2011 Volume 8 Issue 3

HOT DIP GALVANIZING TODAY

HOT DIP GALVANIZERS ASSOCIATION Southern Africa

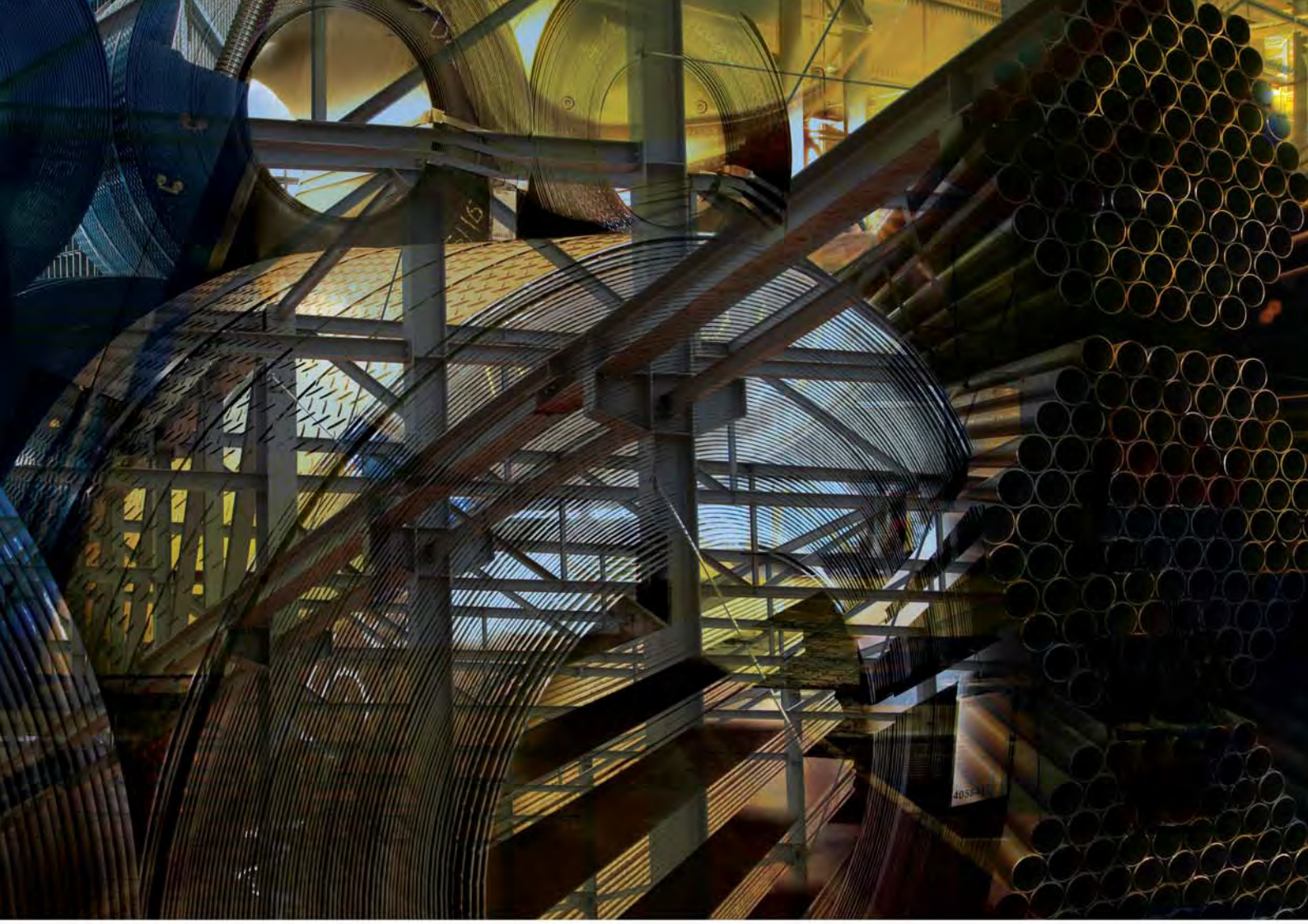
48

Featuring:

- **HOT DIP GALVANIZING AWARDS:**
  Overall and Category Winners and all the entries
- **Cable ladder and tray feature**
- **Desirable but Durable Works of Art**
- **New Elcometer 456 coating thickness gauge**
- **Regulars: Duplex Coating Systems, On The Couch, Bob's BANTER and Education and Training**

ZINC

steel
SOUTHERN AFRICAN INSTITUTE OF STEEL CONSTRUCTION



AVENG
TRIDENT STEEL

Aveng Trident Steel is situated in Roodekop, Germiston with additional facilities in Alrode, Durban, Port Elizabeth, Rosslyn and Cape Town.

We supply a wide product range to the steel industry in South Africa as well as internationally from our extensive steel yards, modern and comprehensive steel processing and steel service centres, speciality steel division and tube manufacturing plant.

We offer our customers a quality product, delivered on time at a competitive price.

Our growth is guaranteed by the contribution we make to the success of our customers.

AVENG TRIDENT STEEL (PTY) LTD
Marthunisen Road, Roodekop, Germiston ■ PO Box 124054, Alrode 1451 ■ Tel: (011) 861 7111 ■ Fax: (011) 865 3035
Website: www.trident.co.za / www.aveng.co.za ■ Email: trident@trident.co.za / export@trident.co.za

AVENG GROUP
Leaders in infrastructure development

The Association is an information centre established for the benefit of specifiers, consultants, end users and its members.

JOHANNESBURG

Executive Director: Bob Wilmot
Cell: 082 325 8840
Email: bob@hdgasa.org.za

Office Manager: Saskia Salvatori
Cell: 082 326 6080
Email: hdgasa@icon.co.za

Receptionist: Marjorie Montgomerie
Email: info@hdgasa.org.za

PUBLISHED BY:
Hot Dip Galvanizers Association Southern Africa
Quality House, Unit U4,
St. Christopher Road,
St. Andrews, Bedfordview
P.O. Box 2212 Edenvale 1610
Tel: 011 456-7960
Fax: 011 454-6304
Email: hdgasa@icon.co.za
Website: www.hdgasa.org.za

CAPE TOWN

Editor and Technical Marketing Director: Terry Smith
Tel: 021 797 4735
Fax: 086 612 7284
Cell: 082 893 3911
Email: terry@hdgasa.org.za

Advertising and Sales:
Anne van Vliet
Tel: 011 462 5073
Cell: 082 775 0711
Email: mwvliet@mweb.co.za

Design and Layout: Sandra Addinall
Tel: 011 868 3408
Fax: 011 900 1922
Email: cbtdesign@adcot.co.za

Reproduction and Printing:
Camera Press
Tel: 011 334 3815
Fax: 011 334 3912
Email: cpress@iafrica.com

HOT DIP GALVANIZING TODAY

Official journal of the Hot Dip Galvanizers Association Southern Africa • 2011 Volume 8 Issue 3

48

ISSN 1023/781X

CONTENTS

Front Cover: *A kaleidoscope of the 2011 Awards winning (centre) and category winning entries together with art works by Willie Bester (Wolfhound) in a new feature that require comprehensive corrosion protection.*

Hot Dip Galvanizing – Adding value to Steel

Executive Director's Comment

Zinc Supply to Annual Awards Programme

It has been reported by Zincor, a company within Exxaro group, has announced that it is considering cessation of zinc production by year end 2011. The final decision to close Zincor will be confirmed during the course of September 2011. Apart from the resultant job losses and the consequential illumination of local content, the knock on effect within the zinc consumer industry is significant and extensive.

In terms of the hot dip galvanizing industry, zinc input represents a significant cost component required to operate a galvanizing business. It also follows that a realignment regarding zinc purchases will be required, which will be based of one or other form of importing zinc ingots and the corresponding impact on cash follow and offshore financing.

Zincor have indicated that zinc supplies will be maintained through to December 2011 and that consequently our industry has four months to plan and arrange a new import supply chain for our requirements. Members of our Association have formed a small working group that have been tasked with formulating procedures to ensure an uninterrupted supply of zinc. Proposals and enquires should be directed to the Association and review by the said working group. Finalisation of the new supply arrangements should be concluded and in place during the course of September.

The other important event, on our calendar, is our formal awards dinner that will take place at Monte Casino on 26 August. The awards dinner is our flagship event when Association members show case some of their outstanding hot dip galvanizing and duplex projects completed during the past 12 months. All award submissions and corresponding category winners are featured within this journal and available for review by our readers. The objective of our awards programme is to recognise & promote the development, application and use of hot dip galvanizing and related technology for corrosion protection purposes

Bob Wilmot

Note from the Editor

The first readers of this edition will be some of the guests attending our annual Awards Evening and hopefully they will have enjoyed a fabulous evening and also be satisfied as to the judge's difficult decisions in selecting the Overall and Category Winners of this event.

The emphasis on coating durability required by the architect of the overall winner of the Hot Dip Galvanizing Awards Event, Waterfall Estates is a clear indication that more and more specifiers are embracing the "Green Building Effect" by ensuring subsequent coating maintenance is eliminated or substantially reduced. The winning categories and all the entries of the Awards Event are also included.

We include our annual Cable Ladders and Trays feature and while the industry is relatively limited in terms of product innovation, we direct your attention to the Duplex category winner, Ambotovy Nickel Mine where duplex coated cable ladders have won the category. Also in this feature is a pictorial durability comparison between two hot dip galvanized uni-strut profiles which are often used for street signage.

Another new feature is one on the artistic use of a metallic coating such as zinc metal spraying or hot dip galvanizing for the comprehensive corrosion protection of steel sculptures that are exposed to the atmosphere.

In the **Duplex article**, Sigma Coatings (Pty) Ltd, emphasises what is essential for successful duplexing of hot dip galvanized steel, based on their experience in marine and other aggressive environments.

Education and Training includes our new 3-day Galvanizers Inspectors Course, which replaced the previous 2-day course. A single day more practical course for those with limited formal education, is also included. Also part of this is the launch of the new Elcometer 456 with an article from BAMR, who are the agents for these instruments in South Africa.

We also include another snippet on the subject, "The real protection is hidden!"

Other regulars include "**On the couch**" where we interview **Rob White** of IZASA (International Zinc Association Southern Africa), who plays an important role by interfacing with general galvanizers throughout the world, especially in China and South America.

"**Bob's BANTER**", Bob discusses "Communicate thoughts and meanings not facts and data".

Should a reader wish to express an opinion or provide us with an article, or comment on our articles, kindly contact us.

Enjoy the "magazinc".

Terry Smith

With over 25 years' experience in the galvanizing industry, **Transvaal Galvanisers** is capable of meeting almost any requirements when it comes to hot dip galvanizing.

Specialising in dipping, spinning and drag line galvanizing, **Transvaal Galvanisers** accounts for 70% of South Africa's demand for transmission line tower and substation galvanizing.

Transvaal Galvanizers' partnership with IMAB Engineering ensures that

"We strive for excellence, meet our commitments and grow with our client base"

1430/05/11 CBT Tel: (011) 868-3408

Transvaal Galvanisers (Pty) Ltd

3 Third Avenue, Vorsterskroon P.O. Box 983, Nigel 1490 Tel: 011 814 1113/4 / 011 814 4710/2 Fax: 011 814 1645

HOT DIP GALVANIZERS ASSOCIATION SOUTHERN AFRICA

2011 HOT DIP GALVANIZING AWARDS

Overall & Architectural Category Winner

Waterfall Country Estate / Village

Description

Situated in Sunninghill lies one of the largest estates to be developed within the South African property market with Waterfalls Hills Mature Lifestyle Community forming an integral part of the Waterfall City development. The extensive and wide spread use of hot dip galvanized steel has been integrated to form part of all the architectural features and aesthetics of the estate structures.

Location

Sunninghill, Gauteng

Project partners

Developer / owner
Century Property Developments

Architect
Century Property Development Architect

Consulting engineer
C-Plan Civil Engineers

Steel fabricator
Goivota

Hot dip galvanizer
Armco Galvanizers

Project completion date

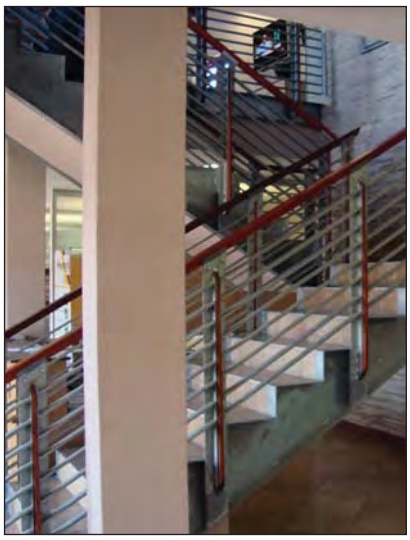
2020 however, all structures comprising this submission have been completed prior to 2010 year end.

