National Certificate in Building, Construction, and Allied Trades Skills (BCATS)

Demonstrate knowledge of the joinery industry within a BCATS environment

Unit Standard – 25330

Level 2, Credit 2

Name: _____

What you need to do

By the end of this module, you should be able to demonstrate knowledge of the joinery industry covering:

- major industry sectors
- industry work processes
- industry clients, supply and inter-trade relationships
- the impact of regulatory and trade bodies on the industry and
- industry jobs and their training requirements.

How you will be assessed

Your teacher/tutor will give you a worksheet that you need to complete, which your teacher/tutor will mark.

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Glossary of Terms

Term	Meaning
BCITO	Building and Construction Industry Training Organisation.
Joiner	A person who makes and installs building components such as doors, windows, stairs, panelling, mouldings, shop cabinets.
Laminate	The surface material applied to the substrate n benches and tables.
Sill, jamb, head or transom, mullions, glazing bars, sash	The names given to different parts of a window.
Stiles, rails, mullions, panels	The names given to different parts of a door.
Stringers, treads, steps, risers	All parts of a stair.
Substrate	The base material that laminate is glued on to.

Introduction

The joinery industry creates several different types of products. These products are generally made by specialist manufacturers, although there are some joiners who manufacture many of the timber-based products in one factory. Products include:

- kitchen cabinets
- bathroom cabinets
- timber doors and frames
- timber windows and frames
- timber stairs
- laminate components

Joinery products/components are manufactured for commercial or residential buildings.

Commercial buildings include offices (which may be multi-storey buildings), factories, and retail shops, or maybe a combination of these.

Residential buildings include single or multi-storey dwellings, or multi-storey apartment blocks.

Both types of buildings require high quality products that are well constructed from high quality materials, and that will stand up to normal use.

Work Processes

In this section, we look at the common processes used to manufacture the different products supplied by the Joiner.

Kitchen cabinets

These are generally made from sheets of particle board with low pressure laminate on each side. The sheets are cut to size on a table saw. Each piece is then edged to hide the particle board. The main components of the cabinets underneath the bench top are boards covered in white laminate, while the doors and drawer fronts are made from coloured board.

The components in kitchen cabinets include

- ends/sides - the side components
- bottom/floor – the bottom components
- top – the top component
- divisions/dividers – vertical components that divide the measurement between the two ends
- shelves (fixed or adjustable) – horizontal components that divide the internal height of the cupboard
- toe kick – the component between the bottom of the cupboard and the floor. Fixed on edge to hide the cavity under the cabinet
- doors – panels that open on hinges to hide the contents of the cupboard
- drawers – sliding boxes that slide in and out on runners

Wall mounted (overhead) cupboards can also be made from white covered board for components that are not seen, and coloured board for the doors and/or components that are seen.

The white components are generally screwed together, and are located in the correct position with wooden dowels. Some kitchen cabinets are supplied as kitsets, and steel dowel and cam connectors are used to assemble the cabinets. The kitset versions come in standard modular sizes ranging from 400mm wide through to 1200mm wide. To hide the ends of cabinets that are seen, coloured panels are screwed on from the inside of the cabinet.

Bathroom cabinets

These can be made from either laminated particle board, or solid timber. Those made from laminated particle board are made in the same way as kitchen cabinets.

Solid timber cabinets are generally custom made to the customer's requirements. The timber panel components are often made from several strips of timber joined edge to edge to achieve the correct width. The components are glued together with wooden dowels or biscuits.

Bathroom cabinets have similar components to kitchen cabinets.

Timber doors

Timber doors are made from solid timber. There is a range of styles available as 'off-the shelf' items that are made to standard sizes. These include solid doors made from strips of timber joined edge-to-edge, framed doors with glass panels, framed doors with moulded timber panels, and framed doors with a combination of glass and timber panels.

The components in framed timber doors include:

- stiles – the side components
- rails – the top and bottom components
- mullion – the intermediate vertical component
- panels – solid components with moulded edges fixed between the other components

Frames are joined together using wooden dowels and glue. The frame components are machined to fit the glass or timber panels. The timber panels are inserted as the frame is being assembled.

