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*"As an industry we need to be equipped for an ever changing future and the CETANZ conference aimed to encourage this"*

## Issue 016, September 2012

### From the Chair...

Welcome to this post conference issue of the CETANZ newsletter. Those that didn't make the conference missed one of the best ones yet, well, at least that's what I've been told by many who were there this year.

The theme was "Taxes, Testing Training and Technology" and from our point of view, this was all about focusing on the challenges that have come about as a result of the recent global economic issues. The changes in funding and uncertainty that our sector is facing, will see many having to adapt to new situations and demands, train new and old staff, assess new types of risk and offer new services. As an industry we need to be equipped for an ever changing future and the CETANZ conference aimed to encourage this.

Our Keynote speaker Steve Killeen from Downers suggested that Laboratories should think about the value for money (VFM) they can bring to a project or customer. How can you articulate this and turn it into a tradable quantity? You must value yourself and your service before others will.



Vanessa Stoddart from Air New Zealand talked about how we are all leaders and that we should take joint responsibility with our employers to plan and execute leadership development, learning and growth.

Sir Ray Avery was very entertaining at the dinner and regaled us with plenty of hilarious stories from his past..... Most of which I don't remember now as the events of that night are a little hazy! I do know that the food and wine were particularly good.

Of course a special thanks to the sponsors of the conference. It goes without saying we couldn't put on such a fine conference without their help. I'd like to personally thank our platinum sponsor OPUS, gold sponsor Geotechnics, silver sponsor Keynetix and our bronze and dinner

### *From the Chair Continued...*

sponsor Coffey Information. I encourage all CETANZ members to support our sponsors where possible.

A new and very special part of this years conference was the awarding of the first ever John Evans Award for the best conference paper. The award remembers John who was a founding member of CETANZ and a key figure in our industry until his passing. The plaque was awarded to Paul Burton and Ian Twichel was the lucky delegate who walked away with the iPad door price thanks to the Measurement and Calibration Centre for sponsoring this generous gift.

During this conference CETANZ held its AGM and elected a new committee. Some new faces have joined the CETANZ committee which has enabled us to maintain our diverse representation of the testing community.

New committee members are: Zach Hooton from Coffey Information, Ewan Cameron from Downer and Ryan Milligan from Geotechnics.

Returning members are: Eric Paton from Fulton Hogan, Brigitte Sargent from Geotechnics, Frank Hu from Downers, Jayden Ellis from Stevenson, Michael McGlynn from Geotechnics, Steve Anderson from Geotechnics, Sarah Amooore from OPUS, David Morgan from Winstone and Steve McCone from Bitumen and Pavement.

The committee has had its first meeting and confirmed the following appointments:

Chair – Jayden Ellis  
Vice Chair – Sarah Amooore  
Secretary – Brigitte Sargent  
Treasurer – David Morgan  
Editor – Michael McGlynn

A special thanks again to all those that have volunteered both past and present and also to the parent organisations that release their people, assets and resources to work on CETANZ issues and initiatives.

I look forward to working with you all on the various challenges and issues ahead.

Jayden Ellis

Chair - CETANZ

## Sources of information relating to Civil Engineering Testing and Civil Engineering Materials for Laboratory Technicians

The following is a list of literature and resources that may be helpful to those that work in civil engineering testing laboratories.

- Manual of Soil Laboratory Testing: 3<sup>rd</sup> edition Volume 1: Soil Classification and Compaction Tests By K.H. Head
- Manual of Soil Laboratory Testing: 3<sup>rd</sup> edition Volume 2: Permeability, Shear Strength and Compressibility Tests By K.H. Head
- Manual of Soil Laboratory Testing: 2<sup>nd</sup> edition Volume 3: Effective Stress Tests By K.H. Head
- Soil Test Manual: Procedures, Classification Data and Sampling Practices By Robert W Day
- Geotechnical Laboratory Measurements for Engineers By John T. Germaine and Amy V. Germaine
- Laboratory Testing of Soils, Rocks and Aggregates By N Sivakugan, A Arulrajah and M W Bo
- Concrete Technology By A.M. Neville and J.J. Brooks
- Engineered Concrete: Mix Design and Test Methods By Irving Kett
- Concrete Materials, Second Edition: Properties, Specifications, and Testing by Sandor Popovics
- Asphalts in Road Construction By Robert N Hunter
- The Aggregate Handbook by Richard D. Barksdale Ed
- Aggregates: Sand, Gravel and Crushed Rock Aggregates for Construction Purposes (Geological Society Engineering Geology Special Pub. No.17) by G. West , P. G. Fookes , etc
- The testing of bituminous mixtures;: A laboratory handbook concerning road and building materials (The Roadmakers' library)by Donald C Broome (Author)
- AGS Guide to the Selection of Geotechnical Soil Laboratory Testing, Association of Geotechnical and Geoenvironmental Specialists, Feb 1998 (amendments to Chapter 6 – 2006)

