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Editorial

With the festive and holiday season now a distant memory, we trust everyone is feeling refreshed and ready for another year of growth in the iron and steel slag utilisation industry. Despite the challenges being encountered throughout the business environment with a weak economy, the focus of Connections this month is on the good news story.

Results from our annual membership survey for the period January to December 2012 show that from the 3.02 million tonnes (Mt) iron and steel slags (ISS) generated nationally or imported, 2.8 Mt or 92% of iron and steel slags (ISS) produced was effectively utilised within various value added civil and construction material applications throughout Australasia. The report indicates that the longer term trend of ISS materials moving towards Higher Value Add (HVA) from Lower Value Add (LVA) applications is continuing. The recovery and reuse of ISS continues to provide significant positive environmental impacts, including resource conservation with the reduction of greenhouse gas emissions from the processing of virgin resources.

The April 2014 Member Employee Profile focuses on Chris Jones, Technical Sales Manager for Boral Cement, a major supplier of cementitious materials. Chris describes his time in the cement industry, how he obtained his technical knowledge and experience and how he became a Scottish Lord as part of a conservation program to halt the development of valuable wildlife areas. The opportunity to be involved in the regular Member Profile is open to all Association members and we encourage them to get involved.

Association Members have been resilient in continuing to make a positive contribution to the industry. For example, Australian Steel Mill Services (ASMS) tells of their supply of steel furnace slag (SFS) aggregate for use in the elimination of key black spot areas in the Sydney Stanmore area. Additionally, SCE Materials and Recycling use Connections as a forum for the release of two new and innovative products: ER-MB20 and E-MB20. Both of these articles demonstrate that Association Members are continuing to move forward despite negative industry pressures.

ISS materials have a long and resilient history of use within Australian industry. The image above in conjunction with the articles supplied by both ASMS and SCE Materials and Recycling demonstrate the past and current product development for their continued use.

The CRC for Low Carbon Living (CRC-LCL) continues in 2014 with its first project completed and the beginning of the next stage of project work and investigation into alternative uses for iron and steel slag products. The Association along with other key industry stakeholders have made both financial and in-kind contributions to the funding of this CRC but with good reward. We would also like to thank Prof. Arnaud Castel from the University of New South Wales (UNSW) for his continued support for the Association's involvement shown through his regular presence at our National Technical and Education Committee Meetings.

Finally, there are a number of industry-related conferences this year. In particular, the Construction Materials Industry Conference (CMIC14) will take place in Brisbane during September with early bird registration opening in April. Also, the 23rd Australasian Conference on the Mechanics of Structures and Materials (ACMSM23) will be held in Byron Bay, NSW during December of this year. These events hold significant value for their participants both in technical and social aspects, therefore we encourage our Members to consider attending.

With the Christmas holidays only recently concluded it seems strange to be anticipating yet another break with the approach of the Easter long-weekend. Nonetheless, we wish our Members all the best for this time of year and good luck with your industry pursuits throughout 2014.

THIS ISSUE

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CONNECTIONS EDITORIAL TEAM | March 2014 Edition
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CHRISTOPHER JONES

Chris Jones is the Technical Sales Manager for Boral Cement. This company is a major supplier of cementitious materials, supplying cement, fly ash, granulated blast furnace slag, lime and a wide range of building products to the construction and stabilisation industry. Recently appointed by Boral to the Association's National Technical and Education Committee, Chris Jones tells us a little about about his role as Technical Sales Manager, providing advice to customers on the benefits and appropriate use of slag.

What is the importance of iron and steel slags to the construction and stabilisation industry?

Granulated blast furnace slag (GBFS) is a key part of the product range for both the concrete and stabilisation industry. It enables concrete manufacturers to achieve the durability requirements they need and stabilisation contractors to use a slow setting binder required for many road construction projects.

Have you always worked in the cement industry?

No, but I have always been involved in the construction industry. After graduating from the University of Surrey, England, with an Honours degree in Civil Engineering, I spent several years in South Africa and the Middle East working for large construction companies. I came to Australia about 25 years ago and started working for Boral Concrete a few years later. After 12 years with the Concrete Division, I moved across to the Cement Division where I now provide technical advice to our customers throughout New South Wales. I am also an active member of Concrete, Cement & Aggregates Australia (CCAA) where I sit on a number of committees and present courses on cementitious materials as part of their training programs.

How did you develop your technical knowledge?

