



Modular Building Solutions

Combining Kiwi DNA and offshore manufacturing to help solve the New Zealand Housing crisis

Nelson Property Investors Association
December, 2021

What a 'Modular' building is not?



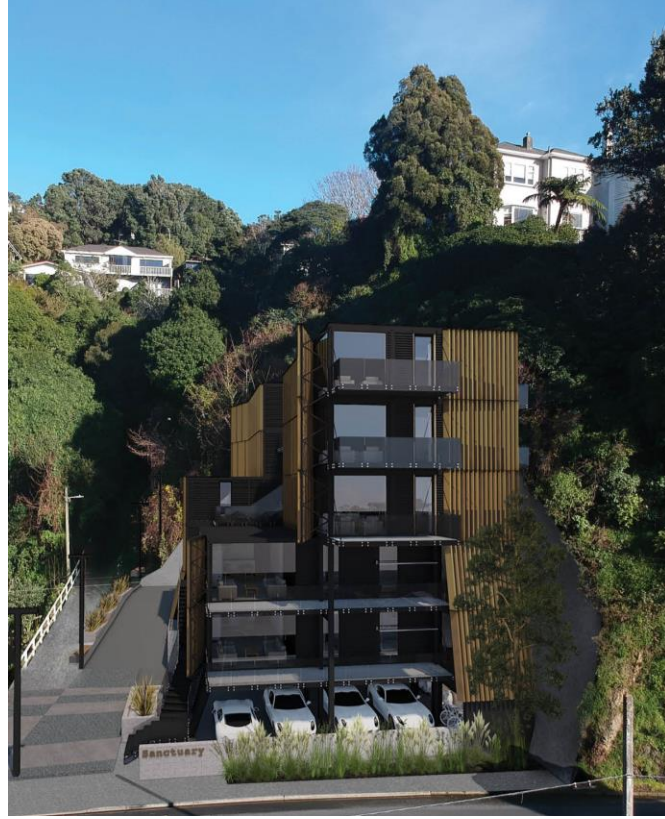
These are NOT containers

These are typical examples of Modular construction in 2021.

Since Ecotech first embarked on this journey the development and design of the modular solution has come a long way.

These are high quality, modern looking, energy efficient family homes.













Definition:

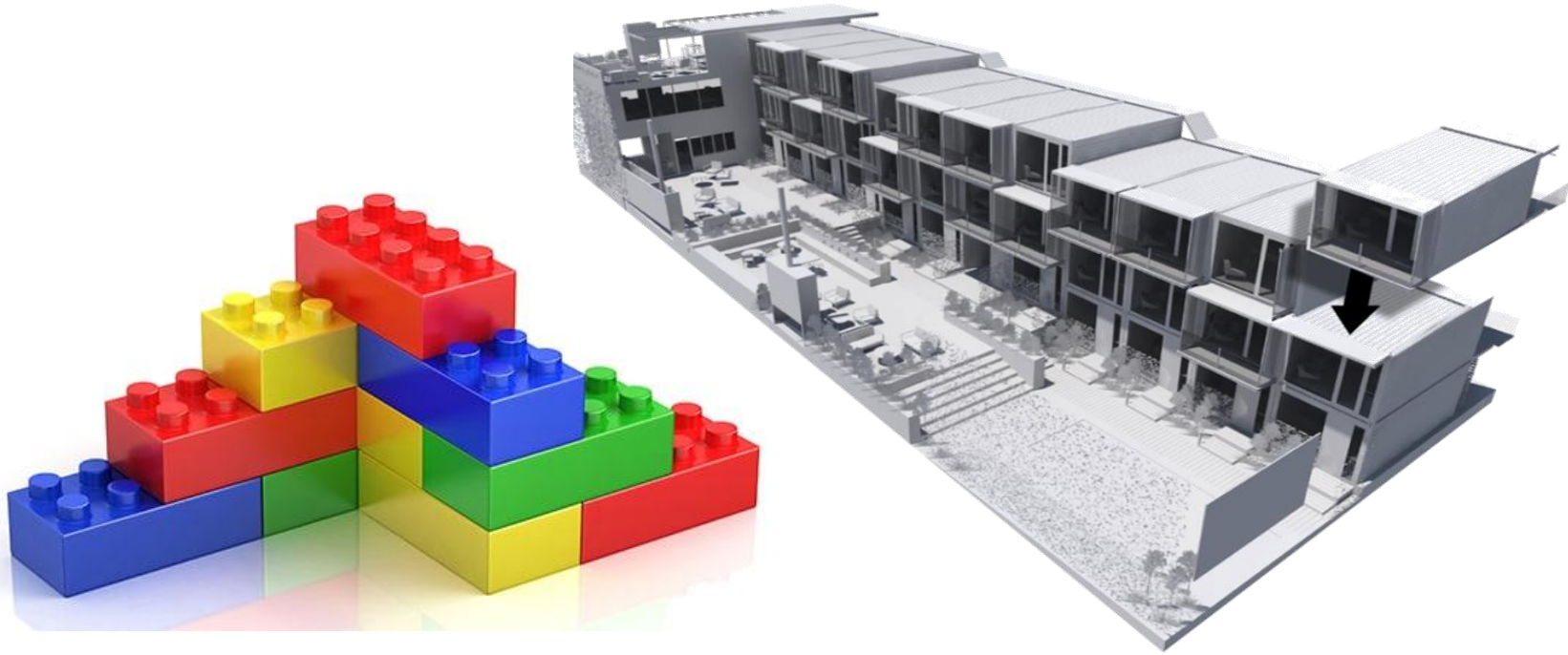
A modular building solution is where the main components of a structure are manufactured off-site (or off-shore) using factory based manufacturing. The completed modules are then transported to site.

