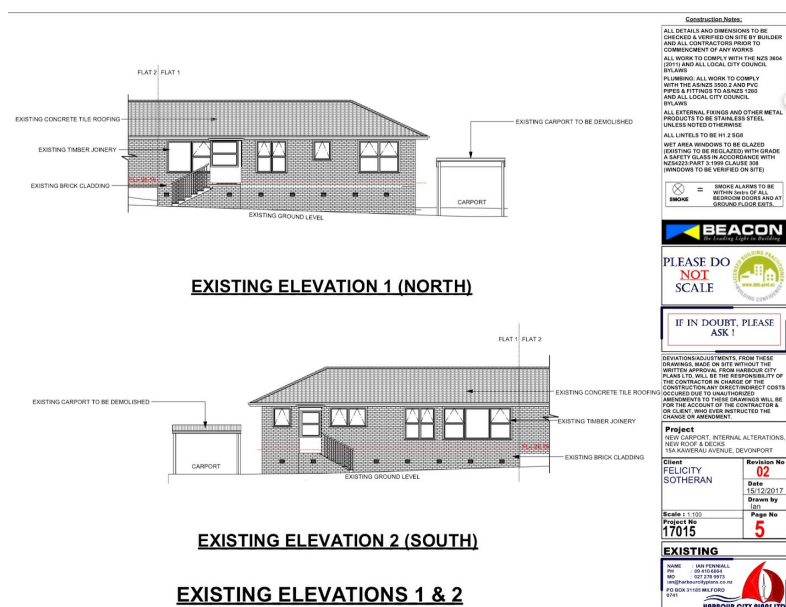


# Thomas O'Brien      *Apprentice of the year 2020 project submission*

## Personal and company profile:

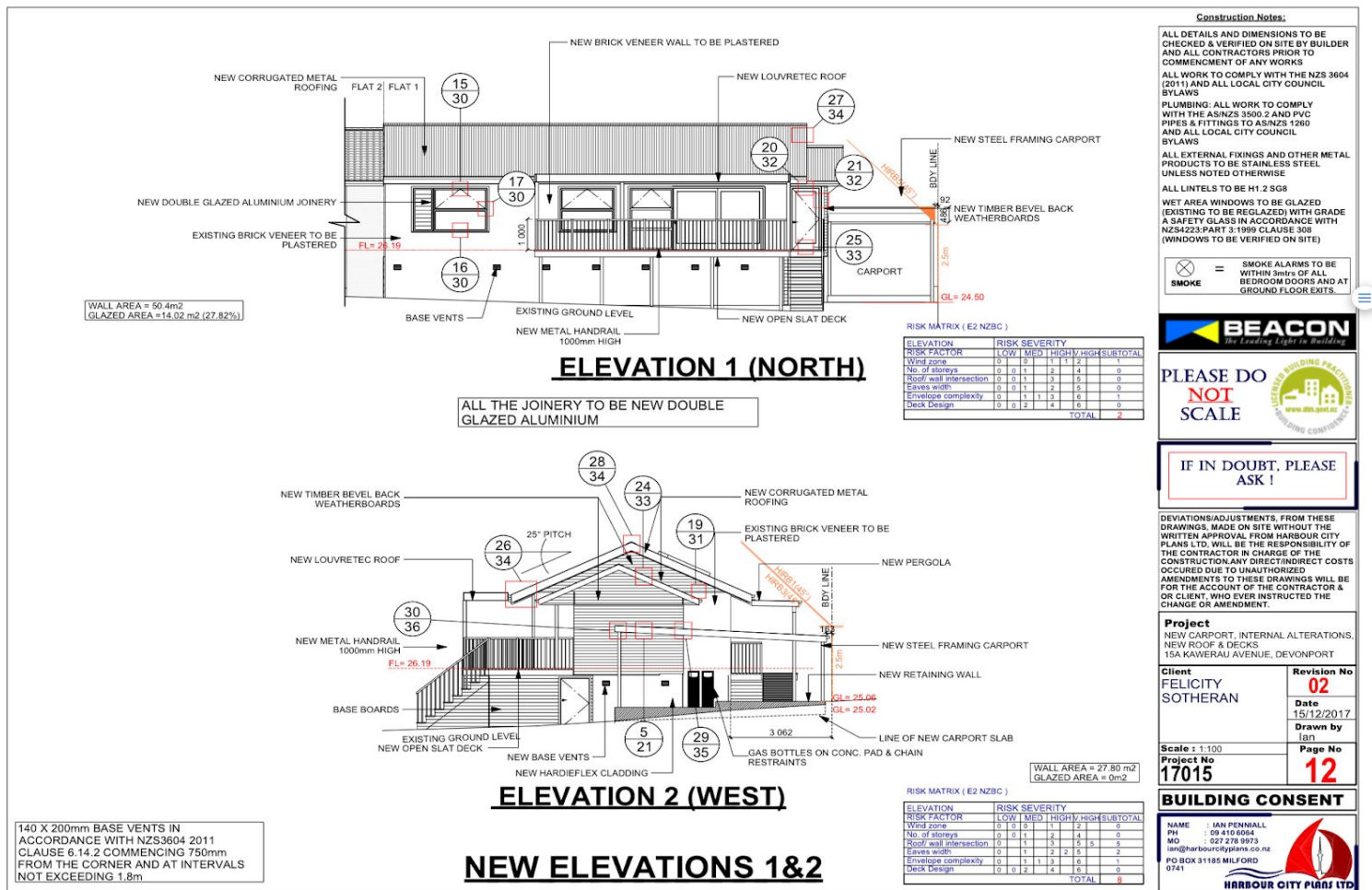
From the beginning of my senior high school years I decided that being a carpenter was the job for me. I had always enjoyed making stuff in my spare time and found my technology subjects a great outlet at school. I have always held myself to a high standard and pursued new knowledge in the building industry to try and further both my skills and value as an employee. I have been employed with Beacon Construction since November 2017 and began my BCITO apprenticeship in February of 2018. The reason I chose Beacon construction is because I wanted to work for a smaller firm that specialized in high-end renovations so that I could attain a wider scope of work and skills. My employer Pieter Oosterbahn has always provided a supportive work environment for me to learn these new skills. Through working for Beacon construction I have gained so many new skills and so much new knowledge which has greatly helped me in my recent role as site supervisor of the current and previous site I was on. Further on in my career I would like to pursue further qualifications in construction management and quantity surveying to equip myself with the tools necessary to run my own construction and renovation business.



