

RIIMPO317F

Conduct Roller Operations

Learner Guide Instructions

Who is this document for?

The learner.

What is in this document?

- Course information that matches the PowerPoint presentation.
- Review questions.
- Practical assessment instructions for learners.

What do you need to do before you use it for the first time?

1. Rebrand the document.
2. Review the document as part of your validation process.
3. Set the reading and test time limits that are highlighted in pink at the end of the document.

See the 'Read Me First' document for a complete set of instructions on how to use these resources.

LEARNER GUIDE

RIIMPO317F Conduct Roller Operations

Learner Name:	
Learner ID:	
Learner Contact Number:	
Learner Email Address:	
Date Training Commenced:	

This Book Contains:

- Course Information.
- Review Questions.
- Practical Assessment overview and instructions.

Evaluation Copy Only

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1.1 Introduction



This course is based on the unit of competency **RIIMPO317F Conduct Roller Operations**.

This course covers roller operations in the civil construction industry and will look at:

- ◆ Planning and preparing for operations.
- ◆ Routine checks.
- ◆ Using attachments.
- ◆ Operating the roller.
- ◆ Maintaining the roller.

The different types of rollers and which roller is best equipped for different activities will also be discussed.

1.1.1 What is a Roller?

A roller is a self-propelled or towed machine used for the primary purpose of compacting a variety of types of construction materials. It may be rubber tyred, smooth drum, padded drum or grid (open) face type.

A roller achieves compaction by one or more of the following methods:

- ◆ Static weight.
- ◆ Kneading.
- ◆ Vibration.
- ◆ Impact.

A grid roller is used to break down oversized construction materials.

Padded drums may include sheepsfoot, padfoot, tamping foot or wedge foot.



1.1.1.1 Types and Applications of Rollers

The types of rollers you may use while working on a civil construction site are:

Self-Propelled Rollers	
	
<p>Self-Propelled Pneumatic Tyred Roller Also known as rubber tyred roller. A roller type that is used to finish fresh sealed asphalt to produce a trafficked finish, and to bed down the asphalt or sealed surface. Spreads the compaction across the tyres and compacts the surface by pressing down on the surface with the weight of the roller and the rolling of the tyres.</p>	<p>Self-Propelled Smooth Drum Vibratory Roller Commonly identified as a basic roller.</p>
	
<p>Self-Propelled Padded Drum Vibratory Roller Rollers that are used for compaction and pulverising materials. They have a square or rectangular block attached to the drum of the roller in a pattern that enhances the ability of the roller to compact and pulverise the ground.</p>	<p>Self-Propelled Double Drum Vibratory Roller The drum vibrates at different speeds and frequencies to achieve greater compaction. At a half setting the vibrating is fast and achieves shallow compaction. At full setting the vibration is slower and achieves a much deeper compaction. A vibratory roller has an advantage over static rollers in that it can achieve greater compaction for the same weight machine.</p>
	
<p>Self-Propelled Smooth Drum Roller (Including 3 Pointers) Sometimes called static rollers. Used in a similar way as smooth drum rollers utilising the weight of the roller to compact materials.</p>	

Towed Rollers



Towed Grid Roller

Used for breaking up rocky material while compacting the materials. These rollers are usually towed behind a tractor.



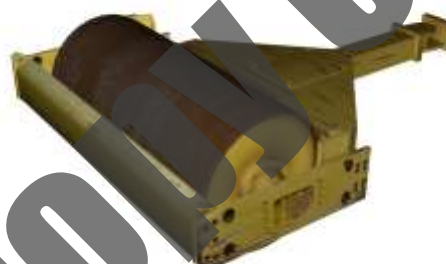
Towed Pneumatic Multi-Tyred Roller

A series of pneumatic or rubber tyres that kneads and smooths the surface



Towed Padded Drum Vibratory Roller

Commonly towed behind another item of machinery such as a grader or tractor. Used for multi-tasking and for keeping onsite costs down.

