

RIICRC203E

Install Sub-Soil Drainage

Learner Guide Instructions

Who is this document for?

The learner.

What is in this document?

- Course training content (this matches the PowerPoint Presentation).
- Review questions.

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.

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



LEARNER GUIDE

RIICRC203E Install Sub-Soil Drainage

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

This Book Contains:

- Course Information.
- Review Questions.

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1.1 Introduction

These materials are based on the national unit of competency **RIICRC203E Install Sub-Soil Drainage Systems**. You will learn about:

- ◆ Planning your work and preparing the area.
- ◆ Setting out for the job.
- ◆ Excavating trenches.
- ◆ Installing bedding materials.
- ◆ Installing sub-soil drainage.
- ◆ Cleaning up.



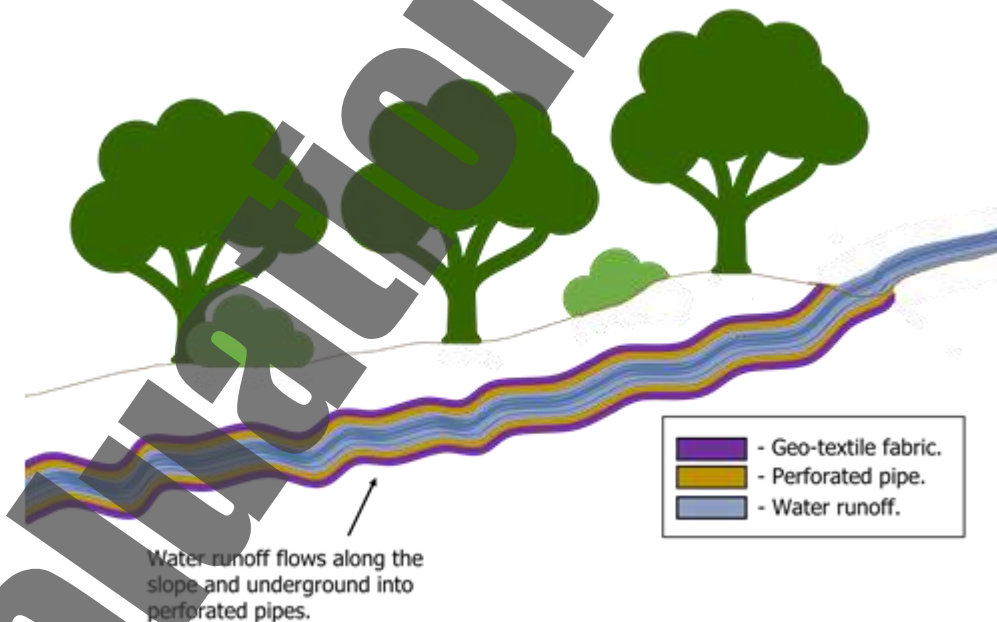
1.1.1 What is Sub-Soil Drainage?

Sub-soil drainage is a drainage system designed to be installed in the ground to remove excess water from soil. This is to prevent damage to buildings and landscapes from wet soil. Common types of sub soil drainage systems include:

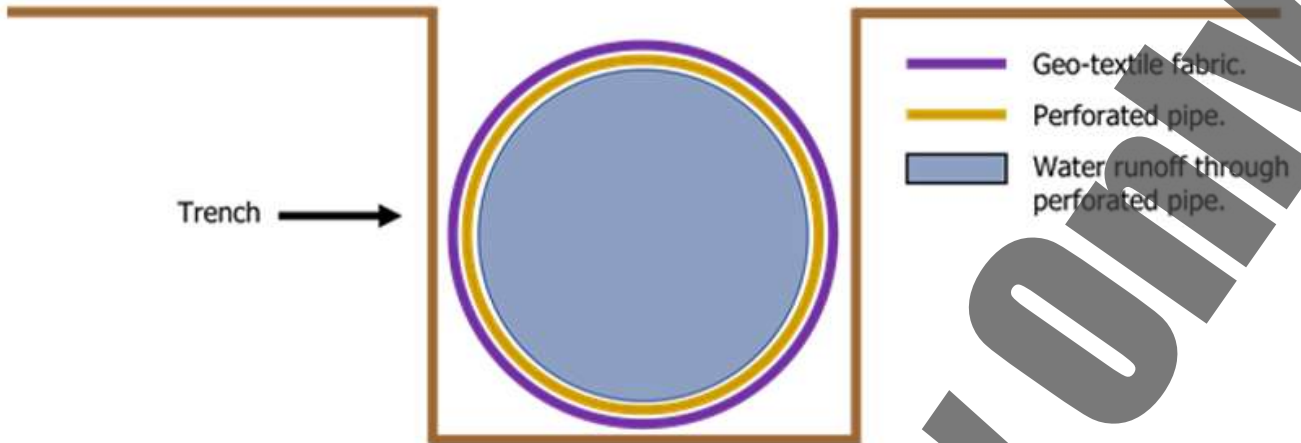
Perforated Pipes with or without Geo-Textile Fabrics

These systems are the most common type of sub-soil drainage and involve the installation of a pipe underground with small perforations (holes) which filter water runoff to remove any sediment (dirt and debris). These drainage systems may or may not include the use of geo-textile fabrics. Geo-textile fabrics increase the drainage systems ability to filter out sediment from runoff water.

Side profile of perforated pipes system:



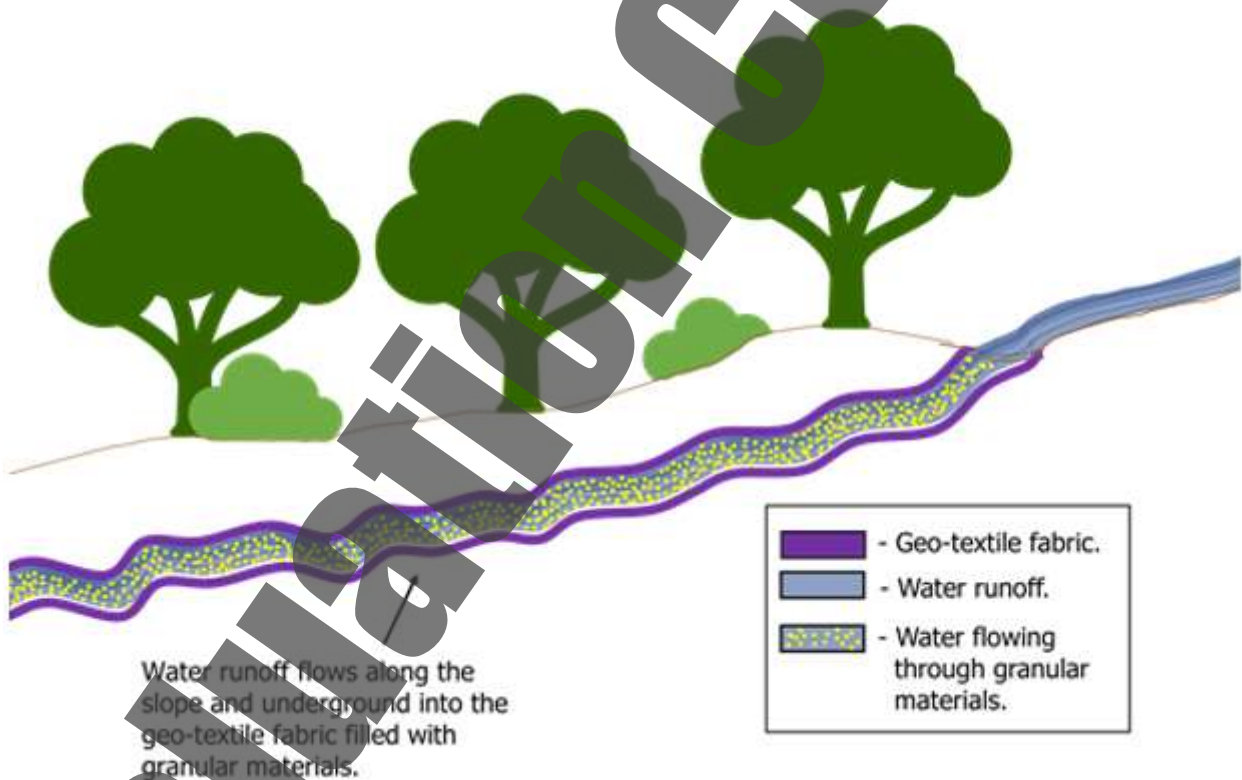
Cut-through section of perforated pipes system:



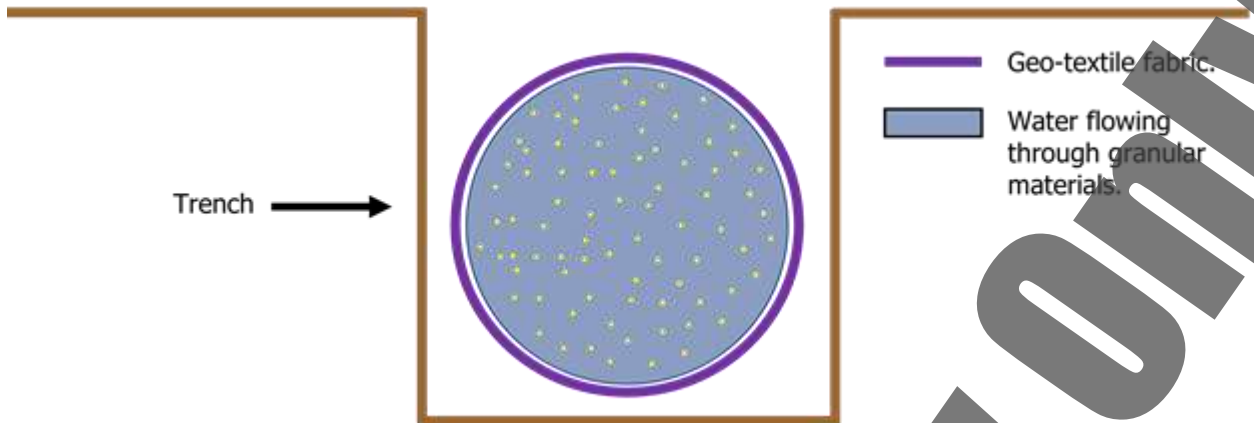
Granular Materials Enclosed in Geo-Textile Fabric

These systems involve the packing of geo-textile fabrics with granular materials like sand or fine pebbles which act in a similar way to a perforated pipe by further removing sediment from the runoff water stream flowing beneath the surface.

Side profile of granular materials enclosed in geo-textile fabric:



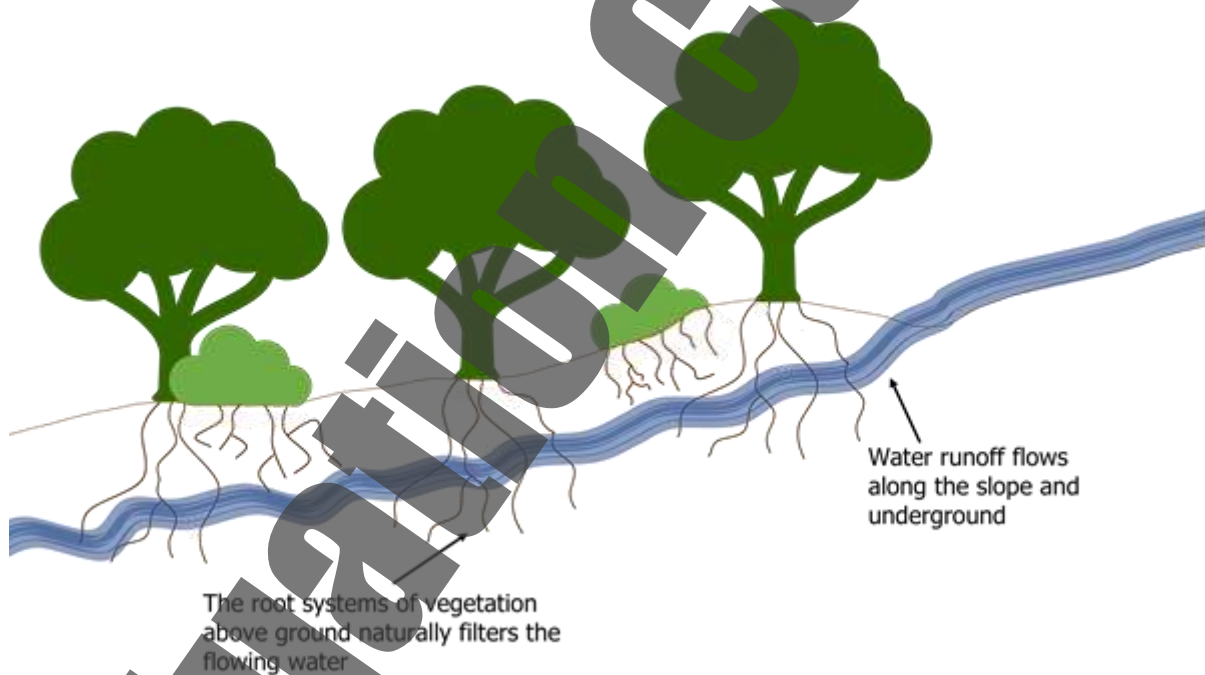
Cut-through section of granular materials enclosed in geo-textile fabric system:



Strip Filter Drains with Geo-Textile Fabrics

These systems involve natural filtration of water runoff using the root systems of densely planted vegetation above ground.

The root systems of vegetation work to mitigate erosion by reinforcing the soil in addition to filtering out sediment from the water stream.



Review Questions

1.	Which is the most common sub-soil drainage system?	<input type="checkbox"/>
2.	Which type of sub-soil drainage system involves natural filtration of water runoff using root systems of densely planted vegetation above ground?	<input type="checkbox"/>
3.	What are two (2) examples of granular materials which may be packed into geo-textile fabrics as part of a sub-soil drainage system?	<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 and Safety Rules

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

Rule or Law	Explanation
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 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 operating procedures.
- ◆ Personal protective clothing and equipment.
- ◆ Safe use of tools and equipment.



Review Questions

4.	What are the four (4) main types of health and safety rules that you need to follow?	<input type="checkbox"/>
1.		
2.		
3.		
4.		

5.

What information could you get from operations documentation?



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 traffic in the way?
- ◆ **The Weather** – Is there wind, rain or other bad weather? Is it too dark?
- ◆ **Facilities and Services** – Are there power lines 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 traffic or machinery?



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

- ◆ **The Task** – What type of drainage will be worked on? Where is it? Does the drain require maintenance or a repair?
- ◆ **Equipment and Materials** – What type of equipment will be used? How big is it? How much room does it need? Are there any special materials or chemicals that will be used?
- ◆ **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.

In some situations you may be required to put together a clear set of instructions from various sources. To do this you may need to understand and obtain relevant information from site drawings, blueprints or plans.

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 Job Specifications

Some of your work instructions might be given to you in plans, maps, reports and specifications. You will need to get the information out of these documents and use it to do your job.

Job specifications will tell you the types, quantities, grades and classifications of materials you will be working with.



