Project Submission

Personal and Company

My journey to building was different to the general way people enter the industry. I started the journey by attending University in America on football scholarship straight after high school, but quickly realised it wasn't for me. When I arrived back in New Zealand, I signed up for a labouring job to get back on my feet and found I really enjoyed working with my hands. This led me to pursue a building apprenticeship from the passion I developed for carpentry.

I've been very fortunate to have received high quality mentorship so far in my apprenticeship over the two companies I have worked for. The first company set high standards for me and from my builder/mentor I learnt the importance of a detailed oriented approach. My boss moved the business to Taranaki, and since then I been with Coastal Concepts.

My current employer, Nigel Stricket (Coastal Concepts) took me on at the beginning of this job and I have again been very lucky to have received mentorship and leadership through the build. The second company has developed me wholistically which has added another element to my development critical to success. Nige has put trust into my by giving me increased responsibility to run aspects the job while looking after a younger apprentice, which has allowed me to reach another level in my apprenticeship.

fundamental goal is to become the best builder I possibly can be. I want to achieve this by doing all my due diligence from bookwork and onto site. With a good base, I would like to take on more leadership roles with the eventual goal of starting my own company.

6A West End Road, Herne Bay

The design brief behind this project was simple. The idea was to build a high-end town house that's easy and comfortable to live in which marries elements of design and architecture.

The project included many different materials that complemented each other and created a point of difference. The front house is the feature house for a set of three houses that are walking distance from the centre of Auckland's Herne Bay. The ever-developing area encourages a point of difference which is hard to achieve when attempting to construct 3 similar natured houses on the same section.

The nature and complexities of the build has been great for developing my skills, understanding of carpentry and all areas of construction. Perfectionism is encouraged to ensure that the best finish is achieved, and we are all able to look back fondly upon the project.

I started on the project mid build, so the floor slab was installed before I began. The basis of this will report will show construction of the superstructure starting at framing.

Framing

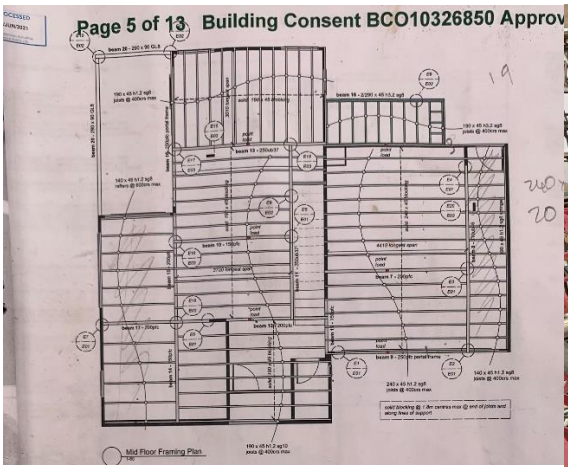
The building has been designed to be almost completely open planned downstairs. To achieve this, steel was required to take the loads from the weight above. We were fortunate enough to build and stand all our own frames on this job. We worked with our engineers who came on site and welded/bolted the prefabricated steel posts and beam in position.

All walls that were less than 2.7 metres in height were built out of 90 x 45 SG8 H1.2 with studs at 600 centres and nogs which were specified to be a maximum of 480 centres. Other walls which were greater than 3 metres but smaller than 3.6 metres were framed from 2/90 x 45 SG8 H1.2 studs at 400 centres and 400 centre nogs. This was also partially to do with the exterior envelope cladding fixing details.

All non-load bearing internal walls were built with 90 x 45 SG8 H1.2 stud framing at 600 centres. Frames were stood up one at a time in a select order. The same order was followed to then square, level and straighten the frames, starting from one corner of the house and working our way around. Lasers were used to ensure accuracy in the complexity.

The mid floor was an interesting stage of the project. With varying requirements, joist spans and steel details, it required a lot of attention to detail. As you can see in the mid-floor framing plan below, each section had different requirements and direction as well. All steel beams were in-filled for fixing. There was varying gauging of timber from 190 x 45 H1.2 SG8 and 240 x 45 H1.2 SG8. It was important that we kept a constant watch on the external boundaries to ensure we didn't bulge out the boundary joists or push the first-floor frames out of square or level.

