

# RIICRC314E

## Handle Concrete Materials

### 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

# RIICRC314E Handle Concrete Materials

<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..

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# 1.1 Introduction

This training course is based on the national unit of competency **RIICRC314E - Handle Concrete Materials**.

This course will cover the following key aspects of handling concrete materials including:

- ◆ Review of work requirements and documentation.
- ◆ Selection, use and storage of concrete materials.
- ◆ Preparation of work area.
- ◆ Management of waste, 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.

## 1.1.1 Accessing and Interpreting Documentation for Compliance

Prior to commencing work on any concrete or civil project you must understand your obligations and responsibilities as a worker. These requirements are detailed in numerous documents, policies, procedures and systems so it is critical that you take the time to find out where they are stored, access them and become familiar with their contents.



Documentation may include:

- ◆ Document control and storage.
- ◆ Health, safety and environmental requirements.
- ◆ Training, licensing and inductions.
- ◆ Site DA and approvals.
- ◆ Community consultation and engagement plans.
- ◆ Quality plans and inspection and testing plans and schedules.
- ◆ Process control documents.
- ◆ Order process and forms.
- ◆ Materials reconciliation and financial performance.
- ◆ Contractual issues and claims.
- ◆ Reporting.



It is an expectation that the work activity will be conducted in compliance with these project requirements.

You will need to follow these steps to ensure compliance with policies and procedures:

1. Access and interpret policies and procedures.
2. Assign responsibility for implementing the policies and procedures.
3. Communicate the requirements to the team.
4. Develop systems to check that they are being followed.



### 1.1.2 Confirming Work Requirements



Work requirements will need to be determined before any work on site can begin. This is also known as the scope of work.

This includes:

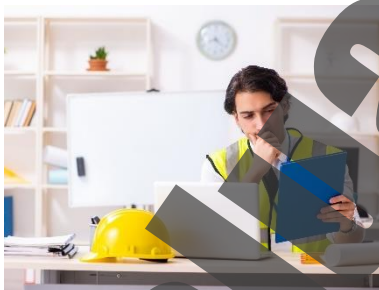
- ◆ Review of plans, designs, specifications and drawings.
- ◆ Creation of traffic management plans including vehicle and pedestrian access, parking and delivery bays.
- ◆ The site establishment including site access and preparation of the ground conditions.

A construction plan or works program will be developed taking into consideration the overall timing of the project.

This schedule will define the activities that need to take place and the order of the tasks.

A detailed construction plan will include the following elements:

- ◆ Activities.
- ◆ Schedule.
- ◆ Resources.
- ◆ Budget.



Resources include personnel, plant, equipment, tools and materials required for the completion of the works.

Proper planning, particularly where projects are complex, involving multiple contractors, suppliers and activities increases the chances of successful completion.

Construction project management software may be utilised to develop plans and compile the project documentation.



### 1.1.3 Communication on the Work Site



Good communication with all stakeholders will ensure that work runs smoothly.

Take the time to put in place the communication processes and assign responsibility for communicating all necessary information, updates and changes as they occur.

Regular communication via site meetings and active supervision can help to make sure that changes on site are addressed and communicated as they occur.

It is important to be able to identify what work is required in order to meet plans, targets and forecasts and to be able to communicate the work to the team.

Work requirements can be communicated in the following ways:

1. Hold a daily meeting, sometimes called a toolbox talk or pre-start meeting. For example, you could assign each person their tasks for the day, what area they will be working in, what equipment they will be using, any hazards for example poor weather or other contractors working in the area, daily targets and take minutes of the meeting on a sign-on sheet for attendance.
2. Issue employees or contractors with job cards or work orders detailing the work required. For example, you may create job cards for all of the maintenance work required on a forklift that is parked in the workshop for repairs.
3. Create a job board with a list of tasks to be completed. For example, you might put a board in the manufacturing workshop or processing plant for persons to tick off each task once they are completed to fulfil an order.



