


concrete

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Concrete Solution for Sustainable Dairying

Concrete is a major component of a revolutionary system for sheltering dairy cows that has recently been developed in New Zealand. Consisting of a roofed complex, incorporating a concrete slatted floor and concrete effluent-processing bunker, a Herdhome® shelter is designed to increase milk production, while at the same time offering a range of environmental benefits.

Designed, built and funded by Northland dairy farmers Tom and Kathy Pow, the prototype shelter also involved AgResearch for effluent advice, and Fonterra in the testing and data preparation for Food Safety Authority approval. Dairy-InSight was also involved in the research program.

There are currently around 160 shelters in operation throughout New Zealand on a large cross section of dairy farms. Available in various sizes, the largest shelter is 10.5m by 60m, allowing enough space to comfortably house and feed approximately 200 cows. These shelters are built in clusters to suit the herd size.

The concept grew out of a desire to provide a space where farm stock could shelter and feed when it was unacceptable or undesirable to have them outside in the paddock. All efforts have been made to manage the stock and process effluent in the most natural and sustainable way possible.

The curved roof of a Herdhome® shelter is made of thick, clear, strong plastic, which allows light to pass through. The UV light kills bacteria and fungi, and assists in the drying of the floor and the effluent underneath. The roof curve generates air m ovement within the shelter, which aids in effluent dehydration and also keeps stock warm in winter and with shade cloth significantly cooler in summer.

As a shelter has no walls, air can flow freely into the internal space. Along the sides, concrete feed platforms give the cows access to feed from within the shelter, while the farmer services these areas from the outside.

The floor of a shelter is made up of pre-stressed concrete grates. These grates sit on top of two long concrete bunkers into which the cows' effluent drops and is stored. A combination of the sunlight, air movement and stock treading establishes a form of "bedding mix" over the concrete grates, providing a comfortable surface for stock to stand, lie down, calve, and walk on.

Underneath the slatted concrete floor panels are two cast-in-situ reinforced sealed concrete bunkers, where the effluent dehydrates and consolidates in an odourless state. Using a standard tractor, the concrete grates can easily be removed for the farmer to clear the processed effluent. This usually occurs only once a year, or less. Recent developments now enable the farmer to separate the liquid effluent off for more immediate use as a nitrogen fertiliser source. All this is achieved without the need for pumps, added water, or regular manual intervention.

A Herdhome® shelter - prestressed concrete grated floor.

Fabricated by Busck Prestressed Concrete of Whangarei, the concrete slatted units of a Herdhome® required careful load testing and chemical analysis to determine their resistance to the corrosive effects of effluent over time.

As an alkaline material, concrete is susceptible to attack by the acids in manure, milk and silage. Acid attack softens the exposed surface of the concrete so that it is easily worn away by water or abraded by hooves, vehicle wheels and scraping machinery. The roughened, more porous surface that results from acid attack will trap dirt, creating a hygiene problem or making the surface slippery for animals and people to walk on.

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Cement & Concrete Association of New Zealand

Upfront...

Patrick McGuire, CEO.

Welcome to the first issue of Concrete for 2008. We have rolled out our Concrete[3] sustainable concrete advertising campaign (see pg 4) which I hope many of you have noticed in trade publications *Build, Architecture Today, NZ Engineers News*, and *NZ Local Government*. Keep your eyes peeled for further placements, promoting the 12 core sustainable properties of concrete, throughout the year.

Last month, former CCANZ chairman Anthony Moss (in Glenda Harvey's absence) and I met with the Minister for Building and Construction Hon Shane Jones regarding the Government's timber design options policy. Our stated aim was to have the policy reappraised and withdrawn, or at the very least made advisory not mandatory. The basis of our case was that the policy was flawed in that it promoted the timber sector at the expense of other sectors (steel and concrete), thus providing it with a commercial advantage. The concrete sector is of similar size to the timber sector and therefore makes a similar contribution to New Zealand's GDP. The policy was developed without consulting with the wider building and construction industry. It is based on disputed economic and technical data, and is also contrary to the Government's stated position on rating schemes. The policy appears to be based on a "feel good", "timber is the most sustainable product" premise which is not supported by any robust technical position. The Minister was unable to indicate what influence he could assert at this point in time and we await his formal response in writing before following up.

