

# ASSOCIATION connections

australasian slag (iron & steel) association newsletter

www.asa-inc.org.au

## Information is key

Key to our advances in society is good and timely information. A significant part of this edition is devoted to conferences in which the Association and its members have presented, played an organising role or attended. Association members have made the Association's case for slag cements contributing to the reduction of greenhouse gas emissions. The opportunity to network with many of the 338 delegates from Concrete 05 including the international speakers helps to ensure the transfer of information.

On October 7th, the National Women In Construction Industry conference was held in Melbourne. Attracting some 170 people the conference created much interest. Keynote speaker for the conference was Janet Holmes A Court. Mid year, was the Euroslag

Conference in Oulu Finland. At the beginning of November the global slag and lime conference was held in Dusseldorf at which Bill Bourke from Multiserv NZ presented. Based on the success of our March Conference, the Association has decided to hold another such event in May 2007. On this occasion, it is expected that there will be more overseas contributions as well as significant updates on research and development work going on in Australia

Overseas, significant work is being carried out by members of Euroslag ensuring they are represented on all relevant standards committees. It is important to ensure that standards do not discriminate against the use of slag products. Despite the significant use of slag products in

Europe for more than a century, it is clearly still necessary to keep the opportunities and benefits before the community of users and Government. Because slag products are manufactured as part of the steel production processes, the need to continue to improve the materials bonafides continues. European regulators are now having to wrestle with the unintended consequences of capturing slag under the waste guidelines. This has given rise to the current push to recognise the place of by products or co products of manufacture.

With so much change taking place in society, organisationally, demographically and attitudinally, the need to find ways to communicate the advances, research and even benefits of slag products both here and overseas is a high order priority.

## ASA Participates in Concrete 05

There were 338 delegates and accompanying persons registered for the 22nd Biennial Conference of the Concrete Institute of Australia – Concrete 05. It was held at the Hotel Sofitel Melbourne from 17th – 19th October 2005. There was a strong delegation of ASA member company representatives including Association Executive Director Craig Heidrich. Craig is also Chairman of the NSW branch of the Concrete Institute of Australia

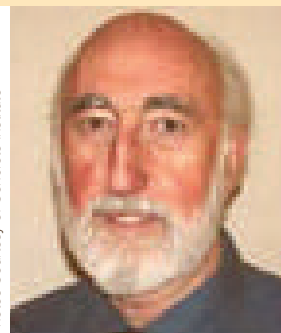
The overall theme of the Conference was Issues, Opportunities and Innovations. The Conference program had International and Australian speakers who provided opportunities to explore issues in design and detailing, construction techniques, new products and reporting new research. The challenge was to think globally as well as locally about the Construction industry today and beyond. Topics, included:

- Advanced Repair Methods, including FRP

Strengthening and External Prestressing.

- Alternative/Supplementary Cementitious Materials and Geopolymer Technologies
- Asset Management
- Basic Concrete Concepts: Materials, Production, Supplies and Properties
- Commercial Applications of New Technologies
- Concrete Composites for Repair and Rehabilitation
- Condition Monitoring of Structures
- Current Projects: Design and Construction
- Environmental Issues
- Latest developments in Cutting Edge Technology
- Preservation of Historical Structures
- Repair and Rehabilitation of Concrete Infrastructure Systems
- Smart Materials, Smart Structures and Integrated Systems
- Testing and Applications

Photos Courtesy of Concrete Institute



**Brendan Corcoran**  
Conference Chairman



**Doug Hooton,**  
International Speaker –  
Sponsored by Readymix

The Conference program also featured a day of workshops and seminars with a topical focus with international speakers. Well known to those working with Supplementary Cementitious materials was Doug Hooton a Professor of Civil Engineering at the University of Toronto, Canada. He is a Fellow of ACI, ASTM, and ACerS and is an honorary member of ASTM Committee C01 on Cements and ASTM C09 on Concrete. His research is concerned with the

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# WOMEN building a better industry

On Friday the 7th October 2005, in excess of 165 women in the Construction Industry converged on the Grand Hyatt in Melbourne for the inaugural NAWIC National Conference.

