BOX CLEVER

PREFABRICATION OPENS UP DIFFICULT SITE

AUCKLAND DESIGN MANUAL

BUILDINGS + SITES // HOUSING CASE STUDY

Box™ Bassett Road
Remuera, Auckland

OVERVIEW

Construction system based on pre-fabricated components allows development on a previously unbuildable site – also allows for savings in cost and time in construction, and high level of design quality and energy efficiency.

PROJECT SUMMARY

Located in the heart of Remuera, the north-facing section was so steep and problematic that it had been on the market for several years. The challenge with this project was to construct a family home with three bedrooms and two living areas on a near vertiginous site that also had complicated issues with access.

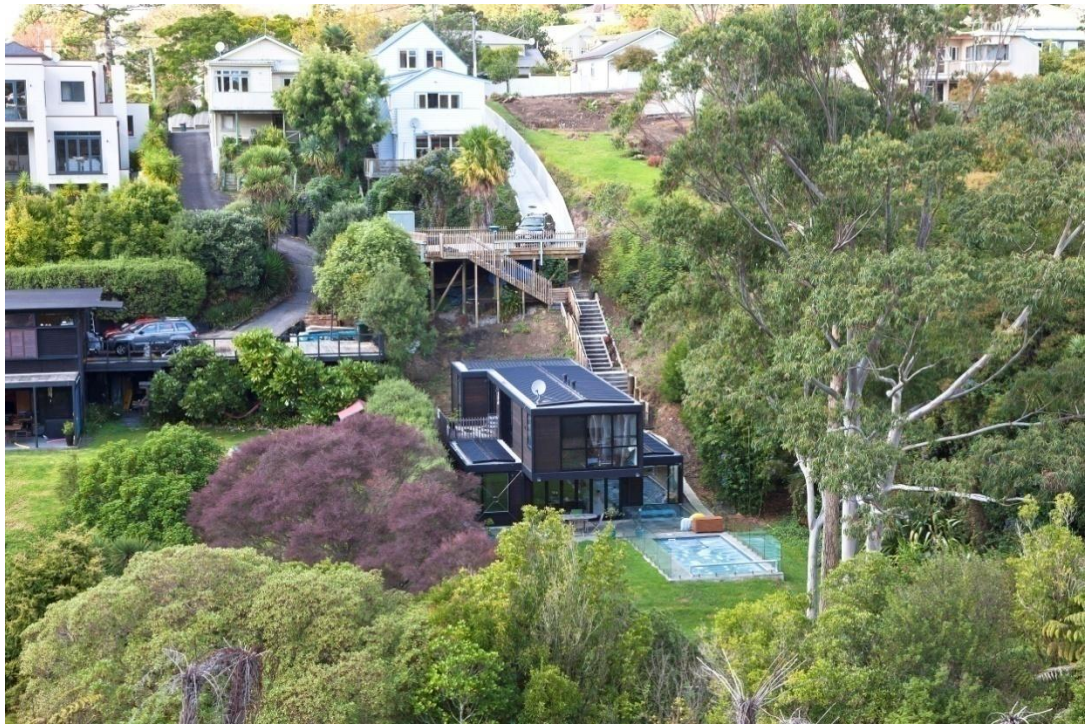
Box, a design-and-build company that has developed a modular system of construction which means many elements of the structure are standardised and able to be prefabricated off-site. Box™ uses a post-and-beam structure and a kitset of parts which means cost-savings are made both in the design stages and on site, since the houses can be constructed in a shorter time-frame. Standardised components in a Box™ home include the posts, beams, wall panels, glazing panels, brackets and stainless-steel cross braces that anchor the structure.

On this site – the result was significant savings in terms of time and cost over a standard construction metholodgy.

Box architect Tim Dorrington designed this home to a modular grid, in response to the site and the owners' requirements. Using increments of material sizes meant less off-cuts - better for the budget and for the environment. Although the dwelling accommodates a family of five, its footprint is a modest 168 square metres. A driveway slivered alongside a Victorian cottage at street level leads to a mechanised turning platform for cars. From here the owners must descend by foot via a set of stairs to the home below.

Modernist in style in a palette of dark timber with floor-to-ceiling glass, the two-storey house is planned around a central staircase encased in a ribcage of battens that lets light into the middle of the building - and no corridors mean no wasted space. Oriented for passive solar gain and with concrete floors to capture and slowly release the heat, energy efficiency is integral to the planning.

The Box modular philosophy inhabits a sector of the market that sits midway between bespoke architecture and the products that generic house building companies offer. By opting for a modular, partly pre-fabricated design, the owners were able to buy a section that many had discounted as too difficult. And by using a system that is standardised in some ways, yet personalised in others, they achieved a much more affordable home.



