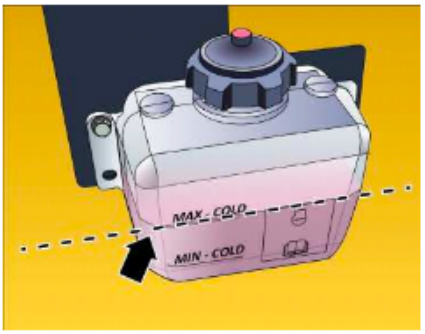
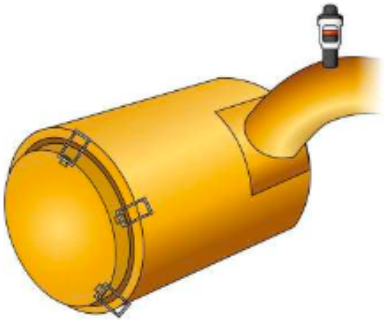
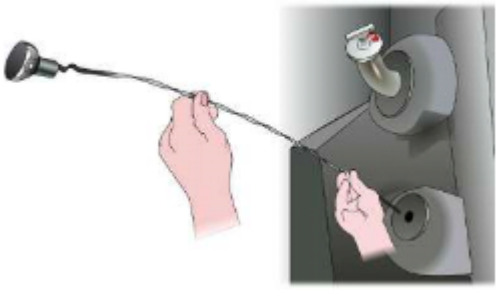
Negative (earth)



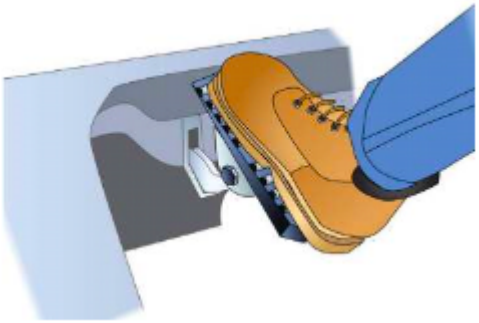
How do you know when and what to service on the roller?

Check the hour meter and service sticker on the machine. The hour meter tells you how many hours the machine has been operated. 	Check the logbook 	Check the operator's manual 

What are some examples of maintenance you would do every 10 service hours?

Check the coolant level 	Check air filter indicator 
Test the backup alarm 	Check engine oil level 

Check brake pedal for excessive movement



Check steering hydraulics

Check seat belt

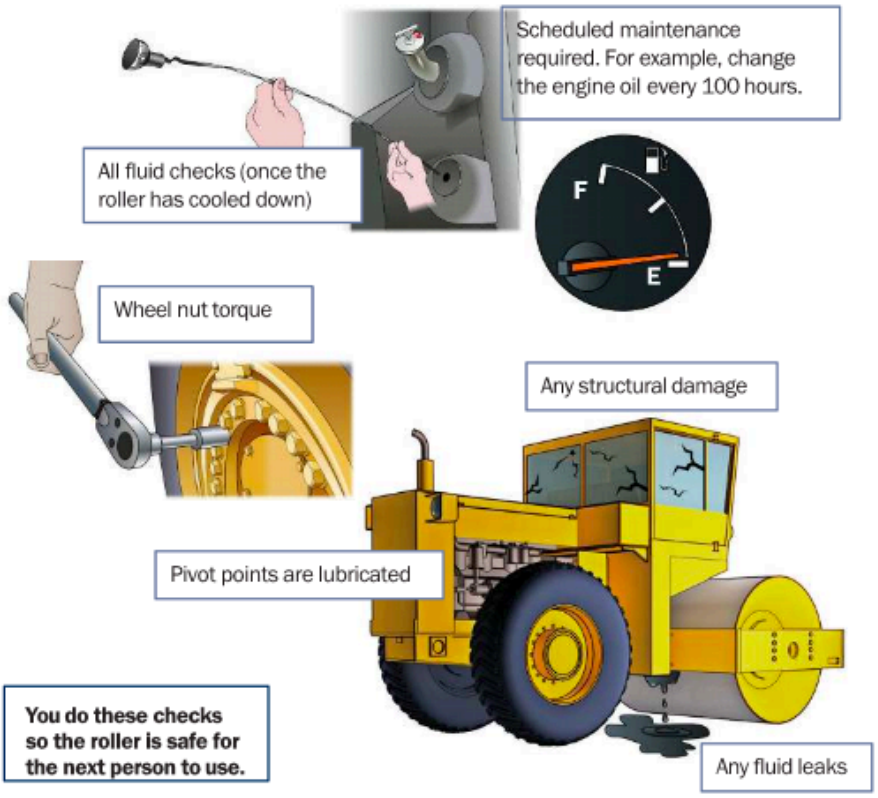
Check indicators

Check gauges

Clean windows

What maintenance checks do you do after you've finished using the roller?

