



BCATS

BUILDING, CONSTRUCTION
AND ALLIED TRADE SKILLS

Knowledge of BCATS trades



Unit Standard 31512 (v1), Level 1

Demonstrate knowledge of BCATS
trades involved in the construction
of a residential building.

2 CREDITS

BCITO
buildingpeople

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(BCITO)**

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Introduction

There are many career opportunities in the building and construction sector. This handbook is a basic introduction to some of the Building, Construction, and Allied Trades Skills (BCATS) trades involved in constructing a house.

There is a lot of other information about trades and their specialities that you can discover through talking with people, paying attention to the names of businesses advertised on cars and buildings, and researching on the internet or your local library.

The trades covered in this handbook are listed below. There are others, and also many specialities within those included, that offer rewarding careers.

- Architectural aluminium joinery
- Brick and block laying
- Carpentry
- Concrete
- Exterior plastering
- Flooring
- Frame and truss
- Glass and glazing
- Interior systems
- Joinery
- Kitchen and bathroom design
- Painting and decorating
- Resin flooring
- Stonemasonry
- Tiling

How you will be assessed

You need to:

- list at least 10 different trades involved in constructing a residential building
- describe how each of them contributes to a successful build
- describe the order in which each trade needs to do their work.

Your teacher/tutor will give you a Knowledge Assessment to complete, which they will then mark.

BCATS trades overview

Trades working to construct a home need to be organised, communicate well, and collaborate with a range of people with different skills, experience and expertise.

Everyone on a project:

- has a duty of care to respect the work of other trades on the job and avoid damage to any completed work
- needs to be clear about the lines of communication
- needs to be aware of their roles and responsibilities to the project
- is responsible for contributing to a safe workplace.

Each individual trade:























- is responsible for completing the work they were contracted to do
- needs to work within the timeframes of the project
- needs to make sure their work doesn't impact negatively on the work of any other trade.

The table below shows the six main stages of residential house construction and what trade tasks are associated with these stages.

CONSTRUCTION STAGE	TASKS
Preliminary work	Client consultation, architect plans, council approval, site establishment, demolition, set out
Support structures	Timber framed floors, concrete floors, retaining walls
Frames and structures	Walls, roofs, ceilings
Exterior envelope	Roof cladding, windows and external doors, exterior wall cladding
Interior lining and finishing	Insulation, wall linings, trims, joinery, hardware, tiling, resin flooring, painting and decorating
Final fit and handover	Floor finishing, landscaping, cleaning, site disestablishment

The stages where BCATS trades are applied during the construction of a residential house are shown on the table on the next page.

RESIDENTIAL HOUSE BUILD SEQUENCE

	Preliminary work	Support structures	Frames & structures	Exterior envelope	Interior lining & finishing				Final fit & handover	
 Architect										
 Aluminium joinery										
 Brick and block laying										
 Carpentry										
 Civil infrastructure										
 Concrete										
 Drainlaying										
 Electrician										
 Exterior plastering										
 Flooring										
 Frame and truss										
 Gasfitters										
 Glass and glazing										
 Interior systems										
 Joinery										
 Kitchen/bathroom design										
 Paint and decorating										
 Plumbing										
 Resin flooring										
 Roofing										
 Stonemasonry										
 Tiling										

Architectural Aluminium Joiners (Te Hanga Matapihi Konumohe)



Sometimes called aluminium fabricators, architectural aluminium joiners machine and fabricate aluminium into joinery items. Most of their work is in creating aluminium framing for windows and doors but sometimes they need to create aluminium joinery for features, such as round windows, specified in the building plans.

Aluminium doors and windows are widely used in New Zealand residential and commercial buildings. Those who make them need to interpret plans and specifications correctly to make the joinery exactly the right size. They

normally also do a final site measure of the framed cavities to check that they are what was specified in the plans.

Assembling the joinery involves working in a workshop or factory. Technology and specialist factory machinery is used to measure, cut and assemble standard and complex, non-standard, aluminium joinery products.