As part of its 10th Birthday celebrations in Australia, NAWIC hosted senior women from all walks of life including Senator Kay Patterson, Minister for Family and Community Services, Christine Nixon, Chief Commissioner of Police in Victoria, and the Chairman of Heytesbury Holdings and John Holland Pty Ltd, Mrs Janet Holmes a Court. All these influential women gave generously of their time and collective wisdom to communicate their experiences and the opportunities open for women in the Construction industry today.

A panel session involving the Building Commissioner Tony Arnel, and Executive Director MBA Vic, Brian Welch further expanded on issues involving the industry as a whole, including skill shortages and how women can continue to be developed in non traditional careers to fill these ever widening gaps.

The last of the formal sessions focussed on building networking and personal development skills to assist the women in the industry to improve their chances of success in their careers both today and in the future.

Two optional site tours, to CH2 and the Urban Art of Melbourne were also well attended by the



Source Shani Smith, ASMS

**Maria Bobeldyk, National President NAWIC Australia, Janet Holmes a Court and Carol Chapman, National President NAWIC USA**

delegates before they hurried off to the Gala event of the evening, the Crystal Vision Award and Cocktail party. Many Victorian identities from the construction industry rubbed shoulders with the delegates to congratulate the Winner of the first National Crystal Vision Award, Ms Maria Mavrikos of Structural Challenge in Victoria, awarded by the Association's Patron, Ms Paula Gerber.

## Overview of the Euroslag Conference

Held in Oulu Finland 20th – 21st June 2005 the 4th European slag conference attracted 140 experts from 20 different countries. They met to discuss the latest developments in technology for the production and use of blast furnace and steel slag. There were 25 lectures during the conference grouped under the general categories of Utilisation, Applications and Slags and Environment.

Oulu, the venue for this conference is home to Ruukki (Rautaruukki Oyj) Steelworks, located in this region in the 1960's because of its proximity to excellent Swedish ore (6 hrs away by ship) and centrally located to manufacturers of steel products. H. Sandvic (Rautaruukki Oyj) in his welcoming speech stated that 'Ruukki decided early on to explore ways of exploiting slag. With the help of Ruukki Production, Co-Products, a form of slag management (was) developed that now allows the slag that is produced to be utilised completely'.

In his welcoming speech, Chairman of Euroslag H. Motz reminded delegates that 'when it was formed in 2000, Euroslag set up 4 working groups 'Hydraulic binding agents', 'Road construction material', 'Fertilizer', and 'Public relations'. This has raised the intensity of research and development of slag and its uses. He further stated that 'Today, members of Euroslag can be found representing its

members' interests on all European committees for standardisation that are connected with slag'.

M Dean from Civil and Marine in the UK reported in the conferences Utilisation strand that slag materials were previously disposed of and now 'a slag product has been developed with a very high demand and which nowadays can in many cases no longer be supplied in sufficient amounts due to the limited amounts produced'. Research from Brazil, into the volume stability of steel furnace slags, means that most of the product can be put to use. Long term field trials have demonstrated the sustainability of fertilizers from iron and steel slags.

### Slag producers in Europe have been dealing with the issue of lack of clarity of the waste definition under European Law.

The applications strand of the conference heard of the many uses and products developed from slag. Some of these include controlling the volume stability of steel slag for use in pavements by the addition of air cooled or granulated slag, stabilisation of low load bearing sub bases with cement activated ground granulated slag, ameliorating low pH

soils with fine LD slag, stabilising of clay using LD slag and improving its resistance to sulphate attack and a method for column stabilisation for non load bearing substrates by use of electric arc furnace slag. Of particular importance to Northern Hemisphere customers, a paper was presented on the freeze thaw resistance of blast furnace cements. Papers were also presented on factors influencing grindability of granulated slag and the introduction of a quality system for slag from stainless steel production.

