



# **Prefab + Green : past, present and future**

CCG Wellington

Pamela Bell, PrefabNZ CEO, 18 April 2012

# Your Questions:



1. What is prefab + green?
2. What's PrefabNZ all about?
3. What's going on in prefab around the world?
4. What's coming up in NZ in the future?
5. How can we all be involved?

# What is prefab + green?

- **prefab** / prefabrication  
= construction off site = offsite = OSM
- prefab **complements** traditional methods
- **green** = sustainable = ESD = eco-...  
= using resources sensibly today so they are able to be used by future generations



# What does prefab look like?



Component - Panel (2D) - Module (3D) - Hybrid - Complete Building

# Why is prefab important?

*Prefab is “**a critical agent in invention**  
in architecture,  
formal and material research,  
and sustainability.”*

MOMA, New York, 'Home Delivery' exhibition text 2008 (Bergdoll and Christensen).

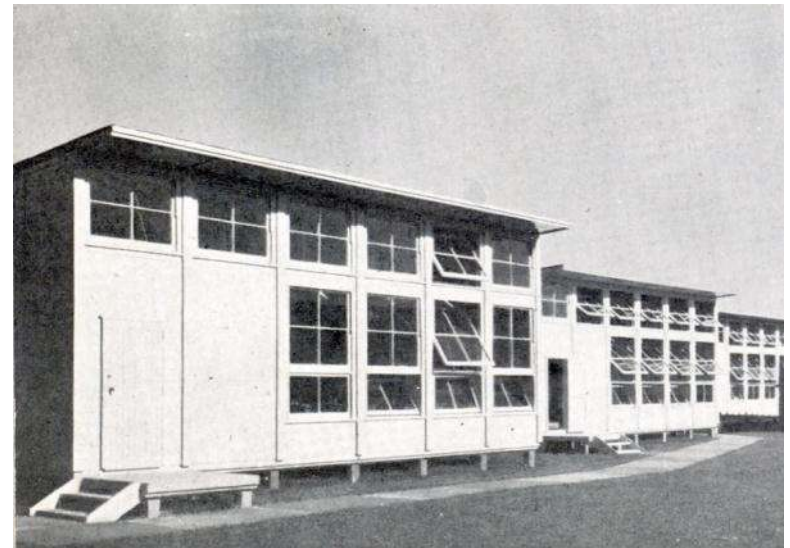
# What is great about prefab?

- **potential merits:**
  - increased quality (Q)
  - shorter time-frames (T)
  - cost-savings (C)
  - efficient resource use (S)



# What is tricky about prefab?

- **potential challenges:**
  - misperceptions
  - individual site context
  - transport box restrictions
  - limited market size
  - start-up costs



# How is prefab green?

- **save material and energy resources:**
  - 90% waste can be reduced
  - 50% saving in construction energy use
  - easier capture and reuse of materials
  - efficient computer-controlled cutting
  - reduced defects
  - closer tolerances for better life-cycle thermal performance





- **reduced carbon footprint:**
  - less transport
  - smaller floor area
  - less energy use
  - and material choices



- **other green benefits:**
  - less noise, pollution, scaffolding and traffic at site
  - reduce habitat disturbance at site
  - safe, healthy, controlled indoor environment
  - correct use of materials (save 18%)
  - protect materials from wet weather
  - designs for flexibility and disassembly

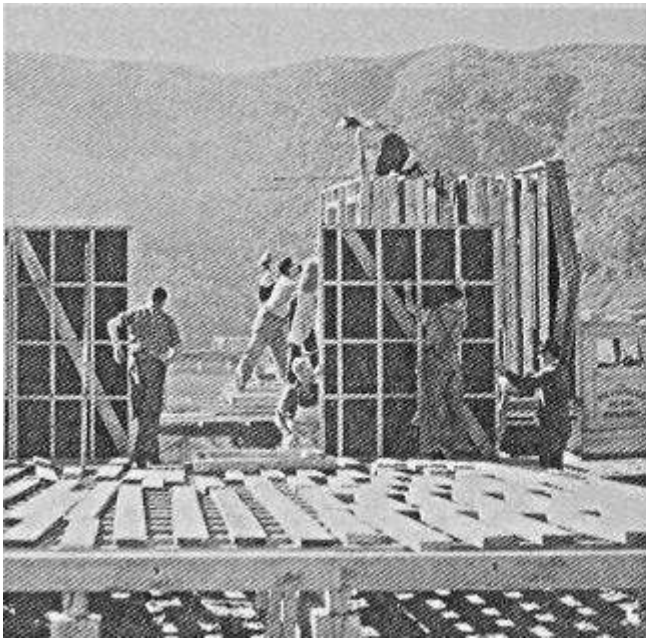


- **but:**
  - over-engineering means additional material needed
  - benefits vary based on design and factory conditions

*Prefab holds the promise of delivering a greener home in less time and perhaps even less money, but it is **only as green as the designer and the builder***

