

Apprentice of the year 2022

Project submission for Paulo Oliveira



23 Muritai Road – Milford





NORTH ELEVATION

636

Weavers BC v2



About me

I am a 28 year old Brazilian guy currently living in New Zealand since 2018. I came to this country to learn English and return to my hometown, but I ended up finding a new place to call home.

In Brazil, I used to work for the biggest opencast mining in the world where most of the material comes from overseas.

I am always keen to learn new things and at that time was a bit frustrating to receive a lot of people from different countries without understanding a single word in English. So I decided to do an exchange in New Zealand.

I arrived in New Zealand to learn English for a period of 5 months, but that time was not enough to be as fluent as I thought, so I decided to stay longer to learn more.

When you arrive in a country and you do not speak the language, normally you do the jobs that you do not need to talk with people. That is how I started my journey in construction.

A lot of things have happened since then and what started out as a need has turned into a passion for carpentry. Probably one of the best choices I have made.

How I became an apprentice

Within the construction industry I could have gone through different careers.

I have done a little plastering, painting and tiling. There are many options, but without a doubt the most interesting for me was carpentry. I used to help my dad on the farm building fences, seats, tables, a cowshed and other simple stuff. I confess that I did not imagine at that time that this would be my profession in the future.

TP Builders gave me the opportunity to be part of their team in August 2019. It was at TP that I saw the opportunity to learn how to be a builder in a proper way.

I did not want to be a professional without qualifications. I have dreams and I want to be a good professional, so I decided to start my apprenticeship on April 2020.

I cannot say that it has been easy. Learning everything in a new language is very challenging but I am very happy with my progress. I have learned a lot so far, especially having the opportunity to start one project from scratch.

Since I started, I have been working directly with Griff who is my foreman who has over 20 years' experience. I have learned a lot from him daily and currently Griff is able to entrust me with the post of second-in-command when he is absent.

TP Builders have been constructing top quality new homes and additions/alterations for over 30 years. TP has a passion for producing the highest quality architecturally designed residential homes. They pride themselves on their team of highly skilled and dedicated people.

Hearing from my leaders that I am progressing well and feel that they trust my work motivated me to participate in AOY 2022.



Muritai Rd project

In January of 2020 I had the opportunity to start the first new house as an apprentice. This project was one of the most important and satisfying that I have been involved in. Where I could be working from foundation to the completion. One of the best things was to feel the gratitude of the owners, Mathew and Brenda. There is nothing better than having a client satisfied about what we have built them.

This project was a highly specified and modern structural design. It is a 2-story house, the main living spaces (living room, kitchen, etc) and double garage on the lower level, while all bedrooms reside upstairs.

 \blacksquare 3 \bigcirc 4 \bigcirc 2 \boxdot 580 m² \bigcirc 348 m²

Timeline

End of 2019 previous house was demolished.

Earth Works

January 2020 started the excavations and preparation of the site.

The excavation works were staged to minimise the area of exposed terrain at any given time. The Muritai Rd site was dug 1 meter below ground level and recomposed with GAP40, 300mm thickness layers of compacted hardfill over WOVEN GEOTEXTILE up to 50mm below the piles to comply with Building code acceptable solution B1/As1.

The building platform was extended by 1 meter outside perimeter of foundation, as referred on Geotechnical Report.





Driven piles

Driven piles are a class of pile foundation that distributes the loads from the structure, including seismic forces, vertically through a depth of soil or to a deeper stratum layer. They are driven to a sufficient depth that the cumulative strength of the pile foundation is sufficient to resist this load. At the project we had 16 driven piles under the house for stabilising the ground near each pipe and 2 in each patio foundation totalling 20. Those under the house were 3.6m deep in the ground. A particular thing to consider was the existing SW LINE was removed from under the building line and moved aside by the boundary. Inspection Foundation (IFO) pass on 23-01-2020.





<u>Slab</u>

A reinforced concrete waffle floor slab was built in accordance with the engineer's design.

