

## Our Man in Panama

FOR SIX MONTHS last year, Ken Wheeler, Manager of the Sydney Bridges Unit, was 'our man in Panama', working with Bilfinger Berger AG on the new Second Bridge over the Panama Canal, as depicted in this artist's impression.

– More on page 7.

## Chairman Becomes President

OUR CHAIRMAN, Dick Kell has been appointed World President of the International Federation of Consulting Engineers (FIDIC) – More on page 2.

## Cardno Celebrates Harold Davies' 100th Birthday

ON the 17th November 2003, one of the co-founders of our company, Harold Davies, celebrated his 100th birthday. The Brisbane office held its Client Function in October honouring this milestone, with over 200 current and past clients and staff attending the event held at the Brisbane Polo Club.

Mr Davies was presented with gifts from our firm and also from Engineers Australia (formerly IEAust) commemorating his career achievements. We all join together to wish Harold many happy returns!

■ Flanked by Managing Director Andrew Buckley and Chairman Dick Kell, Harold Davies is presented with a framed plaque to mark his centennarianship.



# strong presence

## Dynamic Efforts and Cooperative Spirit

### STOP PRESS



- IT is with great pleasure that we announce the merger of Cardno and the Melbourne-based firm, Taylors Engineers.
- Cardno Taylors is a company with a long-standing and very strong reputation in the urban and civil infrastructure and general structural engineering services market in Melbourne.
- The merger completes another strong year of growth for our company during which we capitalised on other recent mergers and grew to around 450 staff in Australia and overseas.

#### A message from the Managing Director

2003 has been an exciting year for the Cardno Group. A strong performance by most segments of our business saw us beat our budget for the June 2003 financial year, and this excellent performance has continued through the first half of the 2004 financial year. I hope that these excellent conditions are also reflected in the performances of our clients and colleagues' businesses.

During the past year we have also experienced several events of significance in the history of our firm.

Harold Davies, who founded Cardno & Davies with Gerry Cardno in 1945, turned 100 on November 17th. Harold has had a highly distinguished career and is certainly the only engineer I have ever known who worked on the design of the Sydney Harbour Bridge! Harold attended our Queensland client function, held in his honour, and made a great speech for our guests and staff. On behalf of our board and our staff, I congratulate Harold on his extraordinary achievement.

Our Chairman, Dick Kell, has also made his mark this year, having been appointed the President of FIDIC in Paris in September. FIDIC is the worldwide association of consulting engineering firms representing 10,000 engineers in 70 countries. We warmly commend our Chairman on his distinguished achievement and wish him every success in this significant role.

On the project front, our US\$10M Rural Roads project in Sri Lanka funded by the Asian Development Bank

*"We are very pleased with our achievement in putting Australian and Cardno's skills on the world stage. We intend to build a strong presence in the USA based on this success."*

is the largest single consulting contract we have ever signed. We are helping to upgrade 2,000km of roads and bridges in Sri Lanka over the next four years.

In the USA, we have been successful in securing a US\$600K Asset Management project for the City of Los Angeles Department of Water and Power. This project has been won against very substantial international competition. Once again we are very pleased with our achievement in putting Australian and

Cardno's Asset Management skills on the world stage. We intend to build a strong presence in the USA based on this success.

Domestically, we have added a new Melbourne office, Cardno Taylors, during the year and we welcome Geoff Welsh (Cardno Taylors' Principal) and his team into the group. We can now deliver a full service to all of our urban development, civil and structural clients in Victoria. As we go to press, there are some more mergers to be announced shortly – so watch this space!

I take this opportunity to acknowledge the dynamic efforts and cooperative spirit of our staff during 2003, and I am sure that 2004 will bring even more impressive results. To our clients, thank you sincerely for trusting us with your projects in the last year, and we stand ready to place our innovative skill and extensive resources at your service during 2004.

**Andrew Buckley**  
Managing Director



■ Cardno chairman Dick Kell accepts the FIDIC Presidency.

