

RIIMPO324F

Conduct Civil Construction Grader 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

RIIMPO324F Conduct Civil Construction Grader 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.

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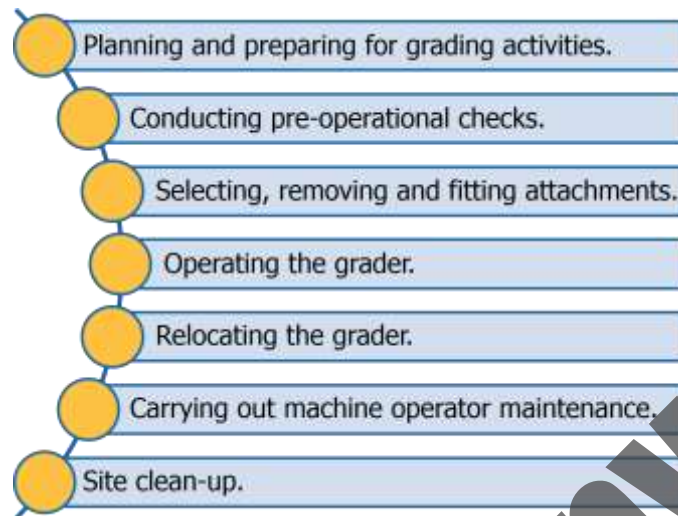
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1.1 Introduction

This course is based on the unit of competency **RIIMPO324F Conduct Civil Construction Grader Operations.**

You will learn about:



1.1.1 What is a Grader?

A Grader is a self-propelled vehicle that is used to move and place construction materials using a centrally mounted blade.

Standard models have three axles, with the cab and engine above the rear axles at one end, a third axle at the front end, and the blade in between.

Graders may have a forward and rear mounted blade, rippers or scarifying points.

On most graders the blade and attachments controls are hydraulic but some may be mechanical. It is important to note that it is not permissible to carry a passenger on the grader.



On a civil construction site a grader will be used to:

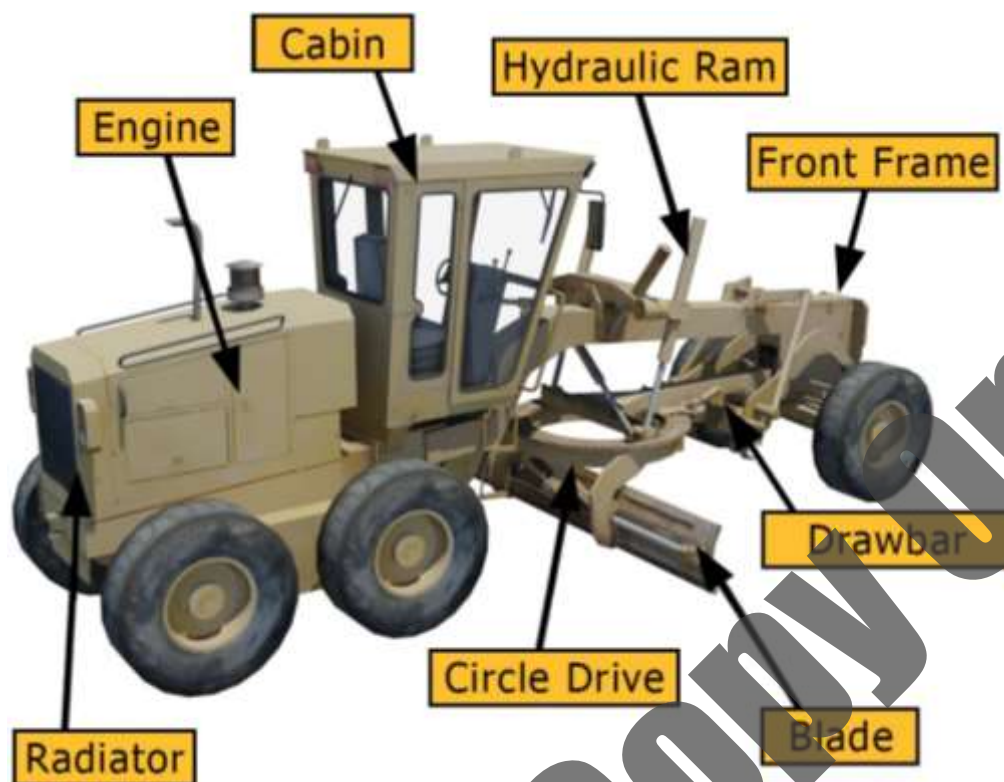
- ◆ Level materials.
- ◆ Form and carry windrows.
- ◆ Cut and maintain drains.
- ◆ Form, upgrade or maintain a road.
- ◆ Mix or spread materials.
- ◆ Perform scarifying or ripping.
- ◆ Cut and trim batters.
- ◆ Trim road sub-grades and pavements.
- ◆ Strip or spread topsoil and materials.
- ◆ Perform cutting and boxing.
- ◆ Cut and fill.
- ◆ Clean-up the site.