Looking towards the North-West elevation of the house - Basset Road in the background.

KEY PROJECT INFORMATION

HOUSING TYPE
DETACHED

DENSITY
31 DW/HA

ARCHITECT & DESIGN TEAM
BOX LIVING DESIGN & BUILD

Project architect: Tim Dorrington
Photographs provided by: Emma-Jane Hetherington

YEAR COMPLETED
2013

SITE AREA
315 M²

Located in the middle of Remuera.

A north facing rear section on an extremely steep sight.

PROJECT TYPE
MODULAR RESIDENTIAL HOME - DESIGN AND BUILD

Built footprint: 160 M²

4 Bedrooms, open plan living, kitchen and dinning, pool and generous lawn space provided at the rear.

Standardised components in this Box home include the posts, beams, wall panels, glazing panels, brackets and stainless-steel cross braces that anchor the structure.

CLIENT/DEVELOPER
NOT RELEASED FOR PRIVACY

PRICE BAND
MID-RANGE

A mid-range project would typically have a current build cost of $2000 - $3000 per m², exclusive of land costs, professional services and regulatory fees

PARKING
FRONT ACCESS WITH SEPARATE TURNING PLATFORM

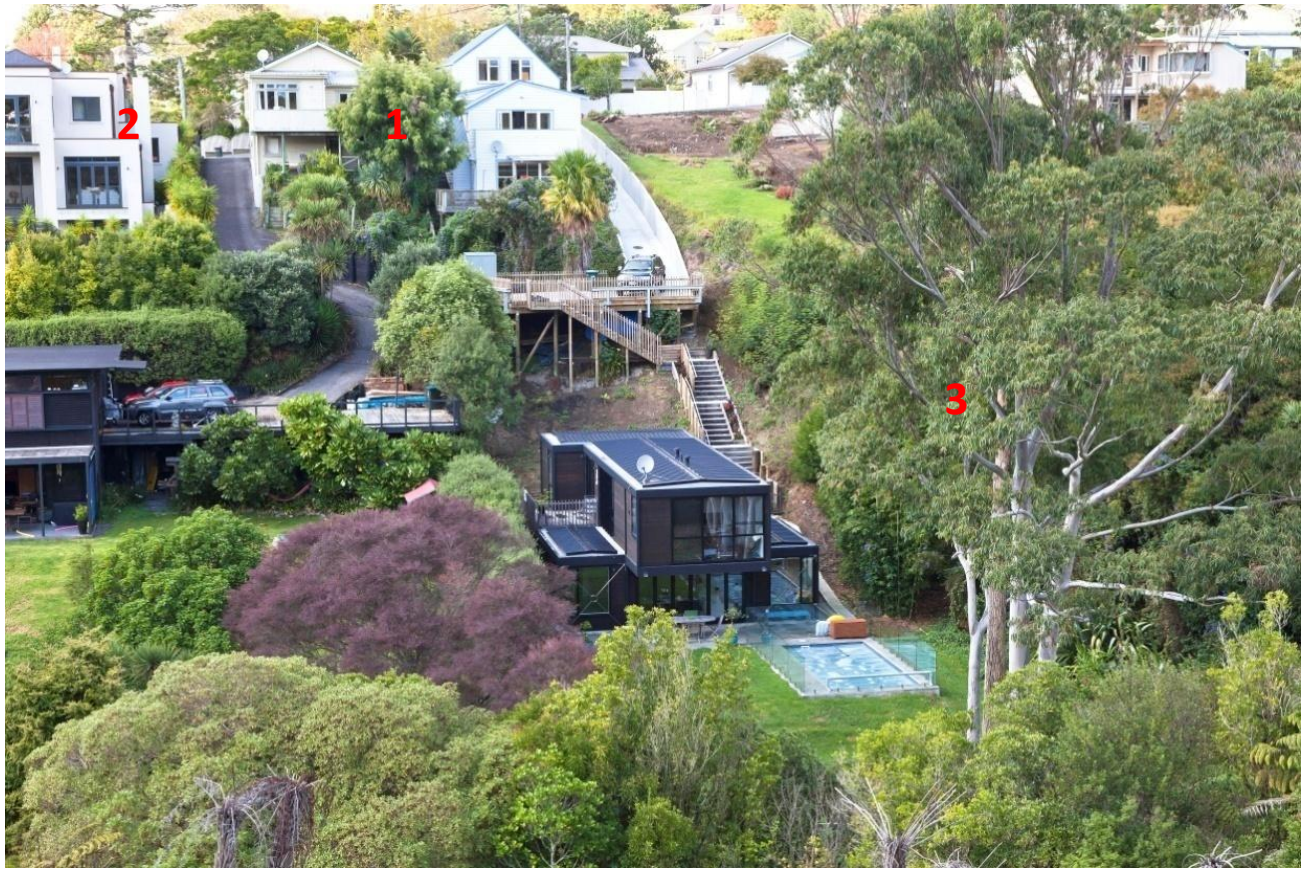
The driveway from the street leads to the rear section. Site constraints led to a separate parking structure at the top of the site, with the house accessed by stairs at the bottom.