Environment and slag was the topic for the third strand. Slag producers in Europe have been dealing with the issue of lack of clarity of the waste definition under European Law. Recognising the problem, the European Commission has established a 'waste framework directive' to provide new definitions for 'waste', 'by products' and 'end of the waste property'. In this section, papers were also presented on adsorption of phosphates and heavy metals from waste water using ground granulated blast furnace slag (GGBFS), stabilisation of contaminated sludges with GGBFS and LD slag for the adsorption of heavy metals

The next Euroslag conference will be held in 2008.

Source: 'A short report on the 4th European Slag Conference Oulu, Finland 20th – 21st June 2005' [www.euroslag.com](http://www.euroslag.com)

## SLAG AS WATER TREATMENT MEDIA RESEARCH AGREEMENT SIGNED

New Zealand has been leading the way in Australasia on slag products for polishing and phosphorus removal of run off and waste water. Previous research into the use of iron and steel furnace slag aggregates as water filtration medium has demonstrated high adsorptive capacity for various metals and the removal of fine particulates in the source solution.

In New Zealand, Storm water has been identified as a major contributor to water quality degradation as it can have significant concentrations of harmful pollutants that can adversely affect the receiving aquatic environment. Although experience particularly at the New Zealand Steel site demonstrates the potential benefits, it is considered important to undertake a

formalized research trial to quantify the results.

The aim of this project is to provide data on the potential environmental effects and effectiveness of different iron and steel slag's (ISS) produced in New Zealand and Australia for remediation of storm water pollution. The project will conduct a desktop and laboratory study to provide statistically significant and repeatable data and results on the potential environmental effects and effectiveness of different slags for remediation of storm water pollution.

Key to the work will be assessing environmental impact of different ISS, Analysing existing data on ISS background levels of contaminants to identify any potential impact of ISS and associated leachate on the environment.

The study will also Assess the effectiveness of different ISS to remove contaminants from storm water using statistically significant and repeatable methods. This will include Leaching study using columns and artificial storm water for six (6) different ISS, Characterising each ISS sample both chemically and physically before and after the experiment to determine the levels of chemical uptake and physical degradation and reconciling water analysis results against each.

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## STEELSERV NZ WINS CONTRACT FOR ASPHALT AGGREGATE

SteelServ Ltd., a division of the MultiServ group, recently signed a contract with Fulton Hogan Ltd., a leading New Zealand civil contractor, for the supply of asphalt aggregates to their new asphalt plant in Auckland.

'This is the culmination of a lot of work over the last five years in developing and gaining the necessary approvals for the use of these materials by roading authorities'. said Barry Gibbon, SteelServ's General Manager. 'Our iron

making or 'melter' aggregate has proved to be an excellent performer on the road, delivering good skid resistance properties and long term durability. Fulton Hogan had been monitoring these trials and began their own examination and mix design work over a year ago. Lay down trials and feedback from their customers convinced them that mixes incorporating our melter aggregate were superior to their conventional, delivering better heat retention, texture, workability and skid resistant properties'.

As a result of this contract and increasing demand for their surfacing materials, SteelServ are upgrading their chip making and washing facilities in anticipation of strong demand in the coming summer months for both chip seal and asphalt aggregates.

Barry Gibbon, GM SteelServ (left) and Tim Ford, GM (Northern) Fulton Hogan signing the recent melter aggregate supply agreement.



## 2007 CONFERENCE BEING PLANNED

Encouraged by the successful conference in March this year, the Association is planning to hold another in May 2007. Programming is moving ahead with a mix of local and international speakers planned. The general theme of the conference is Sustainability. Much is happening here and overseas that demonstrates the significant role that slag products can and do play in lessening the construction industry's environmental footprint on the earth and contributing to the durability of structures. Many well known structures in this country and world wide have used slag products from the iron and steel industry to advantage.



