

RIICRC318E

Cure Concrete

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

RIICRC318E Cure Concrete

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

This Book Contains:

- Course Information.
- Review Questions.

Table of Contents

1.1 Introduction	4
1.2 Planning and Preparing for Work	4
1.2.1 Access and Interpret Documentation	5
1.2.2 Health and Safety Rules	6
1.2.3 Prepare for Work	6
1.2.4 Worksite Communications	7
1.2.5 Identify and Address Risks, Hazards and Environmental Issues	8
1.2.6 Report Hazards and Environmental Issues	9
1.2.7 Control Identified Hazards and Environmental Issues	10
1.2.8 Select and Wear Personal Protective Equipment	11
1.2.9 Signage on the Worksite	11
1.2.9.1 Implement Signage and Barriers	12
1.2.10 Select and Inspect Plant, Tools and Equipment	13
Review Questions	14
2.1 Curing Concrete	19
2.1.1 Install and Maintain Run-Off Devices	19
2.1.2 Importance of Curing	20
2.1.3 Cure Concrete	20
2.1.4 Concrete Curing Techniques	21
2.1.5 Concrete Curing Compounds	22
2.1.6 Apply and Maintain Curing Compound	22
2.1.7 Concrete Protection Techniques	23
2.1.7.1 Isolate and/or Barricade the Work Area	24
2.1.8 Monitor Site Movements and Hazards	24
2.1.9 Confirm Work Activity is Compliant	25
Review Questions	25
3.1 Conduct Clean-Up Activities	29
3.1.1 Manage Clean-Up Activities	29
3.1.2 Manage Tools and Equipment	30
Review Questions	31

1.1 Introduction

This training course is based on the national unit of competency **RIICRC318E – Cure Concrete**.

This course will cover the following key aspects of concrete curing operations:

- ◆ Review of work requirements and documentation.
- ◆ Management of work health, safety and environment.
- ◆ Plan and prepare to cure concrete.
- ◆ Cure concrete.
- ◆ Management of clean-up activities and tools.

The following terminology will be used throughout this training material:

- ◆ **Concrete** – Concrete is a composite building material made from fine and coarse aggregates blended with a combination of cement, water and additives that hardens or cures over time.



1.2 Planning and Preparing for Work

You need to be clear about what work you will be doing, including how you will be doing it and what equipment you will be using. This will enable you to prepare the work area and ensure all safety and task requirements are met before starting work.



1.2.1 Access and Interpret Documentation

Each concrete pour is accompanied by a set of records. Understanding what information is required and how to interpret the information is essential. Different companies use various templates and terminology, so clarifying what you need ahead of time and how to collate, store and manage the information on the day will ensure that your job occurs without delay.

The types of documentation that may be required include:

- ◆ Health, safety and environment – Site induction handouts, safe work method statements, health, safety and environmental policies and procedures, hazard report forms, site inspection checklists, site health, safety and environmental plans, safety data sheets.
- ◆ Concrete specific – Specifications, designs, quality inspection and testing plans.
- ◆ Operational – Site maps, work instructions, project plans, construction plans.

If you don't know where to find the required documentation, speak with your supervisor and they will be able to help you.

Design engineers and architects determine the concrete's specifications to meet the structural and design requirements of the task. Specifications such as road, bridge or kerb mixes may be based on standard industry specifications, set by government agencies, or be unique to the site or project.



Concrete specifications may define:

- ◆ The type or size of aggregate to be used.
- ◆ The type and amount of water to be added.
- ◆ The type and frequency of testing to be conducted.
- ◆ The required concrete strength to be achieved.
- ◆ Approval for the nominated mix to be used.
- ◆ The maximum period of time from batching to placement and compaction.
- ◆ Concrete temperature requirements for curing.
- ◆ Slump and water/cement ratio requirements.

It is important to understand the specifications of the concrete being placed to ensure that the appropriate curing method is used and characteristics such as strength and durability are achieved. Speak with your supervisor if you need help understanding these specifications and how they will impact your work.



1.2.2 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 that protect the health, safety and welfare of people at work.
Regulations	Give 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.

Make sure you understand the health and safety rules and laws that apply to your worksite and the type of work you are performing.



1.2.3 Prepare for Work

Concrete curing operations are time-sensitive processes involving multiple stakeholders and work groups. Delays to the program can be costly. Before any work can begin, ensure that you have adequately prepared for the work activity so that it runs smoothly.