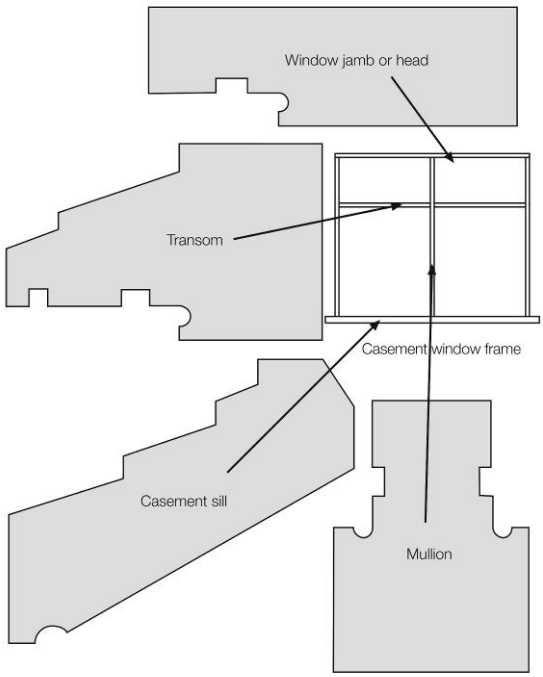
There are other doors called 'flush doors' that a made with a timber frame with plywood glued onto each side of the frame. These are usually made by specialist manufacturers to specific sizes and can be bought off the shelf.

Timber window frames

Timber window frames are made from solid timber that has been treated against insects and rot. The timber components are machined to the correct profile, and glued and nailed together to form the frame.

The components in timber window frames include

- sill – the bottom component
- jambs – the side components
- head (or transom) – the top component
- mullions - middle components
- glazing bars – intermediate horizontal and vertical components for fixed windows
- sash – opening frames with glass in them



Window parts

The rebates that take the glass are primed, left to dry, and then the glass is put in. Because windows need to be water tight, the joiner must make sure that the glass is bedded into the rebate (usually with putty), and that there is a good seal between the glass and the frame. Putty is applied to the outside of the glass and rebate to form the seal.

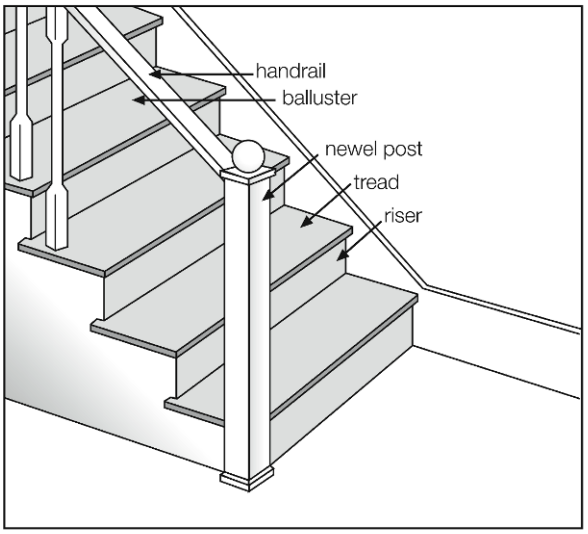
Timber stairs

Timber stairs are made using solid timber for the sides, and either timber or triboard (a man-made sheet material) for the treads (steps) and risers (vertical panels between each tread).

The components in timber stairs include

- stringers – the side components
- treads/steps – the horizontal (flat) components
- risers – the vertical panels between each step

The stringers have slots machined into the inside face to house the treads and risers. The stair is assembled by applying glue to the slots, and inserting the treads and risers into one of the stringers. Glue is then applied to the slots in the second stringer and the stringer is placed against the opposite end of the treads and risers. The stair assembly is cramped together, and wedges tapped into the slots to hold the treads and risers tightly in place until the glue sets.



Stair parts

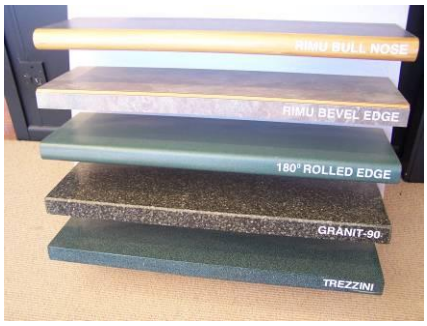
Laminate fabrication

Laminate fabrication generally creates hard wearing surfaces such as kitchen bench tops

The components in laminate fabrications include

- substrate – the sheet material to which the laminate is applied

- laminate – the surface material applied to the substrate



These fabrications are made by cutting the substrate (base) material to size. The laminate is cut slightly oversize. Glue is applied to the substrate and the underside of the laminate. Packers are placed on the glued surface of the substrate, and starting at one end, the laminate is laid on to the substrate, then pressed in place.

Because the glue used is contact glue, the glued surfaces can't touch each other until the laminate is positioned correctly.

Client Base

Joiners supply joinery products either

- directly to the client, or
- by subcontracting to builders or building companies.

