

# concrete

VOLUME 60 ISSUE 1



**+** AWARDS SEASON UNDERWAY  
WITH CONCRETE<sup>3</sup> AND  
APPRENTICE OF THE YEAR  
AWARDS OPEN

**+** LEAVING A GOOD IMPRESSION  
WITH STATE-OF-THE-ART  
FLEXIBLE FORMLINERS FROM  
JACKSON INDUSTRIES

# UPFRONT

## THE UNINTENDED CONSEQUENCES OF PRO-WOOD GOVERNMENT PROCUREMENT



When a construction project is undertaken, the principals should be free to choose the most suitable building materials. Selection should be based on quality, cost, aesthetic and general fit-for-purpose credentials.

They should not be strongly persuaded to use a material that is not necessarily the best fit for the job. Yet this is exactly what the Labour Party's Forestry policy will do.

The policy states that there will be a shift in government procurement to a much stronger orientation towards building in wood. The policy includes requirements that:

- all government-funded project proposals for new buildings up to 10 storeys high shall require a build-in-wood option at the initial concept / request-for-proposals stage (with indicative sketches and price estimates)
- when [Government is] a tenant of the private sector, give preference to new buildings that are constructed out of wood.

While forestry plays an important role in helping to achieve New Zealand's emissions target, and wood can enhance our built environment, that does not mean wood is the best material for every construction project.

There will be unintended consequences of the pro-wood policy, and if implemented it would create instances where the Government's building programme (including KiwiBuild) is disadvantaged by excluding safer, more cost efficient, and more durable material options.

Furthermore, the policy would create a commercial advantage for one construction material over others.

Materials should be selected on their own merits. This is in the public interest. It is entirely wrong to mandate that construction decision makers must consider wood as a structural option. Such arbitrary preferential treatment of one industry over another will lead to perverse outcomes.

There are many examples of the fire risk posed by multi-storey timber construction. Having to rely solely on sprinkler systems to provide fire safety rather than on both the inherent fire-resistant qualities of construction materials such as concrete and sprinklers, puts lives at risk.

We are still grappling with the aftermath of the leaky building crisis and currently spending millions of dollars repairing damaged homes, schools and apartment buildings.

Building environment rating tools, such as Green Star, have gained acceptance over recent years, and offer an objective assessment of the benefits of construction materials.

In addition, the policy does a huge dis-service to the hardworking men and women in the cement and concrete industries. Favouring a single construction material during the design phase of a government building could seriously impact on their livelihoods and jobs.

Resilient infrastructure and housing are central to ensuring the economic success and welfare of all New Zealanders. Builders, architects, engineers, planners and their clients should not feel constrained when choosing the best building material for a construction project.

With construction activity forecast to remain buoyant, the Government must not play favourites. It should operate in the public interest and ensure that the safety, cost and long-term sustainability of New Zealand's buildings and infrastructure under-pin decision making.

*Rob Gaimster*

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*concrete* is published quarterly by  
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ISSN: 1174-8540

ISSN: 1174-9374 (online)

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**concretenz**  
BUILDING RESILIENCE



# FORMLINER DEVELOPMENT AIDS JACKSON BOOM

**JACKSON INDUSTRIES' RECENT EVOLUTION TO MANUFACTURING FLEXIBLE FORMLINERS WHICH PROVIDE A DECORATIVE FINISH TO CONCRETE FORMS HAS COINCIDED WITH THE ONEHUNGA-HEADQUARTERED BUSINESS UNDERGOING AN UNPRECEDENTED GROWTH PERIOD.**

Established in 1977, the firm's traditional focus was on manufacturing its Lifeguard brand of temporary site power products out of fibreglass. However, in recent years, the mould-making capabilities of its composites department was ramped up to establish a new business line for the firm, explains Jackson Industries project manager Kirk Ricketts.

"Our first foray was indeed a leap into the relatively unknown, purely from the finished material perspective -- however, the process is the same in terms of mould creation."

