MOVING FORWARD
AS THE CONCRETE NZ
READYMIX SECTOR GROUP
MESSAGE FROM THE CHAIR

Kia ora readymixers,

At the NZRMCA SGM held in Taupo during March, Full Members voted to confirm the 2018 AGM decision to ‘dissolve’ the Association and commit to Concrete NZ as the Readymix Sector Group.

The NZRMCA Council, now the Concrete NZ Readymix Committee, would like to congratulate Full Members for recognising the value in consolidating with other concrete industry sectors to gain a collective voice and advance all concrete interests.

The consolidation journey has been ongoing for several years under the guidance of Concrete NZ CEO Rob Gaimster. I would like to acknowledge the efforts of Rob, along with those of Jeff Burgess and Bob Officer, our representatives on the Consolidation Committee.

As mentioned above, the ‘NZRMCA Council’ is now referred to as the ‘Readymix Sector Group Committee’, and formerly the NZRMCA ‘President’, I am now the Committee ‘Chair’.

The consolidation has occupied a lot of resource over recent years. So now that the decision has been made to commit to Concrete NZ, we are able to fully concentrate, administrative adjustments aside, on technical and operational matters.

These matters include the retirement of David Barnard as Chair of the Plant Audit Scheme, as well as the ongoing review of NZS 3104 Specification for Concrete Production – see page 3. The Health & Safety Forum also has several issues it would like to address.

The next Readymix News will cover these topics in greater detail. In the meantime, I would like to thank our regional Chairs and Secretaries for organising some enjoyable meetings recently, as well as bring your attention to the Concrete NZ Conference 10-12 October in Dunedin.

Richard Sands
Readymix Sector Group Committee – Chair

On behalf of Full Members, the Readymix Sector Group Committee would like to thank the Associate Members below for their generous support of the recent combined North Island Regional Meeting in Taupo.
NZS 3104 REVIEW UPDATE

The current review of NZS 3104 Specification for Concrete Production continues, with the Standards Committee now having met for a fourth time in Wellington during March.

The following decisions or proposed actions have thus far been taken:

• Statistical approach proposal is closer to reaching a consensus with further options being considered and feedback sought from auditing and plant engineers.
• Revisions were made to the draft Standard on several other issues where there has been agreement by the Standards Committee with the last meeting improving definitions and including an audit checklist.
• As mentioned in previous updates there has been several minor changes put into the draft Standard, which will improve quality assurance and help clarify some clauses that previously required interpretation.

The Standards Committee will meet in early August to resolve the remaining issues, which largely revolve around the statistical approach proposal, and work through Section 2 of the Standard.

The revised programme now appears to have the draft completed by September 2019 with public comment open in October 2019.

NZRMCA WINDS UP

At the New Zealand Ready Mixed Concrete Association’s (NZRMCA) Special General Meeting held on 13 March in Taupo, Full Members voted to confirm the October 2018 AGM decision to ‘dissolve’ the Association and commit to Concrete NZ as the Readymix Sector Group.

Once remaining NZRMCA assets are transferred to Concrete NZ (i.e. Plant Audit Scheme funds) a representative from Council will apply for the Association to be removed from the register of Incorporated Societies. It is anticipated that this will take place around August 2019.

Incorporated on 03 September 1964, and openly based on the American Association model, the NZRMCA sought to advance the industry across technical and business management fields. The proud point of difference, however, was the adoption of a grading scheme designed to classify ready mixed concrete plants based on the quality of their output.

In 1964 the Scheme had 49 member plants, with 1963 statistics indicating that the average quarterly production was 134,464 m$^3$ (175,873 yd$^3$). Although quite respectable for the early 1960s, in 2019 the Scheme boasted around 200 plants and average quarterly production of over one million m$^3$.

The Scheme operates today as the Plant Audit Scheme; having over recent years become automated, and more lately moved under the Concrete NZ umbrella – see below.

While the decision to ‘dissolve’ will end over 50 years of NZRMCA activity, work continues to offer Members value for their membership dollar.

As the Concrete NZ Readymix Sector Group ready mixed concrete producers have joined a consolidated voice that will help to improve perceptions, raise standards and promote quality.

PLANT AUDIT SCHEME REBRANDED

As part of the transition from the NZRMCA to the Concrete NZ Readymix Sector Group, the Plant Audit Scheme has undergone a rebrand to align with Concrete NZ.