*Lloyd Alter, Treehugger*

# Prefab through the ages:



*Source: Archives*



*Source: De Geest*



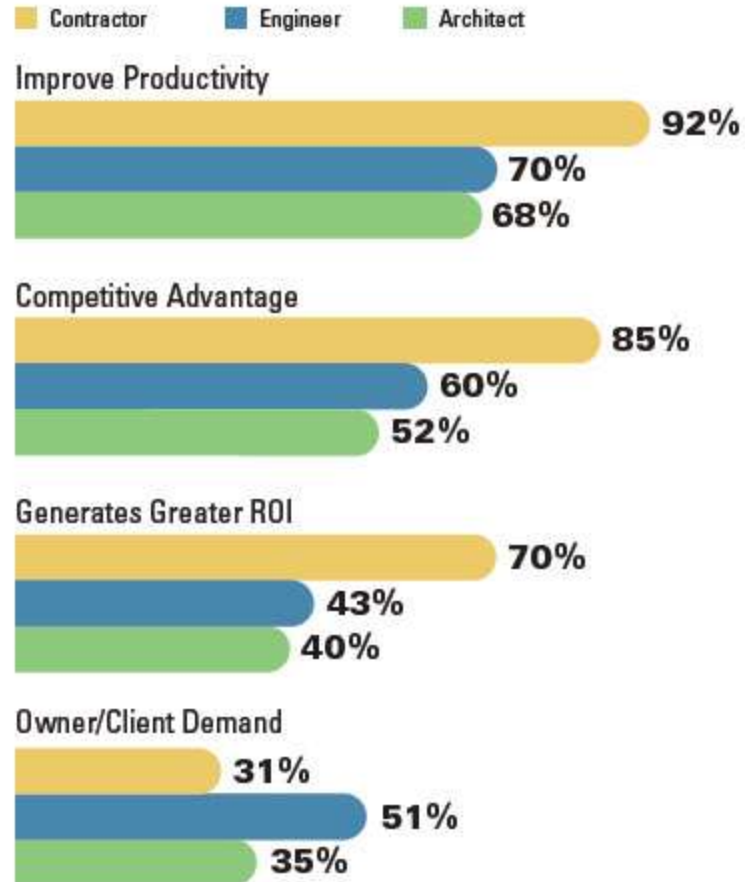


*Source: Roger Hay estate*

# Prefab today:

## Current Drivers to Use of Prefabrication/Modularization (By Player)

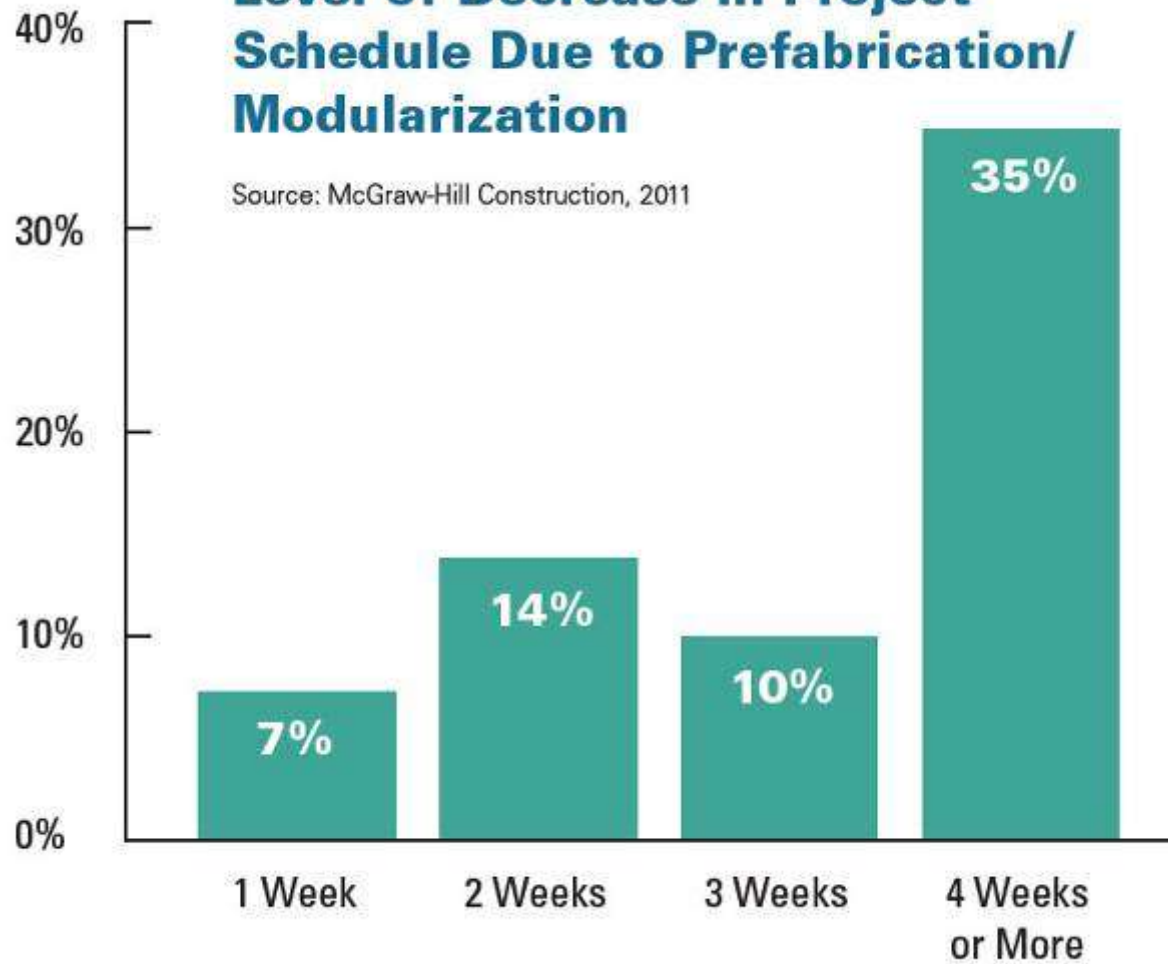
Source: McGraw-Hill Construction, 2011



Source: McGraw-Hill 2011

## Level of Decrease in Project Schedule Due to Prefabrication/ Modularization

Source: McGraw-Hill Construction, 2011