### 1.1.4 Communicating Work Requirements



When communicating it is important to be clear and concise with work instructions and important information. Think about the language and literacy needs of the personnel and how you can present your messages. Using a combination of visual cues such as signage, symbols and pictures can help to make the message easier to understand.

It is a good idea to make sure the team has the same understanding of the work task prior to starting the work.

Even if you think that the instruction has been clear, taking a moment to review your interpretation of the task can save time and errors occurring later on.

Ways to confirm the work requirements may include:

- ◆ Asking questions to confirm understanding.
- ◆ Repeating the instruction in your own words.
- ◆ Highlighting key steps or safety controls on the work procedure or Job Safety Assessment.
- ◆ Reinforcing the major risks involved in the task and how to manage them.
- ◆ Clarifying who is responsible for the various steps or roles in the task.



In workplaces it is common for workers to have varying levels of literacy, including the ability to read or write. One way to deal with this is to present information in a variety of ways including both as written instructions but also through discussion and clarification.

People from overseas or English second-language speakers may also have difficulty understanding work requirements and require additional support or translating services if necessary. Getting to know the needs of your group and how each other communicates best is a helpful strategy to manage these challenges.

Often tasks can involve multiple people or different work groups and when this happens, bringing all of the team together for a short task briefing prior to getting started can help to coordinate the task.



Throughout the work task activity, when changes occur such as changes in the work steps or process, new risks or hazards being introduced, changes to the work environment such as the onset of rain or the onset of poor weather, these may require you to pause, re-assess the risks and seek approval where necessary.

### 1.1.5 Addressing Risks, Hazards and Environmental Issues

Civil sites have many risks specific to the activity and environment.



Performing a risk assessment prior to work commencing is a good way to prepare for potential hazards and apply control measures. 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.

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.

You will need to identify existing and potential hazards.

A hazard is defined as anything that has the potential to cause injury, harm or damage.

Hazards to be aware of include:

- ◆ **Traffic Management Hazards** – Entry/exit, travel to the delivery location, turning area, reversing.
- ◆ **Overhead Powerlines** – Contact with trucks tipping material.
- ◆ **Ground Conditions** – Soft ground, uneven ground, soft edges, unprotected or unmarked edges.
- ◆ **Pedestrian Management** – Persons on foot in trafficked areas.
- ◆ **Environmental** - Material being tracked onto roads and washing into waterways.
- ◆ **Slips, Trips and Falls** – Persons falling from trucks, uneven ground, reo-bar trip hazards.
- ◆ **Manual Handling** – Frequent bending, lifting and installing formwork.



Once you have identified hazards and risks 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 risk assessment or work procedures.

## 1.1.6 Controlling Identified Hazards

Once you have identified that a hazard exists you will need to manage it through implementing controls.

When implementing your control measures consider what is practical for the site to apply and use the Hierarchy of Hazard 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
<b>1. Elimination</b>	Completely remove the hazard. This is the best kind of hazard control.	Animals and pets may be banned from site to prevent accidents.
<b>2. Substitution</b>	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.
<b>3. Isolation</b>	Isolate or restrict access to the hazard.	Exclusion zones may be established to separate personnel and operating plant. Sediment control fences installed to prevent dirty runoff water from leaving site.
<b>4. Engineering Controls</b>	Use equipment to lower the risk level.	Lifting equipment may be used instead of hand lifting. 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.
<b>5. Administrative Controls</b>	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 used to manage vehicles entering and exiting. Bins for different types of waste with signage to store and separate waste material.
<b>6. Personal Protective Equipment</b>	The least effective control. Use PPE while you carry out your work.	PPE such as hearing protection, safety glasses or gloves.

## 1.1.7 Selecting and Wearing Personal Protective Equipment



Personal protective equipment 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 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.



Hearing protection and safety glasses are often required to work in close proximity to pumps and trucks due to the high noise and potential for foreign substances such as concrete slurry to enter the eyes as the pump receives and draws in the concrete.

Gloves are also commonly used to prevent contact with concrete and hazardous materials when they are handled. When selecting gloves it is important to select the type of glove appropriate for the task. Tight-fitting gloves will prevent concrete 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. Remember PPE is the very last line of defence so it's important that it is applied correctly.

