Project: 19 Kingsley Street, Westmere.
March 2023 - September 2023

History

No.19 Kingsley Street (the “Project”) has been in the family since 1914, when the current owner's grandparents first bought this home in Westmere, Auckland. This villa is one of five similar houses in a row, which were the first state houses to be built in New Zealand. They were built under the Workers’ Dwelling Act. The Heritage Act 2014 and the Historic Places Act 1993 protect the home. These Acts are to preserve and protect the cultural and historical heritage of New Zealand.

Verna Smith, the current owner, is updating this multigenerational family home, ready to live in herself when she retires. Verna has lived in Wellington as a University Professor for the last ten years, and the tenants have temporarily moved out while the building work is happening. They are very excited to be moving back into a newly renovated home.

Scope

The Project involved an addition to the rear of the house and a new deck area. A new kitchen was added along with a remodelled interior, the existing bathroom layout was altered, and an ensuite added. We also added Insulation in the walls and floors with the new internal linings,—and a new True Oak corrugate roof. The old chimney has been demolished to create an open-plan area inside, and a replica chimney has been added in its place above the roof. The exterior view of the house from the street had to remain the same to preserve the area's cultural heritage, hence the need for the replica chimney.

Some considerations that had to be taken into account before the project started were to save the plum tree in the back garden, not to damage the roses Verna’s grandma planted in the front yard, and an active building site next door. This could alter certain tasks outside, such as painting, if next door were making dust.

Job Role

This job began near the end of my apprenticeship, so I was given more insight and involvement in the running and organising of the build. I communicated with subcontractors and our Faulkner office, observed the schedule, and ensured we kept up with it. These different forms of involvement prepared me to cover Ben, my foreman, while he was on leave for four weeks.

This leadership role also allowed me to gain more knowledge about the project management side of a building site. Our company uses a software program called Procore in which timesheets are completed, drawings uploaded, Requests for Information (RFIs) logged, programme, etc. If a problem occurred in the drawings or specifications, I would create an RFI and pass it on to the correct party required. Another feature I took part in was checking the timesheets of the workers on site were logged under the correct cost code and with the right amount of hours.

Demolition/Set Out

Demolition began in the middle of March. Demolition at this time consisted of the internal tongue and groove linings, existing internal doors, and all rimu finishing trims to be reused later in the project. The rear wall of the existing dining and kitchen was removed for the new extension, including removing the existing chimney safely from a mobile scaffold. Old windows, external doors, and weatherboards were sold to a recycling business for reuse, while the Rimu and Kauri framing timber not needed were donated to the Beautification Trust.

After most of the demolition was completed, the initial set-out started. Profiles were erected to run boundary string lines for the new extension. The first line was taken from the longest run of the existing house along the master bedroom side, and then other offset lines were squared and paralleled from there. We set up the house's perimeter along with the decks' outside edge.

The datum height for the profiles was taken from the existing hallway floor level. A few walls in the existing house were out of parallel and square with the new lines we set up. However, some would be removed, and the old walls that intersected with the new were surprisingly good for square, for a 107-year-old building.

Piling

Excavations began for the pile holes. The correct hole size and depth were drilled following the plans and NZS3604, for the three different pile types (ordinary, anchor, and brace). I measured the piles from the bottom of the hole to a laser level set up at the bottom of the bearer height and ordered what was required. All the 125x125mm H5 piles were set up 100mm off the bottom of the hole and nailed to a timber straight with the building line along the ground. Braces were then nailed to support the pile plumb and straight until after the concrete pour. The pergola posts were set up later in their 1400mm deep hole as the 135x135mm H5 Prolam posts had yet to arrive on site. I did the concrete measure for both concrete pours. A surveyor was also brought in before the piles were concreted to ensure that the new building line was not within a metre of the boundary (otherwise, the house would need a firewall to prevent a fire from spreading across the boundary).

