



## Editorial

As we approach the end of 2012, this edition of Connections seeks to reflect on the wide-reaching and positive influences of iron and steel slag product use within Australia and across international borders. During this period there have been significant challenges to the industry, especially economic difficulties, which have resulted in reductions in the production of iron and steel and accordingly slag, being a co-product. Nevertheless, from adversity comes opportunity for change and innovation. These changes have been demonstrated through the exploration of new and untapped markets and innovative transitions into niche markets, and in some ways, re-positioning slag products as having greater potential in non-mainstream applications, for example agricultural uses.

The role of the Australasian (Iron & Steel) Slag Association has been reaffirmed, that is continuing its important role in representing the interest of industry members and supporting the continuing and potential expanded usage of slag products. Specifically, 2012 saw the beginning of the Roads Guide Review which will produce a series of "Quick Reference Guides" over the coming 12 months. This project will serve as a modernisation of the original Roads Guide document to ensure that current industry technologies are duly recognised. A detailed update on the progress of the Roads Guide Review can be found later in this edition of Connections.

This edition keeps you abreast of changes in One Steel Limited and a number of significant projects within Australia using iron and steel slags, for example, the South Nowra Highway duplication and six-Greenstar high rise building known as 1 Bligh Street. Internationally there has also been wide-spread use of slag products in the London Olympics super-structures.

Australia Steel Mill Services (ASMS) have featured in our Member Profile section with others to be featured in future editions.

Finally, as part of the Association's industry representation activities, staff attended the Construction Materials Industry Conference 2012 in September at the Melbourne Exhibition Centre. Attendance at these conferences are a valuable source for networking with like-minded industry representatives whilst offering potential membership opportunities to the Association. Our team enjoyed all that Melbourne had to offer and have reported back on their experiences. Additionally, Concrete 2013 is scheduled for October 2013 and we encourage our members to attend.

The Australasian (Iron & Steel) Slag Association wish you all the best over the Christmas holiday period and look forward to bringing you the next edition of Connections in 2013.

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Connections is a quarterly publication with an online circulation of 1,500 copies

## What's in a name? : OneSteel Limited

From the 2 July 2012, OneSteel Limited, formed after its separation from BHP in 2000 announced that its name would change to Arrium Limited. As the result of an Extraordinary General Meeting, shareholders voted in favour of the name change to reflect the changing and increasingly global role of the company. The company is now an international mining and materials company consisting of three core arms; mining, mining consumables, steel and recycling and can no longer be classified as the original steel manufacturer and distributor it once was. In terms of implications for the ASA under this separation of functional lines, OneSteel will still continue to be the main trading name for member interactions.

Arrium Limited Managing Director and CEO, Mr Geoff Plummer stated "Our Mining business is undergoing significant expansion, including doubling its port capacity at Whyalla to 12 million tonnes per annum and bringing on line the Peculiar Knob iron ore development in its new Southern Iron operation in South Australia."

Arrium Limited looks set to continue its expansion on an international scale in taking the Australian mining and steel industry abroad.

**onesteel**



**arrium**  
MINING AND MATERIALS

## Expansion of Port Kembla Update

The Outer Harbour at Port Kembla has been undergoing significant reclamation work to provide additional land and berthing facilities to cater for future expected trade growth. This project is progressing well with a significant milestone achieved during March, with the 1 millionth tonne of material being placed in the Outer Harbour reclamation.



During March, PKPC also entered into an agreement with construction company GPT/Ward Civil who are responsible for the West Keira Street development in Wollongong's CBD. This agreement will facilitate the movement of approximately 60,000 cubic metres of excavated rock to the reclamation site for use. Further steps to progress the development are underway.

Expressions of Interest have been called for suitably qualified engineering consultants to submit details of their capacity and experience to be considered for short listing as preselected tenders for design and contract documentation for the first new shipping berth in the Outer Harbour.

