

RIIMPO319E

Conduct Backhoe/Loader 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

RIIMPO319E Conduct Backhoe/Loader 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 **RIIMPO319E Conduct Backhoe/Loader Operations.**

You will learn about:

- ◆ Planning and preparing for operations.
- ◆ Conducting pre-operational checks.
- ◆ Operating the backhoe/loader:
 - ◆ Lifting, carrying and placing materials.
 - ◆ Selecting, fitting and removing attachments for the backhoe/loader.
- ◆ Relocating the backhoe/loader from site to site.
- ◆ Carrying out machine operator maintenance.
- ◆ Cleaning up.



1.1.1 What is a Backhoe/Loader?

A backhoe/loader is a wheeled, self-propelled machine with a front-mounted bucket and rear-mounted backhoe/loader attachment.



The backhoe/loader loads and pushes materials. The backhoe/loader attachment digs into the ground to excavate materials.

When the bucket lifts or swings, it moves the materials toward the machine and then into the discharge area.

The machine should be stationary while the backhoe/loader attachment is being used.

The backhoe/loader attachment adds weight and length to the machine and this needs to be accounted for when moving it.

The attachment also adds crush, pin or pivot points. It is necessary to be aware of these points when operating the machine.

1.1.2 Backhoe/Loader Components

The following diagram and table outline the basic components of a backhoe/loader.



Component	Description
Bucket (Backhoe)	Hand section of the backhoe. The bucket does the digging and moving of material.
Stick (Backhoe)	Forearm section of the backhoe.
Boom (Backhoe)	Upper arm section of the backhoe. It is angled upwards so that digging is made easier with obstacles in the way.
Stabiliser Legs	Keeps the backhoe/loader stable while digging.
Cabin	Where the operator sits. The operator can face towards the loader or towards the backhoe. Each has separate controls to operate the attachments.
Tractor	Contains the engine of the machine.
Bucket (Loader)	Bucket at the front of the machine that loads, excavates, levels or pushes materials.

1.1.3 Backhoe/Loader Tasks

Backhoe/loaders are very functional machines capable of performing in a variety of tasks. These include:

Task	Description
Backfilling	Filling in holes.
Trench Excavation	Removing materials from designated areas in the trench formation.
Landscaping	Mixing of materials, stripping or spreading of topsoil or other materials such as gravels, also scrub clearing, ripping and cutting surfaces, compacting of surfaces.
Loading Plant	Loading materials onto other plant items, such as dump trucks, wagons, hoppers, chutes and any other cartage vehicle.
Lifting Materials	Transporting materials from one area to another.
Rock Breaking	Breaking rock and other demolition tasks.
Cutting and Boxing	<ul style="list-style-type: none"> ◆ Cutting is removing material above a required level, i.e. cutting down to create a floor or design level. ◆ Boxing is the technique of removing materials below a level and may involve trenching, or removing sections of pavement in a "box" type shape to a desired level. <p>Prior to both cutting and boxing, the area is usually ripped to loosen the materials. This makes the task easier to perform.</p>
Battering and Benching	<ul style="list-style-type: none"> ◆ Batters are the slopes adjacent to constructed works (cuttings or embankments). ◆ Benches are steps that are dug into the materials to allow safe working on slopes. <p>Both battering and benching take practice to achieve the required tolerances and shapes. It is necessary to know the limitations of the machine.</p> <p>Check site procedures and talk to experienced operators before attempting to cut or trim batters.</p>

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"/>
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 buildings, structures, facilities or trees in the way? What are the ground conditions like? Is there a safe place for the materials to be moved to?
- ◆ **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 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 load is being moved? How much is there? How big is it? How much does it weigh? Does it need any special lifting equipment?
- ◆ **Plant** – What type of plant will be used? How big is it? How much room does it need?
- ◆ **Attachments** – What equipment or attachments will you need to shift or handle 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? Are there site rules that affect the way you will do the work?



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.

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 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 used 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.

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.



1.3.3.2 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.

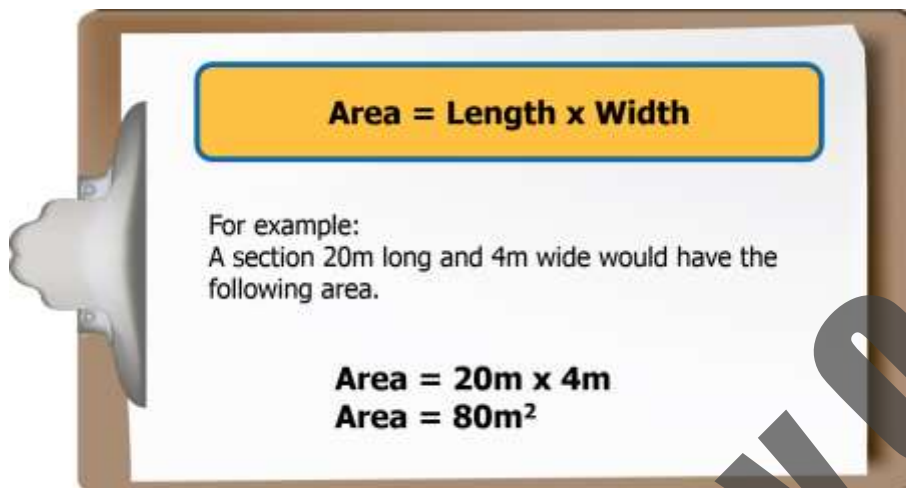
Here is a basic civil construction sequence from clearing the area through to preparing for road construction:



1.3.5 Basic Earthworks Calculations

As an operator, the 2 main calculations you will need to be able to apply are for Area and Volume.