Project value

R220 billion total property development

Information

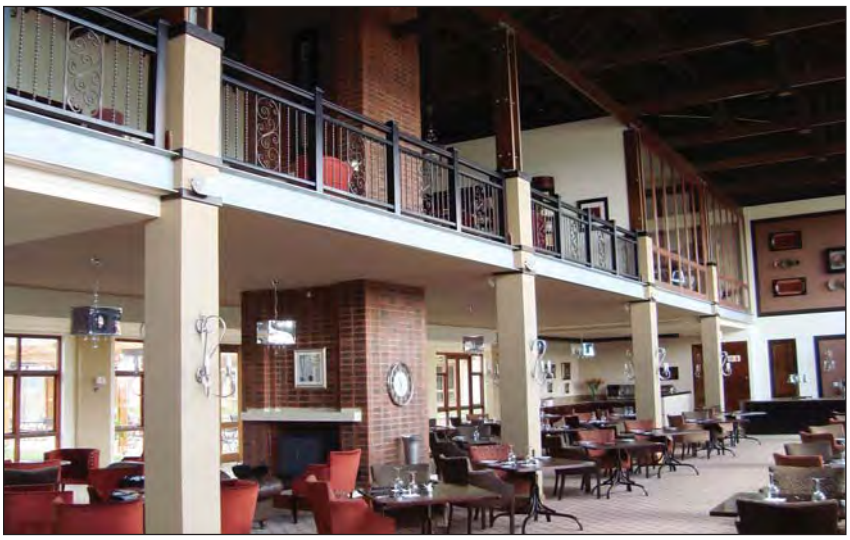
- Between Woodmead and Midrand stretches a 640 hectare expanse of unequivocal natural beauty. Here, along the most scenic portions of the Jukskei River's banks, lies the Waterfall Country Estate – a secure, family-oriented residential development that boasts 800 stands at sizes



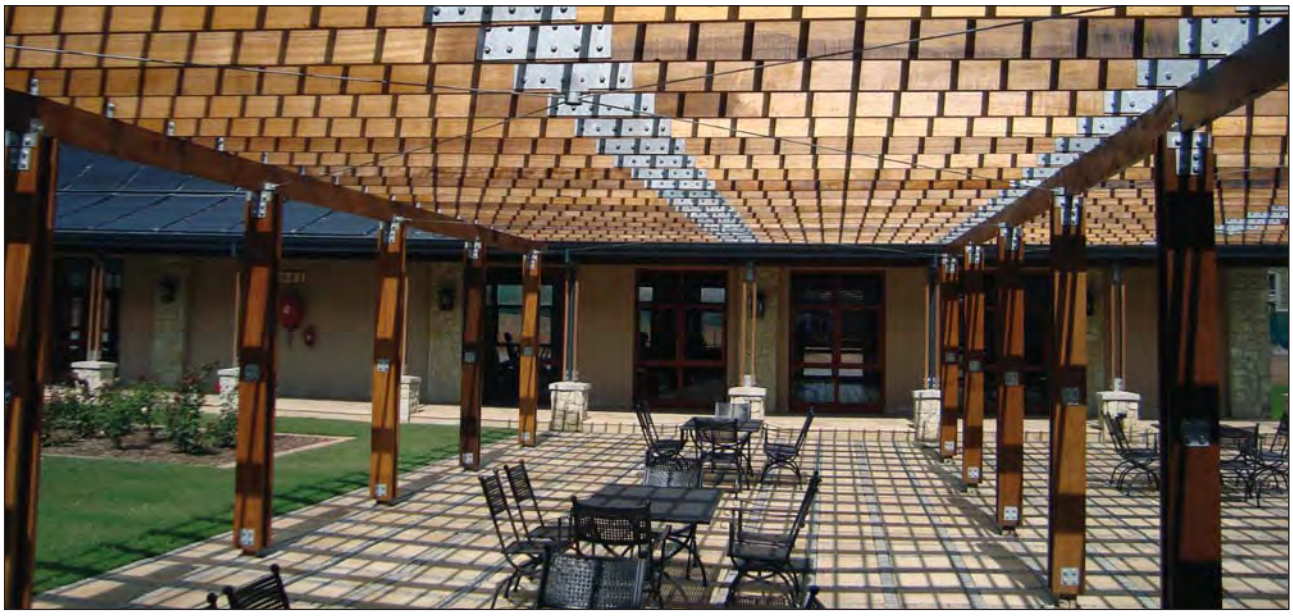
starting from 1 200m² – and its neighbouring estate, Waterfall Country Village, consisting of 1 000 stands of approximately 650m² each.

- These two estates form part of Waterfall City – the greatest multi-purpose development ever to enter the South African property market, which includes facilities such as private schools, an international hotel and conference venue, fishing dams and lakes and an exclusive country clubhouse.
- There is a strong focus on 'green design' within the development, the aim being to create a healthy community centred on environmentally conscious principles. Concepts such as waste recycling and guidelines to sustainable living are mandatory within the estate and will be seamlessly integrated into the lifestyle.
- The successful use of hot dip galvanizing in conjunction with all the other building materials is its ability to blend and harmonise with the indigenous landscape. This theme has been successfully retained on the major structures throughout the estate.
- Hot dip galvanized steel provides the corrosion protection for the structural components; at the same time it forms part of the architectural appeal of the buildings.
- This submission encompasses all the main "common area" buildings on the estate, due to the fact that the central theme using an integral system of building materials is featured throughout.
- Hot dip galvanizing has been used to form part of the façade and ambiance of the architectural design throughout the estate. The use of hot dip galvanizing in combination with wood is of particular aesthetic appeal.

continued on page 6...



- Hot dip galvanized steel exposed to the atmospheric conditions will provide many years of maintenance free service life.
- Many people view the surface finish of hot dip galvanized steel as "rough and unsophisticated", but what is clearly evident in these structures is a blending in and complementary to all the construction materials.
- The architectural guidelines have been developed in consultation with leading firms of consultants, architects, urban designers and landscape professionals. The goal was to provide investors and owners with flexibility and diversity of choice, while ensuring overall aesthetic harmony and high standards within the estate.
- The developer aims to encourage the use of materials in their natural state, thereby creating a unifying element to all the homes, as diverse as they hope they will be. The materials that are expressed in their natural form on the estate are stone, brick, plaster, wood, steel, glass and green materials. According to their guidelines, "steel allows spaces to become light and airy, especially when used in conjunction with glass. It makes it possible to span large openings and create spaces that are open and free. Steel is a modern material that can be used to create dramatic effects. It may be hot dip galvanized or painted grey."
- Designs embrace both classic and contemporary interpretations of Highveld vernacular such as farmhouses, barns, manor houses, sheds and the use of materials such as wood, stone, steel and concrete in their natural and honest state.
- Existing trees on and around the property were protected and preserved.



Duplex Coating Systems Category Winner
Ambotovy Nickel Mine

Description

The use of a duplex coating system using powder coating on cable ladders and support products in a Nickel Mine in Madagascar.

Location

Madagascar

Project partners

Developer / owner
SNC Lavalin / Sherrit

Specifier
SNC Lavalin

Main contractor
B&W

Hot dip galvanizer
Armco Galvanizers

Powder coater
O-line Coatings (Pty) Ltd

Tons of steel

Approximately 1 000 tonnes

Project inception date

September 2009

Project value

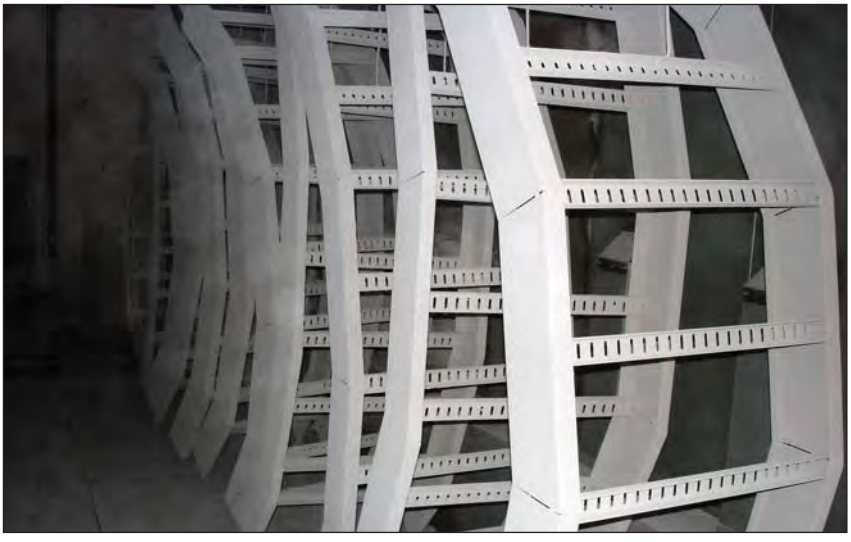
Approximately R45 million (O-line commodities only)

Information

- The need for products, especially in the electrical and mechanical industry to not only be hot dip galvanized, but also coated with a powder coated surface, prompted O-line, through its powder coating facility to become innovative and market leaders in this field.
- During the past few years, various duplex coated projects were successfully completed, some of which are older than 10 years.
- Unfortunately, through no fault of O-line, but rather due to a combination of misinformation, lack of knowledge and bad experience, duplex coated products (with powder coating as the paint system) fell out of favour with local consultants, specifiers and contractors, who opted for stainless steel rather than duplex coated products.

continued on page 8...

- In early 2009, O-line successfully ventured into the area of Duo Duplex for product supplied to Transnet for the Coega Container Terminal and the successful completion of this project returned to O-line the confidence in a duplex system.
- O-line proved that if the duplex process in terms of cleaning, pre-treatment and oven temperature are strictly controlled, the resultant coating is a major enhancement to the galvanizing process, both aesthetically and from a corrosion protection point of view.
- With this knowledge in hand and based on a combination of price and delivery, SNC Lavalin, a Canadian based mining developer, awarded the Ambotovy Mine contract for the supply of electrical support systems to O-line.
- The construction of this mine is currently the biggest mining construction in the world and competing against international companies, O-line was awarded this contract.
- The client specified that all cable ladder and support products (except bracketry) had to be duplex coated. In order to accommodate such a large project, O-line relocated their powder coating plant into bigger, more suitable premises.
- There were various project challenges as this was the first time in South Africa that these cable ladders were manufactured. No zinc rich spray was allowed to be used to repair areas. In order to eliminate the necessity for excessive cleaning, specialised jigging was developed in order to accommodate the galvanizing process.
- No passivation after galvanizing was allowed. The product therefore had to be stored under a roof at all times in order to avoid wet storage stain. The use of Ammonium Chloride was controlled in order to manage visual quality.
- In excess of 1 000 tonnes of product was hot dip galvanized, then pure polyester powder coated before being loaded into 180 containers. To date all products were received in a good condition on site.
- Eight contractors were employed for every container loaded. Twenty five manufacturing personnel were employed until the completion of every received order.
- Approximately 40 tonnes of pure polyester powder was used.
- Closer quality control in terms of the galvanizing process has led to the elimination of degassing process of products as a pre-requisite to powder coating.



Make a lasting investment – HOT DIP Galvanize it!

Specify hot dip galvanizing and get at least 30 years of maintenance free protection

In the vast majority of applications the corrosion rate of a hot dip galvanized coating is less than 2µm per year. Coating thickness achieved on structural steel averages about 100µm.

In some aggressive marine and polluted industrial applications, the additional barrier protection provided by a duplex coating (hot dip galvanized plus paint), together with the sustained sacrificial protection performance provided by the hot dip galvanized coating will invariably solve most steel protection problems.

For further information on our members and general corrosion advice, contact:

Quality House, Unit U4, St. Christopher Road, St. Andrews, Bedfordview
P.O. Box 2212 Edenvale 1610 Tel: (011) 456-7960 Fax: (011) 454-6304
hdgasa@icon.co.za Website: www.hdgasa.org.za

Cape Town: Tel: (021) 797-4735 Fax: 086 612 7284 terry@hdgasa.org.za

HOT DIP GALVANIZERS ASSOCIATION SOUTHERN AFRICA

CBT (011) 868-3408 HDGASA 1443/08/11

Infrastructural Development Category Winner

Lula Pipe Cable Lock™

Description

Lula™ Pipe is a socketed hot dip galvanized steel pipe system that has been designed to be compatible and interchangeable with standard sizes of PVC pipe in common use in the water reticulation industry. The Cable Lock™ makes use of a socket and spigot system, where the socket, complete with an integral seal is formed on one end of the pipe and the other end forms the spigot.

Project partners

Owner
EPNS Engineering

Project manager
Exxaro and Simmer & Jack

Hot dip galvanizer
Macsteel Tube & Pipe

Project inception date

Application Patent 2006 & 2009

Information

- Lula™ Pipe is a socketed hot dip galvanized steel pipe system that has been designed to be compatible and interchangeable with standard sizes of PVC pipe commonly used in the water reticulation industry.
- The Lula Pipe has made for an easy and effective way to install a steel pipe system that is proudly South African and innovatively designed to deal with South Africa's water supply challenges.
- Traditional systems of joining hot dip galvanized steel pipes such as flanged or screwed and socketed systems are difficult and slow to install. The Lula Pipe has speeded the introduction of the alternative plastic systems which are not as skill dependent to install. By making a system compatible with the PVC system has meant that system aspects such as sockets and seals are already accepted and don't have to be proven in service for acceptance.
- Development of the Lula Pipe System to provide an improved locking system led to the Cable Lock™ .

- The Cable Lock™ piping system makes use of a socket and spigot system, where the socket, complete with an integral seal is formed on one end of the pipe and the other end forms the spigot.
- The innovation with the Cable Lock™ system is that in addition to the integral seal there is also a locking element which is

continued on page 12...

Introducing TWO innovative NEW piping systems

Cable-Lock™ Pipe

- Steel pipe with integral socket and rubber seal, locked together with inserted cable spline
- Cost effective – no couplings or clamps required
- Quick and easy installation

NEWS FLASH

Nominated for 2011 Anglo American Supplier Awards

Recipient of 2010 SABS Design Excellence Award

SABS

Lula™ Steel Pipe

- Steel pipe rolled to plastic pipe sizes
- Interchangeable with plastic pipe and fittings
- Both systems rated 25 bar

UNIQUE ALTERNATIVES TO ALL CONVEYANCE SYSTEMS CURRENTLY IN USE!

MACSTEEL TUBE & PIPE

Jon Birbeck
(t) 011 897 2100
(c) 082 568 0237
(e) jon.birbeck@mactube.co.za

Greg Mills
(t) 011 452 7771
(c) 084 516 2253
(e) greg@epns.co.za

EPNS

Leadership in Design

designed to contain the axial force generated by the internal pressure in the pipe. This is different to a standard socket system, as used with ductile iron and plastic pipe, where external anchoring or soil friction is required to hold the pipe together.