## Our Chairman Now International President

CONGRATULATIONS to our Chairman, Dick Kell, who has been appointed World President of the International Federation of Consulting Engineers (FIDIC).

Dick said that his role at FIDIC was to represent equally the 70 member countries, ranging from multinationals with 6,000 staff to single-person firms in developing countries.

He explained that the profile of Australian engineering firms would also benefit from his work. "It really puts us on the map as leaders," he said.

This exceptionally prestigious position brings great honour and recognition for both Dick and the Cardno group. We wish him well as he embarks upon this challenging new adventure.

## Zilzie's New Community is a "Blueprint for Sustainable Development"

CARDNO'S ENVIRONMENTAL DIVISION has coordinated the development design process for a proposed coastal residential community consisting of 390 residential lots, a village community centre and recreation/open spaces land on a coastal headland area at Zilzie, east of Rockhampton.

The 119ha site presented a number of environmental constraints including a nationally endangered ecosystem, a wetland area of international significance, protected coastal vegetation, and steep "visible" land.

The real environmental values of the site were determined and Cardno provided accurate ecological and constraint mapping to allow an "acceptable" design concept to be developed and approved.

Earmarked for conservation are 67ha (encompassing all wetland, foreshore and headland ecosystems) which are capable of supporting a high diversity and abundance of flora and fauna species.

Contact Michael Chessells, Brisbane Office – (07) 3369 9822

*"The Queensland Environmental Minister, Dean Wells, has acknowledged the planning and design of this project as 'a blueprint to guide the sustainable development of our state'."*

environmental

full support



■ Pauline enjoying a visit from Andrew Buckley (left) and Jim Verco soon after her hospital admission.

### Cardno Family Rallies for Pauline

WHEN Pauline Haro, a 27 year old secretary and mother of two, employed in our Port Moresby office, faced a life-threatening heart problem which could only be addressed by surgery in Australia, Cardno's staff gave her full support.

Jim Verco was an indefatigable force behind Cardno's campaign to help raise funds for Pauline, by organising fundraising raffles and

dinners, and working very closely with the Wahroonga Rotary Club.

The unhesitating response of Cardno staff members worldwide to rally behind a colleague in need, has been truly heartening.

Through relentless campaigning by Jim, the support of the Rotary Club, Air Niugini and Cardno staff, the overall costs of Pauline's artificial mitral valve replacement were heavily reduced.

None are happier to see Pauline recovered and back at work than her daughters Stephanie and Jenny.



■ Now recovered, Pauline has enjoyed her return to work. Welcoming Pauline back is Sibona Vavia, Water Board Project Manager, and David Hibbert, Project Manager.

### Rural Roads in the Philippines

IN 2002, Cardno MBK contracted with the Asian Development Bank to prepare a Rural Roads Development Policy Framework for the Department of The Interior and Local Government in the Philippines (DILG).

The Rural Road Network in the Philippines comprises around 171,788km of road with various types of surfacing ranging from earth to concrete. Much of the existing road network is in poor condition, funding is scarce and access to rural areas is often restricted during wet weather.

The Study's objective is to improve the capabilities of the Local Government Units regarding • Planning & Programming • Financing • Road & Bridge Maintenance and • Institutional Strengthening.

Contact Ed Vowles  
Brisbane Office – (07) 3369 9822



■ Much of the Philippines' 171,788km rural road network is in poor condition.

## Transport & Traffic in Brief

■ CARDNO'S Transport Planning and Traffic Engineering group is currently undertaking several **Pedestrian Access Mobility Plans**, and has completed the Parramatta PAMP for Parramatta City Council which details over \$4M in pedestrian facility works.



■ Work is beginning on the **Lower Duck River Bike Path** for Auburn Council, running along the Duck River to join the Parramatta River waterfront. The route alignment, detail survey, an REF and concept design will be undertaken by Cardno.