## Project intro: 15A Kawerau Avenue, Devonport

The Kawerau ave job is a 1960's brick and tile attached unit that we renovated. The roof was rebuilt to allow for raking ceilings and long-run iron roof cladding. The interior floor plan was completely changed and an extension for the front entryway was added with a new carport supported off it. The renovation involved a wide range of skills from foundation works to finishing to complete the project. The site was the rear section approximately 50m back from the road with fencing on either side and the driveway was to remain so no heavy vehicles were allowed up it. Following the excavation a scaffold was erected around the building then a shrinkwrap tent was erected over it so that work could continue in all weather. Various Trades were needed due to the large scope of works involved in the renovation and Timberworld was our go-to supplier due to their wide range of stock and helpful customer service. On this job I worked closely with the foreman John to help grow my skills as he has been in the building trade for 40 plus years and a very willing teacher. I was also the onsite first aider and looked after the Health and safety side of the job. This included running toolbox talks and inductions where hazards were identified and solutions put in place.

## Foundations:



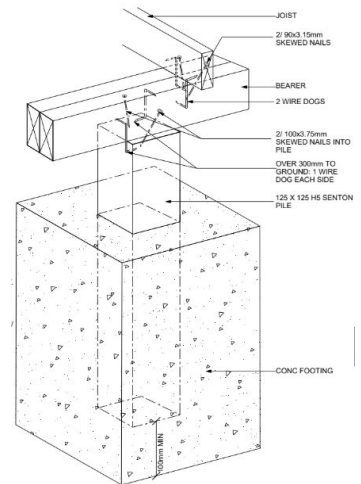
The first job upon arriving on-site was to demolish the existing carport that was removed due to its condition and location. After the carport was demolished the existing concrete driveway was removed and the site scraped. With the digger onsite we had him excavate for a temporary path to provide access for the neighbor while construction was underway. The boundary was then established by our surveyor due to the location of the new carport in relation to the boundary and the council requiring a surveyor's certificate. Profiles were then erected to allow for the setout of the footings and block retaining walls. I then assisted the digger in excavating the footings for the block carport retaining walls, using a rotary laser to set heights and string lines off the profiles to set the lines. During the excavation we discovered that we would have to step the footing in block modules to allow for the ground condition of the site. The footing was a 300x300mm ground beam with 4 D12 bars and R6 links at 600mm centers in accordance with engineers specs and consented drawings. The placement of the footings and reinforcing was then council inspected.



