

RIIMPO320F

Conduct Civil Construction Excavator 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

RIIMPO320F Conduct Civil Construction Excavator 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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1.1 Introduction



This course is based on the unit of competency **RIIMPO320F Conduct Civil Construction Excavator Operations.**

In this course you will learn how to use an excavator in civil construction including:

- ◆ Planning and preparing for work.
- ◆ Conducting routine checks.
- ◆ Operating excavators.
- ◆ Relocating the excavator.
- ◆ Maintenance and other housekeeping tasks.

1.1.1 What is an Excavator?

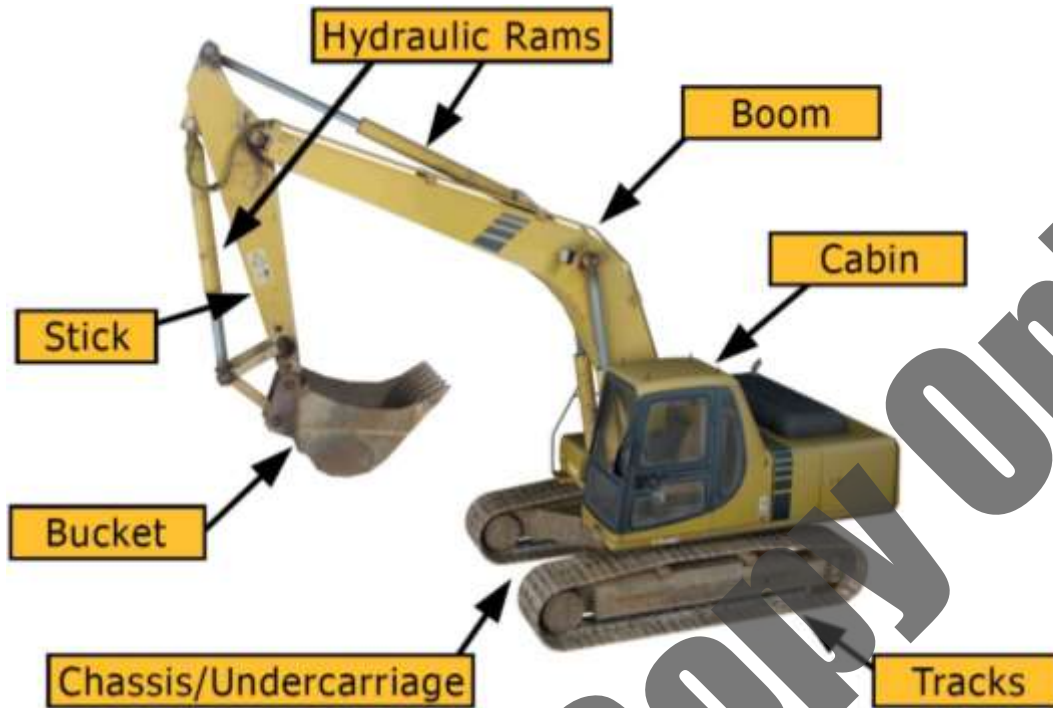
An excavator is a self-propelled vehicle, either tracked (crawler) or wheeled, with an upper structure that can move a minimum of 360 degrees.

The machine can excavate, then swing and discharge materials. This action is done through movement of a bucket fitted to the boom and arm or telescoping boom. There is no movement of the chassis or undercarriage of the machine.



1.1.2 Excavator Components

The following diagram and table outline the basic components of an excavator:



Component	Description
Hydraulic Rams	Control the boom/arms of the hydraulic excavator.
Boom	The 'arm' of the excavator may be used to excavate or control any other relevant attachment. The boom is generally controlled through the use of hydraulic rams.
Cabin	The position that the operator controls the excavator from.
Tracks	Tracks, made up of individual shoes, spread the weight of the excavator over a larger area than with tyres. This makes it easier for the excavator to move across soft ground without getting bogged.
Chassis/Undercarriage	The lower section of the excavator stays stationary while excavation work is being completed. The upper section of the excavator is able to slew (rotate) independently from the undercarriage.
Bucket	The tool used to perform excavation or other relevant tasks.
Stick	Provides the digging force to the bucket. Come in different lengths.

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



Review Questions

1.	What information could you access to make sure your work is compliant?	<input type="checkbox"/>

2.

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

1.

2.

3.

3.

How can you make sure you meet your Duty of Care requirements to keep yourself and other workers safe?

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 work to begin? Are there structures, workers, traffic or areas 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 power lines or 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 moved? How much is there to move? How long do you have to complete the work? Where will the load be discharged? Does the job need a special type of bucket or 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 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 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.

1.3.1.1 Excavator Operations



The tasks performed by an excavator may include:

- ◆ Loading.
- ◆ Lifting and carrying materials.
- ◆ Bulk excavation.
- ◆ Backfilling.
- ◆ Trench excavation.
- ◆ Stockpiling.
- ◆ Battering and benching.
- ◆ Compacting materials.
- ◆ Demolition.
- ◆ Rock breaking.
- ◆ Landscaping (ripping, removal of trees, stripping or spreading topsoil and materials).
- ◆ Cutting and boxing.
- ◆ Pipe laying.
- ◆ Cut and fill.
- ◆ Mixing materials.
- ◆ Site clean-up.

