MY PROJECT DETAILS

Name: Peter Ravn

Project: Park Lane Retirement Village

Client: xxxxxxxxxxxxxxxxx

Project manager:

xxxxxxxxxxxxxxx

Site Forman: xxxxxxxxxxxxx

Leading hands: xxxxxxxxxxxx

Date: 13 March 2017 – present

Company Profile

For the past two and a half years I have been employed by Armitage Williams Construction. I began my BCITO apprenticeship after a month of working as a labourer for Armitage Williams as they were eager to begin my training. We are a market leader in building construction in Christchurch, with over three decades of experience and expertise providing creative building solutions to a wide range of clientele. Today, the name Armitage Williams is synonymous with professionalism, dedication, and quality without compromise in all aspects of commercial, industrial, office, retail, aged care and community construction projects. The company employs over sixty full time staff, including six apprentices.

Working for a large firm has given me a wide range of work experience and the chance to learn from some very knowledgeable individuals, which has been a massive advantage to my professional development. Armitage Williams has been very supportive throughout my apprenticeship, in helping with the apprenticeship costs. Having a contact person inside the company moderating the apprentice's units before the BCITO produces higher quality apprentices.

Park Lane Project

Armitage Williams won the first stage of the new architecturally designed Park Lane four storied apartments. Located in the heart of Christchurch, Addington is an ideal area for this project with access to the central city and surrounding amenities. My involvement in this project saw myself become an integral part of the build, spending sixteen months on the job seeing it to near completion. Throughout my time on the job I have been involved in standing precast concrete panels, landing and fitting concrete flat slabs and boxing foundations. Many hours have been spent framing, using either 90x45 frames from Placemakers yard or fabricating our own using 140x45. This job has introduced me to materials I had never encountered before, which has been a big learning curve. For example, we were required to install 3000 lineal meters of Accoya, which meant adapting to new and different techniques. The internal fit out was designed to be low maintenance and sleek without compromising a homely feel for the residents. A strong Health and Safety standard has been implemented on this job, it has been at the forefront of our company in changing the perception of Health and Safety and creating a new culture for future builds.

Roles and Responsibilities

On this project my role has involved working closely with the Leading Hands, Paul and Pete, and other builders from Armitage Williams. My daily tasks largely revolve around assisting the carpenters in the everyday workings on site. I am also tasked with helping to run the weekly tool box talks and being actively involved in discussions. The tool box talks require all AW staff on site to be present, it is a chance for everyone to catch up on what will be happening on site in the following week. It also is an opportunity for problems to be brought up and resolved, keeping health and safety at the forefront of every discussion throughout the build. On top of this, I also complete a weekly Safety Audit as part of a new health and safety implementation to tighten up safety on site. Some of my other jobs include being involved in ordering materials, keeping track of forward workloads and maintaining a high level of building practice on site.

Challenges faced

Time frames

With the client wanting this project completed in an efficient time frame, we were under the pump from the start. There is currently a high demand for care suites and assisted living in Christchurch, so it was in our interest that the project be completed on time and without delay. A lot of time went in to pre-construction planning and signing off the drawings as soon as possible. This hugely benefited us because it meant we could have the associated parties working on manufacturing components such as the double-glazed windows, doors, and joinery, all of which would be required in the later stages of the build.

New products

In this project we worked closely with Xlam NZ Ltd, a manufacturer of cross laminated timber (CLT) panels. This product had not previously been used in such a high quantity in New Zealand. Although the benefits did outweigh the negative aspects, we did face a challenge in predicting how the material would behave in this climate. It was amazing to see such a large structure come together in only a few days. Another product challenge for us was the massive amount of Accoya cladding that was uses on our site. Once again, this product had not been used in such vast quantities in New

Zealand, being able to solve the splitting and warping on the go was a steep learning curve and frequently tested my skills as a carpenter.

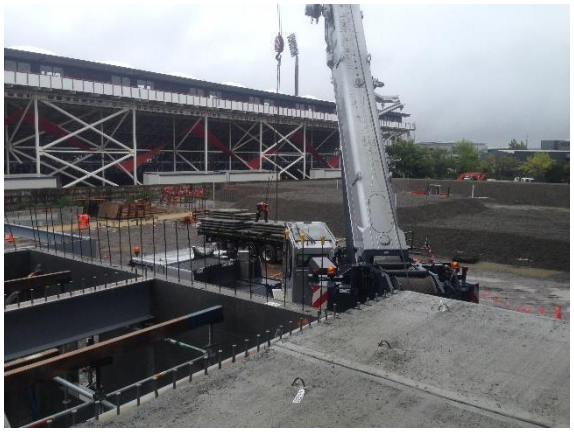
Cladding

The cladding system on this building was one of the most complicated pieces of work I have ever had to do. The system was process based, by doing large amounts of work chronologically meaning everything had a pre-designated place and breaking the order of construction wouldn't work. It was very closely managed by myself and Pete, thanks to his leadership the result was a high-quality finish.

