asa QUARTERLY

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ASSOCIATION connections

australasian slag (iron & steel) association newsletter

www.asa-inc.org.au

Editorial Comment

The role of ASA is Education and ensuring that the attributes and benefits of slag products; from the manufacture of iron and steel, are well known. Considerable slag products research has been carried out over the past 40 years that underpins its use. This work has covered applications as diverse as origami concrete canoes through to the Sydney harbour Tunnel immersed tube segments, Bass Strait offshore gas platforms Sydney's Mascot Airport Third Runway and North West Shell Gas infrastructure and many other large items of public infrastructure. Significant quantities of slag products continue to be used in roads, concrete and other construction on a daily basis. Early seminars promoted by slag producers, processors and marketers included the International Concrete Workshop '88 held in Sydney in 1988 and International Conference Concrete for the Nineties held in Leura in 1990. Australasian (iron and steel) Slag Association has carried on this role. Each year, the Association presents seminars at a number of Universities and Colleges to Engineering and Architecture students. It also sponsors an annual ward for a paper by a University Honors / Masters Students.

This year's seminar brings together some of the ongoing research and the ecosociopolitical and economic environments in which slag producers, marketers and users operate. Buoyant world steel markets are mirrored in Australia, ensuring ongoing supply of slag for the construction industry. Research covers environmental assessment and performance of slag cements. Experience with the use of slag products for waste water treatment points the way for more innovative uses. A special presentation by a cross discipline group of University students brings a quite different perspective on slag products as a resource.

Slag in high performance cements underlines the materials versatility whilst its acceptance as an eco friendly product highlights its value. Read on and don't forget to register for the seminar. C

Important seminar on slag products march 18, 2005 in sydney

The Radisson Hotel Liverpool Street, Darling Harbour is the venue for the 2005 Australasian Slag Association Seminar Iron and Steel Slag Products: A significant resource in a time of scarcity. To be held on March 18th 2005. Commencing at 1.00 pm the seminar focuses on a number of industry and product developments.

Seminar topics include an overview of iron and steel slag production volumes and proposed new capital investment, potentially contributing towards increased volumes of iron and steel slag in Australia. An industry overview of iron and steel slag product utilisation, coupled with new developments from across Australasia. Insights will be presented on recent research and developed activities of the Association, covering concrete technology and blended slag cement performance along with environmental impact investigations and classification.

The seminar will conclude with a presentation from our 2004 Education award winners and joint finalist in the Higher Education Workplace Skills Olympiad competition in 2004. The project task was to investigate opportunities to use or recycle iron and steel slag products streams taking into consideration market activities, environmental issues and the community.

Association Chairperson Shani Smith believes that this is an important seminar for people involved in the construction industry including designers, engineers, specifiers, educators, local and state government policy makers and those interested in durability of structures, greenhouse gas reduction initiatives and resource conservation.

The seminar is being held on the same day as the Association's Annual General Meeting ensuring that key players in the Australasian industry will be in attendance. With a dinner to follow the seminar, network opportunities abound.

Central Location for Association seminar

Only 5 min walk from Sydney Convention Centre the Radisson is close to the monorail, Darling Harbour facilities and the City with all of its attractions, providing an ideal opportunity for accompanying persons to sample the delights of Sydney.

A special conference accommodation package has been arranged for attendee who wish to extend their stay.

Special Conference deal A$179.00 per room per night Room only, A$194.00 per room per night. Including full buffet breakfast for 1, A$209.00 per room per night. Including full buffet breakfast for 2. Buffet breakfasts are served in our Brasserie – excludes room service breakfast. C

THIS ISSUE

Connections Editorial Team
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Ph: 02 4225 8466 • Fax: 02 4228 1777
Email: info@asa-inc.org.au Web: www.asa-inc.org.au
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High Performance Cement

By Alison Terry (RMIT)