Waffle Slabs are a reinforced concrete footing and slab systems. Constructed on the ground, they consist of a perimeter footing (edge beam) and a series of narrow internal beams (strips footings) at 1.2m nominal centres running each way through the slab.

Once we had our ground level sorted, we were good to start our profiles and lines. Then get the slab boxing done with rebates for joinery and brick veneer, this was straight forward. After double checking our measurements and string lines were correct, we started the DPM THERMATHENE to stop any water ingress from below.

Most of the steel work was done on site, cages for footings where we used D16 with stirrups at 150mm centres.

To start laying the pods we made sure all the penetrations pipes were sealed properly and overlaps were done, then we could finish laying the pods and steel bars/chairs and mesh on top. Inspection for the concrete floor Slab (ISF) passed on 16-03-

. 2020.







Framing and steel work

End of April, we had our first frame stood up. To start the process our team had a brief meeting to discuss the plans and approach. At this stage I had an opportunity to make the call which was tell them which framing was to go where and in which order.

Afterwards, we set up a line, 100mm off set to double check our measurements to help set up our frames, all the frames come with HianDri Packers, it is the best way to keep our bottom plates dry and clean.

We stood up the frames using bugles to fix them together and braced the walls plum and straight, we had good progress and were able to finish the first floor on the same day. We used bugles in case we had to move or adjust them again.

With the floor plans we double checked all internal framing with running measurements making sure all of them were positioned correctly, then we stitched them together and fixed the nail plates at the top where the frames butt together.

My other duties at the time were to fix the bottom plates, I used Screw Bolt M10x140 Bowmac Blue Head with 50x50x3mm square washers.

Upper level, 09th of July we started standing the frames and once again I could contribute with more knowledge and confidence. We had a lot of steel work in our structure as ridge beam, columns, apex and base cleats. All steel was packed with timber at 600 centres, fixed with galvanized M12 bolts. Inspection Framing/Remedial (IFG) passed on 14-09-2020.

Rafters and roof

At this project we made all rafters on site, working with a roof pitch of 20 degrees we could establish most of our cuts before we started. Griff and I made a template to work with and had all the cuts precise and correct as we had an internal wall to support our rafters, on top of that wall we had a seat cut, on the ridge beam we had a plumb cut and on top of top plates we had level cuts.

As per the plan we worked with 190x90 H1.2 rafters at 900 max. spacings. Once we finished all rafters, we then we strung some lines with dodge blocks, we made sure all rafters were ready to start our connectors and fixings which were cpc40, cpc80, straps and tenscpc80, straps and tenscpc80, CTs, straps and roof bracing as per NZS3604:2011 as we were working in a high wind zone.

Afterwards, our next step was working out purlins and outriggers with a 600mm overhang, as we were working in a high wind zone, purling's were fixed with 2 nails and 1 blue screw.

Roofs, the project had a total area of 245m2 of roofing. We worked with Ecoply F8 tongue and groove 15mm thick, with a configuration of screws at 150mm around the perimeter and 150 at the centres. Blocking at the ridge on the flat with 25mm air gap for ventilation.

Main roof, we had Architectural Metalformers, Aluminium 38 standing seam roofing with COVERTEK 403 underlay.

Lower roof, TPO membrane on 17mm H3.2 plywood is one of my favourites parts to work with, it requires a minimum 2 degrees fall, with furring on framing with 400 nogs at 400 centres.

Once again, screws at 150mm around the perimeter, 200mm centres, 50mm from the corners and glued down with Gorilla Grip glue 1 hour cure, fasteners 50mm S/S screws. Inspection Framing/Remedial (IFG) pass on 14-09-2020

RAB Board

- Late September, Jaymie and I started the RAB board on the upper level, before we started we talked about the process and followed the specifications for 6mm RAB Board
- Excellent structural bracing,
- Suitable for use in EH wind zones
- Provides a drainage plane for cavity construction
- Pre sealed on the face and edges to resist moisture penetration
- Will not warp or shrink when exposed to the weather for up to 180 days
- Complies with B1, B2, E2 and C3.7 of NZBC
- BRANZ appraised
- Achieves 50-year durability
- Board warranty of 15 years

Working with RAB board fixed directly to the framing is straight forward, Jaymie and I had a good system at the time, that is marking and cut all the sheets, then we had a good run to complete the task in our timeframe.