Direct to the client

This occurs where the client approaches the joiner to price and manufacture products. These could be from drawings or where the joiner discusses the client's requirements, and provides ideas or advice. The client contracts the joiner to manufacture the items. Often the joiner will install the items for the client. The client pays the joiner direct for the items and installation.

Here, the joiner will fit the items required into their production schedule, and advise the client when they can expect to have the items delivered.

Subcontracting

In this situation, the joiner is invited to price the items by a builder or building company. This usually occurs when there is a new building, or an alteration to an existing building. The building company will invite several joiners to provide quotations to supply (and often to install) a range of items.

The builder then chooses a joiner, and offers them the job. If the job is large, the building company may choose more than one joiner, dividing the work between them. This occurs when there is a short timeframe to get the whole job completed.

Once the building company has chosen who will manufacture the items, the company then gives the joiner a schedule detailing when certain items are required. The joiner makes sure they can meet these requirements within their production schedule.

Supply Relationships

Trade account and discounts

The joiner buys the different materials they need from a range of suppliers. This generally involves timber and sheet material suppliers, hardware suppliers, and suppliers of other materials.

A new business must set up trade credit account with each supplier. This allows the joiner to get materials from the supplier on credit, paying for them usually by the 20th of the month following the month they are ordered. The supplier will offer the joiner trade discounts for the materials. These discounts vary, depending on the quantity of materials the joiner orders.

For example, the discount on a crate of sheet material (maybe 25 sheets) will be larger than if the joiner only buys up to 10 sheets and a bundle of timber of a specific size (e.g. 250 x 50) will have a larger discount per metre than if the joiner only orders a few metres.

Generally, materials that are bought in large quantities have larger discounts than materials that are bought in smaller quantities.

Material guarantees

Companies that provide materials to the joiner's suppliers give guarantees that the products they sell will be fit for the purpose they will be used for, and free from defects.

The joiner, in turn, provides their clients with a guarantee for the materials used and workmanship in the joinery they sell.

For large contracts, there is often a maintenance period of three months following the completion of the joinery installation. This allows the joiner to make adjustments to the joinery they've supplied if necessary. Things like door hinges on cupboards may need to be adjusted after the cupboards have been installed.

Product training

When a new product is launched, suppliers will provide product training for people who will be using the product. This is done either within the joinery factory or at special product training sessions. Training sessions may involve the product manufacturer as well as the supplier.

These are very useful to ensure you understand the capabilities and limitations of new products.

Relationships with other Trades

The joinery trade has close relationships with other trades because of the product the joiner manufactures. Other trades the joiner needs to work with include:

- builders/carpenters
- electricians
- plumbers

Imagine a kitchen being manufactured for a client who is replacing or altering their existing kitchen. The builder may have removed the existing cabinets, and re-lined the walls. Before the new wall linings were attached, the electrician and plumber will have been in and installed new wiring and piping.

When the room is ready for the new joinery, the joiner delivers the new kitchen units to the site. The joiner may also install the new units (while the builder works on something else). When the units are in place, the plumber comes back to connect up the pipes and waste. The electrician may also need to come back to connect new switches and power points.

It is very important that each of these tradesmen coordinate their efforts so that the client faces the least amount of disruption as possible.

There can be some cross-over between the builder and the joiner. The joiner may need to undertake work normally done by the builder, and vice versa.

Requirements of Industry Bodies

There are a number of external organisations that are involved with the joinery industry. These include:

- WorkSafe New Zealand (WorkSafe)
- Ministry of Business, Innovation and Employment (MBIE)
- Building Consent Authorities
- Trade or professional organisations
- Industry Training Organisations

WorkSafe New Zealand (WorkSafe)

WorkSafe is the work health and safety regulator and is responsible for implementing the Health and Safety at Work Act 2015.

WorkSafe's functions include:

- Monitoring and enforcing compliance with work health and safety legislation
- Providing guidance, advice and information on work health and safety
- Fostering a co-operative and consultative relationship between the people who have health and safety duties and the persons to whom they owe those duties and their representatives.
- Collecting, analysing and publishing statistics and other information relating to work health and safety.

Ministry of Business, Innovation and Employment (MBIE)

MBIE is responsible for the functions that used to be done by many other departments, including the Department of Labour and the Department of Building and Housing. It is responsible for the Building Act and the Building Code. The regulations that affect the joinery industry relate to the Building Code. Examples of these include:

- Stair tread depth
- Hand rail and landing rail height
- Newel post spacing
- Weather tightness of windows and external door

Standards New Zealand

Standards New Zealand develops, distributes, and administers standards and standards based solutions. They provide information, establish measurements, and set quality and safety levels across a range of sectors.

