

Editorial comment

Focus is a key to success. During the last year, the Association underwent significant change. Based on the earlier Venour / Jones Review, the Association has defined itself around slag products from the production of iron and steel. These products have a long history of successful use in Australia and overseas. Previous issues of **Connections** have described the products and their uses in the Construction industry. There is a new energy in the Association with stakeholders contributing towards a significantly enlarged communications and education program. In the last 4 months of 2003, some 22 tailored slag product presentations were given to engineers and consultants at their place of business.

This program has attracted significant interest with requests for additional presentations.

The versatility of slag products and their contribution to resource conservation, infrastructure development and environmental improvement are featured in the Insider section of this issue. In New Zealand, melter slag is used as a water final water polishing medium for the wastewater treatment plant in the local township of Waiuku. Port Kembla Port has used more than 2 million tonne of iron and steel making slags over several decades including construction of the Coal Loader, construction and eventual reclamation of the Casting Basin where the Sydney Harbour Tunnel

immersed tub sections and later Bass Strait Off shore oil and gas platforms were constructed.

Environmental performance is extending to many areas of life. Energy ratings on electrical equipment are so familiar that they guide us in our choices. Now houses, offices and commercial buildings are green star rated with slag cements making a real contribution. Sustainable construction is a key focus in Victoria for 2004. In USA blast furnace slag can qualify as a sustainable material.

Read on to discover the opportunities that slag products offer in making a positive environmental contribution and supporting sustainable development. ■

Association AGM sets the scene for the year ahead



Executive Committee (L to R) Andrew Wilson, Mike Byrne, Oscar Gregory, Shani Smith (ASA Chairperson), Simon Hodsden, Ross Johnson and Rob Newman.

Novotel Brighton Beach in Sydney was again the venue for the **Association's Annual General Meeting on April 17**. Members heard reports from Committee Chairpersons and Association Chairperson Shani Smith. Technical Committee focus for 2003 was in the development of a research program and assisting with Technical presentations. Education Committee core focus has been the successful contractors and engineers briefings, the University lecture series, **Connections** and preparations for upgrade of the website. The Operations Committee has a hands on focus particularly in the Port Kembla region where member companies have significant operations and numbers of employees. Members remote from Port Kembla participate through email networks. The committee ran a

successful Health and safety workshop in May 2003 and works at encouraging and facilitating best practice in materials handling and site operations.

Ms Smith thanked members for their active participation during a very successful year. Focus for 2003, based on the Venour Jones report has seen concentration on Iron and steel making slags and a reshaping of the membership base and fee structures. The Association's efforts are targeted with an emphasis on education and advocacy. During the last 4 months of 2003, some 22 tailored presentations were made to key consulting and engineering groups; with a significant call back response. **Connections** is another of the Association's success stories with the newsletter focus on road construction and pavements complementary and supportive of the presentations and lecture series. The Association's website www.asa-inc.org.au another key element in the education program, attracted over 4,000 hits per month. The online database of reference material is a key attraction.

Peaks in hits on the site correlate well with each issue of **Connections** and the Education Lecture Series. Shani acknowledged the good work of Executive Director Craig Heidrich in supporting the Association through a year of significant change and improvement.

Officers elected to guide the Association through the next year are Chair – **Shani Smith** (ASMS), Vice Chairman International – **Bill Bourke** (SteelServ NZ), Vice Chairman Australia – **Andrew Wilson** (EcoCem), Treasurer – **Simon Hodsden** (Metserv Australia), Secretary – **Oscar Gregory** (Bluescope Steel), Executive Committee Members – **Rob Newman** (SCE Group), **Ross Johnson** (Hunter Mill Services), **Michael Byrne** (Steel Cement), Technical Committee Chair – **Tom Wauer** (Steel Cement), Education and Promotion Committee Chair – **Mark Furlong** (ASMS), Operations Committee Chair – **Chris Stuckey** (Metserv Australia). ■

Connections Editorial

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ASA Chairperson Shani Smith

Slag contributes to 'green star' rating

Recognition of the finiteness of the world's physical resources and impacts that lead potentially lead to global warming has Governments and now Industry more focused on environmental performance and sustainability. The Green Building Council of Australia has established a 'Green Star' rating to help the construction industry to produce buildings that achieve the lowest overall energy use throughout its life. The rating system takes into account all phases of a building's construction from the initial design phase, through to the ongoing energy needs of the building through its lifetime.