The next phase of tender for this project will call for engineering consultants to work closely with the Port Corporation to produce detailed designs and technical specifications for:

- Dredging of the shipping channel and birthing basins
- Construction of the first wharf; and
- Construction of additional reclamation areas and all associated roads and services to complete a fully operational birth facility





**Australian Steel Mill Services (ASMS) is a joint venture between the Cement Australia Group and Edward C Levy Co. of the United States. ASMS was formed in 1989 upon the successful tendering for the slag handling contract with BlueScope Steel (formerly BHP Steel) at the Port Kembla steelworks.**

ASMS' core business services involve a combination of steel mills services and the manufacture and marketing of iron and steel slags, through the provision of slag handling solutions for environmental, safety, logistics and the sales and marketing of iron and steel slags. More than \$70 million has been invested into constructing new infrastructure and procuring highly specialised equipment to service the Blast Furnace and BOS furnace operations.

These areas of construction include:

- A network of roads and bridges and rail crossings connecting the steel-making area to the recycling area, removing over 500 truck movements per day from public roads
- Relocation of 21 area entrance weighbridges and reconfiguration of 21 Area Entrance Road including truck wash facilities
- No.2 Blast Furnace Granulator
- No.5 Blast Furnace Granulator and slag pits (during the reline period of 1991)
- BOS slag yard reconfiguration from crane to Kress pot carrier operations
- Redevelopment of No.4 Blast Furnace slag pits
- A purpose built crushing and screening plant for blast furnace slag processing
- Water recycling systems both at the furnaces and Recycling Area, and
- The acquisition and then operation of the current ASMS metal recovery plant, drop ball operation and workshop facilities

In subsequent years, as further improvement and development has continued at BlueScope Steel, ASMS has responded by undertaking additional infrastructure projects such as:

- Construction and operation of No.6 Blast Furnace air cooled pit operation
- Handling blast furnace slag using Kress Pot Carriers at No.6 Blast Furnace
- Decommissioning of No.2 Blast Furnace slag handling operations
- Relocation and reconstruction of the No.2 Blast Furnace Granulator to No.6 Blast Furnace operations as a remote system using pot carriers
- Construction of the ASMS Blending Plant to make blended slag based products
- The design, construction and operation of the ECOCEM slag grinding plant
- Redevelopment and upsizing of drop ball crane facilities
- Re-build and expansion of Cold Water Granulation Equipment at Blast Furnace No.5 in conjunction with the 2009 reline

ASMS has consistently demonstrated a successful record of achievement in the design, management and construction of these infrastructure projects, delivered on time, to budget and without delay or disruption to BlueScope's operations.

Currently ASMS handles, processes and markets more than 1 million tonnes per annum of value added iron and steel slag products. To achieve this, ASMS has had to develop new markets, create new products and compete in a mature market environment.

Our services to BlueScope Steel are of a very high quality and our operations are efficiently run and controlled to meet and exceed service delivery requirements. Employing approximately 100 highly committed and focussed staff, we operate continuously to service the needs of BlueScope Steel.

The market environment has created a need to adopt a lean management structure which encourages a cohesive and dynamic team that can successfully and swiftly adapt to change. The company's board of directors, representing its shareholders, provide extensive networks with broad experiences in both steel mill services and the markets we serve.

Continuous improvement is a cornerstone of the ASMS approach to business. From competency based training systems supported by Work Cover accreditation including ISO 9001 certified, to safety systems AS/NZS 4801 and BS 18001 certified aligned with BlueScope Steel. ASMS management have successfully developed and implemented high standards into our workplace culture, achieving and sometimes exceeding the desired measures specified by BlueScope.