UNDERSTANDING THE NEIGHBOURHOOD

1. The neighbourhood is in the inner suburb of Remuera. Bassett Road was originally developed in the late 19th- early 20th century, with infill development occurring over the intervening years.

2. The neighbouring houses towards the street are traditional Auckland bay villas most likely dating from the beginning of the 20th century. The steep sites to the rear have been developed much more recently.

3. The land slopes steeply from the street down to a flatter area at the rear that borders a stream. This gully is filled with mature trees, and provide a park like setting for the house.



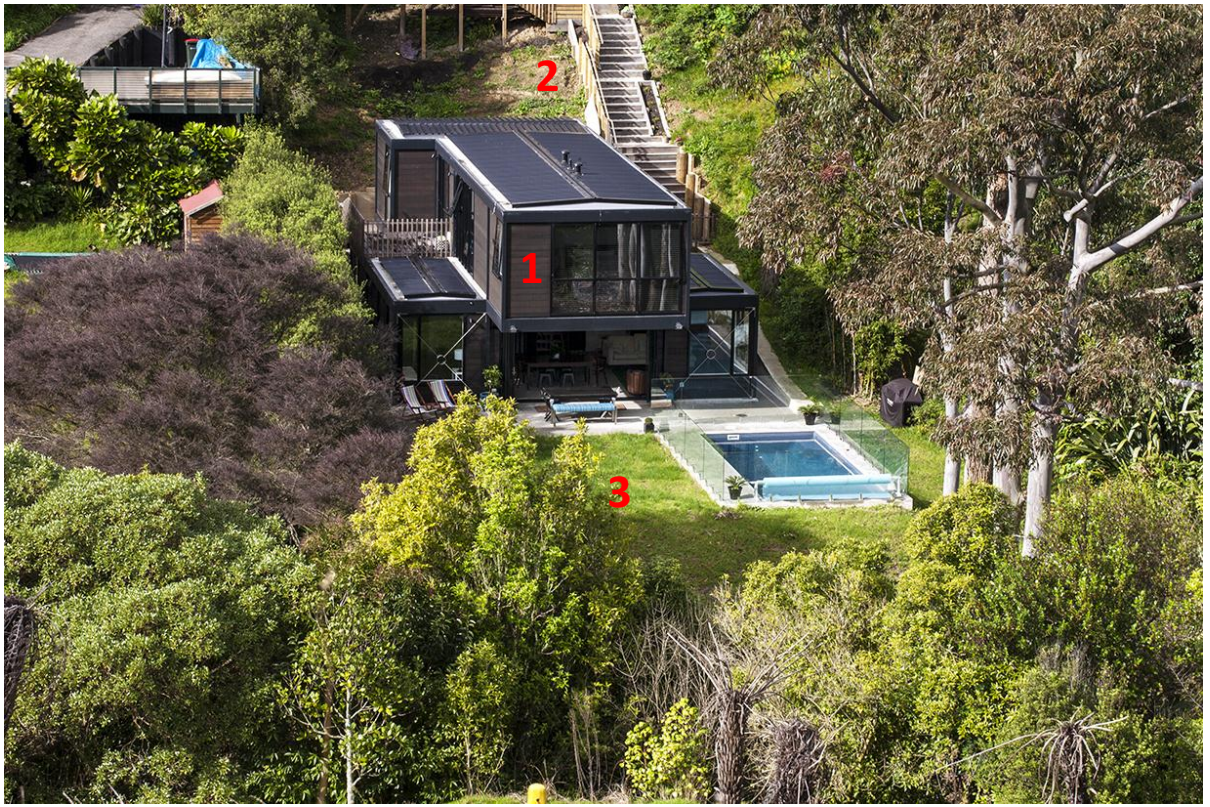
Looking towards the North-West elevation of the house - Basset Road in the background.

GETTING IT RIGHT PLACING THE BUILDINGS ON THE SITE

1. The split level house incorporates part of the level change of the site within the design of the building, as part of the top floor is pushed back into the slope. Using the slope of the site in the design of the house maximises the amount of flat open space to the rear of the property.

2. Separating the parking structure from the house was a key factor in the design. This kept the cost of retaining and excavation down by locating the house on the lower, flatter part of the site and not extending the driveway down to the house. Access to the house is via a set of stairs – while this a relatively steep climb, the owners appreciate the decision has resulted in a better house design and reduced construction costs.