Part of the process that is very important is to use the right product with the material that we were working with. To fix the RAB Board the spacing configuration was 200mm centres, minimum of 50mm horizontally and 75mm vertically from the sheet corners. Type of nails we used were 40 x 2.8mm s/s.

Afterwards we started our Flashing Tape (SUPER STICK) once again, we

finished the task in our timeline without any interference. We were working in a good manner to get all the taping done correctly for all openings, flashings, apron flashings, wrap over the top of the roof membrane and cavity closure.

On the lower level we were working with PRO CLIMA SOLITEX EXTASANA, an excellent product to work with and easy to install. One of the good ways to learn more about the product before we started work was to download the PDF or APP to have aside if we had doubts or questions. Application minimum of 150mm is required at vertical overlaps, bottom plates required ORCON to adhere the Solitex to rough adjoining structural components or mineral surfaces, penetrations were used ROFLEX to seal pipes, around openings Tescon EXTOSEAL required minimum 100mm allowing cover onto windows sill.

Inspection Cavity Wrap (ICA) pass 11-12-2020

Timber facing joinery heads / head flashings

All heads are 75x45 H3.1 profiled headcap with 15 degrees, with aluminium head flashing which were welded 45mm downturn at both ends before powder coating. Installation, heads were fixed with 100mm 10g S/S screws and Sika MS. Head flashings glued down with MS, s/s clouts and flashing tape required to fix UPVC Closer vent strip.

Barge/ Facia and Soffit

End of October, Griff and I started the facia and barge as per plan, 150x28mm pre-prime, thinking ahead I started to do a 10mm groove for my soffit's way before, at the time Griff and I already had worked out our measurements, spacings and cuts for our dummy rafters to cover all joints of the 12mm ECOPLY GROVEED soffits. Important thing to mention was to remember the 10mm VENTILATION GAP to Eaves protected with Insect mesh.

TITAN Boards

January 2021, Jaymie and I set up a timeline to complete the task of installing all cladding (TITAN Board) in 4 weeks, Jaymie thought "I don't think we can make it, but we will try". I agreed with him at the time, due to working conditions and heavy sheets, many cuts in only one sheet, few details to make sure we had measured right, only one shot to make it happen. The process that we stuck with was cut all sheets around windows and heads, and others with some details such as vents etc...Once we had done all the "hard" sheets the process became easier and simple, only part that did not change was the weight of each sheet. Application: TITAN Boards required cavity battens 45x20 H3.1 at 400centres MAX. pre-drill

DIA 5.5mm hole to use 65mm x 10G wood thread screw s/s. Once again, before we started to install the sheets, I downloaded the TITAN Exotec PDF to clarify any doubts or questions in our daily work.

Spacing configuration required minimum of 18mm of the sheet edge, 150mm around perimeter and 50mm from corners also all cuts we made we primed to resist moisture penetration.

Vertical sheet joints, battens 60x20 H3.1 at 400centres were required to finish the cladding, also frieze board to complete the details to carry on the next step of the building which was Dummy Rafters.

Dummy rafters

At that stage most of the last details were self-explanatory, Dummy Rafters are one of the easier parts of the jobs. As the plan was clear and easy to understand I had our dummy rafters at 800centres marked way before at soffit stage, so it made my life easier that day. Process of installation, make sure all my rafters were the same sizes and an important detail to remember was the 30mm showing under the facia and that the bottom cut of the dummy rafters were the same all way along the soffit. Afterwards, I cut all dummies and primed them. Next day I had all my fixings and glue ready and started to place them along without any issues. Between the Dummy Rafters we had other details important to make sure we had it right, ie 25mm SQ H3.1 moulding 10mm off the frieze board to keep a clear VENTILATION GAP.