Supplementary Cementitious Materials (SCM's) are considered a good thing for the cement and concrete industries, some electricity generation industries, the steel industry, industry and, down the line, the construction industry. More importantly, their use in cement and concrete production is a good thing for the environment. Firstly, it takes three industrial co-products; coal combustion products (CCP's), fly ash (FA) from coal fired electricity generation, iron blast furnace slag (BFS) from iron production and amorphous silica from various silica metal process, all co-products out of these primary process. Secondly, each of these SCM's has the potential to displace the demand for virgin materials (lime, silica and alumina) and reduce the impact of mining. Thirdly, it reduces the energy demand for, and CO2 generation from, cement production (one tonne of Portland cement produces one tonne of CO2) which, from a life cycle perspective, is the most energy intensive component of concrete manufacture – surprising, given the fact that cement represents 10-15% of concrete volume dependent on required strength. Substitution by SCM's, in turn, significantly diminishes the embodied energy of concrete thus increasing its merit as an environmentally preferred building material – a benefit which increases the longer the final product remains insitu.

SCM's, can either displace, or largely replace, Portland cement (GP) as the binding agent of concrete depending on use. The resultant blended product is commonly known in the industry as general blended cement or GB cement. This blended product produces many advantages from a resource, cost and environmental perspective but what are the realities of this seemingly advantageous scenario? For one thing, it complicates things because, like a cake mix, varying the ingredients changes the recipe and, for engineered concrete structures, this could spell disaster, especially where multiple batches are required. For this reason a number of controls have been put in place – from implementing quality assurance for SCM's to testing batched concrete mixes. The upside is that, for concrete aficionados, the permutations and possibilities resulting from new materials, mix designs and technologies has broadened its application and improved its specificity.

But, back to fly ash (FA). The quality controls for FA is quite complex as only sources arising from the combustion of black coal in power generation has the most desirable chemical composition for concrete use, Victorian fly ash sources have less desirable properties for use in concrete as they are produced from brown coal. Of the NSW, Queensland and (small) South Australian sources only 'fine grade or high reactivity fly ash' have the right properties for use in GB cements in concrete (as opposed to furnace bottom ash or FBA, which has other uses as an aggregate). Quality controls for the use of FA in GB cements and ultimately concrete are very demanding, any material supplied must comply with the 'Specified Requirements of Table 1 – AS3582.1. Iron Blast furnace slag (BFS) must also comply with similar quality and performance requirements of 'Specified Requirements of Table 1 – AS3582.2.

In terms of GB cements the down-side is that they can retard early strength development within the first three to seven days which has important ramifications (10% increase) in terms of final setting times (although advantageous in hot weather) and thus design and project management implications. The up side is that GB cements improve the ultimate strength and durability of the concrete beyond twenty eight days (as per concrete standards). This quality and performance increases proportionally, dependent to the SCM ratio, but CSIRO has shown for the use of FA that there is a cost benefit optimum between 50-75kg/m3 although higher replacement values have been used depending on their use and design criteria. Other research shows that ratios over 1:4 of fly ash to Portland cement undermines the optimum balance between elasticity and hardness. The ball bearing nature of the particles means that less water is needed to generate the desired slump, which also improves pumpability and decreases segregation and bleeding. It also generates a lower peak temperature during curing time reducing thermal shrinking and cracking. It also has freeze-thaw and sulphate resistance. For more insight into the art of fly ash selection refer to AS 3582.1

While optimum at 25% the fly ash to Portland cement ratio can vary for each application and chloride and sulphate resistant concrete is normally 30% and above. Overall the addition of

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Recycled Concrete Aggregate

Aggregate represents 60-80% of the concrete mix so finding an appropriate substitute has significant resource and environmental benefits. Substitute sources now commonplace are iron blast furnace slag crushed like traditional quarry products into aggregates, as mentioned above, crushed brick, washed returned plastic concrete and demolition concrete. Concrete recovery has grown by 200% since 1993 and, while it (and crushed brick) has quality control issues it is increasingly used for building construction purposes as well as the established uses as road base, fill and hardstand. The quality control issues are associated with contamination (from plasterboard) and the quality and use of the original concrete (affecting chemical composition and 'lumpiness' due to its cement component). Crushed brick contamination is associated with clays containing nitrate residue, which increases the decay rate of concrete.