- The installation skills are also well known and a range of fittings and valves compatible with the system are already available.
- In the Cable Lock™ system, the socket and the spigot both contain circumferential grooves, which when aligned, form an annulus void around the outside of the spigot and the inside of the socket. The locking element comprises a locking "spline" or "flexi-wire" which is inserted through an aperture punched into the groove of the socket. This lock element is made from standard hot dip galvanized steel rope, commonly called cable – hence the name, Cable Lock™.
- The cable when inserted follows the annulus void and effectively locks the pipes together, being capable of handling the axial load including a suitable safety factor.
- The simplicity of the Cable Lock™ Pipe's locking system lies in the ease with which the cable is inserted through the aperture in the socket end groove into the corresponding matching groove. During this lock, neither thrust blocks nor clamps are required, adding to the convenience of using Cable Lock™ and reducing costs.
- This piping and locking system is strong enough to handle axial pressure loads and is suitable for working pressures of up to 25 bar. It has been pressure tested to 75 bar, exceeding normal safety requirements.
- Suitable for both above or below ground piping requirements, Cable Lock™ Pipe can be externally coated and internally lined to suit all piping conditions.
- Cable Lock™ Pipe is manufactured according and marked SABS 1182 and is hot dip galvanized to SANS 32 / EN 10240.
- An economic attribute of the system is that couplings are not required, and hence relatively short lengths can be utilised without incurring a coupling cost for each length of pipe. This is particularly relevant where high flexibility is required and where transport of long lengths of pipe, such as in underground mine use (especially mine hoist cages) is difficult.

Mining and Industrial Category Winner

Medupi Chimneys, North & South – Internal flue support steelwork

Description

The hot dip galvanizing and zinc thermal spray of the flues contained in the two concrete chimneys at Medupi Power Station.

Location

Medupi Power Station, Lephalele

Project partners

Developer / owner
Eskom

Project manager
Karrena / Concor JV

Main contractor
Karrena / Concor JV

Hot dip galvanizer
Robor (Pty) Ltd – Galvanizers

Steelwork fabricator
Aveng Grinaker LTA Mechanical & Electrical DSE Fabrication

Shot blasting
Bulldog Projects

Tons of steel

78 tonnes zinc thermal sprayed

128 tonnes hot dip galvanized

Total steelwork

206 tonnes

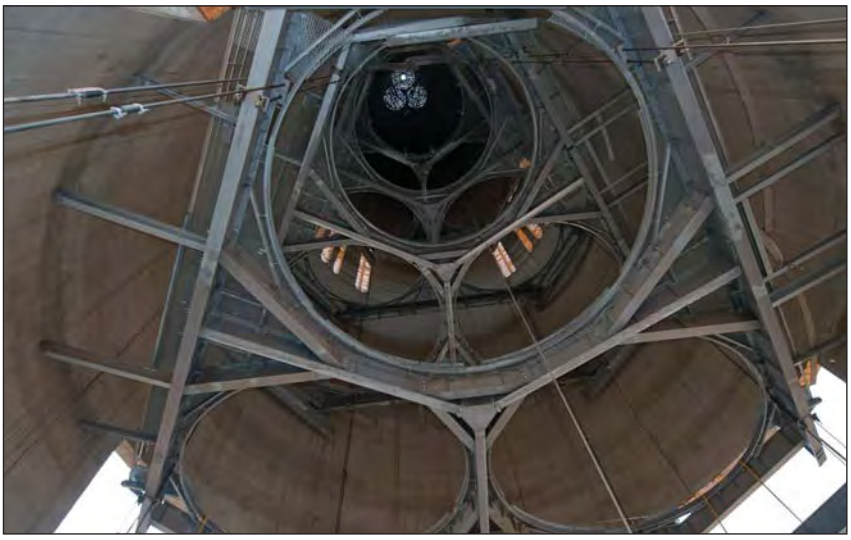
Project completion date

November 2010

Project value

R7 million

Information



- Medupi Power Station has two concrete chimneys, 213m high, with each chimney / windshield containing three flues, which extend all the way up the chimney and protrude 7m above the top of the concrete.
- These flues are supported by 5 levels of support steelwork, at 55m, 90m, 180m and the main support girders at 205m level. As the 205m level girders support most of the load from the flues, these had to be the largest and weigh approximately 13 tonnes each.
- These three fish belly girders (17m long, 3m deep at the centre with 50mm thick flanges and 20mm thick webs) could not be hot dip galvanized due to their size. Even a double dip approach was ruled out due to the length of the girders.
- All the other girders were hot dip galvanized according to the client's specification.
- Robor Galvanizers proposed an alternative to hot dip galvanizing – zinc thermal spray. This is the best alternative when dealing with such large girders due to the fact that the zinc applied during zinc metal spraying is of the same chemical composition as the zinc used in the hot dip galvanizing process. The only difference is that adhesion to the steel surface is mechanical, whereas hot dip galvanizing forms a metallurgical bond.
- Having to handle such large girders, it was decided to complete the metal spray operations at the Aveng Grinaker-LTA DSE Fabrication workshops in Vanderbijlpark. Cranes were readily available for handling large girders, with Bulldog Projects running the blasting facilities on the DSE Fabrication property.

continued on page 12...

- Safety, environment and quality issues all had to be addressed when working on the DSE site. Robor covered all of these requirements with their method statement, which was accepted by the DSE Fabrication management and by the client.
- Robor's equipment, consumables and personnel were transported to Vanderbijlpark.
- The metal spraying process entailed the shot blasting of the girders, which had to be done individually and one side at a time. This was necessary to avoid flash rusting of the newly blasted areas. Spraying was then carried out in an allocated area. This process was repeated for the other side of the girder.
- Robor's operators were issued with calibrated thickness gauges so checks could be made on an on-going basis in order to identify areas that required additional layers of metal spray, with frequent checks made by the management team in order to ensure the correct thickness was maintained.
- Final inspection was based on the requirements of the SANS 121 / ISO 1461 standard.

Community Development Category Winner
Zwelitsha Pedestrian Bridge

Description

The duplex coating of a pedestrian bridge in the Eastern Cape

Location

Zwelitsha, Eastern Cape

Project partners

Developer / owner
Buffalo City Municipality

Specifier / engineer
Vela VKE Consulting Engineer

Project manager
Vela VKE Consulting Engineer

Main contractor
Robert Brothers JV

Steel fabricator
Industrial Service Group

Hot dip galvanizer
Robor (Pty) Ltd – Galvanizers (main structure) and Morhot (Pty) Ltd (handrailing)

Tons of steel

17.5 tons

Project date

August 2010

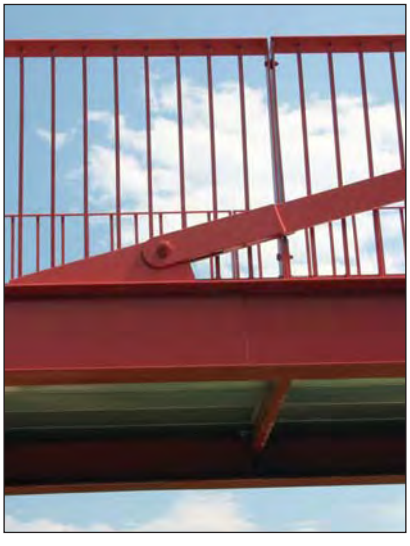
Project value

R2.46 million

Information

- The Zwelitsha Pedestrian Bridge crosses the Buffalo River in a rural area of the Eastern Cape. The bridge was commissioned by the Buffalo City Municipality in response to tragic drowning incidents.
- The bridge now provides a safe river crossing to some 500 pedestrians per day, linking the rural communities with essential services, including schools and clinics.
- The design brief was for an inexpensive and functional bridge that would cross the Buffalo River above the 1:50 year flood level. It was also requested that the construction method be kept simple. This was to encourage smaller local contractors to tender for the construction work, ultimately uplifting the local community through job creation and skill development.
- This project shows that through well planned and innovative design, an attractive rural steel bridge can be developed at an affordable cost. Due to the remote bridge site and the high costs associated with possible future maintenance, effective corrosion protection was a factor that played an integral role in the design process.
- All steel components of this striking 58m long and 1.5m wide rural footbridge were hot dip galvanized and painted with a duplex coating system prior to being bolted together on site.
- The standard stock of rural pedestrian bridges is U-frame steel truss bridges as they are considered the most economical option. Typically these structures are fabricated in sections that can be easily galvanized, transported, handled and bolted together. Their construction on remote sites is therefore possible without the use of heavy plant equipment. The Zwelitsha Pedestrian Bridge took this concept and adapted it for an attractive cable stayed bridge.
- The design had two main goals: the first was to create a cable stayed structure that could be built for a price comparable to that of a simple truss bridge; the second was to detail a durable, low maintenance structure that could be easily erected in a remote area.

continued on page 16...



- The bridge design responds to the natural surrounds of the Buffalo River. Low towers with a limited amount of stays give the bridge an appropriate scale. The steel towers are integral with the concrete piers. Their stiffness is relied upon to limit the deflection in the deck due to asymmetric pedestrian loading. The resulting high moments in the towers are transferred to the concrete pier bases that are dowelled into the river's rock bed. The foundation dowels are hot dip galvanized Y32 reinforcing bars that are grouted into a corrugated plastic encasement for additional corrosion protection.
- The deck section floats independently of the towers and its longitudinal restraint is provided by the stays. This was the only alternative that maintained adequate tension forces in the stays during the thermal expansion and contraction of the deck.
- A key element in the detailing of the bridge was to restrict the length of the individual elements. This meant the sections were easy to handle on-site. It also meant they could be hot dip galvanized. This allowed the specification of a duplex coating system that will ensure the bridge requires minimal future maintenance.
- An important benefit of bolting the bridge together was that no on-site welding was required. This meant that the hot dip galvanizing was not compromised during the erection process. All bolts specified were also hot dip galvanized.
- All the bridge elements are commonly used standard sections. A simple handrail, fabricated into independent panels, was bolted into place with sufficient tolerance to easily align it. The vertical posts to the handrail are 16mm solid square sections and were favoured as they have sufficient stiffness to resist distortion induced by the heat of the galvanizing process. Furthermore, for similar reasons, the minimum thickness of flat plate specified was 10mm.
- The erection process was quick and simple. Trestle towers supported the main beam during the installation of the stays. The concrete deck was then poured onto the hot dip galvanized permanent steel formwork. The stays were then stressed by the system's dead weight as the trestle towers were removed. The vertical alignment of the deck achieved by this simple construction method was very satisfactory.
- The benefits of hot dip galvanizing steel structures exposed to the elements are well known. However, this project is significant from a galvanizing point of view as the decision to hot dip galvanize the entire bridge influenced construction sequence and in turn, the structural form of the bridge. The decision to make use of segmented bolted construction was largely influenced by the fact that the segments could be of a practical length that would facilitate effective galvanizing.
- The successful implementation of this project rested on the professional relationships between the contractor, steel fabricator and the design engineer. An example of this close working relationship is the instance when constructive dialogue resulted in appropriate vent and drain holes being specified for the tower base plate. The pockets created by the tower base plate could have caused air to become trapped during the dipping process.

- This project shows that an attractive structure can be developed at an affordable price without compromising on effective corrosion protection. The total cost of galvanizing the entire bridge, including the handrailing, was approximately R100 000. This cost is similar to the cost of the paint system applied to the bridge and is approximately 12% of the total steelwork cost.
- The specifying of a duplex coating system has enabled the successful delivery of a robust and durable asset. The maintenance free period for the paint work is expected to be in the region of 20 to 25 years.

[Your galvanizer of choice]

[Robor Galvanizers boost demand chain efficiency by partnering with you.

We are well equipped and ideally structured to quickly fulfil your order, from small projects, to high-tonnage contracts that involve large fabricated components.]

Newly upgraded!

- **ISO 9001: 2008 Certified**
- **14001: 2004 Certified**
  6 000m²
- 5 000m² concrete lay down area added to enhance our offering
- Line 2 kettle with a totally matched processing facility
- 4m deep • 2m wide • 10m long
- On-site water treatment facility

Benefits to you:

- Increased flexibility
- Shorter lead times
- Increased kettle depth with fewer vertical dips
- More comprehensive service offering

Logistics capabilities include:

- Lay down areas
- Crane capacity
- Transport fleet
- On-site offices available on request

robor

For more information: • Tel: +27 (0)11 876 2900 • Tel: +27 (0)11 971 1600 • E-mail: info@robor.co.za • Web: www.robor.co.za

ARCHITECTURAL CATEGORY ENTRY

New Head Office for Mauritius Commercial Bank Ebene, Mauritius

Description

The duplex coating of this elliptical shaped nine-storey building in Ebene, Mauritius.