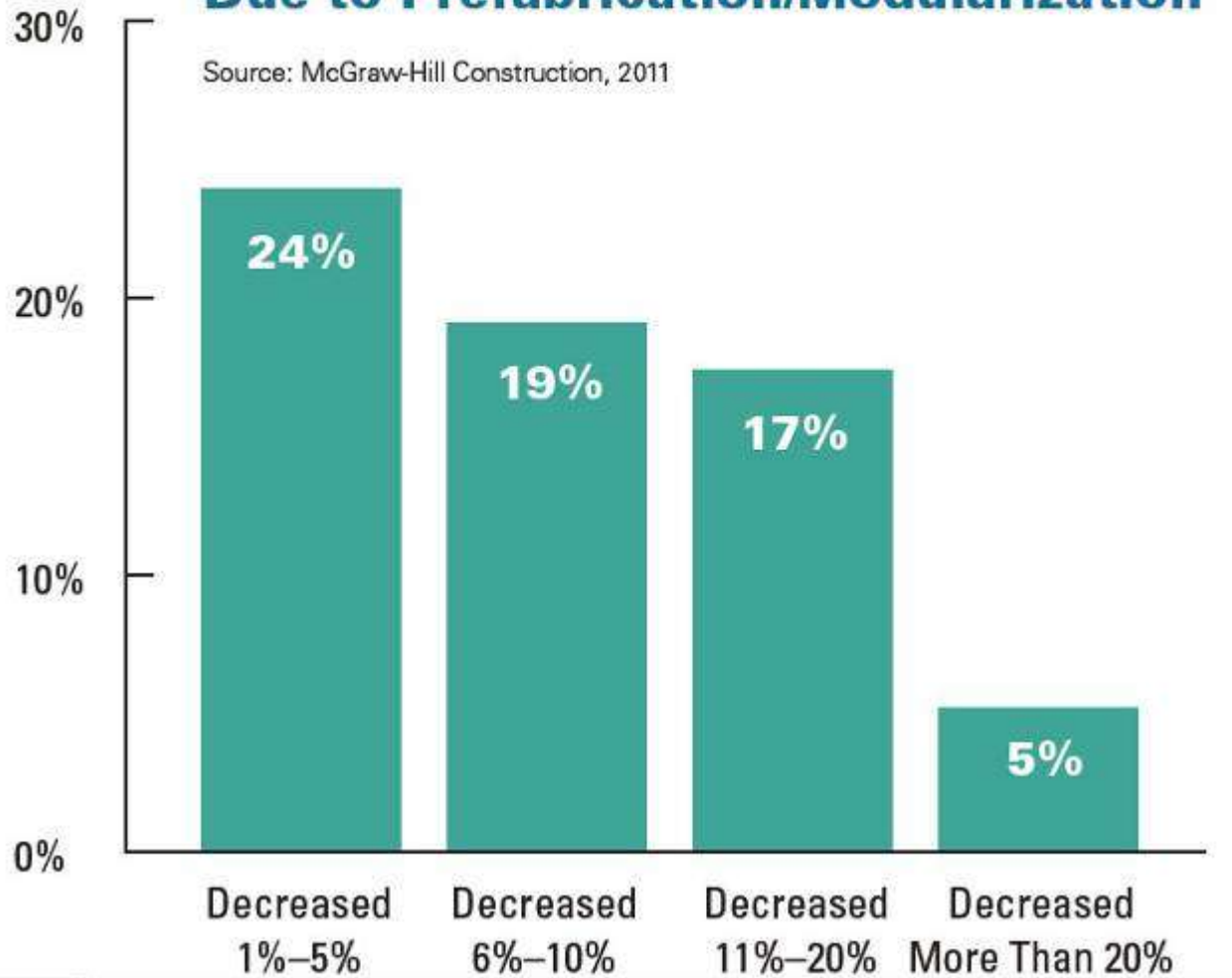


Source: McGraw-Hill 2011



## Level of Decrease in Project Budget Due to Prefabrication/Modularization

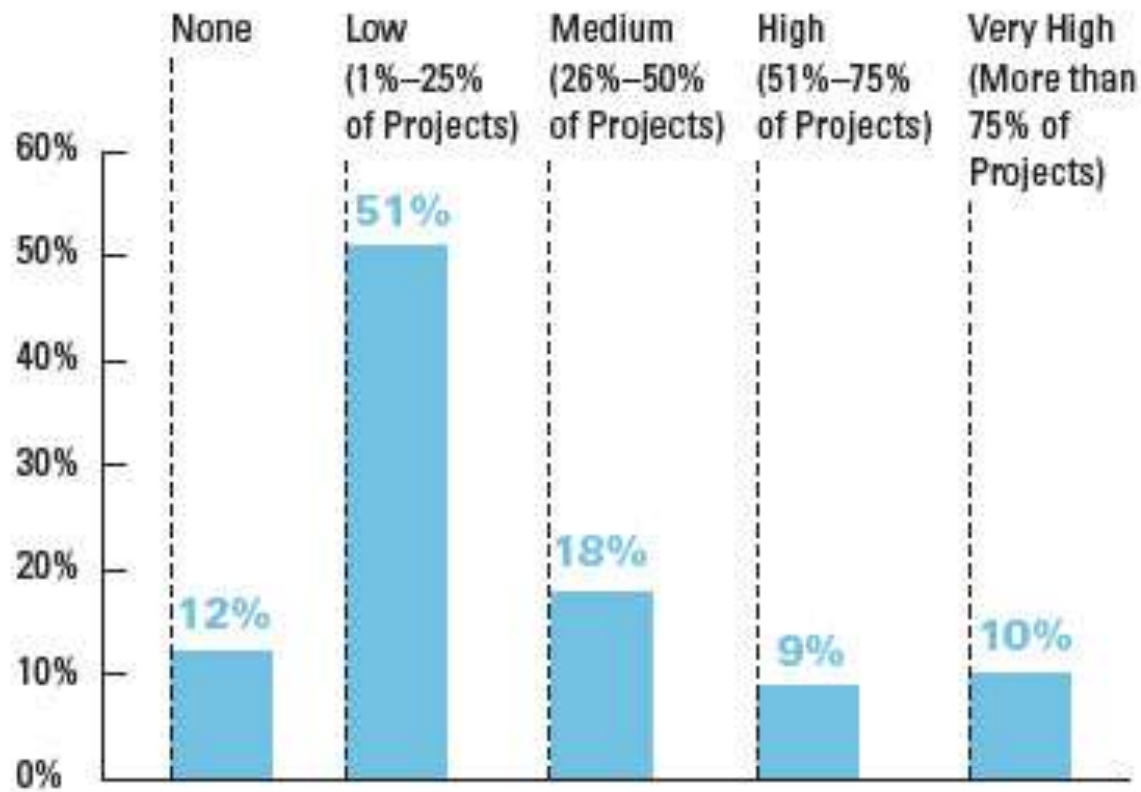
Source: McGraw-Hill Construction, 2011



Source: McGraw-Hill 2011

## Percentage of Green Projects Using Prefabrication/Modularization

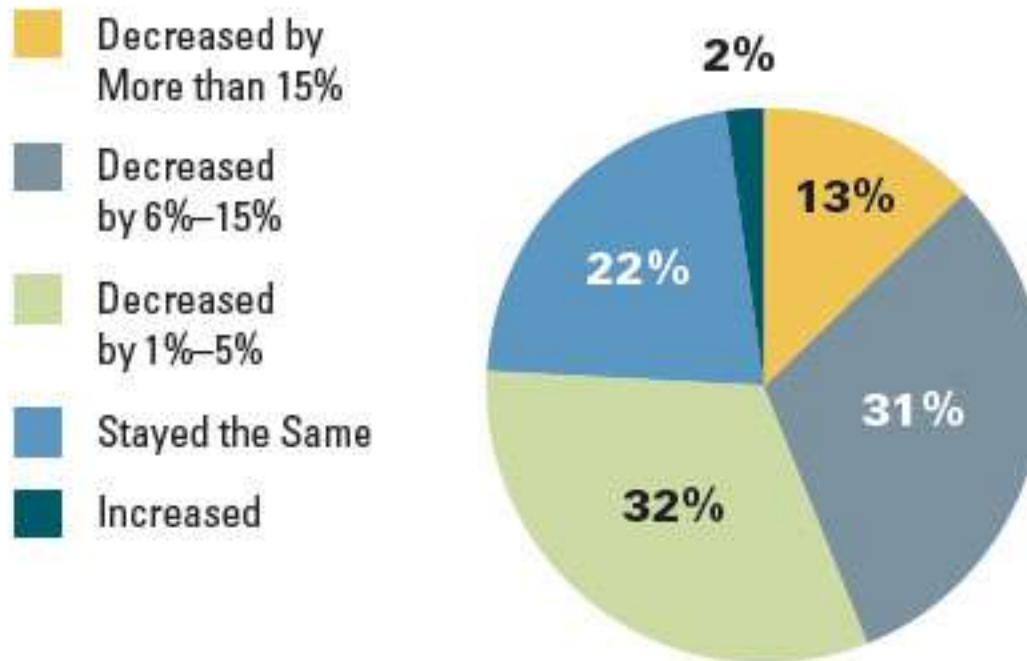
Source: McGraw-Hill Construction, 2011