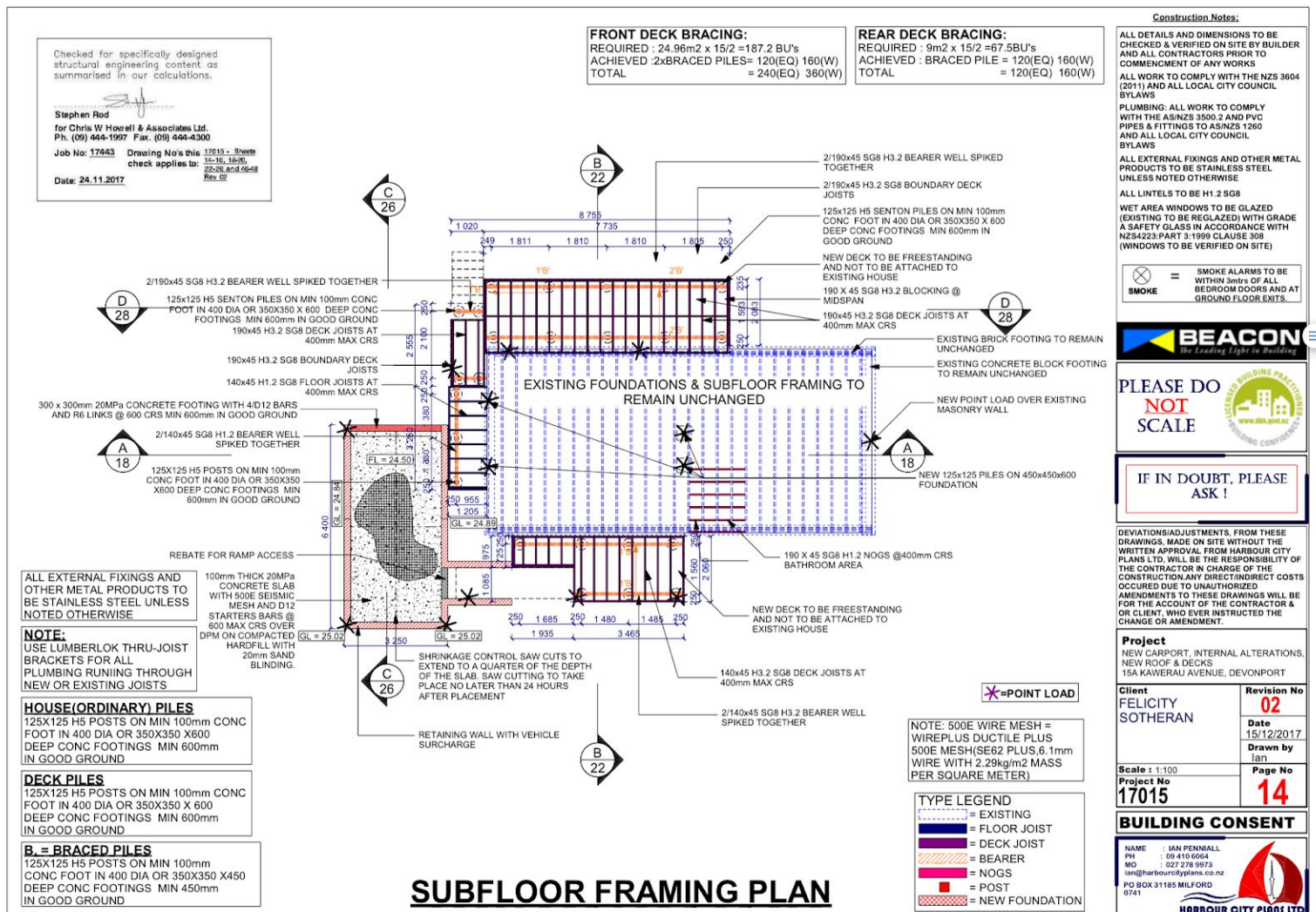


# Thomas O'Brien Apprentice of the year 2020 project submission

The footings and footpath were then poured and finished together with 25mpa concrete pumped from the road due to the access issues. The blocks were then laid with bond beams at 600mm centers and starters from the footing at 600mm centers. After the blocks were laid they were inspected and then grout filled again pumping the mix from the road. After allowing the block fill to cure sufficiently the wall was then waterproofed with Sika Blackseal which is a bitumen based emulsion. The reason we use this product is its simplicity of application and the fact it can be applied without a license, although not an ideal product for dwellings it is a perfect product to use for retaining walls and other exterior walls with no occupancy on the other side. After applying 3 coats, the waterproofing could then be protected with polystyrene and a draincoil placed at the base of the wall ready for scoria backfill. Due to relocation of point loads in the floor diaphragm above, new 450mmx450mmx600mm foundations needed to be dug and poured below the floor. This required hand digging the pile holes under the house and then hanging the 125x125mm H5 piles in the holes with a 100mm punch pad below. Z-nails were then fixed to the tops of the piles in accordance with the consented drawings. Also required was a small extension at the side of the house which would have to be built before that section of framing and roofing could be done. For this the piles were placed and poured in a similar fashion as the deck piles I mention below.

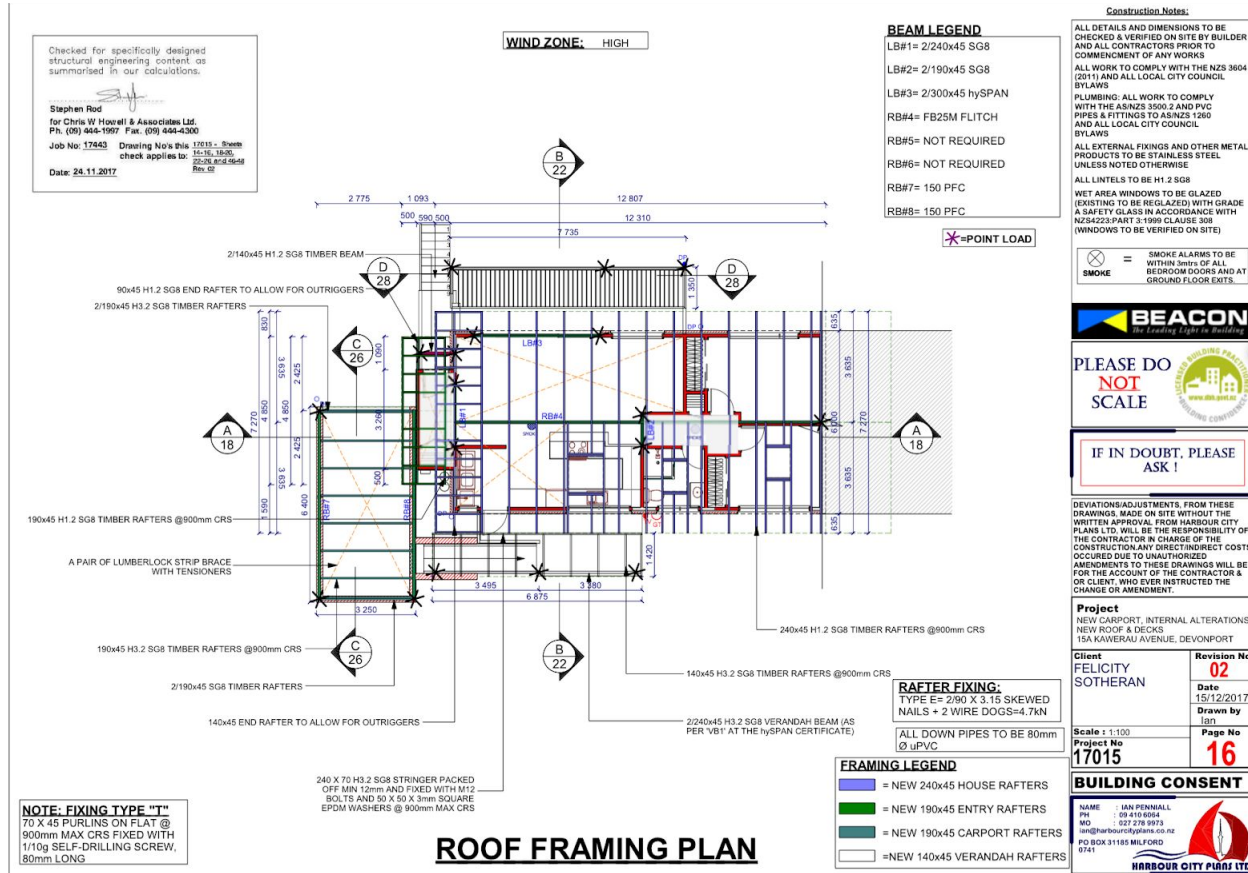


**TIMBER PILE DETAIL**  
SCALE 1:10



# Thomas O'Brien Apprentice of the year 2020 project submission

## Roof and wall Framing:



Construction Notes:

ALL DETAILS AND DIMENSIONS TO BE CHECKED & VERIFIED ON SITE BY BUILDER AND ALL CONTRACTORS PRIOR TO COMMENCEMENT OF ANY WORKS

ALL WORK TO COMPLY WITH THE NZS 3604 (2011) AND ALL LOCAL CITY COUNCIL BYLAWS

PLUMBING: ALL WORK TO COMPLY WITH THE AS/NZS 3500.2 AND PVC PIPES & FITTINGS TO AS/NZS 1260 AND ALL LOCAL CITY COUNCIL BYLAWS

ALL EXTERNAL FIXINGS AND OTHER METAL PRODUCTS TO BE STAINLESS STEEL UNLESS NOTED OTHERWISE

ALL LINTELS TO BE H1 2 SG8

WET AREA WINDOWS TO BE GLAZED (EXISTING TO BE REGLAZED) WITH GRADE A SAFETY GLASS IN ACCORDANCE WITH NZS4223 PART 3 1999 CLAUSE 308 (WINDOWS TO BE VERIFIED ON SITE)

SMOKE ALARMS TO BE WITHIN 3mtrs OF ALL BEDROOM DOORS AND AT GROUND FLOOR EXITS

**BEACON**  
The Leading Light in Building

PLEASE DO NOT SCALE

IF IN DOUBT, PLEASE ASK!

