

RIICWM401E

Supervise Civil Works

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

RIICWM401E Supervise Civil Works

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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Evaluation Copy Only

1.1 Introduction

This course is based on **RIICWM401E Supervise Civil Works**.

You will learn about:

- ◆ Planning civil construction work:
 - ◇ Confirming safety requirements.
 - ◇ Confirming work requirements.
- ◆ Preparing for tasks and activities:
 - ◇ Identifying and managing risks and hazards.
 - ◇ Preparing a job plan and explaining it to personnel.
 - ◇ Identifying the resources required to carry out the work.
- ◆ Initiating civil works:
 - ◇ Acquiring resources.
 - ◇ Issuing instructions.
 - ◇ Setting out tasks.
- ◆ Supervising and monitoring work:
 - ◇ To make sure the right outcomes are achieved.
 - ◇ To make sure work is carried out safely.
 - ◇ To make adjustments to the work or job plan when required.
 - ◇ To make sure all tools and equipment are maintained properly.
- ◆ Reporting on civil works tasks by:
 - ◇ Completing written reports.
 - ◇ Making recommendations for improvements to safety, efficiency and effectiveness.



1.1.1 Supervising Civil Works

Civil works covers a number of areas including:

Types of Civil Works	Associated Tasks
Road and Pavement Construction and Maintenance	<ul style="list-style-type: none"> ◆ Flexible pavement construction. ◆ Rigid pavement construction. ◆ Stabilisation of materials. ◆ Pavement maintenance.
Bituminous Surfacing	<ul style="list-style-type: none"> ◆ Asphalt paving and compaction. ◆ Application of bituminous spray treatment. ◆ Application of polymer modified binders. ◆ Selection and use of bituminous emulsions. ◆ Application of slurry surfacing. ◆ Pavement profiling, using a profiler. ◆ Manufacture and delivery of hot mix asphalt. ◆ Manufacture of cold mix. ◆ Manufacture of polymer modified binders. ◆ Manufacture of bituminous emulsion. ◆ Manufacture of slurry surfacing.
Civil Structures	<ul style="list-style-type: none"> ◆ Civil concrete structure construction. ◆ Civil steel structure construction. ◆ Civil timber structure construction. ◆ Civil masonry, crib and gabion construction. ◆ Inspection of civil structures. ◆ Maintenance of civil structures.
Also Includes	<ul style="list-style-type: none"> ◆ Tunnel construction. ◆ Demolitions.

The tasks involved in civil construction will include, but are not limited to the following:

- ◆ Site preparation.
- ◆ Extraction.
- ◆ Load and haulage.
- ◆ Placement and distribution.
- ◆ Installation of underground services.
- ◆ Surface finishing.
- ◆ Line, grade and level control.
- ◆ Water application.
- ◆ Compaction.
- ◆ Sediment control.



As a supervisor at a civil construction work site it is your responsibility to monitor the work of your team as they complete their part of the project. This will include planning out the work, passing on guidance and instructions and adjusting the work that the team does to meet project, site and quality requirements.

1.2 Site Policies and Procedures

While supervising others you need to make sure everybody in your team follows the safety rules and instructions when performing their work. You should answer any questions that personnel have towards health and safety or direct them to the right person to speak to.



1.2.1 Operations Documentation

Before starting any civil works you need to make sure you and your team have access to all operations documentation for the job. This will help everyone to do their 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.
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 each component of the project.
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 where hazards exist.
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.

1.2.2 Manufacturer Specifications

All the equipment and tools used for civil works will have manufacturer specifications, also called manufacturer documentation or instructions.

This documentation may include:

- ◆ Instructions for assembly and use.
- ◆ Maintenance schedules.
- ◆ End of use guidelines.
- ◆ Known hazards or risks.
- ◆ Important contact details for repairs or enquiries.



It is important that you follow the guidance provided in manufacturer documentation as this will ensure all tools and equipment are being used safely. Reviewing this documentation is an important part of meeting WHS responsibilities.