This in no-way impacts on the operation of the Scheme, other than for key documents (Quality Manual and Handbook) and the Scheme website (www.rmcplantaudit.org.nz) being updated to reflect the new branding.

The Scheme will continue to audit Concrete NZ’s Readymix Sector Group members’ ready mixed concrete plants, as defined in New Zealand Standard NZS 3104 Specification for Concrete Production.

The Scheme provides an independent and rigorous audit of the quality systems in place at a ready mixed concrete plant. Without the scheme, purchasers and specifiers would be faced with a costly and time consuming audit of concrete quality for each construction project.
CONCRETE NZ WELCOMES DENE COOK AS CHAIR

Concrete NZ has announced the appointment of Dene Cook to the position of Chair.

Dene, Firth Industries’ Division Technical Manager and current Concrete NZ Board member, will replace Holcim New Zealand’s Glenda Harvey, who has been Concrete NZ Chair since the Association was launched in August 2017.

A qualified structural engineer, Dene has over thirty years’ experience in the building and construction industry, having worked as a consultant engineer, with the Cement & Concrete Association of New Zealand (CCANZ) and more recently Firth Industries and Fletcher Building.

Dene said he was thrilled to be appointed Chair and was excited about the opportunities and challenges that lay ahead for the young Association and the wider concrete industry. “The construction landscape is currently very dynamic, add to that pending regulatory changes and Standards development, and you have an environment where Concrete NZ, as the industry’s consolidated Association, will play a major role in advancing concrete interests,” Dene says.

Rob Gaimster, Concrete NZ Chief Executive, in welcoming the new appointment, also acknowledged the contribution former Chair, Glenda Harvey, made during her tenure.

“Glenda has been a wonderful leader as the inaugural Chair of Concrete NZ, and now the progress made over the past several years can be maintained under the watch of Dene, a tremendously knowledgeable and experienced operator.”

CONCRETE NZ APPOINTS DAVE MCGUIGAN

Dave is a Chartered Professional Engineer and obtained a Bachelor of Engineering and Master of Engineering degrees at the University of Canterbury.

Dave joined Concrete NZ from the Building System Performance branch at the Ministry of Business, Innovation & Employment (MBIE) where he was the Deputy Chief Engineer and Acting Chief Engineer during his time there.

As part of his various roles at MBIE, Dave sat on Standards committees and also led the MBIE investigation into the performance of Statistics House in the 2016 Kaikoura earthquake.

Prior to MBIE Dave worked in private consultancy, which included five years in the United Kingdom and the Middle East. In these locations Dave undertook design management roles on significant projects including London’s Heathrow Terminal 5 and the Bahrain City Centre development.

Returning to New Zealand in 2010 Dave led seismic assessment programmes for New Zealand building portfolio operators following the Canterbury Earthquakes.

Dave is keen to ensure that future Standards promote effective and efficient concrete design.

BLOW-BACK AND PUMP-BACK SAFETY ALERT

This updated Concrete NZ Safety Alert addresses the issue of concrete blow-back and pump-back into the concrete truck mixing bowl, which can be an inherently dangerous procedure unless carefully controlled.

Blow-back uses high air pressure to move residual concrete from the line or boom pump back into the truck mixer or bowl. Air pressure will cause anything inside the pipe to act as a high velocity projectile.

Pump-back is the return of residual concrete to the truck mixer or bowl by either line or boom pumps, excessive pumping pressure creates similar problems to blow-back.

- Risk 1 – High air pressure or pump line pressure and pipe movement during blow-back or pump-back can cause pipe joints to fail and break apart.
- Risk 2 – Concrete in the pipe is subjected to high pressure during blow-back or pump-back and can cause the hose to eject from the concrete bowl or material to rebound and exit the concrete bowl. In both situations there is the potential to cause injury or damage.
- Risk 3 – Climbing a concrete truck ladder while carrying a line pump pipe or trying to manoeuvre a pump line while not having three points of contact creates a high risk of fall from height.
- Risk 4 – Control measures previously deemed as acceptable in both blow-back or pump-back have not been adhered to resulting in injury or damage.

In response to these risks, Concrete NZ strongly advises against the practice of accepting blow-back or pump-back from concrete pumps.