DEVIATIONS/ADJUSTMENTS FROM THESE DRAWINGS MADE ON SITE WITHOUT THE WRITTEN APPROVAL FROM HARBOUR CITY PLANS LTD. WILL BE THE RESPONSIBILITY OF THE CONTRACTOR IN CHARGE OF THE CONSTRUCTION. ANY DIRECT/INDIRECT COSTS OCCURRED DUE TO UNAUTHORIZED AMENDMENTS TO THESE DRAWINGS WILL BE FOR THE ACCOUNT OF THE CONTRACTOR & OR CLIENT, WHO EVER INSTRUCTED THE CHANGE OR AMENDMENT.

Project  
NEW CARPORT, INTERNAL ALTERATIONS, NEW ROOF & DECKS  
15A KAUERAU AVENUE, DEVONPORT

Client  
FELICITY SOTHERAN

Revision No  
02

Date  
15/12/2017

Drawn by  
Ian

Scale 1:100

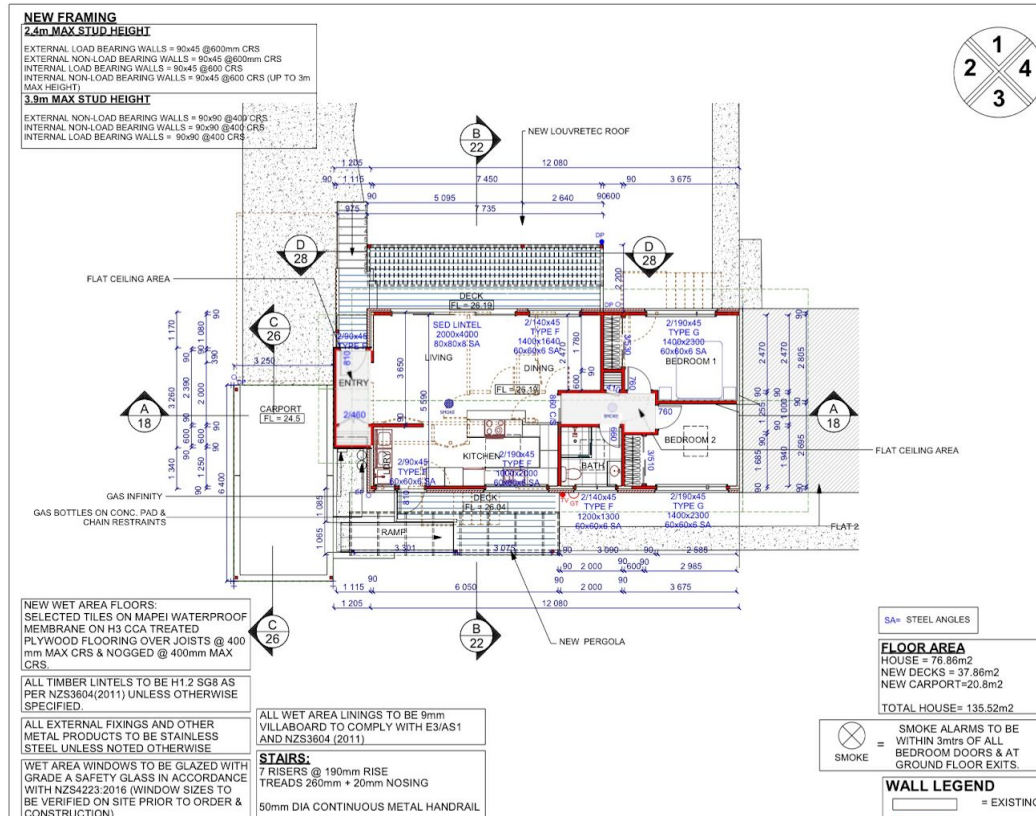
Page No  
16

Project No  
17015

**BUILDING CONSENT**

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PO BOX 31185 MILFORD 6741

**HARBOUR CITY PLANS LTD**



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Project  
NEW CARPORT, INTERNAL ALTERATIONS, NEW ROOF & DECKS  
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02

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Scale 1:100

Page No  
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**BUILDING CONSENT**

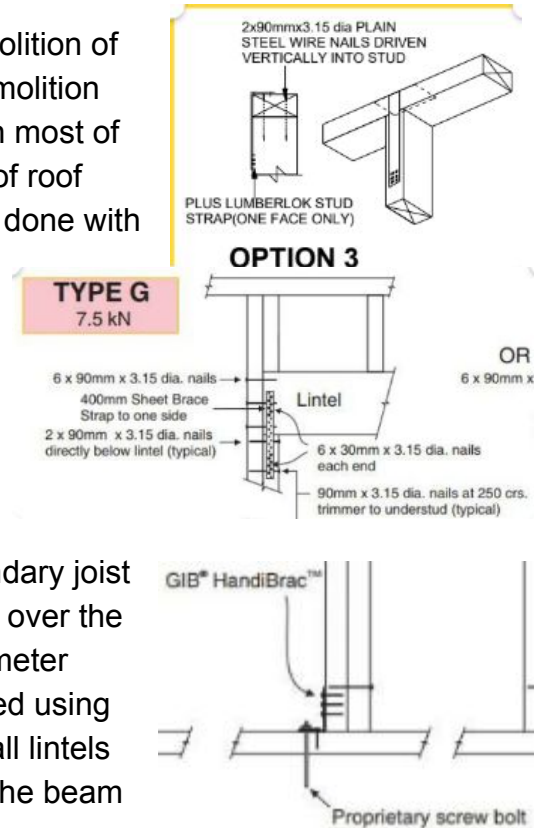
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**HARBOUR CITY PLANS LTD**