For construction purposes recycled concrete aggregates fall into two categories; recycled washed aggregates from plastic concrete returns and recycled crushed aggregates from demolition sites. These are subject to the same quality controls (standard quarry test) required of virgin aggregates. The overwhelming requirement is that the chemical composition of the aggregate will not react with lime or degrade over time and this is confirmed by testing aggregates prior to use. The major difference between the two products is that the washed aggregate can be used up to 100% replacement of virgin material while the optimum use for the crushed product is only up to 30% due to construction and Australian Standard constraints. Apart from its environmental advantages both recycled aggregate products, in particular iron blast furnace slag aggregates are generally slightly lighter than virgin aggregates which also generates some design benefits.

Recycled content concrete can accrue environmental credits – the higher the recycled content (including water) the better. Boral and Independent Cement and Lime (ICL) are considered the two leading edge manufacturers of recycled content products in Victoria and NSW. Both companies operate

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Conference Abstracts

World of Iron & Steel

Presented by **Oscar Gregory** – Manager Operations Services Bluescope Steel

Abstract

World Iron & Steel Production in 2004 is said to have passed the 1 Billion tonne level. The dramatic increase has not reduced the drive for rationalisation, even a suggestion of it in Australia. This is no surprise as the Steelmaking industry in Australia is alive and well following the public listing of BlueScope Steel and ONESTEEL.

Increased steel production increases the supply of by-products such as aggregates and cement substitutes. It is time Australia recognised the "Endless Quarry" in the Steel Industry that is capable of replacing a large proportion of the country's cement raw materials at considerable environmental benefit.

Marketing Iron and Steelmaking by-products has been typically limited to the low value commodity end of the market. It is time to become a "solutions-based" industry that changes the landscape of the country. This will require attitudinal changes on behalf of producers, processors and marketers and the Government and specifiers.

Supplementary Cementitious Materials and Greenhouse Gas Reduction Benefits

Presented by **Craig Heidrich** – Executive Director Australasian Slag Association

Based on a Case study: SCM's Lowering Greenhouse Gas Emissions for Australia

Craig Heidrich[1], Dr Ihor Hinczak[2], Bridget Ryan[3]

[1]HBM Group Pty Ltd, [2]Cementech Pty Ltd [3]Energy Supply Association of Australia.

Abstract

Under the Kyoto Accounting rules, Australia's National Greenhouse Gas Inventory Report emissions for 2002 was 550.1 Mt carbon dioxide equivalent (CO2-e) being a net increase of 1.3% on the 1990 levels. This increase is largely attributed to the stationary energy, transport and industrial process sectors, offset with reductions from reduced land clearing.

For the construction sector significant opportunities exist via increased use of mineral resources like coal combustion products such as; fly ash, iron blast furnace slag and amorphous silica used with Portland cement in the manufacture of concrete. In Australia, the manufacture of one tonne of cement results in the emission of approximately 0.79 tonne of CO2-e or annually 6.1 Mt of CO2-e emitted for total cement sales.

Using data collected from member companies, life cycle analyses were conducted to demonstrate the reduced embodied energy and CO2-e signature for one cubic meter of concrete containing various combinations fly ash, iron blast furnace slag and amorphous silica of the binder. From the resultant data a simple CO2-e estimator has been developed to assist architects and designers in understanding and constructing eco friendly structures.

For the construction of a domestic dwelling (four bedroom home) using approximately 130m3 of 25 MPa concrete containing binder ratios of 70% Portland cement and 30% fly ash, the total savings in CO2-e emissions was 13.04 tonnes, or equivalent to emissions from a four-cylinder car for 4.35 years.

The paper will briefly discuss Australia's current National Greenhouse Gas Inventory Report in the context of how increased use of fly ash, iron blast furnace slag and amorphous silica (SCM's) in the construction sector can further lower greenhouse gas emissions, whilst still delivering improved durability performance.

