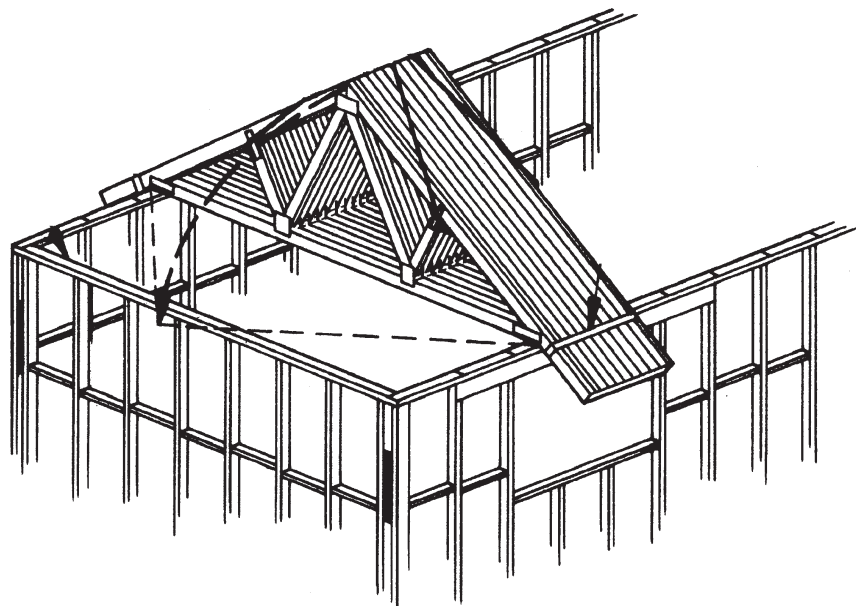


LEARNING RESOURCE PACKAGE

# General Construction Knowledge

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# Appendix:

## Plan and prepare for construction activities

### Timber grades

The grading of timber needs to be considered in wall construction. The main timber grades used in wall framing are *seasoned* or *unseasoned*. The details relating to their use are discussed further in the book and greater detail about their use is covered by *AS 1684 – 1999 Residential timber framed construction*

#### *Engineering construction grade*

This refers to members used being used for structural applications where they form part of a load bearing, compressive or tensile design. Typical situations would be plates, studs, noggings, trimmers and lintels. The main grades of timber used in wall construction are highlighted in the table below:

Stress grade	Colour	Stress grade	Colour
F4	Red	F14	Orange
F5	Black	F17	Yellow
F7	Blue	F22	Pink
F8	Green	F27	Turquoise
F11	Purple	F34	Royal Blue

**Table 1: Stress grades**

Other grades required for wall frame construction will be identified on the plans or in the table of specifications. In some circumstances a Structural Engineers certificate may be required that details the timber grades to be used, particularly when changes to plans have been made.

Other details relating to timber grades to be used can be found in *AS 1684 – 1999*. other Australian standards apply and information on these can be found at the following web address:

<http://www.standards.org.au>

### Ordering timber

Ordering material in a timely manner is a requisite part of the construction process. You should be guided by the overall job plan, which is generally laid out in a schedule of works or a time line chart

See *Basic Building and Construction Skills* page 37 fig.2.19 – Typical Gantt or chart

Timber should be ordered for delivery when it is needed, not two weeks before. The material will only get in the way, be exposed to adverse weather conditions or be damaged by accident.

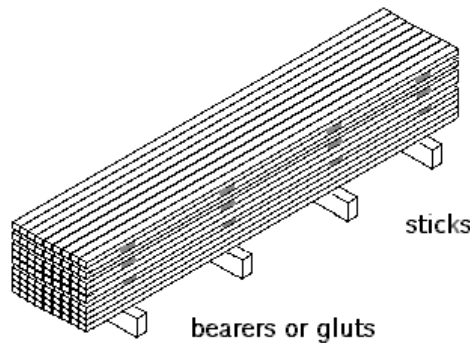
### Material storage

The timber quantities required to build a cottage are considerable and are usually ordered by the cubic metre or lineal metre.

For example a cubic metre (M<sup>3</sup>) of 75 x 35mm gauged pine consists of approximately 380 lineal metres of timber. If stud lengths are 2.4 mtr stock lengths you get 158 stock lengths.

This amount of timber takes up a large space. The timber should be stored off the ground on *bearer* or *gluts* to allow a free flow of air below and prevent moisture take up and insect or fungal attack. To improve air circulation and improve stability, *sticks* or *stickers* should separate several of the layers. The stack should be set as level as possible for safety. Many suppliers will deliver the material stacked, banded and sticked with a plastic wrapping.