Subfloor/ Deck Frame

After all the piles had been poured and the temporary bracing removed, I was able to cut the tops of the posts off to the correct level, along with the scarf cuts on the posts. The scarf cut allows water to run off, making it easier for a nail plate for the brace and anchor piles. Different-sized framing members were in the subfloor and the deck, which required the posts to be cut at different heights. All the 2/140x45mm H1.2 and 2/190x45mm H3.2 bearers were nailed to the posts with skew stainless steel 90mm nails. All the joists were then marked out at the specified centres, as shown on the plans at 400mm centres and fixed in place along with the solid perimeter blocking to create a double boundary for lateral stability. The plans specified a double boundary joist, but this would then require joist hangers, which would be extra stainless steel fixings not necessarily needed. I suggested landing the joist half on the 90mm wide bearer and nog between to form a double boundary, and this is how we proceeded.

There were 19 brace piles, one anchor pile requiring 12kN pile fixing kits, and the brace piles needing the braces installed following the NZS3604 detail, Figure 6.6 (Brace Connected to Pile).

All the remaining ordinary piles had two SS wire dog bearer-to-post connections and 2xM12 SS 250mm engineer bolts connecting the pergola post to the bearer and joist. Five 400x400x600mm holes with 125x125mm H5 posts were added under the existing structure to take new point loads. Temporary plywood was used to make a safe work platform until the Matai flooring could take place.

Wall Framing

Before building the exterior wall frames, we had to establish the stud height. Working down from the existing roof and following the details and roof plan, we determined the wall height by calculating the roof angle over the total run and removing the specified framing members. All the frames were built on-site as the scale and timeframe of the job did not allow prenail, and we would have had to wait too long after the site measure.
Top and bottom plates were cut and marked out following plans and NZS3604 with the stud spacing required for the stud height and wind zone (medium). Studs at 400mm centres for the raking wall and 600mm centres for the level wall as the stud was under 2.7m. All frames were built with 90x45mm H1.2 SG8 RAD. Studs, trimming studs, lintels, and nogs were pre-cut for easier and more efficient assembly. The frames were made, stood and plumbed. Using string lines along the bottom and top plates to ensure they were nailed and braced straight. I built all the internal walls after the roof framing had been completed.

Many of the walls were GS1 or GS2, so we had to ensure that the bottom plate had been fixed correctly (3/90x3.15mm power-driven nails at 600mm centres). The lintel fixing Types E and F were rebated flush with the frame, and the required hold-downs were installed. After the first framing inspection, the inspector picked up the top plate to stud connection that wasn't shown as needed. The architect had provided no detail, so we followed the MiTek guide; we installed fixing Type B as the loaded dimension was over 2.5m for a medium wind zone with a light roof. The alternative to Type B is A, 2x90mmx3.15mm nails with a 0.7kN rating, while B is 4.7kN.

The internal linings from the existing house had been removed to allow for new insulation and plasterboard. The walls originally had scrim and matching, meaning some had to be removed for the new insulation in the wall cavity. Four 200mm matching boards were removed on every external wall to allow sufficient room for the insulation to be installed. There was no need to spend hours straightening walls, and the new plasterboard could be fixed straight over, saving time and materials.

The engineers wanted some new bracing elements in the older areas. The new plans included four EP1 braces and some GS1s and GS2s. Due to the lack of bottom plates in the old framing, we followed a detail in the GIB site guide that the engineer provided to connect the top and bottom plate nogs with a GIBFix angle. The plans specified 12mm plywood for the EP1s, which meant packing the studs 7mm after the 19mm matching had been removed to fit the brace. I suggested using 19mm structural plywood to eliminate the extra packing and using nails three times the sheet thickness as per specifications. The engineer was happy to proceed this way. Nogs at 800mm centres were also added to stiffen and support the existing Rimu studs.

Posts and Beams

Before the roof framing could begin, a 2/240x45mm HySpan and 2/190x45mm Flitch beam with a 12mm plate was installed. These needed to be done first as they were the supporting structures for the roof rafters. Both these beams were connected to a 5.4m 100x9 mm SHS steel post, which would support the replica chimney framing above. One end of the HySpan and flitch beam were fixed with straps and bolts on double studs, with the load transferred down to the foundations below. The engineer provided details for some connections, but I had to contact the engineer directly for information that needed to be included. This was due to a mistake in the plans on the heights of the beams. The flitch beam had to drop 500mm; otherwise, it would protrude through the lean-to roof. This meant that a jack frame needed to be built on the flitch beam to continue the line of the roof rafters, therefore needing connections for the rafters to jack frame and frame to flitch beam.