# Thomas O'Brien      Apprentice of the year 2020 project submission

After the point load foundations had gained adequate strength the demolition of the roof and reframing of exterior walls could begin. Before the roof demolition and exterior wall framing, all existing gib and fittings were removed with most of the brickwork being taken down to bottom plate height. The first stage of roof demolition was to remove the concrete roof tiles and battens. This was done with the help of timber ramps to slide the tiles off the roof to be stacked on the ground. Care had to be taken due to the height off the floor and roughness of the tiles. Once the tiles and battens were removed the existing rafters and other roof framing members were removed. After the demolition of the roof framing the floor framing for the addition could be done using 140x45mm H1.2 joists and bearers. This was built in a similar fashion to the decks I mention below but lacked the extra hardware required on the deck and was fixed to the existing boundary joist by removing that section of brick. 19mm h3.2 plywood flooring was laid over the joists with plenty of glue and fixings at 150mm centers around the perimeter and at 300mm centers in the field. The exterior walls were then reframed using 90x45mm H1.2 SG8 framing timber with studs at 600mm centers and all lintels are to the same treatment as the framing and to the specced sizes on the beam layout plan. During the building process we referenced NZS3604 and the consent documents to ensure that we were building to spec. The exterior wall framing then received its hardware of m12 hold down bolts on all GIB BL braces along with straps on all lintels and stud to top plate connections. After the exterior walls were framed then the middle interior wall could be built to support the ridge in the center and the ridges could be lifted and fixed in place. The bedroom side of the house required a double 240x45 h1.2 ridge and due to the span over the living area a steel flitch of the same size had to be used which was supplied by Timberworld. Due to the finished height and weight of the flitch beam ridge it would provide a challenge to position and due to the scaffold and tent over the site a crane or hiab could not be used so the beam had to be manually positioned with a manual lifter. Following the fixing of the ridges the rafter sizes were then calculated and cut from 240x45mm H1.2 SG8 framing timber. After cutting the rafters the roof was then pitched at a 900mm set out taking into consideration to allow for the skylights to be added. 600mm straps were then added over the top of the ridge tying both common rafters together and multigrips added on either side of the rafters. To frame for the skylights a double trimmer was required at top and bottom with jack rafters keeping the same set out as the common rafters.



## **Thomas O'Brien      *Apprentice of the year 2020 project submission***

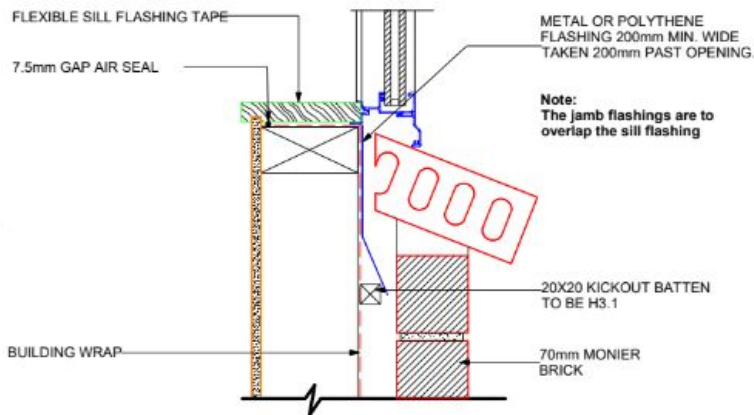
After the roof had been pitched, 70x45mm H1.2 purlins were fixed to the rafters at 900mm centers to provide screw fixing for the coloursteel roof cladding. Soffit framing was then done with extra nogging between the rafter tails and also double sprockets in places to allow for fixing of the Louvretec system. This was followed by the fixing of the 230x18mm h3.1 FJ fascia/barge boards and hardiflex soffit linings. With roof framing and soffits done then the roof was ready to be clad by sub-trades and we could begin framing the interior walls. The interior walls faced the challenge of being both raking and having a stud height of over 3m which in accordance with NZS3604 has to be 140x45mm or double 90x45mm studs at 400mm centers. The choice was made to go with double 90x45mm studs, although at greater cost it would not affect the floor plan which due to the already limited size of the spaces was most important. Some of the walls required extra hardware such as nails plates and GIB Handibrac's which required nogging out in places. Although I had previously done conventional wall framing I had not yet encountered any raking walls so they provided a challenge in working out both angles and stud lengths. This was a really enjoyable process and would have to probably be my favorite part of building as it is the real bones of a house and really defines the spaces. Upon completion, the roof and wall framing was inspected by the Auckland Council to ensure it was within spec and in accordance with NZS3604.



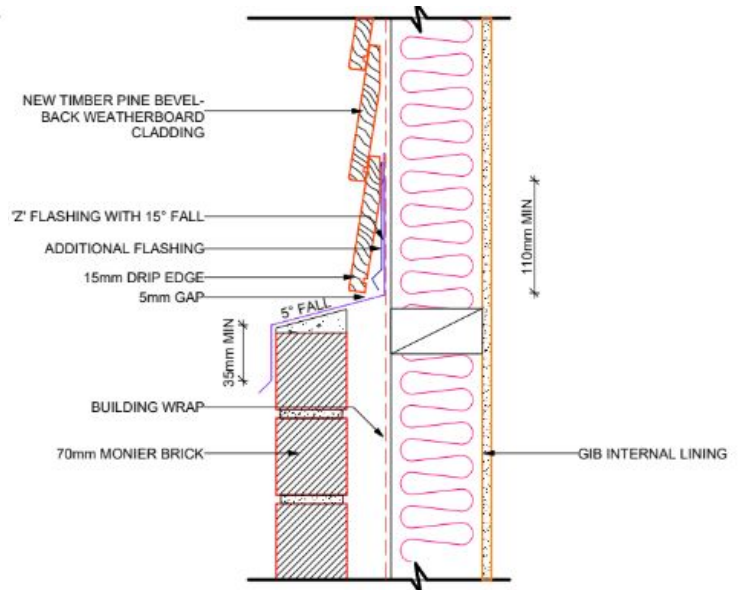
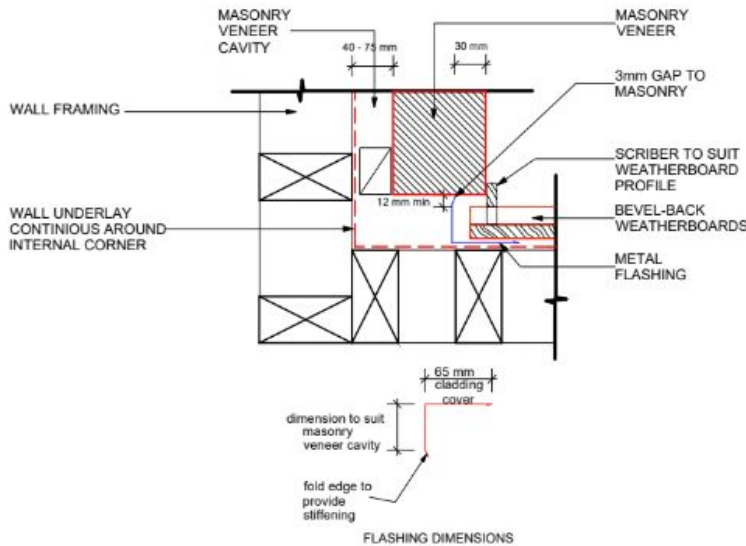