Every task or activity relating to installing sub-soil drainage will also have quality requirements relating to:

- ◆ Compaction.
- ◆ Backfilling.
- ◆ Levels.
- ◆ Slope and grade.
- ◆ Shape.
- ◆ Material standards

To apply the requirements, you need to follow instructions and procedures exactly. It is essential that these quality requirements are known, understood and adhered to in all drainage maintenance activities and tasks.

1.3.2.1 Plans and Drawings

Specifications may be given to you as drawings and plans. Plans are usually "scale drawings" that represent a large area on a small sheet of paper and show proportion at the same time.

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

- ◆ The location of your work area in relation to the whole work site.
- ◆ The position of stockpiles, work zones, roads and access areas.
- ◆ The location of environmentally sensitive or 'no go' areas.
- ◆ Contours, or the lay of the land, e.g. slopes, banks, depressions.



Pictures can give a better and clearer view of the information needed to perform work. For example, a sketch showing the relationship of a drainage line next to a major road will be more easily remembered than a written explanation.

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

1.3.3 Organising Work Activities

After receiving and clarifying all of your work instructions and requirements, you will need to organise and plan for your work activities. This is a major component of installing sub-soil drainage activities because each step must be completed before the next step can start.



Organising your work activities involves scheduling your daily and weekly tasks to complete all assigned tasks in the best, most efficient manner that still meets the requirements of the worksite. It will allow you to plan for the time ahead to ensure that project timelines do not get out of hand.

While you will be performing your own work activities you will also be involved with the activities of plant and machinery operators. This means you are required to sequence work activities and work with others onsite concerning timing issues.

Some people prefer a handwritten checklist or work method statement, others a computerised diary entry. What works for you is the most important thing.

A Work Method Statement (WMS) 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.



Flexibility is important when organising your work priorities to allow you to re-organise if:

- ◆ Higher priority tasks arise.
- ◆ Accidents occur.
- ◆ Weather interferes.
- ◆ There are unexpected conditions onsite.



You need to take responsibility for your own activities to make sure that your assigned activities will be completed to the required standard, in the documented manner and within appropriate timeframes.

1.3.4 Worksite Communications

A drainage installation project is a team effort, from the planners through to the inspectors who check the final product.



It is important to coordinate your activities with other workers when you are planning for and carrying out the work to make sure everyone knows:

- ◆ The work being completed.
- ◆ How, when and where you will be operating.
- ◆ What they need to do.

All workers on site must understand their own role and the roles of others before starting work. It helps to make sure work is done safely and efficiently.

You will also need to alert personnel to any hazards you notice during your work activities, including changing work environments.

People you may need to communicate and coordinate with on site include:

- ◆ Supervisors and management.
- ◆ Plant and vehicle operators.
- ◆ Traffic controllers or other workers on the site.
- ◆ Team leaders.
- ◆ Site safety personnel.
- ◆ Processing plant operators.
- ◆ Maintenance workers.
- ◆ Crane and float operators.
- ◆ Contractors.
- ◆ Inspectors, both internal and external, including WHS, environmental and quality assurance officers.
- ◆ Site visitors.



1.3.4.1 Communicating with Others

When communicating with others on site, make sure that you:



- ◆ Speak clearly and unambiguously – stick to the important details, don't waffle.
- ◆ Give instructions or directions so that they are easily understood.
- ◆ Provide complex information or explain issues to your listener in a way that ensures they understand. You could try breaking down the details, simplifying the information or referring to related examples.
- ◆ Listen carefully, answer questions and provide clarification as necessary. You can also ask questions to clarify understanding.
- ◆ Use all communications equipment appropriately, following the required procedures and protocols.

Communication equipment you might need to use includes:

- ◆ Two-way radios.
- ◆ Telephones.
- ◆ Written reports.
- ◆ Emails.
- ◆ Text messages.
- ◆ Other site-specific systems.



Make sure that you follow your site procedures and protocols for communicating on site. This may include using the correct communication processes for communicating work activities or exclusion zones.

1.3.5 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 details about:

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