Not all aluminium joiners install the joinery. Those who do need to understand adhesives, sealants and proper installation techniques. They ensure joinery is installed and fitted to a high standard and is water-tight.

Aluminium joinery is usually installed as soon as the walls are framed and the roofing is completed but before the external cladding is fixed in place.

It usually takes two or three years to qualify.

Brick and Block Layers

(Te Hanga Pakitara Pereki)

Sometimes also called 'brickies', brick and block layers build retaining and structural walls, and clad houses using bricks, pre-cut stone and concrete blocks to ensure they are weather-tight and look good.

Bricks and blocks can also be used for decoration to create things like fireplaces and other interior features.

Most brick and block layers lay both bricks and blocks, but some specialise in one or the other. They may also lay natural stone and pavers.

All brick and block layers need to know how to:

- read and follow construction plans
- cut and shape bricks, blocks and tiles
- make and place mortar
- lay bricks, blocks and tiles in rows or shapes
- alter, repair and restore brickwork.



The timing of the work brick and block layers do on a house varies depending on its design. As examples:

Block layers may be on site before the house starts being built to lay block foundations for the floor or to install block retaining walls. They may also return once the house is pretty much completed if block fencing is needed.

Bricklayers might be on site laying the brick cladding once the building wrap, windows, and external doors are installed. For other jobs, they may not be on site until items such as outdoor fire places or gate pillars need to be constructed.

It usually takes three or four years to qualify.

Carpenters

(Te Mahi a Kāmura)



Carpenters are commonly known as builders but are sometimes also referred to as 'chippies' due to the wood chips created when cutting timber.

They are often the main contractor on a house build who sub-contracts specialised functions to other trades. They need to have extensive knowledge of the Building Code to build homes that are safe and dry.

Carpenters are almost always on site for the entire house build project. They work with materials such as timber, concrete, steel, and concrete blocks. They lay foundations, construct

and erect wall and roof framing, install windows and external doors, apply cladding to buildings, and fit out interiors. Some of these functions, such as the work involved with laying foundations, are often sub-contracted to those who specialise in doing them.

Carpenters who are Licenced Building Practitioners (LBPs) can construct foundations without a Foundations licence and install lightweight profiled metal roofing without a Roofing licence. Before starting any work, LBPs must check that any work that needs permits has had them issued by the local council.

Carpenters need to read and interpret working drawings, plans and specifications to select, measure, cut and fit building materials to meet their client's needs. Good maths and measuring skills are essential. Any errors could cause the building to not meet minimum Building Code and/or consent requirements.

Accuracy is also important for other trades to be able to do their job to a high standard. For example, poor construction or erecting of building frames could cause kitchen joinery and architectural aluminium joinery to not fit the way it should, leading to expensive rework and time delays. Another example of why accuracy is needed is that the wrong materials or sub-standard installation of internal or external cladding can compromise the building's water tightness. This then delays the work of exterior plasterers and of painters and decorators while it is being fixed. More delays to the build project can occur if these trades are already booked for another job after their scheduled work was due to finish.

It usually takes three to four years to qualify.

Concrete Professionals

(Te Mahi a Rāima Pūkenga)

Concrete is the most widely used construction material in the world. It's used in everything – houses, garden sheds, skyscrapers, aircraft hangers, foundations, floors, walls, bridges, driveways, paths, patios, and storm water pipes.

Overall, concrete professionals use a range of tools and machinery to:

- prepare formwork and lay reinforcing
- pour, finish and sometimes cut concrete for foundations and concrete floor slabs, driveways etc
- make pre-cast concrete items (as in the photo above) and install them in a building project.



It will come as no surprise to learn that there is a lot of specialisation of concrete professionals. Those that relate to residential builds include specialists who only or mainly:

- mix, dispatch and test concrete
- pour and finish concrete to form driveways and paths, foundations and slabs
- install the pre-cast walls and floors
- cut, saw and grind concrete for construction joints, demolition or decorative finishes.