Project partners

Developer/owner	The Mauritius Commercial Bank Ltd
Architect	Jean Francois Koenig Architects
Structural engineer	Arup (Pty) Ltd and ArupSIGMA Ltd
Façade engineer	Arup (Pty) Ltd
MEP engineer	Arup Group Ltd and Proburo Ltd
Quantity surveyors	Hoolooman & Associates Ltd
Project manager	ArupSIGMA Ltd
Main contractor	General Construction Company Ltd
Steelwork contractor:	Cadcon (Pty) Ltd
Hot dip galvanizer	Robor (Pty) Ltd – Galvanizers
Detailers/detailing company	Mondo Cane Detailing and Design Services
Completion date	November 2010
Tons of steel	140 tonnes
Project value	R510 million (converted from Mauritian Rupee)

Information

- Besides being located in Mauritius, a marine environment, restricted access of the steelwork elements dictated a low maintenance coating system.
- A duplex coating system was therefore specified. The paint system was applied on site after erection of the steelwork.
- The building had unique design and construction challenges. This was the first time a sustainability concept based on the principles of BREEAM was implemented in Mauritius. BREEAM is the world's foremost environmental assessment method and rating system for buildings and sets the standard for best practice in sustainable building design, construction and operation.
- The lower portion of the structure consists of four legs created by the external walls, cross walls, lift walls, staircase walls, rectangular and L-shaped reinforced concrete columns, which all work together to resist the vertical and lateral loads on the structure.
- These legs support the elliptical skin of the building, which supports flat slabs and the bottom auditorium slab. The elliptical shape is achieved by the use of curved precast concrete columns and structural steel members at the lower and higher levels respectively.
- To enable a column free space in the main auditorium, the frame includes transfer structures. Similarly, the building entrances are kept column free by means of steeply raking columns picking up the transfer structures.
- Bracing and core walls, supplemented by large diameter columns, provide lateral stability. The ellipse cladding consists of composite aluminium panels and glass rings to allow natural light into the building.
- The northern and southern facades of the building consist of a full height double glazed curtain wall system. Steelwork was also used to achieve the curved look on the sides of the legs below the ellipse.
- The main steelwork in the building includes the roof steelwork, the steelwork supporting the cladding at the legs, the lift steelwork, the dog-legged staircases on the 8th floor and the canteen steelwork.
- The roof is exposed to cyclone conditions, with wind speeds of 275km per hour. The curved beams also support 150mm deep precast panels. The deflection of the beams at the edges had to be limited because of the full height glass façade at the northern and southern faces. The wind uplift forces are most extreme at the ends due to the localized pressures.
- Glass lifts in the building meant that the lift steel frames had to be aesthetically pleasing; this resulted in the use of circular hollow sections to support the lift equipment including the counter weight brackets, car guide rails and lift doors.
- To ensure that the fabricated cellular rafters were fabricated within the maximum tolerances and the correct radii achieved, the rafters were set out on the workshop floor and fabricated in nine sections using three different radii.
- The hot dip galvanized steel was loaded into open top containers at Cadcon's premises and transported via road to Durban harbour, then shipped to Port Louis, Mauritius. The shipping duration including clearance was between 5 and 7 days.
- The fabrication and shipment sequence followed the sequence of construction on site ensuring efficient site progress.
- On site, the containers were carefully off loaded. All steelwork was then degreased, rinsed and then painted with two coats of Corrocoat primer followed by two coats of Polyurethane before being lifted into position (overall paint DFT– 200 microns).
- The steel cell beams were built to an oval shaped radius in order to provide a cost effective, structural sub-structure which could be installed at a much quicker speed compared to an in-situ concrete element. Pre-cast roof panels could be made off-site and installed on top of the duplex coated steel structure.
- Robor was approached by the steelwork contractor to provide input on the coating system, approved by the Engineer. All parties strived for a low maintenance, high quality but cost effective system.
- The steelwork sections were also made in manageable lengths to limit handling damage and to suit the size of the galvanizing bath.
- This project proves that, through the use of a duplex coating system, one can be bold in the use of steelwork in difficult to access areas and provide a long term, low maintenance corrosion protection system.

ARCHITECTURAL CATEGORY ENTRY

Jozini Big Six Private Bush Lodge Jozini, Swaziland

Description

The use of a duplex coating system for a Private Bush Lodge

Project partners

Fabricator & engineer	Cousins Steel International
Erectors	Davgo Rigging & LR Brits Industrial Services
Architect	Lisa Rorich
Hot Dip Galvanizer	Phoenix Galvanizing
Tons of steel	110 tons
Project value	Undisclosed

Information

- The fabricator's (Mike Oldfield of Cousins Steel International) brief to the architect, Lisa Rorich, was to design a bush lodge in keeping within a certain envelope as prescribed by the Developers. The idea was for a main dwelling, linked via pathways with five free-standing units. The design naturally needed to capture the picturesque surroundings, with conservation featuring highly on the agenda.
- Every tree on the site was surveyed and as far as possible the structure was designed around the existing trees. Multi storey structures were not allowed, as well as visible naked lights.
- Mike wanted to opt for a timber home, but needed a sub-frame, which under normal circumstances would also have been done in timber. In the interest of a longer lasting and maintenance free structure, the decision was made to construct the sub-frame with hot dip galvanized steel. Mike also had the added advantage of fabricating the structure in-house.
- The site presented some engineering challenges in that it was located on clay. This meant deeper foundations which reached below where the moisture levels of the soil changed, thus ensuring a stable structure despite the presence of clay.
- The main structure features duplex coated structural steel. Hot dip galvanized (not continuously hot dip galvanized sheet) purlins were used as cross members on which timber cladding was anchored due to the fact that the site is located in a very humid area, right on the water's edge.
- There were many constraints during the construction of the lodge. The site is 360km from Durban, which meant that all the steel had to be transported through the border, which required two permits. Transport and logistics had to be carefully planned in terms of the rigging crew.
- In addition, the final 18km of the journey meandered through the Game Reserve which has a 40km per hour speed limit. Another complication was the fact that the game reserve road ended approximately 150 meters from the site, which made the use of a crane for offloading purposes impossible.
- Off loading by hand proved to be the only solution and in order to keep the weight of the sections down, lengths of steel was restricted to 8 meters long. Mike laughs: "we literally cleared away the snakes before we carried the steel down the narrow pathway that meandered to the site. In total 110 tons of steel was transported to site and off-loaded by hand! There were not many other major obstacles besides the fact that a hippo walked through the site every night!"
- Hot dip galvanizing was chosen because the structure is clad with timber on both the inside and outside and accessing the "core" frame for maintenance would be costly. In the interest of aesthetics, exposed steel was duplex coated.
- This project promotes the possibility of new applications in terms of residential development in that it is a hybrid structure, implementing the use of a structural steel frame which is then clad in timber, creating the illusion of a timber home but with the added advantage of having a secure structural steel core.
- Essentially the dwelling was constructed in kit form, sections at a time. This method of construction is substantially faster than conventional brick and mortar construction, which brings another cost saving factor into consideration.
- A requirement of the development was that local labour be used, as a result, local Swazi labour was trained in thatching the lodge.
- Extensive teamwork existed between the various role players. Hot dip galvanizing was timed and planned, taking into consideration the logistics faced by the owner. Transport and logistics had to be carefully planned in terms of the rigging crew.

DUPLEX COATING SYSTEMS CATEGORY ENTRY

Container Terminal Cape Town

Description

The application of a duplex coating system to the refrigeration container terminal at Portnet.

Project partners

Owner	Transnet National Ports Authority
Project manager	Transnet Special Projects
Main contractor	WBHO
Steel Fabricator:	Scott Steel
Hot dip galvanizer and paint applicator:	Cape Galvanising

Tons of steel 1 200 tonnes of steel (10 tons per unit x 120 units)

Information

- As visitors drive into Cape Town, they will pass the Cape Town docks where they will see row upon row of neatly painted yellow and grey structures for the refrigeration container terminal at Portnet. The structures are being used to house refrigerated containers which are stacked three high, to which they are connected to the local electricity supply provided for at the site.
- Each unit weighs 10 tons, stores 9 refrigerated containers and has separate walkways so that each container can be accessed individually and are positioned directly adjacent to the harbour and in some areas as close as 20 metres to the sea.
- As the galvanized frames spent some time in the zinc due to their size, the zinc coating could be classified as heavy with a mean coating thickness of 175 microns, which together with the paint will provide a total dft of 300 microns.
- However, our classification for this area would be mild to severe marine as Cape Town docks is not subjected to excessive salt spray and is in the main belt of the North West wind which blows only in winter and provides a wash down effect of contaminants.
- This corrosion protection system will have an indefinite lifetime if correctly maintained and if the final paint coat is replaced at reasonable intervals.
- The only items that are not painted (but are hot dip galvanized) are the 200 ton of grating panels that are fitted into the walkways.
- At the same time as the new refrigeration Container Terminal was being planned, Transnet staff also took the decision to renovate and disassemble approximately 100 lighting masts in the entire dock area. In order to achieve this they put out a tender, which included the dismantling, removal of paint by blasting, stripping, re-welding, the base sections, re-galvanizing and then painting the entire mast and ultimately replacing all the electric cables and light fittings on the masts.
- All of this work, including transport, was undertaken by Cape Galvanising, with the exception of replacing the electrical fittings. The original hot dip galvanizing was still in good condition after some 20 years, but as all the welds had to be checked it was considered necessary to strip and re-galvanize.
- This project involved educating the client, design authority and the erectors as to the characteristics of duplex coating systems and the service life advantages that can be obtained.

INFRASTRUCTURAL DEVELOPMENT CATEGORY ENTRY

Soccer City Stadium – Turnstiles Nasrec Road, Soweto, Johannesburg

Description

The design, manufacture and installation of hot dip galvanized turnstiles.

Project partners

Owner	Johannesburg Municipality
Architect	Boogertman Urban Edge
Specifier	Advoco Engineering
Project manager:	Turnstar Systems and Actom
Main contractor:	Grinaker LTA
Hot dip galvanizer:	Phoenix Galvanizing (Pty) Ltd and Galvadip

Tons of steel	Approximately 26 434kg
Inception date:	2008
Completion date:	May 2010
Project calue:	R4.5 million

Information

- Soccer City was originally built in 1989 and was largely rebuilt for the Soccer World Cup in 2010.
- The managing director of Turnstar Systems, then working under a different banner, designed and supplied the turnstiles for the original Soccer City stadium.
- Soccer City is the largest capacity stadium in South Africa and is also known as the "Calabash" stadium due to its outstanding and original design. The stadium seats up to 98 000 spectators and is used for many different gatherings.
- Hot dip galvanizing was specified because of the close proximity of the mine dumps which have acid laden sand which would have caused corrosion if the surfaces of the turnstiles had been painted.
- These turnstiles were specially designed for the stadium, with design specifications which had never been tried by Turnstar previously.
- The architect specified an architectural quality finish, so tests were undertaken with various galvanizers until the acceptable quality was achieved.
- Of the 180 turnstiles, 150 were hot dip galvanized. LED displays which indicated "access granted" were used, which had never before been used in Turnstar's turnstiles. All the turnstiles were provided with a battery backup system so that access could continue in the event of a power failure.

INFRASTRUCTURAL DEVELOPMENT CATEGORY ENTRY

Maxwell Drive Bridge Sunninghill, Gauteng

Description

A bridge, consisting of Superspan steel arches.

Project partners

Developer /owner	Century Property Development
Architect	Michael Bishop, head of Architecture at Century
Specifier	Century Property Development
Main contractor	KNS Construction
Hot dip galvanizer	Armco Galvanizers
Type of steel	7mm hot dip galvanized corrugated steel to an Armco design.
Tons of steel	105 tons
Inception date	2010
Project value	R18.5 million

Information

- The bridge (conceptualised, designed, project managed and commissioned by Century Property Developments), has been touted as the largest "Armco" Arch Bridge in the Southern Hemisphere and will provide a welcome traffic reprieve to residents and commuters in the area. It was financed as a joint venture between Sanlam Properties and Century Property Development.
- It consists of seven low-profile Superspan steel arches providing a bridge crossing length of 140 metres, with a road width of 28 metres, providing motorists with a four-lane carriageway. Armco Superspan structures are produced using a series of corrugated, hot dip galvanized steel plates (multi-plate) that are bolted together to form a structure.
- Waterfall City has been designed specifically to maximise its spatial advantages by exploiting its location relative to the broader economic systems of Sandton, Rivonia, Sunninghill and Midrand. A central consideration to the project was the construction of a road link between Sunninghill and Midrand. The construction of this road link, named Maxwell Drive, was designed to accommodate a traffic volume of 30 000 vehicles per day. As the road had to cross the Jukskei River, a suitable bridge had to be built.
- A design proposal using a reinforced concrete construction method proved too expensive at R15 000 per m^2. The second system, as selected, was an Armco solution which cost R8 250 per m^2. The overall cost was R18.5 million, including design costs for the foundation, this was a cost saving of approximately 45%.
- Construction of the crossing was completed in just 5 months.
- The Maxwell Drive Bridge has an anticipated lifespan exceeding 100 years. Corrosion control design included hot dip galvanized steel, including all fasteners, with bitumen coatings (duplex) to all external, soil side, surfaces.
- The service life estimates are viewed in terms of ISO 9223 with a C2 or at worst a C3 classification - estimated zinc corrosion rate is one micron per year. The hot dip galvanized arch having zinc coating thicknesses in excess of 120µm, the service life is projected to exceed 100 years.
- Corrosion control of the arches from the soil side is not only hot dip galvanized, but in addition coated with more than 200µm of bitumen, in effect a duplex coating system. This combination will allow for a similar service life to that of the interior of the structures.
- As Michael Bishop, the architect, says "adding a touch of finesse, Century has finished off the concrete retaining walls with red brick cladding, providing an old world charm to the new world structure, which is according to the company's goal to ensure its structures blend into the look and feel of the area in which they are built."
- These Superspan structures employ unique reinforced concrete thrust beams located at the two and eleven o'clock positions on the outside of the structure. The design of the beams is such as to dissipate loads from the steel structure into the compacted soil on each side of the installation.

MINING AND INDUSTRIAL CATEGORY ENTRY

DBT Stores Richards Bay

Description

New multi purpose workshop for the Dry Bulk Terminal in the Port of Richards Bay for Transnet

Project partners

Developer /owner	Transnet Capital Projects
Architect	Transnet Capital Projects
Specifier	Transnet Capital Projects
Project manager	Brahma Naidoo
Main contractor	PJ Projects
Hot dip galvanizer	Bay Galvanizers
Tons of steel	58 tons
Completion date	June 2010
Project value	R3.5 million

Information

- It was decided it was necessary to create a suitable facility for Transnet's maintenance staff to carry out daily maintenance related tasks (a workshop).
- Due to the close location of the building which is situated about 100m off the Wharf side, the building is subjected to the aggressive corrosive environment caused by the ocean and more so by the corrosive products being handled by the Port in close proximity to the new workshop. Therefore a duplex coating system was agreed on.
- With maintenance now being carried out in a controlled area the odd fluid spill can be contained and dealt with effectively and immediately, making it not only beneficial to Transnet's safety record but also making it a sustainable investment that will protect the surrounding Fauna and Flora.
- Furthermore, grade 8.8 hot dip galvanized fasteners were used to secure the duplex coated structure.