It has built on the British BREEM (Building Research Establishment Environmental Assessment Method) system and the North American LEED (Leadership in Energy and Environmental Design) system, adapting these

to suit Australia's marketplace and environmental context. The Australian rating system also called on the intellectual property of VicUrban in its work with the Melbourne Docklands ESD Guide.

Factors considered are building design input, management, indoor environment, energy use, transport, water, emissions, materials, land use and ecology, emissions and innovation. Summation of the achievements in each sub

Rating System

Green star is a national voluntary rating system that evaluates the environmental performance of buildings. the first pilot rating tool under this system is for the design phase of new construction or base building refurbishment of office buildings.

section contributes to a green star rating. Ground granulated Blast furnace Slag is recognised for its environmental contribution in the materials section – concrete materials.

Up to 2 credits for awarded for use of supplementary cementitious materials in 75% of all concrete by volume as follows:

1 credit = 30% of cement is replaced with industrial waste product

2 credits = 60% of cement is replaced with industrial waste product

(for precast concrete the % of cement replacement is reduced to 20% for 1 credit and 40% for 2 credits).

[Source: Contact – Green Building council of Australia www.gbcaus.org]

Victoria aims for five star homes



Sustainable construction is a key driver in Victoria's environmental program during 2004. It is a requirement that new homes built from July 2004 in Victoria achieve a five star rating. Similar to the green star rating factors taken into account include energy, water, storm water, building materials, transport energy and an optional category ESD excellence. The self assessment tool is accessible at: www.portphillip.vic.gov.au/attachments/o4964.pdf or www.portphillip.vic.gov.au/attachments/o4964.pdf sustainability scorecard.

Victoria's focus on "sustainable construction 2004 will be a time for us all to consider "what is our built environment", to debate its worth, applaud excellence and question the ordinary. It is an opportunity to stop and think about how the built environment affects our quality of life and how we can contribute to a more positive and sustainable future. Victoria has chosen to

adopt 'Towards Sustainable Communities' as its primary theme. It encapsulates the current focus of Government, industry and community. Victoria is the leading state in Australia in energy efficiency for new homes and boasts a range of activities to ensure sustainable communities into the future".

"Victorians are proud of their built environment and its valuable contribution to shaping our past, present and future. The Victorian Government embraces the Year of the Built Environment as a time of celebration."

Steve Bracks, Premier of Victoria

Independent cement and Lime Victoria has long recognised the contribution that slag products make to reduce the environmental footprint of construction, through greenhouse reduction and natural resource conservation. In addition to their work in Victoria, they are partnering with Resource NSW to have the environmental contribution of slag products recognised.

National Slag Association in USA is pursuing similar objectives by joining the Environmental Council of Concrete Organisations. In USA Blast Furnace slag "can qualify as a sustainable material when used in the manufacture of concrete products such as readymixed, precast and masonry products." ■

[source: NSA Slag Runner February 2004]

STRONG DEMAND FOR TECHNICAL PRESENTATIONS

In last issue of Connections we reported on the Association's new tailored presentations. These show how your durability, resource and energy conservation needs can be met using iron and steel slag products. This is an important factor in the days of energy / environment rated buildings and construction.

Presentation topic areas include:

- Slag in concrete construction and pavement technologies
- Slag in concrete construction applications – case studies
- Environmental benefits derived from increased utilisation
- Slag in road pavement, base and sub base construction

Given the strong demand for the seminars and our commitment to ensure the benefits of using iron and steel making slags in construction are well known we have provided another opportunity to book a presentation for your organisation of an appropriate selection(s) of this material at a time of mutual convenience at your offices.

BOOK YOUR PRESENTATION NOW! →



New Zealand Melter Slag helps the environment

Wastewater Treatment Utilising NZ Steel Mill Slag Aggregates

In the early 1990's, New Zealand Steel's Environmental Engineering Department carried out a series of extensive leaching trials over a two year period, to check that the iron making or "melter" slag was safe to use as a roading and drainage material. During these trials it was noticed that the slag had the ability to remove phosphorous and some heavy metals from water passing through the test rig.