A scaffold was erected around the rear of the house to provide a safe working platform and around the perimeter of the existing house at the spouting level for edge protection.

Roof Framing

As the supporting structures were in, the roof framing was able to begin. The 5-degree skillion roof was framed with 190x45mm H1.2 SG8 timber. I precut all the roof rafters after finding the seat and plumb cuts. The rafters at 600mm centres were installed with two skew nails and two wire dogs into the double top plate to provide the required Kn rating for the wind zone. I also formed the hip rafter and the returning smaller lean-to-roof rafters. Solid blocking nogs were nailed at the end of the rafters on top of the top plate, and all the extra required fixing for the roof, including the roof strap brace.

I marked out and fixed all the purlins following the roofer's details and the roofing material specifications with one blue screw per rafter following the MiTek guide.
Double 70x45mm SG8 purlins were fixed at the top and bottom of the roof for fixing the eave and apron flashings, 600mm from there to the next purlin, then spaced evenly between but no more than 900mm. Vented battens were nailed to the purlins to allow extra airflow through the roof cavity, so roofing mesh and underlay would be installed on top. Proper airflow through a skillion roof is critical as it reduces condensation and moisture and the ability to form mould on the ceiling.

The pergola roof framing had to be completed simultaneously as the roofers wanted to install both the True Oak corrugate roof for the house and the polycarbonate roofing, meaning the pergola roof framing had to be done. A few top weatherboards and fascia were done before the 140x45mm H3.2 stringer could be bolted near the top of the external wall. The roof rafters were set level to the stringer and RB6 (3/140x45mm H3.2), which was bolted to the posts. The rafters were level as they needed to carry the soffit battens. At the same time, the pergola purlins above were tapered from 240mm at its highest point to flush with the roof's edge, providing a 5-degree fall for the polycarbonate roofing. The purlin rippings were CPC'ed to the rafters. All external fixings had to be SS minimum 304 grade as the site is in exposure zone D (sea spray). At this time, the spouting had to be installed above the pergola roof frame before the roof cladding as a ridge flashing lapped into the gutter. This was because the pergola purlin was higher than the bottom of the new house roof.

Heavy-duty tarpaulins were laid over the existing and new roof framing to give shelter and protect the flooring below until the new roof cladding was installed.

Cladding/Windows

The cladding for this extension was bevel-back H3.1 pine weatherboards with an effective cover of 148mm to match the existing old weatherboards. The cladding was direct fixed as the dwelling was low risk following Tables 2 and 3 on E2/AS1 and as specified on the plans. The building was wrapped in Thermakraft Watergate Plus, window and door openings were tapped, sill trays installed, internal and external corner flashings were nailed, and I made a couple of storey rods to ensure accuracy when installing. Datum marks were lasered around the building to ensure the weatherboards were level. We got the all-clear from an inspector to clad up to head flashing as they had to sight them before being covered.

I installed three casement windows and two double-hung windows as a single unit, and the horn had to be scribed to the weatherboard.
I first marked where the sill would finish on the weatherboard with the jamb sitting 10mm inside the frame for GIB lining, then cut the scribed sill to fit neatly into the weatherboard.

The timber windows were then installed plumb and level on 6mm packers under the requirements of E2/AS1 with 2/75mm galv jolt headnails 100mm from corners and 400mm centres. The 6mm packer gap was not sealed as it allows water and condensation to drain.

The two double-hung windows as a single unit were fixed to the frame through the facing nailed to the jamb and the pocket for the sash weights. The remaining facings and scribers were cut and nailed to make the building watertight. Following the BRANZ Direct Fix Window Installation guide, a 50mm sealant bead was applied on the edge of the head flashing under the weatherboard to prevent water driving in behind the cladding on the edge of the flashing, replacing the end cap on the head flashing in cavity system. Pef rod and expanding foam were placed between the window frame and wrapped opening to stop any draughts that could carry water into the building.

Chimney

Since the house is protected under the Heritage Act 2014, and the existing chimney needed to be removed to create space within the home, a replica chimney was needed to take its place. This delayed our resource consent from the Auckland Council by a couple of weeks as they verified that the chimney's design would achieve the Heritage Acts' purpose.