Once we were satisfied with framing, we meticulously ran straight edges over the joists and planed out all the high points to ensure that in the later stages, we weren't left struggling to lay the oak flooring. All joists were fixed down appropriately following the fixing requirements in the plan. We laid 19mm H3.2 structural Plywood on top of the joists which the second storey would subsequently be framed on top of.

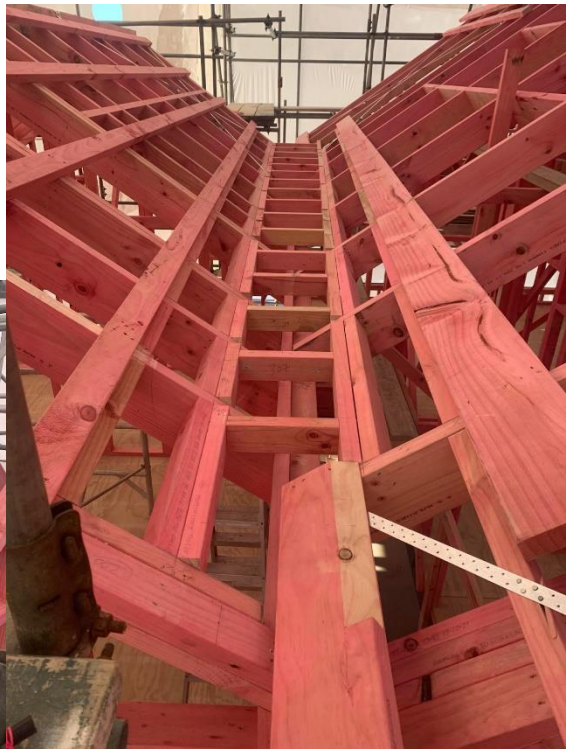


The roof framing of the second storey was one of my favourite elements of this build. Two gables side-by-side with an internal gutter and a mix between rafters and trusses provided me with plenty of learning opportunities. Both gables were pitched at 35 degrees and we built the frames ourselves. This meant we had the opportunity to draw the frame out on the floor to the exact measurements and build the gable ends to suit.

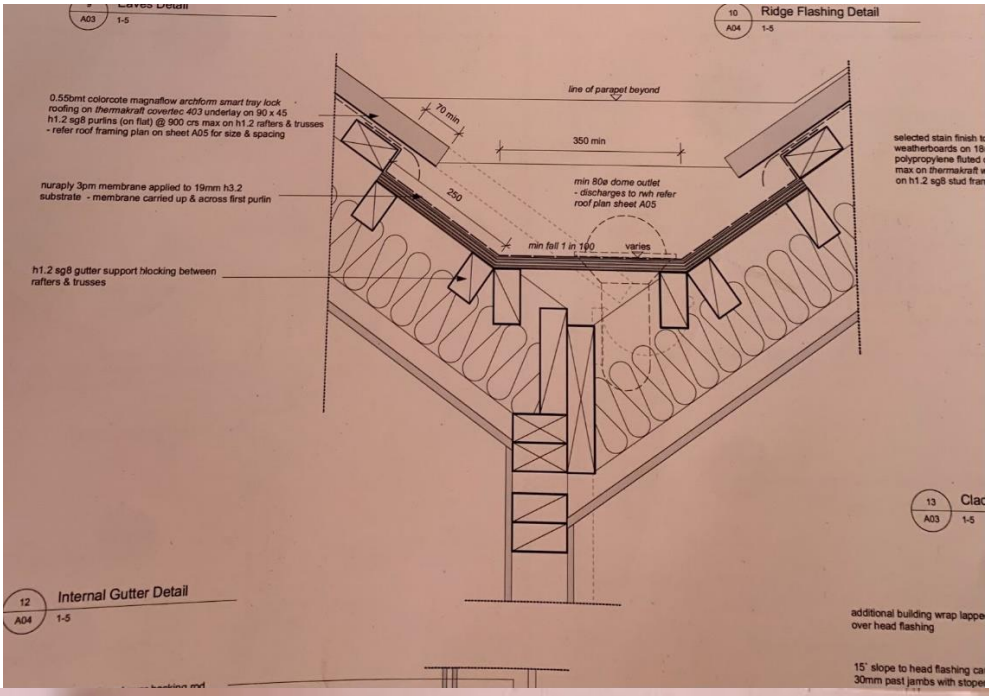
This method increased the speed and accuracy of the gables substantially. All studs which were over 3 metres in length were built with double studs for strength. All external walls were also built on the ground and stood up accordingly. Bottom plates were fixed first followed by the top. Straightening, squaring, and levelling then followed for a couple of days. We then calculated the underside of the ridge heights and notched them out of the top of all 4 Gable ends and the roof framing began.

