


concrete

Volume 46 Issue No. 4 December 2002

Taking the 'HARD' decisions

An Information Bulletin being finalised now by CCANZ – which will be available early in 2003 – could be the key to breaking the flexible pavement stronghold on roading projects in New Zealand.

"Our goal is to provide all the information consultants need," says Dene Cook. "We're trying to make it very easy for them, by putting the figures at their fingertips so they can add the values into a spreadsheet and come up with a clear picture on the cost and benefits of a concrete road."

The IB will include how to evaluate benefits for concrete roading strictly in accordance with the detailed *Transfund Evaluation Manual*. It will also provide information about typical maintenance regimes and performance information for concrete roads.

Contractors at work on a concrete road in Australia.

CCANZ has long talked about the benefits of concrete pavements:

- Lower maintenance cost.
- Lower traffic delays associated with less maintenance.
- Heavy vehicle fuel savings associated with a stiffer concrete pavement. On a flexible pavement the truck wheels cause the pavement to deflect and the vehicle uses more fuel as it tries to drive out of the displacement bowl.
- Fuel savings associated with less surface texture depth to achieve a specified skid resistance.
- Lower vehicle operating costs due to absence of roughness associated with potholes and wheel track rutting.

Many of the consultants who look at projects for Transit NZ don't have the information at hand to properly evaluate concrete pavement. The IB, which will be available for download from the CCANZ website, will address this issue, says Dene.

A number of other factors have the potential to swing things concrete's way.

Increasing traffic density and the scarcity of aggregates are making concrete, which is a more efficient use of materials, more attractive. The thickness of a concrete road tends to be relatively insensitive to heavy traffic volume. But as you get more and more traffic, a flexible pavement has to be thicker and thicker – and as a result, more and more expensive.

The Auckland region is the most likely area for concrete pavement to be shown to best advantage: there is a lot of traffic, a lot of heavy traffic, and significant transport costs for aggregates (already increasing in price) – making thinner pavement a preferred option.

With this in mind, CCANZ approached Transit NZ to suggest a report on an alternative pavement for the Mt Roskill project in Auckland (one of a number of major infrastructure projects in the region). Transit expressed interest, and CCANZ has commissioned consultants to prepare a cost/benefit analysis for approximately four kilometres of four-lane motorway.

Initial feedback indicates that for this project a concrete pavement represents lowest life cycle cost. While its initial capital cost is higher than flexible pavement, when maintenance is taken into account it ends up cheapest.

"This is an interesting project," says Dene, "because the traffic loading on this particular road means flexible pavement is relatively expensive."

It is also believed that in the past the true cost of maintenance - both the physical cost and the traffic delay cost - have not always been considered fully.

With the right information to hand (the concrete facts, so to speak) it is hoped New Zealand might follow the example of its neighbours across the Tasman – seen above laying another stretch of rigid pavement on Queensland's Pacific Highway.

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ccanz
Cement & Concrete Association of New Zealand

Upfront

Inventing the Future

In March this year, CCANZ hosted what was originally designed as a one-off event, the Association Principals' Workshop. As discussed in the June issue of *concrete*, this meeting was convened to bring together the heads of the five cement and concrete industry Associations - NZRMCA, Precast NZ, NZMCPA, NZCMA, and CCANZ, plus our 'learned society', NZCS – to evaluate how we operate individually and collectively for the good of the industry.

This initiative has been very well received by the Associations, and I'm delighted to say that in December I'll be chairing the fourth in what has become a series of workshops. Our goal, to develop cohesive interaction between the different sector groups, is progressing well.

I believe it is a first for our industry to get to this stage, where representatives of its different sectors can sit in one room for a supportive discussion about their plans. The idea that particular sector goals can be achieved more efficiently together has been sustained: on 3 December, each group will be bringing its issues to the table with a view to forming a collective strategic/ business plan for the industry as a whole.

CCANZ is taking a leadership role in this process. As a commercially neutral organisation, we can both act as a facilitator for the workshops and offer some of the resources needed to identify and work through the strategic issues.