Subsequent field trials in a dairy farm wetland and in a commercial growing bed for water cress confirmed the laboratory findings, which eventually led to melter slag aggregate being used as a final water polishing medium for the waste water treatment plant in the local township of Waiuku. Up to 80% of the phosphorous was removed by this system. Two further filter beds in other provincial centers have been installed more recently. At the time of writing, the Waiuku beds are still removing suspended solids and algae and have shown no evidence of clogging after ten years.

Meanwhile SteelServ Ltd are pursuing other

waste water clean up initiatives, particularly with regard to removing heavy metals from industrial site run-off as well as from roadways and car parks. New Zealand Steel is currently constructing a melter slag wetland to treat storm water from its site, the objective being to reduce the zinc and suspended solids content prior to discharge.

In the last few months several companies and research laboratories are examining, or have already specified melter slag as a wastewater clean up medium in small scale operations. These projects will be closely monitored, to further build the knowledge base on the performance of this unique material, with a view to communicating the results to Consulting Engineers, Regional Councils, Environmental Contractors and other interested parties.

Further field trials are about to commence examining the use of



"New Zealand Steel wetland to reduce heavy metals in storm water under construction".

melter slag for the clean up of dairy farm run-off, as well as phosphorous contaminated creek waters discharging into fresh water lakes.

SteelServ Ltd believes that the potential for slag to assist in waste water clean-up is only beginning to be realised, as the price of natural Zeolites and other materials continues to rise, even though the ability of these co-products of the steel industry to carry out these functions has long been recognised internationally. ■

[Source: By Bill Bourke, SteelServ Ltd – New Zealand]

"Field trials in a dairy farm wetland and in a commercial growing bed for water cress confirmed the laboratory findings, which eventually led to Melter slag aggregate being used as a final water polishing medium for the waste water treatment plant in the local township of Waiuku. Up to 80% of the phosphorous was removed by this system."



Slag helps the development of Port Kembla Port

“Iron and steel making slags have played an important role in constructing facilities at the port including the Coal Loader, Casting Basin and the ultimate filling of the casting basin to create portside land.”

Photo Courtesy of Tourism Wollongong ©2004



The Port of Port Kembla has been under regular update and modification since construction of the first breakwater began around 1900. It is a major port for the export of grain, coal and steel products and import of iron ore. There are many other bulk and break bulk cargoes that enter or leave the port each year. At times the port has been host to the construction and floating out of the immersed tube sections of the Sydney Harbour Tunnel and off shore oil and gas platforms. During the Olympics, it was a point of disembarkation for imported motor vehicles destined for the Western Sydney region.

Iron and steel making slags have played an important role in constructing facilities at the port including the Coal Loader, Casting Basin and the ultimate filling of the casting basin to create portside land for offloading of containers, motor vehicles and other cargoes. These constructions have consumed some millions of tonnes of iron and steel making slag products and contributed significantly to development of port facilities. The Port Corporation is winner of the 2001 Public

sector Excellence Awards for its Inner Harbour Development and Growth Project.

The NSW Government is currently undertaking a multi port strategy, which will see the further development of Port Kembla and the transfer of Port Jackson container and general trades to the port. Cargo operations at White Bay ceased at Christmas 2003 and the Darling Harbour leases will expire in February 2006. At that time, this trade will be relocated to Port Kembla. A \$16 Million project in Port Kembla to extend the Inner Harbour multipurpose berth by 130 metres will allow two large ships up to 80,000 deadweight tonnes to use the berth simultaneously. This extension will also help the additional trade transferring from Sydney

Construction is in the form of a reinforced concrete deck on steel piles anchored directly into the bedrock. The design is innovative allowing for construction without raking piles by including a strengthened Western end wall and anchoring the deck on the Eastern end directly into the existing multi purpose wharf. The deck will have reinforced sections along its length to