"Last year we cast something in the order of eight to ten tonnes of our flexible formliner material for various projects, including the new Samoan Parliament building.

"Our material can achieve an excellent finish, cater for large-sized panels and repeat castings. In best-case scenarios it will achieve 100-plus uses.

"The formliner's flexibility greatly reduces the chance of panels chipping when stripped. In fact, for the most part, our formliners can be rolled up and stored away if required."

Mr Ricketts says the business has "grown significantly" over the past four years.

"The company currently has approximately 60 staff spread over six different departments -- electrical, hire and service, precision machining, composites, polymers and architectural formworks.

"Jackson employs two full-time chemists as part of our composites and materials expansion programme. Our precision machining department has acquired three new CNC (computer numerical control) machines and we are looking to upgrade others.

Although the firm has established itself as a key supplier of formliners in New Zealand -- and is understood to be the

only supplier with over-size capabilities -- Kirk nonetheless emphasises that other solutions are deployed as required.

"In the case of the Otahuhu train station, machined form-ply was the obvious choice for the limited number of castings. For the 'spider web' structural façade in Nugent Street, machined poly pods clad in rigid sheeting material was the solution. A recent project in Wellington leaned itself to the use of large fibreglass moulds due to the depth of the profile and it being an upright, in-situ casting application.

"We approach every project differently and all aspects from design to materials play in eventual success. In many situations, the way we design our formwork or formliners is as important as the materials used themselves."

In regards new developments, Kirk says Jackson Industries has been continuing to develop an alkaline-resistant variety of its Caro-C tooling material for direct-to-concrete mould manufacture.

"Whilst this is a rigid material it can be a cost-effective way to achieve an excellent finish for certain applications. The recent University of Canterbury logo panel is a good example of this.

"We now have a variety of this material that we know can achieve 50-plus castings with no surface degradation and are currently working towards a light-weight version.

"Jackson Industries always strives to lead the way, and our use of unique materials and job-specific design methods helps us to support our many customers.

"Expectations are always high and there are many examples of badly-executed concrete moulding. However, this doesn't have to be the case, as with the right dialogue and design / material expertise, excellent results can be achieved."



### Project Profile 1

#### CET WILDBASE

When Central Energy Trust Wildbase Recovery Centre was being planned, Aaron Phillips, senior property and parks planner for Palmerston North City Council, was apprehensive about the long precast wall which would be running through the Victoria Esplanade along the Manawatu River. It was of utmost concern that they

should avoid building a structure that could compromise the city's premier green space.

Instead, using a combination of leading-edge technology and culturally-appropriate design they have produced a result that is now the showcase of the project. Phillips says he is proud to take visitors to see the wall before showing them the rest of the project, and artist James Molnar who designed the detail on the panels is extremely happy with the result.

Molnar has worked on previous moulded concrete panel projects, and says there is often a disconnect between the artist, the formwork manufacturers, and the concrete moulders. From his previous experience he knew how his design would translate to a 3D panel, and confirms that the team at Jackson Industries understood his concerns and delivered moulds that met his expectations.

The technology used by Jackson enables a rapid turnaround to the highest possible standards. Their 5-axis CNC machining produces a casting-ready master tool using their unique CaroC™ tooling material, which requires no sanding or spray coats after machining. The quick turnaround meant that Molnar could travel to Jackson's production facility in Onehunga to oversee the entire process of converting his sketch into a 3D model and then the master tool. From there formliners were produced for casting the final panels.

Although the project is still in progress, Phillips cannot speak highly enough of the team at Jackson Industries, and believes that this phase of the project would have taken considerably longer and probably resulted in a lower quality finish if they had been using conventional formwork methods.



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## Project Profile 2

### ELLERSLIE NOISE WALL

The NZ Transport Agency, which is responsible for our state highways, recently commissioned the installation of a noise barrier along the Ellerslie stretch of SH1. There is growing awareness of the impact of noise pollution arising from motorways, and many new roading projects now include the installation of sound barriers.