- Significance of Tests and Properties of Concrete and Concrete-Making Materials, ASTM STP 169D Joseph Lamond and James Pielert, editors, 2006
- Field Description of Soil and Rock, Guideline for the Field Description of Soil and Rock for Engineering Properties, NZ Geotechnical Society Inc. Dec 2005.
- Pavement Investigation, Guide to Field Inspection and Testing, VicRoads Technical Bulletin No.40, December 1995.
- AASHTO  
Standard Specifications for Transportation Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO), (31<sup>st</sup> Edition), 2011 Edition.
- ASTM International Standards formerly known as the American Society for Testing and Materials (ASTM)
- British Standards
- Australian Standards

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## Rapid Methylene Blue Value – A New Test Method to Assess Contamination of Fine Aggregate

*By Leon Bablouzian, Nathan Tregger; W.R. Grace & Co. (Cambridge, MA, USA)*

*Tasha Eagle; Grace Australia (Brisbane, QLD, AUS)*

In Australia and New Zealand, natural sands used in concrete construction have faced rapid depletion. New commercial deposits are difficult to establish due to multiple environmental and regulatory factors. The decreased availability of natural sand has necessitated higher utilization of fines resulting from the rock crushing process used to produce coarse aggregate products. These fine materials, commonly referred to as crusher fines, rock dust, PAP or manufactured sands, are available in abundance and higher utilization is a cornerstone for improving sustainability of the construction aggregate industry.

Particle size distribution, shape / surface texture and deleterious fines are all key features of manufactured sands that control their use in concrete mixes. Recent developments now allow a rapid, direct measurement of deleterious clays within the fines thus enabling innovative chemical approaches to render these clays inert. By effectively “cleaning up” the manufactured sand through chemical treatment, their use in concrete mixes at significantly elevated levels can now be achieved. Increased manufactured sand usage leads to less quarry waste and strategic use of natural sand deposits – both of which improve the aggregate and concrete industries sustainability credentials. This article will focus on a new test procedure for quantitatively assessing clay contamination, with future publications introducing novel chemical treatment processes for aggregate fines.

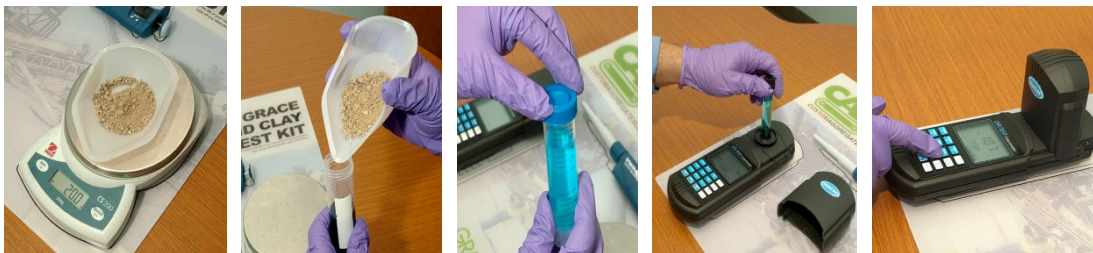
Several useful tests are recommended and we will focus on two of these methods, sand equivalent (SE) NZS 3111:1986 and Clay Index NZS 4407 (consists of a MBV test).

Concrete is done by shaking fine aggregate in a clear graduated cylinder containing a solution of flocculant and preservative. After shaking, the particles are allowed to sediment for twenty minutes and the SE is taken as the ratio of the height of the sand column to the height of the sand and flocculated clay multiplied by one hundred. Higher percentages indicate “cleaner” sand. SE is used heavily in the United States, New Zealand and many European countries to qualify aggregates for use in concrete and asphalt applications. Still, the test has been shown to give false negatives whereby sand with low SE values produced concrete with acceptable performance. Conversely, sand with high SE value has been shown to produce concrete with poor performance. The sand equivalent test relies on apparent density differences between “good” sand and “bad” clay. Even though a flocculant is used to encourage separation of fine clay particles, similar sized fine sand particles can also be impacted by the flocculation process. As a result, the settling behaviors and subsequently the difference in SE may not be sufficiently differentiated. For these reasons, the correlation of SE values and concrete performance can be suspect. The methylene blue value (MBV) is done by reacting deleterious clay fines with a blue dye and measuring dye uptake, as a color change, to estimate clay contamination. This is a well established method to determine the presence of clay minerals in aggregates and there are several variations in the literature based on an end point titration technique. This technique commonly requires a laborious sieving procedure to -75 micron, a slow titration process and visual determination of a blue “halo” on filter paper that is operator dependent.