# CEMENT INDUSTRY ACTION AGENDA

**Australasian (iron and steel) Slag Association** has taken an active role in the current Cement Industry Action Agenda. This is an important step given slag's strategic role in sustainable development as a cementitious binder material.

'The Cement Industry Action Agenda is a government-business partnership that will map a future for the industry by identifying opportunities and challenges ahead. It will address environment, energy, trade and technology issues,' said Mr Ian Macfarlane Federal Minister for Industry, Tourism and Resources.

Appointment of the members of the Strategic Industry Leaders Group (SILG) and the holding of the first SILG meeting was announced on 22 March 2005 by the Parliamentary Secretary to the Minister for Industry, Tourism and Resources, the Hon Warren Entsch MP, who is the Government's champion for the CIAA. The Strategic Industry Leaders Group has been formed to steer the development of the Action Agenda

Members of the Strategic Industry Leadership Group are:

**Malcolm Irving**, AM. Chairman

**Sharon DeHayes**, Readymix Holdings Pty Ltd

**Mark Chellew**, Adelaide Brighton Ltd†

**Chris Leon**, Cement Australia

**Phil Jobe**, Managing Director, Blue Circle Southern Cement

**Dr John Rankin**, CSIRO Minerals Chief Scientist

**Alan Millis**, Queensland Department of Energy

**Robert Williams**, NRG Flinders

**Oscar Gregory**, BlueScope Steel

**Margaret Sewell**, Department of Industry, Tourism, and Resources

Four working groups have been established with leaders and co-leaders drawn from the Strategic Industry Leaders Group to address key issues and formulate recommendations and strategies for the consideration of the Strategic Industry Leaders Group in relation to: Energy and Greenhouse, Sustainable Development, Trade, Workforce and Community

ASA is represented by Mr Oscar Gregory with co-leader Dr John Rankin. The primary role of this Working Group is to address issues relating to the industry's sustainable future in the period to 2005 and longer term to 2025. In May, the working groups pushed with the identification

of issues relevant to their particular theme. Chairman Malcolm Irving, AM commented 'The working Groups have made good progress, successfully pooling their expertise and dedication of their respective members to identify and explore their issues and establish facts to support a range of important findings.'

In July, the groups assembled in Canberra, with each Working Group Leader presenting their initial findings and made suggestions for industry and government to address the issues raised. It was agreed to refine the presentations and hold workshops at the Inaugural National Cement Industry Conference in Canberra on August 4th 2005. Given the broad cross section of delegates at this conference, the Working Group Leaders were able to capture some new insights into the issues raised. Working Groups having incorporated feedback from the conference into their final reports, presented them for review by the Strategic Industry Leaders Group at its October meeting.

Source: Cement Industry Action Agenda News, Edition 2, August 2005 - Department of Industry Tourism and Resources - contact - [chris.lloyd@industry.gov.au](mailto:chris.lloyd@industry.gov.au)

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Trials will include Applying the equivalent of six (6) rain events of 27mm (Auckland 2-year return rain event) to each sample, quantifying the removal of all detectable metals, phosphorus and nitrogen for each event and measuring changes in pH, sulfate content for all detectable metal levels in control and adjusted samples.

A key outcome is to assess the potential usefulness of ISS products as a treatment media in storm water treatment devices and identifying where this treatment can be used, assessing the novel storm water treatment

media for use in infiltration/filtration devices. The project aims to determine what occurs at the surface of Blast Furnace Slag (BFS) and Steel Furnace Slag (SFS) when in contact with different sources of water under a variety of conditions. These to include: Still fresh water in aerobic and anaerobic conditions, Wastewater in aerobic conditions, and Salt water in free flowing tidal conditions. Investigations will focus on chemical reactions occurring at the surface and what elements and compounds are absorbed and released by slag under different

conditions in aqueous environments. Mechanism (ie. ion exchange, reduction-oxidation etc.), rate limiting factors and key environmental influences (ie. temperature, pH, oxygen availability, flow rate etc.) of reactions also to be determined.