Download the updated Safety Alert from the Concrete NZ website – www.concretenz.org.nz
DUNEDIN 10-12 OCTOBER 2019

REGISTRATIONS OPENING SOON
www.theconcreteconference.co.nz

KEYNOTE SPEAKERS

DR ANDY DAVIDS
RENOWNED TALL BUILDINGS EXPERT
THE ART AND SCIENCE OF THE WORLD’S TALLEST BUILDINGS

DAVID ROWLAND
NCTIR COASTAL STRUCTURES TEAM LEAD
MOVING MOUNTAINS TO RECONNECT COMMUNITIES
Concrete apprentices from around New Zealand are encouraged to showcase their abilities and desire by entering the 2019 Concrete Industry Apprentice of the Year award.

Entries are now open, and apprentices can be in to win a share of around $10,000 in prizes, as well as the sought-after title of 2019 Concrete Industry Apprentice of the Year.

Concrete NZ Chief Executive Rob Gaimster believes the rationale for establishing the award in 2017 remains relevant - primarily the huge need for skilled concrete workers, as well as ensuring that those thinking about a career in construction are aware of the rewards on offer through the concrete industry.

"Within the construction sector, our industry has always found it difficult to attract and hold-on-to qualified workers. Over recent years this has become more of an issue with activity remaining buoyant and therefore offering prospective workers plenty of options."

“The Apprentice of the Year award has a long and respected history of recognising exemplary young people in trade training. So, to continue to offer a concrete version as an incentive for those looking to work with concrete, just makes sense,” says Rob.

“Going to the effort of completing an entry so that you can be compared against your peers sends a clear signal of commitment.”

The award is open to all those enrolled in, or who have recently completed, one of the following Building and Construction Industry Training Organisation (BCITO) concrete based National Certificates:

• Precast Concrete (Level 3)
• Concrete Production (Level 3)
• Product Manufacture: Pipe (Level 3)
• Product Manufacture: Masonry Product (Level 3)
• Construction: Sawing & Drilling (Level 3)
• Construction: Placing & Finishing (Level 3)
• Concrete Construction (Level 4)

“The Concrete Industry Apprentice of the Year award is built on the belief that dedication and hard-work leads to success, that apprentices are professionals in the making, and that the concrete industry offers a range of exciting options for those considering construction,” concludes Rob.

Concrete apprentices, their employers and assessors must all complete an entry form.

• Apprentice Entry Form
• Employer Entry Form
• Assessor Entry Form

Entries close Friday 06 September 2019, with details available on the Concrete NZ website – www.concretenz.org.nz
CONCRETE WASHOUT RECLAIM PLANT

PLANT BENEFITS

• Recover Sand, Water and Aggregates for Beneficial Reuse
• Minimise Foot Print (Reduce Waste Storage Areas)
• Minimises Material Handling Costs by Reducing Rehandling

ENVIRONMENTAL BENEFITS

• Increase water recovery
• Less top up water required for sand and aggregates washing
• Filter cake may be transported without liquefying
Te Awamutu-based manufacturer of precast concrete products and supplier of ready mixed concrete, Bowers & Son Limited, has recently undergone significant expansion as it seeks to further enhance its long-standing presence in the industry.

Bowers & Son is managed by directors Jeff and wife Robyn Bowers, their son Lachlan as well as their nephew Scott and wife Rebecca Hill.

The business was established in 1948 by Jeff’s grandfather Howie and father Raymond Bowers – hence the name “Bowers & Son”.

Jeff and Robyn’s three children have also worked within the business at various times – with son Lachlan having recently acquired shares to expand ownership into the family’s fourth generation.

Bowers & Son is the only company in the Waikato region licensed to manufacture Duracrete tanks, using its award-winning technology to produce strong and durable products. It is clear when speaking with Jeff and Rebecca that family values are at the core of their business, as well as a desire to be actively involved in the Te Awamutu, Otorohanga and wider Waikato communities.

“We are proud of being a family-based and operated company and we would enjoy seeing this continue into a fifth generation,” says Jeff.

“There are some members of our staff who are part of the same family – fathers and sons, brothers and cousins – so we have a great sense of family spirit within the workplace.