Phosphorus and metals removal from run off and waste water using slag filter beds

Presented by **Bill Bourke** – Manager SteelServ New Zealand

Abstract

The ability of iron and steel making slag aggregates to remove phosphorous and a number of heavy metals from waste water has been well documented for many years, but for a variety of reasons the material has only been used sporadically internationally for this purpose.

The exception is New Zealand, where there are currently six waste water treatment plants using iron making aggregate from NZ Steel's unique ironsand based operation as final water polishing media, with several more in design. NZ Steel recently installed two melter aggregate filter beds at their Glenbrook mill to improve the quality of site storm water, targeting zinc and suspended solids. SteelServ and NZ Steel are undertaking further initiatives to utilize this unique aggregate's water improvement qualities.

This paper examines the history and performance of the existing operations and discusses some of the new end uses being examined.

Radisson Hotel

Latest Slag Cement research

Presented by **Dr Jay Sanjayan** – Lecturer Monash University

Abstract

The presentation will cover an ASA sponsored experimental program conducted at Monash University to distinguish the factors that affect the long-term drying shrinkages of concrete containing blended cements (Type GB). Altogether 28 concrete mixes were tested up to 180 days for drying shrinkage and compressive strengths. The mixes were based on a typical Grade 40 concrete with 80 mm slump. The mixes included two types of cements (Type GP and SL) and four types of supplementary cementitious materials, namely, three types of slag and one type of fly ash. Type GB ratios of 35/65, 50/50 and 65/35 were tested. In addition to the standard tests, a modified shrinkage test was also carried out to measure the shrinkages between 0, 1, 3 and 7 days. Results show very large strains occur between 0 and 1 day in all the concretes. Concretes containing slag and/or slag exhibited expansion strains between 0 and 7 days. No appreciable expansions were observed in concretes made with Type GP cement only or with GP/fly ash blends.

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Environmental research and classification of iron and steel slag materials

David Aynsley – Director Moeyan Management

Abstract

Iron and steel furnace slag's though sometimes showing elevated metals concentrations are, when assessed against the NSW Environment Protection Authority Environmental Guidelines, able to be categorised by the generator as Inert Waste.

These findings and ongoing investigations will assist regulatory authorities and the ASA in providing the scientific evidence required for appropriate handling and application of iron and steel slag by-products for productive and beneficial end use applications, rather than landfill disposal.

Special Presentation

HEWSO

"Investigation of the opportunities to use or recycle iron and steel slag products taking into consideration market activities, environmental issues and community attitudes".

A special report given by the University of Wollongong cross discipline Higher Education Workplace Skills Olympiad (HEWSO) Yellow Team (2004) – Joint finalists and runners up in the National 2004 Competition.

Presenters

Luke Coombes, Djurdjica (Georgia) Ivancevic, Mohammad Mamun, Claudia Perry-Beltrame, Mitchell Pirie

Abstract

The team from the University of Wollongong, worked with Bluescope Steel, on a problem related to economically and environmentally viable means of recycling by-products from the Port Kembla Steelworks. The problem faced by BlueScope Steel Limited are the industry by-product created due to the production of iron and steel, namely blast furnace slag; environmental issues in regards to the by-product; and community relations to educate or communicate issues about blast furnace slag.

The report produced for BlueScope Steel Limited, as part of the Higher Education Workplace Skills Olympiad (HEWSO) competition in 2004 describes the opportunities present to BlueScope Steel Limited to recycle its by-product streams taking into consideration market activities, environmental issues and the community.

The key recommendations are placed within the context of the need to present a positive and environmentally active image for BlueScope Steel Limited.

The key solutions that appear to be most economically viable include the use of slag for a variety of marine applications, the use of slag as a water filter medium and fertiliser as well as the creation of sulphur pools.

Bluescope commented that "we are already starting to use the work in discussions with our contractors in this area and you may find that we are keen to talk more with some of the students about their work down the track."

The team from University of Wollongong has been announced a National Runner Up at the HEWSO Melbourne finals 2004 as well as the winners of Australasian Slag Association Education Award 2005.