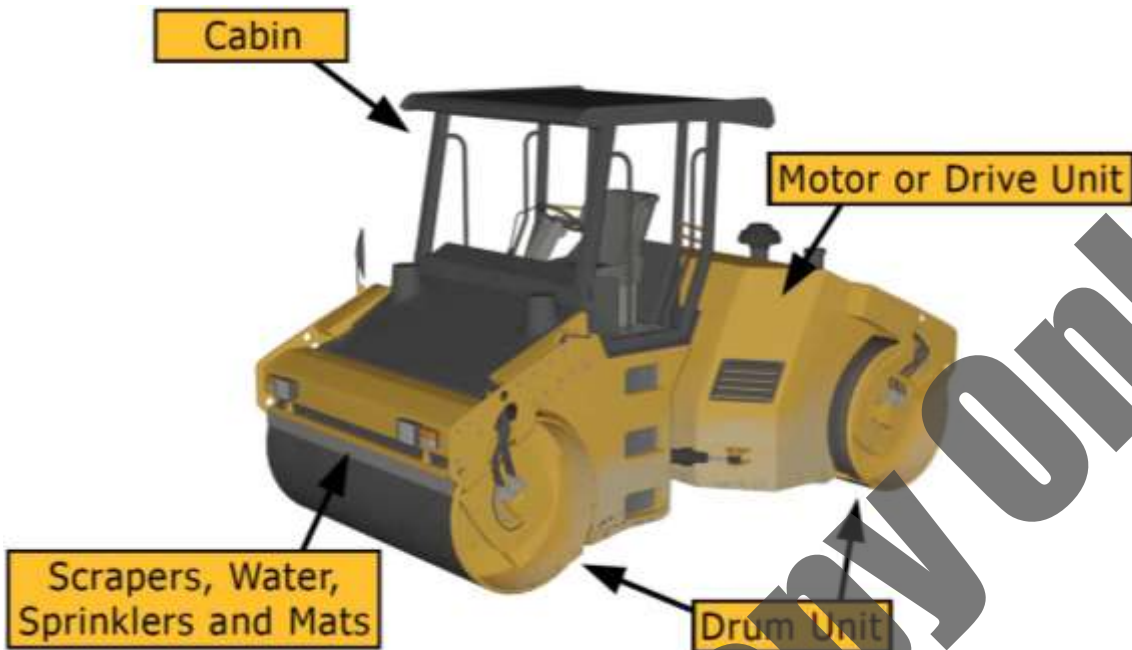


Towed Smooth Drum Vibratory Roller

This tow behind attachment is used to compact materials using vibration.

1.1.1.2 Roller Components

The following diagram and table explains the basic components of a roller.



Component	Description
Cabin	Part where operator sits and operates the machine. Controls include: joy stick or control levers, transmission controls, brakes, and emergency stop controls.
Motor or Drive Unit	Engine of the machine.
Drum Unit	Can be single drum, double drum or rubber tyre.
Scrapers, Water Sprinklers and Mats	Used to prevent hot asphalt from sticking to roller drums. May not be present on all rollers.

1.1.1.3 Roller Operations

On a civil construction worksite the primary task of the roller and roller operator is compaction of materials to the required amount.

When you are operating a roller you will be expected to:

- 1. Compact the materials to the required density.** Also known as percentage of compaction.
- 2. Comply with the roller pattern.** This pattern is generally half a drum overlap from the last pass, but may be different in specific circumstances. The required pattern will be told to you during a tool box meeting or other site meeting. If you are unsure of the required pattern, ask your team leader.
- 3. Seal and finish the surface.** This means you will be ensuring the final road surface is fit for purpose and safe to use. Generally a multi-tyred roller is used for this task.



You may be working with:

Earthworks	Base level materials or soil type materials.
Pavement	Depending on the location within Australia this could refer to the entire road area or may mean a concrete type surface.
Bitumen	The black, oil by-product that is mixed with an aggregate to create a road surface that is flexible, yet waterproof.
Asphalt	The name given to bitumen and aggregate mixture that is used to cover base levels to build a road.

Your roller pattern may vary and the type of roller you are operating will vary depending on the task you are doing and the material you are working with.

