2010 Volume 7 Issue 1

HOT DIP GALVANIZING TODAY

HOT DIP GALVANIZERS ASSOCIATION Southern Africa

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Featuring:

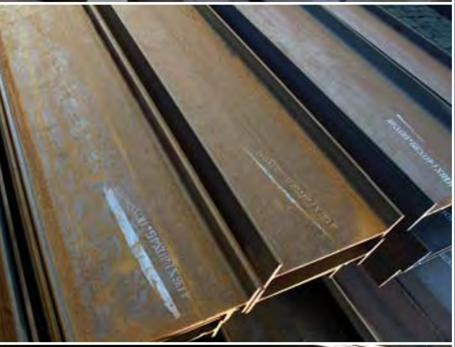
Pictorial review of the galvanizing in four of the Soccer World Cup Stadia

Annual Fastener Availability Matrix

Case History – Newlands Rugby Stadium

Galvanized rebar for concrete & introduction to Professor Stephen Yeomans

Wamosha & Bob's Banter



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Front Cover: *A kaleidoscope of photographs showing some galvanized components in the four larger stadia, with their very different seating colouring arrangements and some bolt and nut photos.*

Hot Dip Galvanizing – Adding value to Steel

Executive Director's Comment

The year 2009 has been assigned to history and we are already 1/6th of the way through 2010. The year ahead is full of promise with a focus on a number of new projects and programmes as well as the continuation of others.

Education and training of people that are directly or indirectly involved in hot dip galvanizing of carbon steel for corrosion control will continue with the introduction of a revamped and upgraded inspector's course. We plan to introduce a new, more practical, entry level course for candidates that find the main course too technically difficult. In addition, a computer based interactive course is to be launched in order to cater for plant operators who have or could be given access to a computer. This course will allow candidates to progress at their own pace and at the same time not interfere with their daily work attendance.

During the month of February we were fortunate to be visited by Prof. Stephen Yeomans from New South Wales - Australia. Together with Association staff, the professor visited Gauteng, Durban and Cape Town and engaged with numerous specifiers and university students via a series of seminars and presentations on hot dip galvanized rebar for concrete. The country-wide market for hot dip galvanized reinforcing steel is growing and the visit by the professor was most welcome.

Corrosion investigations and reports continue to be an area that will receive our attention. Each case study is a learning experience that is used to support future hot dip galvanized steel applications. An area of particular interest for us at the Association is the corrosive conditions found in many of our mines. Corrosion of carbon steel within the mining industry is particularly severe, where hot dip galvanizing and duplex systems do provide economical solutions.

Readers of our magazine are encouraged to use the corrosion investigative services of the Association as we are committed to providing critical, unbiased and objective reports whenever galvanized and duplex coated steels are used.

Bob Wilmot

Note from the Editor

It was extremely gratifying to me that where hot dip galvanizing had been used in the four stadiums that we have pictorially reported on, in many instances the bolted connections used are mainly hot dip galvanized bolts, where in the past due mostly to inappropriate, inconcise specifications and non-availability of hot dip galvanized fasteners, more zinc electroplated fasteners were used. Our feature on fasteners again addresses this essential requirement.

Also we wish to compliment the designers and fabricators of the various hot dip galvanized componentry (in the stadiums) that they have to a large degree, understood the requirements of the hot dip galvanizing process, using modular design, with its benefits of appropriate sizing, ease of handling, minimisation of site coating repairs, etc.

With the rigorous paint coating systems and guarantees now in place for some of the stadia, it goes without saying that we will be monitoring the performance of the two respective corrosion control systems, over the next decade or so, particularly as the "all paint coating system" has been applied to roof steelwork, which is relatively inaccessible in most instances for future maintenance.

At the Association we pride ourselves in providing cost effective advice in the use of our coatings and are always happy to be involved in the evaluation and inspection of previously exposed and weathered hot dip galvanized or duplex coated components.

Should a reader require this evaluation and inspection service, kindly contact Bob, Hendrik, myself or a number of our qualified Galvanizer Inspectors throughout the country (list available from the Association).

Our **features** for this issue include, a pictorial review of the hot dip galvanized components installed at four of the major stadiums. Our regular Fastener Availability Matrix, with some new fastener categories - we had hoped to have incorporated a series of shackles and turnbuckles that are either hot dip galvanized or appropriately mechanically plated to achieve reasonable durability in corrosive atmospheres but we will have to work on this for future issues.