Not following guidance given in the manufacturer's instructions can lead to unsafe work practices which could lead to illness, injury or in some cases death.

Manufacturer's instructions are often referred to when conducting a risk assessment, or training personnel on how to use a new tool or install a piece of equipment.

Review Questions

1.

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



1.

2.

3.

2.

Why is it important that you follow the guidance provided in manufacturer documentation for equipment used in civil works?



1.3 Working Safely

You must ensure that all personnel that you supervise follow all safety rules and instructions when performing their work.



1.3.1 Health and Safety Rules

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

Law	Description
Acts	Laws to protect the health, safety and welfare of people at work.
Regulations	Gives more details or information on particular parts of the Act.
Codes of Practice	Are practical instructions on how to meet the terms of the Law.
Australian Standards	Give you the minimum levels of performance or quality for a hazard, work process or product.

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.

1.3.2 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 everybody safe workers need to:

- ◆ Follow their instructions.
- ◆ Follow all workplace rules.
- ◆ Make sure all equipment is safe to use.
- ◆ Carry out their work safely.
- ◆ Report any problems.



If a member of your team notifies you of an issue or problem you will need to take appropriate action in line with site and organisational requirements. This could include:



- ◆ Stopping, postponing or re-scheduling tasks.
- ◆ Organising for specialists, technical experts or consultants to review the situation.
- ◆ Organising additional resources, personnel, equipment or training before the work continues.
- ◆ Completing forms or reports to document the issue.
- ◆ Assisting personnel to complete documents and forms.
- ◆ Contacting manufacturers or other service providers about the issue.
- ◆ Contacting relevant authorities about the issue.
- ◆ Re-evaluating work plans and making adjustments to manage the issue.

Review Questions

3.

What are Codes of Practice?

4.

How can workers ensure they are meeting their duty of care responsibilities? Provide three (3) examples.

1.

2.

3.

1.4 Site Information

You need to be clear about the requirements of the work you will be doing. Make sure you have access to all details of the job before you start. This includes information about the site, facilities and services, traffic and hazard management.



1.4.1 Work Requirements

Work requirements outline the details of what the task is and how the activity is to be completed, based on the client's needs. It can be conveyed in site or task drawings, plans and documents. Work requirements or project specifications may give broad guidance on how to complete the job, or be highly specific detailing each step of the process.

Project plans and drawings provide an overview of the site including, 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.



When interpreting and sharing this information with members of your team, ensure you are clear and explain in detail what must be achieved and how the requirements are going to be met.



You need to be clear about the requirements of the work. All civil works projects will need to consider the following:

- ◆ **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 preparation work to be done?
- ◆ **Facilities and Services** – Are there power lines or other overhead or underground services to think about? Is there power on-site? Are there underground services in the area that you need to be aware of or work around? Are there adequate facilities on site to provide personnel with clean drinking water and toilets?
- ◆ **Traffic Management** – 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? Are there clear pathways for traffic? Are there defined access and egress points? Are there designated parking and delivery areas?
- ◆ **Hazard Management** – Are there dangerous materials to work around or think about? Will work be conducted close to power lines or other personnel? Has the area been adequately isolated? Have the relevant permits been applied for and authorised? Are there hazards associated with particular jobs or equipment?



1.4.2 Site Geological and Geotechnical Data

Geological and geotechnical data gives you information about:

- ◆ Rock or material types and characteristics.
- ◆ Wet and dry areas.
- ◆ Water tables or other sources of water.
- ◆ Compaction levels.



Knowing the type of soil and rock you are dealing with allows you to determine the correct machinery, resources and work methods to achieve the required tasks.

Information on geological and geotechnical factors that affect the site also allows for better time management and project management by understanding how long it will take to complete tasks.

Identification of the different types of rock and soil is essential to the successful completion of civil construction projects.



Rock and soil types may include:

Rock Types	Description
Metamorphic	Rocks are heavy and hard.
Igneous	Rocks are volcanic and can be hard but may also be very light.
Sedimentary	Rocks and shales could peel out when cut and removed.