Review Questions

1.	What are the 2 main types of rollers?	<input type="checkbox"/>
1.		
2.		

1.2 Working Safely

You must follow all safety rules and instructions when performing any work. If you are not sure about what you should do, ask your boss or supervisor. They will tell you what you need to do and how to do it in a safe way.



1.2.1 Health & Safety Rules

Every workplace has to follow laws and rules to keep everyone safe. There are 4 main types:

Acts	These are laws that you have to follow.
Regulations	These explain what the law means.
Codes of Practice	These are instructions on how to follow the law, based on industry standards.
Australian Standards	These tell you what the minimum requirement is for a job, product or hazard.

Some states use OHS laws, and other states use WHS laws. They both talk about the same thing, but use different words or names for people. If you have any questions about safety rules you should talk to your boss or supervisor.

1.2.2 Operations Documentation

Before starting your work you need to make sure you have access to all operations documentation for the job. This will help you to do your work in the safest way and make sure all work is compliant.

Operations documentation includes:

Site Details	The information and safety requirements of the workplace environment (where you will be working).
Hazard Details	Any hazards in the work area or related to the work. This could also include instructions on how to handle dangerous or hazardous materials.
Task Details	Instructions of what the work is or what you will be doing. Also instructions on how to safely do the job.
Faulty Equipment Procedures	Isolation procedures to follow or forms to fill out.
Signage	Site signage tells you what equipment you need to have, or areas that are not safe to be in.
Emergency Procedures	Instructions on what to do in emergency situations, for example if there is a fire, accident or emergency where evacuation or first aid is needed.
Equipment and Work Instructions	Details of how to operate plant and equipment and the sequence of work to be done.

1.2.3 How to Keep Everyone Safe

WHS law says that all companies and workers need to keep themselves and other people safe while they work. This is called a duty of care.



To keep yourself and other workers safe you need to:

- ◆ Follow your instructions.
- ◆ Follow all workplace rules.
- ◆ Make sure all equipment is safe to use.
- ◆ Carry out your work safely.
- ◆ Report any problems.

If you think something is dangerous tell your boss or supervisor as soon as possible.

Your worksite will also have instructions for working safely including:

- ◆ Emergency procedures, including using fire fighting equipment, first aid and evacuation.
- ◆ Handling hazardous materials.
- ◆ Safe work practices.
- ◆ Personal protective clothing and equipment.
- ◆ Safe use of tools and equipment.



Review Questions

2.	What are the 4 main types of health and safety rules?	<input type="checkbox"/>
1.		
2.		
3.		
4.		

3.

List 3 things that may be included in 'operations documentation'.



1.

2.

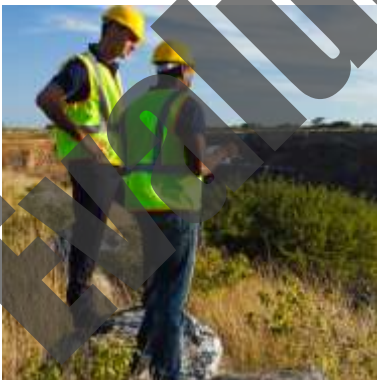
3.

1.3 Work Instructions

You need to be clear about what work you will be doing. Make sure you have everything about the job written down before you start. This includes what you will be doing, how you will be doing it and what equipment you will be using.



Make sure you have all of the details about where you will be working. For example:



- ◆ **The Site** – Is there clear access for all equipment? Are there obstacles in the way? What are the ground conditions like? Is the site ready for your work to begin? Are there structures, workers, traffic or areas that you need to avoid?
- ◆ **The Weather** – Is there wind, rain or other bad weather? Is it too dark?
- ◆ **Traffic** – Are there people, vehicles or other equipment in the area that you need to think about? Do you need to get them moved out of the area? Do you need to set up barriers or signs?
- ◆ **Hazards** – Are there dangerous materials to work around or think about? Will you be working close to other people?