■ The **South Sydney Land Use and Transport Study & Transport Development Control Plan** has been completed. A computer program has been written to analyse hundreds of thousands of bus records to derive a Public Transport Accessibility Index, based on the number and frequency of buses throughout the South Sydney area.

■ The Transport DCP will have an impact on all developments in the South Sydney Council area. A successful seminar on the Study was held by the group which was attended by about 60 state and local governments as well as development industry representatives. A Powerpoint presentation can be accessed via our website – [www.cardno.com.au](http://www.cardno.com.au).

■ Underpinning the **Botany South Transport Study & Action Plan** and the **Gosford CBD Transport Study** in 2003, is network and micro simulation modelling using the PTV Vision software. Cardno is developing its modelling capability by expanding into transportation modelling in 2004.

**Contact: Milly Hawley**  
Sydney Office – (02) 9496 7700



## Neeta City Shopping Centre Re-engineered

THE REDEVELOPMENT of sections of the Neeta City shopping centre in Sydney's west has required some skilful structural engineering.

Steelwork propping and jacking to support the existing level two structure so as to allow for demolition of the level one transfer floor below, is complete.

The propping system included large steel beams up to 900WB in size, supported by a 1200WB steel beam spanning the current loading dock entry. Demolition of the existing structure and construction of the new loading dock and carpark level has now commenced. Internal renovations and strengthening to transform the existing carpark into new retail premises for Big W are also underway.

The project's next stage is a new retail complex with rooftop carparking.

**Contact: Praveel Prasad**  
Sydney Office – (02) 9496 7700

## Cairns' Earl Hill Reborn As 'Bluewater'

THE first stage of the Bluewater development in Cairns, the Bluewater Harbour Precinct, commenced in October 2003 and will be completed later this year.

Cardno MBK worked with Incoll TPC Pty Ltd, the current project managers, on feasibility studies for the Earl Hill development proposed by the previous owners of the site in the 1990s.

Two years ago, Consolidated Properties identified the site as an ideal location for another of their high quality community

developments and renamed it "Bluewater".

Construction is by Hutchinson Builders, and they have commissioned Cardno MBK to carry out the design, environmental management and construction inspections, which will

amount to a co-operative effort between our Brisbane, Townsville and Cairns offices.

*Bluewater represents an investment of \$600M and will be home to 3,000 people housed in five precincts.*



**Contact Graeme McIlwain**  
Brisbane Office – (07) 3369 9822

## Townsville Office Breaks Ground With Mines

CARDNO MBK's Townsville office has recently begun providing engineering services to the mining sector.

■ The North-West Queensland Minerals Province is considered a key future Australian industry, and Cardno MBK has the ability to assist this sector, particularly in inception, development, operational and maintenance phases.

■ Recently completed projects include rehabilitation works at the Trepell airstrip, new haul roads and structural design and certification works at BHP Billiton's Cannington Mine, and a new water supply pipeline, and structural design works at the

Copper Refinery Unit of Mount Isa Mines. Structural design has also been completed on transmission tower lines at the Porgera Mine in Papua New Guinea.

■ Since this industry is a major economic contributor with strong long term prospects, the Cardno group is well positioned to provide engineering services to existing mines, along with new developments as they occur.

**Contact John Johnson**  
Townsville Office – (07) 4772 1166



# urban

## The Avenues in Townsville

**THIS prestigious development is only minutes from Thuringowa City Centre. It will yield around 1,250 home sites and will complement nearby residential estates. Depending on market conditions, the project is expected to continue for another 10 to 15 years.**

**Some specific engineering considerations included:**

- External Roadworks and Drainage were provided in schemes involving up to three other developers as well as the local authority.
- The flat topography involved significant land reprofiling, and the minimum road and drain grades required careful consideration of secondary drainage flood levels in streets and drainage paths.
- The Bohle River overbank sections needed modification – via excavation to increase the waterway area and construction of a levee – so that land, which is currently subjected to flooding, can be developed.