“Many of our staff have been with us for ten years plus. One person has been here since leaving school and he is now in his 50s. We have watched our staff start their own families and have enjoyed seeing them mature.

“We have had several staff members depart for their overseas adventures and return home to Bowers. We are a tight family unit and pride ourselves on this.”

The directors are pleased to see several of the company’s trucks in the space of a few minutes on the drive to work.

“That is a sure sign you’re out in the community and part of
something special. We do a lot of sponsorship and support many community initiatives, with sports clubs and schools – the grass roots stuff.”

GROWTH AND NOTABLE RECENT PROJECTS
Starting the business from the garage at the back of Howie’s house, both Howie and Raymond’s initial focus was the production of water troughs and pipes.

A mobile ready mixed concrete plant was acquired in the 1990s, which then led to investment in a fixed plant and trucks.

A flurry of expansion has occurred in the past two decades, including:
- early 2000s – a factory was built to manufacture precast water tanks
- 2012 – the purchase of an independent ready mix concrete plant in Otorohanga (formerly Michael Watson Contracting)
- 2016 – Bowers & Son opened a second factory in Te Awamutu to manufacture all other precast products, including the popular Duracrete licensed water tanks

“In the space of 20-odd years, we have seen significant expansion, to the point where we have nearly doubled in size.”

Still based at the original site that Bowers & Son was established on in 1948, the business maintains Howie and Raymond’s core principals, while at the same time embracing growth opportunities and modern technology.

The business currently employs 50 staff, of which half would have family ties within the company. Decked out in the company’s long-standing royal blue and white livery, the Bowers & Son fleet includes three Hiab trucks to deliver precast products and 16 ready mix concrete trucks.

EVOLUTION
A trend observed over the years by Jeff and Rebecca is a steady increase in the volume of both ready mixed concrete and concrete products required for specific purposes.

“Farms in current times are expanding in size, what once was a 60-hectare farm is now 100, 150, 200 hectares. Farmers are changing the way they feed stock and manage pastures, now requiring standoff pads and feed troughs for alternative nutrition, and this has grown the market for concrete products.

“With environmental concerns, farmers are implementing greater effluent control practices, and due to this we are seeing a flow-on effect, as we are providing effluent tanks, systems and products.

“A farmer will often come along with a particular need and we sit down and work out how to make a product that will ‘fit the bill’. That is how a lot of our precast products have evolved into what we make today. This includes products such as free-standing walls and a panel arrangement to provide segmented effluent tank up to 30 metres in diameter.”

The directors also note the business is benefiting from such factors as new subdivisions in the region driven by population growth, changes in district plans and greater awareness around water issues.

RECRUITMENT, TRAINING AND ASSOCIATION MEMBERSHIP
Jeff and Rebecca lament the recent rescinding of the 90-day trial employment legislation, which has made it difficult for them to employ local people and “give them a chance”. They also note that available school leavers seem in short supply.

As such, Bowers & Son are finding there is a greater need for migrant workers.

Over the years, the business has helped a number of staff acquire heavy vehicle licenses, including wide load pilot licensing and are continually funding opportunities for employees to upskill and acquire necessary health and safety unit standards. This also ensures health and safety is at the forefront of their business practices moving forward, with Rebecca leading the way on these changes.

On a related topic, the company highly values the decision to become certified to the New Zealand Ready Mixed Concrete Association (NZRMCA) Plant Audit Scheme1 over a decade ago.

“It didn’t take us long to recognise there was an advantage in being part of the NZRMCA and going through the auditing process. Some jobs will require certified concrete, so it opens a wider scope of supply.”

Being members of Concrete New Zealand has also provided good contacts, networking opportunities and sharing of information – an alert from the association even coming through at the time of being interviewed. Company representatives aim to attend each year’s annual conference and are on the association’s Health and Safety forum.

“There is certainly more of a focus on health and safety, not just for us, but everywhere. So, it is now a key part of the business and involves adapting existing processes to create an environment that is going to be accepted by staff and which complies with regulations. It is not necessarily easy, but the rules apply to everyone.”

RELATIONSHIPS
Providing top-quality customer service and maintaining relationships is another core value of the business.

“That is something we work really hard on – not just with ready mix but with our products and delivery of our products. We get plenty of positive comments and someone always seems to be dropping off a box of beers for the concrete batcher because he went out of his way to help.