MINING AND INDUSTRIAL CATEGORY ENTRY

Transnet Pedestrian Bridges Richards Bay, Kwazulu Natal

Description

Two new rail track crossing foot bridges for the Port of Richards Bay.

Project partners

Developer / owner	Transnet Capital Projects
Designer	Hatch
Project manager	Brahma Naidoo
Main contractor	PJ Projects
Hot dip galvanizer	Bay Galvanizers
Tons of steel	54 tons
Project date	August 2010
Project value	R4.37 million

Information

- Living in an era of safety consciousness, Transnet has come up with another safety initiative. The crossing of the rail tracks by pedestrians is fast becoming a mammoth safety hazard and it was decided to fabricate and erect two foot bridges to provide a safe suitable pedestrian crossing over the rail and OHTE lines.
- Yearly maintenance would have been a life threatening task because of the ongoing locomotive traffic and overhead power lines which the bridges span over and would require shutdowns on the line which would affect production.
- Situated only 300 metres from the ocean and 80 metres from a fertilizer bagging facility made it imperative to protect the bridges with a reliable coating system.
- A duplex coating system was selected as the preferred coating method, not only for its proven corrosion protection properties but for its uniform coating that will improve the lifespan of the structure and give it an aesthetically pleasing effect.

Nomkhubulwane by Andries Botha

MINING AND INDUSTRIAL CATEGORY ENTRY

Description

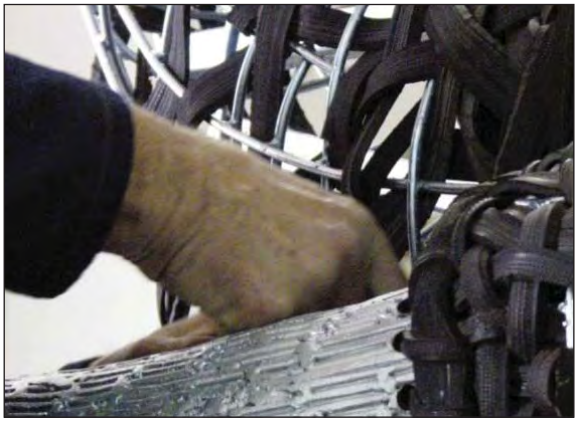
The hot dip galvanizing of Nom-Kee – the Matriarchal figure of the Human Elephant Foundation

Project partners

Artist	Andries Botha
Assistants	Joshua Ogle, Ntokozo Hadebe and Janine Zagel
Developer	The Human Elephant Foundation
Hot dip galvanizer	Phoenix Galvanizing (Pty) Ltd
Tons of steel	1.3 tons

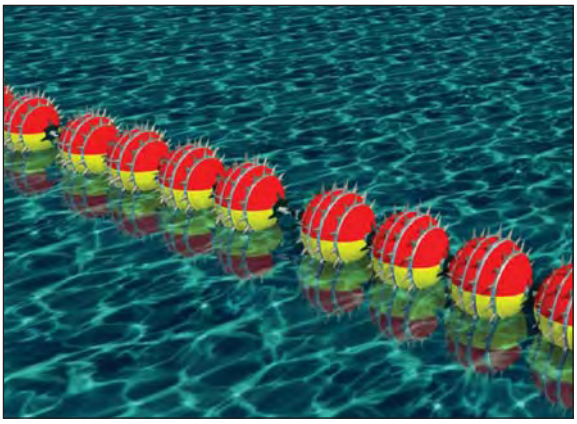
Information

- Hot Dip Galvanizing in South Africa is almost exclusively limited to commercial, industrial and security applications. Its use in the arts is very rarely seen.
- The use of hot dip galvanizing in the arts was first highlighted in 2005 when Phoenix Galvanizing entered Langa Magwa's The Horn, which was installed in the Africa Centre in Somkhela, Northern Natal. Again in 2008, Phoenix Galvanizing entered a sculpture by Andries Botha, called Lux Themba which went on to win a special judges commendation.
- Andries Botha, a Durban based internationally renowned artist, has been a keen user of the coating in various works of art he has produced and has done so again in this, his latest project, which has received international critical acclaim.
- Nom-Kee, as she has affectionately become known, was named by the legendary Dr Ian Player, founder of the World Wilderness Congress and has become the matriarchal figure of The Human Elephant Foundation (which was founded by Andries Botha).
- Standing 9 feet tall and weighing in at 1.3 tons, Nomkhubulwane was created out of a hot dip galvanized steel frame and recycled tyres (the latter material regarded as redundant or burdensome to the planet).
- Nom-Kee was fabricated by Andries Botha and his team of assistants. The artist made use of a steel rod frame which was internally supported by square tubing.
- Andries has had a long standing relationship with Phoenix Galvanizing in terms of the care, handling and galvanizing of his various works of art. Because of this relationship, works of art are manufactured to the size constraints of their galvanizing bath. The project team operate on the general principle that work is booked in advance and then processed as soon as it arrives to avoid damages which could potentially occur with an extended stay at the plant.
- Works of art are also processed on a separate beam, thereby further eliminating possible damages. This process allows the artist to remove the work immediately after it has been hot dip galvanized and continue with the creative process.
- After hot dip galvanizing the frame was "plaited" with recycled types at the Promat Factory.
- Careful consideration was given to the corrosion protection of the artwork, taking into consideration that the piece was shipped all over the world. Needless to say, corrosive conditions during shipment would be extreme and the only coating that could stand up to these conditions would be hot dip galvanizing.
- Hot dip galvanizing was also chosen as a means of corrosion protection due to the fact that it is deemed as an "organic" coating. The whole theme of the project is conservation and looking after the planet for generations to come. The artist felt that it would be inappropriate to use anything other than hot dip galvanizing which he deemed as a "natural response".



MINING AND INDUSTRIAL CATEGORY ENTRY

Marine Floating Barriers Niger Delta, Nigeria (2009) & Simonstown, Cape Town (2010)



Description

A marine floating barrier, with all carbon steel components being hot dip galvanized, designed to prevent boat borne access to strategic sites.

Project partners

Developer / owner Cochrane Steel

Hot dip galvanizer Lianru Galvanisers

Information

- Designed to prevent boat borne access to strategic sites, the marine floating barrier is constructed of multiple floating buoys (standard 1150mm dia) that are coupled together allowing for free 360 degree rotation. The buoys are linked to form a barrier of any length to suit a specific application.
- Buoys are supplied with a smooth surface or are alternatively fitted with an array of spikes, the size and shape of which are tailored to suit the threat.
- All carbon steel components have been hot dip galvanized to provide for corrosion control in a range of operation sites and environmental conditions.
- The Marine Floating Barriers are filled with marine closed cell foam which renders them virtually unsinkable even when perforated or punctured by bullet holes.
- Intruders have no opportunity to gain hand or foothold due to deadly spikes and revolving buoys.
- The ± 30 ton breaking strain barrier will restrict access of most insurgent types of water craft.
- All materials utilized have extended life span in corrosive fresh and sea water conditions. Stainless steel, hot dip galvanizing and duplex coating systems (for high visibility) are offered in terms of corrosion control designs.
- During the development stages of the product, extensive tests were undertaken to establish the performance criteria from a defence and security standpoint. This knowledge has become an essential component in marketing the product.
- To date this product has been successfully used in the Niger Delta and in Simonstown Naval Dock Yard.
- Service life with a duplex system in a marine environment can be projected as 18 years to first maintenance and more than 30 years for hot dip galvanized products on inland water ways.
- The system is movable and can be relocated to suit changing security conditions. It can also be extended in order to cover larger security zones.

Galvaglow – Environmentally friendly plant

MINING AND INDUSTRIAL CATEGORY ENTRY

Description

An environmentally friendly hot dip galvanizing plant in South Africa.

Project partners

Developer / owner	Galvaglow
Project manager:	Johan du Plessis
Main contractor:	VJL Technologies
Completion date:	November 2010
Project value:	R13 million

Information

- The plant boasts a 4m x 2.5m x 1.5m galvanizing kettle manufactured by WPilling.
- The furnace was manufactured by Gimeco in Italy and is the only new technology high velocity gas fired furnace operating in a galvanizing plant in South Africa.
- The pre-treatment plant consists of ten polypropylene tanks manufactured locally using the finest materials available. The tanks have pumps installed to circulate the acid which allows Galvaglow to pickle faster and therefore run their acid to a lower count before replacing it.
- The fume extraction system operates in an entirely enclosed pre-treatment plant built with polyethylene sheeting. The 9 polypropylene tanks are fitted with a lip extraction plenum along the sides of the tank. The pre-treatment plant also has one larger vertical plenum with multiple slots on the further side of the plant which joins into the horizontal plenums along the tanks.
- This form of extraction which is known as the "push pull extraction system" is the most proven and effective localized extraction principle. The plenum size and slot size is critical to ensure the system works efficiently.
- The net effect of the system is that it allows the plant to operate without releasing harmful gasses into the environment.
- The Wet Scrubber System is connected to the extraction unit in the pre-treatment plant; this is designed to absorb toxic particles from the air streams using water to scrub the air.
- A final demister stage removes the liquid from the air stream. In essence, this system cleans the hazard and toxic fumes before releasing it back into the atmosphere.
- Galvaglow's very efficient, high velocity gas fired furnace reduces the strain put on Eskom's electricity supply.
- Excess exhaust gases from the furnace are redirected using hot water pipes to heat the degreaser and flux tanks, saving further energy.
- Civil works are already complete to install their own effluent treatment plant.
- Galvaglow uses a Chrome 6 Free Flux Solution which is an environmentally friendly chemical as it does not emit harmful gases into the air.

MINING AND INDUSTRIAL CATEGORY ENTRY

Anti-Vandalism Covers

Description

The hot dip galvanizing of anti-vandalism apparatus cupboards in the Durban area for Metrorail Signalling Department.

Project partners

Developer /owner	ERB Technologies
Architect	Afri Welding Solutions
Specifier	Metro Rail Signalling Durban
Project manager	ERB Technologies
Main contractor	ERB Technologies

Hot dip galvanizer	Armco Galvanizers
Tons of steel	212 tons
Inception date	January 2009
Project value	R20 million

Information

- Afriweld is a small local engineering firm that has grown rapidly from a small signage company to a firm that services a specialized industry; that of vandal-proof enclosures mainly for railway applications.
- Vandalism has become a country wide problem, which increases annually and this has resulted in many signal cupboards being vandalised or destroyed, for sale as scrap. This in turn leaves the electronics for the signal controls open to the environment and an easy target for theft. Vandalised signal cupboards could lead to train accidents resulting in serious injuries or even death.
- Afriweld, in conjunction with ERB Technologies, has designed and produced vandal-proof enclosures which have already proved their worth as not a single signal cupboard has been damaged since being replaced with these new vandal-proof cupboards.
- In addition to being vandal-proof, this newly designed cupboard has a double layer wall which helps keep the controls cooler, resulting in a longer life span of the electrical components.
- Various vandal-proof designs have been tried and tested, but one of the features which makes this cupboard so effective is the unique design of the lock and key. The door is almost impossible to open without the special key.
- Once the old cover has been removed, a new easy to carry modular foundation is installed under the existing controls. The cupboard and foundation come in several easy to handle components, thus making it easy to carry to remote places.
- As there is no need to disconnect the electrical components, this eliminates long down time of the signal controls, which could lead to delays in the train schedules.
- These vandal proof cupboards are hot dip galvanized. With an average coating thickness of over 50 microns, the life expectancy is at least 50 years and exceeds any normal painted specification. As galvanizing is a neutral colour it blends into the surrounding environment easily.
- Once the initial proto-type had been built, Afriweld contacted the galvanizers for advice on drainage and ventilation holes. They also investigated possible distortion during the galvanizing process. The relevant changes were made and an easy to galvanize enclosure was produced.

MINING AND INDUSTRIAL CATEGORY ENTRY

Sustainable Affordable Buildings Parys

Description

Affordable housing, manufactured in kit form.

Project partners

Architect	Urban Edge SV PS Architects & Plan Services
Project manager	SASSI
Main contractor	SASSI
Hot dip galvanizer	Armco Galvanizers
Tons of steel	4 tons per low cost dwelling
Completion date	November 2010
Project value	>R250 000

Information

- SASSI is an organisation engineered to offer a sustainable, affordable and innovative approach to construction methodologies. Their methodology entails steel structures that are pre-cut in their factory to a set design and used for either commercial or residential projects.
- Utilities such as plumbing and electrical can be packaged with the home and are easy to apply. Their completed structures are achieved swiftly and because of the bolt on system, ease of erection and assembly is ensured. As a result, high level skills are not required.
- This housing project is an easy to erect concept which allows the owner - builder to participate in a venture which is recognised by financial institutions.
- Buildings are all based of hot dip galvanized steel platforms and superstructure. Longevity is guaranteed to exceed 50 years in most urban and rural environments.
- Demountable structures are available in either 35m^2 or 40m^2 units. The elements are packed and ready to be transported and assembled. Foundations are cast as part of the assembly process.
- For the demountable structures, only the holding down bolts are cast in concrete bases. For permanent structures, the holding down bolts and nuts are cast into concrete. The steel elements are bolted on and the roof is fitted as part of the assembly process.
- All structures are erected above the ground in order to reduce the risk of flooding. Walling-Demountable-Channels are secured to Sassi elements to receive externally corrugated sheets and internally plaster boards are used.
- As the basic steel structure is sent in a kit form, the local market supplies the cement and bricks for the walls and foundation, thereby creating a further partnership between the fabricator and local industry.
- SASSI is currently awaiting approval for the first 1 000 houses in the Free State.