Behind the organisation of the first workshop lay some concern that the cement and concrete industry was failing to address the generic issues that will affect its future. Different sectors have tended to focus on short term goals and there has been insufficient connection between the industry Associations and CCANZ.

Through the workshop process, we are now working on the idea of a new combined industry organisation. The governance structure of such an organisation, which would provide full-time resources to deal with pan-industry and sector-specific issues, would include all existing industry sectors.

At our last meeting, it was agreed each sector group would circulate its business plan to the others before the December meeting, where we'll make a first cut at combining these documents. Our goal is a joint industry business plan and budget by the end of the first quarter, 2003.

As we continue to discuss this concept, the benefits of a more cohesive approach to both sector and generic industry issues will become clear. A new broader-based organisation may result, with a different funding structure and board representation. Consensus will be required before this occurs.

Watch for a report on the December meeting in the next issue of *grey matters*.

News...

Concrete Home Group

A meeting of different groups involved in the construction of concrete homes has been hailed as a positive step towards a cohesive growth strategy for the sector.

While the current leaky-building crisis offers immediate opportunity for promotion of high mass homes, the group's discussions, which took place in Auckland in mid-November, took a much wider look at the sector, focusing on the need for increasing demand to be matched by adequate numbers of skilled tradespeople.

"It is a big step for competitors to sit around a table like this," said David Gray of CCANZ. "We're delighted to see the participants committed to the idea of working together for the benefit of the industry as a whole."

CCANZ has undertaken to facilitate the development of a strategic plan focussing on growing market share with support from the construction companies, engineers, industry manufacturers, and the cement companies represented at the meeting.

The group, which will continue to meet on an informal basis, brought its collective experience to the table on issues such as training needs, changing insulation codes and cladding/ substrate compatibility, in addition to discussing communication strategy to support growth.

Farewell....

To **Tricia Hawkins**, who has been the friendly voice on the end of the phone at CCANZ for over 16 years. Tricia, who is retiring to spend more time on her lifestyle block close to Wellington, moved from Tawa to the city with the organisation and has, she says, survived seven chief executives during her time. She joined the organisation with the proviso that her ideal job was12 hours a week, close to home, with school holidays off – CCANZ has managed to extend that considerably, and Tricia and her administrative expertise will be missed.

Congratulations...

To **David Barnard**, of Godiva Consultants Ltd, who has been awarded a Meritorious Service Award by Standards NZ. The majority of concrete and masonry Standards in daily use in the construction industry in NZ bear evidence of David's involvement, and Standards NZ reports he has been identified as a key figure in the concrete industry by his colleagues, possessing the "broadest and most exemplary knowledge of any engineer in NZ".

To CCANZ member **Anthony Leighs** of Leighs Construction in Christchurch, who won first place in the New Zealand Institute of Building Young Achiever Awards for 2002. Anthony, who is only 30, set up his own company in 1995, which today employs 35 people and turns over $10m.

Undergraduate Excellence

James Mackechnie, CCANZ Fellow at the Department of Civil Engineering, University of Canterbury, presented the CCANZ undergraduate prize for excellence in concrete materials to Jonathon Booth at a Canterbury structures group meeting in September. Jonathon is a second professional year student.

Architecture Awards

Concrete projects around the country have been winning Local Awards for Architecture from the New Zealand Institute of Architects.

The south's reputation for high quality concrete projects was reinforced in a number of award-winning designs in that region.

In its addition to an old stone cottage in Queenstown, New Work Studio chose tilt slab walls with a roughcast finish to complement the original structure. Concrete pavers for the floor (manufactured by Stresscrete in Otaki) are made of Southland stone, in the unique autumnal colours of the region's natural material.

Precast blade columns cast into the slab form the primary structure for an Architecture Workshop home in the Gibbston Valley. The F5 finish of the columns (which were made "very economically" in Alexandra, says architect Christopher Kelly) has been left exposed, the natural material an appropriate anchor in the strong Central Otago landscape.