Prepare for concrete curing operations by following these steps:

- 1** Review the work plan and confirm the curing method and materials to be used.
- 2** Obtain and inspect the plant, equipment and materials required to perform the task and place it at the work location.
- 3** Ensure safety checks and risk assessments have been completed.
- 4** Implement safety and environmental control measures such as water management devices.
- 5** Ensure that traffic management controls are in place.
- 6** Check and monitor the weather, hazards and other external factors that may impact your work.



Good preparation is about being organised and having a plan. Your work instructions will guide you and help to ensure you complete the job per the job requirements. Make sure you confirm and clarify your work instructions with your supervisor to ensure you have a good understanding of what you need to do, where you need to do it, and how you will need to do it.

Be prepared for changes to occur by knowing the risks to your plan such as changes in weather, operating conditions, equipment failures and other unforeseen events, and having contingency plans in place to deal with them.

1.2.4 Worksite Communications

Carrying out concrete work is a team effort, from the planners through to the inspectors who check the final product.

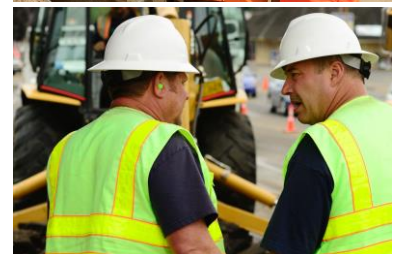
It is important to communicate with other workers when you are planning for and carrying out the work to make sure everyone knows:

- 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 role of others before starting work. It helps to make sure work is done safely and efficiently.

Workers you may need to communicate with on site include:

- ◆ Supervisors and management.
- ◆ Plant and vehicle operators.
- ◆ Traffic controllers or other workers on the site.
- ◆ Team leaders.
- ◆ Site safety personnel.
- ◆ Plant operators.
- ◆ Maintenance workers.
- ◆ Crane and float operators.
- ◆ Contractors.



Some communication methods may involve:

- ◆ Site meetings.
- ◆ Toolbox meetings.
- ◆ Team briefings.
- ◆ Notice boards.
- ◆ Policies, procedures and manuals.
- ◆ Work Method Statements (WMS).
- ◆ Site signage and barricading.
- ◆ Communications equipment, such as two-way radio.

If you are at all unsure about any aspects of communication on your worksite, re-read your work instructions or plans and speak with your supervisor.



1.2.5 Identify and Address Risks, Hazards and Environmental Issues



Concrete pour sites have many risks specific to the activity and environment. There is a range of information available from regulators and industry groups, such as concrete or pumping associations, which have been developed for concrete related activities that provide guidance on hazards and suggested controls for this activity.

Performing a risk assessment prior to work commencing is a good way to identify and prepare for potential hazards and apply control measures. In performing your risk assessment consider the types of activities being conducted, how those people will perform their tasks and where on the site they will occur.

Safety hazards to consider include:

- ◆ Traffic management hazards – Entry/exit, travel to the pour location, turning area, reversing.
- ◆ Ground conditions – Soft ground, uneven ground, soft edges, unprotected or unmarked edges.
- ◆ Pedestrian management – Persons on foot in trafficked areas including testers, spotters, and concrete curing personnel.
- ◆ Slips, trips and falls – Slipping on uneven ground, tripping on exposed reo-bar.
- ◆ Manual Handling – Frequent bending, lifting and dragging of hessian and plastic rolls, applying curing compounds by hand.
- ◆ Contact with chemicals – Inhaling or ingesting chemicals causing health issues and injury, chemical burns from incorrect dosing and inadequate PPE.





As part of planning for concrete operations sites must consider the impact to the environment.

In doing so, an environmental management plan may be developed which outlines the potential hazards and risks to the environment and the required control measures. The content of these plans should be included in site documents and information such as inductions, safe work procedures and toolbox talks.

Environmental hazards may include:

- ◆ Concrete spills – Contamination of waterways through concrete spills.
- ◆ Uncontained use of curing compounds and chemicals – Contaminated water and chemicals washing onto the ground and into waterways.

Once you have identified hazards, risks and environmental issues on site it is important to make sure that you have communicated them to others. This may be through a hazard report, speaking directly to the supervisor or including it in your work procedures.