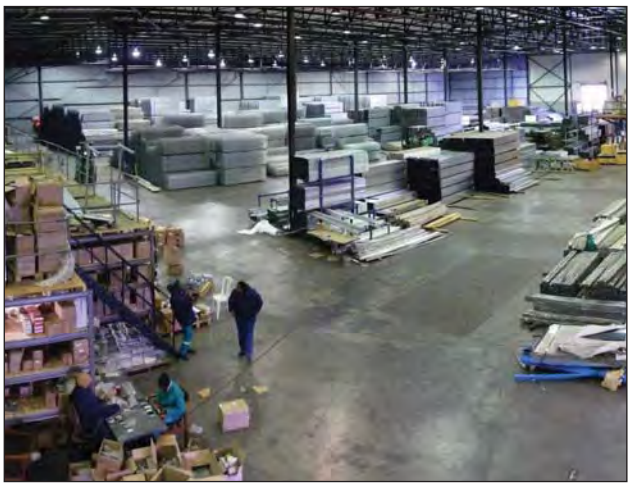
More than just bent metal

Two views of edge mounted cable ladders for a recent major project.

With their recent move to larger and better appointed premises in Maraisburg, conveniently situated just off the N1 in Johannesburg, Strutfast has shown confidence in the market they set out to serve when the company was established in 2001.

Strutfast's focus is the manufacture and supply of cable management products to construction and industry throughout the African continent. The company's competitive edge in the market is achieved by the

continued on page 30...



A view of external and internal storage facilities at Strutfast.

continual addition of new manufacturing expertise and new product development in all areas.

Its success has been achieved by a hands-on management approach and employing people with the necessary knowledge and skills, people who are genuinely passionate about service and quality. Strutfast believes in empowering its staff to give the customer the best advantage.

Besides its people skills and commitment to Broad Based Black Economic Empowerment (BBBEE) and constantly striving to grow skills development in the country, quality is also essential to Strutfast. Its Management System for the Design, Manufacture, Stocking and Supply of Cable Management Systems is certified by Bureau Veritas to be in accordance with the requirements of ISO 9001:2008. The company is in the process of extending its Management Systems Requirements to attain compliance with the ISO 14001:2004 "Environmental", and the OHSAS 18001:2007 "Occupational Health and Safety" Standards.

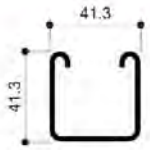
Cable management systems for the mining and petrochemicals industries form the majority of its work. Strutfast has completed numerous exciting projects in the past. Supply of support solutions for cable reticulation at Medupi Power Station in Lephalale is one of their largest current long term projects. Strutfast's centralised stock is based in Gauteng, however the company distributes throughout South Africa and the African Continent.

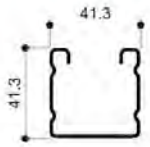
Strutfast provides a network of services to ensure total support. The company provides system design, marketing and project management support for its customers as well as being the stockist of manufactured products.

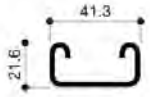
An additional view of edge mounted cable ladders for a recent major project.

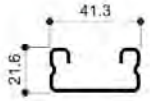
General and continuous hot dip galvanized unistrut sign support channels

Metal Framing and Wiring Channels

Typical Section	Material	Length	Finish	Usage
	2.5mm Thick Mild steel.	6.0m	Hot Dip Galvanized to SANS 121 (ISO 1461)	Metal framing, Cable ladder support systems, condenser support systems, pipe & air ducting support systems.
	2.5mm Thick Mild steel.	5.0m	SANS 3575 Coating Class Z275	

Typical Section	Material	Length	Finish	Usage
	1.6mm Thick Mild steel.	5.0m	SANS 3575 Coating Class Z275	Light framing, shelving and Wiring systems (Electrical wiring).
	1.0mm Thick Mild steel.	5.0m	SANS 3575 Coating Class Z275	Wiring systems (Electrical wiring).

Typical Section	Material	Length	Finish	Usage
	2.5mm Thick Mild steel.	6.0m	Hot Dip Galvanized to SANS 121 (ISO 1461)	Metal framing, Cable ladder support systems, condenser support systems, pipe & air ducting support systems.
	2.5mm Thick Mild steel.	5.0m	SANS 3575 Coating Class Z275	

Typical Section	Material	Length	Finish	Usage
	1.6mm Thick Mild steel.	5.0m	SANS 3575 Coating Class Z275	Light framing, shelving and Wiring systems (Electrical wiring).
	1.0mm Thick Mild steel.	5.0m	SANS 3575 Coating Class Z275	Wiring systems (Electrical wiring).

Source: Strutfast Doc. No. RN12052010-CL01-A00

The top four photos show the location, cross sectional shape and typical coating thickness of a 1.6mm thick continuous hot dip galvanized strut. The lower three photos show the location and typical coating thickness of a 2.5mm thick general hot dip galvanized strut. As life of the coating is proportional to its thickness, it makes sense to use the thicker coating offered when the signage support is exposed to more aggressive environments.

The Association would like to thank Strutfast for this table.

Artistic works of art that require durability while maintaining their desirability

What internationally known artists and sculptors such as Willie Bester (*photos* 10 *to* 15) and Andries Botha both South Africans (*photos* 3 *and* 9), Ralph Helmick (*photo* 6), Roxy Paine (*photos* 1 *and* 7) and Bettye Hamblen Turner of the USA (*photos* 4, 5 *and* 8) and Andy Scott of Scotland (*photo* 2), have in common is their desire to use steel as their selected material of choice. But because of steel's tendency to return to its natural state (rust) it has to be suitably protected.

While providing the flexibility required, steel has one major drawback in that it rusts if not properly coated. For long term durability and very little or no maintenance after exposure to the elements these artists chose to either hot dip galvanize or zinc metal spray their works of art.

A traditional choice of material such as bronze is always a consideration due to its natural durability but by including other less exotic and more flexible materials such as steel the artist is able to expand on his or her choice.

Many of these artistic structures, besides being eye-catching, innovative and unique must be maintenance free for as long as possible because most of them are exposed to the natural elements of

continued on page 34...

Photo 1.

Photo 2.

Photo 3.

Photo 4.

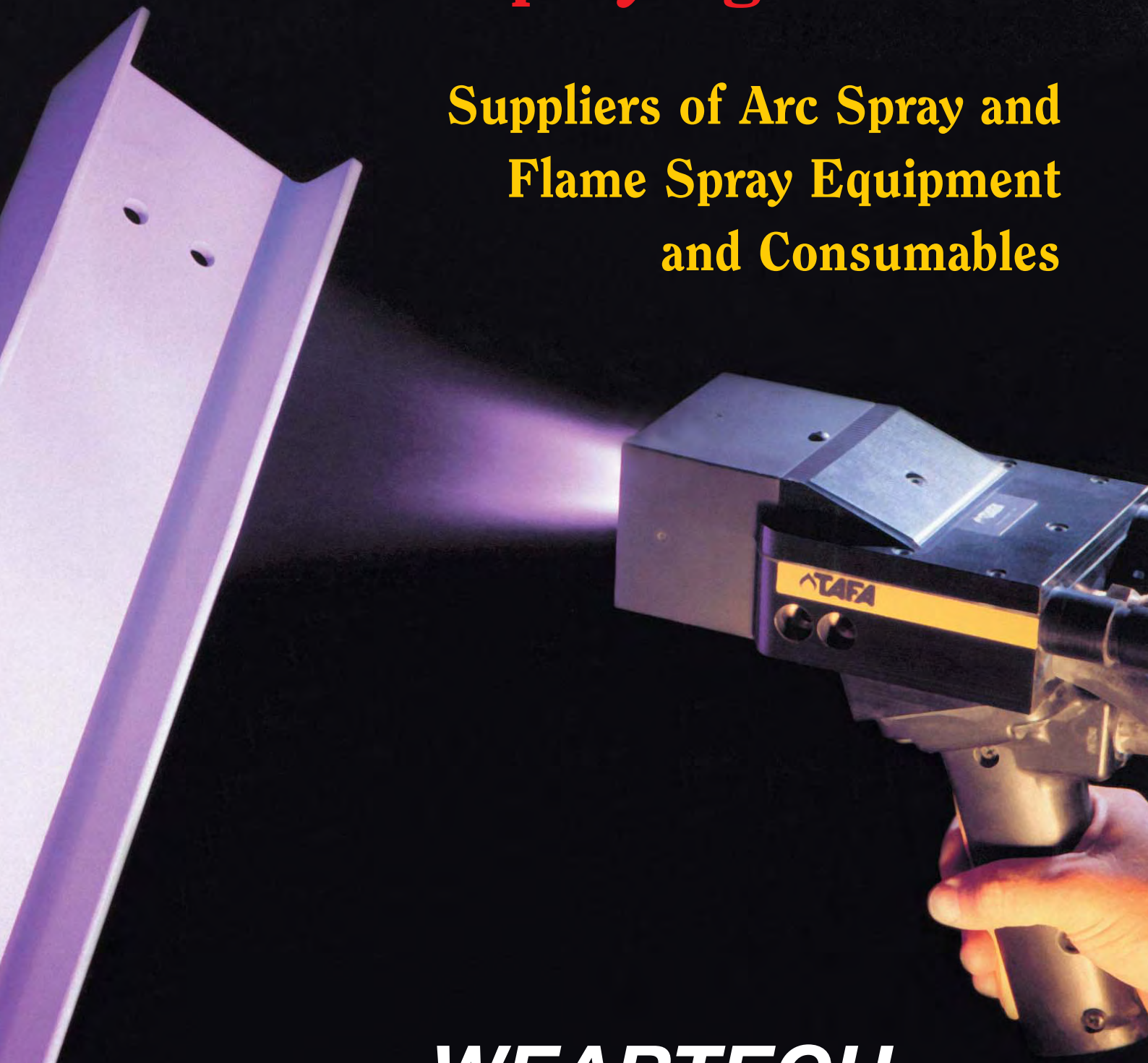
Photo 5.

Photo 6.

Photo 7.

Zinc Metal Spraying?

Suppliers of Arc Spray and Flame Spray Equipment and Consumables



WEARTECH (Pty) Ltd

THERMAL SPRAY DIVISION

187 Galjoen Street, Wadeville
P.O. Box 14125, Wadeville 1422
Gauteng, South Africa
Telephone: (011) 824-6010/2/3/4/5
Fax: (011) 824-6090
KZN - Telephone: (031) 466-4461
CAPE TOWN - Telephone: - (021) 447-4728
E-mail: sales@weartech.co.za
Website: www.weartech.co.za

collectors' gardens, public parks, and other outdoor public spaces.

Both zinc metal spraying (for more fragile and thin structures) and hot dip galvanizing (for more robust structures) are utilised to perform this function.

Some of the works of art are over coated using some form of paint or lacquer spray and then afterwards finely etched using a mechanical wire wheel to produce the desired artistic effect.

It is important however, that these artists have a sound working understanding of the design requirements necessary in order that their sculptures are comprehensively coated while maintaining their shape. Also important is the addition of adequate vent holes that when dipped into molten zinc, prevent the formation of super-heated steam, the inevitable explosion and sub-sequent loss of an expensive work of art.

Furthermore, the sourcing by the artist of a galvanizer who is willing to undertake this type of work is extremely important to achieve the necessary results.

As Bettye Hamblen Turner says, "Planning, co-ordination and luck, luck never hurts, even when everything is carefully planned. The American Galvanizers Association has a website that offers tutorials, *http://www.galvaniziet.org/*. I studied the tutorials when I made the horses. I

Photo 8.

Photo 9.

Photo 10.

Photo 11.

Photo 12.

Photo 13.

Photo 14.

Photo 15.

spoke with the plant manager at US Galvanizing in Arlington, Texas several times during the sculpturing process on the horses. By the time I made the bull, I had a better idea of how to brace the floating pieces to avoid distortion. As most galvanizers spend their time doing structural, gates, burglar bars and uninteresting widgets, hot dip galvanizing a sculpture is a pleasant change of pace for them"

We salute these artists in their choice of long term metal protection.

The Association wishes to thank Willie Bester for his time and material as well as Desere Strydom for her love of hot dip galvanizing and encourage readers to visit her blogspot for more information on these artists and much more: http://commentfromthecouch.blogspot.com

Bob's BANTER!

Problem solving means reaching destinations, not just reading signposts

Steven Rose, in *The Making of Memory*, describes how many ancient philosophers were dubious about having a written culture. They claimed that writing was inhuman-it depersonalised thoughts and weakened the mind. Socrates even argued that writing destroys memory and those who write will become forgetful since they have to rely on external sources for what they lack in internal resources. Many people will undoubtedly disagree with Socrates and will quote all the literary masterpieces, ancient and modern, which passed onto their readers wonderful insights and intimate knowledge of their writers. Great scientists too, like Albert Einstein, who communicated very complex thoughts by writing, certainly cannot be accused of being forgetful and lacking internal resources.

And yet, do these apparent beliefs of the ancient philosophers not strike a cord with many of us, especially those of us who work for large corporations where everything has to

be written down in endless memos, reports, notes, etc., and where the spoken word has become secondary to the written one? Are our executives not becoming depersonalised, and possibly inhuman, as a result of having to write everything down, be it on a notepad, a laptop computer or in an electronic diary? Even with all the alarms and whistles that one can get today, why is it that so many of us are late for meetings or appointments; are we becoming forgetful? Why is it with so much available gadgetry for reminding us, do we still hear the excuse: "I forgot".