< from page 2: high performance cement

fly ash improves durability and serviceability as it significantly slows the ingress of moisture, oxygen, chlorides, and aggressive chemicals (alkali and sulphate attacks). As a resource fly ash has merit but users should ensure any material selected or nominated meets the required criteria set down in AS3582.1. So, the question is 'will supply meet construction sector demand as it increases'?

As a way of responding to this question iron blast furnace slag (BFS), when granulated (GBFS) (think sand), can be further finely ground (GGBFS), analogous to grinding cement clinker, can be used as a cement replacement either in conjunction with fly ash or in its own right. Iron blast furnace slag is a by product of iron manufacture and has a huge range of applications, depending on the particle size, such as road base, back fill, concrete aggregate (see next article). While fly ash is referred to as an SCM, Australian fly ashes have not cementitious properties due to chemistry, They are in fact pozzolanic, which essentially means they will harden when combined with an activator (eg. cement) while slag which has hydraulic qualities like Portland cement, can displace it up to 100% but normally up to 65% displacement is usual for special application concrete. Typically, general construction uses a 20-40% slag component blended with cement. To reduce heat of hydration and improve sulphate resistance requires 60-70% slag component. Concrete paving, exterior and interior flatwork, basement floors, walls and columns, tilt-up panels and other high strength uses use a 25-50% slag mix. Pre-stressed and pre-cast concrete, concrete blocks and pavers use a 20-50% mix. Footings use a 30-65% mix (see the Australasian Slag Associations – A Guide to the Use Slag In Concrete for more details). Like fly ash, slag cement has delayed early strength and drying time but superior workability due to reduced water requirement. Both materials create a 'high performance concrete', which is highly resistant to chemical attack, very low permeability and low shrinkage. C

membership

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)
Concrite 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)

< from page 2: recycled concrete aggregate

from new energy efficient, dry processing plants which also improves environmental performance. ICL's Ecoblend is a blended cement which contains a minimum SCM content of 30%, being either slag, fly ash or a combination of both. This product range and the company's Steel Cement ™ and Australian Builders Cement™ (Type GB), have been awarded the Good Environmental Choice Guide by the Australian Environmental Labeling Association (AELA). They also meet ISO 14024 for environmental best practice and environmentally preferred materials. The use of Ecoblend also gains Greenstar™ credit points under the technical manual I: Materials – Part 5.

Boral's products include Triple Blend Cement – extending Portland with slag and fly ash; Envirocrete – using recycled crushed aggregate; and Green Concrete which used washed recycled concrete aggregate. Green Concrete complies with Greenstar specifications by using a combination of Triple Blend Cement, Envirocrete and recycled water. Envirocrete is mainly used for subdivision pavements and footpath repairs, commercial site works, car park construction, slab preparation, driveways, pipe bedding and backfill, access and walking tracks. Green concrete is used for foundations, paving, house slabs, and other higher strength construction needs. For example, the 60L building met the 20 and 25 Mpa compressive strength specificiations of the concrete with a total of 94% recycled content including recycled aggregate, 60% fly ash and slag content cement and 100% recycled slurry water. The Positive Footprints project used 100% recycled content concrete by using reclaimed materials, Boral Blend cement, recycled aggregate and slurry water.

Given the diversity of applications and complexity of recycled content concrete it will not be surprising that, in the future, along with your environmental rating you will be given a materials verification certificate for your concrete construction to indicate to future recyclers its materials source and combination! Otherwise, how are we going to keep up the good work and continue closing the loop by replacing virgin materials with recycled sources which, research verifies, has improved performance and wider applications.

(Research guides include the Environmental Design Guide Nov 2003 Pro 31; the Australasian (iron & steel) Slag Association – www.asa-inc.org.au; Ash Development Association of Australia – www.adaa.asn.au; www.concrete.com; Boral and Independent Cement and Lime homepages; www.60lgreenbuilding.com).

Holcim puts money where its mouth is with sustainable construction contest

In a continuing industry-wide effort to promote sustainable construction around the world, Swiss construction materials giant Holcim Ltd. has created a competition open to anyone who pursues such projects, including architects, planners, engineer or project owners. Launched in November 2004, the Holcim Awards for Sustainable Construction was created by The Holcim Foundation for Sustainable Construction, which was formed in December 2003.

