

# RIIWMG203E

## Drain and Dewater Civil

### 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

# RIIWMG203E Drain and Dewater Civil Construction Site

<b>Learner Name:</b>	
<b>Learner ID:</b>	
<b>Learner Contact Number:</b>	
<b>Learner Email Address:</b>	
<b>Date Training Commenced:</b>	

## This Book Contains:

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

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# 1.1 Introduction

These training resources are based on the unit of competency **RIIWMG203E Drain and Dewater Civil Construction Site**.



You will learn about:

- ◆ Planning and preparing for the work.
- ◆ Positioning sedimentation control equipment.
- ◆ Removing surface water.
- ◆ Constructing sumps and wells.
- ◆ Removing water from sumps or wells, trenches and pits.
- ◆ Cleaning up the site once the work is finished.

## 1.1.1 Drainage and Dewatering

Drainage and dewatering refers to any activities that move water from the worksite in a controlled manner.

The process of drainage and dewatering may involve:

- ◆ Any form of erosion or sediment controls.
- ◆ Pumping out of sumps or pits.
- ◆ Shifting water from one location to another using the site controls or water transfer devices such as pumps.



Drainage includes graded surface level gutters and ditches excavated manually or by machine and various types of plastic piping.



Other materials used in drainage include:

- ◆ Silt fences.
- ◆ Rocks.
- ◆ Straw bales.

Dewatering techniques include the use of:

- ◆ Sumps.
- ◆ Wells.
- ◆ Submersible pumps.
- ◆ Vacuum pumps.
- ◆ Surface pumps.
- ◆ Sludge pumps.







Areas that are drained and/or dewatered include:

- ◆ Control of surface water.
- ◆ Bores.
- ◆ Cofferdams.
- ◆ Springs.
- ◆ Creeks.
- ◆ Wetland water.
- ◆ Seepage water in trenches and pits.
- ◆ Low lying natural ground where water may not escape.

The most important part about draining and dewatering a construction site is that **no dirty or contaminated water or pollution must leave the site**. If this happens, severe penalties can apply. These penalties can be imposed by federal, state and local government authorities.

## Review Questions

<b>1.</b>	What are three (3) pieces of equipment dewatering techniques may include the use of?	<input type="checkbox"/>
1.		
2.		
3.		

**2.**

What are three (3) examples of areas which may be drained or dewatered?



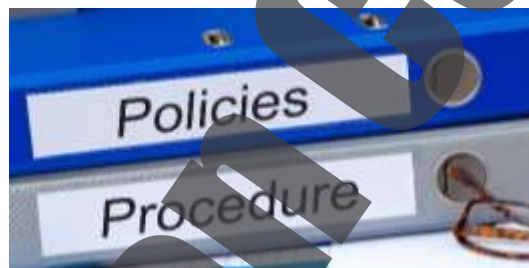
1.

2.

3.

## 1.2 Working Safely

You need to follow all relevant safety rules and instructions when working on site. This will help you to do your work in the safest way and make sure all work is compliant.



### 1.2.1 Health and Safety Rules

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

Rule or Law	Explanation
<b>Acts</b>	These are laws that you have to follow.
<b>Regulations</b>	These explain what the law means.
<b>Codes of Practice</b>	These are instructions on how to follow the law, based on industry standards.
<b>Australian Standards</b>	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.

Operations documentation includes:

<b>Site Details</b>	The information and safety requirements of the workplace environment (where you will be working).
<b>Hazard Details</b>	Any hazards in the work area or related to the work. This could also include instructions on how to handle dangerous or hazardous materials.
<b>Task Details</b>	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.
<b>Faulty Equipment Procedures</b>	Isolation procedures to follow or forms to fill out.
<b>Signage</b>	Site signage tells you what equipment you need to have, or areas that are not safe to be in.
<b>Emergency Procedures</b>	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.
<b>Equipment and Work Instructions</b>	Details of how to operate plant and equipment and the sequence of work to be done.

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.

## 1.2.3 Emergency Procedures and Response

Every work site will have detailed procedures for responding to emergencies. They may include common procedures such as:

- ◆ Evacuating to designated evacuation points using predetermined exits and routes.
- ◆ Calling for assistance from your site emergency management team or external agencies, e.g. dial 000.
- ◆ Initiating alarms and sirens.
- ◆ Applying first response fire fighting if you have the required training.
- ◆ Administering First Aid in accordance with appropriate levels of training.



Taking appropriate initial action during an emergency can help to control the situation and decrease the risk of injury to yourself or others on site.



Emergency procedures may be listed in:

**EVACUATION PROCEDURE**

- 1** WHEN ALARM SOUNDS LEAVE IMMEDIATELY BY THE NEAREST EXIT.
- 2** PROCEED IN AN ORDERLY MANNER TO ASSEMBLY POINT.
- 3** REMAIN AT ASSEMBLY POINT UNTIL ALL-CLEAR IS GIVEN.

- ◆ Emergency response plans displayed in each area.
- ◆ Procedural manuals.
- ◆ Induction information.
- ◆ Site instructions.
- ◆ Other site-designated locations.

For every possible type of incident or emergency situation on the site there should be a procedure that outlines exactly how to respond.

In a fire emergency, for example, someone will be required to dial 000 for the fire department. An emergency involving injury will require a 000 call for an ambulance while someone from the site applies first aid.

Always follow the emergency response procedures that have been specially developed for your work site.



## Review Questions

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

4.

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



1.

2.

3.

5.