Concrete professionals often come onto a house build project at the beginning to build retaining walls and lay the foundations and floor slabs. Depending on the design of the house, they may install pre-cast (or 'pre-formed') concrete panels after the heavy foundations or concrete block walls have been built. If the house is to have a concrete driveway, paths or patio as part of the landscaping, the concrete professionals will return once the house is completed.

It usually takes one to three years to qualify. Exactly how long will depend on your experience and skill. It would take longer – maybe four years – if you are building concrete commercial/infrastructure projects or multi-story buildings.

Exterior Plasterer (Te Whakapiri Ukutea ki Pakitara Whakawaho)



Exterior plasterers are sometimes simply known as plasterers. They mix and apply plaster to form the exterior cladding of a building, or to form smooth or textured surfaces for pools and walls.

There are two exterior plastering specialities in New Zealand, though some choose to specialise in both:

Solid plaster. These plasterers apply protective and decorative coats of sand and cement-based plaster.

PPCS (Proprietary Plaster Cladding System).

These plasterers install a variety of exterior cladding substrates and finish them with coats of plaster modified to form a 'system' with the particular substrate.

All exterior plasterers need to be able to interpret building plans and specifications to select and measure the right materials to apply and create the required finish.

The quality of their work has to be high to ensure water-tightness. Plaster applied to a high standard also makes for a good base for the painters to work on and so can affect how the finished house looks. Exterior plasterers apply decorative finishes and mouldings to buildings and so it pays to have an artistic bend, and be physically fit.

Exterior plasterers come on site once the house structure is built to apply the backing panels or materials that form the substrate for the plaster coating. It is important they install the specified system to the manufacturer's instructions as this forms the house's protective barrier against the weather, and affects the system's guarantee. All the necessary flashings and cavities must be installed before a council inspection can take place. Once the council has confirmed it is content with the backing and flashing system, the exterior plaster can be applied.

It usually takes two to three years to qualify.

Flooring Professional (Te Hanga Papa Whare, Te Horapa Whāriki Whare)

Flooring professionals are sometimes called carpet or vinyl layers. They lay, replace and repair floor coverings. Floor coverings include carpet, vinyl, timber, and other types of flooring.

Flooring installation is a key part of the building process. Flooring helps to finish rooms by making them practical and attractive spaces.

Flooring professionals need a good understanding of:

- how to measure and prepare surfaces to be covered
- how to install different floor coverings
- technical skills, such as knowing how to measure a floor's moisture content
- health and safety equipment and processes.



They also need to use specialised equipment, such as floor sanders.

Floorers need to be able to manage heavy flooring materials. Dust, adhesives, and varnish can all cause severe health problems so they also need to read and follow instructions on Safety Data Sheets.

The flooring industry is always improving and introducing new technology, products and installation techniques. Flooring professionals keep themselves up to date with these changes.

Floorers usually come on site once all the internal work is complete. Attention to detail is needed to accurately measure, cut and lay the floor coverings.

It typically takes 2-3 years for someone to become a qualified flooring installer. This may depend on the speciality selected.

Frame and Truss Manufacturer (Te Hanga Anga Whare)



Frame and truss manufacturers make pre-nailed framing sections of walls and roofs.

The frames and trusses are built in a factory environment to each building's plans and specifications. They are then delivered to the construction site for builders to erect.

For more complex builds, the manufacturers may travel to the site to oversee the fitting and standing of the frames.

There are two specialities within frame and truss manufacturing:

Frame and truss fabricator. Fabricators work on the workshop or factory floor. They measure, cut and assemble the frames and trusses. Fabricators work with a range of specialist timber processing tools, machinery and equipment such as saws, cranes, hoists, press for truss plates, and nail guns.

Frame and truss detailer. Detailers work in the office. They interpret plans and drawing to create layout plans and cutting lists. They usually use CAD (Computer-Aided Design) software to design the frames and trusses the fabricators make.

It normally takes one to two years to become fully qualified.