“We have developed many long-standing relationships over the years. Having dealings with all types of businesses – including builders, farmers, effluent and irrigation specialists, plumbers and drainlayers – as well as the general public.”

1 The NZRMCA Plant Audit Scheme is now the Concrete NZ Plant Audit Scheme – see page 3.
The improvements to the Wellington Northern Corridor – Levin to Wellington Airport, are being constructed across eight sections. The latest NZ Transport Agency project heading north is Peka Peka to Otaki (PP2O), which is a four-lane highway that will bypass Otaki. It includes the construction of interchanges, a rail overpass, a river overpass and a huge amount of concrete from the local Firth teams.

Firth was the principle concrete supplier to the Alliance for the 18km Mackays to Peka Peka (M2PP) section, which opened to the public in February 2017, so was delighted to also be awarded the concrete supply for the next stage of the project – Peka Peka to Otaki (PP2O).

“We have plants in Otaki, Kapiti and Levin that have been supporting the sections of the Wellington Northern Corridor project from the beginning,” says Ian Morby, Area Operations Manager (Wellington & Manawatu) for Firth. Firth upgraded their plants in Otaki and Kapiti with improvements to the batching plants and an increased fleet in early 2014 to enable supply of the high volumes of concrete required for the project.

The work includes high performance concrete for piles of up to 3 m in diameter, cross heads, piers, abutments and bridge decks. “We have also been supplying the concrete for the ‘Super T’s’ to Brian Perry Civil which are being made off-site at their Otaihanga precast yard,” says Ian. “Our Kapiti plant has been supplying that side of the work which to date totals about 5,300 m³. “With an additional 11,000 m³ of in-situ concrete supplied since October, which represents the bulk of the projected requirement, and over 40,000 m³ already supplied to the M2PP section of the corridor, project demands have been keeping the local Firth teams on their toes for the past few years.

And that’s not all...

“In addition to the high volumes supplied to PP2O our Kapiti plant continues to also supply high strength spray concrete to the Transmission Gulley project,” says Ian. “We have supplied 3,600 m³ of a 5,000 m³ order which is testament to the flexibility and ability of the guys at the plant and especially of Gerard Howard, the Plant Supervisor, who is successfully managing both projects on a daily basis.”

“On top of all this we recently received a call from the Transmission Gully Project team requesting our help with the supply of approximately 5,000 m³ of 5 MPa flowable fill concrete. This is being supplied from our Kapiti plant. Over a six week period we have managed to supply 3,600 m³ of the overall 5,000 m³ requirement which was supposed to be shared 50/50 with another supplier.”
“Over the last 18 months there has also been an ongoing requirement for Cement-Treated Base (CTB) for the stream diversions across the Transmission Gully section of the Wellington Northern Corridor, (south of the completed M2PP section)” explains Ben Jury, Major Projects Delivery Manager for Winstone Aggregates. “We were approached by the Northern Zone Manager to provide a stabilised GAP20 product for their stream diversions. Our partnership approach with the CPB HEB JV on this project ensured we were their first port of call for a solution.”

“The obvious solution was to engage Firth, our sister company, as Firth Belmont has a central bowl mixer and we have previously worked with them on another stabilisation project,” said Ben. “This requires very good coordination and communication between all the parties to mix this product in amongst Firth’s normal work and keep our customer supplied with what they need.”

“The Winstone Aggregates team liaise with us as to what other work we have on and when we can process the CTB and at the volume they need,” says Ian. “We have been able to choose quieter times to process the mix and have the flexibility to switch our normal concrete deliveries to our Aotea plant which has been working really well and which means we can keep the CPB HEB JV supplied.”

“The logistics of having the plant available, trucks ready and the weather playing ball are crucial, as this material can only be placed on dry days,” says Ben. “This involves meticulous planning and we work with the Transmission Gully team on a daily basis to ensure we can help them meet their targets. Ian and the team at Firth have been great to deal with and understand the flexibility required for these works. They have made the plant available to make this product during an exceptionally busy period for them.”

“The stream diversions are a critical part of the project and there is a large team of Ecologists and Hydrologists at Transmission Gully who ensure the design creates the best conditions for a new habitat to establish,” adds Ben. “The two largest sites for diversions are the Te Puka and Horokiwi streams.”