**Contact John Johnson, Townsville Office – (07) 4772 1166**

## New Hotels Add Major Tourism Components To Darwin's Chinatown

AUSTRALIA'S leading hotel operator, Accor, has signed an agreement with Leeon Consortium, the developers of the Darwin Chinatown project, to manage two new hotels in this precinct in Darwin's CBD. The hotels are scheduled for completion later this year.

They are part of a AUD\$90 million multi-purpose development project that will also include an office tower, a ground floor retail complex with 30 specialty outlets, underground and above ground multi-story car parks, food courts, and colourful pedestrian links reflecting a strong Chinese architectural theme.

Cardno Willing has been working on the conceptual design of this project for over 12 months. Extensive traffic investigations and analysis were undertaken for the underground carparks and for the multi-story above ground carparks. Preliminary design for the stormwater drainage and all on-site civil works has been completed.

Chinatown is reportedly the most extensive and significant urban development project to take place in Darwin for over two decades.

**Contact: Craig Waters  
Darwin Office – (08) 8981 3613**



## FEA Continues to Hold Water

CARDNO MBK has enhanced its ability to examine structures associated with water storage, with recent finite element analysis (FEA) work undertaken for Tank Industries.

Tank Industries – based in Sydney and Melbourne – produce a series of rectangular water storage tanks up to 150,000 litres. The face panels are modular with internal tie rods providing stability for the applied hydrostatic pressure.

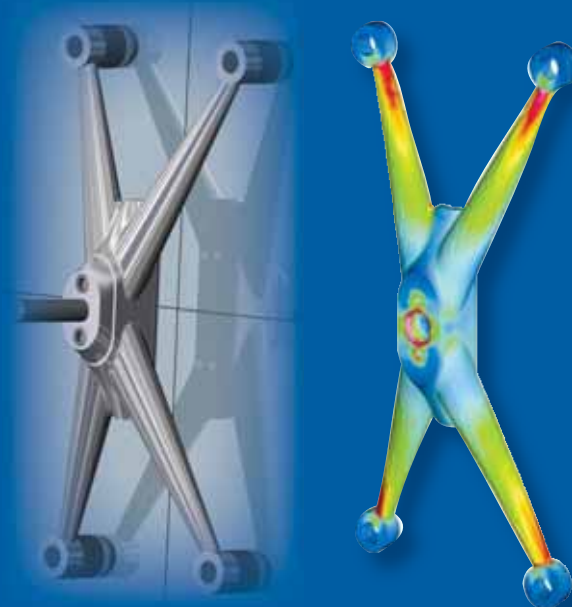
Traditionally, the face panels of these types of water storage tanks were constructed from cast iron, however recent trends have

involved the use of light gauge materials including stainless and structural steels.

Using modern analytical techniques, these modular water storage tanks were rigorously examined with our FEA model.

The unusual aspect of the analysis was that at ultimate load, sections of the tank had buckled locally. The analysis confirmed that even with this buckling present, the structure had sufficient reserve strength so as not to fail.

**Contact: David Beneke  
Sydney Office – (02) 9496 7700**



- An interesting example of a current FEA project (for our client Hycast Metals) is this cast duplex stainless steel spider connection, for use on a façade structure at Pacific Place, Hong Kong.

## Seminar

THE FEA TEAM recently held an in-house seminar on "Finite Element Analysis in Manufacturing", aimed at informing manufacturers and product managers about the usefulness of this technology in reducing risk exposure and saving money on mass-produced items.

Attendees included CSIRO, Siemens Dematic, Avantec, Sika, DPWS, Revetec and Sylvania Lighting Australasia.



■ The 130m Lake Kawana Boulevard bridge over Lake Kawana.

## Cardno's Major Design Work on The Sunshine Coast Road Network

THE Sunshine Coast's unprecedented growth has placed very high demands on the existing road system, thereby requiring a variety of initiatives to ameliorate traffic movement.

Cardno MBK is privileged to be involved in projects for both private and local authority clients. A total of 11.4 km of arterial and subarterial roadworks has been designed as well as seven major bridges. The roadworks have a value of \$24.5M and the bridges, \$23.5M.