You should check that the right material has been delivered immediately and locate the material as close as is practical to the area where the material will be cut and assembled. Cover the stack with plastic to prevent moisture penetration from above but keep it clear below so air can circulate within the stack.



**Figure 1 - Timber stack on gluts with stickers for stability**

**Note:** Seasoned timber and prefabricated frames should be on bearers 150mm clear of the ground. Bearers should be spaced at 600mm centres.

Fasteners, brace material and other hardware items eg like nails and nail plates, required for frames should be store in boxes or strapped together to facilitate ease of movement. They should be kept in a dry environment such as a shipping container or site shed.

## Tools

Hand tools associated with frame building:

- rules, tapes pencils and crayons for measuring and marking out plates and other joints
- claw hammers for nailing frames together and applying nail plates.
- chisels for cutting housings, trenches and scarfs in small wall framing tasks
- squares and combination squares for marking squared lines and gauging depths
- plumb bobs for plumbing up frames
- string lines and chalk lines for straightening and marking out frame positions
- levels for checking levels on sill trimmers and door heads and plumbing frames
- clamps for temporary holding of frames together while nailing is in progress
- cross cut hand saw for cutting joints and removing bottom plates through door openings

It is important to make sure your tools are in good working order before using them. Keep chisels and saws sharp, hammer faces clean, chalk lines chalked and check that the spirit level is reading correctly.

## Machinery and equipment

***Electrical equipment associated with wall frame construction:***

- electric leads should be of sufficient capacity to carry the current.
- multiple outlets in double adaptors are NOT allowed. All multi point connections must incorporate an earth leakage device. They must comply with *AS 3105, 2007*
- lead stands are used to keep the leads off the ground
- portable power saws to cut frame members and joints – blades should be sharp
- portable electric planer for flushing noggings and trimmers, with sharp cutters
- radial arm saw for cutting frame members to length. They can be used in conjunction with a trenching head to make housing and scarf joints.
- air compressors, which are required to operate nail guns

**Note:** All electrical devices on a building site must comply with AS3000 - Wiring rules - 2007.

*WorkCover* NSW enforces the *Code of practice – Electrical practices for construction*. This code specifies the requirements for electric equipment used on construction sites in NSW. In most cases electric tools, leads, including machinery must be inspected and tagged monthly by a qualified electrician. The codes of practice enforced within each state may differ in their interpretation and you should check and become familiar with the requirements of the particular state code.

The following web addresses will help you keep up to date with the latest information for your particular region.

NSW: [www.workcover.nsw.gov.au](http://www.workcover.nsw.gov.au) WA: [www.workcover.wa.gov.au](http://www.workcover.wa.gov.au)  
VIC: [www.worksafe.vic.gov.au](http://www.worksafe.vic.gov.au) NT: [www.worksafe.nt.gov.au/](http://www.worksafe.nt.gov.au/)  
QLD: [www.workcoverqld.gov.au/](http://www.workcoverqld.gov.au/) SA: [www.workcover.com/](http://www.workcover.com/)  
TAS: [www.workcover.tas.gov.au/](http://www.workcover.tas.gov.au/) ACT: [www.worksafety.act.gov.au](http://www.worksafety.act.gov.au)

## Equipment

Other types of equipment that may be required to cut assemble and erect wall frames include:

- nail guns (75 – 100mm pneumatic nailers) for framing or gas (combustion) operated types nailers. Regular manufacturer specified maintenance must be performed.
- air hoses for connecting air compressors and nail guns. If the lead is too long, the air pressure may drop significantly, causing the tool to misfire.
- explosive power tools for fixing frames to concrete slabs. A certified operator must operate them. These tools should be regularly maintained and serviced by authorised service agents.
- portable generators for running electrical equipment where no mains connection is available. They must comply with *AS2790 -1989*

**Note:** Hired equipment is required to be tested and tagged at the supplier's premises, *but it is the responsibility of the hirer to meet the requirements of the Code of Practice thereafter for the period of the hire agreement.*

All equipment should be checked for serviceability before each use.

Leads should be checked for cuts or breaks, plug ends checked for loose pins or signs of over heating. Never leave leads tightly coiled during use.

Oil levels should be checked on generators and compressors before use. All cutters should be sharp and inserted in the right machine correctly with holding screws/bolts checked for tension.

For further advice on the maintenance on plant tools and equipment refer to: Construction and Transport Educational Services Division, 2000, *Basic Building and Construction Skills – 2<sup>nd</sup> ed.* – Chapter 5 – Pearson Education, Sydney

## **Environmental issues**

Due regard must be given to the protection of the environment. In particular the production of waste, noise and dust. Due care must be taken to ensure air borne contaminants and waste products from the fabrication and erection of walls must be contained within the construction site.

