

PP26 Middlemore Hospital Centre for Health Services



A view of the new hospital

Project: Middlemore Hospital Centre for Health Services
Innovation
Publication date: 2011
Client: Counties Manukau DHB
Architect: Jasmax Architects
Client Representative: Ncenter
Contractor: Arrow International
Region: Auckland
Sector: Health/Public Building
Final Contract Value: \$9m
Tender: Design & Build, GMP
Construction timescale: September 2010 to April 2011
Form of Contract: NZS 3915

In the 26th Pathfinder Project, we explore how off-site construction is being used to deliver a unique centre of excellence for the health sector for Counties Manukau DHB at Middlemore Hospital.

Background

This \$9m project is the vision of Counties Manukau District Health Board to create a centre of excellence for the health sector and to foster closer links and enhanced collaboration between the DHB, hospitals and universities. The new facility is a joint venture between the DHB, the School of Medicine, Manukau Institute of Technology and Auckland University of Technology. It is the first facility of its kind in New Zealand which has been developed as a centre for training and innovation to train and retain staff as well as recruit the next generation of healthcare professionals in New Zealand.

The facility has been designed by Jasmax to cater for different types of training that can be delivered in a variety of different formats. It has a large lecture theatre that can accommodate 230 people, individual and bespoke training rooms, PC laboratory, simulation rooms, meeting rooms, a library as well as a large open plan communal space for students to use.

Due to budget constraints this building is an interim option for the next 5 years and had to be designed and built as a temporary demountable structure. However, the client demanded a whole of life approach to accommodate a potential future change in functionality, from a training facility to an administration complex, at some point in the future. As a result, the building had to be built with the functionality for the current training need as well as the flexibility to become an office building.

Challenges Faced

The need for ECI when managing risk

Arrow successfully inputted into the methods of construction and buildability and they were also involved in pre-planning along with key specialist contractors prior to construction starting. This led to a significant amount of pre-planning and also resulted in the added benefit of information being provided very quickly to satisfy the consents process. However, a great deal of time was lost to the 2-stage design process. As a result, D&B projects of this nature require more Early Contractor Involvement (ECI) to get the design right first time and to eliminate the waste associated with the resulting re-design process.

Working relationships were excellent throughout the project and were critical to maintaining the integrity of the design and also when exploring alternative options when the project team were exploring opportunities to innovate on the project.

Importance of planning in offsite projects

Pre-planning is essential with any project, however, it is essential to enjoy the benefits of offsite manufactured projects. For this project, Arrow International was engaged after preliminary design had been completed. At this stage, the budget was insufficient to deliver on the original design resulting in the design needing to be re-visited and re-engineered whilst still meeting the client's original brief.



The process required more planning and critically engagement with the client and key stakeholders that were also involved in the project. To manage this ongoing relationship a single point of contact was created to act as a liaison point and to communicate and manage the stakeholders and their associated expectations. This resource enabled the project team to focus solely on the project delivery and meeting the tight timescales and budget.

Meeting the demountable building brief

After Arrow International was appointed to the project they worked with Jasmx and Carters to meet the design brief within the allocated budget. Arrow used their previous expertise of providing off-site manufactured solutions to alter the original design to move to a totally off-site manufactured solution with many features that are typically installed on site, such as glazing and insulation, were already incorporated into the prefabricated units.

Working closely with Carters via a pre-existing supply agreement, Arrow worked with the consulting engineer to create a solution that included prefabricated panels for the walls and floors with engineered joists. These panels were then bolted into place. During this process the project team also took key stakeholders to see other similar types of build to manage their expectations as to what the final building would look like. This included visits to other projects such as Albany High School, an award winning project that Arrow International had recently completed.

Successful Outcomes

Design & buildability options

From the outset, a whole of life approach and buildability were key requirements from the client. It was made clear to the design and construction team that this facility would be an interim option for the next few years with an overall master plan to change the functionality of the building as well as completely dismantling the structure to re-locate it elsewhere on the Middlemore Hospital campus. Also the project team had very short timescales from preliminary design through to the finished asset to be ready for the first intake of students in April 2011.

From initial design, the demountable modular system was an integral feature of the project and other similar structures at MIT and Albany High School were visited and explored by project team members and key stakeholders to understand the design & build process and manage expectations.

