

# ARCHITECTURAL FORMWORKS



Architectural  
Formworks



## A LEGACY OF INNOVATION

Founded by Jim Jackson in 1977, Auckland's Jackson Industries is a multi-faceted company providing diverse engineering expertise – from electrical equipment, through precision CNC machining and tooling, to composite structures and the development of bespoke polymers.

Innovation and development are the common themes running through the company's DNA.

Family-owned-and-operated, the company's origins lie in electrical equipment – with an emphasis on safety. It has grown into Australasia's leading supplier of industrial power applications and portable power solutions, and is particularly well-known for its LIFEGUARD® power distribution systems.

These enclosures are manufactured in highly-resilient polyethylene, glass-reinforced

plastic or stainless steel. Many of the products have become the industry standard, using components from suppliers such as Fuji Electric, ABL Sursum, Wieland and Multi-contact Earthing Systems.

Developing and manufacturing the enclosures has created and nurtured niche engineering skills – an evolutionary process which has seen the establishment of specialist divisions within Jackson Industries.



### Electrical

Manufacturing industrial power applications and portable power solutions.



### Hire & Service

Hiring electrical distribution equipment to reticulate power around new building sites.



### Precision Machining

Producing tooling and moulds for clients in an enormously varied range industry sectors.



### Composites

Creating purpose designed components in materials such as fibreglass, kevlar and carbon fibre.



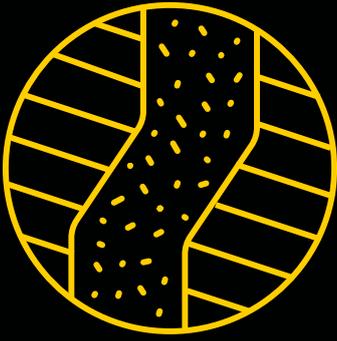
### Polymers

Developing specialist compounds to meet unusual composite engineering needs.



### Architectural Formworks

Making high precision moulds for casting concrete, extensively used in architectural applications.



## ARCHITECTURAL FORMWORKS

### CONCRETE AS ART

Jackson Industries is often described the “architect’s invisible partner” – a facility that enables the designer’s ideas and visions to become a reality.

That reputation stems from our knowledge and expertise in formwork manufacturing and form liners used for architectural concrete.

And it’s all a function of our state-of-the-art CNC machining technology, the integrated design and production teams, the revolutionary mould materials and a passion to deliver

the optimum solution for the job. Together these give us the ability to tackle complex concrete feature works – projects which previously might been considered too difficult or too expensive.

Intricate designs become reality with the aid of sophisticated 3D modelling software. And with specialist expertise in Master Tool, Form-liner and Formwork manufacturing, we’re supremely confident about delivering solutions fast and efficiently – no matter how small or large the project.

Collaborative involvement underpins our philosophy. We prefer to work closely with clients, contractors and other stakeholders within projects – helping to develop solutions to tricky problems. In many cases the way the formwork is designed and put together can simplify the process.

Translating imaginative concrete design into reality often requires imaginative engineering.

We thrive on it.

“The mother art is architecture. Without an architecture of our own we have no soul of our own civilization.”

– Frank Lloyd Wright



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**NORTH ISLAND** 18 Gloucester Park Road,  
Onehunga, Auckland  
0800 543 348

**SOUTH ISLAND** 26 Tahuna Street,  
Wainoni, Christchurch  
03 377 7247



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## REINFORCING OUR HERITAGE

**SYNOPSIS** A HISTORIC CHURCH GETS MUCH-NEEDED SUPPORT

**CUSTOMER** LT MCGUINNESS LTD

**PROJECT** EARTHQUAKE STRENGTHENING **DATE** 2014

Designed in 1918 by Frederick Jersey de Clere, Wellington's St Mary's of the Angels is believed to be the world's first reinforced concrete gothic-styled church.

The church was closed after earthquakes in 2013, re-opening three years later following a \$9.5 million re-strengthening project. This involved the introduction of replacement gothic columns to support the structure.