Without delving too deeply into the psychology of thought or the physiology of the brain, let us for a moment dwell on whether writing something down improves memory. Most memory-enhancing courses recommend that pictures or symbols are better than words when preparing for a speech or a lecture. Words on their own seem difficult to remember whereas graphics are more easily absorbed by the brain. Why is this? Is it perhaps because the brain works more with thoughts and meanings and is unlike a computer which works with data? Pictures and symbols carry with them personally interpreted thoughts, whereas words, or sentences, are more rigid in their interpretation, although they can be subject to free thought word association. Words and data are facts with rigid meanings and are difficult to translate into thoughts. As a result the brain has difficulty in remembering them. As Mark Twain

said: "A man's private thoughts can never be a lie; what he thinks, is to him the truth, always." We are more easily able to forget facts than our thoughts. From here can we not deduce that written facts will be more easily forgotten than our own special thoughts, and they are all special for we as individuals are unique? So perhaps Socrates and his colleagues may have been right.

One of the problems psychologists have in the measurement of memory is that each time we remember we transform our memories; the human memory is not like that of a computer, called up from store, consulted and replaced unmodified. It's almost as if the memory is recreated each time we have to remember. Our thoughts are also transformed by our environment, which again is very unlike the memory of a computer. Spare a thought for one Shereskevskii (he was mostly called Mr.S because nobody could remember his name) who had a major problem; he could not forget. Psychologists who studied him found that he translated all inputs into his brain in the form of intricate pictures and stories. All past memories kept intruding on fresh ones.

But let's get back to our corporate obsession with written documents. What we are writing to each other all day are mostly facts and data which may be very important but which are difficult to remember. Perhaps we should rather communicate thoughts and meanings. Ricardo Semmler at Semco (*Maverick*) has obtained amazing results by asking all staff to write only 'headline' memos. The full meaning, not the facts and data, is thus communicated. An engineer in his organisation who invents and develops a new machine does not have to write an endless report to communicate and justify his idea: he simply sends the boss a memo stating' "New Cost Effective Gismo Invented-It Works!". Those who want to see how it was developed can ask him. There is also little doubt that we should use the spoken word more. As Socrates implied: when we speak to each other we communicate our thoughts and our meanings of things. In this way we enrich not only our own minds but also those that listen to us. Quoting Mark Twain again: "Life does not consist of facts and happenings. It consists of the storm of thoughts that is forever blowing though one's heads."

The Association wishes to thank Bob Andrew who is a consulting value engineer and honourary member of the Association for his article. He can be contacted on anneve@iafrica.com or boband@mweb.co.za.

3 CPD POINTS

3-day Galvanizers Inspectors Course

Hot dip galvanizing is one of the most widely used methods of protecting steel from corrosion. During fabrication and after hot dip galvanizing the coating is inspected for compliance with the relevant specifications.

Following up on comments received from the many participants attending our regular two day inspector courses over the last nine years, we decided to expand and update our 2-Day course into a more comprehensive 3-Day course.

Included are revisions of the course material and the introduction of more practical activities in the form of a full morning at a hot dip galvanizing plant followed by an afternoon of Duplex coatings. The galvanizing plant visit examines materials prior to galvanizing and hands on inspections of finished product. The afternoon is a visit to a paint applicators yard and Duplex coatings systems. Included are demonstrations on chemical cleaning and/or sweep blasting, examination of resulting profiles and followed by the application of paint onto galvanizing. The course will provide delegates with sufficient knowledge to advise on fabrication for successful hot dip galvanizing and also test, inspect and interpret test results after hot dip galvanizing.

COURSE DURATION AND CONTENTS

Day 1	**(08h00 to 16h00)**
Lecture 1	Introduction to the Environment, Steel & Corrosion
Lecture 2	Understanding Zinc Coatings (How does Zn protect)
	ISO 9223 & 12944
Lecture 3	Designs, Fabrication and Inspection before hot dip galvanizing SANS (ISO) 14713:1999
Lecture 4	General Hot Dip Galvanizing Processes
	SANS 121 (ISO 1461:2009) Batch type galvanizing
	SANS 32 (EN 10240: 1997) Automatic T & P
	SANS 10094:2007 HDG of Friction Grip Fasteners
Day 2	**(07h00 to 16h00)**
	Hot Dip Galvanizing Plant Visit and Inspection
Lecture 5	Duplex Coatings and HDG Reinforcement in Concrete
	Duplex Coatings Plant Visit and Applications
Day 3	**(08h00 to Completion of Exam)**
Lecture 6	Inspections after Hot Dip Galvanizing
Lecture 7	Quality Assurances in Coating Applications
	Application of specifications
	Control documentation for a QA System
	Examination on Course Effectiveness

Course schedule may be altered and interesting activities added for the benefit of delegates.

Following the course and successful result in a three part exam, the delegate will be issued with a certificate and if required, registered as an approved HDGSA Galvanizing Inspector. Registration will be confirmed on an annual basis. Successful galvanizing inspectors will become Affiliate Galvanizing Inspector Members of the HDGASA for the year.

VENUE AND NUMBER OF DELEGATES

The courses are usually run in Johannesburg from the Hot Dip Galvanizers Association in St Andrews, Bedfordview and also from a suitable venue in Cape Town. Bookings are limited to 10 people per course on a first come first serve basis.

DATE AND TIME

Courses commence at 08h00 sharp and end at 16h30 (or as otherwise instructed). Lunch and refreshments will be provided. Comprehensive course notes can be collected from our offices two weeks before the course (this is highly recommended).

Johannesburg:
15 to 17 February; 15 to 17 March; 19 to 21 April; 17 to 19 May; 21 to 23 June; 16 to 18 August; 4 to 6 October; 22 to 24 November.

Cape Town:
8 to 10 March; 7 to 9 June; 6 to 8 September.

Special courses can be arranged for a minimum of 6 delegates at appropriate venues in South Africa.

COURSE COST AND PAYMENT TERMS

R4 200.00 per person exclusive of VAT. Should you have two or more delegates from the same company, course costs will be R4 000.00 per person exclusive of VAT. Please note that payment is due on the first day of training. Cheques are to be made out to "Hot Dip Galvanizers Association SA". Members qualify for a discount.

CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD)

By attending the Association's 3 day course Galvanizing Inspectors Course, you will obtain 3 points (accredited by ECSA).

SHOULD YOU BE INTERESTED, KINDLY CONTACT SASKIA SALVATORI OR MARJORIE MONTGOMERIE AT THE ASSOCIATION

Elcometer sets new standards for coating inspection data management

Introduction

Many clients now request evidence of the coating inspection processes carried out when a coating is applied. It is often said that while inspection processes earn money, the reporting of such inspections costs money, as this is time that the inspector is not inspecting. A method for automating and speeding up the coating inspection process is essential.

Elcometer have recently introduced a new range of coating thickness gauges with a new and much improved data management software, ElcoMaster 2.0, which offers users a single software solution, not only for coating thickness measurements, but also for other gauges used in the inspection and monitoring of coating processes – such as surface profile and climate monitoring equipment - providing a solution for the creation of professional inspection reports in minutes, for all coating inspection parameters, thereby giving a competitive advantage in today's industrial environment.

The new Elcometer 456 coating thickness gauge

Fast, reliable and accurate, the new Elcometer 456 sets new standards in coating thickness measurements. Available in a range of models for measuring dry film thickness on ferrous & non-ferrous metal substrates, the new Elcometer 456 is even more powerful, rugged and easier to use than ever before.

Key features include:

- Incredibly fast measuring speed of more than 70 readings per minute – the new Elcometer 456 is more than 40% faster than other gauges.
- Memory capacity of up to 75 000 readings in alpha-numeric batches, interchangeable probes and output to ElcoMaster 2.0™ software the new Elcometer 456 is incredibly powerful.
- Impact resistant and sealed against dust and water equivalent to IP64, the new Elcometer 456 is incredibly rugged and is the ideal gauge for all environments.
- A 2.4" colour display, clear menu structure and large buttons making the new Elcometer 456 incredibly easy to use.
- Measurement capability to ±1% on smooth, rough, thin and curved surfaces the new Elcometer 456 gives you repeatable and reproducible results and is backed by a 2 year gauge warranty.

The new Elcometer 456 gauges are available in four Models with each level providing the user with increasing functionality, from the entry level Elcometer 456 Model E to the top of the range Elcometer 456T with memory, alpha-numeric batch identification and Bluetooth® wireless communication.

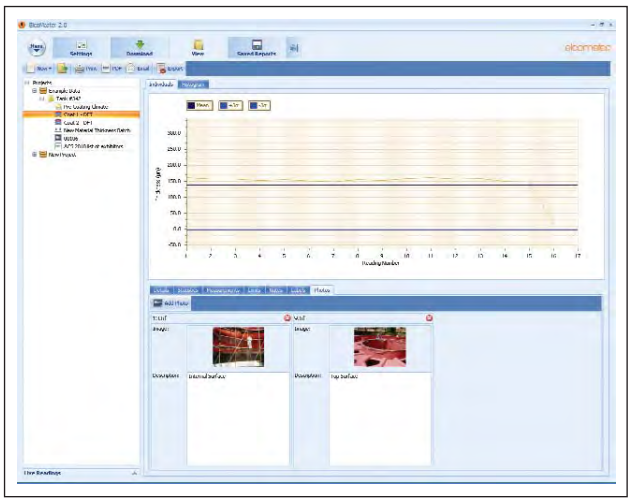
Integral and separate probe versions are also available - allowing users to select the most appropriate coating thickness gauge for their application. Integral probe versions are ideal for single handed operation and the wide footprint of the Bigfoot™ probe provides good stability on the coating surface during measurement for consistent, repeatable and accurate results. Separate probe versions provide a very wide range of thickness scale and probe-format options, which greatly enhances the measurement flexibility. Straight, Right Angle, Miniature and Telescopic probes are available as well as a range of special probes for under water, high temperature, soft coatings and anodising. Armoured probes, which have metal reinforced heavy duty, are also available.

Separate probe models can be converted to an integral version using the Elcometer Plug-In Integral probe (PINIP).

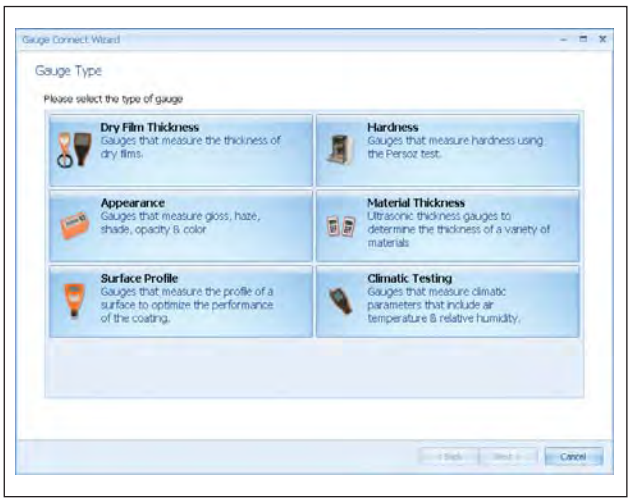
Data management software

Once all the inspection readings have been taken, and stored within the gauge's memory, Elcometer's

continued on page 40...



Data Management Software.



Data Management Software.

new ElcoMaster™ 2.0 Data Management Software provides users with a simple, yet powerful tool for managing, analysing and generating reports.

Elcometer began developing software over 30 years ago and, with the release of ElcoMaster 2.0, has created an easy to use solution for the need to minimise the time generating inspection reports. Some of the key features of the ElcoMaster 2.0 software include:

- Download readings from any type of Elcometer inspection gauge and combine different measurement parameters (climate, profile, coating thickness, etc.) on a single report
- Import and attach photographs, together with inspection notes, to your reports
- Export readings, images and notes, together with gauge and calibration information, into Excel or other spreadsheet formats
- Print, email or generate a .pdf report file directly from ElcoMaster 2.0
- Design your own reports, scan or directly import from a pdf file a predefined report template and simply drag & drop readings or statistics onto the appropriate area of the report
- E-mail a partially completed report to another site location for completion at final assembly - ideal for combining multiple site inspections
- Using the 'webupgrade' feature ElcoMaster 2.0, allows users to ensure that their gauges and software are always up to date
- Connect to the Elcometer Internet Cloud and download predesigned report formats

ElcoMaster 2.0 has been designed to be completely user friendly. Internal wizards guide the user through all the various steps from connecting and downloading readings from a gauge to generating reports and archiving the data for ISO records.

Other data collection gauge options

ElcoMaster 2.0 combines data from different electronic gauges in to a project folder so, for a particular coating

project or client, data on material thickness, surface profile, climatic conditions, appearance (Gloss) and coating hardness can be combined with the coating thickness data to provide a single comprehensive report.

Gauges, connecting via Bluetooth, USB or RS232, can either download the measurement readings from the batch memory, or can connect to ElcoMaster 2.0's live gauge reading application, allowing real time charting and data storage – directly into the computer.

For those inspection tasks that do not have a gauge to record the value (relying on pictorial comparisons for example), or have mechanical or non-memory test equipment (adhesion, surface cleanliness or wind speed gauges for example), data can be manually entered – making ElcoMaster 2.0 the data management solution.

Conclusions

The management of data collected when coating inspection tasks are carried out can be vital when the Client requires detailed reports on the quality control procedures. A new

continued on page 42...

Zinc Deficiency in Cane Sugar

The two essential micronutrients needed by cane are iron and zinc. Though needed in ppm levels, they are as essential as the macronutrients for the normal growth and yield of all crops. When the contents of iron and zinc in the 3 - 6 leaves from the top of the sugarcane fall below 10ppm, the crops will suffer deficiency. Deficiency of iron and zinc is aggravated by high alkaline pH, calcareousness and low organic matter status of the soil. In case of zinc deficiency, veins and areas adjacent to the veins become chlorotic while the intervenial spaces remain green. Under severe deficiencies of iron and zinc, the crop will become chlorotic and presents a sickly yellowish-white canopy.

To rectify the deficiencies of iron and zinc, the crop must be sprayed with spray fluid prepared by dissolving 1kg ferrous sulphate, 0.5kg zinc sulphate and 2kg urea in 100 liters of water at the rate of 500 liters per hectare of spray fluid immediately after observing the characteristic chlorotic symptoms and the spraying must be repeated once or twice fortnightly.