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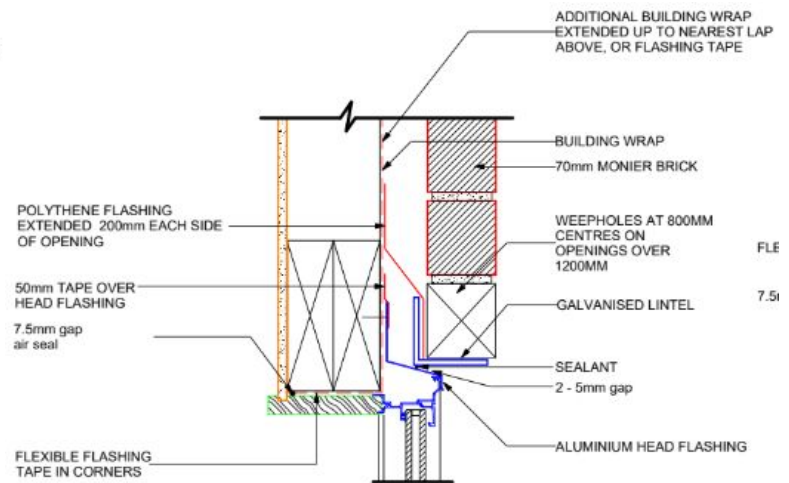
## House Wrap/Cavity and Cladding:



### 16/12 BRICK VENEER WINDOW SILL



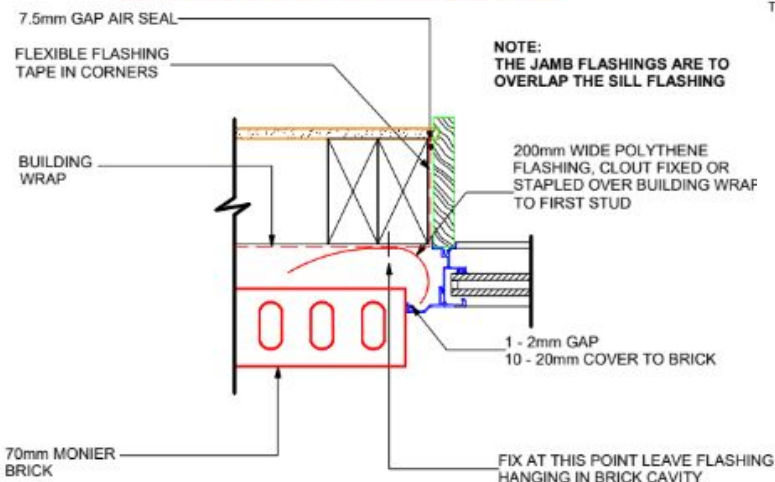
### 19/12 TRANSITION FLASHING DETAIL WEATHERBOARDS - BRICK VENEER



- Note:
- For openings greater than 2.0m, provide a landing for the lintel of 200mm for each side of the opening.
  - For openings less than 2.0m allow 100mm each side of opening.

- Important:
- All lintel bars must be propped until mortar is set (7 days).
  - It is important to allow the first 3 courses of the brickwork over an opening to set before laying any more bricks above. Provide brick ties within the bottom two courses.