My degree in civil engineering has provided a good base and about six years ago I obtained a diploma in Advanced Concrete Technology. However, a lot of my knowledge has simply come from my experience working with the various divisions within the Boral Group. In particular, Boral Concrete, Boral Cement, Boral Quarries and DeMartin & Gasparini have provided excellent learning opportunities. I have also worked at Boral's laboratory in Baulkham Hills which is the largest construction materials laboratory in Australia. The laboratory is proficient in a wide range of tests on construction materials and is internationally recognised for its research and development capabilities. As a result of my qualifications and experience, I am now a member of the Institute of Concrete Technology.

We heard that you recently became a 'Lord'. Can you tell us how that happened?

Well, last year I became a Lord. The Lord of Glencoe to be precise. My two daughters, Julia and Joanna, bought me some land in Scotland for my birthday. It was only ten square feet but according to a very official looking certificate it makes me a Lord and I should now be referred to as 'The Much Honoured Christopher Jones, The Lord of Glencoe.' Its part of a conservation project which sells small parcels of wilderness areas making it almost impossible for the area to be developed. So not only have I become part of the Scottish nobility but I am also doing my bit for the environment.

Boral Cement

GOOD NEWS STORY

ASPHALT AGGREGATE FOR USE IN SYDNEY BLACKSPOTS

ASMS
AUSTRALIAN STEEL MILL SERVICES

As we have seen in a previous Connections story (http://www.asa-inc.org.au/documents/ASA_Connections_March_2013.pdf), over the past 20 years the use of steel furnace slag (SFS) in asphalt has become widely accepted, particularly in the Illawarra, Sydney and Newcastle regions of NSW and more recently in Melbourne, VIC for asphalt applications. This use was built on over 30 years of experience overseas including the US, UK and Europe where SFS has been widely used and is accepted as a premium asphalt aggregate.

Culminating in these local and international successes the Guide to the Use of Steel Furnace Slag in Asphalt and Thin Bituminous Surfacings was published in 1999 which was the third in a series of publications to promote understanding and the appropriate usage of slag based products. To these ends, the Association enjoyed the opportunity to co-operate with and receive valuable input from organisations such as the Roads and Traffic Authority NSW (now RMS), VicRoads, and the Australian Asphalt Pavement Association in the production and the publication of the Guide.

Fifteen years on, the popularity of steel slags continues for use in road blackspots due to its superior skid-resistance. The story, published in the Connections March 2013 edition, focused on the use of Electric Arc Furnace slag (EAFS) by Association member, Harsco, on roads around the Melbourne area. This edition of Connections delves into the use of a slag product, once again for beneficial purposes, in key blackspot areas throughout Sydney, New South Wales.

Recently, a long stretch of New Canterbury Road was resurfaced with asphalt containing 10 mm and 14 mm SFS aggregate complying to NSW RMS specification 3152. SFS aggregates were chosen for a combination of high friction and anti-polishing properties due to this road being regarded as an accident blackspot in the Stanmore area.

The 6,000 tonne of asphalt used in the project contained over 2,000 tonne of SFS aggregates supplied by Association member Australian Steel Mill Services (ASMS) and continues the long history of SFS use by NSW roads authority in areas with high motor vehicle accident rates to improve road safety.

Several other blackspot roads in Sydney have also been resurfaced with asphalt containing SFS aggregates, including King Georges Road, Hurstville, and Stacey Street, Bankstown, both utilising more than 2,000 tonne of 10 mm and 14 mm aggregate produced from BOS SFS.

These projects further demonstrate both the sustainable and safety benefits of iron and steel slag materials to support the continued usage of this product in road applications. Its increased use of SFS, as a valuable industrial byproduct in bituminous surfacings will result in improved performance for the road user and owner and a decrease in the demand for our limited natural resources.

NEW MEMBER PRODUCT

SCE
Materials & Recycling

ER-MB20 and E-MB20

SCE Materials and Recycling have recently announced the introduction of several new innovative electric arc furnace (EAFS) slag-based pavement materials for the civil construction market. These products have been primarily developed, in consultation with Road and Maritime Services (RMS) Road Pavement & Geotechnical Engineering - Engineering Technology Services Branch Asset Maintenance Division, for supply to RMS projects requiring a heavily bound pavement material, but also providing the civil construction industry with a sound and durable pavement material using a combination of recycled materials. These newly developed products offer the benefits of constructing civil works using steel furnace slags and recycled materials providing a smaller environmental project footprint along with protecting the environment from further degradation.

For more information, please visit: http://www.sce-recycleit.com

ER - MB20

SCE Materials and Recycling has developed this innovative product to primarily meet RMS Quality Assurance Specification R73, 'CONSTRUCTION OF PLANT MIXED HEAVILY BOUND PAVEMENT COURSE'.