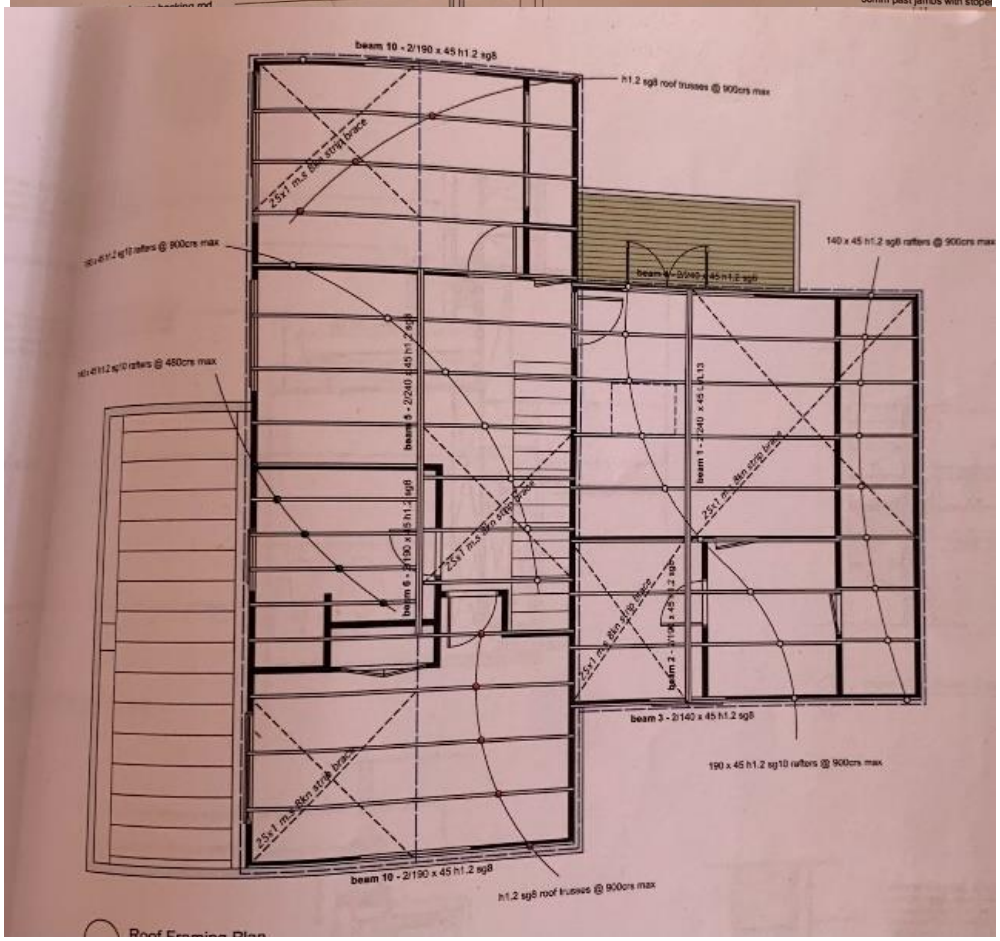
This project incorporated a combination of rafter and trusses, dictated by the ceiling design. The rafters provided a raking ceiling, and the trusses were used for flat ceilings.

The set out each gable was different. One of the gables had a larger span and therefore had different requirements to the other which also incorporated the trusses. As you can see in the roof framing plan below, The smaller gable roof structure had a ridge beam (beam 1) of 2/240 x 45 LVL13 and another connected on top of the internal wall of 2/190 x 45 H1.2 SG8 for beam 2. The parallel Gabel used two beams as well. Beam 5 was 2/240 x 45 H1.2 SG8 and beam 6 was 2/190 x 45 H1.2 SG8. The variation in beam materials was due to the length of the span. Both gables had a rafter/truss spacing of 900mm centres. The intersecting point where the two parallel gables met created an internal gutter, which I was tasked with framing up.