1.2.6 Report Hazards and Environmental Issues

It is important to communicate information about hazards and environmental issues in a way that ensures that they are dealt with promptly before they can pose a hazard to yourself, others, or the environment.

When providing hazard information be clear and timely in your communication:

- ◆ Be clear – Provide specific information about the hazard, fault or issue such as when it occurred, what situation or circumstance created it, where exactly it is.
- ◆ Be timely – Report the information immediately to the appropriate personnel.

Ensure that your communication is adequate to enable the issue to be resolved.

Use tools where necessary to assist with locating hazards such as a tag, label or visual marker (such as a witch's hat or danger tape).

Use pictures and diagrams in addition to a written report where necessary to identify the location of the hazard.



If you are the person receiving the information, confirm what you have heard by:

- Repeating back to the person the issue as you have understood it.
- Ask follow-up questions for clarification.
- Pay attention to the person speaking and note important details.

Refer to your organisational procedures for guidance on how to report issues appropriately.

1.2.7 Control Identified Hazards and Environmental Issues

Once you have identified that a hazard or issue exists you will need to manage it by implementing suitable control measures.

Control measures prevent the identified hazard from causing harm.

When implementing your control measures consider what is practical for the site to apply and use the hierarchy of control to select the most effective control measures for the circumstances. Try to apply control measures that are higher up the hierarchy wherever practicable to ensure they provide the best level of protection.



Hierarchy Level	Explanation	Example
1. Elimination	Completely remove the hazard. This is the best kind of hazard control.	Animals and pets may be banned from site to prevent accidents.
2. Substitution	Swap a dangerous work method or situation for one that is less dangerous.	Certain chemicals may be replaced with those which are less harmful if contact with the skin occurs. Reversing beepers on trucks may be replaced with squawkers so the sound doesn't carry as far impacting neighbours.
3. Isolation	Isolate or restrict access to the hazard.	Exclusion zones may be established to separate personnel and operating plant. Guards are placed over the concrete pump hopper to prevent access to moving parts. Sediment control fences installed to prevent dirty runoff water from leaving site and damaging the environment.
4. Engineering Controls	Use equipment to lower the risk level.	A line pump may be set up to transfer concrete across long distances instead of manually moving it. Wheel washes may be constructed at the exit to the site to ensure that all trucks have clean wheels before exiting onto public roads and do not contaminate waterways.
5. Administrative Controls	Site rules and policies attempt to control a hazard.	Reversing trucks require a person to be the spotter while the task is being performed. Traffic control signage used to manage vehicles entering and exiting. Bins for different types of waste with signage to store and separate waste material.
6. Personal Protective Equipment	The least effective control. Use PPE while you carry out your work.	PPE such as hearing protection, safety glasses or gloves.

1.2.8 Select and Wear Personal Protective Equipment

Personal protective equipment (PPE) should be selected and worn in accordance with the site requirements. Many sites will define the minimum PPE required in their site induction information and site entry signage. In addition, you should be aware of any hazard specific risks, for example hazardous substances (such as curing compounds) which are being used and apply the PPE appropriate to the situation.

Common PPE may include:

- ◆ Safety glasses.
- ◆ Hearing protection.
- ◆ Gloves.
- ◆ Respirators.
- ◆ Hard hats.
- ◆ Hi-visibility clothing.
- ◆ Safety footwear.



Gloves and safety glasses are commonly used to prevent contact with chemicals when applying curing compounds.

When selecting gloves it is important to select the type of glove appropriate for the task. Tight-fitting gloves will prevent substances from entering the glove and reduce the likelihood of skin reactions or burns. Inspect the gloves prior to wear to identify any tears or openings to ensure that the glove provides the best protection possible.

In order for PPE to be effective it needs to be in good condition, without damage and be worn in the manner prescribed by the manufacturer. Check all PPE before using it to ensure it is fit for use and will provide the required level of protection. Faulty or damaged PPE should not be worn and will need to be replaced. Remember PPE is the very last means of defence so it's important that it is applied correctly.

1.2.9 Signage on the Worksite

Signage can be used to display important information and communicate messages quickly and efficiently.

Construction sites can be busy places. Sometimes many things are being completed at once. Having appropriate signage helps to keep everyone on site safe. In addition, signs with pictures can make information easier to understand, especially for those with language or literacy barriers.