The Association wishes to thank IZASA *for this contribution.*

powerful, fast and easy to use software solution is now available, ElcoMaster 2.0.

ElcoMaster 2.0 software has been developed not only to make use of many of the features available in the new Elcometer 456 Coating Thickness Gauge, but also allows users to link other digital inspection gauges to handle inspection data such as material thickness, surface profile, climatic conditions, appearance and coating hardness, whilst also allowing manual data entry of other inspections.

The new Elcometer 456 Coating Thickness Gauge is fast, versatile, rugged and has benefited from over 60 years of Elcometer experience.

For more information on the Elcometer 456 Digital Coating Thickness Gauge range including the ElcoMaster 2.0 Data Management Software contact Elcometer at *sales@elcometer.com* or visit our website *www.elcometer456.com*.

For information on the other Elcometer products mentioned in this article, contact Elcometer at *sales@elcometer.com* or visit our website *www.elcometer.com*

About Elcometer

Elcometer is a leading manufacturer of high quality inspection equipment, with specialised divisions dedicated to coatings inspection, concrete inspection and metal detection.

For information on our full range of products visit our website at www.elcometer.com

The real protection at Jozini Private Bush Lodge is hidden!

In the interest of a longer lasting and maintenance free structure, which would not easily be accessible in future, Cousins Steel International decided to construct the sub-frame using hot dip galvanized steel and then clad with timber on both the inside and outside.

General hot dip galvanized (and not continuous hot dip galvanized) purlins were also used as cross members on which ceiling timber was anchored.

PROPOSED FEATURES FOR 2011

November / December (No 49):

- The world of hot dip galvanizing around us
- Greening of the hot dip galvanizing industry

NOTE: FEATURES MAY BE SUBJECT TO CHANGE

GALVATECH 2011

BRINGS STEEL AND ZINC INDUSTRY TOGETHER

Over 500 steel company engineers and researchers joined with academic and government officials at Galvatech 2011, the 8th edition of the worlds premier zinc and zinc alloy coated sheet conference during June 21-24 in Genoa, Italy. Nearly 200 papers and posters were presented in 72 technical sessions, plus an opening session for all participants.

Highlighting the opening session were speeches by Kazuaki Takada of Toyota Motor Europe on expected challenges for galvanized automotive steel applications, Don Smale of International Lead Zinc Study Group on the certain adequacy of zinc supply for further galvanizing demand, Debanshu Bhattacharya of ArcelorMittal with a global perspective of advanced galvanized steel development, and Klaus Peters of ThyssenKrupp who described European challenges and opportunities. The session concluded with a presentation by Qifu Zhang of the China Central Iron and Steel Research Institute on Chinese industry developments.

For the first time, sessions were dedicated to recent advances in Zn-Al-Mg coating development and also hot press forming steels for ultra-high strength automotive applications. Special sessions on laboratory simulation and quality control were also included. In addition to Toyota, leaders from Fiat and General Motors presented future automotive challenges for galvanized steel sheet to participants. Challenges from the appliance and construction industry were given by Whirlpool and the University of Naples. Sessions giving details of many of the new galvanizing lines constructed in the last 4 years, especially in Europe, were included together with many sessions on operating technology and product characterization.

Galvatech 2011 was co-chaired by Josef Faderl (voestalpine), Frank Goodwin (Intl Zinc Assn.), Thomas Koll (Saltzgitter) and Giancarlo Quaranta (ILVA). According to Dr. Goodwin, Galvatech 2011 carried on the story of success originating in Tokyo in 1989. In many cases the session speakers included the worlds leaders on each topic, making this a compelling conference to attend. I was very pleased that speakers came from 24 countries, with many more countries represented among attendees. The exposition, which sold out a few weeks after it was announced, included 20 leading suppliers of galvanizing equipment.

At the conference dinner at the Genoa Aquarium, the largest in Europe, it was announced that Galvatech 2013 will be held in China, followed by Galvatech 2015 in Canada.

International Zinc Association

On the Couch.....

Rob White

By Desere Strydom

On the couch caught up with **Rob White of the IZASA** on the eve of his first holiday in four years!

Please tell us briefly about your background? I was born in a small market town in Yorkshire. My first degree at Manchester was followed by five years working in the Water Industry, before returning to varsity. I was fortunate to be a Shell Bursar at the time of the troubles in Iran, so my research work was diverted from the oil industry to the Royal Navy in Portsmouth. That was my first real taste of corrosion close up and after completing my M. Sc. on diving life support systems and nuclear subs, I was offered a position, in SA, to start up a research group at the then National Institute for Metallurgy to support the mining industry. This group developed numerous corrosion protection schemes for industry and was my first real taste of the galvanizing industry.

How did you get into this industry? The early 1980s were heady days and mining development was expanding at an unbelievable pace. The HDGASA was very active in the mining industry with Walter Barnett pushing hard for the use of galvanized steelwork for underground shafts. Work at Kinross mine, dating back to the 1970s, still stands out as a milestone in the adoption of galvanized steelwork in deep level mining world-wide. I became more involved with the Corrosion Institute. Those days the Executive Director was Dennis Twigg who had been the Head of the Metallurgy Section at the SABS before. I went overseas for a bit and on my return I worked in the stainless steel industry for some years. I then got to know the galvanizing industry very well as we had constant battles between 3CR12 and galvanizing.

About the IZASA? Anglo and the then Kumba Resources had been members of the International Lead Zinc Research Organisation and the international Zinc Association for a number of years. The feeling was that local market development activities in the zinc industry should be stepped up and Ernst Venter (who headed the Base Metals Division at Kumba) felt that we should establish a local body to leverage the international work locally. From this IZA Southern Africa (IZASA) was born.

Your role at the Zinc Association? I was asked by the IZA if I would be willing to provide general galvanizing industry support globally at about the time that IZASA was formed and this has continued.

What synergies are there between the IZASA and the hot dip galvanizing industry? Galvanizing is still the main market for zinc in SA with the general galvanizing industry consuming over a quarter of all the zinc produced locally. We have provided support through hosting two conferences with the HDGASA and have funded seminars using Prof Stephen Yoemans of Australia, to support the development of galvanized steel reinforcement (rebar) applications locally. I personally keep in touch with the key industry players.

The IZASA has associated itself with AZ coating technology, now available in South Africa, through SAFAL steel. Your comments comparing AZ coating technology to that of the traditional continuously hot dip galvanized roof sheeting, traditionally available? I am on record as having said that it was a pity that South Africa did not have a AZ coater in the country so it's pleasing to see SAFAL (who are IZASA members) finally in production. AZ coatings are superior in most circumstances to normal galvanized coatings and savings can be made in terms of coating weights for each exposure environment. With the recently adopted new standards in building it is essential that specifiers have confidence in specifying correct systems. With this in mind IZASA is project managing a limited corrosion exposure program to test full systems in the more aggressive environments of the country. This program will include fasteners as well to try and protect consumers from using substandard, roofing and cladding products being currently imported.

Please tell us about your hobbies and passions? I enjoy canoeing, and cycling and I do have a piano and try to play when time permits. I have found that the zinc industry is quite a musical fraternity and we would have enough players to found a good band!

When Rob White goes home... I try to park off by either reading or listening to music.

HOT DIP GALVANIZING MEMBERS

GALVANIZER	LOCATION	TEL. NO	SPIN	NO. OF LINES	BATH SIZES (L x W x D) (m)
GAUTENG					
ArcelorMittal South Africa	Vanderbijlpark	016 889-9111		3	Sheet galvanizer
Armco Galvanizers	Isando	011 974-8511		1	13.2m x 1.5m x 2.2m
Armco Galvanizers – Dunswart	Dunswart	011 914-3512	●	3	5.2m x 1.2m x 2.0m 3.0m x 1.0m x 1.5m 2.0m x 1.0m x 1.5m
Armco Galvanizers – Randfontein	Randfontein	011 693-5825		1	6.5m x 1.3m x 2.0m
Babcock Ntuthuko Powerlines (Pty) Ltd	Nigel	011 739-8200		1	12.0m x 1.4m x 1.8m
Cape Gate (Pty) Ltd	Vanderbijlpark	016 980-2270		#	Wire galvanizer
DB Thermal SA (Pty) Ltd	Nigel	011 814-6460		In-line	16.0m x 1.0m x 1.0m
Galvadip (Pty) Ltd	Waltloo	012 803-5168		2	7.2m x 1.7m x 2.2m 7.0m x 1.5m x 2.5m
Galvaglow	Factoria	011 955-5200		1	4.0m x 1.5m x 2.5m
Galvspin Galvanizers cc	Boksburg North	011 918-6177	●	2	2.0m x 1.2m x 1.5m 1.5m x 1.0m x 1.5m
GEA Air Cooled Systems	Germiston	011 861-1571		In-line	11.5m x 1.0m x 1.0m
Lianru Galvanisers cc	Nigel	011 814-8658		2	7.2m x 1.3m x 1.6m 4.5m x 1.3m x 1.6m
Macsteel Tube & Pipe	Boksburg	011 897-2194		In-line	13.5m x 1.6m x 2.4m
Pro-Tech Galvanizers (Pty) Ltd	Nigel	011 814-4292	●	2	3.2m x 1.1m x 1.5m 3.0m x 1.1m x 1.2m
Robor Galvanizers (Pty) Ltd	Germiston	011 876-2900		3 Tube	14.0m x 1.35m x 2.5m 10.0m x 2.0m x 4.0m Dia 42mm to 114mm max tube length 6.7m
Robor Tube	Elandsfontein	011 971-1600		1	Tube & pipe galvanizer
Supergalv	Alrode	011 908-3411		1	6.0m x 1.2m x 1.8m
Transvaal Galvanisers In-line & general	Nigel	011 814-1113		3	9.0m x 1.0m x 1.0m 8.0m x 1.2m x 1.5m 6.0m x 1.3m x 1.3m
NORTH WEST					
Andrag Agrico	Lichtenburg	018 632-7260		#	In-line galvanizer
FREE STATE					
Harrismith Galvanizing & Steel Profile (NB: Big line is not in operation)	Harrismith	058 623-2765		2	4.5m x 1.3m x 2.5m (12.0m x 1.2m x 2.5m)
WESTERN CAPE					
Advanced Galvanising (Pty) Ltd	Bellville	021 951-6242		1	8.0m x 1.5m x 3.0m
Cape Galvanising (Pty) Ltd	Parowvalley	021 931-7224		1	14.0m x 1.6m x 2.6m
Galvatech (Pty) Ltd	Bellville	021 951-1211		1	7.5m x 1.5m x 2.6m
Helderberg Galvanizing	Strand	021 845-4500		1	5.5m x 0.8m x 2.4m
Pro-Galv cc	Stikland	021 945-1803		1	7.2m x 1.3m x 2.6m
South Cape Galvanizing (Pty) Ltd (NB: Big line is not in operation)	George Industria	044 884-0882		2	3.7m x 0.94m x 2.3m (5.5m x 1.0m x 2.6m)
EASTERN CAPE					
Galvanising Techniques cc	Port Elizabeth	041 486-1432		1	12.0m x 1.3m x 2.3m
Galvaspin (Pty) Ltd	Port Elizabeth	041 451-1947	●	1	3.0m x 1.2m x 1.8m
Morhot (Pty) Ltd	East London	043 763-1143		1	6.0m x 1.2m x 2.5m
KWAZULU/NATAL					
A&A Galvanisers	Pietermaritzburg	033 387-5783	●	1	3.3m x 0.9m x 1.9m
Bay Galvanisers	Richards Bay	035 751-1942		1	5.0m x 1.2m x 2.5m
Phoenix Galvanizing (Pty) Ltd	Phoenix	031 500-1607	●	2	14.0m x 1.4m x 2.5m 3.0m x 1.2m x 1.2m
Pinetown Galvanizing	Pinetown	031 700-5599		1	9.0m x 1.2m x 3.0m
Voigt & Willecke (Pty) Ltd	Durban	031 902-2248		1	14.0m x 1.3m x 2.5m

 # Sheet, wire, pipe and other in-line galvanizing members dedicate their plants to the galvanizing of their own products.

Note:

- *Where more than one galvanizing line is available, the number of lines and the significant bath dimensions are listed, ie. widest, longest and deepest.*
- *For specific contact names (e.g. sales or production personnel) and mobile telephone numbers, contact company receptionist.*
- *The bath sizes are inside dimensions and not maximum component size (length, width and depth). Kindly take note of the expansion of the component when dipped into molten zinc, or discuss with relevant galvanizer.*

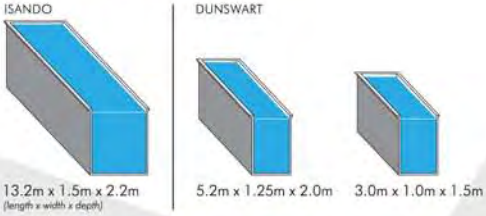
CONSISTENTLY DELIVERING **SUPERIOR QUALITY** GALVANIZED PRODUCTS TO ALL OUR CUSTOMERS

Our **Isando** plant can accommodate heavy steel structures due to our 13,2 meter kettle and improved cranage and loading facilities.
Our **Dunswart** plant specialises in difficult-to-handle items as well as centrifugal work.
Both plants offer an in-house transport facility, a high level of expertise and quick turn around time.

The company has it's own SANS 121 2000 ISO 1461 accredited Hot Dip Galvanizing plants. And is listed under the SABS ISO 9001 scheme.

"ARMCO IS OUR NAME, GALVANIZING IS OUR GAME"

GALVANIZING BATH SIZES



Isando +27 11 974 8511 | Dunswart +27 11 914 3512 | www.armco.co.za

A division of O-LINE HOLDINGS LIMITED

ARMCO SUPERLITE