3. The Box Living system of a prefabricated components allowed this property owner to build on a site with significant constraints because much of the house was able to be fabricated off site, craned into place, and as such difficulties of construction access was solved.



North – West elevation of the house.

GETTING IT RIGHT SITE DESIGN

1. The house is a split level design that incorporates the slope of the site into layout of the house. This minimises retaining wall heights, and the amount of cut and fill onsite – an important consideration given the cost of removing fill.

2. The area outside the bedrooms uses a mix of low retaining and a landscaped slope to provide an outlook for the rooms. Once, the vegetation matures over time it will provide a good visual backdrop.

3. The house sits within a secluded , private, park like setting which has a large number of mature trees. The onsite landscaping plays a secondary role to this backdrop.

4. The long, rectangular shapes of the building create a series of forms that define different spaces with differing levels of privacy. The front porch is the formal entry to the house, there is an upstairs courtyard to the east accessed off the bedrooms, and the upper floor projects over and shelters the private outdoor space to the rear.

The house is a split level design that incorporates the slope of the site into layout of the house.

GETTING IT RIGHT THE BUILDING

1. The material palette is modernist in style with dark timber and floor-to-ceiling glass which maximises the amount of light that can enter the house. The dark color scheme is intended to help the house blend into the landscaped backdrop.

2. The house is oriented north for passive solar gain and has concrete floors to capture and slowly release the heat during the day. Energy efficiency was integral to the planning, - the house is fully double glazed, and is insulated to above building code standards.

3. The post and beam construction system means the exterior wall panels between the posts are non-structural. Walls can have floor to ceiling windows, or a range of different materials. Box gutter and flat roof form is critical to the success of the architectural design of the house.

4. Maximising views out to the surrounding landscape and natural bush along with the prominent ridge of newmarket park were the key parts of the client's brief.

The house is oriented north for passive solar gain.

GETTING IT RIGHT THE BUILDING

1. The kitchen and dinning space are located on the east side of the building to capture morning sun and create a sunny warm space for breakfast.

2. Service and circulation spaces, where direct sunlight is not so important, are located along the south side or in the middle of the house.

3. Living and dining areas are used mostly in the afternoon or evening, so are located for solar gain occupant comfort during these times of day.

4. The internal form of the house is open and flexible - allowing for the house to adapt to the families changing requirements over the years.

5. Large floor to ceiling sliding doors allow most of the rear of the house to be open to the garden. Large amounts of glazing and a high stud height make the house feel light and spacious.

Internal shot showing the open plan living conditions and indoor to outdoor flow of the house.

GETTING IT RIGHT THE BUILDING

1. The houses is designed around a central staircase which is encased in a frame of open battens. Floor to ceiling glazing on the first floor enables sun light into the middle of the house, and this is filtered into the middle of the ground floor through the open staircase

2. The house has no corridors – minimising wasted space. Here the circulation space at the top of the stairs has been expanded to create a functional second lounge with access to a deck.

Internal shot showing the circulation space and its interaction with the communal family area and bedrooms.