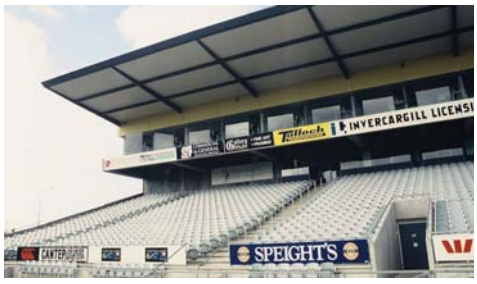
Further south, Rugby Park Stadium in Invercargill, designed by McCulloch Architects, has a strong raw concrete aesthetic. The exposed concrete structure is an integral part of the architecture, said jury convenor Mark Garden.

In Christchurch two concrete buildings received 25-year awards in recognition of timeless quality and appeal. The block and in-situ concrete Canterbury Society of Arts Gallery was designed in 1968 by Minson, Henning-Hansen and Dines; while the white painted concrete block of Peter Beaven's Tonbridge Mews, redolent of a particular era in the city's design history, dates back to 1974.

Lower Shotover House

Gibbston Valley House

Tonbridge Mews



Rugby Park Stadium

CCANZ Lecturer

CCANZ has signed an agreement with the University of Auckland to renew its sponsorship of a lecturer in the Department of Civil and Environmental Engineering.

Jason Ingham, who has been the CCANZ Fellow at the University for the past five years, has now moved into a permanent academic position at the Department, and advertising for a replacement has begun.

CCANZ sponsors the full-time lecturer to encourage teaching, research and research supervision related to concrete.

The position, says CCANZ Chief Executive David Gray, ensures students training as structural engineers become very familiar with design and construction using concrete. "The sponsored lecturer is also able to get involved in research around the use of these materials by supervising graduate and post-graduate projects. This gives the industry a technical edge," he says.

The CCANZ lecturer also provides additional support to the CCANZ technical services team and contributes to seminars and publications.

The lectureship agreement was formally signed by (from left in photo) Faculty of Engineering Dean, Peter Brothers; CCANZ CEO David Gray; Professor of Geotechnical Engineering, Mick Pender; and University of Auckland Vice-Chancellor John Hood.

An appointment is expected early in 2003.

One man's rubble...

At first it looks rather like schist. Closer inspection of Dave Baker's sinuous freeform walls, however, reveals the surprising truth: they're made of concrete rubble. The Winton man learned the basic skills of his art three years ago from Invercargill bricklayer Greg O'Connor. Since then his schemes have become ever more ambitious. The landscaping around his home, the former Winton Post Office, includes nearly 100m of walling representing maybe 100 tonnes of concrete rubble. His next project is a 3m high retaining wall. Last year Baker won a Southland District Council environmental award for his novel recycling scheme.

The foundations are 1m x 300mm reinforced concrete and the walls themselves, a minimum of 500mm thick, are rubble facing work held together with a weak cement/crusher dust mix. Concrete is a great medium but only old unreinforced concrete meets his requirements for the facings, Baker says. The rubble comes free – the locals stockpile it for him. The main expense is in chiropractor's bills.

Dave Baker, left, and one of his concrete walls, below.

Why Steel?

One of the strategic issues facing the cement and concrete industry is the identification of strategies to compete effectively with alternative commercial construction systems such as steel. To that end, CCANZ has just completed an investigation of the use of structural steel in frames of multi-level structures.

Over the past 10 years, steel has gained some share of the multi-level frame market. CCANZ's 'Why Steel?' project aimed to clarify the impact of steel on this market. To find out why steel might be chosen interviews were conducted with architects, structural engineers, contractors and owners of multi-level buildings. Research concentrated on the Auckland market, although projects throughout New Zealand were reviewed. Trends in the United Kingdom and Australia were compared with patterns of material use in New Zealand.