Despite these shortcomings, the test directly measures clay contamination and results can be very useful in predicting concrete performance.

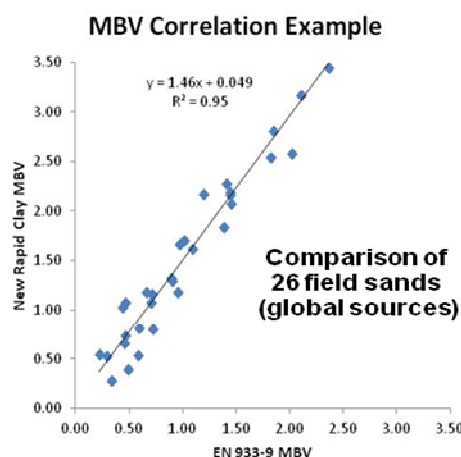
Recently, an improvement of the standard methylene blue value (MBV) test was developed to address the disadvantages of the titration method. This new method relies on a colorimeter, a device that can measure the absorbance of a given solution at a specific light wavelength. The colorimeter removes the human interpretation of the blue halo and significantly improves reproducibility of the results. An additional benefit is that the entire sand sample can be used, not just the 75 micron fraction. The new test takes approximately 10 minutes to complete, thus providing a quick and reliable MBV that can be measured easily in the field as well as in the laboratory. The equipment and testing sequence is shown in

**Figure 1.**



**Figure 1. Improved methylene blue method.**

In comparisons to standard MB tests, such as AASHTO T330-07, ISSA 145 or EN-933-9, the improved MB test provides an excellent correlation. An example correlating the new test and EN 933-9 for 26 field obtained sands from around the world is shown in **Figure 2**.



**Figure 2. Comparison between a modified EN 933-9 and improved MBV test method.**

From the MBV, a simple conversion can calculate an equivalent clay amount based on a widely known deleterious clay, sodium montmorillonite (Na-Mont). This measure provides

a unit of measure applicable to a wide range of clay systems.

Currently, this improved methylene blue test is becoming extensively used in Australia for determining equivalent clay contents of both natural and manufactured sands. The test is a rapid, accurate quality control tool to determine the variability of aggregate contamination. With knowledge of concrete mix performance, aggregate clay contamination can become an important predictor of behavior in concrete and allow both the aggregate producer and concrete producer flexibility for increasing fines utilization. The MBV also identifies situations when high levels of clay contamination preclude increased use of fines. For such cases, Grace is actively developing chemical solutions that will limit the negative impact of clay in concrete and further enhance the ability to increase fines. The products will be sold by Grace Custom Aggregate Solutions® under the Clarena™ product line and will be the subject of future publications.



Please contact the author(s) to learn more about the new Rapid Methylene Blue Value test.

1. Standards Australia, "AS 2758 Aggregates and rock for engineering purposes – Part 1: Concrete aggregates", Standards Australia, 1998.
2. Cement Concrete & Aggregates Australia, "Manufactured sand: National test methods and specification values", Technical Liaison Committee, 2007.
3. Cement Concrete & Aggregates Australia, "Abrasion resistance and effect of manufactured sand on concrete mortar", Technical Liaison Committee, 2008.

International Slurry Surfacing Association, "ISSA Technical Bulletin 145: Methylene blue absorption value in mineral aggregate filler and fines", ISSA, 2007.

5. Standards Australia, "AS 1289 Methods of testing soils for engineering purposes", Standards Australia, 2009.

Standards Australia, "AS 1141 Methods for sampling and testing aggregates", Standards Australia, 2009.



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31 August 2012

Media release

## Civil laboratory technician qualifications – first graduates

InfraTrain's first civil laboratory technician graduates were presented with their certificates at the Civil Engineering Testing Association New Zealand (CETANZ) conference recently.

Arnold Maiquez from Downer NZ in Auckland received the *National Certificate in Infrastructure Civil Engineering (Laboratory Technician)* – Level 4, while Latoya Gibson of Fulton Hogan in Christchurch received the Level 4 qualification and the *National Certificate in Infrastructure Civil Engineering (Senior Laboratory Technician)* – Level 5.

Latoya decided to study because she wanted to become as qualified as possible. "I wanted to continue to develop professionally and achieve formal recognition for what I do," she says. "The qualifications I have achieved are highly regarded in the industry and having them will hopefully improve my career prospects."

