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Working with Concrete is a part of the Pacific programme of Basic Trades training for small island nations.

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Credits

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The Tutor Guide

This tutor's guide will help you lead students through this course. It contains teaching material, resources, and suggestions on how to use them.

What is this course for?

This course is a basic introduction to working with concrete and concrete blocks. It is intended for school leavers and community groups who have limited knowledge or experience of concrete work.

It helps students to:

- think about the type and quantity of materials needed for a job
- plan and follow the steps to mix and lay concrete
- plan and construct a wall made from concrete blocks
- use simple tools.

Students will work with materials and tools that are available locally to carry out basic concrete and block projects.

Students who complete this course may be able to work on simple projects on their own. They will still need to work under supervision for more complex concrete or block construction — such as those involving structural work, steel reinforcing, safety or compliance with building standards.

What does the course cover?

Working with Concrete covers two main topics that are taught as four separate modules:

Choosing concrete

Students learn about cement and what goes into concrete. They identify the types of materials available locally and where to get them from. They learn about different mixes for different purposes.

Mix and lay concrete

Students work out the size and thickness of concrete for a job — and how much they will need. They prepare the ground and formwork for a simple concrete project. They mix concrete, by hand and by mixer, then pour, compact, screed, finish and cure the concrete.

Introduction to blocks

Students learn about the types and sizes of concrete blocks that are available locally and what they can be used for. They think about the need for reinforcement and foundations for a job.

Build with blocks

Students firstly work with “dry’ blocks. They practise how to fit blocks together in different patterns and learn how to use simple level and alignment tools to keep the blocks plumb and square.

Students work out quantities and costs of blocks for a project and the need for foundations and any steel reinforcing. They learn about when to ask for expert or engineering assistance.

Finally they lay blocks with mortar, finish the joints and fill the blocks to the project design.

How is the course put together?

The course is a basic introduction for people who know little about making concrete or laying blocks.

The course must be led by a tutor or experienced tradesperson who can show students the steps and how to use tools correctly and guide them on their developing skills.

The course will work best with small groups of students who can talk about things and learn from each other.

The course is packaged in three parts:

- This Tutor guide
- Student workbook
- A video tape

Here is some information on each part:

Tutor guide

The Tutor guide you are reading gives you preparation plans and tutor notes for each module and each section within the modules.

The main learning material for each part is included in the both the Student workbook and this Tutor guide. This gives you a planned order for the things you need to talk about, explain and demonstrate. It also gives questions and activities — and practice — for students.

The Tutor Notes at the beginning of each section — on the blue pages — suggest the things that you need to find out, or collect, before you start each section. The notes then suggest additional ideas, points or questions for you to use as you work through the learning material.

Student workbook

The workbook contains the main learning material. It has exercises, illustrations and explanations of processes for students as well as space to make their own notes.

All the workbook material is repeated in the Tutor guide, with notes and directions added.

Video

The video for this course shows the various steps involved in preparing, mixing and laying concrete and building with concrete blocks. It shows examples of the materials and tools you need and how to use them.

Student checklist

A copy of the Student checklist is at the back of this guide and in each student workbook. It provides students with a record of what they have done.

Complete it for each student as they do the course activities. Sign it for them at the end of the course.

In what order do I run the course?

You can run the course material as a continuous 'block' course over several days, or you can run it as a number of shorter sessions spread over a longer period.

You should run the *Choosing concrete* module first. You can change the order of the others if you wish — but there are practical limitations to this. For instance, you have to prepare the ground before you can pour concrete and, once you have students with mixed concrete or mortar, you will need to finish the job!

What resources do I need?

This Tutor guide and the Student workbook are the main written resources for the course.

You will also need to provide students with materials, tools and equipment to work with. The front page of each section lists the specific resources needed, but here are some general requirements and suggestions:

Tools and equipment for students

You will need enough tools for small groups of students to work with. You can use tools that are similar to those shown — you do not need tools of exactly the same style or size.

Working area

Students will need a working area where they can prepare ground, mix and pour concrete and build block walls. This could be a piece of waste ground where students can make a small concrete slab and build a low section of wall. The wall and slab can be demolished afterwards. Much better would be a real, useful, building project that can be of use later.

Materials

You will need materials for students to work with. You will need quantities of cement, and suitable sand and rock (aggregate). You could take students to dig, prepare and transport these from local supplies.

Salvaged blocks are good enough for most building activities. Full and half blocks are needed.

You will also need suitable timber and tools for formwork.

You could ask some local businesses to help you with some samples. They can also give you local information on cement types and their size, availability, prices etc.

The role of the tutor

As a tutor for this course you should be a competent tradesperson with knowledge of concrete and block construction — and skills in using the tools.

You do not need to be a formal teacher, but you do need to be able to follow the material in this guide, talk to students about the topics and how things apply locally, and then show them the correct use of tools and processes.

As a tutor, you need to:

- **Collect** resources — local examples and working stock, tools, equipment etc
- **Identify** suitable local projects for students to work on
- **Lead** students through the material
- **Explain** how students can apply the material where they live
- **Demonstrate** concrete properties and show how to use plans
- **Demonstrate** how to use tools correctly and safely
- **Watch** students work and give feedback on how they are doing.