In addition, the Construction Industry Council (CIC) will be writing to the Minister for Agriculture and Forestry Hon Jim Anderton regarding the lack of process and poor industry consultation that took place in drawing up the timber design options policy.

As you will be aware we have for some time been advocating the use of concrete road safety barriers. To this end an opinion piece was run by the *Dominion Post* (26 March 2008) and *New Zealand Herald* (8 April 2008) highlighting the need for an urgent reassessment of the type of median barriers being installed throughout New Zealand's roading network. For those of you who missed the article we have reproduced it on page 5. Transit New Zealand responded to the article and we have entered into discussions with their barrier team.

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However, chemical analysis revealed that the service conditions experienced by the concrete units were only mildly aggressive, and that only very minor surface deterioration occurred due to sulphate exposure. Static live and static point load tests also generated favourable results.

Case studies have indicated that farmers who have incorporated a Herdhome® shelter into their operational systems have experienced substantial lifts in milk solids production and profitability. Such growth is attributed to the range of benefits offered by the shelter, which include increased pasture production by eliminating over-grazing, and proactive routine-based winter stock management. Furthermore, the covered environment provided by the shelter during winter enhances stock quality and reduces feed demand, while in summer the temperature can be controlled through venting and shading to ensure content and productive stock.

Another major benefit of the design is that the flexibility and durability achieved through the use of concrete allows the self-contained effluent system to store and process approximately half a million litres of effluent at source, therefore avoiding the negative environmental impacts often associated with traditional effluent systems. The processed effluent is recycled back to the farm as it has a real dollar value as a fertiliser and can provide a large proportion of the annual fertiliser bill.

As the expectation for our farming systems to be environmentally sustainable increases, the use of cast in-situ concrete bunkers and prestressed concrete floor grates within the Herdhome® design have assisted farmers deliver this without compromising productivity and profitability.

Concrete floor grates removed for effluent collection.

News...

Enrolments Open for Concrete Technology Courses

WELTEC is taking enrolments for the 2008 London City and Guilds (LCG) course in concrete technology and construction, and for the extension course for the National Certificate in Concrete Technology (NCCT).

The courses are correspondence-based and there are no pre-enrolment requirements. Although, it is recommended that students are engaged in the building or concrete industry and are able to have a reasonable grasp of writing and English.

The LCG examinations are held here in New Zealand at various provincial centres in May 2009. The NCCT extension course is completed via assignment-based assessments.

Cross-credits are available for NCCT where students have completed Unit Standards from other concrete courses administered by the BCITO.

For further details, please contact the course tutor, David Barnard, who will arrange to send out the appropriate forms and more detailed course information.

Tel (04) 232 6684 Fax (04) 232 6689
Email godivadh@actrix.co.nz

Establishment of the New Zealand Transport Agency

The New Zealand Transport Agency (NZTA) will be established as a Crown entity on July 1, 2008. The new agency will replace Land Transport New Zealand (LTNZ) and Transit New Zealand and will have a mandate to give effect to the Government's vision for an affordable, integrated, safe, responsive and sustainable transport system by 2010.

The NZTA will integrate decision-making and accountability, and will retain all the functions of LTNZ and Transit New Zealand, except for the power to declare and revoke state highways, which will become the responsibility of the chief executive of the Ministry of Transport.

The functions of the Director of Land Transport will also be transferred to the Board of the new agency.

The new agency will both deliver its own projects and services and fund the activities of others. However, the agency will not be able to fund projects and services that are not contained in a Regional Land Transport Programme, with the exception of some nationally-led programmes such as road policing and research, education and training.

