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## Issue 027, September 2016

### From the Chair...

Hello and welcome to this issue of CETANewZ, the first under a new committee. Looking at the names I see this committee contains fresh faces mixed in with some significant industry experience. We are most grateful to have Jayden's wealth of experience and knowledge continuing to lead the technical working group.

Welcome to our new members in the CPT working group. This group has an excellent opportunity to shape the future of CPT testing and, I am sure as a collective will have a positive influence and results in many areas.

Reflecting on the conference held just two weeks ago, there is general consensus that the quality of papers presented and more importantly, their relevance and timeliness to current issues showed that our members and their supporters are at the forefront of improving the way civil engineering materials are tested within our great country.

The things that stood out for me were:

- Work safe and how they see themselves as an organisation applying the new laws to industry
- Education and staff retention, this is something that we all have lamented in the past
- New ways of designing pavements
- A Scala/ DCP innovation that is finger friendly
- The customer experience, how every 'touch point' is critical to the overall journey and satisfaction of our clients
- The rock crushing process – from quarry face to end product.
- Dealing with the pressure and data overload of providing testing services on nationally significant infrastructure projects.
- The size and progressive nature of the Ports of Tauranga Operation and the ships they are now expecting to dock.
- Highwaymen in Taranaki are decent folk who only wish to rob those who don't work hard for their money (thanks to Te Radar for an enlightening and entertaining dinner talk)



The AGM generated great discussion and ideas, work will be done in the next while to assess and if agreed action these ideas to the benefit of our membership throughout the country.

It is very encouraging that already we have had contact from a member in the South Island who is keen to host a CETANZ get together in the next month or two. This is something I will try my best to attend and hopefully it will be the start to an active CETANZ presence in the South.

Looking nationwide, projects are at the tender or construction phase like never before, in

- Christchurch, there has been a slowdown after the initial boom of the rebuild but there are still some projects in the pipeline to ensure that the city is restored to a new look in the near future.

- The Wellington region has several large projects that continue to dominate and will continue for some time yet. Here it is not only Road infrastructure projects but a potential Airport runway extension and ongoing earthquake compliance work.

- Further up the North Island, the Waikato Expressway rages ahead in time to assist the hordes of Aucklanders' to faster flee to the regions.

- The Auckland City Rail link plans continue, among several other main arterial routes including an extension to the highway north of the city where a lot of people head each summer to populate the beaches up that way.

Let's not forget regionally there are many other projects that are associated with the current building boom we are experiencing. This brings many opportunities to our industry. With so much going on I can only see the next few years being a busy for us all.

In a Chairs address I believe there should not be an excess of 'I's from the top so they have intentionally been avoided in writing this. In saying that however, you may be interested to know that I have been in this industry for over 20 years now since a young age, from both an engineering consultants perspective and now from a construction based perspective.

The photo below depicts a young Danny (not posing) heading a test pit team in Arthurs Pass to assess the pavements under the 52 NZTA 'Benchmark' sites. These sites stretched from Cape Reinga in the North to as far South as the 'Presidential Highway' from Clinton to Gore and was a great way to see the country.

Ask others that have worked with me in the past and they will tell you that I LOVE doing test pits, there is a certain beauty in a test pit dug with perfectly straight sides from top to bottom. It is good honest work and my competitive side enjoyed trying to smash out as many as I could in a day.

Enjoy the rest of this publication.

Regards

Danny Wyatt

CETANZ Chair



## *Caption competition.....*



What on earth do you think could be going on here?

Send your caption to [info@cetanz.org.nz](mailto:info@cetanz.org.nz) by 30 September. The best caption will win a \$50 voucher of your choice for Farmers, iTunes, Countdown, Pak n Save or Hunting & Fishing. Judges decision is final.

## *On a Global Scale .....*

### Could this be a world first?

Travelling through tunnels may be an everyday occurrence for some, but how would you feel about driving through a tunnel submerged around 30 metres below the surface of the water in a fjord?



(Image credit: Statens Vegvesen / NPRA)

Engineers in Norway want to build an underwater tunnel that floats in one of their fjords. Proposed as part of the E39 coastal highway route which runs approximately 1100km in length from Kristiansand in the South to Trondheim in the North, the aim is to create a road without ferries that will reduce the current travel time of around 21 hours down to a mere 11 hours.

