

Singapore symbiosis
Auckland's new hospital
and more...



■ INFRASTRUCTURE

A new road to infrastructure delivery

As a top priority Transit project, the upgrade of Auckland's Grafton Gully is attracting a lot of attention. For the first time in New Zealand a major roading contract will be completed under an alliance model.

Continued inside...

Construction at Grafton Gully, photo by Fraser Harding

Singapore symbiosis

One of the advantages of a multinational company is the ease with which knowledge can be transferred between separate but compatible markets.

A good case in point is Singapore where, after modest beginnings, Beca S.E. Asia is now a premier supplier of engineering solutions. The 140-strong team has built a reputation for innovative engineering methods and successfully caters for a very sophisticated property market. Beca S.E. Asia director, Yeow Mei Leng, explains "To become a key player in this environment, the Singapore team has acquired specific knowledge in areas such as sustainable buildings and high-quality designs."

Knowledge transfer in this context means making specific knowledge accessible to specialists (based anywhere in the group) when they review the design concept. This means that design solutions reflect

experiences from all Beca markets and are tuned to meet local needs resulting in better service delivered to clients.

Beca S.E. Asia executive director Keith Paterson explains that the island state is a very mature and competitive market with a great deal of development activity in the office, apartment and hotel sectors. "Given the high land values, developers focus on design and quality while maximising the saleable area. And because time is also critical, initial engineering inputs must be very close to the final requirement. This is where experience and expertise are essential," says Keith.

That same expertise is available to New Zealand clients where developers don't yet have ready access to this volume and quality of information because the market is on a much smaller scale. On the other side of the coin, the Singapore office will have increased access to a broad range of multi-disciplinary engineering services to help service industrial and civil clients.



With track record in both markets, Keith Paterson (left) is facilitating the transfer of knowledge between Singapore and New Zealand.



When completed, Auckland's new hospital will be one of the country's largest buildings with a floor area of 80,000 m².

A new road to infrastructure delivery – *Continued from cover*

The new model promises fast-track construction and 'best-for-project' decisions by sharing risks and rewards among Freeflow alliance members (Transit New Zealand, Fletcher Construction, Higgins Contractors and Beca) who together contribute a vast portfolio of skills and successful projects.

For the Grafton Gully project, the new alliancing approach has already resulted in a strong team environment with members committed to project objectives. However, while

cost factors are important drivers, alliance members are also targeting agreed non-cost-related key performance indicators such as site safety and community relations.

Beca's head of infrastructure Peter Hay says, "The alliance model allows an earlier and more effective interaction between the designer, the constructor and the project owner. This is particularly suitable for a project like this where timing is an overriding factor."

Transit's national works manager Colin Crampton agrees and says that it's realistic to expect faster project start-up and completion as well as a higher level of design innovation and cost control.

Alan Powell (Beca) and Grant Higgins (Higgins Contractors) are members of the Freeflow alliance – a radical new project delivery mechanism which will help deliver the strategic link between Auckland's motorway network and the port area.



Auckland's new hospital

Aucklanders are getting used to a new addition to their city's skyline as the construction of New Zealand's flagship hospital progresses. The state-of-the-art health facility is halfway to completion and project teams are already cautiously happy, talking about a well executed project.

Partnered with architectural heavyweight Jasmx and Australia's MSJ, the Beca Buildings team is contributing the experience gained from hospital developments in New Zealand and throughout Asia. "This is a sizeable building and combines the inpatient services for three main Auckland District Health Board hospitals in one purpose-built complex," explains Beca Buildings managing director

Mike Quirk. "The design is the result of an extensive user consultation process and also takes into consideration key parameters such as capital and operating costs, erection time and future-proofing. As with all large projects, the value management process is continuous, keeping the design team on their toes."

Dr Nigel Murray, general manager of the Grafton and Greenlane programme, is very happy with the progress and says, "The design not only reflects our needs but also allows for more flexibility if expansions or alterations are made at a later date."

The hospital will cater for up to 800 inpatients and is scheduled for completion in 2003.