Experience from previous offsite manufactured projects

Arrow International was selected for their previous experience of delivering innovative solutions and for their previous track record of using off-site manufactured solutions. Prior to their selection the client and design team held an open dialogue and competition with five short listed contractors. They were ultimately selected for their combination of a solutions-led approach, previous experience of similar projects and competitive pricing.

Having the right team & the right attitudes

This was critical to the successful outcome of the project. From the outset, the project team was focused on delivering a solution for the client that met their original design and project brief. This has been successfully delivered with the project team members enjoying the benefits of a collaborative working approach that enabled the team to successfully overcome budget and programme constraints during the project. Having the right team, attitudes and behaviours in place is critical to utilising and delivering results through collaborative working principles on projects.

Key principles for repetition

- Use of early contractor involvement to enable meeting the project brief
- Role of planning with off-site projects
- Managing multiple key stakeholder relationships
- How continuity within the team is critical to success
- D&B can be used to deliver highly complex projects
- Be prepared to accelerate the decision making process and put mechanisms in place to manage this
- Utilise experience & expertise from previous projects

Key Lessons & Possible Improvements

Key lessons to take forward from this project have been identified as:

- **Plan, plan & plan again:** When using off-site manufactured solutions even more planning is required over a traditional build programme to consider the time to manufacture, on-site logistics and construction delivery. The learning from this project was that the build process could have been even quicker, however, there was recognition of the increased pressure that speeding the process up further can put on suppliers. For the client, there was potential on this project to have their facility available to use even quicker than was originally proposed and agreed with the project team.
- **Teams focused on delivering solutions & results:** Team working is essential on projects – getting the team focused, having the right processes in place and focusing on delivering solutions rather than creating barriers to successful project delivery is critical to the overall success of the project.

Summary of Benefits

Importance of planning in offsite projects

Pre-planning is essential to enjoy the benefits of offsite manufactured projects. This is essential to manage expectations, plan the programme and successful delivery.

Using ECI to manage risk

Early Contractor Involvement (ECI) was used to manage project risk and to get the design right first time and to eliminate the waste.

Experience from previous off-site projects

Previous experience of delivering innovative solutions and for their previous track record of using off-site manufactured solutions.

Continuity in the team

Strength in depth in key positions was critical to the success of the project as it progressed.

Early engagement of local and sporting communities

This engagement enabled the project team to manage stakeholder expectations as well as incorporating their requirements and views into the design of the centre.

- **D&B can work on complex projects:** Clients take note – D&B does work on complex projects. As long as you have the right processes in place and have developed a team ethic by engaging the supply chain partner early in the decision making process can deliver successful results.
- **Be prepared to accelerate the decision making process:** When faced with tight timescales and a bulging group of key stakeholders to manage expectations and keep happy, then be prepared to innovate and put mechanisms in place that enable the project team to get on with building and delivering the project whilst the stakeholder groups can be managed separately. This worked particularly well with this project where the client representative for the DHB managed this role on behalf of the project team.
- **More ECI to be used in future:** A key learning from this process is to involve the contractors earlier in the decision making process and during the design phase of the project. Utilising the experience and expertise of the construction team created the opportunity to develop the original designs and this could have been avoided if the principles of Early Contractor Involvement had been used on this project.



Conclusion

Tight timescales and budget constraints led to a challenging project that has focused the project team on delivering a revised design that meets the original client brief and utilises a hugely productive offsite manufactured solution. Pre-planning and previous experience of delivering similar solutions have been key aspects to the success of this project.

With tight timescales and buildability issues this project faced a number of challenges. The off-site manufactured solution has enabled the construction team to continue to deliver on programme in creating a truly state of the art facility to educate and train the next generation of healthcare professionals.

Off-site manufactured solutions are still in their infancy in New Zealand, however, this method of delivery clearly has its benefits enabling project teams to deliver highly complex building solutions in short timescales. It does come with its challenges for our sector – traditional ways of working have to be revisited when considering offsite manufacturing as a solution with more collaborative working practices required to drive the design and construction process.

Experience from this project showcases that with more early contractor involvement, even more pre-planning and advanced engagement of specialist contractors could result in buildings being built more productively, quicker, safer and to a higher standard of quality. Offsite manufacturing has much to offer our sector and now needs to be embraced.



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