GETTING IT RIGHT OUTDOOR SPACES

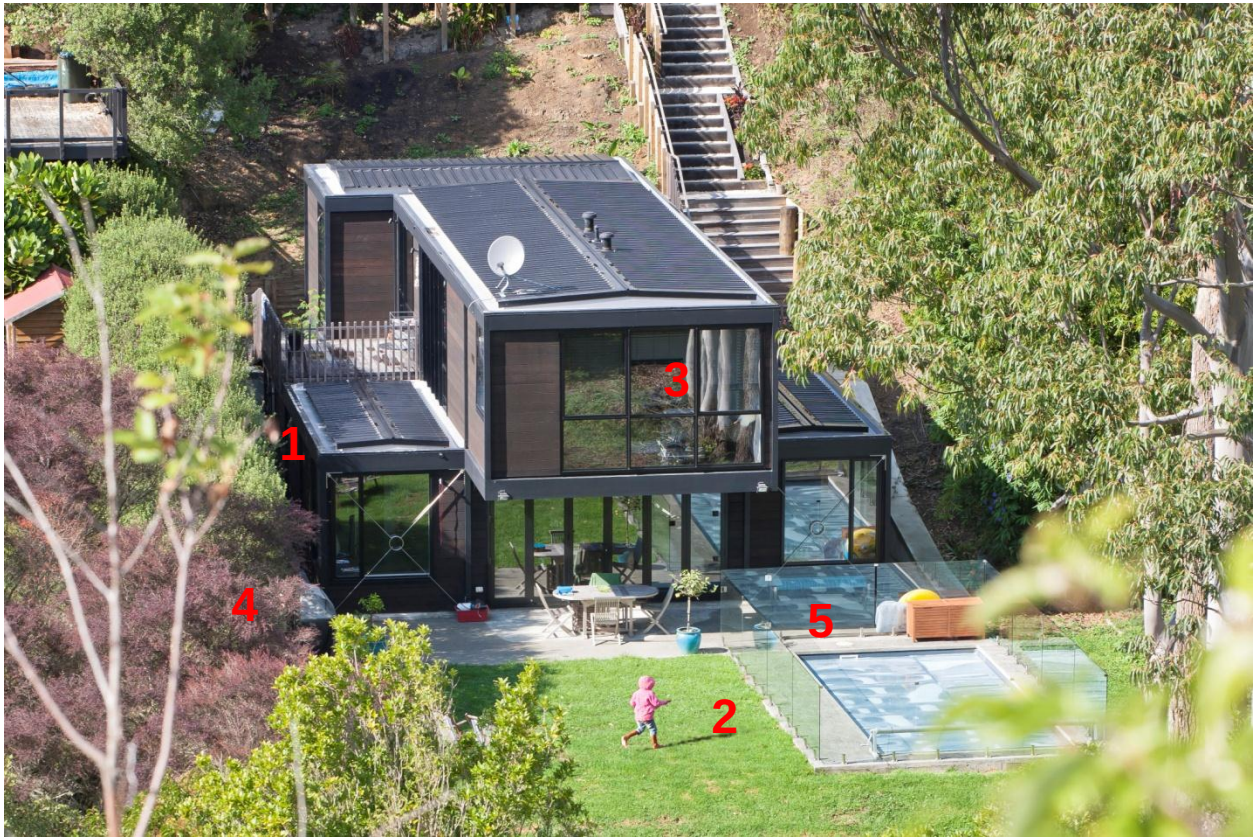
1. The rear garden and pool area opens directly out from the main living area. The native bush and exotic vegetation provides privacy from the neighbours. A partly screened service area has been carefully located off the laundry and secondary family area which provides the water tank, fold out clothes line and the recycling bins.

2. The house is set into the slope of the site, which maximises the amount of flat area in the back yard. The landscape design has concentrated on making the most of the existing mature trees.

3. The master bedroom has floor to ceiling windows to allow views over the backyard and surrounding planting.

4. The private garden and courtyard is not overlooked by the neighbouring houses due to the significant vegetation that surrounds these spaces.

5. Clear glazing around the pool allows views through to the landscape beyond.



The rear garden and pool area opens directly out from the main living area.