In our continuous wire feature we include a short account with respect to corrosion protection on the 2009 version of SANS 675 versus the 1993 version. Also in this feature is an account on "Galfan" wire and its attributes.

"Wamosha" includes a story of inappropriately used continuously hot dip galvanized purlins fixed to generally hot dip galvanized rafters in a corrosive marine atmosphere and the effects after nearly three years.

We report on a recent brief tour by **Prof. Stephen Yeomans** from the University of South Wales, Australia. Stephen, a world renowned authority on hot dip galvanized reinforcement for concrete, who together with Association staff and Rob White of IZASA toured the major centres and presented his ideas.

Case History includes an evaluation and inspection of the hot dip galvanized seating brackets and handrails at Newlands Rugby Stadium after 31 years!

Education and Training, expands on our certificated coating inspectors course, an essential requirement in any coating inspectors portfolio.

Other regular articles include, **Bob's Banter**, where Bob Andrew chats about **"Like bacteria, the business community needs a common immune system"**, **Members News**, where some members report on their involvement in the stadia.

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

Due to lack of space **Duplex Coatings, Coating Report, Guest Writer, "On the Couch"** and **Misconceptions** are not included in this issue but will resume in subsequent issues.

Enjoy the "*magazinc*".

Terry Smith

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Fastener availability matrix and participating fastener suppliers

From experience it has been shown that on many occasions at building sites, alternatives such as zinc electroplated fasteners are mistakingly used. In order to provide a similar service life to that of the hot dip galvanized structure, it is important to specify and use hot dip galvanized fasteners. To this end we provide the following "Fastener Availability Matrix", indicating the feasibility and availability of a range of hot dip galvanized fasteners, etc. Should a particular fastener that you require not be listed, kindly contact one of the participating fastener suppliers at the end of this matrix or the Association.

TYPE OF FASTENER	COMPANY	STEEL GRADE	SPECIFICATION	SPECIFICATION	AVAILABLE SIZES	HOT DIP GALVANIZED TO ORDER	HOT DIP GALVANIZED EX STOCK
LOCKING NUTS							
Half Lock Nuts	Bolt Fast	MS			M8 – M30	Yes	
	Impala Bolt & Nut	MS/HT			M8 – M36	Yes	Yes
	New Aloe Fastening Systems	MS/HT			M8 – M48	Yes	
	Tel-Screw Products	MS/HT			M8 – M48	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS/HT			M8 – M36	Yes	Yes
Hard Lock Nuts	Bolt Fast	Gr: 8			M8 – M30	Yes	
Castle Nuts	Bolt Fast	MS/Gr:8			M8 – M30	Yes	
	New Aloe Fastening Systems	MS/Gr:8			M8 – M100	Yes	
	Tel-Screw Products	MS/Gr: 8			M8 – M100	Yes	
Steel Hex Lock Nuts	Bolt Fast	MS			M8 – M100	Yes	
	New Aloe Fastening Systems	MS/HT			M8 – M100	Yes	
	Tel-Screw Products	MS/HT			M8 – M100	Yes	
	WLS Fastener Manufacturing Co. cc	MS				Yes	
Crimped Nuts	Impala Bolt & Nut	MS				Yes	
	Tel-Screw Products	MS			M8 – M48	Yes	
Locking Washers	Bolt Fast	MS			M8 – M52	Yes	
	New Aloe Fastening Systems	MS/HT				Yes	
Nyloc Nuts	Nyloc nuts are currently not available in hot dip galvanized form, some other form of bolt locking device is necessary						
Cleeve Lock Nuts	Bolt Fast	Gr: 8			M8 – M30	Yes	
Prevailing Torque Hex Lock Nuts	Tel-Screw Products	Gr: 8 & 10	DIN 980V			Yes	
NORMAL NUTS							
Hex OS Nuts	Bolt Fast	MS/Gr: 8 & 10			M8 – M64	Yes	Yes
	CBC Fasteners	Gr: 8	DIN 934	ISO 4032	M8 – M30	Yes	Yes
	Impala Bolt & Nut	Gr: 8	DIN 934		M8 – M30	Yes	Yes
	New Aloe Fastening Systems	Gr: 8 & 10			M8 – M24	Yes	
	Tel-Screw Products	Gr: 8, 10 & 12	DIN 934		M16 – M36	Yes	
	WLS Fastener Manufacturing Co. cc	MS/HT			M8 – M64		Yes
Hex Long OS Nuts	Bolt Fast	MS			M8 – M20	Yes	
	Rawlplug South Africa	MS	SEE WEBSITE: www.rawlplug.co.za		M8 – M16	Yes	
	Tel-Screw Products	MS/HT	TSP		M8 – M48	Yes	
	WLS Fastener Manufacturing Co. cc	MS			M8 – M36		Yes
Shear Nuts or Anti-vandal Nuts	Bolt Fast	MS			M8 – M20	Yes	
	Impala Bolt & Nut	MS					Yes
	New Aloe Fastening Systems	MS			M8 – M24	Yes	
	Rawlplug South Africa	MS	SEE WEBSITE: www.rawlplug.co.za		M8 – M16	Yes	Yes
	Tel-Screw Products	MS/HT			M8 – M48	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS			M8 – M24	Yes	
Flanged Nuts	Bolt Fast	MS			M8 – M10	Yes	
	New Aloe Fastening Systems	MS/HT			M8 – M100	Yes	
	Tel-Screw Products	HT/MS			M8 – M36	Yes	
	WLS Fastener Manufacturing Co. cc	MS			M8 – M16		Yes
WASHERS							
Thru Hardened Washers	Bolt Fast	Gr: 8			M8 – M48	Yes	
	New Aloe Fastening Systems	Gr: 8			M8 – M48	Yes	
	Tel-Screw Products		DIN 6916		M10 – M64	Yes	
	WLS Fastener Manufacturing Co. cc				M8 – M36		Yes
Flat Washers	Bolt Fast	MS			M8 – M64		Yes
	Impala Bolt & Nut		DIN 120/125		M8 – M30		Yes
	New Aloe Fastening Systems	MS			M8 – M64		
	Tel-Screw Products	MS	DIN 120/125		M8 – M76		Yes
	WLS Fastener Manufacturing Co. cc	MS			M8 – M76		Yes