*“Ecotech is the closest I’ve seen to best practice for an off-shore building manufacturer.
I would not hesitate to purchase an Ecotech home myself”*

Jeff Fahrensohn
Inspections Manager at Auckland Council



Buildings that form like...Lego



One 'module'. Unlimited Possibilities.

Our base Ecotech module can be joined, side by side, end to end and even stacked vertically to form terraced housing, multi-level hotels & apartment blocks.

Horizontally & Vertically

Low rise apartments, duplex and town houses



Stacked

High rise apartments





“At some point the NZ Construction industry is going to figure out why Toyota assembles cars in factories, not their customers’ driveways”

- Pamela Bell (Prefab NZ)

The Genesis of Ecotech

Who is Ecotech?

- The Ecotech Group of Companies is a Nelson based group that was established over 15 years ago by Tony Frost who wanted to develop and specialise in the provision of modular housing solutions.
- Ecotech has developed a team of 100% kiwi architects/designers and engineers to establish a modular solution that was then sourced through off-shore manufacturing facilities in China because, unfortunately New Zealand did not have the infrastructure to provide this.
- In its first decade of development Ecotech supplied more than 60 single storey standalone homes throughout New Zealand.
- Ecotech has invested millions of dollars developing a modular technology that has the capability to stack up to 10 levels. Ecotech has received 11 National Multiproof certificates for its modular designs, with 2 further applications currently before MBIE.

Who is Ecotech?

- 5 years ago Ecotech Commercial (NZ) Ltd was set up to target the multi-rise residential market with a high volume, affordable product. Our order book now exceeds 600 modules.
- This volume is only set to grow as developers see increasingly more modular projects being successfully delivered in New Zealand. Ecotech has an exclusive New Zealand supply contract with the off-shore production facility, Yahgee.
- Ecotech has worked closely with MBIE and Councils around New Zealand to create an off-shore building system that fully complies with New Zealand's challenging building code and standards. A robust third-party independent inspection system provides confidence that every module has been manufactured and tested to the same rigorous standards as any NZ-built home.
- Ecotech is now a Kainga Ora approved builder, and its development arm, MOD Developments, is a Kainga Ora approved developer.
- Ecotech is now in the perfect position to assist with one of the biggest issues facing New Zealand today – housing affordability.