The details specified a 360mm square frame built from 140mm and 90x45mm H1.2 timber bolted to the 100x9 mm SHS steel post at 400mm centres protruding from the roof. The frame was lined with plywood and Thermakraft Watergate underlay. As the original chimney was plastered, a StoStucco Render System was used over the Lath. An Accumen shape terraced brick chimney top with a pot above was produced off-site to finish the replica chimney.

Plasterboard

I was in charge of the GIB measure for the plasterboard.
First, I read the plans and marked all the brace walls and wet areas to ensure the correct sheets were ordered. I also looked at the sheet sizes on the GIB site guide for the correct wall lengths to provide less installation wastage. I read the site guide to ensure the product was installed to the manufacturer's specifications. A problem we ran into was that the GS2 wall screws could not go to the top plate because the ceiling was framed lower in one of the rooms. However, looking at the GIB guide, a 90x45mm ribbon plate could be double nailed to the studs, above the ceiling linings to act as fixing, and above a row of wall nogs for wall GIB fixing.

Interior Doors

Two existing internal doors remained in place throughout the build, and two were reinstated in different locations. I installed an old stained timber door from the hallway to the altered bathroom. This was difficult as the door and the existing wall both had a slight twist. After pre-packing the framing, I first nailed the hinge jamb and ensured it was plumb. I then altered the bottom of the opposing jamb so the head would sit level. The remaining packers were installed once everything was level and plumb and the door jambs nailed off. There was a little fiddling around with the jambs, but it was satisfying when the door shut flush with a tidy 3mm clearance around the door leaf.

Finishing Lines

After the post-line inspection, we installed tongue and groove linings in the kitchen/dining area as they were over the bracing element walls. We had salvaged many of the existing boards by carefully prying them off the wall without splitting the tongue or face during the demolition, as we knew the client wanted to reuse them for a few feature walls. The 150mm TG&V boards were glued and nailed to the nogs vertically up to the splashback height above the kitchen bench, then ran horizontally to the ceiling, separated by a dado. I measured the required new scotia, skirting, architrave, dado and picture rails for the job. I also had to provide our QS with a profile drawing of the existing lines to try and match as best as possible. Once the new flooring was installed, we could finish the remaining skirting and architraves, along with the old rimu finishing lines (which were salvaged earlier), to be reinstated.

The rimu lines had to be carefully pry-barred without damage as they were original from when the house was first built. Some had to be installed before the plasterboard to match the existing detail where the GIB was met flush with the bottom of the scotia or top of the skirting, finished with an arch bead, and GIB stopped. The plasterboard was finished in specific areas like this because this detail was in the existing archway, and the client wanted to keep it the same. Also, the existing jamb thickness was to suit the original scrim and wallpaper, so we would have had to replace the jambs on doors and windows to allow for GIB.

Outside Works

Bench Seat

I framed the bench seat on one side of the deck. This required me to study the plans and details, follow the MiTek guide and F4 Safety from Falling. Complying with Figure 6 of F4, the seat could be at most 500mm, and the back rest must be at least 760mm when the fall is over a metre, and it must provide climbing difficulty for a small child. Structural posts were bolted to the deck joists with studs between them as decking would run down the outside. I then figured out the ripping for which the backrest would be most comfortable while creating the best layout for the 140x18mm Kwila decking boards and complying with the building code. The kwila decking would line the entire bench seat frame and backrest with 10G x 63mm 304 SS screws. The decking boards would also cover the 9x3m deck and the exterior stairs.

Pergola Battens

H3.1 65x18 PP dressed mouldings were nailed to the underside of the pergola rafters to allow the unwanted sight of the polycarbonate roofing above while still letting some sunlight through. I created a story rod as the battens had 20mm gaps, and a few offset lines were chalked to ensure the battens stayed parallel to the weatherboards and posts. The architect and client wanted to continue the battens to the deck to create a privacy screen from the neighbour's outdoor living area. An H3.2 90x45mm SG8 timber frame was built to provide the relevant fixing and stability for the screen, as it also acted as a safety barrier. The mouldings were mitred, glued at the top, and nailed to the framing.

Stairs

The exterior stair design changed because the plum tree the client wanted to save would have to be cut down if it remained the same. A proposed landing was built out from the deck with stairs turned 90 degrees. Once the new landing was built, I had the task of framing the stairs.