I was excited by the challenge of framing up the internal gutter. The minimum fall was 1 in 100 with the smallest flat section being a minimum of 350mm. As you can see from the framing photos above, it perfectly copies the plan. I particularly enjoyed framing up this section of the roof as it was something I hadn’t previously done so to tick off an internal gutter was exciting. The gutter was lined with 19mm H3.2 plywood and then the water proofers came and completed the waterproof membrane.


Ridge Flashing Detail
10
A04
1-5
line of parapet beyond
0.55bmt colorcote magnaflow archform smart tray lock roofing on thermakraft covertec 403 underlay on 90 x 45 h1.2 sg8 purlins (on flat) @ 900 crs max on h1.2 rafters & trusses - refer roof framing plan on sheet A05 for size & spacing
70 min
350 min
nuraply 3pm membrane applied to 19mm h3.2 substrate - membrane carried up & across first purlin
250
min 80ø dome outlet - discharges to rwh refer roof plan sheet A05
min fall 1 in 190
varies
h1.2 sg8 gutter support blocking between rafters & trusses
selected stain finish t
weatherboards on 18
polypropylene fluted
max on thermakraft
on h1.2 sg8 stud fra
13
A03
1-5
Clad
Internal Gutter Detail
12
A04
1-5
additional building wrap lappe
over head flashing
15° slope to head flashing ca
30mm past jambs with stope


beam 10 - 2/190 x 45 h1.2 sg8
h1.2 sg8 roof trusses @ 900crs max
2.5x1 ms 8kn strap brace
140 x 45 h1.2 sg8 rafters @ 900crs max
beam 5 - 2/240 x 45 h1.2 sg8
beam 1 - 2/240 x 45 h1.2 sg8
beam 6 - 2/190 x 45 h1.2 sg8
beam 2 - 2/140 x 45 h1.2 sg8
beam 3 - 2/140 x 45 h1.2 sg8
190 x 45 h1.2 sg10 rafters @ 900crs max
beam 10 - 2/190 x 45 h1.2 sg8
h1.2 sg8 roof trusses @ 900crs max

Exterior envelope

The client's chose to use the beautiful material of Cedar to clad the house. They liked the look of it over the various other cladding options.

Before we began the process of wrapping the house and fixing the cavity system, we meticulously went around the entire house from top to bottom with a long straight edge and planed out all the proud sections. The method behind this was to ensure there was a seamless transition from top to bottom storey and confirm there were no high points that would kick the boards out proud and take away the perfect finish we were after.

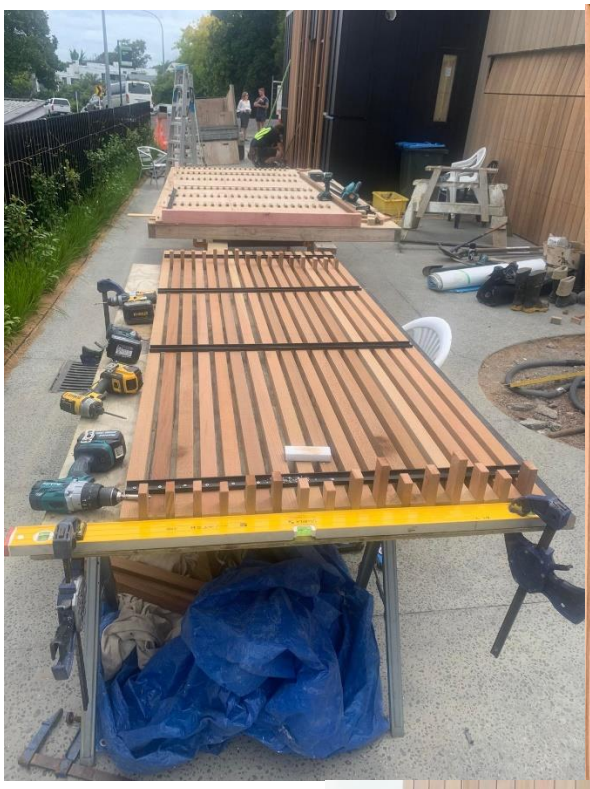
The house was wrapped with Thermakraft Watergate building paper, then we used a 18mm Cavibat system. Most of the house was cladded with the vertical Shiplap cedar boards as seen in the photo above. The East wall was deemed to be a fire wall and therefore cladded with the 0.55bmt Colorcote Magniflow Archform smart tray lock seam cladding. The client/architect also opted to clad the exterior front entrance with a feature cedar batten wall.