These new columns had to precisely match the existing set – an achievement requiring an innovative

approach. It began with 3D imaging of the existing portals and columns. They were scanned to millimetre tolerances with a high-tech, point-cloud scanner to create a 3D model.

Rubber moulds were developed from the 3D models, boxed up on four sides and filled with high-strength, self compacting concrete.

The new additions look identical – in style and texture – to the existing columns, but also feature rods of reinforced steel and ties into new ground beams, making them vastly stronger. Most visitors

marvelling at the restored interior think the new portals and columns are original.

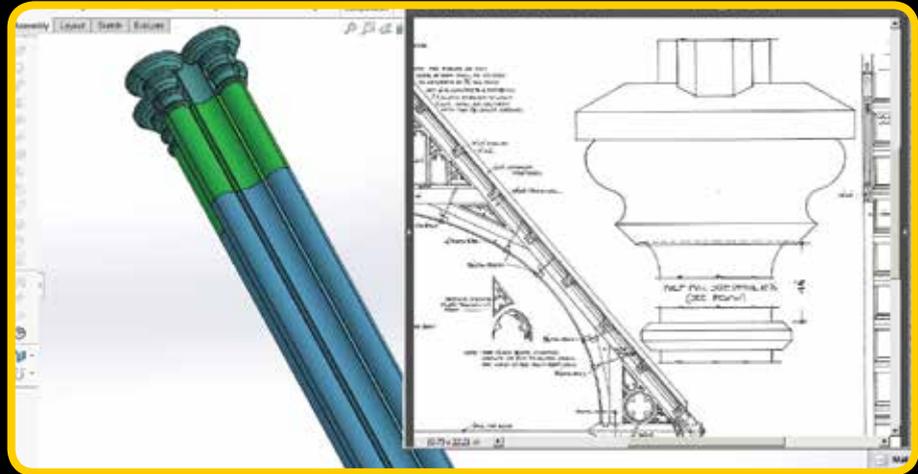
St Mary's passed its first big test with flying colours – a 7.8 magnitude earthquake in November 2016, soon after the structural works had been completed. Engineers couldn't find a single crack.

Wellington has around 600 earthquake-prone buildings and many owners are looking at St Mary's as an example of what can be achieved.

**"The team at Jackson were exceptional to work with. The columns at St Marys were one of the more complex elements to construct, but with the help from the Jackson team, as well as the point cloud model of the building, the columns were replicated identically to the old. A job well done!"**

Matt Pattinson – Site Manager, LT Mcguinness Ltd

1. INHOUSE DESIGN  
3D Modelling conversion  
from scanned data to  
replicate original designs



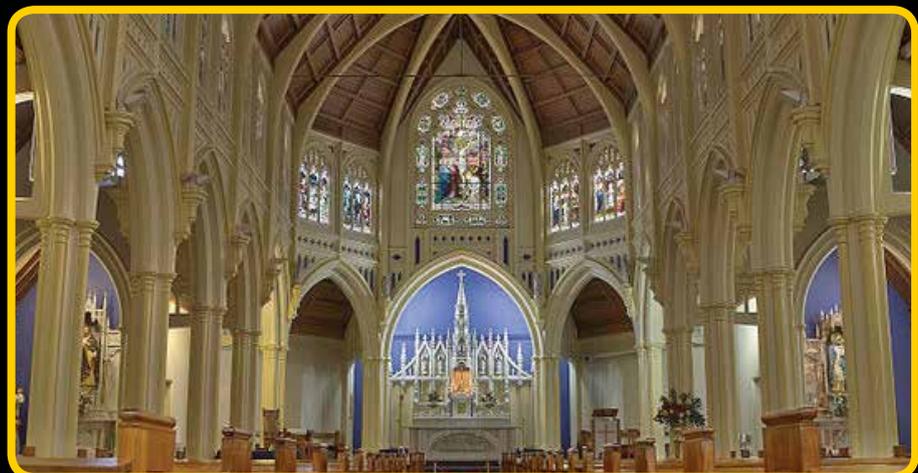
2. MANUFACTURING  
Column Formwork  
assembly parts ready  
for dispatch