Check for:



5.2 Housekeeping

5.1.1 Clean Up

Recycling items

Many environmentally sensitive items can be recycled. Items such as batteries, oil and gas cylinders can sometimes be recycled and reused.
Some oils can be taken to a recycling centre. With oil, bring your materials to the recycling centre in a clean, plastic container with a lid. The original container is a good container to return the oil in.

What instructions do you follow when cleaning up?

The environmental management plan and site procedures.

What is the danger of leaving earth and rocks around the work site?

Someone might trip on a rock and be injured. Rocks left on the road can damage cars.

After you've finished the job, what should you do?

Tell people who live in the area that the work is finished

Clean the job site	Throw away any rubbish and recycle what you can.
	

What do you do with other equipment and tools you've used?

Clean tools and equipment, and put them back in their place.

5.3 Record Keeping

Where do you record the work done when repairing and maintaining service equipment?

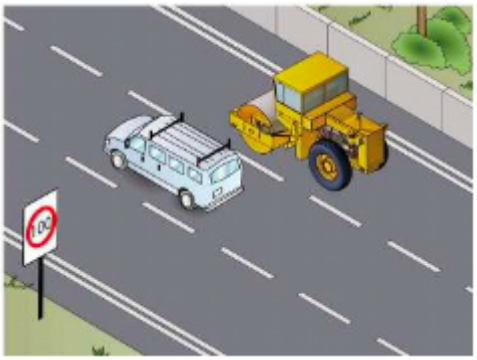
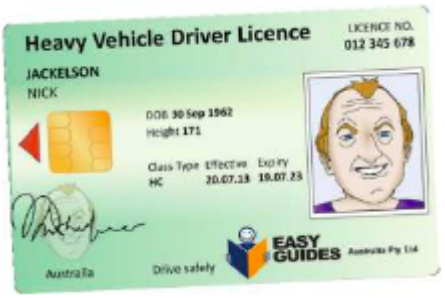
Enter all repairs and maintenance on equipment in the site specific record book or system.

Where do you record the materials, parts and lubricants used when servicing machines and equipment?

In the site specific record books or record keeping systems.

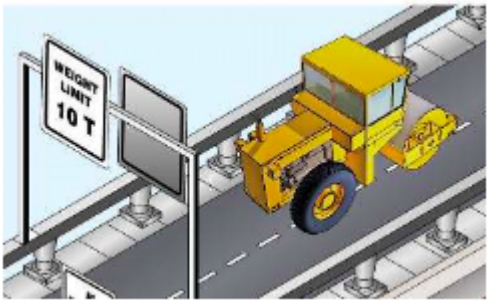
5.4 Relocate Equipment

You are going to drive a roller to a new work site. What should you do before starting to relocate themachine?

Clean the machine to prevent the transfer of contaminants and weeds 	Check to see which roads you can or cannot use 
Check any speed restrictions that may stop you from using a road 	Check to make sure you have the correct licence to drive the machine on the road 
Obey speed limit signs	Drive in the correct lane

Check the registration details of the machine to make sure it is allowed on the road

Check if there is any weight restrictions on any road you will need to use.

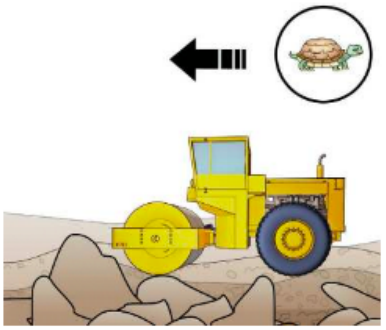


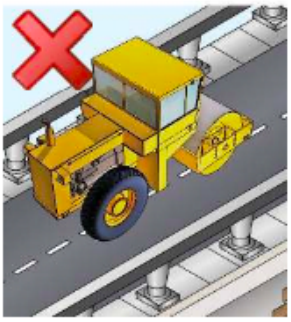
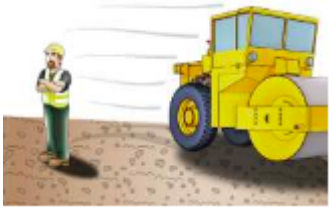
You are going to move the roller between worksites. You will be loading the roller on a public road and will need to control the flow of traffic. Do you need to be qualified to do this?

Yes, you must be a qualified traffic controller. For example: RIIWHS302 – Implement traffic management plan This unit covers the competency required to implement a traffic management plan in the civil construction industry. It includes planning and preparing, setting out, monitoring and closing down the traffic guidance scheme and cleaning up.