Source: McGraw-Hill 2011

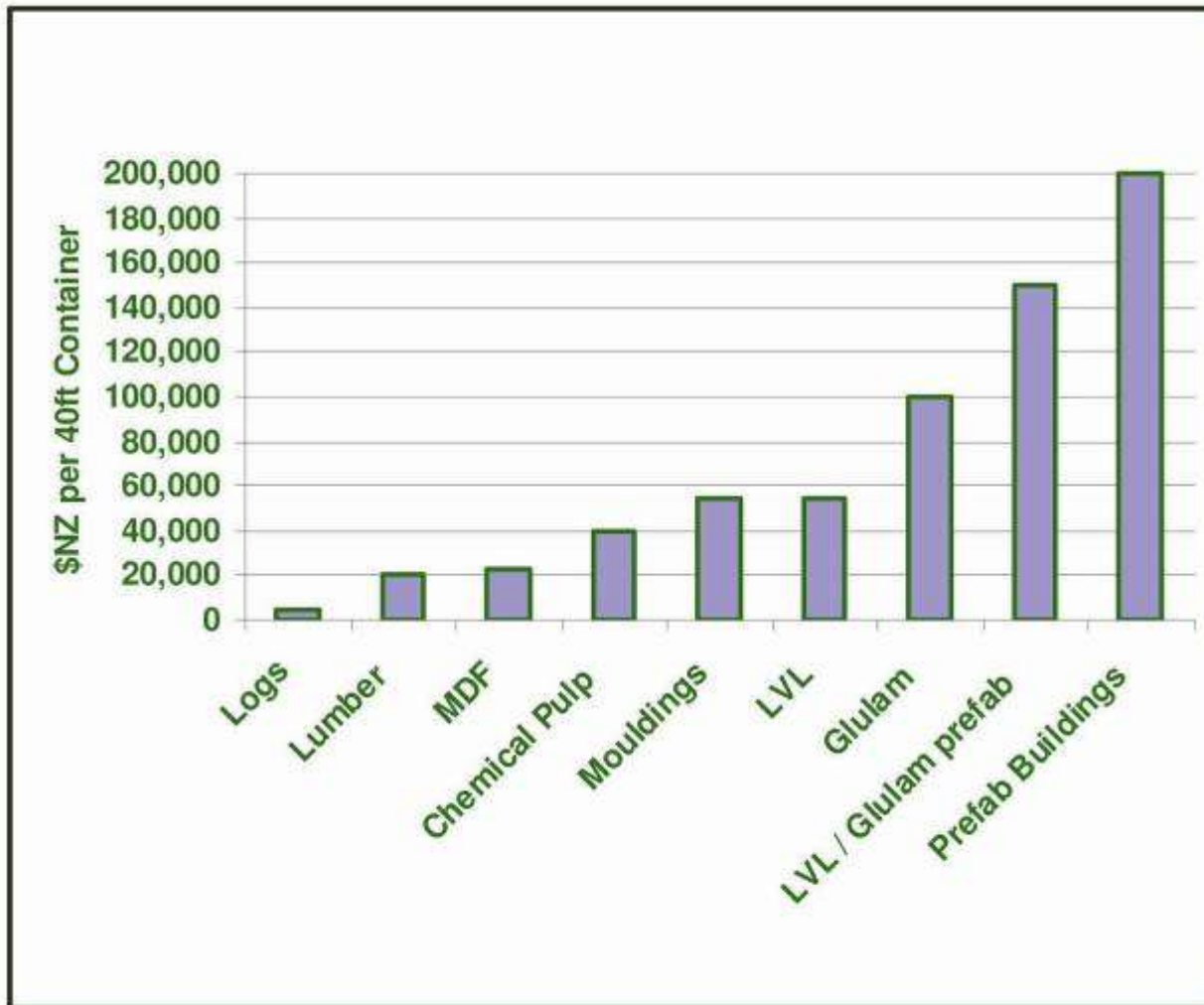
## Impact of Prefabrication/Modularization on Amount of Construction Site Waste

Source: McGraw-Hill Construction, 2011



Source: McGraw-Hill 2011

## Value Added Wood Products (2010)



Source: PMA

# What is



- a **catalyst** for prefab collaboration,
- a front-door **portal** for prefab information,
- an **incubator** for prefab innovation.