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. 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.



1.3.3 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 Material 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 or damage to equipment if they are not handled just the right way.

Part of the civil construction project may involve compacting materials as part of creating roads. You will need to confirm the level of compaction that is needed in your work instructions or project plans.



1.3.3.2 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 site personnel for help.

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.

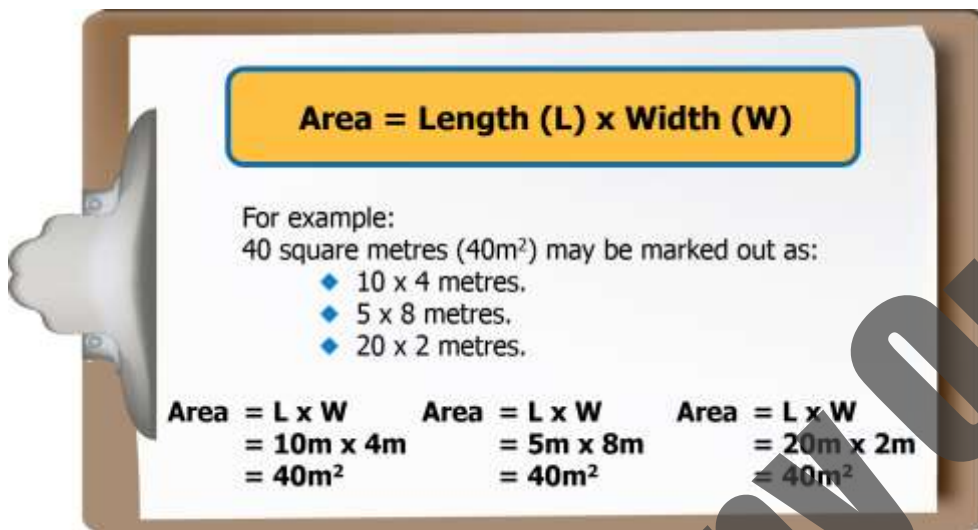
Here is a basic civil construction sequence from clearing the area through to preparing for road construction:



1.3.5 Earthworks Calculations

As an excavator operator, the two main calculations you will need to be able to apply are for **Area** and **Volume**.

Area can be calculated using the following formula:



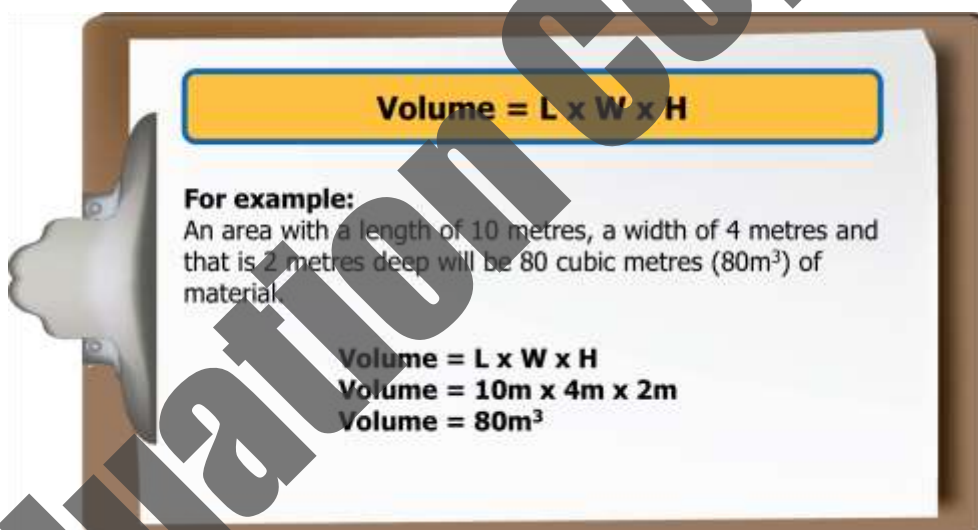
Area = Length (L) x Width (W)

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

Volume can be calculated using the following formula:



Volume = L x W x H

For example:
An area with a length of 10 metres, a width of 4 metres and that is 2 metres deep will be 80 cubic metres (80m³) of material.

Volume = L x W x H
Volume = 10m x 4m x 2m
Volume = 80m³

1.3.6 Emergency Procedures



Emergency procedures will vary depending upon the worksite. These procedures could include:

- ◆ Emergency shutdown.
- ◆ Evacuation.
- ◆ First aid.
- ◆ Fire fighting.

1.3.6.1 Emergency Shutdown of Equipment

If there is a fire, emergency or accident you might need to use the emergency stop on the equipment you are using. This will turn the equipment off immediately. You can also use the emergency stop if the equipment stops working properly or you lose control of the equipment.



1.3.6.2 Evacuation

Things to remember are:

1. Keep calm.
2. Move away from the danger to a designated evacuation point, sometimes called an emergency assembly area.
3. Do not let other people into the area.
4. Call emergency services in accordance with workplace procedures and policies.



1.3.6.3 First Aid



First Aid is the quick care given to an injured or ill person. Every site will have a First Aid Officer. If somebody needs first aid you must tell your supervisor or First Aid Officer. Do not try to give first aid if you have not been trained.