Glass and Glazing

(Te Karāhe Whare)

Glass and glazing involves processing and/or installing glass in the construction or automotive industry. There are two specialities within the construction industry:

- Glazing
- Glass processing

Glaziers cut and install glass products and related structures. They need to know how to handle and install different types of glass, like toughened glass, solar controlled and specially coated glass and insulation systems.

Glaziers install glass in timber, metal and PVC frames. Aside from windows, they install shower cubicles, glass walls, floors, and canopies.

They also need to master the techniques needed to manually cut irregular glass shapes on-site from working drawings and plans. Attention to detail to measure and cut to exact requirements is essential. Installed glass needs to fit tightly to be waterproof.

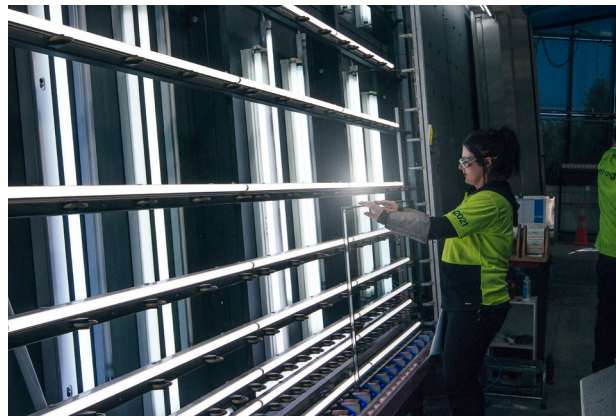
Glaziers install their glass products once its framing has been constructed.

Glass processors prepare and process glass before it is delivered to site for installation. They need to understand different types of glass, as well as methods like:

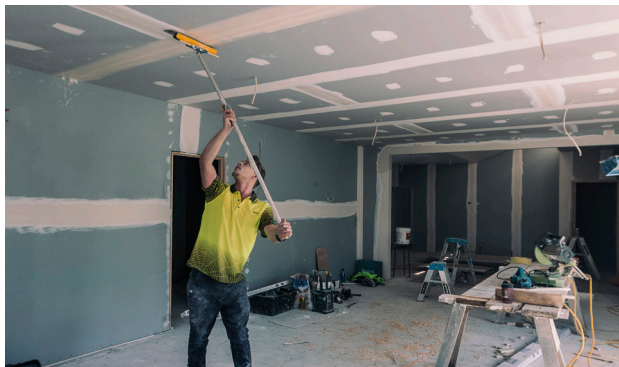
- cutting
- processing Insulating Glass Units (IGUs) (also known as 'double glazing units')
- notching glass to regular and irregular shapes
- edgeworking
- manually processing toughened and heat strengthened glass
- the safe loading of glass for transportation.

Glass processors normally hand their finished product to glaziers for installation.

Depending on the speciality, it can take 18 months to three years to become qualified.



Interior Systems Specialists (Ngā Pūnaha-o-Rō-Whare)



Depending on their speciality, interior systems specialists are often called gib-stoppers, plasterers, fibrous plasterers or ceiling fitters.

All do their work once the carpenter has constructed the frames their material needs to be fixed to. Painters then seal the fixed material.

Interior systems specialists whose work contributes to residential buildings are officially known as:

Interior linings fixer	Interior linings fixers install plaster board, fibre cement, and fibrous plaster ready for stopping and finishing. Interior linings are those such as walls and ceilings. They line the inside of the room on top of the framing structures carpenters install.
Interior linings finisher	Interior linings finishers stop (seal the lining's joins) and finish the linings ready for painting. They also install coves and cornices to provide decoration between walls and ceilings.
Suspended ceilings installer	Suspended ceilings are secondary ceilings suspended from the structural floor slab above, or existing ceiling, creating a void (gap) between the underside of the floor slab and the top of the suspended ceiling. In a multi-floor residential or commercial building, the void provides space for the likes of plumbing pipes and air conditioning. Suspended ceiling installers set out and install the suspended ceiling grids. They then either line or place ceiling tiles into the grids.
Fibrous plaster manufacturer	Fibrous plaster manufacturers work in a factory, using moulds to make the fibrous plaster sheets, cornice and decorative mouldings the fixers and finishers install.