# What is PrefabNZ doing?

- National Prefab Directory
- Prefab Cost-Benefit Toolkit
- Monthly PrefabNZ Newsletter
- Informative Networking Events
- Key Stakeholder Relationships
- Marketing Opportunities
- Major Project = HIVE







# PREFAB IS HIGHER-QUALITY BUILDINGS



## Upcoming Events

View what's in store for PrefabNZ >



Stair by Kabbell Daish, photo by Joseph Kally



## Become a member

Click here for full details >



## Email newsletters

Sign up for our email newsletter and get all the latest updates:

First name:

Last name:

Email address:

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## ABOUT US / PREFABNZ

[PREFABNZ](#)[PARTNERS](#)[PROJECTS](#)[PEOPLE](#)[QUESTIONS & ANSWERS](#)

You have told us there is a clear need for a prefabrication industry hub to connect, catalyse, inform, inspire and promote prefabricated building solutions. Here it is.

### What is prefab?



Prefab is a way to create innovative high-quality buildings on time and within budget. Your home probably has prefab roof trusses and wall frames. Your bach might be a transportable building. Your workplace may use precast concrete elements.

Prefab is short for prefabrication. It refers to any part of a building that is made away from the final building site, which is why it can also be referred to as offsite construction.

Prefab is a complimentary system to traditional construction. Prefab comes in all shapes and sizes, from small components such as pre-nailed wall frames, to panels, larger modules (3-D volumes) or even complete buildings. Hybrid prefab is a





## DIRECTORY



You can find contact information for PrefabNZ members here, as well as some info about their products or services.

Further info can be found at their websites and links are provided below. If you can't find what you are looking for, try the search function above or [get in touch](#) with your questions or comments. If you want to feature in the PrefabNZ Directory, please consider [joining up as a member](#).

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- ↓ [Artelier](#)
- ↓ [Ashton Wright \(Victoria University\)](#)
- ↓ [Assembly Architects](#)
- ↓ [Beacon Pathway](#)
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→ [Architex](#)

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[andre@architex.co.nz](mailto:andre@architex.co.nz)

More info coming soon...

See also iPad

<http://www.ipad.net.nz/>



# What are our Members doing?

- Innovating
- Winning Awards
- World-class Design
- New Products in NZ



First Light Team + industry:

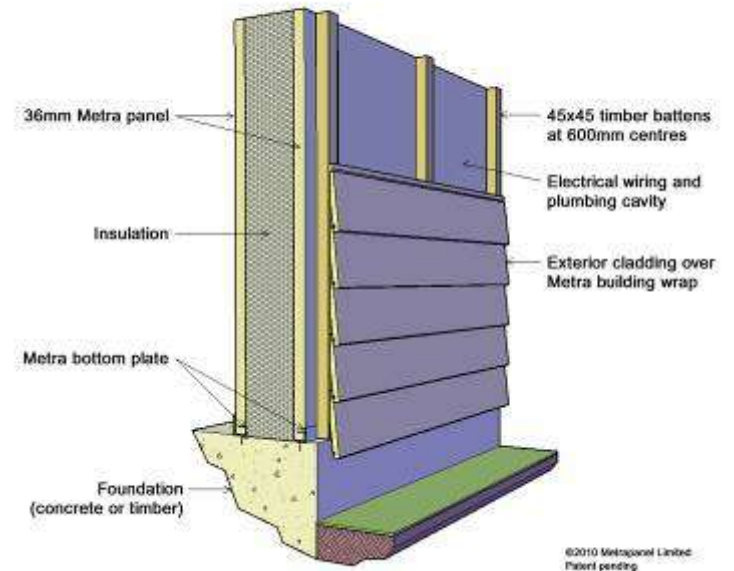




## PLB + Metrapanel:



Metra Black Heart  
R6.0



## Irving Smith Jack, WR Jacks + XLam:





CottagesNZ

2011 Solar Decathlon (3<sup>rd</sup>): First Light





*NZIA 2011 National Winner: Architex*



*NZIA 2011 Local Winner: SGA + Studio 19*



*Future Proofing Schools Sustainable Environment Winner: CMA+U*





*RMBF Tourism & Leisure: Knoll Ridge Café, Stanley Group (HB Architecture)*



*Too many awards to remember....: NMIT Arts + Media, Irving Smith Jack*

# What's happening abroad?

- Worldwide resurgence of interest in architect-designed contemporary sustainable prefabs, eg. 'green modern prefab' movement California



- Worldwide housing shortage is causing manufacturers to use prefab methods to meet demand, eg. Pretek, UK



- The prefab world is getting smaller – large international prefab manufacturers are extending their reach, eg. Sekisui Japan moving into Australia



- Multi-storey structural timber buildings are an option to steel and concrete structures, eg. Murray Grove, UK





- Large-scale factory manufacture  
eg. Unite Modular Solutions, UK

[http://www.youtube.com/watch?v=SyZN9ZleLNw&feature=player\\_embedded](http://www.youtube.com/watch?v=SyZN9ZleLNw&feature=player_embedded)

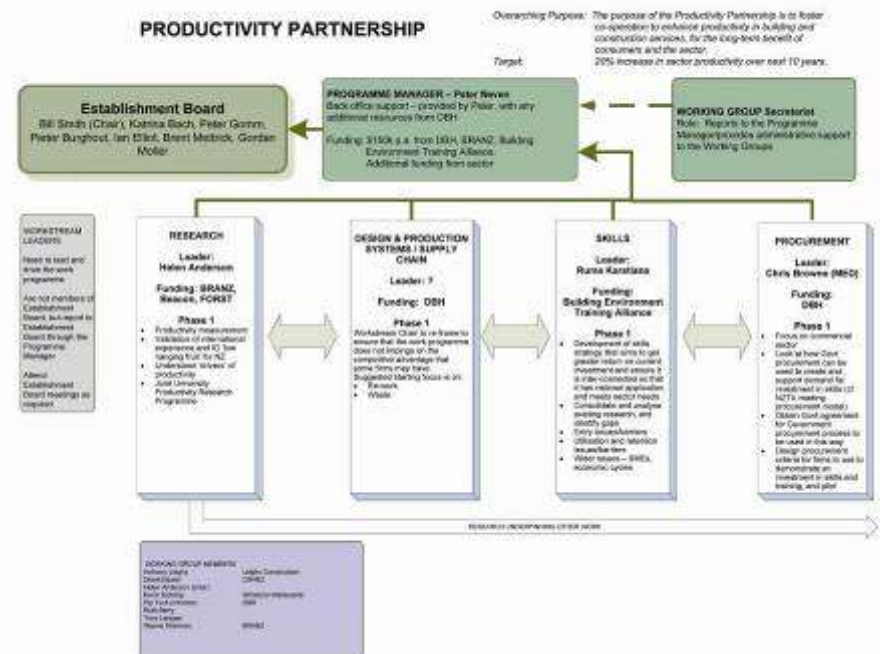


- Bespoke high-end architect-designed solutions  
eg. Marmol Radziner Prefab, USA