Pre-cast panels

By the time I arrived on site, the ground work had already been completed. The 800m2 concrete pad had already been placed and the starter bars had been accurately located. We began setting out for the precast panels that were expected to arrive at any day. The panels were a special thermal design with a polystyrene interior, giving them an R rating of 1.8 and reducing overall weight. They came in at 350mm think, being one of the thickest panels I have ever worked with. We offset our lines from the set out, this is the most vital part of the preliminary as it ensures everything is straight and square. Once the panels arrived I was to help the contractors lift and place the panels by locating the starters into the dross packs. Every morning before the lifts we would go through the proper AW crane lifting procedures, which outlined the correct health and safety to use and to cordon off parts of the site to have restricted access. This part of the build was rather straight forward, placing and propping as we went and being mindful not to place any props onto visible parts of the panels or in the way of the steel skeleton. Once all the ground floor panels were places another contractor began erecting ther first-floor sub floor steel framing, two large K braces were installed in the ground floor dining area, this was to take most of the weight of the remaining floors. Following closely behind the steel, the scaffolders were constructing our false work to take the weight of the flat slabs which would be going on top as well as organising access to the first floor and our edge protection.

First floor prep



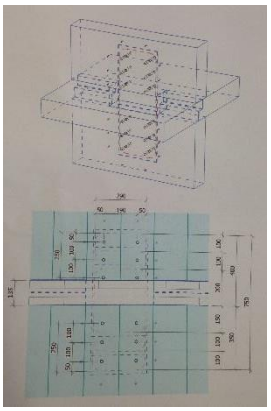
Once all the panels had been assembled and stood, and the sub floor steel had been installed it was time for the pre-cast floor slabs to be installed on the first floor. These were divided into sections following grid lines A through to H, starting from the scaffolded end out to the stadium. Before we could begin lifting with the 250-ton crane, we held a meeting outlining safe lifting techniques, exclusion zones, and correct placing methods. This also included setting up a rigging system and using a harness with fall restraints to navigate the panels into their correct places. Overall there were 68 flat slabs to be placed over three days which was completed without a problem. My role in this was to assist the landing of the flat slabs onto the steel and precast panels. This process involved setting long pieces of plastic down before the slabs were seated to make movement easier once they were disconnected from the crane. This also made sure we had a minimum of 80mm of seating on either

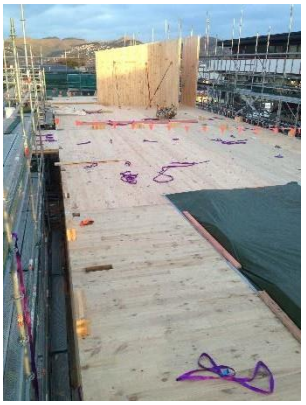
the steel or precast panel. Some were a tight fit, but we achieved the correct spacing as per the specifications. We also capped the starter bars as we were placing them as having a good health and safety practice in place is very important on this site and our trade.

After the flat slabs had been installed we moved onto boxing around the edge formwork of the first floor. This had to be done in two separate pours as the area was too large to be done in one, this allowed us to minimise wasted boxing by reusing the first set. The floor would be 150mm thick as per the engineer's specifications. We were unable to fix the boxing to the face of the panels as they would be finished and visible, to overcome this obstacle we used a series of 40mm by 40mm aluminium angles that were fixed to the top of the panels, then the ply was connected to the angle to hold it in place. We then tied the ply off to the reinforcing to keep it plum. Twelve penetrations were boxed into in the concrete for where the steel beams would connect with the sub floor mountings. After completing all our checks, we were ready to pour the first 60m3 concrete section, the subsequent section used mainly the same method and the work was carried out without a problem.

CLT

The next part of the job was to assemble the CLT panels. AW took a back seat to this while our certified subcontractor lifted and placed most of the wall panels and walls. It was very exciting to see such a large amount of timber being used on a commercial job, it was something I was not used to. Although this was a subcontracted job, I was able to jump in and help here and there. One of the more interesting parts of assembling the structure was the different ways in which anchors were used to connect adjacent panels. One of the methods that was applied to this build, as shown in the detail on the right, is the use of a large steel tongue penetrating through both panels, this together with 18mm folded-steel rods housed into twelve 18mm holes created enough compression to hold the panel in place. This process was drawn out due to unforeseen supply issues, it took over 3 months for all the panels to be delivered.