Environmentally, ASMS are a leader on the BlueScope site. Since commencement in 1989, we have continuously improved our overall environmental performance and Environmental Management systems, being ISO 14001 certified. For more information, please visit: <http://www.asms.com.au/>



# 1 Blich Street Sydney

## 6 Star Greenstar High-rise Building



Greenstar is a voluntary national environmental rating system provided by the Green Building Council of Australia (GBCA). The 6 Star Green Star Rating is the highest that can be achieved in the process of environmental design and construction evaluation.



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Designed by Ingenhoven Architekten of Germany and Architectus of Australia, the 28 level development is encased by a double skin facade that reaches the full height of the structure and its naturally ventilated atrium. It is due to this double skin that the heating and cooling requirements are significantly reduced and natural lighting is maximised to its full potential. Such large reductions in energy consumption have substantiated a 5 star NABERS Energy level with 42% CO<sub>2</sub> reductions when compared to a similarly sized, traditional office tower.

In terms of other innovative technologies that contribute to the high-levels of sustainability in this project, they include:

- A solar cooling system that reduces reliance on the grid network by a further 25% and provides free cooling
- Specially formulated high strength concrete and efficiency designed columns reduce concrete usage in the structure
- Black water recycling that will save the equivalent of an Olympic swimming pool over the period of two weeks. This is the first of its kind in a high-rise office building
- Water efficient fittings, rainwater collection and re-use of fire system water
- All timber and plywood used is either recycled or FSC accredited
- 50% of steel used was obtained from recycled sources

The role of steel slag products in this project was facilitated by Concrete Alexandria as experienced manufacturers in the use of aggregate replacement. To maintain sustainability objectives, 40% of cement was replaced with Ground Granulated Blast Furnace Slag (GGBFS) as well as 30% slag aggregate replacement in most mixes including those which were post tensioned. This in conjunction with reductions in concrete use of 5,768 tonnes has in part enabled for the recycling of 94% of all construction waste produced from the development.

This project has been an exciting new addition to Australia's construction industry and will stand as the benchmark for sustainable design.



# South Nowra Princess Highway Duplication

The NSW Government is funding the \$62 million upgrade of the Princess Highway at South Nowra. By widening the existing 6.3 kilometre two lane stretch to four lanes, both traffic flow and efficiency will be increased. Therefore, this project will be important to facilitate the continued growth of both local and holiday traffic to this region and its South Coast neighbours.

The upgrade has been underway for several months with most work scheduled to be completed before Christmas of this year. However, it is expected that completion will not occur until late 2013. In terms of slag use, 50 kt of modified blast furnace slag road base produced by Australian Steel Mill Services (ASMS) will be required for the project. This material has been used on NSW RMS projects in the Illawarra region since 2002, accounting for more than 250 kt of natural material replacement.



# Roads Guide Review: Introducing the Quick Reference Guide

Originally published in 1993 and revised and republished in 2001, the Guide to the Use of Slag in Roads has been an important publication culminating in some 30 years of research and development work on iron and steel slags in road technology in Australasia. Areas of particular interest have been in pavement materials development and road stabilisation.

In 2011, the National Technical & Education Committee proposed to supplement the original published guide with a series of Quick Reference Guides (QRG's) incorporating and updating current road technology in Australasia. Relevant changes to State road agency practices and requirements for iron and steel slag use in pavements have also provided large scope for the updating of resources to ensure information is current. Four (4) separate QRG's are planned to be developed and published over 2012/2013:

- General
- Stabilisation
- Steel Furnace Slag (SFS)
- Electric Arc Furnace Slag (EAFS)

Currently, authors are working on the first of these documents which will outline the general characteristics of slag products, especially those which make them desirable for use in industry applications. This is expected for publication later this year.

# London Olympics 2012 Learning Legacy

The 2012 London Olympics brought the best athletes from around the world to a world-class venue to compete in front of crowds of thousands. Despite their conclusion, the infrastructures left behind have a longer lasting effect, especially in terms of the sustainable materials used in their construction.