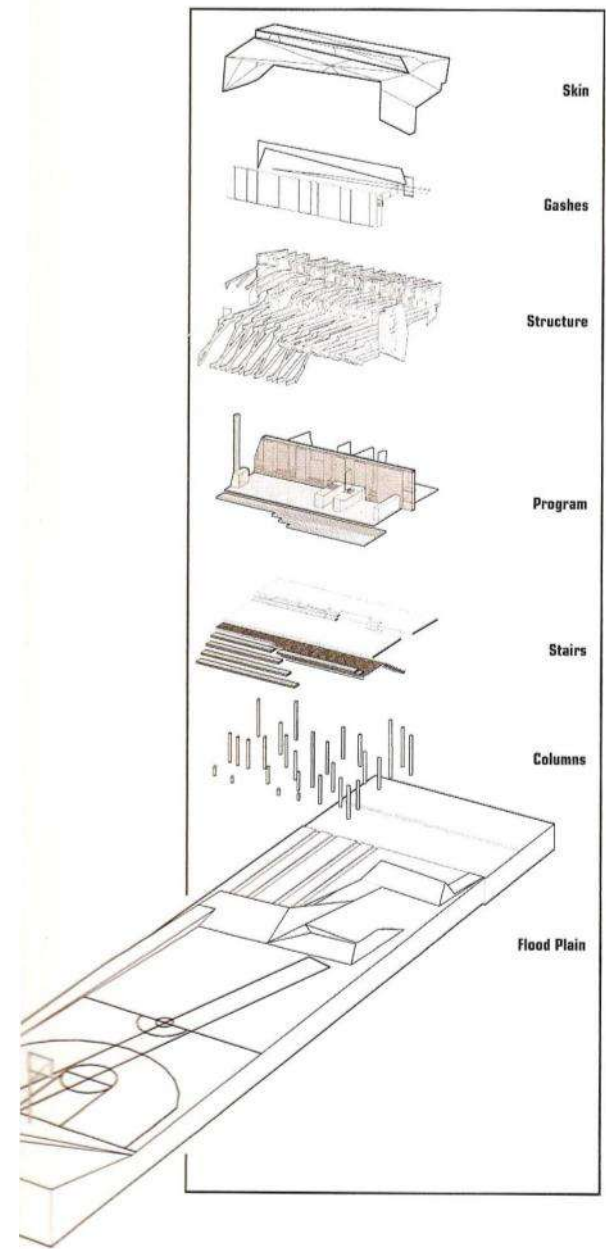
# What's coming up locally?

- The NZ government is working with design and construction industry leaders to focus on productivity, eg. Productivity Partnership





- Looking offshore for inspiration – educating public and industry through exhibition and book “Home Delivery”, MoMA, NY [www.momahomedelivery.org](http://www.momahomedelivery.org)



- Looking offshore for inspiration – educating public and industry through a housing park  
eg. BRE Innovation Park  
[www.bre.co.uk](http://www.bre.co.uk)



# What's the buzz about HIVE?

- Showcase innovation
- Showhome village
- UK & Europe precedents
- 'One-stop shop'



# Key messages:

- High-quality
- Architect-designed
- Sustainable features
- Permanent materials
- Fast assembly
- Compliant engineering
- Affordable (\$200-300k)