## **Machine generated saw dust**

Where it is possible dust extraction equipment should be used on portable power equipment and radial arm saws. Work area should be cleaned before starting and regularly cleared to reduce slip and trip hazards. Sweeping up saw dust is a form of dust suppression that can be done regularly and will reduce the amount of airborne pollution.

## **Noise pollution**

Tools should be well maintained to ensure proper working order. Loose belts and poor lubrication can lead to excessive noise. When a portable generator is used for power the fitted muffler should be in good working order.

## **Air pollution**

Diesel generators can create excessive fumes if not well maintained. If the machine is producing noticeable exhaust fumes or excessive noise, the machine should be stopped and serviced. All generators should have an earth leakage device fitted.

## **Waste material**

When establishing a construction site, consideration must be given to the recycling, reuse or removal of waste materials. In constructing wall frame scrap material is likely to be created. Longer length should be stacked safely away from the immediate work area for reuse as trimmers, noggings and blocking etc.

Waste plastic wrapping from timber stacks can be placed in the right receptacles, ready for collection by waste companies, or they can be folded and used as protective sheeting for other materials when they are delivered to site. Another use is as a temporary barrier near machinery to prevent the spreading of saw dust over a wider area, or to create a weather barrier for some portable machinery when necessary. Metal strapping can be recycled along with other waste metals. It can also be nailed through as a temporary brace. It cannot be used as a permanent brace as it generally does not have a galvanised finish.

## **Personal Protective Equipment**

Eye and hearing protection must be worn whenever you are operating or working in the vicinity of portable power tools, plant and equipment. Steel capped safety boots should be worn at all times.



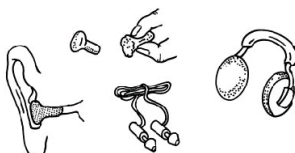
**Figure 2: Personal Protective equipment**

Loose clothing should be avoided and exposed skin areas should be covered with a factor 15+ UV sunscreen.

A hard hat should be worn where there is danger of tools or materials falling from height, or head injury is possible from exposed scaffolding components. Otherwise a wide brimmed hat should be a minimum when working in outdoor environments.



**Figure 3 - Wear a hard hat when necessary**



**Figure 4 - Different types of hearing protection**



# Contents

<i>Glossary of Terms</i>	1
<b>Section 1: CPCCCO2003A - Carry out concreting to simple forms</b>	<b>13</b>
<b>Section 2: CPCCCA3001A - Carry out demolition to minor building Structures</b>	<b>51</b>
<b>Section 3: CPCCCA3002A - Carry out setting out</b>	<b>87</b>
<b>Section 4: CPCCCA3003A - Install flooring systems</b>	<b>123</b>
<b>Section 5: CPCCCA3004A - Construct wall frames</b>	<b>182</b>
<b>Section 6: CPCCCA3006A - Erect roof trusses</b>	<b>235</b>
<b>Section 7: CPCCCA3005A - Construct ceiling frames</b>	<b>275</b>
<b>Section 8: CPCCCA3007A - Construct a pitched roof</b>	<b>303</b>
<b>Section 9: CPCCCA3008A - Construct eaves</b>	<b>383</b>
<b>Section 10: CPCCCA3010A - Install and replace windows and doors</b>	<b>403</b>
<b>Section 11: CPCCCA3023A - Carry out levelling operations</b>	<b>481</b>
<i>Appendix</i>	509

# Preface

Each of the eleven chapters in this resource package is aligned with a unit of competency from the CPC08 Construction and Plumbing Services Training Package, Carpentry qualification.

The aim of the work is to produce a learning resource that, for the most part, focuses on widely used techniques in various aspects of carpentry work. No attempt was made to address all conceivable alternative techniques that may be prevalent in some areas of the residential carpentry sector.

Each unit of competency includes learners' self-test questions to reinforce the learning cycle. **For teachers, suggested answers for the self-test questions will be available by electronic means or on CD.**

Units of competency have been used as the identifier for each section of the resource (rather than conventional chapter headings). This will allow greater flexibility as delivery of units may be sequenced independently to suit local needs.

During the development and review process of this resource it became apparent, almost immediately that, some considerable differences exist in the terminology that is applied to a range of structural components. In an effort to overcome some of these differences, we have as far as possible applied the terminology used in the Timber Framing Code, AS 1684.

We are confident that this work will prove to be of great benefit and a highly valued resource for all learners and teachers immersed in the qualification of Certificate III in Construction from the Construction and Plumbing Services Training Package.