This project has delivered an accurate fix on how decisions about choice of material are made. It has also helped dispel myths about steel, such as speed of erection and cost. The report has also identified some key strategies to strengthen the industry's position, both technically and commercially, to ensure concrete remains the material of first choice for this market.

NZS 3101 Update

2003 will see the commencement of a two year programme to review and rewrite the concrete design Standard NZS 3101. This extremely important Standard for the concrete industry, which is now seven years old, needs modification to:

- Tie into the new joint loading Standard.
- Incorporate new research and innovation (work that's been done on grade 500 reinforcing, on precast flooring systems, lightweight concrete, and on thin panel walls).
- Match modern design methods.

In November, presentations were made to the Auckland, Wellington and Canterbury structural groups, outlining proposed modifications tabled to date and requesting feedback.

Fundamental issues requiring industry feedback include:

- Should the Standard be arranged on the basis of elements (beams, columns, walls, diaphragms, etc) or forces (ie durability, flexure, shear, etc)?
- Should a new section be provided on precast concrete design and detailing?
- Should the commentary be a separate document?
- Should 3101 be more closely aligned to an overseas Standard?

Topics tabled for review include strength reduction factors, crack widths, seismic requirements for elements of limited ductility, unbonded tendons, two way slabs, waffle slab type foundations, and fire design provisions.

At the presentations it was stressed that all feedback is extremely valuable. If a certain section causes problems, says Dene Cook, let the committee know as this forces the re-writers to review the information critically.

If you wish to comment on the Standard, either use the Standard survey form (which can be downloaded from the web) or contact Dene directly on 03 359 3853 or at dene@cca.org.nz.

All going to plan, a draft for public comment should be available in March 2004.

Cook's Clinic...

Saw Cuts

Most conventional ground floor slabs are saw cut at between 3 and 5 m centres. The cuts are provided in an attempt to force the concrete to crack where the designer intends. Although often specified, the reason for cutting the slab is often not fully understood. In this article we explore this ubiquitous construction method, by providing answers to some frequently asked questions.

Why do we saw cut ground floor slabs?

As concrete dries, it shrinks. If the slab is restrained at the edges, or by friction along the base, tension stresses will develop in the concrete over time. If these exceed the tensile capacity of the concrete, it will crack. Tensile stresses also develop in the concrete due to induced bending moments created by curling of the slab. Joints, and a saw cut is a type of joint, are provided in an attempt by the designer to direct where the concrete will crack.

Why are they normally provided at 3 to 5 m centres?

If a slab is unreinforced, NZS 3604 requires saw cuts be provided at 3 m centres. For conventionally reinforced slabs, the spacing between saw cuts is typically limited to between 4 and 5 m. Why do we need so many saw cuts? Calculations are sometimes performed evaluating the expected tensile stresses in a slab as it shrinks, created by friction along the base. These calculations usually assume only axial stresses are developed, and generally show that the joints can be placed considerably further apart than 5 m. However, these calculations fail to consider that a slab can often only lose moisture from the top surface. This creates a shrinkage gradient that causes the slab to curl. Although the amount of curling might be small, the tensile stresses it develops in the slab are large. Unless precautions are taken to avoid slab curl, saw cuts in conventionally reinforced slabs should be provided at 4-5 m centres.

Should I cut every second reinforcing bar crossing the saw cut?

Saw cut joints are normally designed as tied joints located between free isolation joints. Shrinkage movement is expected to be concentrated at the free joints, and the saw cuts are provided to prevent unsightly random cracking between the free joints. The saw cuts are not expected to open up. For this common design situation, reinforcement crossing the saw cut should not be cut. The reinforcement is placed in the ground floor slab to control shrinkage cracking. It is normally proportioned to ensure that if the concrete were to crack, the reinforcement across the crack would not yield – therefore ensuring that the crack width remains small. If some of the reinforcement is cut at the location of a saw cut, the reinforcement might yield at this location if the concrete cracks, meaning that the cuts will open up more than is strictly necessary.