I first figured out the total rise of 1436mm from the deck to the area where the stairs were set to land on the sloped ground. The total was 179.5mm for eight risers with the treads at 288mm (2/140x19mm with 4mm gaps), both complying with D1/AS1 Access Routes. The treads had a nosing (tread projection) of 20mm. Common staircases have a maximum of 190mm rise and a minimum tread of 280mm. Clamping a straight offcut of timber to my framing square on the correct rise and run, I marked out the sawtooth stringer on the H3.2 290x45mm.

I cut the first stringer and checked to ensure it was accurate and sitting at the correct angle, then traced the stringer to create four more. Another 290x45mm H3.2 was laminated to the outside of the sawtooth stringer to close the deck off and the gap under the bottom rail of the balustrade. Without it, there would have been a diameter larger than 150mm on the stairs, not complying with Clause F4, which states that no sphere larger than 150mm diameter can pass under the barrier. My solution, the outside 290mm, allowed the bottom rail of the raking balustrade on the stairs to be raised to the same height as the bottom rail on the level balustrade while still achieving the Building Code. Nogs were added to stabilise the outside stringer, which the balustrade would be bolted.

Balustrade

I was also in charge of building the balustrade. The first task was to mark out the posts between the pergola posts and bolting them to the deck framing. Following the MiTek face fixed baluster posts detail, the 88x88mm H5 laminated post could not be spaced greater than 1m centres. I determined that the baluster centres would become 118mm (76mm gaps) between the pergola posts. However, I ensured the same centres could work around the landing area and down the stairs. With the posts spaced two baluster centres further apart but no further than 1m, the entire balustrade would be the same. I also found an easier and faster way of creating the balustrade. We would make a premade panel by pinning and screwing a 10x42mm fillet to hold the 42x42mm H3.2 balusters at the correct centres between the structural posts. They could then be screwed to the bottom rail with the capping and then placed on top, which were both 88x42mm H3.1. This saved time compared to the nailing three jolt headnails per end of each baluster.

Inspections

Part of being more involved with running the site meant I could organise, book and run building inspections with Auckland Council. I organised the framing inspection to cover the subfloor to the roof framing. I ensured all the correct lintel connections and bracing hold-downs were in place. The correct fixings were done on the subfloor brace and anchor piles and the roof framing, such as roof strap braces and purlin screws for the wind zone. I ran another framing inspection, which passed along with getting the go-ahead to clad to head flashing height as the extension was wrapped and corners flashed.

I booked the pre-line inspection as the building was almost ready to be fully enclosed. Planning out the following days if the preline passed, I allowed one week for plasterboard and booked a post-line inspection simultaneously to keep the job progressing. I ran the post-line by showing the inspector all the brace walls (BL1s, GS1 and GS2s), that they were all done correctly, and that the right plasterboards were on the correct walls.

Reasons Why

- I had a more significant role in the job's running and project management. Calling subcontractors, keeping current with the schedule, and booking inspections. This experience will assist me in the near future when I begin to run my own projects.
- Learning about the history behind the house and what it meant to the client and her family. Taking care to preserve the uniqueness of the villa.
- Building the replica chimney to ensure the house's original character was kept the same under the Heritage Act while providing a comfortable living space below.
- I enjoyed the challenge of working on a very old villa built over 100 years ago. When a problem is faced, such as walls and floors not being straight, square or plumb and, finding different ways to fix it.
- Building the deck seat was challenging and exciting as I had to find a way to cut the most comfortable angle to sit while following the plans and complying with the Building Code. It was satisfying when I stood back and saw the end result.
- Finding and changing to an easier way of which we would typically build a balustrade to build more efficiently and improve the final look.
- Researching more in-depth into the building code. Looking at required details and information in building clauses (D1, E2/AS1, F4, H1), details in NZS3604 and GIB Site Guide. Also, reading and learning different manufacturer specifications ensured the products were installed correctly.

I, Jack Nevines, hereby declare that the information presented on this
form is correct. I confirm the project is all my own work and I have not been assisted in the preparation of these details. I also understand that failure to provide correct information may result in my disqualification

Signed by national finalist: Jack Nevines Date: 9/10/2023