“Up to the end of June we have processed about 8,800 m³ of the CTB mix plus their other requirements,” says Ian. “It’s been busy but that’s good – that’s what we’re here for.”
FIRST-CLASS DEVELOPMENT AT WATERLOO STATION

JOSH BENNETT – TARMAC

Advanced concrete technology including high early strength and bespoke self-compacting mixes have been integral to the redevelopment of Waterloo, the UK’s busiest railway station.

A major £800 million overhaul by Network Rail has built greater rail capacity and an improved passenger experience for Waterloo station’s 500,000 daily users. As a showpiece in the national rail network, exacting quality and visual standards and innovative installation of materials were crucial.

The extensive works involved reconfiguring platforms 20 to 24, bringing the former Waterloo International station back into use and extending platforms one to eight to allow for longer ten-car-length trains to operate from the station. The refurbishment is the biggest package of improvements delivered to the station since the 1930s and has increased its capacity by 30%, equating to an extra 45,000 passengers annually.

The Wessex Capacity Alliance (WCA) – a consortium of Skanska, Colas Rail, Mott MacDonald, AECOM and Network Rail – was tasked with delivering the vital upgrades and brought Tarmac on board to fulfil the specialist concrete element of the works.

Given the holistic and multifaceted nature of the redevelopment, flexible approaches were required for the concrete supply. In collaboration with the WCA materials team, Tarmac developed several bespoke Self-Compacting Concretes (SCCs) to meet the brief’s complex requirements.

When it came to constructing the platform walls, access was severely restricted. A mix had to be designed that could be placed within a confined space, while also mitigating against the potential for cracking in walls with very little steel reinforcement. To meet these challenges, Topflow SCC with shrinkage-reducing admixtures and a blend of micro/macro-synthetic fibres was used.

This mix was only designed for a small section of the work, but the WCA team was impressed with how the bespoke material performed. This led to use of several other variants of the mix in parts of the works that had originally been intended to be constructed with conventional concrete, including work on another upgrade at Vauxhall station.

AESTHETICS AND PERFORMANCE

The impact walls that mark the end of the tracks were also constructed using the free-flowing SCC. At 4 × 3 × 3 m, the risk of early-age thermal contraction cracking needed to be managed. As the walls will remain exposed and form a prominent feature of the station’s platforms,
it was important that a high-quality finish was achieved. Aesthetics were therefore a key consideration and the final concrete needed to deliver strong visual appeal as well as uncompromising performance.

These two challenges were met by designing a bespoke 'low-heat' self-compacting concrete, which was trialled on-site prior to the installation. The concrete enabled a high-quality finish by removing the need for compaction by site operatives and, in doing so, eliminating the risk of under-compaction. The temperature of each pour was then monitored during installation to ensure any heat evolution was within the specified limits, guarding against early-age thermal contraction cracking.

The real test came during the upgrading of platforms one to four. The works were so significant that the platforms needed to be closed to passengers for 24 days, creating significant disruption and making it vital that the work was completed in the specified time period.

Working collaboratively, Tarmac, BASF and the WCA members’ technical teams designed a bespoke Toproc Rapid concrete with a set-accelerating admixture, which was added at site before placement by technicians. The mix was tested extensively at Tarmac’s King’s Cross plant, along with full-scale pumping trials to optimise the mix design and simulate the placement. A full-scale site trial was also performed during construction of the temporary site office that was erected prior to the platform closures.

**EARLY-AGE STRENGTH**

The old foundations of the platforms needed to be excavated and replaced before being loaded with 2-tonne precast platform sections. In order to take the load and keep within the programme requirements, the concrete needed to achieve a compressive strength of 20 MPa in just eight hours. To further complicate the brief, the only access to the platforms was from outside the station, so it was imperative that the material could be pumped up to 200 m.

This was no small feat. The accelerating admixtures required to meet the early-age strength meant the concrete was setting within an hour, so Tarmac had to move fast.

It was very important to keep deliveries to schedule and disruption to a minimum. In addition, the material had to arrive at the correct intervals, as the concrete’s life-span was short and the pour sizes required constant pumping.

The concrete pours were carried out at night when the central London traffic had died down and over the course of three nights 150 m³ of the bespoke mix was placed successfully.