The Olympic Delivery Authority (ODA) set a high sustainability benchmark for the construction and development of the Olympic Park and successfully produced the most environmentally-friendly Games the world has seen. The ODA surpassed a number of targets including the reduction of carbon emissions and embodied carbon held within these super-structures, becoming a hard act to follow for future Games.

To illustrate these reductions, a number of statistics are available:

- An average of 32% cement substitution across the park which resulted in an 11.6% or 14,200 tonne embodied carbon reduction. This figure would have been higher if ground granulated blast furnace slag (GGBFS), was promoted as the preferred cement substitute over fly ash
- GGBFS accounted for 24% or 29,000 tonne of cement substitution throughout the Park



GGBFS was the preferred substitution material for all visible faces of the infrastructure because of its lighter concrete finish in comparison to concrete substituted with fly ash. Therefore, a range of 0-70% GGBFS substitution occurred in visible concrete with levels of 36-40% substitution more common when utilised in walls and columns which required an early strike time. Although slag is the most common form of cement substitution in the UK because of its favourable aesthetic characteristics, further substitution amounts could be facilitated with further industry testing and trials. This would then aid the development of more favourable industry practices.

As part of a "Learning Legacy", the ODA has produced a number of documents which outline the innovative methods and planning mechanisms used in the project. These operate as a method of knowledge transfer for incorporation in future applications. These are available online: <http://learninglegacy.london2012.com/index.php>

# CMIC12 Wrap-Up

Kicking off on Wednesday 19 and concluding on Saturday 22 September 2012, Craig, Melissa and Olivia supported by Association members attended the Construction Materials Industry Conference 2012 (CMIC12), hosted at the Melbourne Exhibition Centre.



This event offered a great opportunity for the Association and its members to network with other industry-related organisations in both a business and relaxed setting. Many of our Association members visited the stand and we thank those who gave their time and technical expertise when enquiries were made.

Delegates were enlightened and challenged by a series of keynote speakers including Paul Clitheroe and Saul Eslake who offered a unique perspective on the world in which the construction industry now operates, the changing face of consumption and global competition. Participants attended a number of networking events

including the Komatsu sponsored dinner held at the Melbourne Cricket Ground where individuals were honoured to be able to walk on the renowned turf of the cricket ground so close to the AFL final. Fantastic entertainment and dining ensued, including Tim Watson MC who carried the program throughout the evening with a lovely night had by all.



The Association's stand did receive a number of technical enquiries regarding the use of slag products with a popular fascination in material samples displayed on the stand. A number of membership enquires will be followed up in due course.

Conferences such as this promote slag and its products, the Association and its activities to a broader audience and serve as a valuable membership generation source. The active utilisation of slag in industry continues to enjoy greater knowledge transfer, especially as the Association maintains technical documentation to support both current and future potential applications. We continue to encourage our members to participate in these events as a well-rounded networking experience with the next CMIC to be held in 2014.

Thanks should also be given to the conference organisers who ensured that the event ran professionally and smoothly.

# Concrete 2013



Concrete 2013, as an industry leading event in the Southern Hemisphere, will take place on 16-18 October 2013, on Queensland's renowned Gold Coast. With a location that boasts sun and surf not to be rivaled around the world, the Gold Coast Convention and Exhibition Centre places participants close to Brisbane and the beach.

The theme of this conference boasts "Understanding Concrete", which will delve into the areas of materials, research, design, construction and innovation in a forum that facilitates knowledge share as well as valuable industry experience. Sessions will include

formal presentations, industry displays and informal contact with delegates culminating in a Gala Dinner on the final evening and the Awards for Excellence ceremony.

Conference organisers have placed high importance on quality technical presentations, with keynote speakers currently being recruited from global concrete industry leaders. Abstract submissions to the Technical Committee are now open. For more information, please see: <http://www.concrete2013.com.au/technical-program/>

The ASA looks forward to attending this conference and encourages members to make the journey to enjoy the benefits of this valuable technical and professional networking opportunity.

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