Officially called a submerged floating tube-bridge (SFTB), this is currently one of three proposals being assessed for crossing this particular fjord. A final decision is expected by the end of 2016.

The original and full article can be found here <http://www.forbes.com/sites/lauriewinkless/2016/07/22/could-norwegian-engineers-really-build-a-floating-tunnel-in-a-fjord/#259a873f6878>





## Science and Engineering Summer students

**Only 2 months left to get your requirements in**

### The story so far

We have had a great response from our employers who have already identified their requirements for this summer and we have a record number of students who already have their placements secured. So a big thank you from the Cooperative Education Unit with helping us find summer work placements for our students.

Our students have been travelling across the country to attend interviews for various placements and even skype meetings with our employers overseas. We are now in full swing with students securing placements daily and the office couldn't be busier!

Having said that, **we still have students who are looking for summer placements.** We have students looking for placements in their home regions of Auckland, the Bay of Plenty and of course the Waikato so let us know if you would like a student for any projects or other general tasks this summer. Also, we are particularly keen to find Earth Science placements. We have a lot of very keen students who have been inspired by great lecturers, and who now want that hands-on experience to link their university learning into the real world.  
(Contact [j.springall@waikato.ac.nz](mailto:j.springall@waikato.ac.nz) or on 07 837 9454 with your requirements and Jodie will pass them on to the relevant Coordinator)

## Alarm bells over buying low-cost steel

Australian and New Zealand Standards Authorities have released warnings over non-compliant low-cost steel being bought for local projects. Kiwi steel expert, Ian Jacob (pictured), who is based in Asia, offers *Contractor* readers his advice on avoiding being caught out.

**WITH QUESTIONS OVER** the standard of steel sourced in this region from low-costs countries the Australian Certification Authority for Reinforcing Steels (ACRS) has issued a warning about the potential supply of construction steels of unconfirmed origin and quality.

“Due to the strong focus on quality and safety in the Australian construction industry, local builders, specifiers, designers and customers expect construction materials to comply with all relevant Australian and New Zealand Standards,” it says.

“However, with reinforcing, pre-stressing and structural steels now sourced from multiple suppliers both from within Australia and from other parts of the world, often even within a single project, designers, specifiers and contractors can no longer assume that the construction steel delivered to the construction site will necessarily meet their minimum requirements.”

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***Alarm bells over buying low cost steel******Cont. from page 6***

Subsequently, the Australian Steel Institute stresses the need for third-party certification and says there are structural steel products sold in Australia that don't comply with the relevant Australian Standards. "Failures of products during erection and in service are known to have occurred with the cause being traced to non-compliant products," it says.

The institute has also released a guide to third-party certification and independent specialist auditing that is accredited by a governing body.

Ian Jacob, a Kiwi steel industry veteran based in Asia and working for Mill-Pro Hong Kong, says while the Australian Steel Institute has highlighted the problem, it doesn't go far enough.

"Their suggestion involving an independent specialist auditing organization accredited by a governing body is simply not strong enough, and in our experience this needs to go a step further."

Ian was visiting New Zealand at the time steel quality issues in major projects being built here were being discussed in the media. He was called to a meeting at the MBIE relating to steel procurement. MBIE manager of engineering science and design Derek Baxter consequently says the big message from that meeting was that suppliers had to improve their testing programs.

"We've got good reason to have some concerns about the level of faith that some of our New Zealand purchasers (are putting) in the system," he says.

"It's the old adage of 'If it seems to be too good to be true it probably is'. And if you have some concerns, rather than just pocketing the profit, you have got to spend some of that money on due diligence."

Ian Jacob has stronger views through his experience dealing with steel supplies and suppliers. "Random on-site testing is the only way you can address this issue and it must apply to everyone, including New Zealand fabricators as they are also using imported raw materials.

Excerpt thanks to Contractor Magazine, August 2016 issue, full article is available at <http://www.contractormag.co.nz/contractor/low-cost-steel/>

## *From the working groups .....*

### **TECHNICAL**

#### **NZ Vibrating Hammer Project**

NZTA has approached CETANZ regarding forming a small NZTA working group made up of NZTA and CETANZ reps. The group will be tasked with looking at a solution to the variation between laboratories in Vibrating Hammer Compaction (MDD) testing.