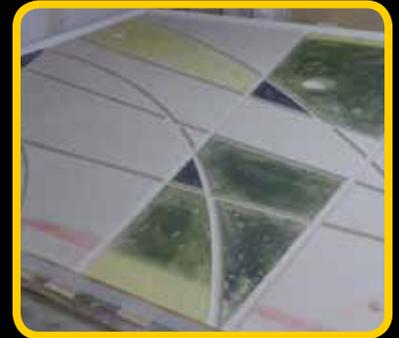


3. INSTALLATION  
1 of the completed  
columns cast  
from completed  
Formwork assembly



4. COMPLETED  
Some of the completed  
columns within the church





## SNAPPY EXTERIOR, FUN INTERIOR

**SYNOPSIS** A FUN FAÇADE FOR AN ARTIFICIAL WHITEWATER THEME PARK

**CUSTOMER** HEB CONSTRUCTION

**PROJECT** VECTOR WHITEWATER PARK **DATE** 2014

Auckland's Vector Whitewater Park is New Zealand's first artificial whitewater facility.

Jackson worked with HEB Construction to supply the concrete form-liners for the patterned pre-cast elements of the Park's buildings and retaining walls.

We collaborated closely with the client from the outset to ensure the correct combination of flexible form-liners and hard formworks would deliver the exact configuration and finish. Accuracy, longevity and reusability of the supplied components were critical to the end goal.

We used our master tool material CaroC, a product that eliminates

the traditional joint lines common with standard master tool materials. CaroC is a grainless material which creates a high-spec machined surface and a flawless finish when sanded.

There were additional complications: The requested pattern matched existing panels already on the site. The textured areas needed to be identical. We had to establish what the texture was and then undertake reverse casting to translate the required finish into the textured areas of the form-liner.

To do this we took the original textured material and cast thin layers of poly rubber onto the surface. These were then precisely cut to shape on our programmable

plotting table and inserted into the relevant areas of the master tool. The pattern was formed using a rubber form-liner.

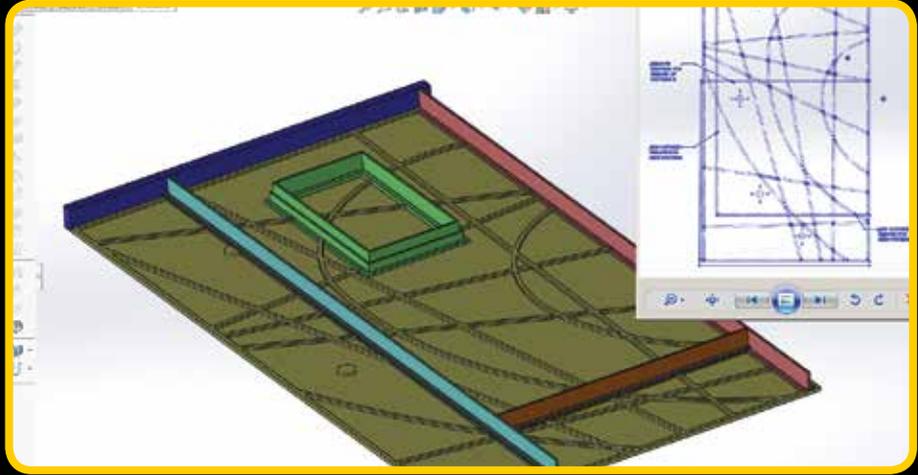
With the elaborate pattern – incorporating angled and radial trenches – precisely-machined shuttering was required to accommodate various panel sizes and window block outs.

We supplied exact hard form shutters incorporating the original perimeter rebate detail which sat perfectly on the liner face in every instance. This eliminated any need for extra liners or cutting of the liners, effectively reducing overall cost to the client.