When should the concrete be cut?

The preference would be to use an early entry saw and cut the slab within 6-8 hours of placement. Cutting early means the risk of random cracking from restrained early thermal contraction is reduced (refer to Cook's Clinic, *concrete,* September 2002, for more information, which can be downloaded from www.cca.org.nz).

If a conventional diamond edged circular saw is used, the slab should be cut as soon as it is sufficiently hard to get a clean cut (typically within 24 hours).

How deep and wide should the saw cut be?

A saw cut should be one-quarter the thickness of the slab, though this depth can be reduced if an early entry saw is used.

The width is dependent on whether the cut will be sealed with a flexible sealant. If the joint is not going to be sealed, a single pass of the saw blade is sufficient. This typically creates a cut approximately 5 mm wide. If the joint is to be sealed, the practicalities of installing the sealant and the movement that is expected across the joint need to be considered. The more the expected movement, the wider the joint will need to be. To be effective, a debonding tape, or backing rod, is required in the joint to prevent the sealant from sticking to the bottom of the cut. This means that a practical minimum width for a sealed joint is 10 mm.

Can the number of saw cuts be reduced or eliminated?

Yes, but you will need to explore using expansive cements or post tensioning.

Where can I find more information?

The CCANZ publications *Concrete Ground Floors and Pavements for Commercial and Industrial Use, Parts 1* and *2* are a very good sources of information. Alternatively you can contact Dene Cook of CCANZ on 03 359 3853.

We'll explore saw cuts further in the next issue of *concrete*.

Enduring Concrete

The NZ Concrete Society Conference for 2002, 'Enduring Concrete', was held in early October. Brief accounts of the different sessions follow (full reports can be found at www.cca.org.nz), reported by Neil Lee, BRANZ; Bill Hickman, Opus Central Laboratories; Warren South, Golden Bay Cement; David Sharp, BBR Contech; Gavin Wight, University of AK; Jason Ingham, University of AK; and Morten Gjerde, Victoria University.

Copies of the Conference papers (and Dr Bamforth's post-conference paper) are available as *Technical Report 27* ($60 to members, $80 to non-members) from NZCS.

Keynote Address

It is time to move durability design to a rational basis, said eminent British concrete technologist Phil Bamforth.

Bamforth advocates an approach analogous to structural design, in which deterioration processes are modelled by equations, the stress imposed by any particular environment is quantified, and condition limit states are adequately defined. This would be combined with probabilistic analysis to give a rational method for quantifying design life with respect to durability.

His proposed performance model for deterioration caused by chloride induced corrosion of reinforcement is based upon the error function solution to Fick's second law of diffusion.

The primary inputs to the model are easily measured from chloride concentration profiles developed in marine concretes, allowing substantial performance databases to be collated for different concrete types. The inputs also correlate to familiar engineering concepts of load and resistance.

While researching the model, Bamforth made the key discovery that cement chemistry plays the dominant role in determining durability. In particular, concretes containing blast furnace slag, fly-ash, or silica fume all show marked improvements in their resistance to penetration by chloride ions as they age, quantified by a time dependent chloride diffusion coefficient.

Session 2: Durability of Marine Structures

Sue Freitag from Opus International Consultants presented findings from a research project carried out on marine structures in New Zealand. Various durability indicators such as workmanship, design, exposure, cover depth and concrete properties were measured on actual elements in existing structures, then compared with the actual performance of the elements to date, the current requirements of NZS 3101, and the performance as predicted using a deterioration model based on Fick's Law. The principal finding from the work was that various micro and macro exposure conditions exist on individual structures within the C zone and that environmental exposure is the single most important parameter in marine concrete durability.

Neil Lee from BRANZ presented a research project investigating the use of sorptivity as a guide to the durability performance of concrete. Test results presented showed that sorptivity coefficients obtained are highly dependent on the preconditioning of the sample prior to test. Discrepancies noted between test results obtained from the core and the cast cylinder samples indicate that sorptivity is strongly influenced by factors such as compaction and aggregate distribution. These results suggest that absolute sorptivity coefficients may not be appropriate as acceptance criteria and that further work is required.