PLY groove and Exposed Rafters (variation)

Exposed Rafters on 12mm Ply Groove without doubt was one of the best choices made at this project. Tony made the call with the Trinity Design team. The original plan was supposed to be rondo and a flat

celling. The result, with that variation, all upper level celling's had to be framed with celling battens at 600centres, we also had to think ahead so that our exposed rafters covered all sheet joints.

Materials used to form new celling, Douglas Fir and ECOPLY 12mm grooved ply.

Brick veneer and Lintels

Rebate to edge of slab for 70 series Brick veneer cladding with ROCKOTE masonry render system were laid in 2 phases to be inspected then afterwards we carried on with the last courses. Fixings that were used: 85mm EM TIES, screw fixed at 400centres.weepholes every third brick, 100x100 S/S Lintels above windows and garage door were 10mm short of opening each end, we used M12 to fix through the framing at 600centres. Around windows and doors, we had our super course flashing extended 200mm either side of opening.

Louvre canopy (variation)

The original plans showed 75x50 cedar framing and 100x25 cedar blades at 45degrees equally spaced painted finished. We changed to LOUVRETEC aluminium framing powder coated Flexpod to match joinery.

Parapets

At this project we had big parapets to work with, 600mm wide with 5degrees fall. Architectural Metalformers made our Cap Flashings and saddles.

Minimum of 100mm of coverage on the bricks and 75mm internal sides. Saddles behind the cladding were required with a minimum of 50mm upstand. Fasteners that we used were 50mm clouts S/S.

Important thing to remember was once we got our saddle in place, 2 lines of sealant 6mm thick as per E2/AS1 to seal. All saddles and caps were powder coated.

Driveway / Longburn

At this stage we were almost able to see the final product, all the bits and pieces were coming along together and taking shape.

To form the driveway, we worked alongside AT to make sure we were following all standards required.

Boxing up the driveway and gardens was easy as we had the garage floor and existing footpath to make our falls, typically 3% fall (1 in 30) or 1 in 15 max.

Griff and I ran some strings lines and marked heights on our boxing between those points and formed the driveway. A 100mm min. GAP40 compacted basecourse, mesh as per AS/NZS 4671 and 150mm 25MPa concrete to form the driveway is standard. Longburn Pebble is one of New Zealand's favourite exposed aggregate concrete mixes and was the choice for our project.

Finishing lines / Blind boxes

April, all inside started to change completely, painters were about to finish and all finishing lines done, we worked with 90x10 SB clear for skirtings. All internal corners were false mitred and external were glued and mitred, were then fixed on as standard. Architraves followed 40x10 SB clears, were used around the windows and jambs.

Vanda Blinds, without doubt one of my favourite products to work with, it requires knowledge and a good set up to start with.

We need to have the blind box fixings done at framing stage. The process required I worked the heights out before rondo was installed to my fixings which lined up with my blind boxes. I used the laser to make sure all boxes were the same height.

Conclusion

Working on this project was fundamental to my personal and professional development. Having the opportunity to be able to start and finish an architectural project is a fantastic school for an apprentice. I have progressed significantly in my learning, and I certainly feel more confident moving forward. We met our customer's expectations and delivered a beautiful house, with high quality materials and within the planned deadline, even with the logistical situation that impacted receipt of materials throughout the country due to COVID restrictions. Our team managed to think ahead and streamline as many processes as possible.

I feel very proud about the result and knowing that I was part of the 18 months of hard work and good times. Behind every house built there is sweat, determination, commitment, the new people who we met and finally who we become after all the learning. A builder often does not live in the house he builds, but always leaves a bit of him in each project. I hope to have the opportunity to present this project to the judges and show the final result and the level of quality it offers.