Creacrete™ – exploring new sides of concrete

German designer Alexa Lixfeld has experimented with temperature, moulds and the basic ingredients of concrete to develop Creacrete™, a highly dense, permanently glossy material that can be less than three millimeters thick. Abrasion and acid-resistant, Creacrete™ is an alternative to ceramics for floor and wall coverings, decorative objects, and facades. A cold-casting process, as opposed to the two firings necessary for ceramics, streamlines production – reducing cost and energy consumption. Creacrete™ has for the first time made thin-walled objects with glossy surfaces possible. It explores new uses for concrete to realise surfaces that are permanently glossy, abrasion and acid resistant, food-safe and hydrophobic.

For more information please visit www.alexalixfeld.com or email info@alexalixfeld.com

Concrete³ launches ad campaign

Using the proposition "Concrete - The Responsible Choice", the Concrete³ initiative recently launched a series of print advertisements demonstrating the sustainable properties of concrete.

The advertisements began appearing in selected national trade publications such as *Architecture New Zealand* and *New Zealand Engineering News* in February 2008.

The Flood Protection advertisement appears on page 11 of this issue of *Concrete* magazine.

The examples below will soon be accompanied by advertisements that demonstrate concrete's recyclability, CO_2 absorption capabilities and contribution to safer roads.

Fire Resistance

Flood Protection

Thermal Mass

Zero Waste – Interlocking Concrete Blocks

Counties Ready Mix Limited, situated in Drury, South Auckland, has found an innovative use for its returned and surplus concrete that enables both the minimisation of its environmental impact, and generates a valuable construction product.

In a cooperative venture with its site neighbour, Interbloc Limited, residual concrete is transformed into precision, interlocking, mass concrete blocks. The self-aligning concrete block system provides a cost-effective solution to accommodate grade changes in any landscape. The interlocking concrete block system's range of applications includes soil and aggregate bins, terrace, sea and containment walls, as well as traffic and work safety barriers. Ranging in weight from 0.5 – 1.5 tonnes each, the blocks are easy to transport, handle and assemble.

Counties Ready Mix Limited director Graham Payne says the partnership with Interbloc Limited offers numerous benefits. "Having a legitimate use for our returned concrete not only eliminates our previous disposal problem, but also frees up our fleet of trucks by allowing them to quickly discharge directly into Interbloc's true form steel moulds upon returning to the ready-mix plant."

Murray Lee, who manages Interbloc's yard, backing onto the Drury ready mix plant, says, "The blocks are an excellent way to deal with waste and surplus concrete in an environmentally sensitive manner."

This is a view echoed by Interbloc director Scott Bright, who adds, "Each block holds just under $0.5m^3$ of concrete. It's a perfect avenue for recycling material that would otherwise have to be dumped."

Graham Payne emphasises that by supporting the service offered by Interbloc, Counties Ready Mix is recycling 100% of its waste concrete.

"This is a clear demonstration that the ready-mixed industry takes its environmental responsibilities seriously, and is proactive in its commitment to New Zealand's ongoing sustainable development."

Interlocking block production using residual concrete.

OPINION

The Case for Concrete Road Safety Barriers

By Patrick McGuire

Several recent road accidents on our highways have highlighted the need for an urgent reassessment of the type of median barriers being installed throughout New Zealand's roading network.

These incidents have prompted road user groups, such as the Bikers Rights Association, to call for the wire-rope barriers to be replaced with concrete barriers to improve road safety. They reiterate the position of the Automobile Association and some emergency services specialists, which have advocated in favour of concrete barriers as the safest device for median strips.

One particularly tragic crash, on Auckland's Southern Motorway last October, resulted in the death of a young motorcyclist after he lost control of his vehicle and collided with the wire-rope barrier adjacent to the road.

Another crash on the same stretch of highway involved a truck smashing through the wire-rope median barrier, and colliding with cars approaching in the opposite direction on the other carriageway – a so-called "cross-over" accident.