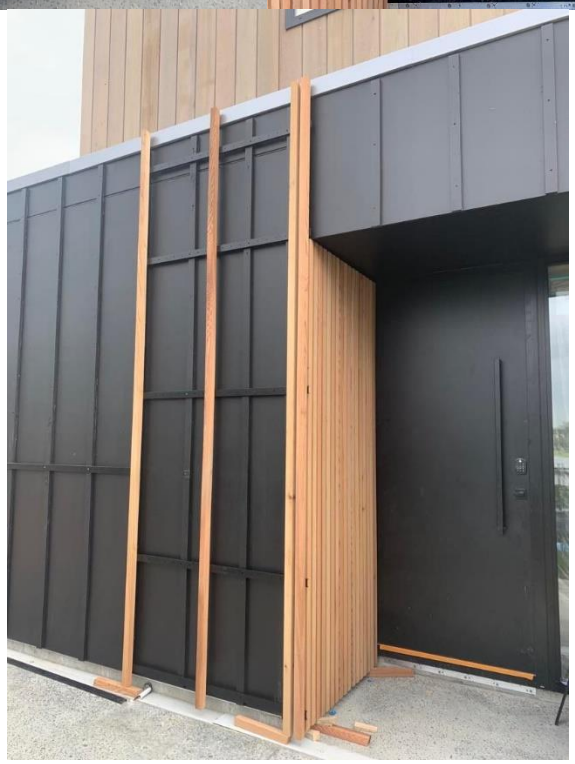
The process behind this type of cladding detail has been very beneficial for me in my development and I take pride in installing something that has caused numerous people and some builders to ask how exactly we did it.

As you can see in the photo below, we set up a Jig with 20mm spacing in between the 40x40 cedar battens. Each section varied in length depending upon factors such

as windows, doors, and corners. We altered the spacings to suit, ensuring that the theme was consistent and to the naked eye, you wouldn't be able to notice the subtle differences. These were methodical thought out well before beginning. This is because we got the 10mm C channel aluminium track pre-cut, hole punched and then powder coated to suit every desired panel.

The battens were screwed to the back of the cedar batten to hide all the fixings. We subtly fixed the aluminium to black vertical timber battens we had fixed to the James Hardies titan board previously. We painted all the screws used for this black, trying to minimise any trace of fixings. I particularly enjoyed this task as it demanded perfection and a keen eye for detail which is something I strive to achieve daily and through all aspects of my apprenticeship.





Floating Stairs

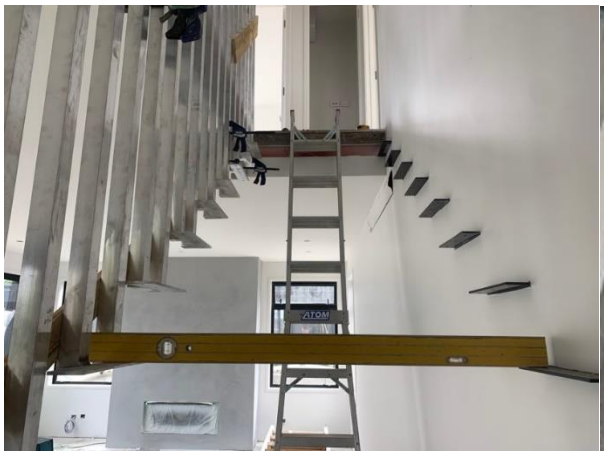
Interior Joinery was an element of my apprenticeship which I had less experience on than other aspects such as framing and cladding. I was tasked with setting out, carrying out and finishing this task of building stairs with no stringers.