**“Kirk Ricketts' handling of our enquiry and Jackson's attention to detail was without fault. The team was diligent in matching existing on-site patterns and delivered a high-quality end product that performed as required with little loss of detail throughout all the numerous casts. It was great to work with them.”**

David Wyeth – Managing Director, HEB Construction

1. INHOUSE DESIGN  
Form-Liner and casting  
shutter 3D modelling



2. MANUFACTURING  
Master mould assembly



3. IN CONSTRUCTION  
Concrete panels cast  
and ready for shipping



4. COMPLETED  
Large panel series  
installed on-site





## TERMINUS REFLECTS CULTURE

**SYNOPSIS** A RAIL-BUS STATION THAT CELEBRATES OUR ORIGINS

**CUSTOMER** AUCKLAND TRANSPORT

**PROJECT** OTAHUHU INTERCHANGE **DATE** 2016 - 2017

Auckland Transport's new, fully-integrated Otāhuhu bus-train station offers commuters more frequent services and much improved connections between bus and rail.

The \$28m facility links the rail platform with two new bus platforms and a terminal building, via an elevated concourse.

Particularly distinctive for its graphic façade and architecture, the building's designed to reflect local and historical narratives – specifically the site's importance to local mana whenua as a historic portage site for waka.

In fact, three narratives were incorporated into the design: navigation, the portage of waka

– and maunga. While this resulted in the integration of iwi art and design throughout the station site, it's especially well-presented in the building's outer concrete panels.

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

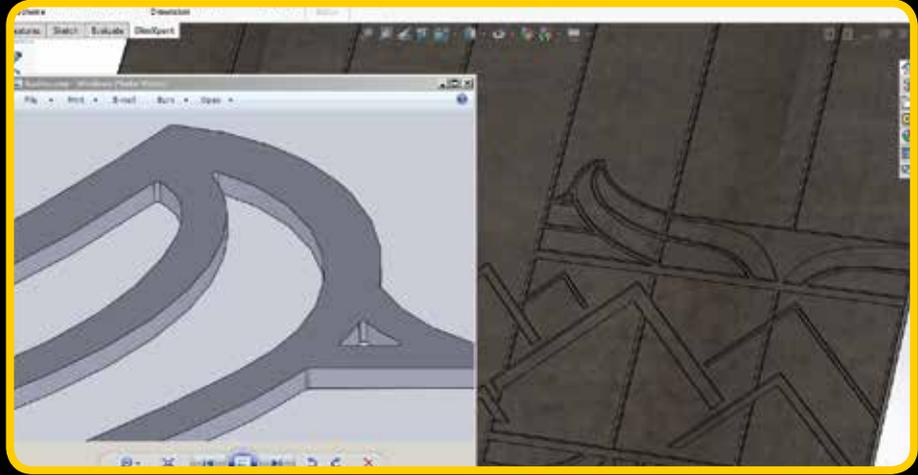
Because the client wanted a high-quality surface finish with crisp detail, the formwork was CNC-machined from laminated sheets of high-grade form ply, with false rebates running vertically. The interchangeable centre sections

carry a "mountainous" relief.

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.

Judges said the design team weaved together multiple cultural and historic narratives, all while navigating a raft of complicated technical planning issues required for the site.

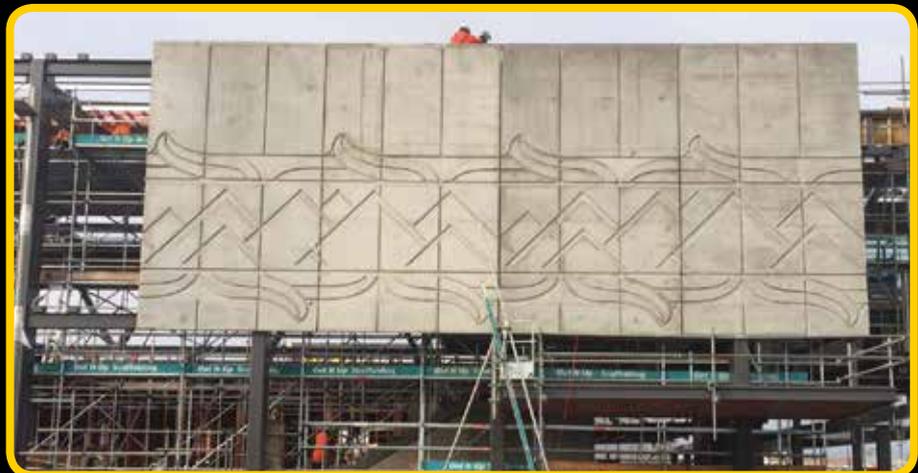
1. INHOUSE DESIGN  
3D Modelling and draft  
analysis for effective  
releasing of concrete parts