Here are a few picture of how the building looked during the time of construction, unfortunatly most of the surfaces have been covered up in the final design.

Frames

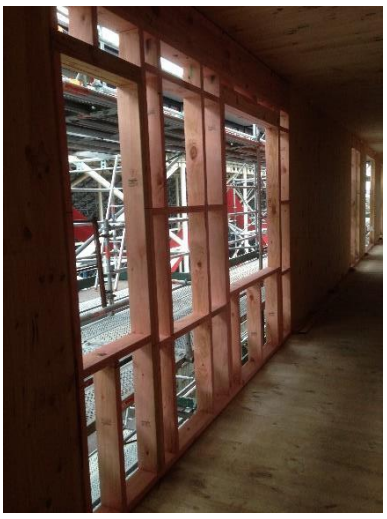
While the CLT was going up around us we also started the mammoth task of framing up the partition walls and windows. We received a delivery from the Placemakers frame yard consisting of the whole ground and first floor frames. We instantly got to work setting out, the transference of the grid lines to the pad was very important as that is what we would later use to set out all the frames from. Due to this being a high-spec building designed to have disabled and wheel chair access, it was critical that the measurements were spot on. Had we been under then there would have been problems gaining our code of compliance.

We began standing the Placemakers frames to make sure they were straight, plum, and square, bracing as we went. All the internal walls are constructed out of 90x45 H1.3 SG8, 2.4 stud with

600mm centre and in contrast to that all the exterior walls are 140x45 H1.3 SG8, 600 centres made to fit the cavities

Some frames needed to be constructed on site. We marked out where the walls were to go then got to work cutting. Assembling the frames wasn't too difficult and we were able to store them against the installed walls. To fix the frames together we used a 75mm ramset spitfire which allowed us to shoot down the frames, then came back later with a 12mm hold down bolt.

The exterior walls were constructed in-between the CLT installation, filling the cavity, and framing out for the windows. The frames were made up of 140x45 H1.3 SG8, 600mm centres and made to fit, they were stepped back 7mm from the CLT edge so that once the 7mm eco ply was attached, it would be flush with the exterior wall. We used 100mm teck screws to fix the 140x90 to the timber floor and timber sides, this was so if we needed to, we could move the wall. The exterior was clad with 7mm eco ply treated to H3.2 making sure the panted edge was always to the top. It was screwed down with 55mm stainless wood crews every 150mm centres around the edges and 300mm through the middle, I created a story rod to make it easier to make



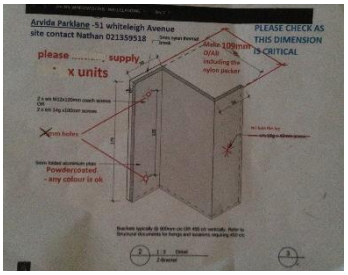
and screw.

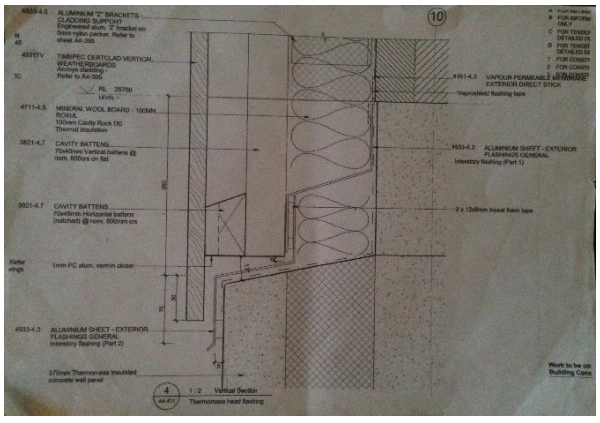
I installed the timber ceiling using 140x90 timber over 30m. On either side of the corridor the height was shot on with a laser and a large LVL beam was installed to would take all the joist, it was screwed off with_____spax screw. Forty-eight joists were installed at 600mm centres with stiffeners installed at 1200mm off the exterior wall. It was again clad with 7mm eco ply on one side as a bracing element, on the other side we built a walkway using cheap 12mm non-structural ply, giving access for subcontractors to install their services.