And only two weeks ago, an accident on Centennial Highway north of Wellington resulted in a major traffic jam because the wire rope barrier prevented traffic from being diverted around a crashed vehicle.

There is clearly an urgent need for authorities to reconsider their policies on New Zealand's road safety barriers, as steadily growing traffic volumes on our motorways and arterial routes will inevitably result in more frequent cross-over accidents.

The cost of failing to address this important road safety issue is too great, not only for the people directly affected by the horrific smashes, but also for the health system and the wider economy.

While there has been significant investment in our roading infrastructure in the past few years, there has not been the same level of investment in the most effective road safety barriers – those made from concrete.

The wide-scale introduction of concrete road safety barriers will require a different approach from decision makers, however, who have traditionally given preference to perceived lower initial costs when choosing the type of barrier. This focus has led to a proliferation of the wire-rope barriers along our highways, as concrete barriers are about twice as expensive to install.

But long-term safety performance and lower life cycle costs, both key advantages of building with concrete, must be taken into account when making these decisions.

There is a ground swell of international opinion in support of the benefits of concrete road barriers over alternatives such as steel and wire-rope barriers. In Norway, for instance, wire-rope barriers have been banned and are being gradually replaced, while in other countries wire-rope barriers are being modified to reduce their impact in crashes to road users such as motorcyclists.

Wire-rope barriers - minimising initial cost at the expense of safety.

In 2005, the UK's Highways Agency announced an initiative to install concrete median barriers on all of England's motorways which carry more than 25,000 vehicles a day. Traffic volumes on many of New Zealand's major highways exceed this threshold.

A review conducted by the UK agency concluded that rigid concrete safety barriers provided the greatest benefit in terms of safety and reduced long-term cost. In addition to their vehicle containment and impact resistance capabilities, concrete safety barriers had reduced maintenance requirements, and did not require repairs following accidents, therefore minimising consequent disruption to traffic. At least a 50-year lifespan was also expected for concrete barriers.

Concrete road safety barriers prevent dangerous motorway cross-over accidents by redirecting the errant vehicle along the direction of the flow of traffic in which it was travelling, rather than into oncoming vehicles, regardless of the type of vehicle.

As such, these barriers easily meet the performance criteria required for New Zealand's roading infrastructure, and the evidence from overseas indicates they are a suitable and affordable alternative to the wire-rope median barriers currently being installed throughout New Zealand.

While the industry I represent may benefit from the wide-scale introduction of road safety barriers made from concrete, this issue is not about extra business or profit for our members, but the best solution for New Zealand's roading network.

When deciding what type of road safety barrier to use, New Zealand should consider all the benefits of concrete barriers, including the long-term safety performance and reduced life cycle costs. Surely New Zealanders' lives are worth it.

Concrete cloth – flexible fibrous cement

William Crawford, Concrete Canvas

Four years ago, William Crawford and his business partner entered a design competition run by the British Cement Association. At the time, they were students studying for postgraduate degrees in Industrial Design Engineering in London.

The pair had no idea that their entry for a rapidly deployable emergency shelter would result in the launch of their own technology development company involving research trips to disaster zones around the world including Uganda and New Orleans.

Four years on, and the concept has matured into a technology that has applications far beyond emergency shelter. Following development, funded through a combination of private equity investment and grants, the company has now relocated to larger premises in south Wales and is setting up the volume production facility for concrete canvas shelters (CCS) and concrete cloth.

Concrete cloth

The shelters have been enabled by the development of a core material technology called concrete cloth – a unique proprietary material that has a very wide range of applications throughout engineering.

The cloth consists of a three-dimensional fibre matrix, containing a dry concrete mix. A PVC backing on one surface of the cloth ensures the material is completely waterproof, while hydrophilic fibres on the opposite surface aid hydration by drawing water into the cement.