NZTA has already engaged a consultant to start a literature review. The group will start with the literature review and look at alternative test methodologies and calibration techniques.

#### **More Working Groups at CETANZ?**

NZTA's John Donbavand (National Pavements Manager) attended the recent CETANZ conference and indicated that he was very impressed with the conference and CETANZ and would encourage more NZTA representatives to attend in future. He also indicated a willingness to engage over other testing related issues which would likely see more working groups such as the new CPT group, formed within CETANZ.

### **CAREERS & EVENTS**

With another successful conference behind us, careers & events will be looking at the opportunities raised by a few members at or shortly after the conference. Some energy will be spent on our qualification along with a few networking opportunities in the regions with Christchurch the first of these. Keep an eye out for information relating to this get together.

### **CPT**

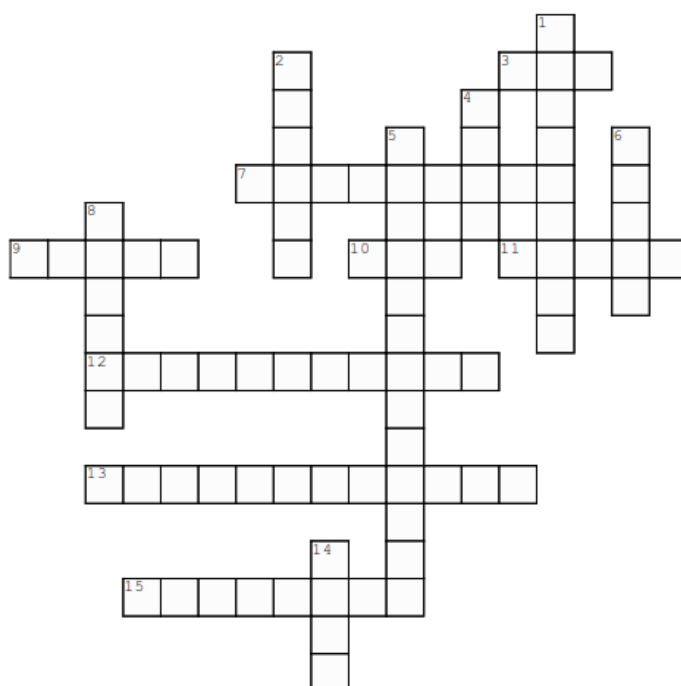
The newest of the working groups to be formed, the CPT group has many things to work towards, the first of these being how to introduce standardisation and repeatability into CPT testing. The first meeting of the group had guests from MBIE, NZTA and Auckland Council so all stakeholders were engaged. The second meeting held during the conference has seen agreement on how to move forward as a group and is seeing some goals and dates for these agreed to. Watch this space for what will look to be a very active group.



## Puzzle time .....

### Land and Water

Complete the crossword below



Created with TheTeachersCorner.net [Crossword Puzzle Generator](#)

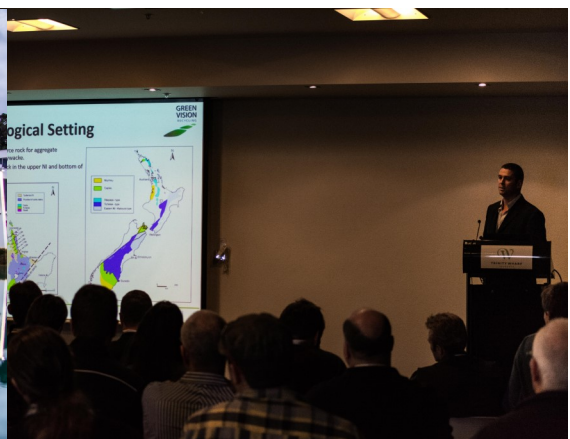
#### Across

- 3. a body of water that is partly enclosed by land
- 7. a natural or artificial pond used for the storage and regulation of water
- 9. a rocky or sandy edge of land along a body of water
- 10. frozen water
- 11. every living thing needs it
- 12. when water changes to water vapor
- 13. when water vapor changes to water
- 15. a very tall, high natural place on earth

#### Down

- 1. when a stream or river falls off steeply
- 2. a large area covered with trees and other plants
- 4. water crystals of various sizes and shapes
- 5. when water falls to earth
- 6. a large flowing body of water that often empties into the sea
- 8. a low place between mountains
- 14. a large body of water surrounded by land on all sides

## Conference Pics .....







# Comparison of an Electronic Density Meter

On the Vanuatu Airport project, the nuclear density meter was initially going to be used to control compaction of the cold mix asphalt, however due to difficulty with importing this class of dangerous goods, another tool for compaction control was sought.