Cladding

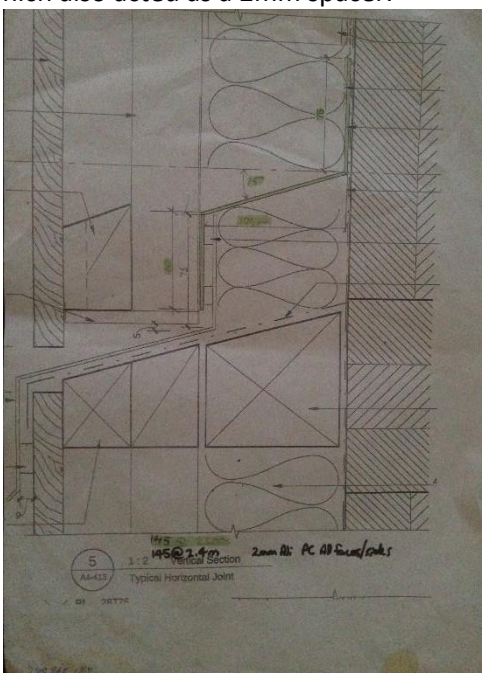
Test Panel

As this was such a complicated system the client requested that we make a mock up panel before attempting the actual cladding. A large 3m by 8m off-cut panel arrived from the XLam factory for us to practice on, a 1200x 1800 cavity was later cut from the centre to act as a window. The panel was propped up against the existing scaffold and tied off, then additional scaffold was erected around the front to provide access. This was by far the most confusing and complicated process I had faced in my apprenticeship so far. We began with the Z brackets, depicted in the diagram to the right, of which, the dimensions are 109mm to the front edge with the addition of a 5mm nylon packer between the bracket and the panel to prevent moister from reaching the timber. The brackets were set out at 600mm centres horizontally and 900mm centres vertically and fixed off with 75mm stainless teck timber screws. They were all set out from the interstory where the floors met, this was achieved by shooting on a 90x45 H3.1 with a 15-degree bevel at the correct height followed by a piece of 17mm H3.1 ply also with a 15-degree bevel, followed by another 90x45 and a 70x45 after that as shown on the drawing below, this was solid blocking to create a fire break. We were then able to build our way down to the below interstory. 70x45 H 3.1 timber was strapped onto the Z brackets vertically and fixed off with self-tapping 75mm stainless teck screws, we were then able to add the 100mm ROXUL insulating mineral wool board, which was cut and fit in between the Z brackets. A 70x45 H3.1 castellated batten was fixed to the 70x45 with 75mm, 8g stainless timber screws. After this point were able to start cladding with the Accoya, the dimensions of the board being 215mm by 25mm, they were all fixed off with rose head 75mm stainless nails through the face and a 45mm stainless clinch nail along the tongue which also acted as a 2mm spacer.





This drawing detail shows the flashing system over the first-floor concrete panels



This drawing detail shows the interstory flashing

This picture shows the interstory flashing system along with the solid blocking for fire resistance

The interstory timber fire break

Here is the overall look of the test panel, the application will be replicated onto the building in a few weeks

The window sits back from the front of the cladding, as you can see there is a capping installed on the corner then a returned piece of Accoya, all fitting around a sill flashing.

Application to the building

Starting on the first level over on the back wall we began the massive job of cladding. Each floor was roughly 50m long making this part of the job very material heavy. At the beginning we stated with setting out for the three stories then continuing with the 600 centres and expanding from there with the 900 vertical measurements. After that stage was over we replicated the same building techniques as on the test panel, the Z brackets were installed the ROXUL was placed and the 70x45 could be installed over that. Following the castellated batten, we were able to start cladding, we lasered in a line at 1060 onto the batten then marked every board the same, this was so we could keep a straight line on the bottom of our boards. Every morning we would cut around 30 boards and fit them in a day, making sure to pull lines ever 480mm on the boards and nailing them off. When it came to the windows we would have to cut our boards individually to suit, taking 25 mm plus the length of where the board landed, this was so we could add the corner moulding onto the sides once the sills were installed. This was a very lengthy process, taking around eight months to complete the building.





This set of pictures show how the cladding came together, starting from the back and working our way around to the front, this was a massive job and really tested my skills as a carpenter, but I think it was a very valuable experience considering it's a cladding system that is not yet common in New Zealand.


Conclusion

Nearing the end of this job, I was very satisfied with what has been accomplished with the help of my fellow contemporaries. Although it was very challenging at times, seeing a building standing where there was once an empty lot is extremely rewarding. This is why I enjoy my job so much. I have confidence in the fact that my employer is happy with the outcome and so is the client. Creating a positive working relationship with the client is something we strive to create. I am looking forward to showing the judges around this building and showing off my building knowledge, workmanship, and Health and safety principles to them.