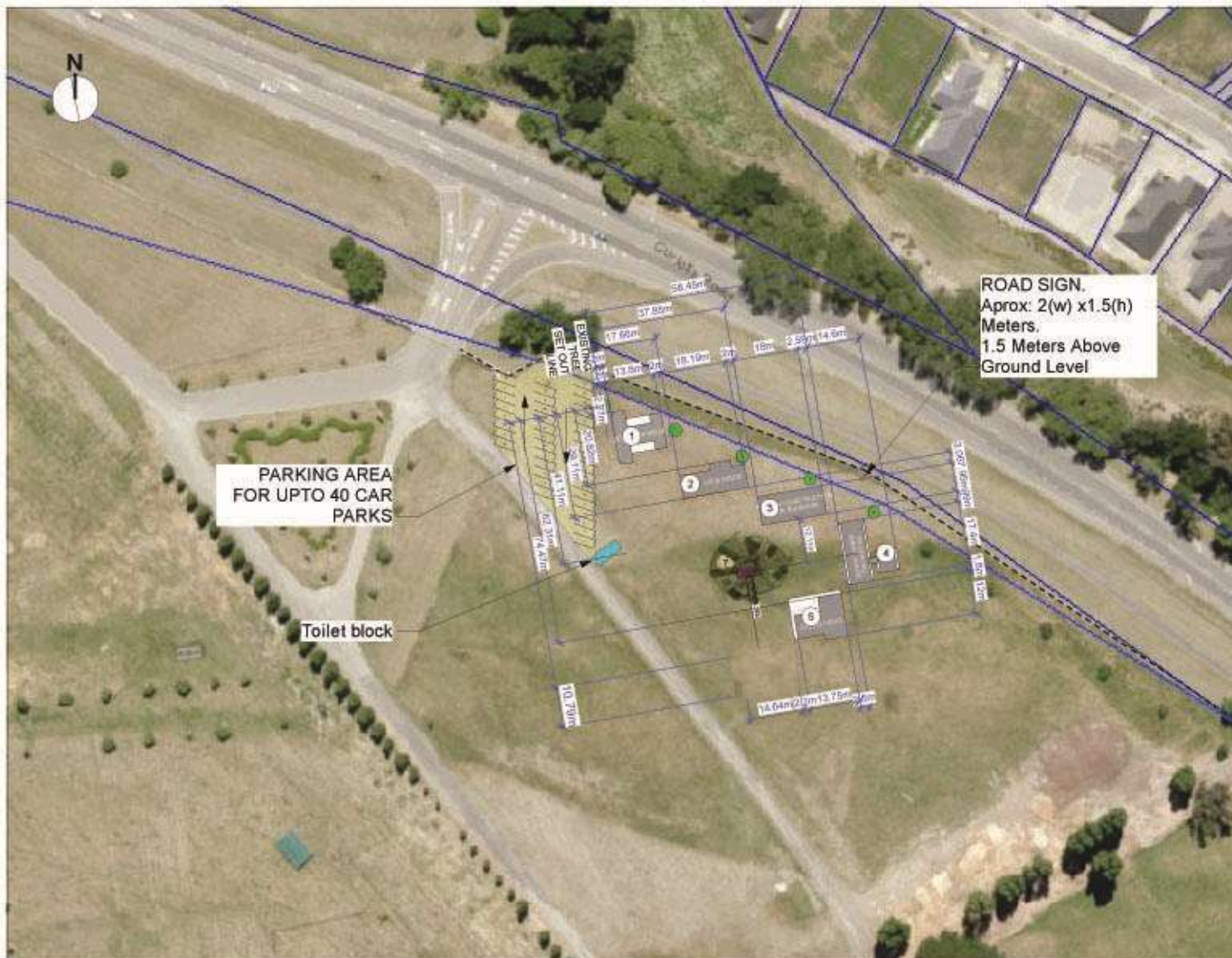




The site plan of Canterbury Agricultural Park (CAP) shows a large area with various facilities. Key features include:

- Wigram Road** running along the top and left sides.
- Curletts Road** running along the right side.
- Stable Area** in the center, surrounded by horse paddocks and stables.
- Trade Show Area** on the right side, adjacent to Curletts Road.
- Information Centre** and **Curletts 2 Entrance** near the top right.
- Curletts 3 Exit** and **Curletts Entrance** near the bottom right.
- Proposed Housing Innovation Park site** (6m from road boundary) highlighted in yellow on the right side.
- Other facilities** include a **Stable Area**, **Horse Paddock**, **Trade Show Area**, **Information Centre**, **Curletts 2 Entrance**, **Curletts 3 Exit**, **Curletts Entrance**, **Stable Area**, **Horse Paddock**, **Trade Show Area**, **Information Centre**, **Curletts 2 Entrance**, **Curletts 3 Exit**, **Curletts Entrance**.





- ① Show Home  
KEITH HAY SHOWHOMES &  
ARCHITEX
- ② Show Home  
LOCKWOOD (Canterbury)
- ③ Show Home  
FALCON CONSTRUCTION LTD  
And ALLIED CONCRETE
- ④ Show Home  
WILSON & HILL ARCHITECTS  
& LAINGS HOMES
- ⑤ Habode IHSL

- ⑦ SITE OFFICE  
The Snug. Min 6M distance from all  
show homes

GENERAL NOTE  
Refer to each individual show home  
drawing set for local access ramp into  
show home

- ⑦ GENERAL NOTE  
Protect all Trees.

FIRE SEPERATION  
Maintain Minimum 1M clear of any  
built to show homes exterior walls

SITE OFFICE: Maintain 6M clear of  
all other buildings

Site Set Out Plan:  
REVISION 3,  
December 4th 2011

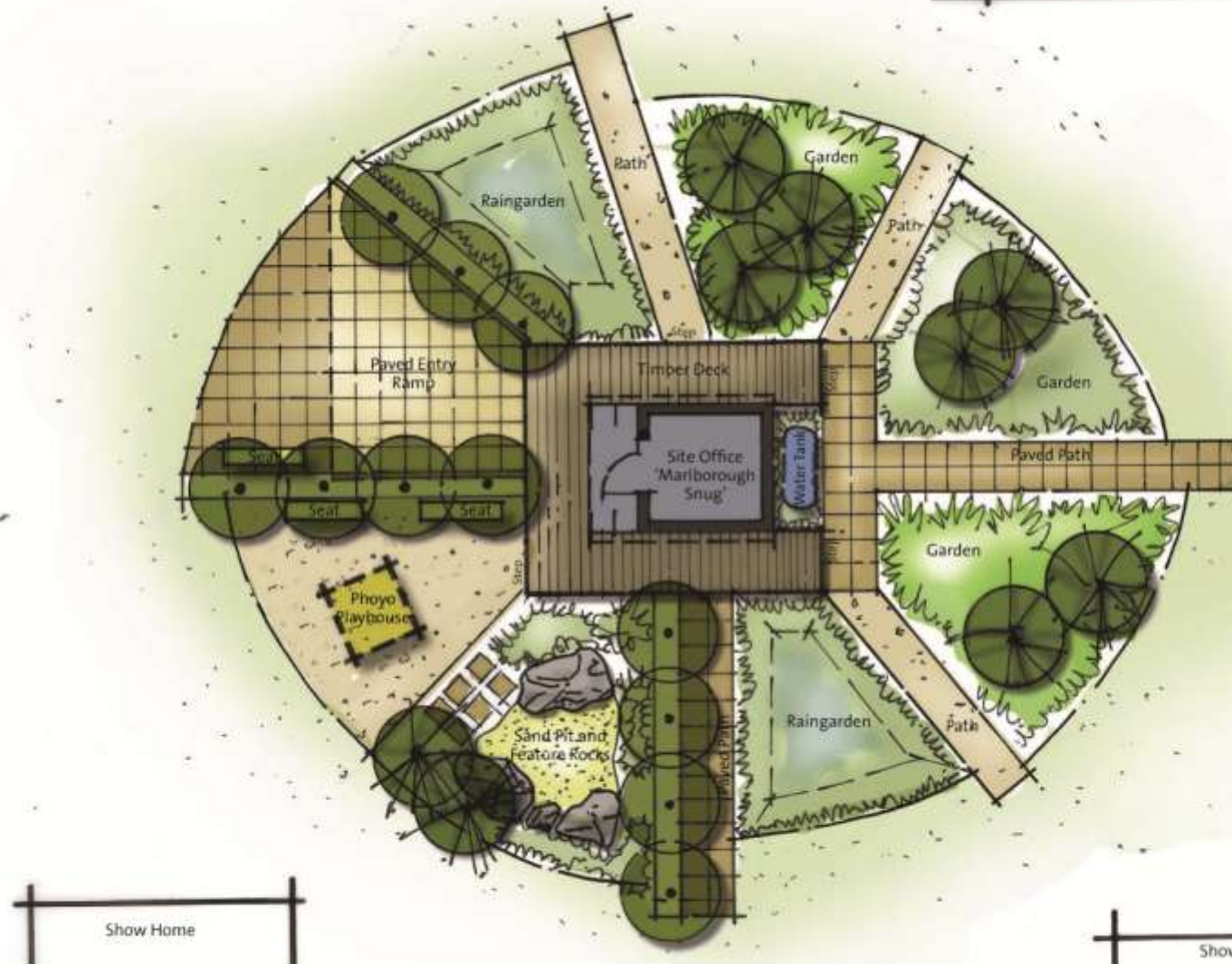
**PrefabNZ**

Housing Innovation Expo  
(HIVE)

1

**SITE SET OUT PLAN**  
Scale: 1:1000

Show Home



Show Home

Show Home

#### NOTES

All levels shown are conceptual only and based on an assumed flat site.  
All dimensions and levels are conceptual and must be confirmed on site by the installing contractor.