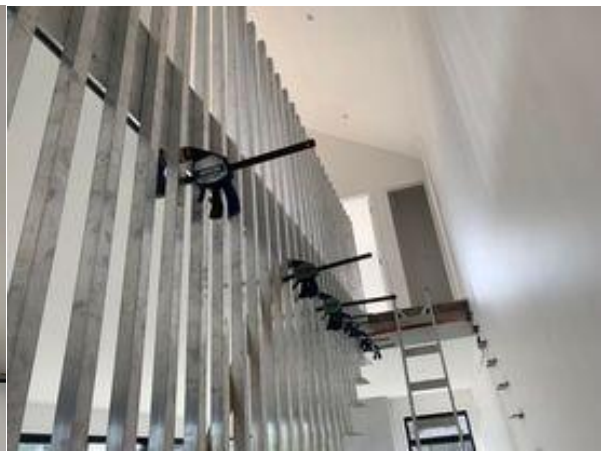
To start, we worked out what the height from the finished floor level was, how far it was going to go and then calculated the ride and run for every step. We started by marking out where our steel plate would be fixed to the wall, from top to bottom. We checked out the exact depth of the steel into the framing to ensure the Gib would float over the stringer in a way that no one would know it was there (as seen in the photo beside).

We then meticulously drew out the steps from top to bottom, to make sure that all the maths was accurate before making an order for the 40mm solid oak stairs to be cut to size. Each step had a rise of 180mm and a run of 280mm. I then clamped, marked, and screwed holes in the steel plate in the exact position for the brackets to be fixed. They had to be perfect, ensuring the underside of every step sat down hard on the bracket. The steel was drilled in a controlled and accurately manner by a magnetic drill. Once we were satisfied the brackets were sent off to be powder coated as they would be visible.

The next task was to set out the parallel side of the step for the big feature steel balustrade/screen. The engineers came to site and bolted a 370x10mm steel plate to the mid-floor. We marked these spacings out on the steel plate and then clamped the balusters in the desired position with a gap of 40mm between each steel baluster. Each baluster had a foot on it which we intended to line up perfectly level with the opposing bracket. The balusters were screwed from the backside of the

plate to hold them in place before being taken to the engineer’s workshop for welding and then eventually taken for powder coating.