We use the benefits of off-shore manufacturing that has 100% Kiwi DNA

The Ecotech Mantra

- To deliver 1000+ warm, dry and efficient houses to New Zealanders per annum
- Focusing on affordable housing and/or accessible housing for the disabled

...and this is how we can do it!

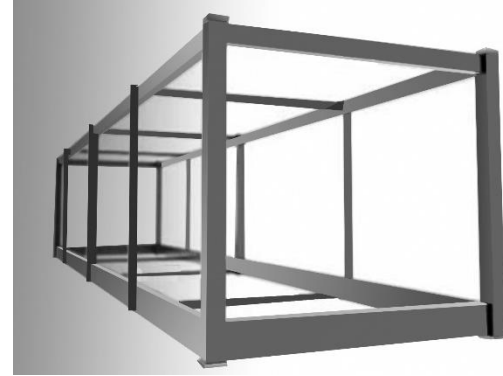
Proprietary Technologies

SUPER-STRONG STRUCTURAL STEEL MODULES

At the heart of the ECOTECH system is an innovative structural steel chassis that can be connected seamlessly together to create fully complete buildings of virtually any dimension.

The frame's strength unlocks new architectural freedom, with the creation of expansive floor to ceiling windows, spacious openings along an entire side or joins multiple modules together to form a large connected space. All without the need for additional internal supports.

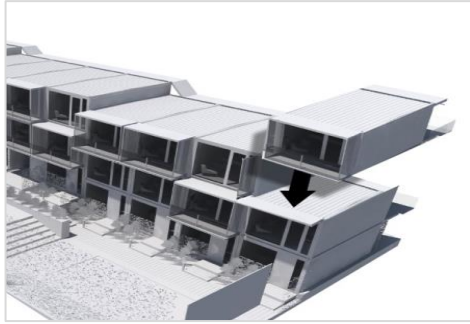
The concept of modular design comes direct from the shipping industry and builds on the vast experience that comes from manufacturing tens of millions of shipping containers over the past 60 years. The Modules utilise the same lifting mount system as shipping containers; enabling them to be transported and craned damage-free to site without special equipment.



THE RAW
STRENGTH TO

**STACK
VERTICALLY**

Research and Development



Modular Technologies

Ecotech brings together over a decade of development and millions of dollars in R&D to create NZ's foremost off-shore modular building system.

Proprietary technologies such as the fire protection systems, structural engineering and stacking capability, allow Ecotech to supply a world class home at pricing everyday New Zealanders can afford.

Innovative Design

One-off custom designs are prohibitively expensive and beyond the reach of most consumers.

However, by applying mass-production thinking to design we can re-define what's possible. Ecotech is able to share beautiful architectural design by maximising architectural budgets from volume manufacturing to develop a small number of stunning but repeatable designs. Each design iteration brings new ideas and smarter ways of delivering more on a budget.

Testing, Testing & Testing

Ecotech is committed to testing and third party quality assurance inspections that independently assure that all product is manufactured to NZ building code, standards and best practices.

SGS, the world's leading 3rd party inspection company, is always onsite in the factory during manufacturing.

NZ accredited labs are used to independently test new technologies and materials before they go to production.