ER-MB20 consists predominantly of Electric Arc Furnace slag (EAFS) which is blended with coal combustion products, recycled crushed concrete and recycled fibre cement board along with a stabilising binder.

Through thorough testing and field trials, EAFS and the other recycled materials incorporated in the ER-MB20 blend, proved to be a high quality, easily placed and compacted alternative to naturally sourced heavily bound pavement materials .

To date, more than 15,000 tonnes of this new product has been certified and supplied into the civil construction industry including RMS and Local Government authorities. It has received positive feedback regarding workability, product performance, ease of compaction and ability to sustain repeated loading soon after compaction.

Technical:

MDD*:	(Maximum Dry Density)	2.15 t/m3
MWD*:	(Maximum Wet Density)	2.45 t/m3
OMC*:	(Optimum Moisture Content)	14.0 %
CBR*:	(California Bearing Ratio)	>100 %
PI:	(Plasticity Index)	Non Plastic
UCS*:	(Unconfined Compressive Strength)	>3.0 MPa
Misshapen Particles:	(particle shape by proportional calliper)	<10 %
Wet Strength:		>100 kN
Wet Dry Variation:		<35 %

*values obtained using test method RMS T111 standard compaction

E - MB20

SCE Materials and Recycling also developed E-MB20 in consultation with RMS to meet their Quality Assurance Specification R73, and also for supply into the civil construction industry.

E-MB20 consists predominantly of EAFS which is blended with coal combustion products along with a stabilising binder.

Again, through thorough testing and field trials, E-MB20 also proved to be a high quality, easily placed and compacted alternative to naturally sourced heavily bound pavement materials.

To date, more than 5,000 tonnes of this new product has been supplied into the civil construction industry receiving positive feedback from all clients regarding workability and product performance.

Technical:

MDD*:	(Maximum Dry Density)	2.20 t/m3
MWD*:	(Maximum Wet Density)	2.49 t/m3
OMC*:	(Optimum Moisture Content)	13.0 %
CBR*:	(California Bearing Ratio)	>100 %
PI:	(Plasticity Index)	Non Plastic
UCS*:	(Unconfined Compressive Strength)	>3.0 MPa
Misshapen Particles:	(particle shape by proportional calliper)	<5 %
Wet Strength:		>100 kN
Wet Dry Variation:		<15 %

*values obtained using test method RMS T111 standard compaction

CRC for Low Carbon Living

2014 marks the second year of the CRC for Low Carbon Living (CRC-LCL), which continues to forge ahead with its innovative research on low carbon concretes (e.g. geopolymer concrete) as one of the most promising high volume and high value add applications for iron and steel slags (ISS).

The 2013 Scoping Study identified that the major barriers to geopolymer adoption were the lack of standard specifications, track record and exclusion from current standards (e.g., AS 3600). The project submitted to the CRC-LCL in 2014 aims to gather field data from geopolymer real-life constructions to develop greater confidence in geopolymer use. Using the field and laboratory data, a comprehensive Handbook for geopolymer specification will be developed and published through Standards Australia.

Additionally, a pilot program will develop lightweight aggregates based on slag to produce lightweight concrete which reduces energy usage in buildings. This project aims to develop low carbon processes based on geopolymerisation and alternative methods for producing aggregates from fly ash.

Our partner organisations include the University of NSW, Swinburne University of Technology, Ash Development Association of Australia, AECOM, Sydney Water and Standards Australia. The project coordinators also obtained letters of support from the major suppliers and infrastructure owners such as Zeobond, Wagners Concrete, State Transport and Main Roads owners across the eastern seaboard and Milliken Infrastructure Solutions.

In February 2014, this new project was approved by the CRC-LCL Board with a cash contribution of $1.1 million in combination with the in-kind contributions from partner organisations of $1.8 million.

The Australasian (iron & steel) Slag Association will continue to keep members abreast of any updates on the CRC-LCL throughout 2014. For more information, visit: http://www.lowcarbonlivingcrc.com.au visit: http://www.lowcarbonlivingcrc.com.au

Roads Guide Review

The review of the Guide to the Use of Iron and Steel Slag in Roads continues throughout 2014. Since its commencement in mid-2012, authors have been working together in the design and completion of drafts for each of the four Quick Reference Guides (QRGs). The aim of this review is to produce summary documents for the key sections of the original 2002 publication however it will not replace this document as it still holds significant relevance to today's industry.