*"The past 18 months have seen Cardno MBK's Sunshine Coast Office make a significant contribution to the upgrading of the major road network on Queensland's Sunshine Coast."*

■ **Kawana Waters Development** – These projects are being undertaken under a Transport Infrastructure Agreement between the developer, Caloundra City Council, and the Department of Main Roads, and will help alleviate current congestion on the Nicklin Way.

■ **Pelican Waters Development** – This initiative will significantly improve access to the 3,000 lot Pelican Waters development and reduce traffic volumes on the existing road network.

■ **Maroochydore Southern Access Link** – This long awaited project will provide greatly improved access to the Maroochydore CBD.

■ **Eenie Creek Road Stage 2** – This venture involved significant environmental challenges and will provide a bypass to the Noosa Junction and Noosaville business areas.

**Contact: Graham Tamblyn**  
**Sunshine Coast Office – (07) 5443 2555**



■ The Maroochydore Southern Access Link bridge over the Sunshine Motorway

## TAB Headquarters Completed

THE official opening for the refurbished headquarters of the NSW TAB brings to a satisfactory conclusion Cardno MBK's involvement in this \$30M project.

The recently completed refurbishment encompassed a new unified facade to the complex, plus extensive internal alterations and services upgrades.

The Client's requirement that staff be moved around the complex during the works, rather than being relocated off site, has been a logistical nightmare for the builders and has posed many interesting engineering challenges. Various items of structural works have had to be completed out of normal sequence, thus requiring temporary support at upper levels until vacation of lower levels allowed construction of final support structures.

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## f l o o d

### Sri Lanka Flood Damage Assessment

**PROLONGED** torrential rains in mid May 2003 caused the worst flooding and landslides in southern Sri Lanka in more than 50 years.

Flooding affected five districts in the south of Sri Lanka. The Ministry of Social Welfare estimates that around 150,000 families or 600,000 people were directly affected. To date, 235 deaths have been confirmed and 9,500 houses destroyed, with a further 30,700 damaged.

The highest number of deaths were attributed to major landslips in Ratnapura (81) and Matara (63) Districts, with flooding accounting for lesser numbers.

To assist with the assessment of restoration and rehabilitation of the flood damage, the Asian Development Bank has engaged Cardno MBK Director Ed Vowles to undertake a detailed assessment of flood damage.

The focus will be on road, power, education and irrigation sectors, and will cover national, provincial and rural roads and bridges, small footbridges, schools, health facilities, factories and power transmission lines and substations.

The Report will be used to develop sub-projects for rehabilitation and restoration, utilising proceeds from donor loans.

**Contact Ed Vowles**  
**Brisbane Office – (07) 3369 9822**

# superstructure

## Second Bridge over the Panama Canal



■ Ken Wheeler standing in front of the famous Culebra Cut which is adjacent to the bridge site.

FOR SIX MONTHS last year, Ken Wheeler, Manager of the Sydney Bridges Unit, was seconded to work with Bilfinger Berger AG on the new Second Bridge over the Panama Canal in the Republic of Panama.

- Bilfinger Berger in joint venture with Baulderstone Hornibrook are constructing the US \$91M cable-stayed bridge with a 420m main span which is due for completion in August 2004.
- The superstructure comprises a single cell concrete box girder 34m wide and 4.5m deep, supported by a single, central plane of stay cables from two single pylon towers 204m high. The superstructure is to be constructed and cast in place using four form travellers, which will be the world's largest form travellers.

- Ken's role on site was to provide a technical link between the major temporary works designers and the site construction engineers.
- Cardno MBK also assisted Bilfinger Berger in carrying out the independent proof check of the approach span falsework, which will be used to construct the four single cell box girder approach spans.
- Whilst in Panama, Ken was interviewed by ABC Breakfast Radio in Sydney on his experiences working in Panama on their Expats segment. You can hear Ken's interview on:

<http://www.abc.net.au/sydney/stories/s824321.htm>

Contact: Ken Wheeler  
Sydney Office – (02) 9496 7700

# planning

## Analysing the Impact of Debris on a Telecommunications Tower During Major Floods

EVOLVING practices for floodplain management now mean that Councils and communities would be wise to consider the potential impact of floods greater than the 100 year average recurrence interval (ARI) flood.