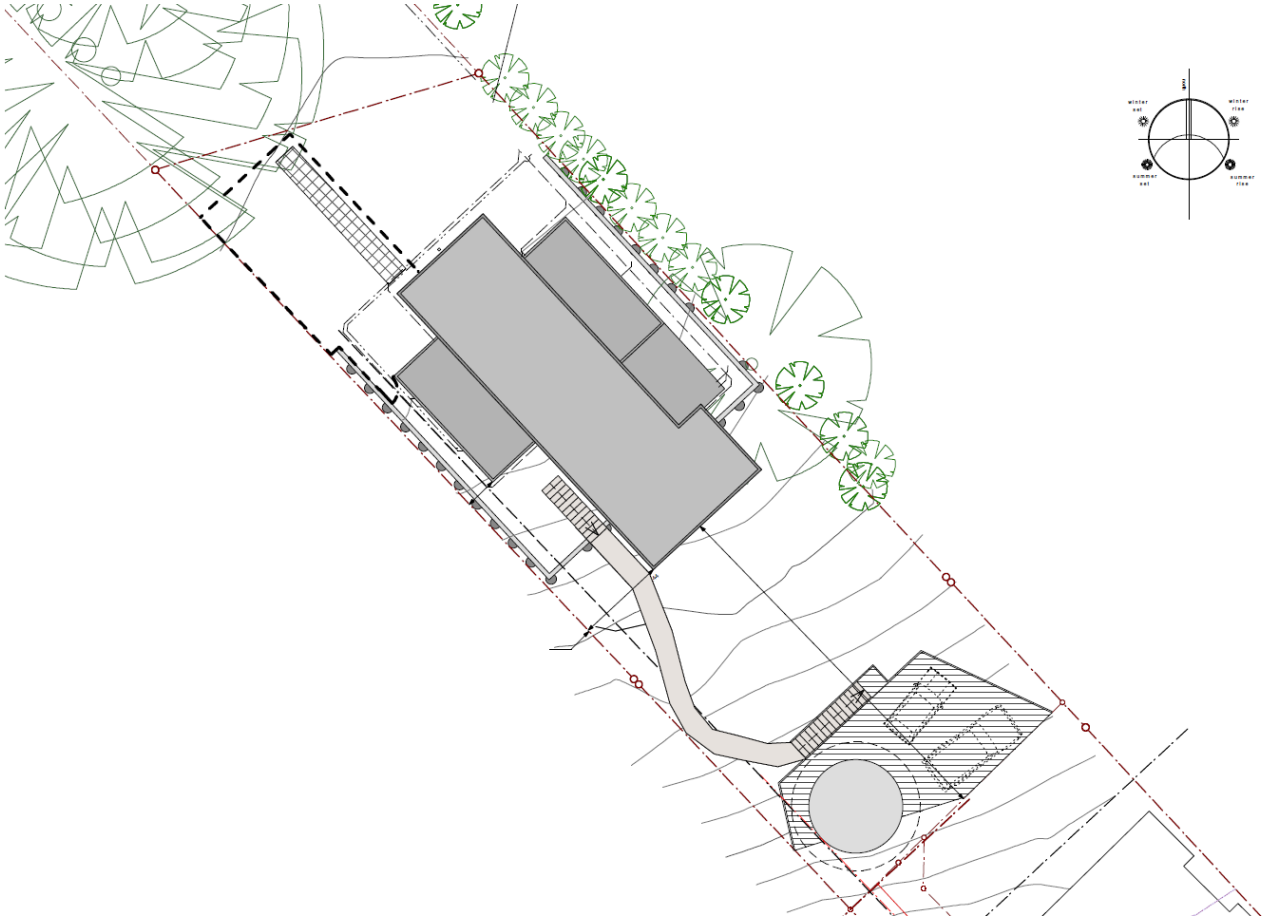
GETTING IT RIGHT ACCOMMODATING THE CAR

1. Designing the parking as a completely separate structure to the house was a fundamental decision in the design process and helped keep costs down. Extending the driveway further down the site would have been complex and expensive because of the steep slope; and building the house on the lower, flatter section meant construction required less retaining.

2. The mechanised turning platform is the only practical way of getting onsite maneuvering – without which the development would not have been able to proceed.

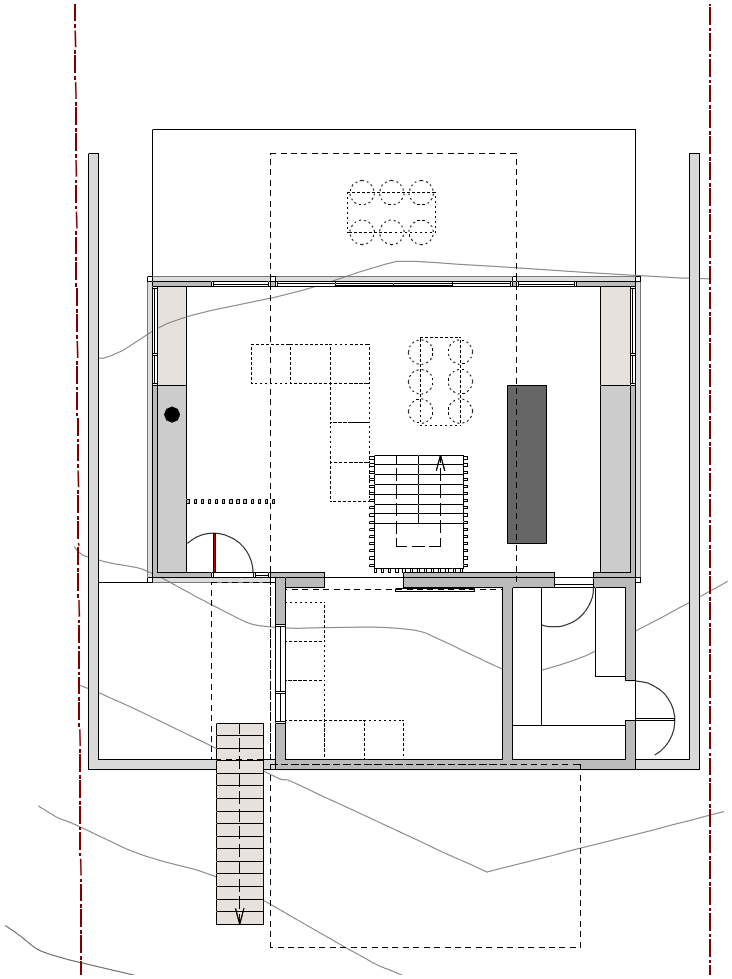
The mechanised turning platform is the only practical way of getting onsite maneuvering.

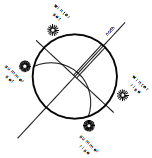
GETTING IT RIGHT SITE PLAN



Site Plan.