The Key Features and Benefits of Modular

Product Advantages



Volume at pace

Our factory has the ability to deliver up to 10,000 modules per year



Technology

Game changing stacking technology & materials



Faster Builds

Build times measured in days, not months



Use of Air Space

Ability to build vertically >3 levels efficiently and economically



Lower Cost

Up to +30% better value through Economies of scale



Quality

Consistent quality guaranteed by QA systems



Design

Architectural designs at mass production costs



Safer Sites

Built off site in factory-controlled conditions

Product Features



6+ Home star energy rating



Floor-to-ceiling Thermally broken Glazing



Exceptional Weather tightness



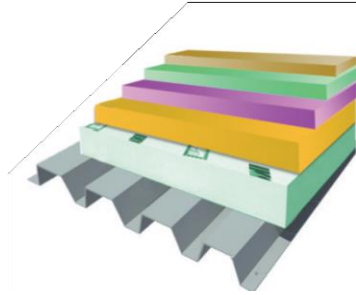
High quality kitchens



Level Bathrooms

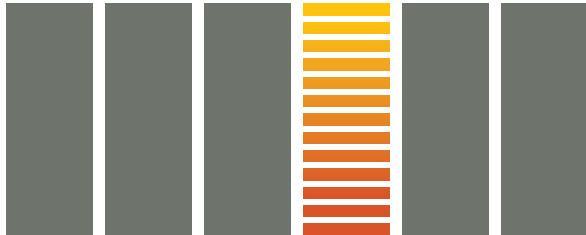
Product Features

Multi-layer Insulation



Plaster Board
Thermal Fire
Acoustic Moisture

Inbuilt 60-minute fire rating



engineered as
independent fire cells

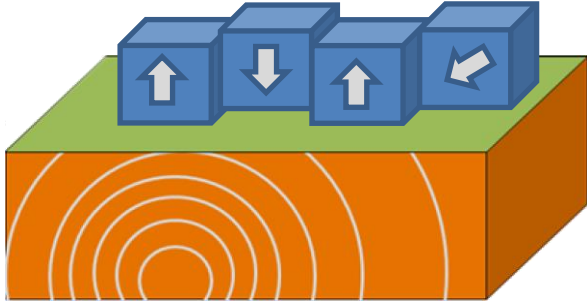
High Performance Window Systems



The Ecotech window system that is able to deliver exceptional thermal performance.

Seismic Performance

- Our modular buildings are uniquely suited for use in high seismic zone areas. Buildings are not only designed to allow *people* survivability but also long term *building* survivability
- As each module is a separate structural cell, modules can interact both with each other and the foundations.
 - This feature allows Seismic waves to pass through the structure with significantly less chance of causing the type of severe damage you see with rigid single piece buildings.



The ability to interact with the ground



Non-Concrete foundations



Smarter service connection points

Evolution in Design

The Kiwi DNA

Design and Aesthetics

Our modular buildings have a unique, fresh and contemporary look

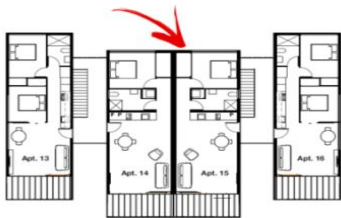
Facades, shapes and colour

Our architects use a rich mix of facades, materials, textures, shapes and colour to create variation, vibrancy and personality –without compromising affordability. Via our pre-installed 'nutserts' system, we can install any cosmetic cladding system that may be preferred.

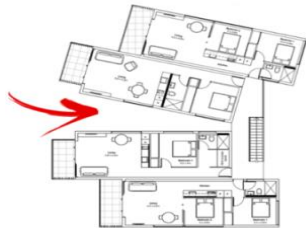


Site layouts

Modules can be configured and positioned on site to create a wide variety of looks and aesthetics. Here are some examples.



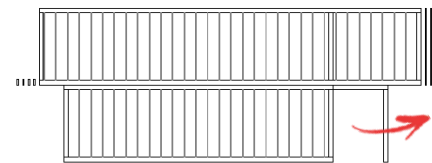
OFF-SET CONFIGURATION TO
CREATE INTEREST



ANGLED CONFIGURATION TO CREATE
LIGHTWELLS



MODULES ROTATED
90 DEGREES

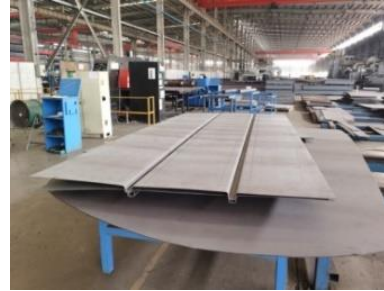


CANTILEVERED MODULES FOR
SLOPED SITES

Modern flexible exterior options

The modules use a stylish pressed steel cladding that provides a modern and contemporary look. Panel joins are hidden in the 'valleys' to create a high-end virtually seamless finish.