### 23/10 WEATHERBOARD/MASONRY VENEER JUNCTION INTERNAL CORNER



### 15/12 BRICK VENEER WINDOW/DOOR HEAD

### 17/12 WINDOW JAMB - ALUMINIUM

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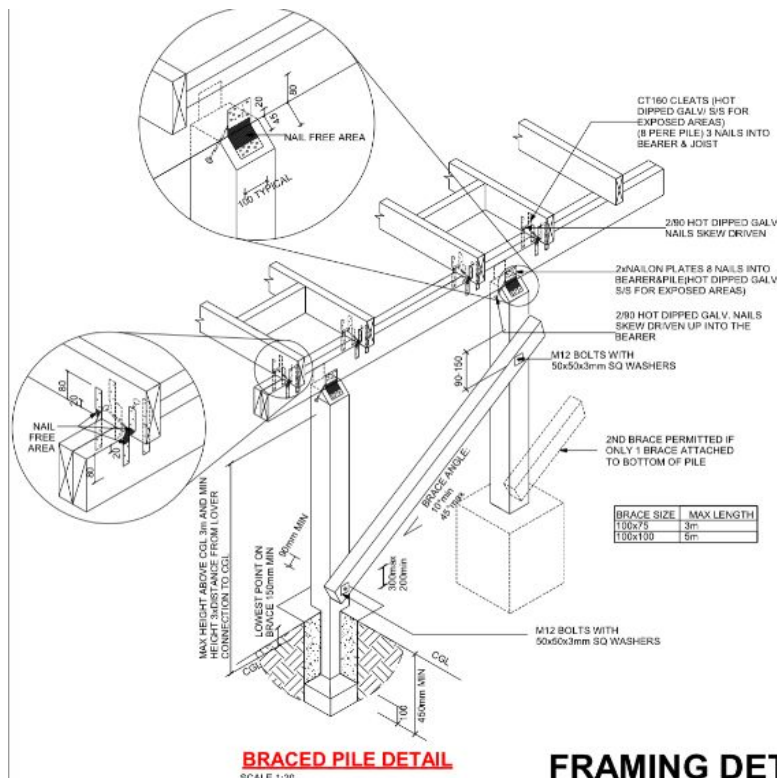
Once all the framing was finished and the roof on, the house was wrapped with watertight building paper as normal with window and door openings cut out and trimmed with Aluband flashing tape. Due to the complication of the two claddings, details had to be checked to ensure that we met the specs of each cladding both brick and weatherboard. Aluband was used on the external corners to provide a back flashing which was to be covered with a standard galvanized corner soaker fixed with 25mm soaker nails. Prior to cladding could begin a cavity inspection had to be performed by Auckland Council so all windows had to be installed and flashed prior to the inspection. Sill support bars were then fixed to the framing to support the window aluminum due to the large overhang in the brick cavity. Windows were fixed in place allowing 10mm of jamb to protrude inside the framing line for GIB, then fixed with 75mm jolts heads at 400mm centers with packing. Care was taken to ensure that packing was supplied under all window mullions and in behind hinges and striker plates on the exterior doors. We then cut and then fixed head flashings in place with clouts which were taped over with aluband. Where the cladding is brick 200mm DPC was used as a flashing to divert water away from the window and down the cavity. This was a detail that I had not yet seen as prior houses we did were mainly weatherboard cladding directly fixed. Following the completion of window flashings and building wrap they were inspected by the Auckland council and following a pass result we could begin cladding. For the brick cladding a new Monier brick had to be used as it would be too time-consuming to clean the old bricks and it was not crucial that we matched the size of the brick as the brickwork was to be plastered. We worked closely with the bricklayer to ensure that all flashing details were done and all lintels had the proper bearing surface. Following the completion of the bricklaying exterior plastering could begin, for this, we used a licensed exterior plasterer who used acrylic-based plasters due to their flexibility and durability. Once the plaster had been finished and sufficiently dry it was painted and the two cap flashings could be added for the intersection between weatherboard and brick. These were the first coloursteel flashings that I had done so I worked closely with John to ensure a fit for purpose result. Although a challenge, it was a really useful skill to learn and one that I continue to use. We used 180x18mm h3.1 bevel back weatherboards directly fixed for the front entry extension. set out was done for this with a story rod, then the boards were cut and primed ready to go. The boards were then fixed on with jolt head nails taking care to nail in the correct places and leave the ends un nailed so that soakers could be slipped under the boards later. Fixing the weatherboards was quite an enjoyable process as it provided a great transformation for a relatively small time investment. We ensured that all our flashings and cladding were done to the consented drawings specifications but also took care to double-check that we meet the standards laid out by E2/AS1. With the cladding and framing completed, Plumbers and Electricians were called in to pipe out and prewire.



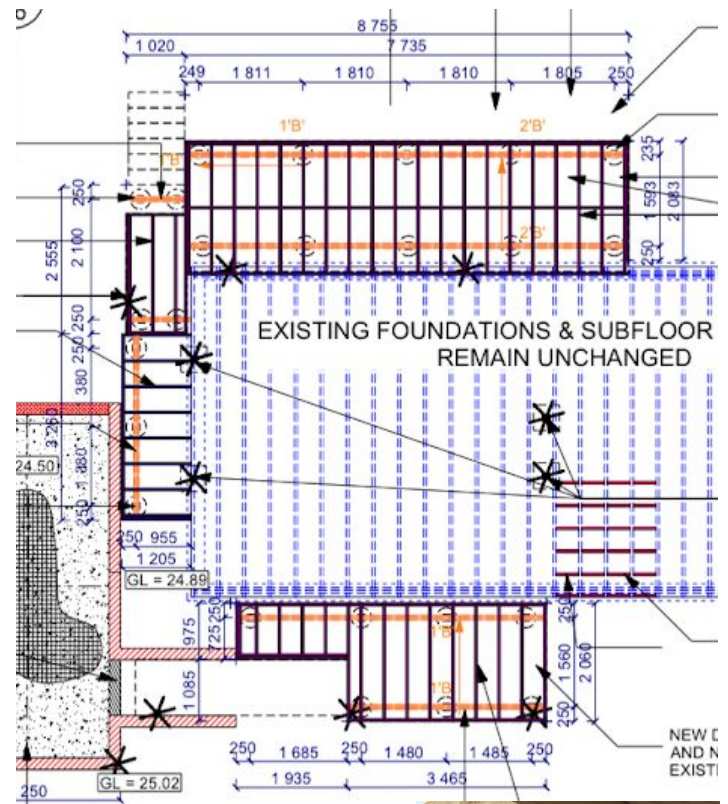


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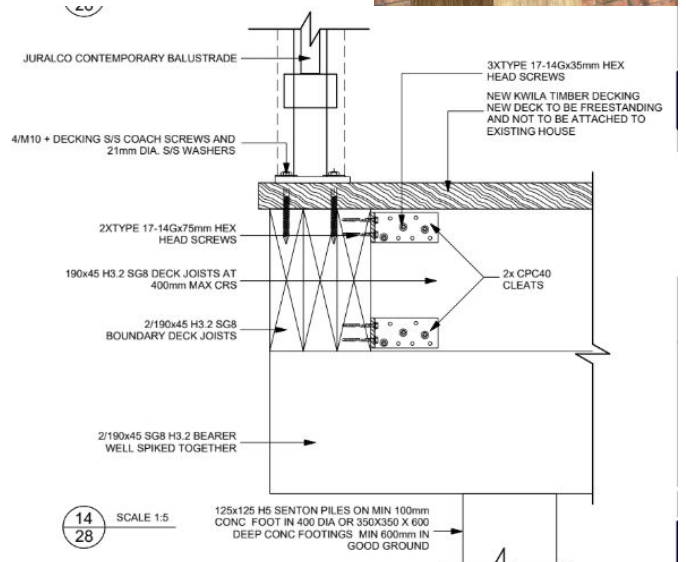
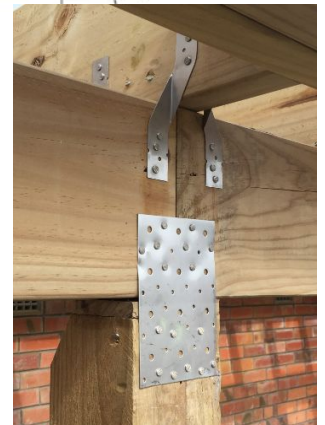
## Deck framing, laying, and handrail/louvretec:



## FRAMING DETAIL



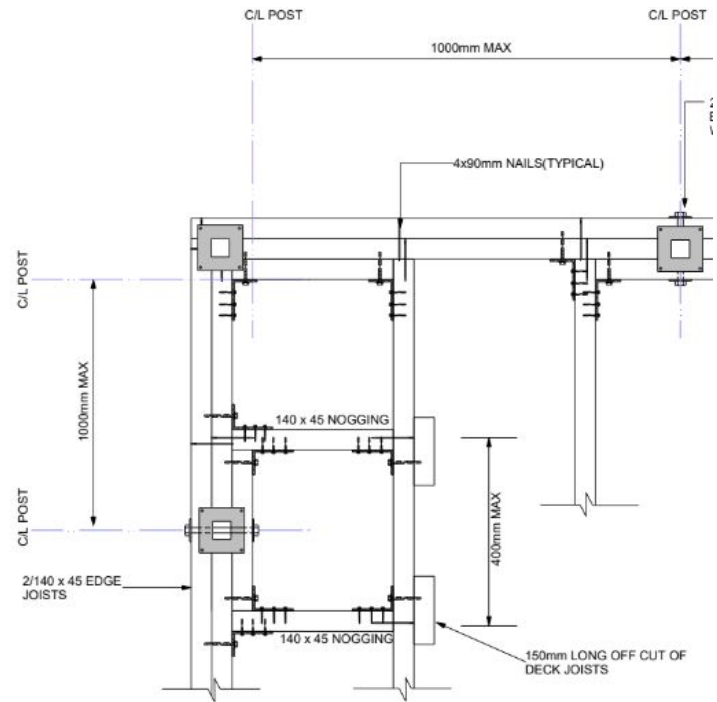
Towards the end of the build with the scaffolding removed, we began to work on the front and rear decks. Deck piles were marked at the front and rear of the house and drilled with the digger where accessible. 125x125mm H5 piles were then put in the holes and braced plumb with space-its on the bottom of the piles to allow for a 100mm punch pad. Prior to pouring, the piles had to be inspected by the Auckland Council as part of the foundation inspections. Piles were then poured as before pumping from the road with a line pump. After giving sufficient time to cure the bracing was removed and the piles were marked with a laser and string line to be cut to height. Following cutting the piles off with a skill saw, the 190x45mm sg8 H3.2 bearers could be added taking care to crown any bow up and ensure that the doubles were not misaligned when spiking together. This deck varied from some of those I had built before which had been attached to another structure therefore not requiring the bearer line close to the house but due to the brick construction this was not possible. After fixing the bearer on, the joists could be rolled and fixed, again with care taken to fix them with any bows up. Two extra joists had to be allowed on the ends of the deck to allow for a picture frame border around the deck. With all the joists rolled then the double 190x45mm boundary joist could be fixed to the ends of the joists. Due to the handrail and



## **Thomas O'Brien      Apprentice of the year 2020 project submission**

louvretec attachment above extra hardware was required and was done in accordance with both the consented drawings and Mitek details. This included a few braced piles which required two nailon plates, both front and rear to be fixed onto pile and bearer followed by four Stainless CT160 fixed from bearer to joist either side of the pile as drawn above. The Brace piles were then joined by 100x75mm RS H4 diagonal braces fixed with one m12x200mm Stainless Bolt at each end. The handrail post locations were then calculated and marked so that the extra blocking and hardware could be fixed. This consisted of two Stainless CPC40's, top and bottom of the joist and on each side, either side of the handrail post. The ends of the deck required nogging out perpendicular to the joists with extra CPC40's at the ends of the nogs as detailed to the right. After all the hardware and bracing had been fixed we could then

finally begin to lay the 90x19mm Kwila decking starting with the border. For the border, the same 90x18mm Kwila was used with the ends being mitered and chamfered at all corners and any ends that terminated at the house were kept 12mm off in accordance with E2/AS1. The deck was then laid five or six runs wide in each go, with the outer board being fully fixed to a string line and the boards in between then being spaced and gapped with hardwood wedges. A straightedge could then be used to mark nail lines to be drilled and then fixed. With the decking fixed then the louvretec and handrail could be then installed by sub-trades. Both the louvretec and handrail were powder-coated aluminum supplied by the sub-trades fitting them.





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## **Finishing lines and door hardware:**

Following the lining and stopping of the building by Global linings we moved back inside to complete the finishing work required. Prior to fixing the skirtings the floor was to be sanded, but before this could happen we had to patch various holes and remove any damaged boards. To do this I had machined some salvaged Rimu in my thicknesser and then the damaged boards on the floor were cut out with a multitool. The boards were then carefully fitted and nailed down to match the rest of the flooring. Sub trades then came in and sanded the floor and applied their flooring urethane. All the interior doors were then hung with their door stops being nailed on at the same time ready for the locksets. We then could cut the mortises for the locksets and test fit them prior to painting. On the wardrobe doors, a recessed door pull



was used and due to the number of doors I made a router template so that I could rout out the recesses quickly and accurately. Architrave and skirtings then followed. A 40x10mm single bevel architrave was used around all windows and doors with mitered corners and fixed with 16g finish nails in the typical fashion. In the tiled areas, we used a 40x20mm single bevel architrave so that after the walls were tiled there would be a 10mm reveal between the face of the architrave and face of the tile as there is between the face of the architrave and the GIB elsewhere. 60x10mm single bevel skirtings were then fixed on as standard with all internal corners being coped and external corners were glued and mitered. Tilers then began their work in the bathroom which included the Mapei waterproofing which had to be flooded and inspected by the Auckland Council. With the tiling done the Painters were then called in to finish the interior painting. Following this the kitchen was installed by sub-trades and the benchtops templated. While the kitchen was being fitted we began to refit the door hardware and any door stops. With the benchtops fitted, Plumbers and electricians were then called in to fit off.

## **Conclusion:**

I am very proud to say that I worked on this project due to the almost unrecognizable change that we made in updating the look of the building. I found this build challenged me and was such a great project to learn on due to the large range of skills needed and the quality of tradespeople that Pieter and Beacon construction uses. This renovation was a great learning platform for me to gain further knowledge and skills but also hone skills I had already attained. This project came out to a very high standard and upon handover, the client was very impressed with the quality and thoroughness of the work we had done. Our relationship with the client developed positively over the course of the build so much so that they commented that they would be happy to work with us on other projects in the future. It was a great satisfaction to meet the client's vision and expectations. I am hoping to have the opportunity to show the judges around this completed build so they can see the quality of the projects I have worked on.



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