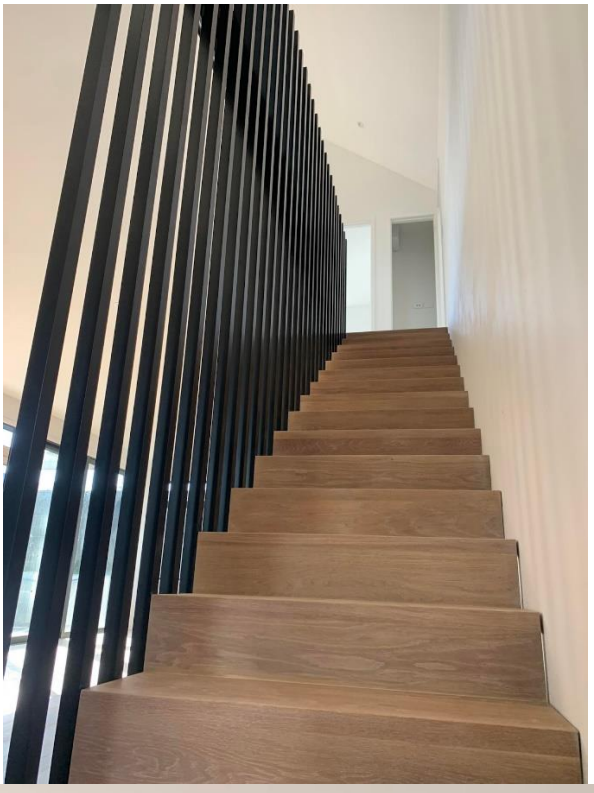


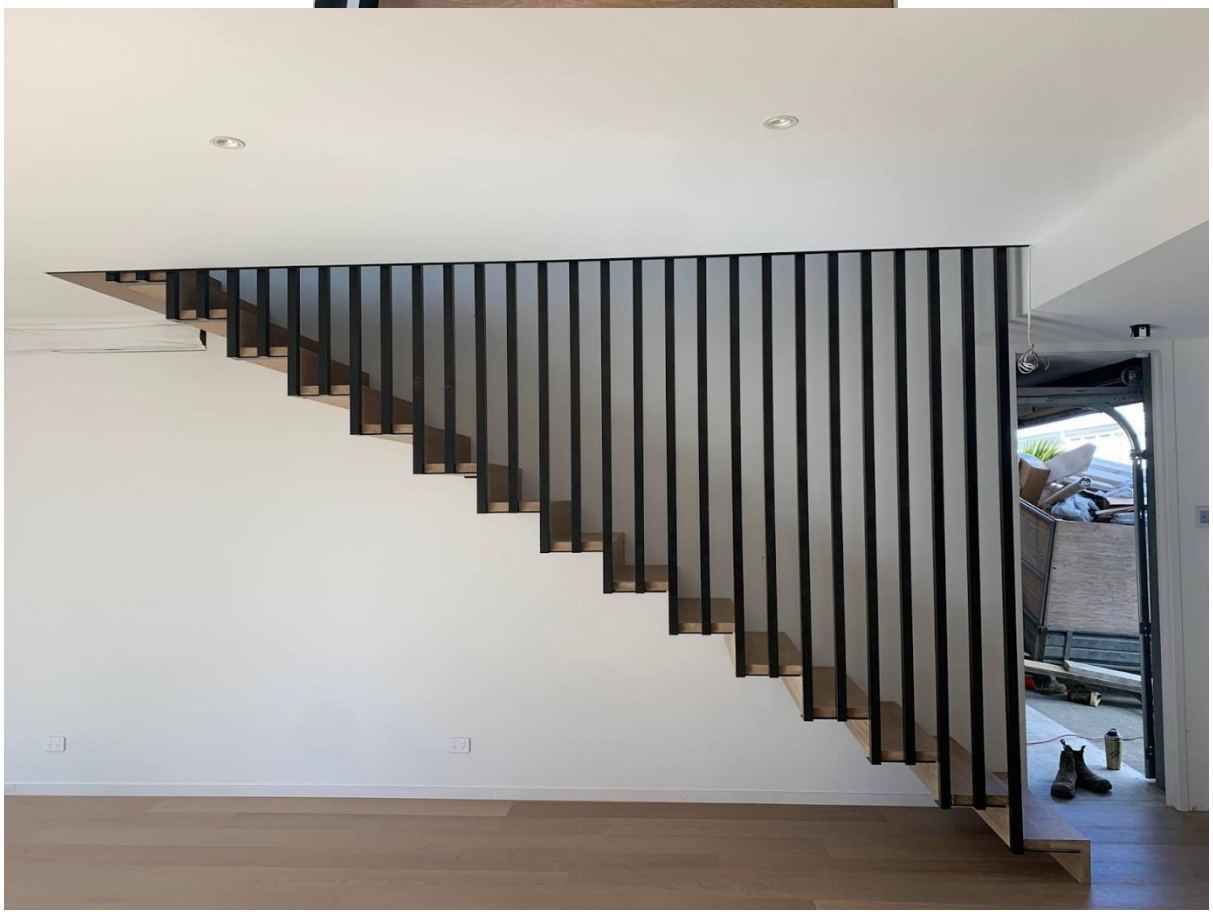


Due to the size and weight of the balustrade, it was broken up into two parts and then bolted back together into the mid floor on site. I then set out the building of the stairs. We received each step individually (one rise/run).

I used trigonometry to mark out exactly where the first step needed to land on the first floor as its positioning would dictate the rest of the stairs. We built the stairs in sections of three to maximise efficiency as every step needed to be perfectly square and flush with the next.

Pre-drilled holes on the underside of the tread provided us with the ability to glue and screw the following rise with 100mm bugles. These holes were then plugged with the plugs provided, chiselled flush and the entire backside of the stairs were sanded to eliminate the appearance of a joint. This method was very successful, and the stairs were finished to perfectly and within good time. 32mm Stainless steel screws were used to fix the underside of the bracket and balustrade feet to the oak stairs.





Tilt panels

Another career first was the feature tilt panels which we pre-cast ourselves on site. The challenge, and transferrable nature of the task enhanced my skills as an apprentice.

We started by pouring four level pads in the courtyard to box and pour the permanent panels. For effect and to provide a unique point of difference, the client decided to use palings as the finish.