Entries for the competition are open, and sustainable construction projects can be submitted for the awards via the internet (at www.pbm3.com/trk/ct.aspx?x=1504.61ee.98472" www.holcimawards.org) until March 31, 2005. **C**

<Source: Holcim Ltd (Published in Cement Newsline February 4, 2005)>

Prize money for the five regional competitions and the global awards totals $2million.

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 apon request for representatives from Engineering and Construction organizations Government Departments and Councils.

During the quarter presentations were made to:

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

Australasian Slag Association: Technical Seminars

asa

I am interested in: *(please tick ✓)* ***PHOTOCOPY FORM 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: Website:

Expected number of people: Preferred times/dates: Potential disciplines attending:

SCE Group: James Young, has been appointed as General Manager Resources Division – SCE Northern Region (A Division Of SCE Group). Responsibilities include Steelstone and Hebden Quarry.

<Source: Norm Clifford – Steelstone / Hunter Bulk Materials>

ASMS: Rick Jarrett has recently joined the Sales & Marketing Team at ASMS in his new role of Product Manager – Road Products.

Rick has been previously employed by Concrete Recyclers, Rock & Dirt, Cleary Bros and Thiess Contractors. These companies have given Rick a range of differing perspectives to work forward from in addition to developing his significant industry experience, invaluable to the slag aggregate industry in his role of marketing Roadbase Products.

Rick's interests include Snow skiing, Gardening, wine and Cooking with a passion for cars and motorbikes that currently extends to a Honda Goldwing and a Fiat Strada cabriolet to be restored one day.

<Source: Shani Smith – ASMS>

ICL Ecoblend specified for Council pavements

Maribyrnong City Council has specified the Ecoblend range (30-50% slag content) for pavements in its Maribyrnong River Trail – Chifley Drive – Stage 2 Landscape Specification. This is a clear recognition of the environmental benefits from the use of slag cements and supports the Victorian Government Greenhouse Strategy.

<Source: James Howard ICL – jhoward@independentcement.com>

CSIRO Fertiliser Review – call for comment

CSIRO's Centre for Environmental Contaminants Research has released a discussion paper on the background and scope for establishing a list of prohibited substances and guideline limits for levels of contaminants in fertilizers. (www.clw.csiro.au/cecr/publications.html).

The review is being undertaken by CSIRO on behalf of the Product Safety and Integrity Committee's Fertilizer Working Group, which has been established by the Department of Agriculture, Fisheries and Forestry.

The closing date for comments is Friday 18 March 2005. For further details contact: robert.molloy@csiro.au

Municipal Association of Victoria Eco Buy rewards program

The program is a joint initiative of the Municipal Association of Victoria, the peak body for Victorian Local Government; EcoRecycle Victoria, the state authority responsible for waste and litter management and the Victorian Greenhouse Strategy, Victoria's plan to reduce greenhouse emissions.

Customers of recognised eco products receive bonuses and discounts according to the products used.

Products that satisfy the Eco Buy criteria, can be identified from the Eco Buy website at www.mav.asn.au/buyrecycled.

Ecoblend, Steelpave and Australian Builders type GB have qualified and listed as participating products. James Howard of ICL advises that any Council that changes to one of these products will receive a rebate on their purchases.

<Source: James Howard ICL – jhoward@independentcement.com>

Euroslag Conference – 4th European Slag Conference to be held 20-21 June in Oulu Finland

To date 22 papers have been accepted to be presented covering:

- Production, processing and utilisation of slags from steel production including stainless steel
- Slags and environmental questions new results from research and development/technical applications.

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.

CD Technical Resources

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 Surfacings") 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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Position

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Business Category *(please tick ✓)*

❑ Producer ❑ Materials handler ❑ Industry supplier ❑ Government agency

❑ Processor ❑ Refining/value adding ❑ Specifier/Engineer ❑ Other _____

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