

Colour cover
WORKING WITH CONCRETE

STUDENT WORKBOOK

THE COMMONWEALTH of LEARNING

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

This programme was initiated and supported by the Pacific Association for Technical and Vocational Education and Training (PATVET) and the Commonwealth of Learning.

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Modules

Concrete

 Choosing concrete

 Mix and lay concrete

Blocks

 Introduction to concrete blocks

 Build with blocks

Student checklist

Credits

The idea of a Basic Trades programme was originally proposed at the PATVET Institute in 2002 and then explored and documented at a workshop held in Suva, Fiji in June 2003. This workshop involved ideas and input from representatives of, mainly, smaller island nations in PATVET:

Kiribati	Taeboa Tabanga
Nauru	Ande Dubuae
Niue	Charlie Tohovaka
Tuvalu	Lapana Ene
Fiji (FIT)	Joeaia Vinali and Viliame Ramici

Further input and validation of the material was gratefully received from:

The Cook Islands – Harry Ivaiti
Nauru Vocational Training Centre
Tarawa Technical Institute
Fiji Institute of Technology
Vanuatu Institute of Technology
The Open Polytechnic of New Zealand —
Michelle Strand and David Weston

Thanks also to all the people of Tarawa, Nauru, Tuvalu, Suva and Vanuatu who contributed information or who appear in this material.

Especially:

Betio Hardware, Tarawa
Bairiki Hardware, Tarawa
The workers at the Block Making plant in Tarawa
The construction workers at the new Betio Island Council building, Tarawa

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 you to:

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

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

When you have finished this course you should be able to work on simple projects on your own. You 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 covered as four separate modules:

Choosing concrete

You learn about cement and what goes into concrete. You find out what types of materials are available locally and where to get them from. You learn about different mixes of concrete for different jobs.

Mix and lay concrete

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

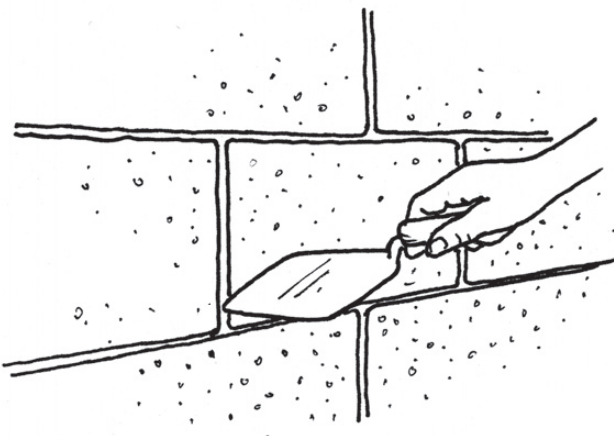


Introduction to blocks

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

Build with blocks

You firstly work with “dry” blocks. You practise how to fit blocks together in different patterns and learn how to use simple levels and alignment tools to keep the blocks plumb and square.



You work out quantities and costs of blocks for a project and the need for foundations and any steel reinforcing. You learn about when you **must** ask for expert or engineering help.

Finally you 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 trades person who can show you the steps, teach you how to use tools correctly and guide you with your developing skills.

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

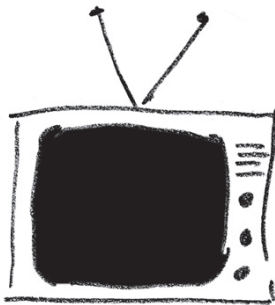
Student workbook

Your workbook has exercises, pictures and explanations as well as space to make your own notes.

The four modules in your workbook have separate sections for most of the big steps — such as *preparing your site*, *mixing*, and *pouring concrete*. Your tutor will work through each section with you, talking about the tools and materials and showing you how to use them.

You should not use the modules to learn on your own, but they should make good notes for you to look back at later on.

There is a Student Checklist at the back of the workbook for you to tick-off the work you do.



Video

The video for this course shows you 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.

The role of your tutor

Your tutor for this course is a competent tradesperson with knowledge of concrete and construction methods and skills in using the tools. They will show you how to work with concrete correctly and tell you how well your skills are developing.

Your tutor will:

- Have samples of cement, blocks and materials, tools and equipment for you to work with
- Lead you through the course
- Explain the written material
- Show you
 - types of concrete and how to work with them
 - how to use plans
 - types of blocks and how to build with them
 - how to use tools correctly and safely
- Watch you work and tell you how you are doing
- Complete your student checklist to record the work you have done.

Projects

During the course you will work on a project that uses the skills you have learned. You will get to make something like:

- a path or piece of roadway
- a concrete slab for a small building
- a low wall
- the base for a water tank

This course tells you a lot about concrete and tools, but you need to be able to really lay concrete and use the tools – not just talk about them.

The course books and your tutor can show you how to use a float, but you need lots of practice to develop any skill in using that float. Take plenty of time for practice during the activities.

Whenever you can, work with two or three other students. You can watch and give each other feedback on how you are doing.