Initially all data collected from the trial involved the use of a nuclear density meter however with the use of this instrument now not possible an electronic density meter (EDM) was proposed as the tool of choice.

The objective of the investigation was to compare the density readings of the electronic density meter to that of cores taken to obtain an understanding of the EDM's reliability and to accurately predict an offset that could be used while paving.

Eight points on the laydown trial area were selected for assessment. Readings were recorded with the NDM and the EDM directly on the mat (in a dry surface condition) where the cold mix trial was laid. These spots were marked and then extracted as cores on the same day. 4 EDM readings and 2 NDM readings were taken per test spot and averaged to obtain one density reading per test spot. The extracted cores were trimmed and tested in accordance with laboratory methods to obtain the bulk density and air voids. Core densities were then retested with the EDM while the cores were in a dry condition before being saturated in water and the excess water removed by turning the core on its side for 2 seconds. The cores densities were then retested with the EDM with water present on the surface.

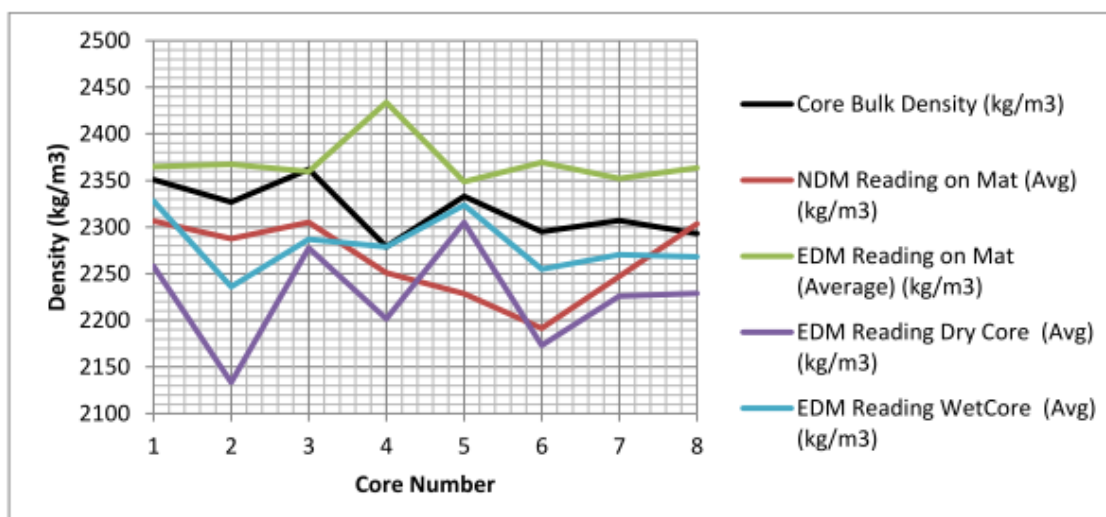
The graph below contains a summary of findings based on the raw data recorded where it can be seen:

- The EDM's "range" of offsets is significantly higher when tested on asphalt in the dry condition.
- The EDM's "range" of offsets significantly decreases when tested on asphalt in the wet condition.
- Overall accuracy and stability of the EDM increases when there is moisture present on the surface of the asphalt being tested.
- This is supported by the Standard Deviation of the results decreasing after testing the cores in a wet condition.