What are some things you should remember when driving the roller between sites?

Ask someone to help you if the area is busy	Travel at low speed



Do not drive on surfaces the roller may damage 	Don't get off the machine while it's moving 	Always follow all rules and laws. 

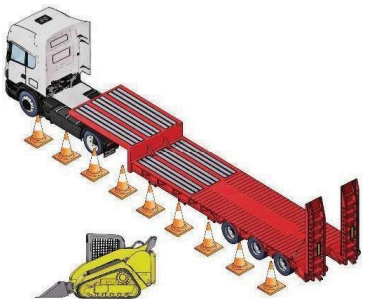
5.4.1 Loading and Unloading from Float/Trailer

As the operator of a skid steer loader there may be times when you need to assist in loading or unloading the skid steer from a float or trailer. To perform this activity safely you should have completed, or be assisted in the loading/unloading by a person who has completed suitable training in loading and unloading plant. For example unit RIIHAN308F Load and Unload Plant or an equivalent unit would be suitable.

Anyone who loads or unloads a heavy vehicle is responsible for playing their part in the Chain of Responsibility which falls under Heavy Vehicle National Law. As a loader/unloader you have an influence over where and how goods are loaded and therefore have an ongoing responsibility to prevent breaches.
The key responsibilities of a loader/unloader may include ensuring that:

- Loads do not exceed vehicle mass or dimension limits*
- Goods carried are appropriately secured*
- You provide reliable weight information to drivers*
- Load documentation is accurate*
- Delays in loading/unloading are prevented
- Your loading/unloading do not require or encourage drivers to exceed the speed limits or regulated driving hours, fail to meet the minimum rest requirements or drive while impaired by fatigue.

* Not relevant to an unloader

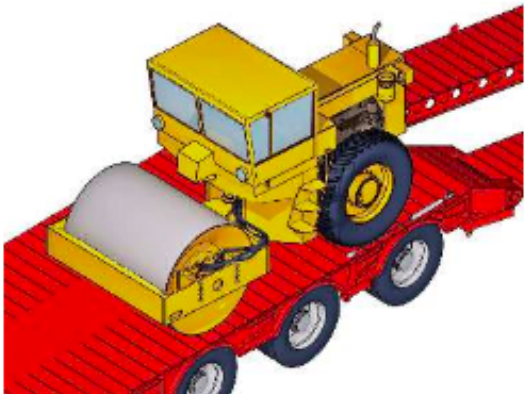


How do you load the roller on to the float or low loader?

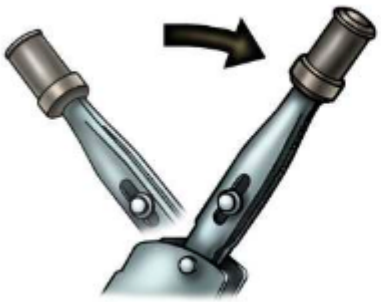
Ask someone to help you	Check that the float is clean and ready

Drive the roller towards the ramp at the right speed and angle. Don't change direction on the ramp.

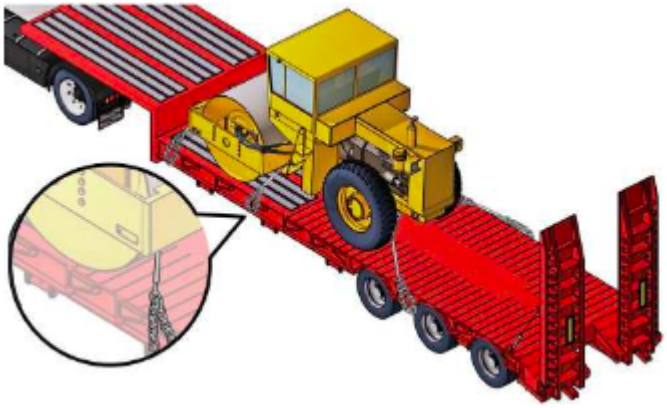
Park the roller on the vehicle



Secure the roller with the handbrake and remove the keys.



Tie down the roller using lashings, chains or straps to secure it to the vehicle.
Make sure you check the condition of the tie downs.



Are there regulations about securing a load on a truck or trailer?

Yes, the load restraints must be able to hold the load from moving as shown in the table.

Direction	Retrain needed
Forward	80% of load weight
Rearward	50% of load weight
Sideways	50% of load weight
Bounce or upwards	20% of load weight

What is the danger of not securing the roller properly on the float?

The roller will move around on the float and could fall off on to the road. You could cause injury or death.