We fabricate the cladding using robust 2mm steel sheeting that is 5 times thicker than the traditional 0.4mm Colourbond steel cladding commonly used in NZ.



Modern flexible exterior options

Ecotech has key product features that improve the liveability and durability of each dwelling.

Sleek Aluminum Flashings



The exterior cladding is fully welded 1.5mm – 2mm steel coated with a heavy duty 15-year paint system. Powder coated aluminum flashings are used to close the gaps between modules and cover the corner castings. Powder coated, pressed aluminum flashing system to cover the joins between modules.



Modern flexible exterior options

Clip on Balconies



Balconies are a cost-effective way to provide access to the outdoors. Importantly, they are easy to connect into the corner castings of the module.

The deck is a heavy duty, low/no maintenance composite 'wood'. The Balustrades (either glass or aluminum) are supplied and fitted on site.

On lower floor apartments it may be more cost effective to use a site built standard wooden deck.

Production Facility

Factory based precision manufacturing combined with a comprehensive quality assurance framework ensures high quality housing modules.

High quality specifications with local New Zealand sourcing and warranty of appliances, fixtures and fittings.



Just one half of the six 150m wide x 650m long manufacturing sheds at the Changshu manufacturing plant in Shanghai

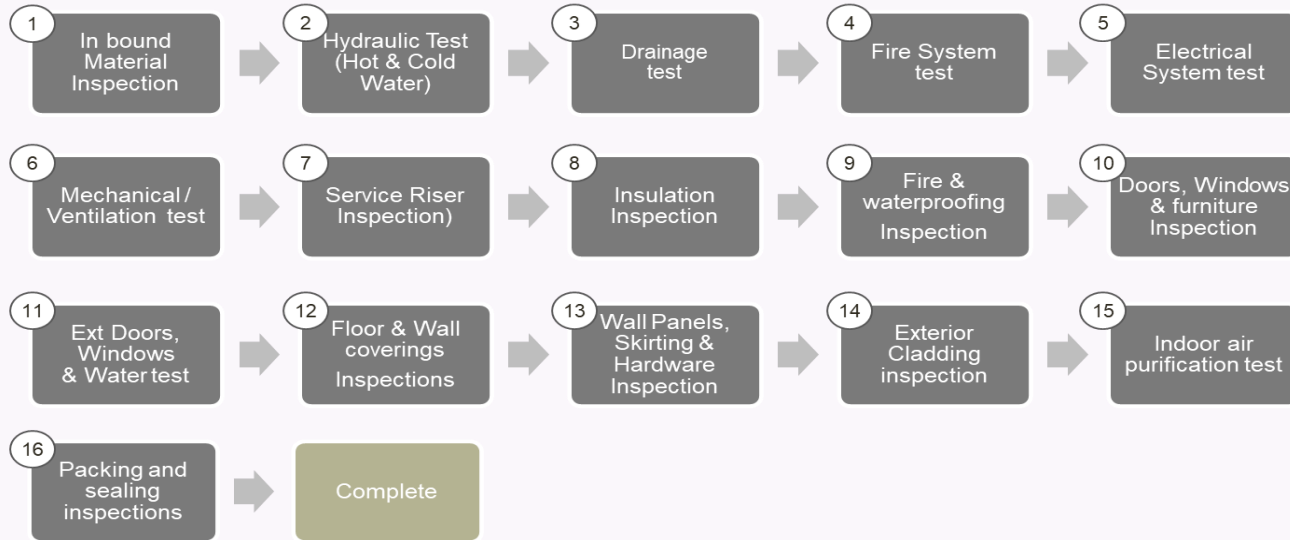




Modules being machined and hand welded within the manufacturing jig

Quality doesn't happen by accident

16-STAGE QMS PROGRAM



ISO 9001



Quality Assurance - Certification

Off-Shore manufactured buildings must meet the same building standard as any building constructed in NZ.