The cloth has the following key advantages:

- Rapid – the material can be hydrated either by being sprayed or by being fully immersed in water. Once hydrated, it remains workable for four hours and hardens to 80% strength within 24 hours. This time can be reduced by adding accelerants into the dry mix at the point of manufacture.
- Easy to use – dry concrete cloth can be cut or tailored using simple hand tools such as Stanley knives. The PVC side can be supplied with an adhesive backing and the fibrous side bonds well to concrete or brick surfaces when set. It can be easily repaired or upgraded using existing cement products.
- Flexible – concrete cloth can be easily nailed through before setting. It has good drape characteristics, allowing it to take up the shape of complex surfaces including those with a double curvature.
- Strong – the fibre reinforcement acts to prevent cracking, absorbs energy from impacts and provides a stable failure mode.
- Fireproof – concrete cloth is a ceramic-based material and will not burn.
- Waterproof – the PVC backing on one surface ensures that concrete cloth is completely waterproof.
- Adaptable – concrete cloth is currently supplied on 1.2m-wide rolls but can be manufactured with a roll width of up to 5m. The cloth can be produced in a range of thicknesses from 5–20mm.
- Durable – concrete cloth is chemically resistant and will not degrade in UV.

Delivery, inflation, hydration and setting for 54m² shelter.

Deployable shelters

The original concept was to create rapidly deployable hardened shelters that require only water and air for construction. The key to the idea was the use of inflation to create a surface that is optimised for compressive loading. This allowed thin-walled concrete structures to be formed, which are both robust and lightweight.

The shelter is deployed in four stages:

- Delivery – CCS is supplied folded and sealed in a sack. The 16m² variant is light enough to transport in a pick-up truck or light aircraft.

Interior of a concrete canvas shelter.

- Inflation – once delivered, an electric fan is activated which inflates the plastic inner to lift the structure until it is self-supporting. The shelter is then pegged down with ground anchors around the base.
- Hydration – the $54m^2$ shelter is then sprayed with water (with smaller variants, hydration takes place by filling the sack with water. The volume of the sack controls the water:cement ratio). Hydration is aided by the fibre matrix, which wicks water into the cement.
- Setting – the concrete cloth cures in the shape of the inflated inner and 24 hours later the structure is ready to use. Access holes allow the installation of services; water, power, air conditioning and heating units.

The structures are designed as part of a modular system; units can be easily linked together enabling the space to be tailored to the application. If required, they can be demolished using basic tools. The thin-walled structure has a very low mass, leaving little material for disposal.

The University of Bath has conducted finite element analysis on the shelters, showing that the structures can withstand a high distributed compressive load, enabling sandbags, earth or snow to be piled on top. This gives the shelters excellent thermal properties and protection against shrapnel, blasts and small arms fire. Concrete canvas shelters are specified to withstand 0.75m of wet sand on the sides (sufficient to stop 7.62mm rounds) and 0.5m on the roof (to protect against shell fragments).

In summary, concrete cloth can be used to rapidly create waterproof, fireproof, fibre-reinforced thin concrete forms across a wide range of applications. Some of these applications include: rapid trackway or landing

Inflated concrete canvas shelters.

Concrete cloth is a ceramic-based material; it is flexible, can be cut using simple hand tools and will not burn.

surfaces, structural reinforcement, back blinding, ground stabilisation, tunnel lining and even improvement of ballistic protection. The British Army has recently placed an order to test the cloth on operational trials.

Further information:

Readers with ideas for new applications for the material, particularly in niche applications, or for more information can visit: www.concretecanvas.co.uk

This article originally appeared in the UK Concrete Society journal Concrete for the Construction Industry (Volume 42, Number 1, 2008).

Dustless stabilisation on Stage 1 Harbour Link project

The latest in dust-free stabilisation technology has proved critical to the successful completion of the $12.3 million Stage 1 Harbour Link project in Mt Maunganui.