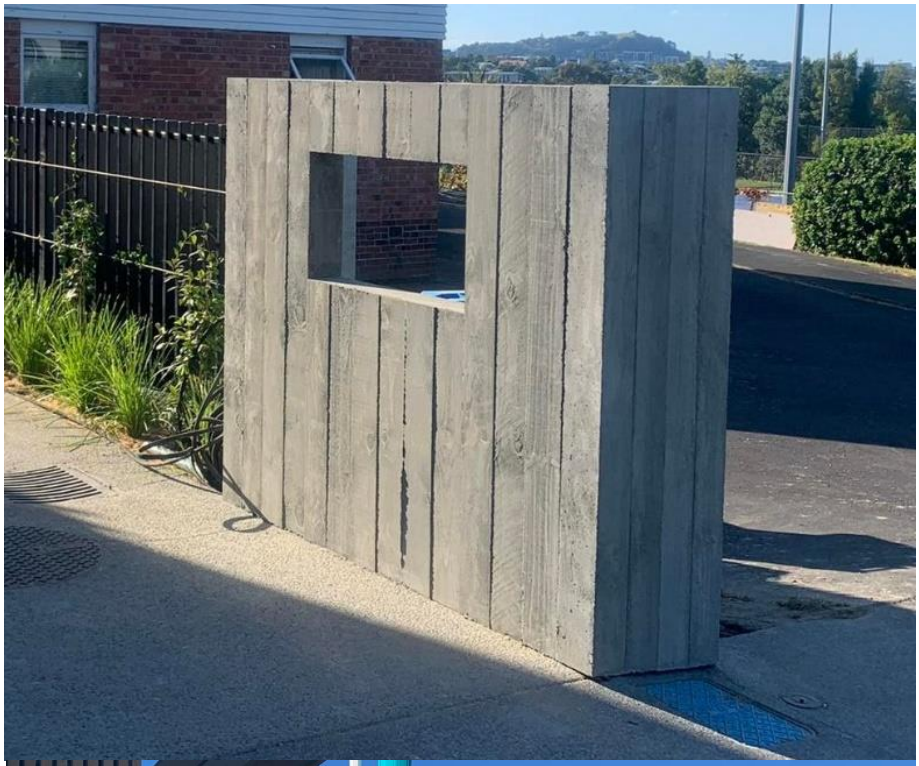
We formed the panels on top of the pads using 150x50 rough sawn on top of a sheet of plywood. We then placed the palings inside the boxing. Every second paling had a 3mm MDF ripping underneath to give a slight variation in heights between each paling. Following the engineer's description, we then proceeded to tie the high tensile 12mm steel rebar with 75mm cover. The spacings between each piece of rebar was specified to be 300mm.

Lifting eyes were cast into every panel for the crane to come and lift each panel into position. We tactically went about pouring these panels over the course of a week. Since we had a number of panels to do, we boxed up in preparation for a Monday pour, de-boxed and re boxed on top of the first panel on Tuesday to be ready for another pour on Wednesday. The process was repeated until all the panels were complete. We gave the panels some time to sit until we were satisfied that they had cured enough to be lifted into place.

Lifting the panels into place is a high-risk work activity, which made in a very tense but satisfying experience. I had never been a part of an operation so coordinated and controlled, which is vital to ensure everyone was safe and the panels were

placed properly into position. Lifting Pre cast tilt panels is deemed to be one of the top 10 most dangerous operations. This is due to the sheer weight involved and the risk of several things going wrong including the panel breaking overtop of someone or the panel hitting something/someone unexpectedly.

We braced the panels into position using temporary braces bolted into the first panels we poured as they were going to be broken up later for the garden to go in. The panels sat in between universal beam steel posts that had been concreted in the week prior. The panels were adjusted to the final height while we had the aid of the crane. The Panels were later concreted in with the patio concrete pads and then tied in together further with a cedar feature fence in between each panel.




AUCKLAND
CRANES

Conclusions

This project has provided me with the opportunity to gain an enormous variety of knowledge about more construction processes. It has also showed me how innovative ideas that can contribute to successful delivery for the client who can save money without losing quality spec.

Coastal Concepts is big on not subcontracting out every minor detail, so I have been able to get directly involved in every aspect of the construction process. This has given me a very strong foundation to continue to build my career and better myself as a builder.

I have been fortunate to gain experience in other aspects of a building site such as minor management roles within the build. By being afforded the opportunity to teach a younger apprentice, I was able to also confirm my own understanding of construction processes.

The project is in its final weeks of completion whilst writing this report. We are only touching up minor details and finishing the landscaping aspects so a photo of the finished product can’t be added below.