The materials that a civil construction grader will commonly work with include clay, mud, topsoil and organic materials, stones, rocks and gravel, silts and sand, and construction site materials such as bituminous mixes and waste materials.



1.1.2 Common Grader Components



Component	Explanation
Engine	Engine of the machine. With a grader this is located behind the cab.
Radiator	Helps to maintain the temperature of the engine.
Cabin	Part where operator sits and operates the machine. Controls include: joy stick or control levers, transmission controls, brakes, emergency stop controls.
Blade	The pushing implement on the machine. It is used to push, level and shape materials.
Hydraulic Ram	Generic name given to all hydro-static drive units including hoses and rams.
Front Frame	The front frame is connected to the front wheel axle, and supports the structure of the entire grader. The front frame is designed to allow for the movement of the blade underneath.
Drawbar	Part of the blade and circle drive assembly system for the grader. Acts as a support system for the blade. Sometimes called a 'saddle'.
Circle Drive	Allows the blade to be rotated. May also be nicknamed a 'turn table'.

For exact details on the components for the machine you are operating, check your operator's manuals as different brands have different components.

1.1.3 Grader Abilities

As the grader is such a versatile machine, they can perform many specific movements to complete a task. Most of these movements happen with the front half of the grader.

Some of the main movements include:

Straight

Uses front wheel drive steering.

Most often used for long straight passes, finishing surfaces, small windrows and scarifying/ripping.



Articulated

Uses front wheel drive steering and the frame.

Often used on the side of windrows and to alter the blade cutting width.



Crab Steer

Both front and rear wheels travel in the same direction.

The front frame travels in an angled direction.

Most often used for levelling dumped materials without driving over the dumped pile in front.



1.2 Site Policies and Procedures

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.

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 (this can include diagrams or plans). 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.



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 operating procedures.
- ◆ Personal protective clothing and equipment.
- ◆ Safe use of tools and equipment.

Review Questions

1.	List 3 things that may be included in 'operations documentation'.	<input type="checkbox"/>
<div>1.</div> <div>2.</div> <div>3.</div>		

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?
- ◆ **Facilities and Services** – Are there power lines or other overhead or underground services to think about?
- ◆ **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 materials are being moved? How much is there? How long do you have to complete the work? 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 shift the materials 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 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.

1.3.2 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. This is because they outline the details of all tools, equipment and coordination requirements with other workers relating to your job. Make sure all of these are available and ready before you start.



1.3.3 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.

1.3.3.1 Site Product Characteristics

Make sure you are familiar with the site product or materials before you start to move them around. Have a look at the composition of the materials to see what kind of equipment you will need to move them, and what techniques to use.

Some materials are more cohesive or sticky while others may be much less stable to work with, or create hazards like dust, contamination or damage to equipment if they are not handled just the right way.



1.3.3.2 Checking Level and Grade Requirements



You need to check the floor clean up procedures to make sure you are able to achieve the specified levels and grades. These will be outlined in the project details and your instructions.

This could also include other areas such as the pad, road, ramps, and bench clean up procedures.

1.3.3.3 Plans, Drawings and Sketches

Some of your work instructions might be given to you in drawings and sketches. You will need to get the information out of these and use it to do your job.

Project plans and drawings give you an overview of the site, for example:

- ◆ Location of the site and earthworks in relation to the surrounding area.
- ◆ The position of structures, roads, access areas.
- ◆ Layout of drainage lines.
- ◆ Foundation details and landscaping features.



Depending on the project, drawings may be very detailed or they could be simple sketches.

You should learn about the conventions and symbols used in the plans and drawings so you can understand what the information means.

1.3.4 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:



1.3.5 Basic Earthworks Calculations

As a grader operator, the main calculation you will need to be able to apply are 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 = 40m²	Area = L x W = 5m x 8m = 40m²	Area = L x W = 20m x 2m = 40m²
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Review Questions

2.

What details about the work area can you get from your work instructions?

☐

3.

Why is it a good idea to check your work instructions with your boss or supervisor?

☐

4.

What is a work method statement?

☐

5.

What details are outlined in project quality requirements?

☐

6.

How can you make sure you are familiar with the site product materials before you start to move them around?

☐

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