Better, greener, cheaper

Beca Simons engineers set new standards when they installed a new "Save-all" for the Paper Machine 3 (PM3) at Norske-Skog Tasman's Kawerau plant.

Pulp and paper manufacturing is one of the most cost-intensive industries with plants spending millions each year to improve quality and environmental performance and decrease production costs.

Norske-Skog Tasman wanted to achieve all three objectives with the installation of the succinctly named "Save-all". Sometimes referred to as the "kidney of the paper-making process", the \$7.7 million machine filters some 20,000 litres of water per minute and removes the fine wood pulp fibre. The process allows both the fibre

(about eight tonnes a day!) and the water to be re-used.

Given that PM3 produces more than a third of the plant's output, minimising shutdown time during installation was a key requirement. Beca Simons project manager Andrew Thorpe explains that the application of a 3D plant design was a major benefit. It detected physical equipment clashes at design stage and reduced the cost of rework by more than 90% compared to industry benchmarks.

This, together with the fact that the team was able to test the control system prior to commissioning, resulted in much praise from the client who was pleased about the "excellent outcomes for Norske-Skog Tasman." Says Norske-Skog Tasman's Malcolm Macfarlane, "The PM3 Save-all project has set new standards for teamwork and project delivery techniques."



The "Save-all" at Norske-Skog Tasman (pictured right) is extremely efficient and helps reduce waste, use of chemicals and fresh water at Paper Machine 3.

Chew Chong and a clip with a difference

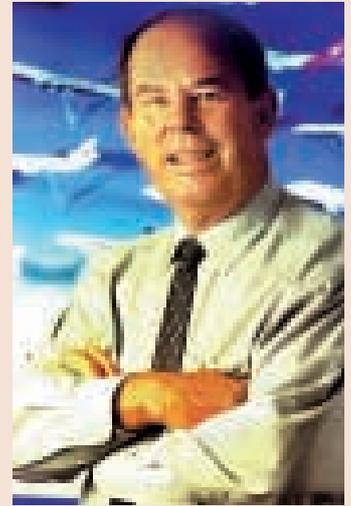
Nineteenth century Chinese immigrant Chew Chong and senior IFBS engineer Steve Kelly share a fundamental talent for innovation. Chew Chong revolutionised farming in Taranaki by paying cash instead of using the bartering principle. This gave farmers a small cash flow and him the capital to establish the Jubilee dairy company in 1887.

Today's dairy companies are benefiting from Steve Kelly's innovation. Working alongside Kiwi Co-op Dairies' maintenance and production staff (now part of Fonterra), Steve co-ordinated the redesign of a pipe clip which is used to hold dairy product pipes in place. Until now, these

clips were designed for ease of disassembly during maintenance. The downside of the design was the potential risk that components might separate and come into contact with the product. The modification eliminates this risk with a new design which prevents the bracket from separating once in place.

In terms of quality assurance the clip was a real leap forward not just for this organisation but also for the entire NZ dairy industry which has been quick to adopt this innovation, making the old design obsolete in a matter of months.

Kiwi Co-op Dairies were so impressed with Steve's input that they honoured him with the annual Chew Chong award for innovation which they presented for the first time to a non-employee.



AIAL managing director, John Goulter

CLIENT PROFILE

Auckland International Airport

New Zealand's gateway airport handles over 75 percent of all visitors. It is a major economic force and a successful public company. Managing director John Goulter, who has been at the helm since AIAL's incorporation, answers some questions.

Q: How do you achieve consistent growth and success for the company?

By well understanding the product that we offer, and the prospective benefits our product can offer our many customers. Providing innovative solutions to the demands of our total marketplace is also key to our ongoing success. Our long-term vision for the company includes a real understanding of the needs of the community that we serve, which in turn provides us clear objectives to deliver on.

Q: What major challenges are ahead of you?

We are a major employer within the region and are New Zealand's second largest port by value as well as handling

over 75% of all visitors to New Zealand. Our major challenge therefore is to provide the necessary infrastructure in a timely and cost efficient manner, enhancing the overall prospects for ongoing aviation and transport development. It is critically important that we continue to get it right in the provision of such infrastructure to support both social and economic development within the region.