When Stage 1 and 2 are finished, the $255 million, 4.9km long Harbour Link project will provide a continuous, four-lane state highway linking Tauranga with Hewletts Rd and Mount Maunganui.

The dustless cement stabilisation carried out during the project used Fulton Hogan's WR 2500 SK stabiliser/recycling machine manufactured by Wirtgen GmbH of Germany. The recycler has an integrated spreading device fitted directly in front of the milling and mixing drum.

The dustless process involves a cement truck and water tanker, which are connected to the front of the recycler by push bars. This ensures continuous and simultaneous cement spreading and water injection for optimum moisture content.

The project, which was designed by BECA, involved an of 37,600m^2 area of Hewletts Rd. The design called for a heavily bound sub-base that was stabilised using 5% cement to a depth of 230mm, incorporating the sub-base and 50 mm of the sand subgrade. In total, approximately 950t of cement was used.

The basecourse consisted of either 100mm of 1.0% Cement Modified Base or 100mm of 14mm Asphalt Concrete (AC) on the intersections, with a 40mm Stone Mastic Asphalt (SMA) surface. Two applications of Polymer Modified Emulsion (PME) were used as a tack coat.

The pavement structure at the intersections, which amounted to 8100 m^2, was changed from the conforming design by using foamed bitumen as a binder. The main reason for the alternative design by Fulton Hogan was the construction advantages at the intersection areas. To help minimise traffic disruption, side roads were closed for a whole weekend while the intersections were reshaped, foamed bitumen treated, sealed & asphalted.

The binder contents consisted of 3% foamed bitumen and 1% cement to a depth 230mm. The basecourse layers consisted of 65mm of 14mm Asphalt Concrete (AC), and the running surface was done with a 40mm Stone Mastic Asphalt (SMA) running surface.

The intersections are loaded with the low-speed, high-stress demands of 70t trucks destined for either the Port of Tauranga or the Ballance Agri-Nutrients Service Centre.

Using the dustless stabilisation process meant the project could easily comply with the need for one sealed traffic lane each way to remain open, and with the dust control restrictions that where stipulated in the contract due to the presence of car and boat dealerships. Furthermore, the challenges posed by general environmental considerations, 40,000 passing vehicles each day, and the ever-present threat of heavy wind and rain made dustless stabilisation technology the ideal construction technique in terms of cost and time effectiveness.

The latest in dustless cement stabilisation on Hewletts Rd

Concrete that could save your life

It's called the Engineered Material Arresting System (EMAS).

MD-11 cargo plane arrestment at JFK International, May 2003. Photo courtesy of the Port Authority of NY & NJ

EMAS uses materials of closely controlled strength and density placed at the end of a runway to stop or greatly slow an aircraft that overruns the runway. The best material found to date is a lightweight, crushable concrete. When an aircraft rolls into an EMAS arrestor bed, the tires of the aircraft sink into the lightweight concrete and the aircraft is decelerated by having to roll through the material.

This innovative concrete is ideal for preventing emergencies like the near catastrophe involving Air France Flight 358 at Toronto Airport last year. So far 14 airports In the U.S. have installed the material and airline pilots want it to be required at all airports. The technology has already stopped three planes at John F. Kennedy International Airport, including a 747 cargo plane flown by Polar Air earlier this year.

Sydney Airport was recently the subject of complaint from the International Federation of Airline Pilots's Associations (IFALPA) urging the airport to either extend the safety areas to 240 metres or use crushable concrete to bring overrunning planes to a safe halt. Without such measures, accidents such as the Garuda Airlines crash at Yogyakarta in Indonesia last year, which claimed the lives of 21 people could still occur, the Pilots' Federation said. The Federation said 90 metres of crushable concrete could provide at least the same level of protection as a 240 metre runway safety area because it was designed to bring overrunning aircraft to a safe halt by allowing wheels to sink into the material.