As part of the consent process MBIE/Council creates the **Inspection Regime**, detailing the 3rd party independent inspections that must be completed during manufacturing. SGS conducts these inspections and issues a **Release certificate** for each completed inspection

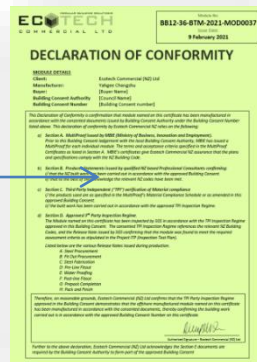
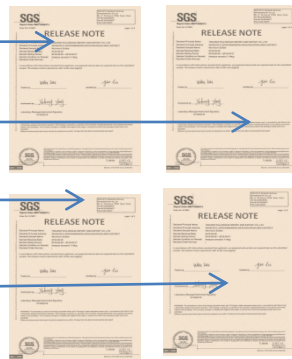
At the end of production, a **Declaration of Conformity ("DOC")** is issued by Ecotech. The DOC brings together all the various consultant approval (including SGS's Release Notes) into a single summary document confirming that the module covered by the DOC Certificate has been designed, engineered, procured, and manufactured in accordance with the MultiProof and Approved Building Consent.

Inspection Regime

Release Certificates

Declaration of Conformance

Procedure	Inspection test	Process / Primary factor	Role of 3 rd party	Level of 3 rd party inspection
Wood test	Completion of standard wet areas flood test inspection (as per NZ Council tests)	QC Inspector	1. Observing Factory QC inspectors have correctly completed prescribed tests	3P present for 100% of factory run test
		QC Inspector	2. Review QC documents for passed modules to confirm QC inspectors have correctly signed off inspection docs	30% of modules inspected and confirmed it has passed test
Electrical testing	Completion of the 7 Electrical tests as prescribed in procedure 13	3P	3. Testing of a random selection of modules by 3P Inspector. Confirmation that 3P testing matches Factory tests results	none required
		QC Inspector	1. Observing Factory QC inspectors have correctly completed prescribed tests	3P present for 100% of factory run test
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		3P	3. Testing of a random selection of modules by 3P Inspector. Confirmation that 3P testing matches Factory tests results	none required
2nd Hydrostatic Test	Hydrostatic testing to confirm installed plumbing holding pressure. Recording taken at 30 mins with no pressure drop on 300kPa. To be completed after attachment of plaster board linings & signage	WS	1. Observing Factory QC inspectors have correctly completed prescribed tests	3P present for 100% of factory run test
		QC Inspector	2. Review QC documents for passed modules to confirm QC inspectors have correctly signed off inspection docs	30% of modules inspected to be signed and confirmed it has passed test
		3P	3. Testing of a random selection of modules by 3P Inspector. Confirmation that 3P testing matches Factory tests results	none required
		QC Inspector	1. Observing Factory QC inspectors have correctly completed prescribed tests	3P present for 100% of factory run test
Drainage testing	Testing to confirm all drainage is correctly draining to external wastes with out leaks	WS	2. Review QC documents for passed modules to confirm QC inspectors have correctly signed off inspection docs	30% of modules inspected and confirmed it has passed test
		QC Inspector	3. Testing of a random selection of modules by 3P Inspector. Confirmation that 3P testing matches Factory tests results	none required



Quality assurance - Process

- Ecotech's Quality Management Program has been 15 years in the making.
- SGS (the world's largest independent testing company) have completed detailed audits of the facility – including a supply chain review that traces steel, paint and key componentry right back to source.
- Ecotech's Quality Assurance Framework (QAF) manages all aspects of the Manufacturing process. Many NZ councils regard it as best practice for off-shore manufacturing.
- Auckland Council and Kāinga Ora have completed their own independent inspections, including a formal audit to verify worker welfare and safety.
- Prior to production, SGS certifies each individual factory Welders to ensure they meet the same welding standards as NZ based welders.
- During production, SGS are in the factory full time performing exhaustive QC checks on the procurement, manufacturing and assembly process.