Port Kembla Inner Harbour Multi Purpose Berth extension – image supplied by Port Kembla Port Corporation

accommodate crane rails. Around 100,000 cubic metres of blast furnace slag will be used as backfill to the wharf deck, covered by a layer or larger rock material at the water fill interface. Blast furnace slag has also been specified for the heavy duty pavement on top of the backfill. ■

[Source: Port Kembla Port Corporation – www.kemblaport.com.au and NSW Government multi port strategy – www.transport.nsw.gov.au/ports/index.html]





Regeneration of slag filter bed material adds value

The iron and steel making processes at BlueScope Steel's New Zealand Steel site are unique in the world, because of the source material (titanomagnetite ironsand) and the processes required to turn it into iron and steel. The resulting chemistries of the iron and steel making slags are, in turn, different from the industry norm with unusual elements such as TiO_2 being present.

Field trials in a dairy farm wetland and in a commercial growing bed for water cress confirmed earlier laboratory findings, which eventually led to melter slag aggregate being used as a final water polishing medium for the wastewater treatment plant in the local township of Waiuku. Up to 80% of the phosphorous was removed by this system, although the performance started to drop off after about five years.

One possible solution to the gradually diminishing performance of slag based filter beds, is to rejuvenate the material by drying it out. This was discovered by Dr Aleksandra Drizo and others working at the University of Montreal. The Canadian work indicated that with Electric Arc Furnace slags under test in the laboratory, rejuvenation levels of up to 75% were achievable. Following publication of these results, Massey University in Palmerston

North, New Zealand, decided to further investigate this potential attribute.

Samples were taken from the Waiuku filter beds, along with fresh melter slag supplied by SteelServ Ltd and subjected to laboratory trial and microscopic examination. Rejuvenation of the samples was achieved at varying levels and considerably lower than the Drizo studies. The University believes that the lower results may reflect the different nature of the input fluids \bar{n} treated sewerage water verses laboratory mixes. However, they are sufficiently encouraged to further pursue this attribute, as well as to examine why these materials work in the way they do. The University has obtained a grant to engage a PhD Graduate to undertake this study over the next two years. A paper discussing the work to date will be published later this year.

Dr Drizo herself will arrive in New Zealand in November this year on an OECD scholarship to study clean up of dairy farm waste water, as well as to contribute to the Massey studies.

The next few months should see some interesting results beginning to emerge. ■

[Source: Bill Bourke, SteelServ Ltd - New Zealand]

Company Members

A primary role of our Association is to bring together Slag Producers, Processors, Customers and Suppliers to the Slag industry. Our activities cover Technical Developments, Plant Operations and Processes, Education and Promotion. If you would like more information on the Association and how you can become involved, just complete the information section at the end of this newsletter.

Current membership is as listed below.

Australian Steel Mill Services Pty Ltd
BlueScope Steel Ltd (Port Kembla)
Blue Circle Southern Cement Ltd
Brambles Equipment Ltd
Brambles Industrial Services Ltd (Whyalla)
Concrete Pty Ltd
CSIRO CMIT
Gough & Gilmour Pty Ltd
Heckett Multiserv (UK)
Hunter Mill Services Pty Ltd
Komatsu Australia Ltd
Mahaffey Associates Pty Ltd
Metserv Australasia Pty Ltd
Milburn New Zealand Ltd
OneSteel Limited (Whyalla)
University of Newcastle – Mr Stephen Fityus
University of Wollongong – Dr Denis Montgomery
Premium Tyre Service Pty Ltd
Readymix Holdings Pty Ltd
Roads & Traffic Authority of NSW
Slag Cement Sdn Bhd, Malaysia
Smorgon Steel Ltd (Melbourne)
Smorgon Steel Ltd (Newcastle)
Steel Cement Ltd
SteelServ Ltd (NZ)
Steelstone Services (Aust) Pty Ltd
Sunstate Cement Ltd
Wormald Fire Systems Ltd

Personal Members

Anderson, L
Dobson, G
Gregory, G
Hanley, P (Hon.)
James, W (Hon.)
Jones, D E (Hon.)
Heaton, B (Hon.)
Maric, M
Prosser, S D (Hon.)
Venour, M (Hon.)