Latoya continues, "I found both Level 4 and Level 5 gave me a solid foundation of skills, theoretically and practically. Everything I was learning was relevant to what I was doing on a daily basis and helped develop and expand my skills and knowledge. Gaining these qualifications is evidence of my professional development."

CETANZ Chair Jayden Ellis presented Arnold and Latoya with their certificates. Speaking at the conference, he said, "It is great to see our first graduates coming through. Latoya and Arnold have obviously put a large amount of time and effort into learning and developing, and now that hard work had been recognised with the presentation of their certificates."

Jayden added, "The presentation signifies an historic event in our civil materials testing industry and a major step forward for the CETANZ organisation and its members. These qualifications form part of the overall goal to have our people and civil laboratory businesses recognised as technically competent, professional, experienced and able to add value to any civil engineering projects. We need to continually challenge, develop and reward our people. They are our most important asset."

InfraTrain launched the qualifications in May last year, and they have been well received by the civil engineering testing industry. Both were developed in partnership with CETANZ, to meet the need for a structured career pathway for civil engineering laboratory technicians, based on qualifications.

The qualifications have been specifically designed to recognise the skills and knowledge required for civil engineering laboratory testing. The two different levels mean they are suitable for people who are new to the industry, as well as experienced technicians.

For enrolment information call InfraTrain on 0800 486 626 or go to [www.infratrains.co.nz](http://www.infratrains.co.nz)





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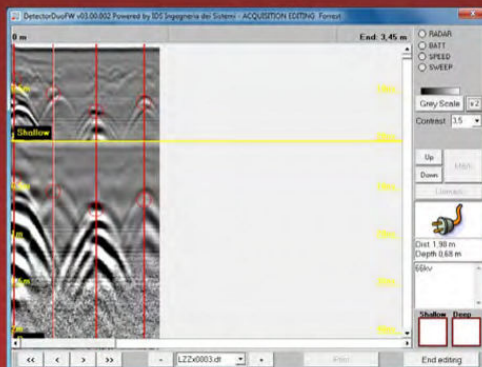


### Applications

- Locating underground services
- Locating burst pipes
- Measuring pavement thickness
- Measuring concrete slab thickness
- Identifying geological or manmade anomalies

### Advantages

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## Technical Group Update

**1. Last meeting was 04/07/12 at Stevenson Drury Quarry**

**2. NZ Vib Hammer Study – UoA**

*JSE to seek meeting with stakeholder group re next steps.*

**3. Sand Equivalent Proficiency**

*Report about to be completed.*

**4. Weathering Quality Index Proficiency**

*Report about to be placed on website.*

**5. Plasticity Index & Linear Shrinkage**

*Report now on website.*

**6. PSV Proficiency**

*Sean from Higgins working on report.*

**7. Bitumen Penetration Proficiency**

*Report on website..*

**8. Proficiency Program**

*Technical Group has reviewed, next schemes will be getting underway soon.*

Category	Test	Volunteer Laboratories
Aggregate	Clay Index	Stevenson - STARTED
Aggregate	ASTM D&A	Fulton Hogan - STARTED
Soil	Standard Compaction	???? TBA
Concrete	Compression & Density Tests	Stevenson
Field	NDM	Stevenson (North Island)
Asphalt	Binder Content Grading	Bitumen & Pavement
Asphalt	ServoPac	Downer –STARTED
Bitumen	Penetration	Fulton Hogan –DONE

**9. RTSSG update**

*NZS 4407 review is now completed and has is about to be presented to SNZ. We expect SNZ will send out for general public review.*

**10. PPAC**

*IANZ proficiency policy to be released shortly, will require Laboratories to establish program.*

**11. AGS** Electronic transfer of geotechnical and geoenvironmental data

*Final version has been released and is expected to be used on Christchurch and Waterview projects.*

**12. Linked IN**

*The CETANZ group has 61 followers with a good amount and variety of discussions being held.*

**13. Technical Reports and Technical Guides**

*Several up on website now more to come. They include Asbestos guide, Proficiency reports, scala calibration issues etc....*



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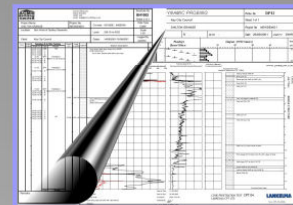


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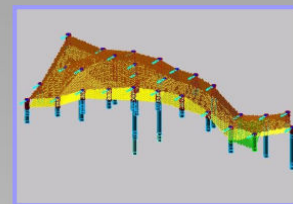
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## CETANZ CONFERENCE PHOTOS













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- Analysing test data and drafting technical reports
- Consulting with client and stakeholders to ensure expectations and needs are managed

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For more information please Contact Zach Hooton

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