Results of this project should be available by the end of the year. They are expected to add to our store of knowledge on this subject, building on the practical work carried out by Multiserv NZ and research work conducted during the 1990's at the University of Western Sydney.

Further information [info@asa-inc.org.au](mailto:info@asa-inc.org.au)

## 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  
BlueScope Steel Ltd (Port Kembla)

Brambles Equipment Ltd  
Brambles Industrial Services Ltd (Whyalla)  
Concrete Pty Ltd  
CSIRO CMIT  
EcoCem Pty Ltd  
Fractum ApS  
Heckett Multiserv (UK)  
HiSmelt Ltd  
Holicm NZ Ltd  
Hunter Mill Services Pty Ltd  
Komatsu Australia Ltd  
Multiserv Australia Pty Ltd  
OneSteel Limited (Whyalla)  
University of Newcastle

University of Wollongong  
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  
Sunstate Cement Ltd  
Wormald Fire Systems Ltd

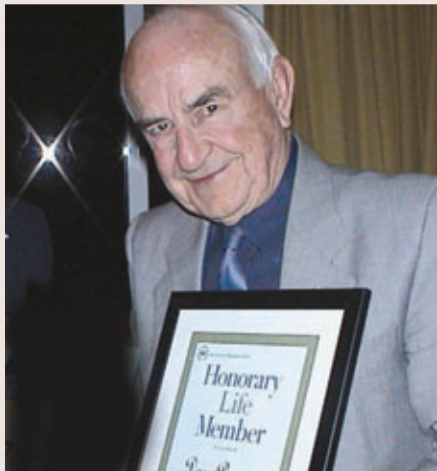
**Personal Members**  
Anderson, L

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

## Related Associations

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

# DOUG PROSSER AWARD



**Founding Executive Officer of ASA Doug Prosser** (Hon. Life Member) has been recognised by the Institute of Quarrying at its recent National Conference in Adelaide. Doug has been made an Honorary Fellow of the Institute, recognising his many years of service to the IQA, including his part in the foundation of the Illawarra Sub-Branch, his period of service as Chairman of the Sub-Branch, his current work collecting information regarding the history of the quarrying industry and of the IQA make him a very worthy recipient of this honour.

Doug's efforts in establishment of the ASA are also well appreciated and were recognised when we presented him with Honorary Life

Membership. At the time he helped us get underway; the Association lived in offices at his place, ASMS and BHP Steel (now Bluescope). These frontier conditions did nothing to impede the Associations growth driven in good measure by Doug's experience, skill and persistence. In those times, the Association was incorporated, Launched by John Button (Federal Minister for Industry and Commerce), set up its working groups, ran a number of workshops and began the process of publishing several guides on the use of slag.

Doug, never one to sit idly by has a particular passion for Lake Illawarra and has been quite involved in its management and improvement through his Chairmanship of the Lake Illawarra Management Authority. In recognition of his service to the community and the Lake Authority, Doug is also an OAM recipient.

A key often unheralded member of the team in whatever Doug undertakes is his wife Marie.

Doug has recently celebrated his 80th birthday and Doug and Marie have also just celebrated their 56th wedding anniversary! Ever the intrepid world explorers Doug and Marie are now about to take a well-earned break with a holiday in India and Thailand.

Congratulations Doug on your latest award and to you both in celebrating your 56th Wedding Anniversary.

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properties and performance of cements and supplementary cementing materials, as well as fluid transport properties, durability, service life, and performance testing of concrete. Doug has received the Award of Merit from both CSA (1998) and ASTM (2003). Professor Hooton also presented a paper on October 27th at the NSW Branch workshop of the Concrete Institute following the Conference

Papers presented from the perspective of the ASA were Case Study: SCM's Lowering Greenhouse Gas Emissions for Australia Craig Heidrich Long-Term and Drying Shrinkage Measurements of Concretes made with Slag-Blended Cements Associate-Professor Jay Sanjayan.