# Who is involved?



*The Housing Innovation Park project has been discussed with these organisations who have shown support to work alongside:*

- Canterbury Earthquake Recovery Authority (CERA)
- Christchurch City Council (CCC)
- A&P Committee
- Canterbury Development Corporation (CDC)
- Industry Capability Network (ICN)
- Canterbury Employers Chamber of Commerce (CECC)
- NZ Transport Agency (NZTA)

# Hive Partners:

- Meridian Energy
- Resene
- Winstone Wallboards
- Homestyle
- Octa Associates
- Boffa Miskell
- Homestar
- Lifemark
- Gardenmakers
- Anthony Harper
- RadioNetwork
- The Press
- Signtech
- The Snug
- Allied Concrete
- Go2Events
- Wai-ora Nursery
- Treetech
- Firth
- Assembly Architects
- Native Design
- Phoyo
- Plumbing World
- Philips Lighting



# Hive Teams:

## **Stage One (4 houses):**

- Laing Homes / Wilson & Hill
- Keith Hay Homes / Architex
- Falcon Construction
- Lockwood Canterbury / SGA

## **Potential Stage Two (6 houses):**

- Beacon Pathway / New Zealand Steel / High Performance Homes
- Bainbridge Homes / Module NZ
- Ekokit by Hybrid Homes
- SPACE Moveable Rooms
- and two others from a short long-list of 8 housing teams



# Laing Homes with Wilson & Hill:



# Keith Hay Homes with Architex:



# Falcon Construction / Allied Concrete:

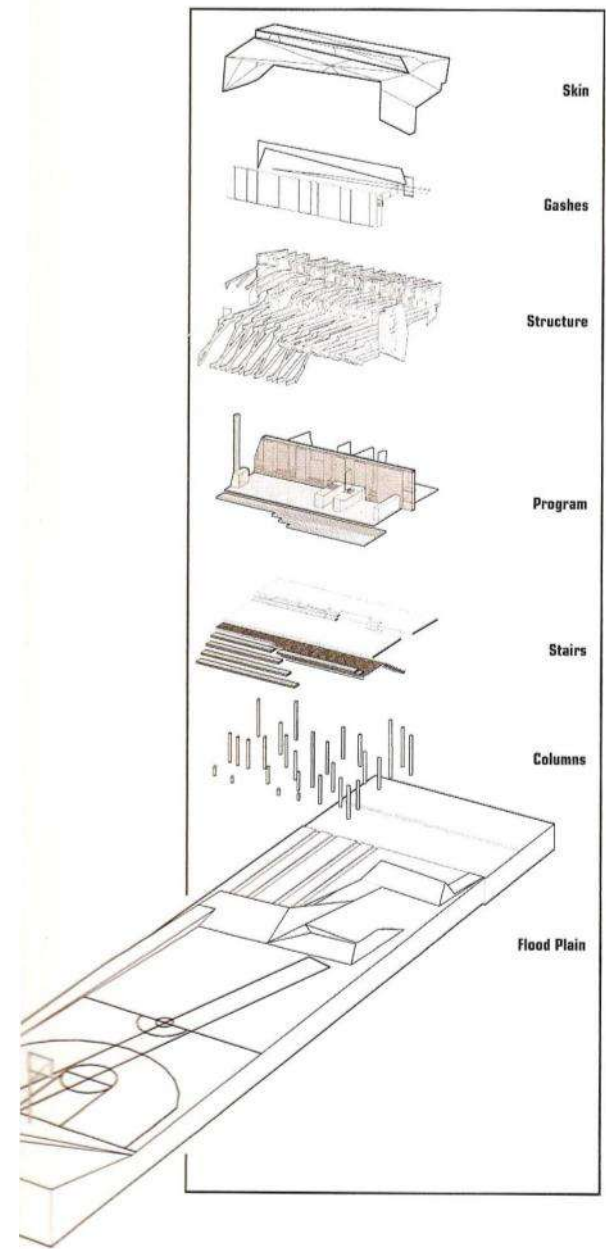


# Lockwood Canterbury / SGA:





- Looking offshore for inspiration – educating public and industry through exhibition and book “Home Delivery”, MoMA, NY [www.momahomedelivery.org](http://www.momahomedelivery.org)







December 1<sup>st</sup> 2012 - March 31<sup>st</sup> 2013, Puke Ariki, New Plymouth

- **Kiwi Prefab Homes: from cottage to cutting-edge**  
national prefab event,  
exhibition and book –  
December to end March 2013



- Puke Ariki museum and gallery in New Plymouth, Taranaki – interior exhibit plus several exterior houses on foreshore



- History -  
over 200 years of kiwi  
prefabs – featuring icons  
like the Treaty House,  
Railway Houses + Hydro-  
scheme houses



- Contemporary - full-scale houses, eg. iPad, Folding Whare, Port-a-bach, K-bach, Lockwood Homes and Habode





- Future -  
cutting-edge provocative  
works from the edge of  
research and industry,  
eg. First Light House,  
Click-raft, Jigsaw House,  
Studio 19...



# How can we all be involved?

- Visit HIVE
- Learn about prefab options
- Tell someone about prefab
- Be informed, read newsletter
- Come along to an event
- Get in touch with your ideas...



# Summary:

1. Prefab = anything built off site
2. PrefabNZ = front-door to prefab industry
3. International = green + prefab + productivity (lean + BIM)
4. Local = HIVE and Kiwi Prefab Home
5. PrefabNZ + you = share, network + collaborate