### 1.1.8 Drawings, Job Specifications and Work Instructions

Each project will be 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.

Consult your design engineers, architect, approvers and site manager to determine what specification the concrete is required to meet. Specifications may be specific to the site or project, standard industry specifications, or set by government agencies such as road, bridge or kerb mixes.

Reviewing the concrete specification will be important to ensure the correct materials are obtained for the mix.

Characteristics to be met for individual concrete materials are detailed in Australian Standards and specifications.



For example, specifications for aggregate materials may include:

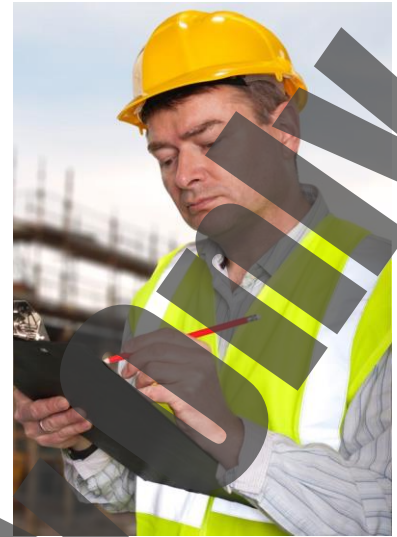
- ◆ Bulk density.
- ◆ Grading.
- ◆ Proportion of fines.
- ◆ Consistency of materials/standard deviation.
- ◆ Durability.

In order to demonstrate that the material characteristics are conforming, materials must be sampled and tested using approved testing practices by an accredited technician or laboratory.

Regular testing in accordance with the standard and relevant works specifications is required to ensure ongoing compliance throughout the project.

Site design drawings will contain details including the location, size of components and structural elements such as framework and reinforcement, depth and size of slabs and other structures on site.

Work instructions will describe the work methodology, sequencing and activities required to complete the works.



### 1.1.9 Setting Up Work Activity and Layout

The work activity must be planned for to ensure that the works are completed in the most safe and efficient manner for all parties.



This includes preparing a detailed layout plan.

When considering the possibilities for layout consider:

- ◆ Site entry and exit.
- ◆ Delivery of materials.
- ◆ Details of vehicles attending the site including size and turning radius.
- ◆ The planned location of structures and buildings.
- ◆ Amenities including toilets and crib rooms.
- ◆ Movement of pedestrians.
- ◆ Potential for obstructions.
- ◆ Plant, equipment and vehicle parking.
- ◆ Visitor parking and access.
- ◆ Separation from the public.
- ◆ Storage areas for bulk materials, concrete components and tools.
- ◆ Areas of environmental sensitivity such as wildlife habitats, endangered species and waterways.





Setting up the layout will require consultation with the work parties to ensure that their needs are met.

One or more plans may be required before the final layout is decided. It may also be useful to mark out the proposed locations on site using line-marking paint and have vehicles attend site to test the turning circles and traffic flow are achievable before installing or constructing buildings and fixed structures.

The traffic plan should be risk assessed and as the works progress it is normal for the plan to change accordingly. These changes will also require monitoring and assessment to ensure new hazards are not introduced.

## 1.1.10 Implementing Signage Requirements

Signage can be useful to display important information and deliver messages quickly and easily.

Signs with pictures can also help to overcome language and 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.



Construction sites can often be a hive of activity with multiple activities taking place simultaneously. Using appropriate signs can be an effective way to ensure that persons arriving at the site for the first time know where to go, which route to take and what hazards to be aware of.

Ensure the signage you select can be placed so as not to cause obstruction and is large enough to be seen and read from a distance.

Providing a site map with key locations to your concrete supplier ahead of time can help to ensure the drivers arriving at your site for the first time have an idea which direction or street they should enter from, where to queue to get on site and where the pump or pour will be located. This can also help to prevent any issues you may have with local councils or communities due to delivery trucks becoming lost or confused in the local area.

Key safety measures may also be included on site documentation such as Work Method Statements and induction handouts.