Related Associations

National Slag Association (US)
Nippon Slag Association (Japan)
European Slag Association (EU)

Australasian Slag Association: Technical Seminars

I am interested in: (please tick ✓)

PHOTOCOPY AND EXPRESS FAX: 4228 1777

☐ Receiving a presentation on ☐ Receiving more information about

Presentation topic areas: (please tick ✓)

- ☐ Slag in Concrete Construction and Pavement Technologies
☐ Slag in concrete construction applications – case studies
☐ Environmental benefits derived from increased utilisation
☐ Slag in road pavement, base and sub base construction
☐ Other (please specify)



Contact Name	Position
Organisation	
Business Category	
Postal Address	P/Code
Street Address (if different)	
Telephone	Mobile Phone
Facsimile	Email
Expected number of people	Preferred times/dates
Potential disciplines attending	



NEWS BRIEFS



Metserv – Dr. Chris Stuckey moved to Australia from the United Kingdom in July 2003 to assist with Special Projects in Australasian region. He began his career with British Steel in South Wales investigating cold mill defects. Following completion of a doctorate, he moved to technical management in the Cold Rolling and Galvanising Plant in British Steel's Llanwern Plant. Chris then moved to Heckett Multiserv's (MetServ's Parent Company) Division Office in London providing business development and project management support on a global basis. In 2002 he took responsibility for the briquetting operations at Corus's Scunthorpe Works.

National Slag Association (USA) has recently become a member of ECCO – the Environmental Council of Concrete Organizations. It will work with ECCO to "promote slag products used in concrete both as aggregate and as GGBS (ground granulated blast furnace slag). ECCO works in conjunction with the Green Building Council, which operates a green building rating program.

[Source: NSA Slag Runner No. 1-04 February 2004]

Dr. Ihor Hinczak – Left Australian Steel Mill Services in December 2003 after a 3 year term. Ihor is the former Chair of the Technical Committee of the Association. He has been involved in the development and marketing of Ground Granulated Blast Furnace Slag in the Australian Market over many years and has worked for Monier, Blue Circle Southern Cement and James Hardie.



Dr Hinczak has served on Standards Australia Committees for Cement and Supplementary cementitious Materials (Ground granulated Blast furnace slag, Fly Ash and Amorphous silica). He is now consulting generally to industry as Cementech Pty Limited.

PRESENTATIONS

A key focus of the Association is ensuring that Universities and their Engineering and Architecture students and lecturers have an appreciation of slag products. Tailored presentations are also available upon request for representatives from Engineering and Construction organizations Government Departments and Councils. During the quarter presentations were made to:

November / December 2003

- Geopave / Graham Foley
- Mildura City Council
- Australian Road Research Board
- AS James
- Chadwicks
- MineHarts

February 2004

- GHD
- Maunsells

Upcoming

- University of Wollongong
- University of NSW
- Monash University
- Australian Defence Forces Academy
- Queensland University
- Melbourne University
- University of Western Sydney
- University of Newcastle
- Australian National University

Slag – "the ultimate renewable mineral resource"

The video has proved to be very useful to many members. New additional footage has been incorporated demonstrating the beneficial properties of slag in various large-scale projects completed in recent years. The video (15mins duration) outlines slag's historical beginnings through to the various types of slag produced in a modern production process today.



Copies are available to members at a cost of \$15.00 each, non-members \$20.00 plus postage and handling. Just complete and fax back the subscription/order form indicating your requirements.

Technical Resources on CD

ASA produces a number of high quality technical guides (i.e. the new – "A Guide to the use of Iron and Steel Slag in Roads" and the "Guide to the Use of Steel Furnace Slag in Asphalt and Thin Bituminous Surfacing")



bulletins, newsletters and general industry information on current issues. The Education and Promotion Committee has developed a Technical Compendium on CD; an invaluable readily accessible reference tool for engineers, specifiers, consultants, government authorities, and slag users. A limited number of hard copies are also available.

Copies are available to members at a cost of \$15.00 each, non members \$20.00 — plus postage and handling. Updated CD's will be available for registered users as new material is added. Stay up to date! Complete and fax back the subscription/order form today.

Subscription Form: Connections

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