Melvin Maylin from Opus International Consultants outlined issues at Britomart Station, currently under construction. The underground station's proximity to the Auckland waterfront means a high groundwater table with saline water conditions, and variable ground conditions that include fill, volcanic ash, and soft sandstone. Design solutions include a combination of top down and bottom up construction methods to suit localised conditions and tension piling to overcome buoyancy caused by the high water table. Concrete specification and mix design were essentially performance based but with specific performance characteristics defined such as drying shrinkage and chloride ion diffusion requirements. A minimum compressive strength of 35 MPa was also defined and used as a performance measure.

Andrew Dallas, Technical Manager for Allied Concrete, outlined the benefits and methods of in-situ measurement for performance-based specification. Several key aspects of concrete practice, including vibration and finishing and curing, were discussed and their effect on the performance of the finished product outlined. Numerous methods of performance measurement currently exist. These range from simple measurement such as slab thickness and depth of concrete cover over reinforcement to more sophisticated measures such as in-situ determination of abrasion resistance and sorptivity. The latter methods require a build up of local knowledge to allow them to be effectively instituted.

Session 3: Concrete - Meeting the Challenges

This session dealt with business issues within the cement and concrete industry, including the ratification of the Kyoto Protocol. Murray McKee presented a high level review of how the present situation has developed. He also updated the government policy position. A negotiated 'shelter' position needs to be established to ensure continued New Zealand operation, as established industries such as cement will be faced with competing imports from non-ratifying countries while justifying investment to reduce the carbon burden.

The second paper presented efforts by the cement industry to meet what might be its future obligations. The New Zealand cement industry has been actively engaged in developing a response to the requirement to lower carbon emissions and is recognised as a leader in the local context.

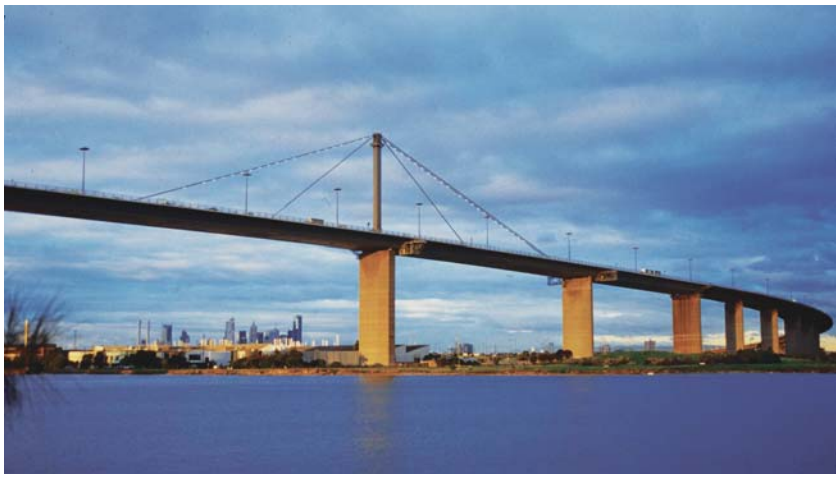
Chris Munn presented *Building Comfortable Homes*, the recent CCANZ publication that outlines the case for concrete homes – demonstrating that they are of similar cost to traditional timber and brick veneer construction but deliver improved performance in terms of energy efficiency and relative comfort levels.

The final paper demonstrated how the industry can respond innovatively to unique projects.

The wide-ranging session showed the depth of cooperation and thought within the New Zealand cement and concrete industry.

Session 4: International Advancements in Fibre Reinforced Polymer (FRP) Technology

The advent of FRP as a means of enhancing the performance of concrete has created a huge market worldwide for the design and construction activities associated with the use of these materials. In recent years, FRPs have gained international acceptance as a highly effective means for retrofitting reinforced concrete and masonry structures. Presently, a variety of international guidelines and practices are referenced for work carried out although there is no uniformity. The papers presented illustrated the mechanics, design and construction of FRPs in the international market place.