Supplying a concrete that could reach the desired strength in such a short space of time was vital. Beyond the technical expertise required to realise the mix design, the regular communication between the partners was equally important to keep the project on track.

More than 230 million railway passenger journeys are made to and from Waterloo every year – an increase of over 100% in the past 20 years. The concrete innovations used in the recently completed station refurbishment will help to futureproof this vital asset for the next 20 years and beyond.
DRONING ON ABOUT CONCRETE

Well, not quite, as we’re talking about a mixture of clay and fibre – but application by drone is pretty cool.

Stephanie Chaltiel, founder of MuDD Architects, has grabbed headlines by using drones to coat a shelter in clay, demonstrating a fast construction method that could be used in disaster zones.

Chaltiel spoke recently to Dezeen magazine about MuDD’s Mud Shell at the 2018 London Design Festival, a sturdy domed shelter from bags of hay attached to a wooden lattice that was then sprayed with a mixture of clay and fibre using a drone.

The resulting structure can be constructed rapidly, in this case just four days, from cheap, lightweight and readily available materials. It combines the ancient building techniques of wattle and daub with cutting edge drone application technology.

Little sacking bags filled with hay were mounted on a formwork of wooden struts arranged in a dome shape. The drone-sprayed coating binds the structure together, making it durable, weatherproof and permanent.

Chaltiel is hopeful that this system could be applied to building emergency housing in disaster situations or refugee camps, using clay sourced from the surrounding site.

She has been experimenting with a variety of mud mixtures with her projects. “My work has been to fine-tune which material could be fitted in the drone. We work to make the tool viable so you can spray huge amounts and have a constant flow of material, which is a limitation at times for digital fabrication.”

Clay acts as the glue and arid ingredients such as sand, marble powder and lime absorb excess moisture. The architect has experimented with adding different fibres to the mix to reinforce the structures and prevent the surface from cracking.

“For a recent project on London’s Southbank we used linen fibres, which are really thin and long, a bit like a human hair, that breaks down in the machine, so it doesn’t block the pump,” Chaltiel explained.

The drone was custom made by the team’s engineers in Belgium at the University of Leuven, and requires a pilot and a co-pilot. The mud mixture is fed through a hose underneath that acts like an umbilical cord.

Chaltiel hopes that the installation proves the drone spraying system has the potential to be used safely for construction in dense urban areas.

REFERENCES:
MuDD Architects. https://www.muddarchitects.com/
CONCRETE NZ READYMIX SECTOR GROUP COMMITTEE MEETINGS

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<tr>
<td>Committee</td>
<td>Wednesday, 7 August</td>
<td>9:30am - 3:00pm</td>
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<tr>
<td>Committee</td>
<td>Wednesday, 6 November</td>
<td>9:30am - 3:00pm</td>
<td>Miramar Links Golf Club, Wellington</td>
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CONCRETE NZ READYMIX SECTOR GROUP MEETINGS
(CHECK LOCAL NOTICES FOR PRECISE TIMES)

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<tr>
<td>Readymix Sector Group H&amp;S Forum</td>
<td>Wednesday, 18 September</td>
<td>10.00am – 3.00pm</td>
<td>Novotel Auckland Airport Auckland International Airport</td>
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<td>Readymix Sector Group Annual Meeting</td>
<td>Thursday, 10 October</td>
<td>11.30am</td>
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<td>Concrete NZ AGM</td>
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DISRUPT & EMPOWER WITH JOEL BOUZAID

Based in Wellington, Joel Bouzaid is an owner of Maia CrossFit, Director of Leadership at Scots College, and runs his own Thought Leadership Practice as an inspirational keynote speaker and trainer, focussing on ‘Team Culture’.

Courtesy of Holcim New Zealand, Joel spoke at the Concrete NZ Readymix Lower North Island meeting at the Copthorne Hotel in Wellington on 11 July.

Whether you are looking to create an intimate programme to ignite your team culture and increase performance or to disrupt your organisation from the bottom up - Joel is your guy!

Joel Bouzaid's Wellington presentation was proudly sponsored by Holcim New Zealand, associate members of Concrete NZ Readymix.
At Golden Bay Cement, the product we make is genuine NZ made, NZ grade cement.

It is strong, reliable and consistent.

Being Genuine is part of our fundamental approach to how we work as a team and work with our customers.

This is who we are.