You also need to make sure you have all of the details about the kind of work you will be doing:

- ◆ **The Task** – What kind of material is being compacted? How much is there to work with? How long do you have to complete the work? Where will the work be done? Does the job need a special type of attachment?
- ◆ **Plant** – What type of plant will be used? How big is it? How much room does it need?
- ◆ **Attachments** – What equipment will you need to compact the load safely? Is the equipment available?
- ◆ **Communications** – How are you going to communicate with other workers?
- ◆ **Procedures and Rules** – Do you need any special permits or licences for the work? Are there site rules that affect the way you will do the work e.g. traffic control requirements?



1.3.1 Roller Operations Documentation

Examples of details that will be included in your operations documentation:

Operations Details	Use
The Pattern and Density of Compaction Requirements	To ensure the task meets specifications.
Sealing or Finishing Compaction Percentages	Is required for quality assurance and to meet task specifications.
The Type of Materials Being Compacted	This makes it easier to predict the amount of time needed to complete the task.
Earthworks Calculations	Best described as knowing the capacity of the machine, how much material it can compact in each pass, how many passes can be done in an hour or the length of the pass circuit.

Being able to access, interpret and apply the requirements of the documents is part of the job for any plant operator.

1.3.2 Reading and Checking Your Work Instructions



All work needs to follow worksite, environment and company safety procedures.

Procedures help to make sure that all work is done in a safe way, without damaging equipment or putting people in unsafe situations. They also help to make sure that work is done in the correct order and doesn't interrupt or get in the way of other work that is happening on the site. This is especially important in civil construction projects that need to be completed in a particular sequence.

Your work instructions will tell you the safest way to do the job, and the equipment that you will need to use. It is a good idea to check your work instructions with your boss or supervisor to make sure you know exactly what you need to do.

If you don't know where to get your instructions or you can't understand the language or civil construction terminology being used in them, you can ask your boss or supervisor. They will tell you where to find your work instructions and explain what they mean.

1.3.3 Work Method Statements



Many worksites require a work method statement before any work can start. A work method statement is a list of steps that outlines how a job will be done. It also includes any hazards that occur at each step, and what you need to do about them.

These statements can also be known as Safe Work Method Statement (SWMS), Job Safety Analysis (JSA) or Safe Operating Procedure (SOP).

Work method statements are a great tool for organising your work activities and making sure you have completed everything. They will also outline the details of all tools, equipment and coordination with other workers relating to your job. Make sure all of these are available and ready before you start.

1.3.4 Project Quality Requirements

Every civil construction project will have quality requirements. These outline when tasks need to be completed and the required standard of the work.

Your work instructions and plans or drawings will guide you, and help you to make sure you are achieving the quality standard for the project.

They can include:

- ◆ Project dimensions.
- ◆ Project tolerances.
- ◆ Standards of work.
- ◆ Material standards.



1.3.4.1 Plans, Drawings and Sketches



When looking for information or instructions for a civil construction project, you will come across plans, drawings and sketches. Examples of these are:

- ◆ Project plans.
- ◆ Site plans.
- ◆ Work plans.
- ◆ Project drawings.
- ◆ Sketches made to explain work that is happening on site.



Plans and drawings are useful because they can help you to get an overview of the site and the project as a whole. It can also be the best way to explain exactly what needs to be done.

You need to be familiar with the scale and symbols used in the plans and drawings so you can understand them properly. If you're not sure ask your supervisor or other site personnel for help.

1.3.5 Civil Construction Sequences

Civil construction projects are made up of a range of smaller tasks or activities. It is important that these are done in the right order for the project to go smoothly.

Here is a basic civil construction sequence from clearing the area through to preparing for road construction:



1.3.6 Basic Earthworks Calculations

As a roller operator, the main calculation you will need to be able to apply is for Area.

Area can be calculated using the following formula:

Area = Length (L) x Width (W)

For example:
40 square metres (40m²) may be marked out as:

- ◆ 10 x 4 metres.
- ◆ 5 x 8 metres.
- ◆ 20 x 2 metres.

Area = L x W = 10m x 4m = 40m ²	Area = L x W = 5m x 8m = 40m ²	Area = L x W = 20m x 2m = 40m ²
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