Modular can help solve NZ's Housing Crisis

“We can provide up to 1,000 houses within 6 months of Resource Consent – delivered to site with compliance certificate”

- *Ecotech's production facility has allocated production capability to produce 10,000 p.a. and can allocate up to 40% just for the NZ market –
 - *that's the daily equivalent of 10 x 3 bedroom houses!**
- *There are no material supply shortages*
- *Not affected by a skilled labour shortage*

Business Evolution



www.ecotechcommercial.com



www.ecotechconstruction.co.nz



www.moddevelopments.co.nz

Activity	Tasks
Design – OSM and Foundation	Site specific foundation solutions
Design - Land	Geotech, civils, furniture, landscaping etc
Resource Consent	Client or Ecotech
Building Consent	Client or Ecotech
Delivery – Turnkey	Works inside boundary ready for module delivery
Assembly	Rapid efficient assembly
Outside boundary	Works outside boundary
Shipping and logistics	Management of shipping and logistic requirements
Contract Management	Engagement and management of specialist contractors
Traffic Management	Council interaction and management
Defects	Identification and review
Handover	Final review

ECCL – No job is too big or small

- With over 120 years combined experience across NZ within the ECCL team. No job is too big or small
- The team have experience in delivering up to 1,300 lot subdivisions
- Successful delivery of government projects
- Management in environmentally sensitive terrain
- Provide rough order costs for full turnkey delivery followed by detailed costing



Development Specialist

Specialist Modular Developer

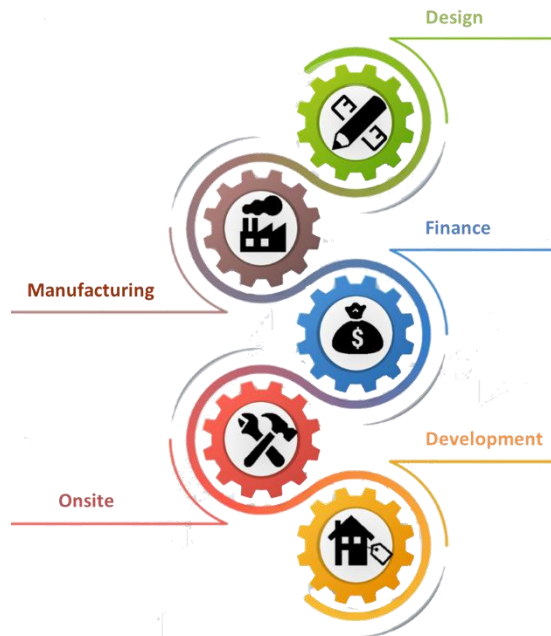
Modular Developments is the development arm of Ecotech Commercial. It brings together NZ's leading modular construction experts into a focused development company to deliver turnkey modular projects— in volume and at pace.

Vertical Integration

By bringing together partners with specialist expertise such as Design, Construction and Property Development we have created a true vertically integrated supply chain - giving a unique end-to-end control from the factory to the end home owner.

Delivering Scale

The Modular Developments structure allows for Ecotech's modular technology to be used in a wide range of projects - from small scale private projects to large scale government tenders. Our strategic partnership with Ecotech Civil and Construction, who understands the nuances of modular allows us to tailor solutions for each opportunity.



Process and Credentials?

- Modular Developments is an approved Kāinga Ora developer. We have undergone extensive due diligence from both:
 - ✓ PWC; and
 - ✓ Kāinga Ora

- We provide an end to end solution:



- The synergy created by the MOD Developments team allows us to take on a number of projects at one time and manage to completion. We cater to:
 - ✓ Government (national and local);
 - ✓ Not-for profits, for social and accessible housing options;
 - ✓ Private individuals or companies looking at development opportunities; or
 - ✓ Land owners looking to develop but don't have either experience, expertise, capital or time

Project - RS-27 (Kāinga Ora)

Location:

1173 Dominion Rd, Mt Roskill, Auckland

Assembler:

Ecotech Construction and Civils

Modules involved

6 x MultiPod-67 modules with central share stairway

Scheduled Date of Completion

Late 2022

Build Duration

- Site works: 4 weeks
- Craning onto foundations: 1 day
- Finishing: 3 weeks

Description of Build

- Site constructed concrete perimeter foundations and landscaping
- Factory supplied hot water system and AC
- Factory supplied modules and decks
- Factory supplied central shared stairway
- Interior finish – joining of modules. No inter tenancy fire walls are required.