QRG 1- Roads Guide Supplement on General Applications was published in late 2013 and is available for download from the ASA website: http://www.asa-inc.org.au/technical-guidelines.php

The second of the documents, QRG 2, focuses specifically on the use of steel furnace slags (SFS). It is currently in the drafting stage with authors undertaking numerous Working Group meetings to finalise the content as well as ensuring its technical validity. Publication of this document is expected later this year.

We will continue to keep members updated on the progress of this project with the next Supplement to focus on Electric Arc Furnace Slag (EAFS). Association members with relevant experience in the use of this product are welcome to contribute to the content development process via the National Technical and Education Committee meetings which are held every 3 months - http://www.asa-inc.org.au/committee-meeting-schedule.php

Conference:
Construction Materials Industry Conference (CMIC) 2014

The Construction Materials Industry Conference (CMIC) 2014 will take place this year from Wednesday 3 to Saturday 6 September at the Brisbane Convention and Exhibition Centre located on the iconic South Bank.

The theme for this conference is Building Productivity which aims to explore the changing business environment in Australian industry where each aspect of your business will be challenged by the structured technical program.

The keynote and plenary speakers have been announced with a number of other important dates:

- March 2014 — Call for Abstracts closes
- April - June — Early bird registration
- May 2014 — Speakers notified of Abstract status

The Association will be in attendance with significant value derived from the networking opportunities in the Exhibition Hall. Weencourage our members to attend and take advantage of the valuable networking and knowledge transfer opportunities provided to build on the educational and technical foundations of the Association in the long term.

For more information, visit: http://www.iceaustralia.com/cmic14/index.php#.UvwIaqW7Ns4

Conference:
23rd Australasian Conference on Mechanics of Structures and Materials

The 23rd Australasian Conference on the Mechanics of Structures and Materials (ACMSM23) will be held in Byron Bay, NSW from 9-12 December 2014, organised by Southern Cross University.

This conference is a well-known forum that focuses on the latest trends and developments in the fields of structural mechanics and materials. Both practitioners and researchers alike are invited to this event in the beautiful seaside town of Byron Bay. This town in particular demonstrates some of the problems that are faced in the built environment from a number of factors including population migration, sea level rise and adverse human-induced environmental actions.

There are a number of key dates:

- Submission of Papers for Review — 15 June 2014
- Submission of Camera Ready papers — 15 August 2014

For more information, please visit: http://scu.edu.au/acmsm23/

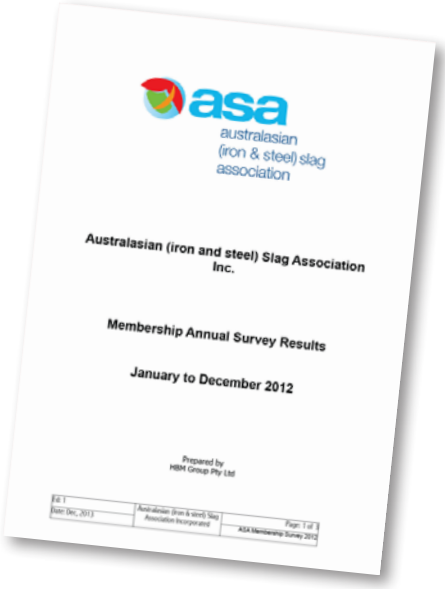
Annual Membership Survey
OUT NOW!

The Association conducts a survey on an annual basis, collecting information regarding iron and steel slag (ISS) production and sales by members and non-members for each calendar year.

The information collected is used for a number of purposes within the Association but primarily as justification during advocacy activities within the industry to support the Association's standpoint. It also provides an industry snapshot for the Management Committee to then tailor the Association's programs to ensure that Member's interests are supported in the majority.

For your convenience, the Association has committed to publishing an Annual Membership Survey Report, providing a brief overview and commentary on statistics and figures returned by our survey participants in regards to their annual production and sales of slag products.

To download an electronic PDF version, please visit: http://www.asa-inc.org.au/annual-membership-reports.php



Connections:
Your Association's Publication

Connections is produced twice a year for the benefit of ASA members. Before each publication is drafted, an email is sent to all members, urging them to contribute stories that they think are of interest. The types of content we are looking for include:

- New developments or technologies
- New projects
- New employees

We also have a Member Profile section which is open to all member companies for contributions on behalf of the business in general or a specific employee.

So, if you have an idea or even some content that you think might make an interesting article for our readers, get in contact with Editor Olivia Yeatman today: research@hbmgroup.com.au

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All contributions are welcomed, though the publisher reserves the right to decline or edit for style grammar, length and legal reasons.