The IFALPA have also expressed concern about Wellington Airport's end of runway safety areas, which although meet minimum standard, still fall short of recommended best practice, and would benefit further with a crushable concrete EMAS.

Lightweight crushable concrete blocks also provide an affordable energy-absorbing system for obstacles on highways, with much interest now being shown by road authorities for bridges and tunnels as well. The 'traffic' blocks are standardised for easy replacement. The attraction is the low cost compared to other energy absorbing barriers, easy placement without needing tools or specialist skills, and their durability. Retrofitting existing buildings to enhance their blast resistance is one of the greatest challenges facing engineers. Rather than using heavyweight additional walling thicknesses that require expensive foundations and structural supports, it has been found that lightweight crushable concrete placed against existing walls and faced with steel sheeting is very effective as an energy absorber.

For more information about EMAS visit www.esco.zodiac.com

CCANZ Library

Listed below is a small selection of recently acquired material by the CCANZ library. To request a copy, simply email library@cca.org.nz

Sustainable development and climate change initiatives
J.S. Damtoft, J. Lukasik, D. Herfort, D. Sorrentino, E.M Gartner
Cement & Concrete Research
Volume 38, Number 2, February 2008. Pages 115-127

In this paper it is argued that the cement and concrete industry is contributing positively to the Climate Change Initiative by:

- Reducing the CO_2 emission from cement production by increased use of bio-fuels and alternative raw materials, as well as introducing modified low-energy clinker types and cements with reduced clinker content.
- Developing concrete with a low environmental impact, by selecting the cement type, the type and dosage of SCMs and the concrete quality to best suit the use in question.
- Exploiting the potential of concrete recycling to increase the rate of CO_2 uptake.
- Exploiting the thermal mass of concrete to create energy-optimised solutions for heating and cooling residential and office buildings.

Production of autoclaved aerated concrete (AAC)
Schober, G.
BFT International
December 2007. Pages 4-11

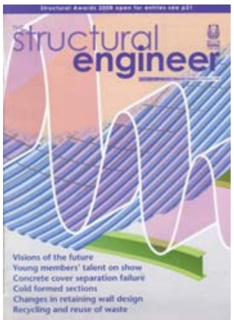
Compared to other building materials, the production of autoclaved aerated concrete (AAC) is a complex process. This is one of the reasons why production lines for AAC products still show a lesser degree of automation than facilities to manufacture bricks or sand-lime blocks. This situation is compounded by the lack of research supporting the technical processes used to manufacture steam-cured products, which means that hardly any manufacturer-independent research projects are currently being pursued in this field. As a result, the opportunities to optimise the process with respect to manufacturing cost and AAC product quality are far from being utilised fully.

Ultra High Performance Concretes
Rossi, Pierre
Concrete International
Volume 30, Issue 2, February 2008. Pages 31-34

Due to the limited tensile strength and brittleness of ultra high performance concrete, it was natural for researchers to investigate the use of steel fibres to overcome these deficiencies. The characteristics of each of the three major types of ultra high performance fibre-reinforced concrete are described, and current research is summarised.

Precast concrete parking structure lighting study
Monahan, Donald R.
PCI Journal
Volume 52, Number 6, November – December 2007. Pages 89-98

There is a perception among some members of the design community that lighting of precast concrete parking structures is not as efficient as lighting post-tensioned (PT) concrete parking structures. This is based on the assumption that there is more light blockage from the closely-spaced, precast concrete double-tee stems, compared with the wider spacing of beams in a PT concrete parking structure. The author argues that there is no difference in horizontal illuminance on the floor, or vertical illuminance on the perimeter walls, for identical lighting configurations in precast concrete and PT concrete parking structures. This report describes the configuration of the two parking structures, the lighting configuration, the design methodology, and the results of the analysis.