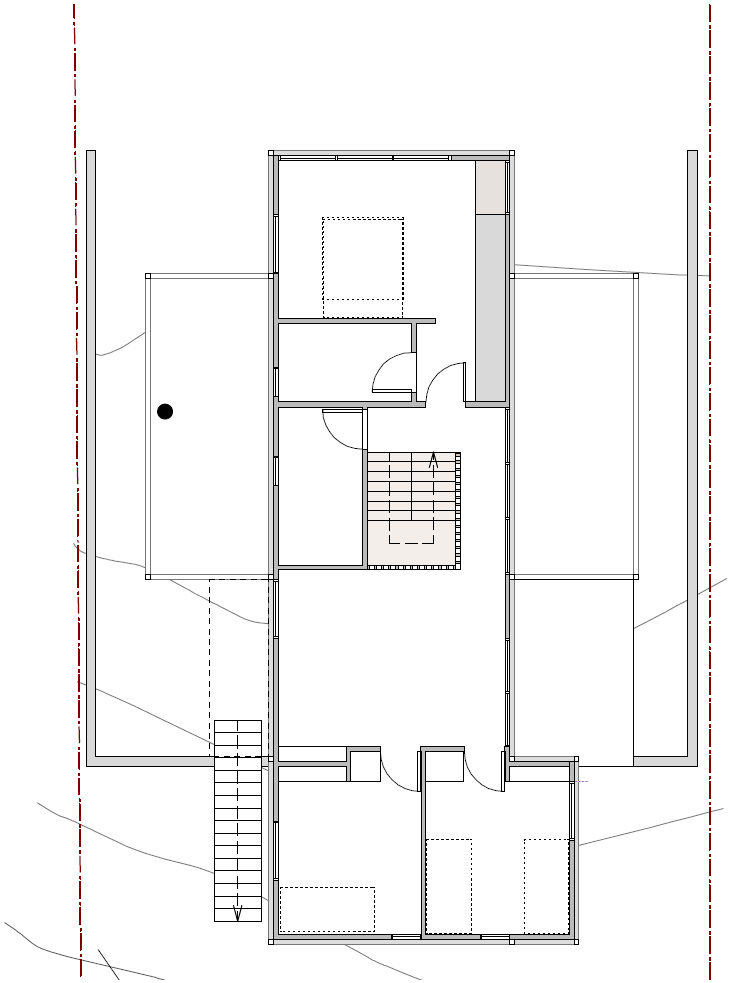
GETTING IT RIGHT FLOOR PLANS

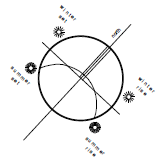




Ground floor level.