The Westgate Bridge in Melbourne used some 50,000 lineal metres of FRP.

Points noted during the discussion period included:

— Durability and design life: the track record of FRPs applied to structures is around 10 years and the real life expectancy is currently unknown. However, accelerated tests in the laboratory suggest that the performance of FRPs will be consistent with current design practices of 50 years. Carbon fibre is considered to be indestructible and resin records go back some 15 - 20 years. Coating of the FRPs is essential.

— Design of FRP in new buildings: The cost difference between FRPs and steel was historically quite significant but the technology is rapidly developing and materials are becoming more cost competitive.

— The future of FRP in New Zealand: despite some 17,000 square metres of fabric being applied to structures in New Zealand since 1995, the New Zealand industry does not currently have a national guideline available for the design and detailing of FRP for strengthening of structures. A task force that involves designers, clients, suppliers and researchers needs to be established to educate engineers of the potential and appropriate use of FRP.

Session 5: Advancements in Structural Concrete

First up Nathan Kirk outlined concrete solutions for the Vector Tunnel in Auckland: half the tunnel was constructed using a road header with cast insitu concrete; the remainder using a tunnel boring machine that placed approximately 36,000 precast concrete elements for the tunnel lining.

Graeme Beattie reported on a coordinated research project being undertaken by BRANZ, Canterbury and Auckland Universities, considering the seismic performance of slender precast wall panels. The general nature of a design guide that is currently being prepared was outlined, which will focus on walls having a single layer of reinforcing and low axial loads.

Chris Allington spoke about the new Grade 500 reinforcement, outlining concerns associated with the use of higher bar stress. He went on to outline a comprehensive analytical assessment of the range of material strengths obtained using grade 500, which has established appropriate overstrength values of 1.40 for beams and 1.35 for columns.

Jeff Matthews, a doctoral student from Canterbury, explained the background to the full scale precast hollowcore floor test that has recently been conducted. The implications of this testing resulted in the formation of a Technical Advisory Group, and the session was wrapped up by Dene Cook who outlined the composition of the Group and future test proposals.

(The Technical Advisory Group has produced two reports which summarise the work done by Jeff and the implications for various categories of buildings. These reports are available free from www.cca.org.nz)

Concrete Briefs

This session offered a chance to hear about a range of interesting research projects.

Shrinkage Characteristics of South Island Concrete came to the conclusion that not all concretes are created equal and similar materials with respect to compressive strength may exhibit different levels of dimensional stability when exposed to drying. This must be taken into account, especially when designing shrinkage sensitive structures.

Concrete Architecture - Roles of Exposed Structural Elements and Forms considered how exposed concrete structural systems or components can make a major aesthetic contribution to the architecture of a building.

The next session looked at the shrinkage crack performance of the typical concrete ground floor slab with perimeter edge restraint offered by the footings in different reinforcement scenarios. Findings were that all slabs cracked to varying degrees and that plain and deformed reinforcing mesh maintained the crack widths to less than 1 mm. Slabs that were either unreinforced or reinforced using polypropylene fibres suffered surface cracks in excess of 6 mm.

In the Use of Sprayed Concrete in New Zealand, the audience heard about the development of the application nozzle and the wet-mix process compared with the dry-mix.

David Barnard, the presenter on industry training, made the case for the industry as a whole to embrace trade qualifications as a way of shedding risk and ultimately ensuring the best results. This paper and the challenges laid down seemed a fitting way to conclude the final session of the Conference.

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Happy Holidays

The CCANZ office will be closed between Christmas and New Year. We're shutting up shop on Christmas Eve, and reopening Monday January 6 2003. Our best wishes for a happy Christmas and a prosperous New Year to you all.