2. MANUFACTURING  
Assembly of formwork  
components prior  
to dispatch



3. CONCRETE PANEL  
INSTALLATION  
Completed panels  
being placed onsite



4. COMPLETED  
Finished exterior wall





## RECONSTRUCTIVE SURGERY

**SYNOPSIS** A NEW FAÇADE FOR AN EXISTING BUILDING, WITH COMPLEX STRUCTURAL CHALLENGES

**CUSTOMER** DOMINION CONSTRUCTORS AND JASMAX ARCHITECTURE

**PROJECT** CREATIVE CONCRETE FORMWORK **DATE** JANUARY 2013 - 2014

This architectural concept required a visually-striking façade for an existing building – to blend into the rapidly-changing face of Nugent Street in Auckland's Newmarket. Jackson was commissioned to create the formwork for the façade.

Dominion Constructors approached Jackson Industries in the early design stage of this project. The façade would need specialist concrete moulding design experience – as well as CNC manufacturing facilities.

To be successful the intricate Voronoi pattern had to be poured in situ, in a single stage – using a

concrete mix Dominion developed specifically for the project. The concrete had to be pumped from the ground up, to eliminate any air pockets.

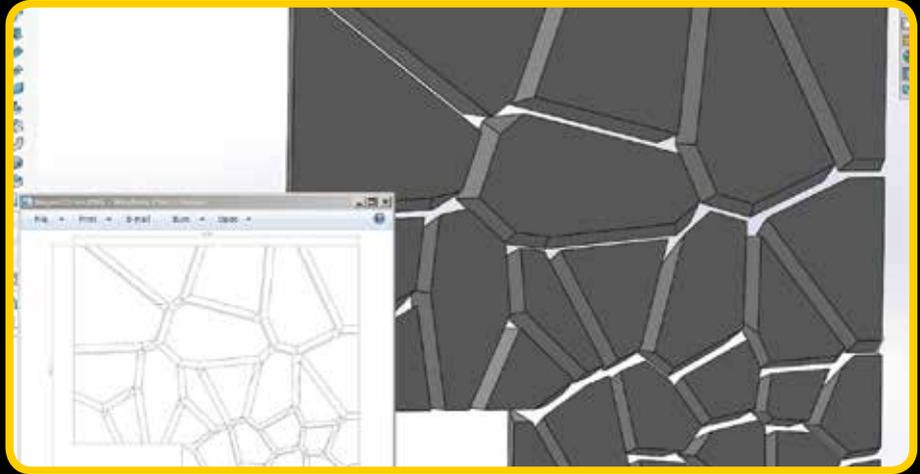
Jackson's unorthodox solution involved the combination of 3D CAD modelling and five-axis CNC machining services. This resulted in building large blocks to generate a cavity into which the concrete was pumped from to a height of three stories.

Some 26 'modules' were constructed from multi-axis machined polystyrene with form-ply tool-faces. Each was

finished with a high-quality mould surface. Significantly, each module was sufficiently lightweight for manoeuvring into place by hand. In addition, a large-scale jigsaw puzzle template was machined to create a 1:1 layout guide for the modules.

The finished building has attracted high praise from Nugent Street tenants keen to see the area's aesthetic and cultural feel enhanced. The project also won an award at a 2017 New Zealand Concrete Industry event.

1. INHOUSE DESIGN  
File referencing and  
3D Model Design



2. MANUFACTURING  
Initial poly pod machining



3. FORMWORK  
INSTALLATION  
Erection and assembly  
of template jig and  
cavity pods



4. COMPLETED FACADE





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