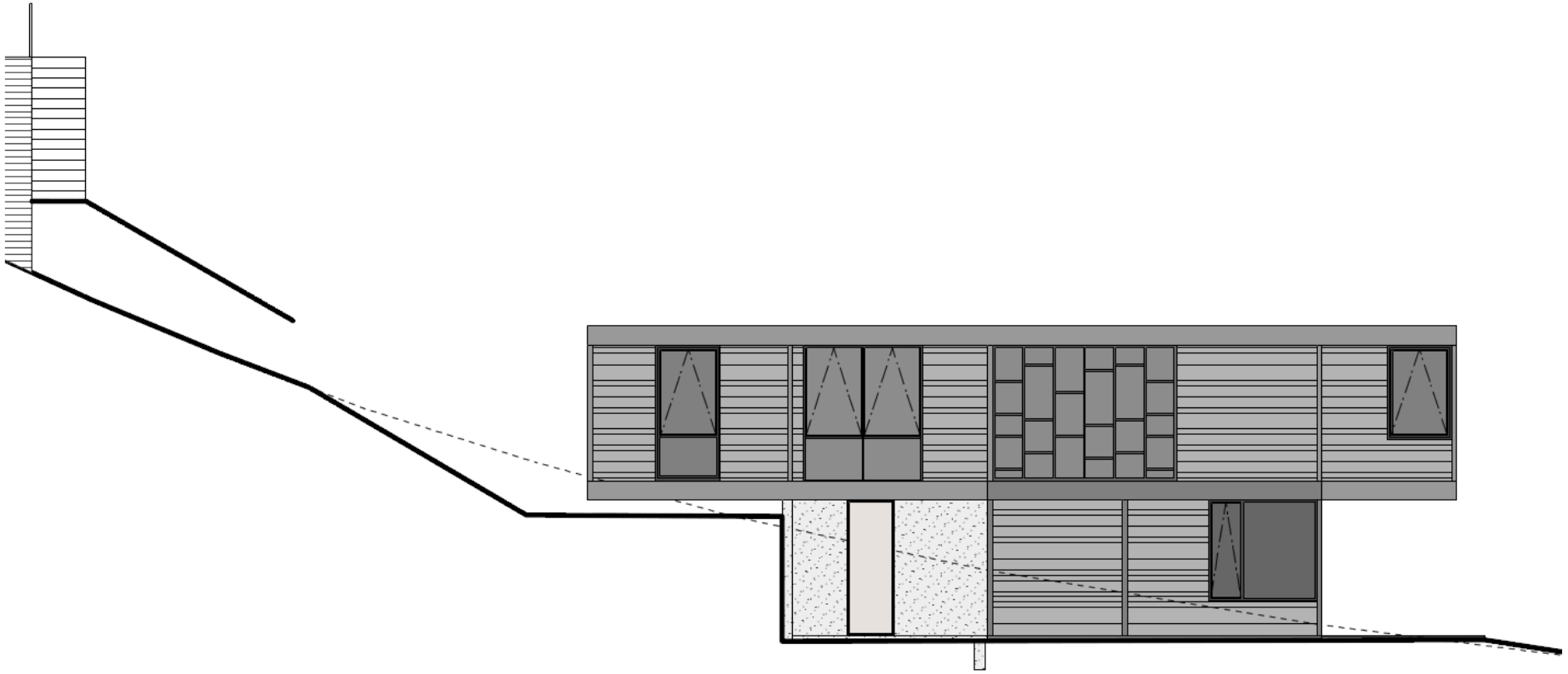
GETTING IT RIGHT FLOOR PLANS





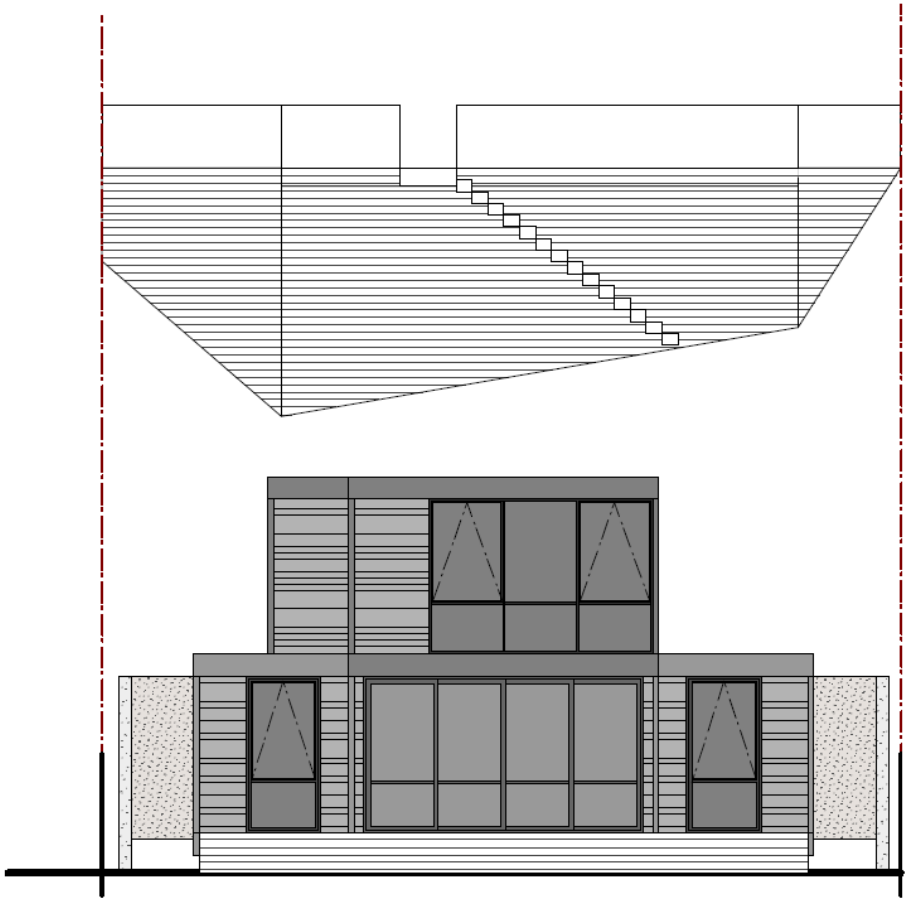
First floor level.

GETTING IT RIGHT ELEVATIONS



East elevation.

GETTING IT RIGHT ELEVATIONS



North elevation.

AUCKLAND DESIGN MANUAL

TE PUKA WHAKATAIRANGA I A TĀMAKI MAKAURAU

The Auckland Design Manual provides practical advice, best practice processes and detailed design guidance to enable us to design and build the world's most liveable city. The manual will enable us all to make informed choices, to build houses and develop our streets and neighbourhoods to not only look good but to ensure they are built to last, sustainable and give the best return on investment.

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