There are also career opportunities specifically on commercial sites as proprietary partition installers, install partitions to create rooms inside open spaces.

It normally takes two to three years to qualify in interior systems.

Joiners

(Te Hono Rākau)

Many joiners work in large workshops programming designs into multi-million dollar machines (called a CNC, or Computerised Numerical Control, machine). They use these to make cabinetry for kitchens, laundries, bathrooms, feature walls, and many other home features and furnishings. These can be completed in full or prepared as ready-to-assemble flat pack pieces.

Other joiners use more traditional tools and equipment to craft timber into old world windows, doors, French barn doors, and bespoke products such as floor to ceiling libraries.

Joiners need to be good at interpreting plans and specifications. The cabinetry and components (parts) have to be cut and constructed to exact dimensions. This involves the use of a combination of craftsmanship and technology.

Joiners also need a thorough understanding of the materials they work with and their properties. Different types of timber have their own strengths and weaknesses and looks. Other materials, such as laminates, are also common.

Joiners normally start preparing cabinetry and other joinery items at the preliminary stage of a build. They come onto site after the linings are in to check measurements and fit their work.

As with many trades, there is increasing specialisation in joinery. Apprentices can choose to specialise in one or more of Cabinetry, Timber Doors and Windows, Timber Stairs, and Laminate Fabrication. There are also those who focus solely on installing completed kitchen cabinetry.

It usually takes 2 to four years to qualify as a joiner.



Kitchen and Bathroom Designers (Te Whakahoahoa Kīhini me Rūma Horoi)



Kitchen and bathroom designers create kitchen and bathroom designs and plans. These plans are used by joinery firms to create the cabinetry or by merchants to source prefabricated cabinetry.

Kitchen and bathroom designers need excellent communication skills. They communicate with clients and interpret their needs to create concept sketches and technical plans. All need to apply knowledge of cabinet construction, ergonomics and materials to solve problems so the design can meet client's needs.

New designers often start their careers in national retail chains like Kitchen Studio, Mitre 10, and Ikea or in a joinery manufacturing business. Some then move into the world of bespoke design, where it is not unusual to have a budget of more than \$100,000 for a kitchen.

Specifically:

- Kitchen designers use specialised knowledge of mechanical systems, kitchen appliances, cabinet construction and installation, and space planning.
- Bathroom designers use specialised knowledge of bathroom fixtures, fittings, accessories and mechanical systems.

Kitchen and bathroom designers are normally contracted before the architect has completed the building's plans. This allows the architect to ensure there is enough space for the design and to incorporate plumbing and electrical needs into the plans and specifications. Some then complete their designs and hand it over to the joiners. Others manage the process right through to installation once the carpenters, interior systems specialists, and painting and decorators have done their jobs.

It normally takes two to three years to qualify as either a kitchen or bathroom designer. Because there are so many skills and knowledge in common, most qualify first as a kitchen designer and then get certified for their bathroom design knowledge, skills, and experience.

Painter and Decorators

(Te Peita me te Whakarākei)

Painters and decorators apply decorative and protective paint coatings inside and outside homes and wall coverings (such as wallpaper) inside them.

Painters and decorators need to know how to prepare substrates (what they're painting on or wallpapering) and what product is best for the job. Product selection also needs to take into account what weather conditions it is designed to be applied in and withstand, what the surface or room will be used for, and the final finish the client wants. They can erect scaffolding up to five metres high to complete their job.



Painters and decorators need good maths skills. They need to calculate the amount of paint needed for an area to purchase enough in one batch, which is important for colour consistency. They need to know ratios for mixing wallpaper paste and for diluting paint according to manufacturer's recommendations.

They also need good communication skills to convey their expertise of colour selection and to understand their clients' vision and expectations. Reading and interpreting plans and specifications and reading and following product use and safety instructions is important for the outcome of the job and for their and others health and safety.