Building Consent Authorities (BCAs)

A Building Consent Authority (BCA) is an organisation or individual accredited to administer building control functions which is most commonly done by Territorial Authorities (local authorities or councils).

They make sure that the work that has been done meets the Building Code.

They have to check the work before it starts, while it is underway and when it is finished. This is shown in the table below.

What the Building Consent Authority does	When	What they are checking
Issue building consents	Before any building work starts	Checking that the details shown on drawings meet the Building Code
Perform inspections	As building progresses	Checking that construction, insulation, lining, bracing, weather tightness, plumbing, and electrical work complies with the Building Code
Issue Code Compliance Certificates	When the building is completed	Checking that all the requirements of the Building Code are met.

Trade or professional organisations

These organisations are often regulatory bodies working with specific areas of an industry. Apart from the Industry Training Organisations (ITOs), there are other bodies that work with the joinery industry. A couple of these are:

- Window Association of New Zealand (WANZ)
- National Kitchen and Bathroom Association (NKBA)

Industry Training Organisations

Industry training organisations (ITOs) set the skill standards and arrange training for people employed in the industries the ITO is responsible for. Almost all apprentices in New Zealand are enrolled with an ITO.

Industry Training Organisations (ITOs):

- Develop qualifications, training resources and assessments
- Administer apprenticeship training agreements
- Provide information for people working or wanting to work within the joinery industry

The ITO covering the joinery industry is the Building and Construction Industry Training Organisation (BCITO). Aside from the joinery industry, the BCITO is the ITO that serves:

- Architectural Aluminium Joinery
- Glass and Glazing
- Interior Systems

- Flooring
- Tiling
- Stonemasonry
- Frame and Truss Manufacturing
- Concrete
- Exterior Plastering
- Painting and Decorating
- Kitchen and Bathroom Design
- Brick and Block Laying
- Carpentry.

Job Roles

As a joiner, you can take on a number of different roles in the factory. These include

- Timber or component machining
- Cabinet assembly
- Stair assembly
- Window and door assembly
- Laminate fabrication
- Installation of joinery products

Timber or component machining

Working as a machinist, you'll be taking raw materials (timber and sheet materials) and creating specific components using different machines. The machines you'll use include:

Saws – docking saw, rip saw, table saw, band saw

Surface planer

Thicknesser

Spindle moulder

Router

Mortise and tenoner

Boring machines

CNC machines – these are computer controlled machining centres

You'll be given instructions on how to use these machines safely and efficiently to create components for joinery products. When you have mastered each machine, you can be assessed as part of your qualification.

Cabinet, stair, window and door assembly

Assembly work involves taking the components created by the machinist, and putting them together to create a finished cabinet. You may be assembling a cabinet for a bathroom, part of a kitchen, or part of an office fit out. No matter what the assembly job is, you'll be given a drawing or sketch showing how the finished product should look.

Before you start, check that you have all the components you need. For example, let's take a simple cabinet with a door and a shelf inside. The cabinet has four legs. The components you should have will be

- Top
- Bottom
- Two ends
- Shelf
- Door

- Legs
- Hardware – hinges, screws, shelf brackets

If you get into the habit of checking before you start assembling anything, the assembly should proceed without any problem.

Laminate fabrication

Laminate fabrication generally creates hard wearing surfaces such as kitchen bench tops.

Here, the machinist will have cut the substrate to the finished size and the laminate slightly over size. Your job is to apply the contact glue to both components, and then bring both surfaces together to create the component. You'll trim the laminate back to the edges of the substrate.

Because you'll use contact glue, you need to take care that the glued surfaces don't touch each other until the laminate is positioned correctly. You place packers on the glued surface of the substrate, and starting at one end, lay the laminate on to the substrate, press into place as you remove the packers one by one.

Installation

Installation work involves working outside the factory. The items are delivered to the site and placed in their final position. They are then fixed in place either using brackets or by screwing them directly to a wall.

Training

To become a qualified Joiner you need to complete a formal apprenticeship, which usually takes between three and four years. An apprentice is a person who has signed into a Training Agreement with an employer to learn the range of knowledge, skills, and competencies that are required for a career in the joinery industry.

Joinery apprentices receive on the job training, and are also expected to attend block courses on occasion. Throughout the apprenticeship a person is assessed for a range of theory and practical joinery work. Apprenticeships are "competency based" which is all about demonstrating the ability (both in terms of knowledge and skill) to complete a range of tasks to a recognised industry standard.

Training enquiries

If you are interested in a career in the Joinery industry contact the BCITO:

Phone: 0800 4BCITO
0800 422 486

Web: www.bcito.org.nz
getacareer@bcito.org.nz

For more experience at school contact your school Gateway supervisor or careers advisor.