Area can be calculated using the following formula:

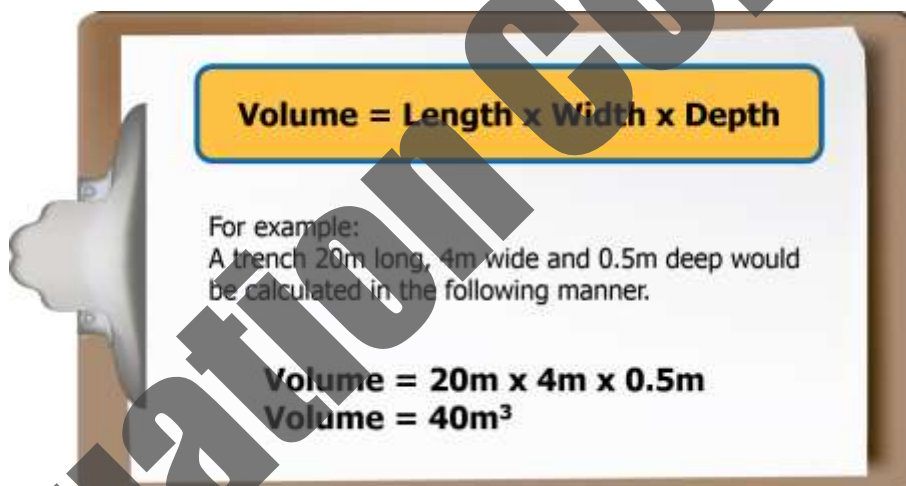


Area = Length x Width

For example:
A section 20m long and 4m wide would have the following area.

Area = 20m x 4m
Area = 80m²

The other common calculation is for volume. This is calculated by multiplying length x width x depth or height. That is, depth if it is a hole or height if it is a pile.



Volume = Length x Width x Depth

For example:
A trench 20m long, 4m wide and 0.5m deep would be calculated in the following manner.

Volume = 20m x 4m x 0.5m
Volume = 40m³

It is important that you are familiar with basic earthworks calculations, and are able to access and use calculation data on the worksite.

Review Questions

2.

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

3.

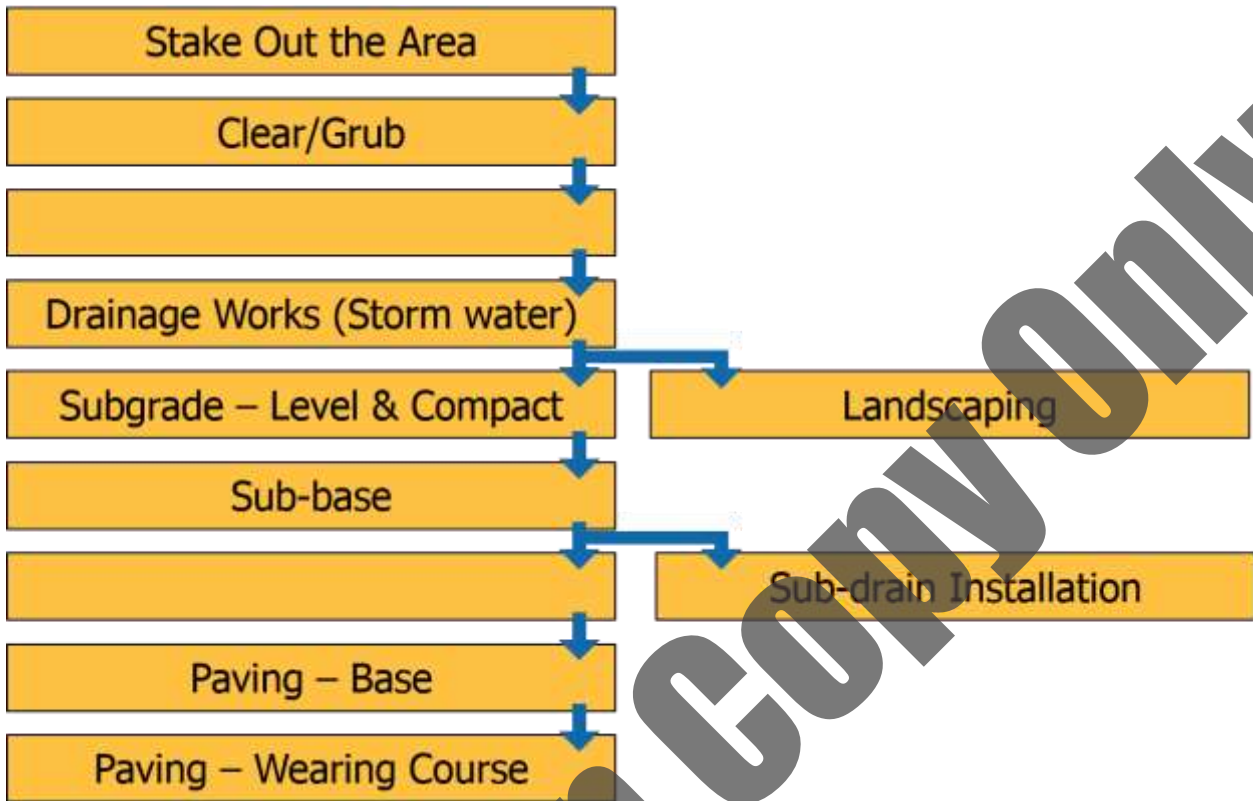
What is a work method statement?

4.

What details are outlined in project quality requirements?

5.

Fill in the blank steps in the civil construction sequence.



6.

What is the formula for calculating area?



7.

What is the area of a space that is 18m long and 2.2m wide?
Show all workings.

8.

What is the formula for calculating volume?

9.

What is the volume of a space that is 22m long, 2m wide and 1.5m deep?
Show all workings.