In NSW, the 2001 Floodplain Management Manual redefined the extent of the floodplain in urban and rural areas as the area inundated in the Probable Maximum Flood (PMF). Councils and other infrastructure owners now need to consider potential flood impacts on key infrastructure during floods as rare as the PMF.

Recently, Cardno Willing and Cardno MBK collaborated to analyse threats that floods pose to a new Telstra communications tower being constructed on Sydney's Lansvale peninsula. The peninsula is subject to flooding both from Prospect Creek and the Georges River.

The assessment combined modelling of 100 year ARI and PMF floods to identify the depth of flooding, and direction and velocity of flood flow in the vicinity of the tower with finite element analysis (FEA) of the tower to calculate its ability or otherwise to withstand debris impact loadings during floods.

It is expected that Councils and owners of infrastructure will increasingly need to conduct similar assessments of key items of infrastructure that are located on floodplains in order to protect these assets during periods of extraordinary inundation.

Contact our Sydney Offices:  
Brett Phillips – (02) 9496 7799 or  
David Beneke – (02) 9496 7700



■ Von Mises stresses on the Communication Tower base – before, midway and at the peak of the impact event.

## New Appointments



Michael Chessells

■ **Michael Chessells** has joined the Environmental Division after a long association with Cardno. He is a scientist specialising in identifying environmental issues and providing optimum management options.



Steve Coote

■ **Steve Coote** has been appointed Division Manager for the SE Queensland Branches Division of Cardno, giving him full responsibility for Wide Bay, Sunshine Coast and Gold Coast offices. He was previously Manager, Gold Coast office.



Michael Renshaw

■ **Michael Renshaw** has joined Cardno as the Group Business Development Manager, following a successful career with the Queensland Department of State Development as Director – Export Supply Development.



Mark Ricketts

■ **Mark Ricketts** replaces Steve Coote as Manager of our Gold Coast office. Mark joined Cardno nine years ago and has recently filled the role of second-in-command in the office.



Brian Adams

■ **Brian Adams** has joined Cardno MBK's Sydney office as Business Unit Manager – Transport Infrastructure. He is a widely experienced heavy civil/structural engineer and manager.



Shane Gesch

■ **Shane Gesch** has been appointed as Manager of our Sunshine Coast office. Shane started his career with Cardno in 1988 and has since been a major contributor to the success of our Sunshine Coast office.



Jamie Alonso

■ Previously Manager of the Water Supply & Sewerage section, **Jamie Alonso** recently rejoined Cardno as Manager of Brisbane Urban business unit. This unit is considered a leading force in the current urban market.



Matt Herrmann

■ **Matt Herrmann** has joined Cardno's Sydney office as Civil Manager (NSW Infrastructure Division), following a successful career with Abigroup Contractors as Project/Engineering Manager.



### Engineering the Future

[www.cardno.com.au](http://www.cardno.com.au)

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## Living With The Koala

CARDNO MBK Gold Coast is playing a key role in the design and development of a unique 490 lot residential estate located on the Tweed Coast near Pottsville.

“Koala Beach Estate” has been planned so as to allow specially designed pole home residential dwellings to co-exist with a range of threatened flora, fauna and aboriginal heritage areas.

The development has many restraints because this area is home to a large population of Koalas, Queensland Blossom Bats and Glossy Black Cockatoos amongst others.

The current development of Stages 5 & 6 will see the remaining 208 lots of this prestigious estate become available shortly. The land is being developed and marketed by The Koala Beach Discretionary Trust.

**Contact: Steve Coote**  
**Gold Coast Office**  
**(07) 5539 9333**