There are some products and techniques that have remained almost unchanged for many, many years. However, the painting and decorating industry is always creating new products and techniques that professionals need to keep informed about and use. An example of these changes is rapid improvements in minimising health and environmental impacts of paint and associated products.

Painters and decorators' work usually begins once internal linings and exterior cladding has been fixed and finished.

It would usually take three to four years to become qualified.

Resin Flooring Applicators (Te Mahi Papa Kāpia)



Resin flooring applicators apply specialist resin flooring systems. Resin floors are made by mixing together ingredients that have a chemical reaction. The chemical reaction produces a durable and safe protective surface on concrete.

Resin flooring was originally used only on commercial floors but has increased in popularity for residential homes due to:

- the increased use of concrete flooring for passive heating
- attractive finishes that complement home décor
- how well they last on heavy-use floors such as kitchens, entry areas, and living rooms.

Resin flooring applicators require a sound understanding of how to prepare concrete surfaces. Resin is absorbed into the concrete during the process of hardening. Providing the concrete is prepared correctly, the two can't be separated.

Knowledge of different products and chemical compounds and how to safely use them is essential. Which resin flooring system is used will depend on the intended use of the surface. For example, a different system would be used on a garage floor to resist oil stains than one used inside the house for hygiene and appearance.

Resin flooring applicators need to be good at measuring areas to calculate how much product is required. They also need to measure weight and volume accurately to mix the resin flooring system's ingredients according to the manufacturer's specifications.

Resin flooring applicators come on site once the concrete floor has been poured and has set.

It usually takes two to three years to qualify.

Stonemason

(Te Hanga-ā-Kohatu)

Stonemasons work with traditional and modern building tools and materials like limestone, schist, granite and other natural New Zealand stone. They might also work with digital design and computer-driven cutting machinery to create custom shapes.



There are three main types of stonemasonry specialists in New Zealand:

Construction stonemasons

build and restore buildings, walls and retaining walls, and may also carve decorative features into the stonework.

Natural stone fixtures and fittings

stonemasons shape stone to form benchtops, handbasins and surface panels.

Monumental

masons sculpt and carve stone to create meaningful designs. Monumental masons do not often work on residential buildings.

Stonemasons need to understand the physical make-up and structural integrity of natural stone to shape it, match it with other stone in the structure or environment, and fix it well.

They are often involved in the design, creation, installation, repairs and refurbishment of different natural stone elements, both inside and outside the building. Stonemasons need to be physically fit and have a creative eye.

Depending on the house and property design, masons will come onto site early on to shape and lay stone for retaining walls. Once the house's supporting structure is built, they will shape and fix stone for the exterior cladding or interior feature walls. After the interior wall linings and kitchen and bathroom have been installed, they will return to fit stone features such as benchtops, splashbacks, fireplace hearths and natural stone floor and wall panels and tiles.

It usually takes between two and four years for a stonemason to become qualified.

Tiler

(Te Horapa Papariki)



Tilers use materials like ceramics, stone, glass, marble and terracotta. They cover walls, floors and surfaces in entrance ways, bathrooms, kitchens, living areas, patios, fireplaces and swimming pools. Tilers may also undertake restorative or repair work on historic buildings.

Tiling can be very creative. Even the same shaped and coloured tiles can be laid in different patterns for different effects. Add in different sizes and colours and tiling become a true art form even when the purpose of the tiles is to be

functional. Some jobs require mosaic patterns that are purely decorative.

It is obvious even in a small tiled area if care hasn't been taken to keep the tiles correctly spaced and lined up. Attention to detail is important.

Tilers have to interpret specifications and plans to calculate what materials and quantities are needed. Materials need to be handled with care and are heavy. As with pretty much all BCATS trades, a good level of physical fitness is a must.

Tilers come onto building projects after interior lining and finishing is complete, ready to fix tiles on-site. Depending on the house design, they will also be on site once the flooring substrate is ready for the floor tiles and again once kitchen and bathroom cabinetry has been installed.

It usually takes between two and three years to qualify.