What are three (3) examples of locations you may find emergency procedures listed in?



1.

2.

3.

## 1.3 Work Instructions



Activities on a construction site all follow a similar format so the general principles for draining and dewatering will be similar between sites. The tasks may vary between sites and organisations but the principles of drainage and dewatering remain fairly constant across the industry.

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.

### 1.3.1 Work Instruction Details

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?
- ◆ **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 area needs draining and dewatering? How big is it? How long will it take? Does it need any special equipment?
- ◆ **Plant** – What type of plant will be used? How big is it? How much room does it need?
- ◆ **Equipment** – What equipment will you need to carry out the work? 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?

### 1.3.2 Reading, Checking and Confirming 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.





Before starting work, you will need to confirm your work instructions with the appropriate personnel. This may include:

- ◆ Supervisor.
- ◆ Health and Safety Representative (HSR).
- ◆ Industry groups.

Make sure that prior to doing this you are sure of the specific information you will be confirming.

This is also a good opportunity to discuss with the relevant personnel any information you found to be unclear. They can explain how this information relates to your own work activities.

Make sure that prior to doing this you are sure of the specific information you will be confirming.

This is also a good opportunity to discuss with the relevant personnel any information you found to be unclear. They can explain how this information relates to your own work activities.

Confirming your work instructions will ensure that you know exactly what is expected of you, particularly when it comes to keeping the workplace safe for everyone on site.

### 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 Statement's fulfil a number of objectives:

- ◆ They outline a safe method of work for a specific job by identifying associated hazards and giving instructions of how these need to be managed.
- ◆ They provide an induction document that workers must read and understand before starting the job.
- ◆ They assist in effectively coordinating the work, the materials required, the time required and the people involved to achieve a safe and efficient outcome.
- ◆ They are a quality assurance tool.



The Work Method Statement must be available for inspection at all times.

### 1.3.4 Safety Data Sheets (SDSs)

Site materials including any hazardous chemicals and materials must be stored and maintained under particular conditions and handled in a specific way. These details will be provided in the Safety Data Sheet (SDS), previously called a material safety data sheet (MSDS), for each product.

The SDS will help you identify:

<b>Basic Details of the Chemical or Material</b>	Name, type and identification number.
<b>Hazards Associated with the Material</b>	Whether it is flammable or corrosive.
<b>Safe Handling and Storage Procedures</b>	PPE to use, sealed containers or storage temperatures.
<b>Emergency Procedures</b>	What to do if the chemical or material gets out of hand.
<b>Disposal Procedures</b>	Suggestions for removing the chemical or material from the site.

In an SDS, information on the chemical hazards is based on the Globally Harmonized System (GHS) of classification, rather than the hazardous substances and dangerous goods classifications. Both provide equivalent levels of information on chemical hazards and health and safety precautions, and either may be used in the workplace.

The processes for use, maintenance, and storage of materials listed within the product Safety Data Sheets must be followed to comply with legislative, operations and site safety requirements.

### 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.



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.



### 1.3.5.1 Job Specifications

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

These tasks will also have quality requirements. The job specifications outline when tasks need to be completed and the required standard of the work.

These requirements will guide you to make sure you are achieving the quality standard for the project. To apply the requirements, you need to follow instructions and procedural documents exactly. You will need to get the information out of these documents and use it to do your job. It is essential that these quality requirements are known, understood and adhered to in all your activities and tasks.



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.

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.

### 1.3.6 Engineering Drawings

During drainage and dewatering activities, plans and specifications give details on how tasks are to be completed.

This information can be presented within engineering drawings and may include:



- ◆ Proposed view of the area or object.
- ◆ Relative size and shape, landscape features.
- ◆ Drainage or water flow control lines.
- ◆ Utilities and service details.
- ◆ Traffic management.
- ◆ Other features specific to the worksite.

Engineering drawings are usually similar across civil projects with only minor differences in organisational style and terminology, but you should always check with a supervisor if you are not certain.

The view of the drawing or illustration may include:

Plan View	View Description
<b>Side View</b>	Looking at the object or detail from a side-on perspective.
<b>Plan or Longitudinal</b>	This is also called an overhead view where the object is viewed from above.
<b>Cross-Section or Profile</b>	The object is viewed from a "slice through" perspective.
<b>Crossfall</b>	Used in road, bridge and drainage construction and shows the degree of fall from a given point. This then shows water direction and camber on the surfaces.

The drawings may also detail highly specific information concerning particular aspects of the project such as:

- ◆ Compatibility requirements – all aspects of the plan should be compatible with other plans for the site.
- ◆ Australian standards and industry requirements.
- ◆ Material compatibility.
- ◆ Schedule of actions to ensure compatibility between various aspects of the project.
- ◆ Laboratory testing requirements.



When interpreting maps and drawings you will need to locate the legend or key box. This defines the information contained in the document and will normally be at the bottom of the drawing.

The intended use of the drawing will determine the type of information contained within it.

You need to know how to find the information contained in the site drawings, and this knowledge will only develop with practice with the different drawings.

### 1.3.7 Identify and Locate Required Materials

There will be materials required to complete the work, these materials will be detailed in your work instructions. The details about materials you may find in your work instructions includes the:

- ◆ Type of materials to be used.
- ◆ Grades of materials to be used.
- ◆ Classification of materials to be used such as sub-grade materials that differ from finished level materials.
- ◆ Quantities of materials that need to be used.
- ◆ Safe handling methods of materials.
- ◆ Stockpiling requirements.