**Register your interest NOW !**

**ASA – CONFERENCE  
MAY 4TH 2007**

**Theme:** Sustainability

**Venue:** Sydney NSW

Register your interest now by emailing  
info@asa-inc.org.au

**to attend to present to exhibit**

To be kept informed watch this space for details

## 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.

### Up Coming:

- 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**



**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) \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_ Website: \_\_\_\_\_

Expected number of people: \_\_\_\_\_ Preferred times/dates: \_\_\_\_\_ Disciplines attending: \_\_\_\_\_

News from AUSTRALASIA

**CONNECTIONS INTERNATIONAL PRESENCE**

Each issue of Connections is posted on the Associations website and 2000 printed copies are produced for conventional mail distribution. Some printed copies are also forwarded to our international contacts. Back issues of Connections are available for download on the website as is the opportunity to register to have your copy delivered electronically.

**AUSTRALASIAN REPRESENTATION TO FIRST GLOBAL SLAG CONFERENCE**

Bill Bourke from Multiserv NZ and Andrew Wilson from ASMS/Ecocem Australia attended the first Global Slag Conference in Dusseldorf in November this year. The conference itself was billed as the first global gathering of those in the slag industry, as opposed to Country based conferences such as those run by the NSA, ASA, Euroslag etc. Bill presented a paper

'Recent Water Improvement Initiatives in NZ Using Melter slag Filter Materials'. This paper is a substantial update of the paper delivered at the ASA conference last year in Sydney and

contains the latest information that is coming from our various trials and installations.

**MS MARIA MAVRIKOS INAUGURAL WINNER OF WOMEN IN CONSTRUCTION INDUSTRY AWARD**

On Friday 7th October at the Grand Hayatt Hotel in Melbourne many Victorian identities from the construction industry rubbed shoulders with the delegates to the NAWIC National Conference to congratulate the Winner of the first National Crystal Vision Award. Recipient Ms Maria Mavrikos of Structural Challenge in Victoria, received the award from Association's Patron, Ms Paula Gerber.

**INTERNATIONAL News Items**

**FIRST GLOBAL SLAG CONFERENCE ATTRACTS OVER 200 DELEGATES**

The first Global Slag Conference has successfully taken place in Dusseldorf, 14-15 November 2005. Over 200 delegates attended the event, from over 40 countries. An exhibition of slag-related equipment and services (seen right) took place concurrently with the conference. In all, 23 presentations were given over two

days, and delegates were also able to visit the Schwelgern slag grinding plant of Cemex Deutschland. The second Global Slag Conference will take place in Bangkok, Thailand, 20-21 November 2006. Main themes for the conference will be: Global and regional slag market overviews, Slag optimisation: mineralogy and chemistry, Steel slag for cement: the final frontier, Emissions trading, Slag transport and shipping, Slag handling and storage, Slag grinding: innovations and case studies, Slag and cement: economics, standards and case studies, Slag and slag products: applications in the construction industry.

Source / further information: [www.propubs.com/gs2006](http://www.propubs.com/gs2006)

**RECYCLING AND BY-PRODUCTS**

95% of Arcelor by-products are converted. They are used by third parties to manufacture products such as cement and concrete, fertilizer and soil ameliorants, roads, dykes, rock wool for insulation, glass, ceramics, pigments, magnets, electrodes for the aluminum industry and electric steel plants, and cosmetics. Some are recycled by Arcelor to manufacture cast iron or steel.

**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 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.



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**Business Category** (please tick ✓)

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- Industry supplier
- Government agency
- Processor
- Refining/value adding
- Specifier/Engineer
- Other \_\_\_\_\_

\*Plus postage and handling • Inclusive of GST.



**EXPRESS FAX: 4228 1777**