Recycling and reuse of waste in the construction industry
Charlson, Andrea
The Structural Engineer
Volume 86, Number 4, 19 February 2008. Pages 32-37

Various methods of recycling in the construction industry are outlined by the author, who singles out concrete as a material with few recycling options. In an attempt to develop new approaches to concrete recycling, a recent scheme in Berlin, in which precast concrete panels were reclaimed from a disused building and reused in the construction of a new house, is examined. To test the viability of this scheme, it was compared to a masonry house built in the UK, in terms of both material costs and CO_2 generated. The study revealed that the Berlin scheme was 59% cheaper than the UK construction method and produced 68% less CO_2.

Experimental formwork for facing concrete – benefits for research and practice
Lohaus, L. & Fischer, K.
CPi Concrete Plant International
Issue 1, February 2008. Pages 54-59

The appearance of facing concrete surfaces depends on many factors. The desired surface finish requires time-consuming preliminary work and exceptional quality management measures to achieve. Special test formwork, which lessens the risk of errors peculiar to facing concrete at a concrete engineering, organisational and sociological level have been developed at the institute of construction materials, Leibniz University, Hanover. Designed to assist in adjusting a facing concrete system made of formwork skin, release agent and concrete mixture, they have been tested successfully.

2008 NZ Concrete Industry Conference

Save the dates in your diary now for the 2008 NZ Concrete Industry Conference, which will be held in Rotorua from 2-4 October. The event is jointly organised by the Cement & Concrete Association of NZ, NZ Concrete Masonry Association, NZ Concrete Society, NZ Ready Mixed Concrete Association and Precast New Zealand Inc.

This is a great opportunity to join more than 350 industry decision-makers to hear about best practice and new developments. If you have a product or service to advertise, contact concrete@bluepacificevents.com for more details on trade display space at this key industry event.

New Concrete Society Conference Travel Bursary

The NZ Concrete Society (NZCS) is a learned society that promotes the use of concrete within New Zealand. Part of this promotion is demonstrating to New Zealand and the world some of the significant projects and research being undertaken using concrete.

In order to assist in promoting some of these concrete projects the NZCS will be offering a yearly conference travel bursary. The bursary will be used to assist the recipient to attend a conference and present their work.

The value of the conference travel bursary is limited to a maximum of $NZ5,000.

Applicants wishing to apply for this conference travel bursary must submit the following:

- A copy of the abstract being submitted to the conference
- A brief description of the conference
- A one page resume
- One character reference
- A breakdown of what the conference travel bursary will be used for.

Applications should be submitted to the NZCS, addressed as follows:

The Secretary
NZ Concrete Society Incorporated
PO Box 12
Beachlands
Auckland
Email: concrete@bluepacificevents.com

As part of the conditions of accepting the NZCS conference travel bursary, the successful applicant must submit a copy of the conference paper to the Society to enable it to be posted on the NZCS website, provide a brief summary report of the conference attended and provide a copy of the conference proceedings to NZCS.

Red Book Available to Purchase

The February 2008 Edition of the *Red Book (Examples of Concrete Structural Design to New Zealand Standard Code of Practice for the Design of Concrete Structures – NZS 3101)* is now available to purchase. Copies cost $295.00 (+ GST) – CCANZ members receive a 20% discount.

This edition was written following the 2006 revision of NZS 3101 and subsequent release of NZS3101 Amendment 1.

Sections A1, A2, B1 and B2 (structural frame building) were released at a series of seminars held during February 2008. Sections B3, C1 and C2 (structural wall system and low rise industrial building) will be released later in 2008.

If you purchase the Red Book now, you will automatically be sent the additional sections (and any amendments) when they become available. Notification of future Red Book Seminars will also be advised.

For further information, contact CCANZ on (04) 4998820, or email admin@cca.org.nz

CONTACTS:

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DIARY DATES 2008:

May

May 21	NZRMCA Council Meeting, Wellington
May 28	CCANZ Board Meeting, Wellington

June

June 10	NZCMA Executive Meeting, Auckland

October

October 2-4	NZ Concrete Industry Conference, Rotorua

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