Gansen Govender, senior project manager at GHD, engineers and project managers for this enterprise, said their design brief was for a visually pleasing wall which involved several intricate patterns. They wanted something that “really stood out and was more than just a textured surface”, meaning many design iterations. Govender says that conventional methods of formwork would simply not have enabled them to achieve the end result they wanted, and the ability to rapidly prototype using the 3D modelling capabilities of Jackson Industries gave them a result that satisfied the concerns of the community.

A further complication arose when a design modification midway through production called for a recessed service door to be added into one of the panels. Using conventional casting methods would have meant that a completely new mould

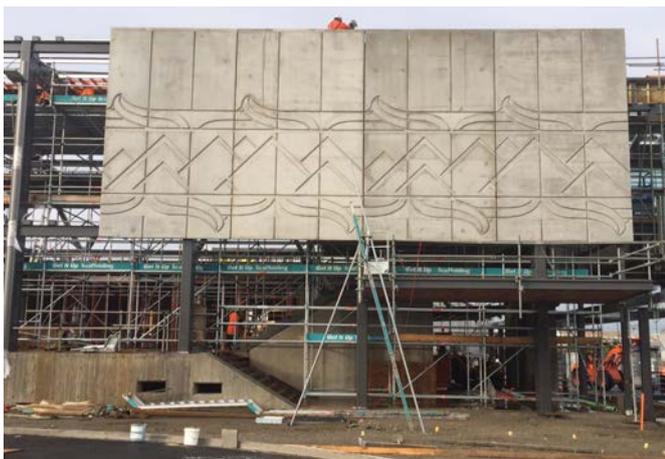
be required for a single panel. This would have taken several weeks, and incurred considerable cost. An alternative was a permanent modification to the existing mould, but this would have affected the ongoing production of further panels.

However, the 3D modelling technology being used by Jackson Industries enabled them to rapidly design a blocking plug and manufacture this through CNC machining. This took Jackson Industries just a few days to produce and deliver, and the plug was then dropped into the existing formliner to produce this one-off modified casting. After completing this customised panel, the insert was removed without damaging the liner and without impacting on the tight schedule of further castings.

Joshua Espiritu, project manager at Wilco Precast who produced the finished panels, was also extremely impressed at the precise engineering characteristics that only computerised 3D modelling can provide. At one point a set of panels needed to be side-lifted to fit under the bridge, and it was a simple matter for Jackson Industries to determine the exact centre of gravity of the panels. These could then be safely lifted into place for fixing, something that would have been impossible with conventional formwork casting.

*Artists: Johnson Witehira (Manaaki) and Clytn White (White Landscapes).*





### Project Profile 3

## ŌTĀHUHU STATION

Auckland Transport's new fully integrated \$28m bus-train station is particularly distinctive for its graphic façade and architecture. The building is designed to reflect local and historical narratives - specifically the site's importance to local Mana Whenua as a historic portage site for waka.

Three narratives were incorporated into the design: navigation, portage/waka and maunga. This resulted in the integration of iwi art and design throughout the station site and is most prominent in the station's outer concrete panels. The designs were brought to life through a collaborative approach including artists Tessa Harris (Ngai Tai Ki Tamaki), Graham Tipene (Ngāti Whātua Ōrākei) and Jasmx Architects.

Jackson Industries machined the moulds for incorporating the art and designs into the panels, working alongside HEB Construction. The façade comprises a series of patterned panels - two outer sections with an alternating middle panel. Each panel measures 6.3 m x 3.76 m. In total, seven panels were cast.

A high-quality surface with crisp detail was required so the formwork was CNC - machined from laminated sheets of high-grade form ply incorporating vertical false rebates. The centre sections held a 'mountainous' relief, adding an extra challenge as they were arranged in an alternating pattern. In order to keep costs down due to the deep pattern depth, these sections of the mould were designed to be 'interchangeable'.

The station picked up an Award of Excellence in the Te Karanga o te Tui category at the 2017 New Zealand Institute of Landscape Architects Awards.