Copies of each module and section of learning material are included in your Tutor guide as well as in the Student workbook.

You need to work through each section with the students, talking about the tools and equipment and showing students how to use them.

The learning material is not designed to be used by students learning on their own.

You will find more detailed guidance on how to prepare yourself and lead students through the learning material in the section called *General — tutor notes* later in this Introduction.

Activities

The activities in the material should help students to gain a basic skill in doing the job and using the tools. Many activities are linked directly to a project.

Make sure you give students lots of time to have lots of practice.

Assessment

No formal assessment is included in this course.

Each worksheet has suggested practical activities for students to practise and complete. You should watch these activities, give feedback to students and encourage practice until your students are competent.

A Student Checklist is provided for you to check off each activity for each student. This will provide a record of completion for each of the key requirements of the course.

Projects

Provide your group of students with a project (or projects) to work on through the course so they can apply the skills they have learned. Ideally, these should be real, useful projects rather than just a small practice concrete slab or a few blocks made into a wall.

Students should work together in small groups to plan and construct the projects.

Suitable projects could include:

- **Concrete:** a path, part of a roadway, foundations for a wall or small building.
- **Blocks:** a low boundary wall (include at least one corner), the base for a water tank, others.

Plans or pictures for some of these are included in the modules. You can suggest others that fit local materials and conditions.

Student learning

Whether or not your students have had much school, they have much knowledge and skills from their life experience. You should use this when you are teaching groups. Students like to compare what they are learning with their experience. Many of the introductory sessions of this course help students to link the course material with the resources, tools and techniques used in their own locality. Talking about their knowledge, experience and feelings is important.

Discussions are important for learning. Asking questions and looking for solutions to problems are good ways of helping students to learn. Students learn best by working things out for themselves - the activities and practice sessions are most important. As a tutor you should be a guide rather than a teacher.

Most importantly, make every person feel that their thoughts, feelings and experiences are important. Then, people will be more confident at taking part in group discussions and activities.

This course gives a great deal of information and knowledge about concrete and blocks, but the main learning should be in developing basic skills. Students must be able to use the tools – not just talk about them. The course material and the tutor can show how to use a builders line, or a float, but it needs practice and feedback for a student to begin to develop any skill. Give plenty of time and materials for practice and activity sessions.

Groups of two or three students working together, watching and giving each other feedback can work well. It encourages students to recall knowledge, look critically at what they see and then give feedback to each other.

General — tutor notes

These notes should help you use the workbook with students.

Preparing yourself

Before you start working with students you need to get yourself ready.

Look through the Student workbook material to see what you have to cover.

Then read the tutor notes. These notes will:

- tell you what to collect or find out for each section
- give extra important information and guidance that you should include as you work through each section of the workbook.

Each section of the course starts by telling you:

What students will learn

Your notes and the student workbook modules each start by saying what the students should be able to do when they have finished the section.

Things you need before you start

Each section tells you what you need to find out, or things you need before you start. These are usually:

Information

Such as ideas, where to buy materials and what they cost, local regulations or ways to do things

Materials

Materials for students to use. For example: mortar, blocks and water

Tools or equipment

Tools and equipment for the students to work with

Project

For most activities, students make or build things. If you can find or create one, a real job or project is much better than a practice piece of work (such as a small concrete slab or a piece of wall) that is of no use afterwards.

Working through the material with students

Workbooks

The Student workbook modules have notes, pictures and activities for students. Most modules are in sections that follow a process — or the steps in which to do things.

For example, the *Build with blocks* module has sections on

- Design and plan blocks
- How to fit blocks together
- Laying blocks with mortar

Copies of the workbook sections are included in your manual here as well as in the Student workbook.

The workbooks are not designed to be used by the students learning on their own.

You need to work through each section with the students, talking about each step and showing the students how to do it.

Tutor notes

The tutor notes at the beginning of each section give you extra or important information and guidance that you should include as you work through each section of the workbook.

Here are some general ideas about using the workbook notes:

Talk the students through each section of the module

The *Introduction* and *Choosing* modules give information about materials, how they work, where they come from and what is available locally. The modules have notes and activities for students.

The *Mix & lay concrete* and the *Build with blocks* modules are more active. They have sections that show:

- how to carry out this stage
- the equipment, tools and materials needed
- safety issues
- activities for the student to answer or practise.

Show and explain

You need to:

- show local examples of materials and tools
- explain and follow each step, demonstrating how to:

do it correctly

use each tool

- help students do any calculations needed and apply what they have learned to a project
- explain the dangers and
- show safe ways to do things.

Student activity

The activities in the workbook should help students to gain a basic skill in preparing and laying concrete and blocks. The activities take students through all the preparation and laying or building stages.

In most activities, students have to answer questions and then practise each stage on a real project or job.

Make sure you give them time to handle the materials and have lots of practice with the equipment.

Where possible, get students to work in small groups of 2 or 3 people.

Encourage them to

- talk about what they are doing
- help each other to get things right
- check that others are doing things safely.

You should continue to help, show and guide students through the activities — they are not exams! However, let the students do all the thinking and the work.

Check the students' activity work and give feedback on how they have done.