This development provides six, 2-bedroom, 67-75m² apartments on a 631m² Kāinga Ora site at Mt Roskill, Auckland. Façade re-design underway.



Project – Hotel (Queenstown)

Location:

Queenstown

Assembler:

Ecotech Construction & Civils

Modules involved

140 bespoke designed hotel rooms

Scheduled Date of Completion

June 2023

Build Duration

- Current ECI with 4 prototype rooms
- Site works: 8-10 months (by others)
- Module placement on foundations: 4 weeks

Description of Build

- Oversized modules with dual room configuration
- Full fire safety compliance
- Full fitout completed in the factory



Project – Haven Road

Location:

Haven Road, Nelson

Assembler:

Ecotech Construction and Civils

Modules involved

12x 1 bdm Units @ 57m²

28x 2 bdm units @ 79m²

4 x 3bdm units @ 151m²

(subject to resource consent)

32x car parks (some with stackers)

Scheduled Date of Completion

Mid/late 2023

Build Duration

- Site works including, foundations, ground floor carpark and roof, staircases and elevator shafts: 15 weeks
- Craning 44 modules onto foundations/carpark roof – 2 weeks (would be 5 days if not on a state highway)
- Finishing: 3 weeks



Project – Haven Road (Investment)

Opportunity:

1. Equity investment in the development @ circa 15-20% p.a.
2. Debt @ circa 6-9% returns

Investment Manager:

MOD Finance (www.modfinance.co.nz)

Pre-Sales:

Beginning March 2022 – following anticipated completion of the resource consent

Prospectus:

Available early 2022 following RC.



Costings

- Completed Modules, ex works from \$2,000 m2, installed on site from - \$4,000 m2
 - ✓ Level of specifications on finish etc change the pricing
 - Basically 4 levels of finish (tapware, appliances, façade etc) from Basic to Premium
 - ✓ Smaller size the price per sqm will appear higher but that is because all of the costs of the key aspects i.e. bathrooms and kitchens are spread over a smaller meterage
 - ✓ Shipping is currently highly volatile
- Key factor's in price
 - ✓ Delivery from Resource Consent in circa 6 month
 - ✓ Fully completed – once landed it is only weeks to land and complete the site
 - ✓ Site usage can be extended for the existing dwelling as the need to do the ground works can wait until the ship is on the water

Live List

PROJECT	DESCRIPTION
1. Client (Confidential)	100x 2 bedroom units (63m2) units for delivery mid-2022
2. MOD Developments - RS27 Kainga Ora (Kiwi Build), Auckland	6x 2 bedroom low rise apartments (67m2)
3. MOD Developments - Haven Road, Nelson	42x units (1, 2 and 3 bedroom mix) – 6 level apartments
4. Client (Confidential), Queenstown	140 room 5 star hotel – 96 modules used to create the hotel. Completed early 2023
5. Client (Confidential), Wellington	80x Unit apartment complex. 6 or 7 levels, predominantly 1 bedroom studio configuration
6. Client (Confidential) Wellington	4x 2 bedroom units on a very steep hilltop, due for completion mid 2022
7. Client (Confidential) Wellington	2x 2 bedroom and 2x 3 bedroom townhouse/unit configuration
8. Modul, Auckland	13x 2 level 3 bedroom townhouses

Actively looking for projects

- MOD Developments is actively looking for projects in the Nelson region. We have a strong team in place who are well versed with the Ecotech system.
 - ✓ With current projects such as Haven Road we are educating the market on the product
- We can bring supply to assist the housing shortage in the region at a pace that will be faster than a traditional build.
- We are open to partnership models to deliver developments with landowners.
- We are keen to talk to developers about uneconomic projects currently not going ahead which might still be possible with cost effective modular solutions.

Want to chat? Email sales@moddevelopments.co.nz