Q: You have guided AIAL through a number of major upgrades. What makes your projects a success?

The success of any one of our projects is underpinned by the personal commitments that key players make to that project – whether they are company personnel or personnel from suppliers to the company. There is very definite ownership by all involved. Outstanding performances are many and there is a high degree of recognition which is shared by all.

Q: Explain in five words what you value most in business relationships.

The simple achievement of expectation.



Steve Kelly with a small but important innovation for the dairy industry.

AWARDS

The Oscar of engineering

Beca's Ian Billings (pictured right), received the coveted IPENZ* Technical Award for Infrastructure which is presented for lifetime technical achievement. IPENZ acknowledged "Ian's leading role in the design and asset management of New Zealand's infrastructure."

Ian has a track record of creating new technical solutions to engineering problems and earned international recognition for his project achievements which include the Otira Viaduct and the Auckland Harbour Bridge seismic retrofit.



* Institution of Professional Engineers New Zealand

Eggs for Malaysia

After some time in the design stage, construction has begun on a major liquid egg plant in Malaysia.

Beca affiliate JPBC* together with the IFBS* team are delivering leading-edge technology for egg producer Consolidated Farms Berhad.

The plant has a capacity for millions of eggs to be broken and turned into liquid egg product each week.

The IFBS team faced three project specific challenges with the liquid egg plant. The first was reducing the risk of contamination of the egg product with the shell. With half a million eggs broken per shift, there was a critical need to keep stringent separation between the components.

The next challenge was ensuring the correct processing temperature was attained. It needed to be high enough to destroy dangerous microbes, without inadvertently producing 'omelettes'. And finally, catering for a range of food processing companies – from small manufacturing to large commercial companies – the plant design allows for a huge range of packaging quantities from one-litre cartons to road tankers.

The plant will combine leading-edge technology with traditional technology in a modern, critical hygiene design. IFBS project manager, Warren Thomas, says "Normally fresh egg products have a short shelf life but by reducing the opportunity for contamination, we're extending the shelf life allowing the company to also export its products."

*JPBC – Jurutera Perunding Beca Carter Sdn Bhd
IFBS – Beca Group company International Food and Beverage Services Ltd



The no-fuss approach to managing properties

Like most other local authorities, the Auckland City Council (ACC) is in charge of an extensive and very diverse property portfolio. With over 1,400 buildings to manage, the council has a tough job keeping track of its assets and planning for associated expenditure.

In response to such needs, Beca designed an Asset Information Management Service (AIMS) – a software tool which gives organisations secure access to specific and relevant data about their properties via the internet.

"AIMS is designed to interface with current systems and capitalise on existing information," says Beca's Peter Steel. He also highlights the system's ability to provide consistency in recording, reporting and analysis, with a number of different consultants and contractors having access to enter or access data. ACC assets planning manager, John O'Brien, has used it for some time now and speaks from experience, "The system is exactly what we needed. It's also very time and cost effective."

For large property holders, this is a practical down-to-earth tool that adds certainty to forecast data and planning activities.

With the help of a new business tool, the Auckland City Council now has total access to detailed and tailored information about its large, diverse property portfolio. Pictured outside one of the council's largest assets are Peter Steel (Beca), John O'Brien (ACC), Ceri Bain and Tom Clarke (both Beca).

AWARDS

Dedicated to the water environment profession

Dedicated water environment engineer, CH2M Beca's Garry Macdonald, received the Richard S Englebrecht International Activities Service award from the Water Environment Federation for "sustained and significant contributions for the furtherance and improvement of the Water Environment Federation (WEF) in the international field."

WEF president Al Goodman (left) with Garry Macdonald



MANAGEMENT SERVICES

Planes, trains, automobiles ... and much more

A masterplan will help the Museum of Transport and Technology (MOTAT) make the most of its unique and diverse exhibits.

For many years, MOTAT was run as a volunteer enterprise with enormous enthusiasm and effort but scant financial support. A recent Act of Parliament, however, has secured ongoing funding and allowed the museum to commit to much-needed redevelopment to improve the visitor experience and care for our national transport and technology heritage.