New Standard (Highway) Precast Bridge Beams — PCNZ

Precast NZ's survey of precast prestressed bridge beam manufacturers found that the most popular deck cross-section is the durable double hollow core unit, followed by the long spanning I beam. These results were presented at workshops (attended by representatives from Transfund, Transit, Consulting Engineers, Contractors, and Precasters) in Wellington, Christchurch and Auckland. Feedback from these events indicates that refinements to the double hollow core beam are required to provide a more durable deck system. Also recommended was a new shape similar to the Super Tee (in use for some years in Australia), which could also double as a replacement for the Ministry of Works U beam. A report is being prepared based on data received during the three days of the workshops and ongoing consultation with interested parties.

Construction Contracts Bill — PCNZ

The Bill has been passed by Parliament, under urgency, during November 2002. Delays caused by the addition of Part 6 – Weathertight homes resolution service – have now been dealt with in a Supplementary Order Paper. This is seen as an add-on and independent of the original Bill. Precast NZ recommends members take advantage of the NZ Building Subcontractors Federation's explanatory road shows, which are expected to take place early next year.

Canterbury University/Jeff Matthews Hollow Core Seating Project — PCNZ

Precast New Zealand, CCANZ, McDowels (Wilton Joubert Ltd.) and the hollowcore manufacturers Stresscrete, Stahlton and Pre-Cast Components combined to provide funding for a Stage 2 series of tests aimed at improving the seating arrangement for the popular suspended hollowcore flooring system. The first test of an improved and revised seating detail and control assembly has been successfully carried out. A second test (of a seating detail design to provide support continuity) has recently been completed and results are expected to be reported in the near future.

Conference Acknowledgements — NZCS

NZCS wishes to thank both the speakers who made the 2002 Conference so successful and the sponsors of the event: Allied Concrete, Pacific Steel, Fosroc Ltd and Firth Industries. The Conference's trade display area was well patronised, with maximum exposure ensured for the 14 exhibitors: Auckland University; Canterbury University, Hollowcore Floor Support Group; Construction Techniques Ltd; Demden Limited; Flooring Wholesale Ltd; Fosroc Limited; Fraser Brown & Stratmore; Golden Bay Cement; Grace (New Zealand) Ltd; Novocon New Zealand Ltd; Nuplex Construction Products; Sika (NZ) Ltd; W Stevenson & Sons Ltd; and WWRMDA.

Sandy Cormack Award — NZCS

Jeff Matthews, Des Bull and John Mander from the University of Canterbury were the joint winners of the Sandy Cormack Award for their paper 'Seismic Performance of a Precast Hollowcore Floor Slab Building'. The award was established by the NZCS in honour of the contribution made to the industry by the late H.W. (Sandy) Cormack, and is presented to the author/presenter of what is judged the best paper at the Concrete Society's annual technical conference. The main consideration is the degree of originality and innovation in the development of the knowledge and uses of concrete. The recipients receive a commemorative plaque and a cheque for $1000.

Looking Back — NZCS

Gavin Cormack, Executive Chairman of Beca Carter Hollings & Ferner and Past President of the NZ Concrete Society, gave a fascinating address at the Conference on the formation of the Society and the role it played in establishing concrete standards in the state-controlled construction industry 40 years ago. Copies of the address can be obtained from the Society, and a formal history has been proposed to coincide with the 40th birthday of the organisation in 2004. Comments/ suggestions are welcome, to DerekChisholm@branz.co.nz or (04) 238 1334.

BCITO – Industry Trade Training — PCNZ

There are currently 62 registered training agreements for the National Certificate in Concrete Construction (Precast Concrete):

Northern Region	23	
Waikato/BOP	18	(one completion)
Central North Island	10	
Wellington	0	
Central South Island	3	
Southern	8	

concrete is published quarterly by the Cement & Concrete Association of New Zealand,
Level 6, 142 Featherston St, WELLINGTON. Tel: (04) 499 8820, Fax: (04) 499 7760.
Email: admin@cca.org.nz Website: www.cca.org.nz ISSN: 1174-8540

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