You may see the following signs in use on construction sites:

- ◆ Site entry.
- ◆ Site office.
- ◆ Sign-in.
- ◆ Parking.
- ◆ Wheel wash.
- ◆ PPE rules.
- ◆ Traffic management signage.
- ◆ Overhead powerlines.



The use of signage is an essential tool for communicating critical health, safety and environmental information about hazards, control measures, and site rules to ensure the safety of all persons entering the site.



They can be placed at the location of a hazard as a warning and be used to directly communicate with anyone in the vicinity. Certain colours such as red and yellow are commonly used in barricading, warning tape and signage to indicate that danger is present and caution is required.

You may locate details of where to position signage using site checklists, risk assessments, safety and environmental management plans, and safety and environmental procedures. If you are unsure of the signage requirements for your task, speak to your supervisor.

The signage on site must not obstruct any paths of movement and needs to be of an appropriate size to be easily understood.

1.2.9.1 Implement Signage and Barriers

If the concrete curing work is to be carried out on a road or in a public area, for example adjacent to a road, you are required to protect the public and provide a safe route around the work space.

In some cases you may need to isolate the work area. Set up barricades and signage to warn others that you are working in the area and that it is dangerous for them to come too close.



You will most likely be required to:

- ◆ Close or partially close access to roads or footpaths.
- ◆ Barricade the work area to protect pedestrians and prevent vehicle entry.
- ◆ Set up warning signs and caution lighting where necessary.
- ◆ Organise for traffic to be re-directed.
- ◆ Provide directions to any foot or vehicle traffic along a safe, alternate path.



Signs and barriers you may use to make your work area safe include:

- ◆ Danger signs – Red danger signs such as “Prepare to Stop”.
- ◆ Warning signs – e.g. “Roadwork ahead”.
- ◆ Flashing lights.
- ◆ Barricades, fences and cones.
- ◆ Flashing multi-message signs.
- ◆ Arrow boards.
- ◆ Bollards.
- ◆ Portable traffic lights and signals.
- ◆ Hazard markers.



Although there are a number of site signs which will be used across most sites, signage and barrier requirements will differ depending on the type of work and location. Refer to the site policies, procedures and documentation for details about the isolation, signage, and barrier requirements relating to your site and task.

When implementing signage and barrier requirements, ensure that they are placed securely, are suitable for the environment, and do not cause any visual obstructions or hazards for personnel and traffic in the area.

1.2.10 Select and Inspect Plant, Tools and Equipment

You will need to select the plant, tools and equipment required to perform the work. When choosing tools that will be used frequently and for long periods, consider the safe handling procedures, their design, and weight to reduce the risk of fatigue or injury.

During concrete curing the following tools and materials may be utilised depending on the curing method selected:

- ◆ Spray applicators.
- ◆ Brooms.
- ◆ Hoses and sprinklers.
- ◆ Rollers.
- ◆ Curing compounds.
- ◆ Plastic sheeting, tarpaulins and covers.
- ◆ Hessian.
- ◆ Sandbags, timbers and other items to weigh down covers.



Refer to the manufacturers specifications to properly understand the capabilities and limitations of the equipment before use. Manufacturers specifications include a range of essential information such as operating limits, setup instructions and health and safety warnings. It is important that you follow the guidance provided in manufacturer documentation as this will ensure all tools and equipment are being used safely.

Always inspect your tools and equipment for faults and damage before use. Look for things like loose handles, tears and holes, split hoses, and damaged or blocked spray applicators.

The appropriate tools should be used wherever possible, and the use of home-made tools should be avoided as they carry their own risks.



Review Questions

1.	In what types of documentation might you find concrete specific information?	<input type="checkbox"/>
2.	Where might you find information relating to the concrete temperature requirements for curing and the concrete strength that needs to be achieved?	<input type="checkbox"/>
3.	What health and safety information can you find in 'Australian Standards'?	<input type="checkbox"/>

4.

Why should you confirm and clarify your work instructions with your supervisor?

5.

What should you consider when performing a risk assessment?

6.

What type of hazard may be caused through concrete spills and the uncontained use of curing compounds and chemicals?

7.

What type of document may be developed to outline the potential hazards and risks to the environment and the required control measures?

8.

Exclusion zones would be an example control measure for which hierarchy level?

9.

What might be installed to prevent dirty runoff water from leaving the site and damaging the environment?

10.

Which types of PPE are commonly used to prevent contact with chemicals when applying curing compounds?

11.

What does PPE need to be selected and worn in accordance with?