Soil Types	Description
Sandy	Soils will require a lot of stabilisation.
Clay	Soils are harder to work with due to the physical hardness of the soil and the ability of these soils to hold water for long periods of time.

Rock and soil types will have been identified during the site engineering surveys. Interpretation of this data allows for successful planning and preparation on the worksite.

1.4.3 Site Hydrological Data

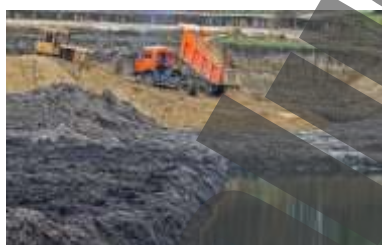
This data relates to water on, in, near or under your site. It will include surface water and ground water but could also include rivers, creeks, dams, dry waterbeds, wetlands and other areas where water is or could be.

The hydrological data is used to ensure correct drainage of the site, for protection of the waterways and water dwelling flora and fauna. Having an understanding of what the water on the site is doing allows you to anticipate drainage issues and erect erosion and sediment controls before drainage becomes a problem.



1.4.3.1 Drainage Requirements

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



Drainage and dewatering requirements 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 on a worksite can apply to areas such as:

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



Drainage is essential to the success of any task in earthworks. Once drainage issues have been identified, they will need to be managed promptly and effectively in line with environmental protection legislation and site requirements.

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 that can be imposed by federal, state and local government authorities.

1.4.4 Site Meteorological Data

This data includes rainfall, humidity, temperature, wind and night conditions such as frosts and fogs. Having a good understanding of this data allows you to plan activities more successfully.

On civil construction worksites, meteorological data can have a huge impact on the tasks and activities that are undertaken. To access meteorological data use a reputable website, such as www.bom.gov.au.

Rainfall and humidity can affect materials and the way they handle. Heavy or unexpected rainfall can affect site drainage or interrupt works. Fogs or mists may impact on visibility. Very high or very low temperatures can impact on equipment and personnel. These will need to be considered to make sure adequate protective clothing, drinking water and shelters are organised for the project.



1.4.5 Engineering Survey Principles and Data

Engineering surveys are a very important aspect of supervising civil works. Without appropriate surveys for setting out works, monitoring progress and for confirming completed components, the job will be made much more difficult.

Survey data covers information about job outcomes including:

- ◆ Bench heights and widths.
- ◆ Floor heights.
- ◆ Floor, ramp and bench grades.
- ◆ Underground working and voids.



A lot of civil works tasks rely on accurate survey and level points to achieve the work targets. For example:



- ◆ Draining pipes must be surveyed to ensure they are in the right place and allow the water to have the correct fall.
- ◆ Embankment construction uses survey to ensure that the fill layers are placed correctly.
- ◆ Construction of structures, such as dams and bridges, rely on engineering survey to meet strict conformance requirements.

Site engineering survey data is used in monitoring the progress of the job. Survey and levelling reports are also used as a historical record for the project.

In the case of large structures that may have a design life long beyond the duration of the project such as pavements, dams and bridges, survey data can prove valuable where defects and faults may occur in the future.

Survey data for large infrastructure works is monitored after the end of the works to assess the need for maintenance or to indicate potential problems. This is most evident where changing conditions may occur such as in the case of dams that may not have water to full capacity all the time, during drought conditions or following spill over events. The survey data provides an ongoing record of the integrity and stability of the structure.



1.4.6 Material Properties and Test Results



In most cases, the material properties have been tested through a geotechnical laboratory prior to the start of works. Sometimes it may also be necessary to conduct tests during work processes as materials or conditions change.

The test results from the materials analysis will provide details of any additional treatments that may be required to meet the specification requirements. In some cases, additives such as lime, cement, fly ash, or other blends may be necessary to ensure the material is stable to use in earthworks construction.

Always follow your organisation's procedures for material sampling and testing and if you are unsure check with the relevant personnel.