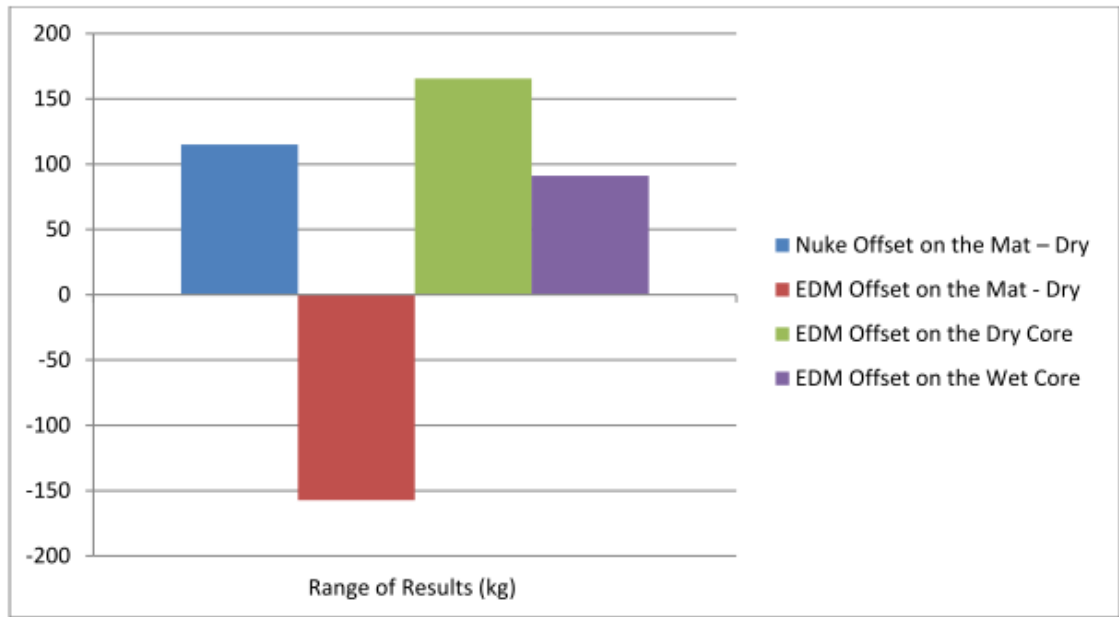
Averages Based on 8 results				
Conditions	Compared to Actual Core Density(kg)	Offset Compared to Average Core Density	Std Deviation	Range of Results (kg)
Nuke Offset on the Mat – Dry	53	2.3%	38	115
EDM Offset on the Mat - Dry	-52	-2.2%	50	-157
EDM Offset on the Dry Core	93	4.0%	48	166
EDM Offset on the Wet Core	38	1.6%	31	91

Further analysis showed the addition of moisture has a significant impact on the performance of the EDM that is specifically on the offset changing the polarity from a negative to positive once moisture was added. The offset of the EDM is less dependent on the density of the asphalt and the range of offsets become more stable once moisture is added onto the surface being tested.

Chart 1: Core bulk density comparison to NDM and EDM



**Chart 4: Displays the range of offsets graphically**



It was recommended that to improve the EDM’s accuracy and performance on asphalt (specifically the Vanuatu Cold Mix) all surfaces tested are kept in a moist to wet condition and a +30Kg offset should be used while testing

In conclusion the trial showed the EDM can reliably be used in place of an NDM to control compaction of the cold mix for Vanuatu Airport.

Compiled by Curwin Boltman  
Fulton Hogan Auckland Laboratory

For the purpose of publishing in the CETANZ newsletter the full report has been minimized. If you would like a copy of the full report please contact Curwin by emailing [info@cetanz.org.nz](mailto:info@cetanz.org.nz)



## *Blast from the Past .....*



Ministry of Works Cadet class of 1976

We have a couple of names but If you recognise any of these faces please email us so we can match them up [info@cetanz.org.nz](mailto:info@cetanz.org.nz).

## *A word from the Editor .....*

Thanks to everyone who has contributed to bringing this issue together, it certainly isn't a self creating publication and I am very grateful for your help. CETANZ aim to publish 4 newsletters each year and content for the next newsletter is now being sought.

Please email your articles, pictures, idea's or advertisements to [info@cetanz.org.nz](mailto:info@cetanz.org.nz)

I hope you enjoy this issue

Brigitte Sargent

### **Land and Water Crossword answers:**

#### **Across**

3.bay, 7.reservoir, 9.beach, 10.ice, 11.water, 12.evaporation, 13.condensation, 15.mountain

#### **Down**

1.waterfall, 2.forest, 4.snow, 5.precipitation, 6.river, 8.valley, 14.lake



## Three tips to get the most out of your MCC calibration

- 1** Pre book your Airmeter, Shearvane, Impact tester or Schmidt hammer for calibration with The MCC
- 2** Request a hire unit while yours is being calibrated to keep your down time to a minimum
- 3** Use the hire equipment until you receive your re-calibrated unit

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