Given the size of the site and the number and diversity of exhibits, MOTAT wanted a comprehensive long-term vision and asked Beca's planning team to help develop a strategic plan. This said and done, the team is now working on a complete masterplan. Greg Pollock, Beca strategic planner, explains that this is a very exhaustive process that carefully examines the big picture and what stories are to be told. "We are working with the MOTAT team to develop their dream for the museum. That involves going back to first principles and designing the



The Museum of Transport and Technology sought and found guidance for future developments thanks to a masterplan.

ideal museum. Combined with the hard-hitting technical investigation, this will result in a concept for a well-planned facility of world-class standards."

Once the masterplan is completed, an international design competition will take the concept to the next stage with museum designers developing the finer details.

INDUSTRIAL

Cutting costs without cutting production

Traditionally, energy costs are a significant expenditure for water treatment plants and distribution systems. While operators try to keep these costs low, a complex tariff structure coupled with multiple pumping schedules and unpredictable water demand makes this almost impossible to achieve.

Enter Derceto, a Beca software innovation, which achieves the objective by optimising the pumping costs. The system, considered to be a world-first, schedules the water production and pumping to utilise best possible energy tariffs and also accommodates demand spikes, maintenance shutdowns and changes in weather. As the only real-time online system available, it is set to make a distinct difference to energy costs for water supply systems.

The software is already helping Wellington Regional Council save some 12% in pumping costs for its entire water distribution and is the brainchild of Simon Bunn and

talented graduate systems engineer Stephanie Pegg. Simon Bunn, of Beca Applied Technology, tailors the software to individual plants' needs and conditions.

Following local success, Derceto is now being actively assessed in Victoria, Australia and is also receiving much interest from key water industry players around the world.



Graduate systems engineer Stephanie Pegg and Simon Bunn developed Derceto - a software which helps water treatment plants make significant savings in energy costs without reducing production.



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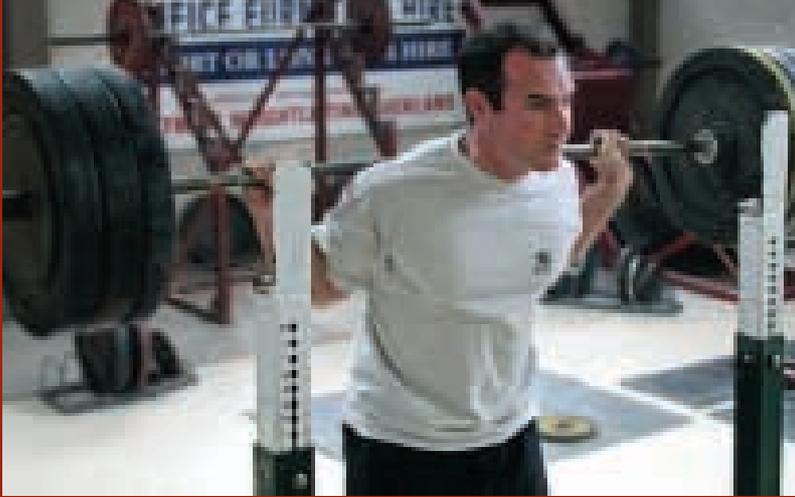
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Simon Weaver (above) and Tim Grammer (below) compete against the world's best with some assistance from Beca.

A WORD FROM THE SPONSOR

Beca sporting achievers

Six days of non-stop river rafting, mountain biking and climbing (of distances equivalent to twice the distance between sea level and Mt Everest!) is not everybody's idea of fun. But seasoned adventure race competitor and structural engineer Tim Grammer can't resist such a challenge. With his team, he finished ninth in the Adventure Racing World Champs held in Switzerland.

Fire engineer Simon Weaver is equally ambitious but with the difference that he likes to lift the heaviest weights humanly possible. He is the country's strongest man (in the under 100 kg weight class) and was recently placed 12th in the world powerlifting championships in Finland where he lifted 305 kg in the squat.



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