### 1.1.11 Maintaining a Safe Working Area

Maintain a safe working area around the work location by establishing exclusion zones. Delivery trucks may be required to reverse to the delivery location or to make turns on site. This activity can add risk to both the driver and others working in the area.

Using a spotter for all reversing activities is one way to manage this particular risk and has become common practice amongst many concrete placement and construction companies.



To create an exclusion zone around the work location, use any of the following methods and equipment including:



- ◆ Water-filled barriers.
- ◆ Danger tape.
- ◆ Signage.
- ◆ Safety cones.
- ◆ Bunting.

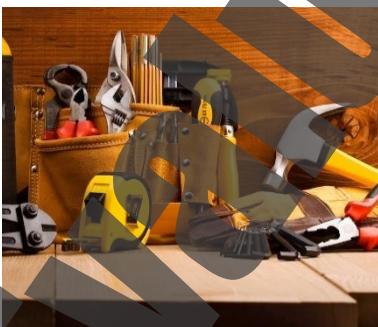
Exclusion zones should be communicated via:

- ◆ Site maps.
- ◆ Induction documents.
- ◆ Work procedures.
- ◆ Pre-start meetings.
- ◆ Signage.
- ◆ One-on-one conversations.
- ◆ Site familiarisation walk-arounds.



Use hi-visibility materials and signage help to ensure the exclusion zone stands out on the worksite and make sure that the requirements and understanding of the hazards are regularly communicated to the work teams and their importance reinforced.

### 1.1.12 Selecting Plant, Tools and Equipment



Select plant, tools and equipment that are required to perform the work. Consider the safe handling, ergonomics of design and weight when selecting tools that will be used frequently and for long durations to ensure that personnel do not fatigue or risk injury as a result of poor tool choices.

Always inspect your tools and equipment for faults and damage before use. Look for things like frayed leads, loose handles, cracked welds, deformation in supports and missing guarding.

The appropriate tools should be used wherever possible. The use of home-made tools should be avoided.



The following tools may be utilised depending on the type of activities being conducted:

- ◆ Shovels.
- ◆ Wheelbarrows.
- ◆ Levels.
- ◆ Crowbars.
- ◆ Hammers.
- ◆ Clamps.



Large items of plant such as forklifts, cranes and mobile pumps often come with their own pre-start equipment inspections which are completed by the plant operator who has been trained in what faults and damage to look for. Ensure that you have discussed the site inspection requirements, minimum safety hardware and key hazards with plant suppliers so that plant arrives in a safe condition and ready to use.

## Review Questions

<b>1.</b>	What is the first step to ensure compliance with policies and procedures?	<input type="checkbox"/>
<b>2.</b>	What type of plan will define the activities that need to take place and the order of the tasks?	<input type="checkbox"/>

**3.**

What kind of meeting is held daily to assign tasks, issue equipment and discuss hazards?

**4.**

What three (3) things should you do to confirm work requirements?

1.

2.

3.

**5.**

What should be done to prepare for potential hazards before work commences?

**6.**

What is the name of the level of the Hierarchy of Hazard Control that swaps a dangerous work method or situation for one that is less dangerous?

**7.**

What type of PPE is worn to prevent contact with concrete and hazardous materials when they are handled?

**8.**

What documents are used to describe the work methodology, sequencing and activities required to complete the works?

**9.**

When planning for the types of vehicles attending the worksite what two (2) factors need to be considered?

1.

2.

**10.**

What can be used on signs to help overcome language and literacy barriers?

**11.**

What must be established around the work location to maintain a safe working area?



**12.**

Give three (3) examples of different tools that may be utilised depending on the type of activities being conducted.



1.

2.

3.

## 1.2 Select Materials and Components

Concrete is produced using a combination of materials in proportions designed to achieve the specific strength, durability and project requirements.

Materials used in concrete production are:

- ◆ Cement.
- ◆ Coarse aggregates.
- ◆ Fine aggregates or sand.
- ◆ Water.
- ◆ Additives.
- ◆ Admixtures.
- ◆ Form release agents.