TYPE OF FASTENER	COMPANY	STEEL GRADE	SPECIFICATION	SPECIFICATION	AVAILABLE SIZES	HOT DIP GALVANIZED TO ORDER	HOT DIP GALVANIZED EX STOCK
WASHERS continued							
Square Flat Washers	Bolt Fast	MS			M12	Yes	
	New Aloe Fastening Systems	MS			M8 – M30	Yes	Yes
	Tel-Screw Products	Specially manufactured to order			M8 – M76	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS			M8 – M30		Yes
Square Curved Washers	Tel-Screw Products	Specially manufactured to order			M6 – M76	Yes	Yes
Spring Washers	Bolt Fast				M8 – M52		Yes
	Impala Bolt & Nut		DIN 127		M8 – M30		Yes
	New Aloe Fastening Systems				M8 – M52	Yes	
	Tel-Screw Products		DIN 127		M8 – M64		Yes
	WLS Fastener Manufacturing Co. cc				M8 – M36		Yes
BOLTS AND SCREWS							
Hex Head Screws	Bolt Fast	MS/Gr: 8 & 10			M8 – M42		Yes
	CBC Fasteners	MS	DIN 558	ISO 4018	M18 – M30	Yes	Yes
	CBC Fasteners	Gr: 8.8/10.9	DIN 933	ISO 4017	M8 – M30	Yes	Yes
	Impala Bolt & Nut	MS	DIN 658		M8 – M24		Yes
	Impala Bolt & Nut	MS/Gr: 8.8	DIN 933		M8 – M30	Yes	Yes
	New Aloe Fastening Systems	MS/Gr: 8 & 10			M8 – M30	Yes	
	Rawlplug South Africa	MS	DIN 933 SEE WEBSITE: www.rawlplug.co.za			M8 – M12	Yes
	Tel-Screw Products	MS/Gr: 8.8			M8 – M39	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS/HT			M8 – M36		Yes
Hex Head Bolts and OS Nuts	Bolt Fast	MS			M6 – M8		Yes
	CBC Fasteners	MS	DIN 601	SABS 135	M8 – M30	Yes	Yes
	Impala Bolt & Nut	MS			M8 – M30	Yes	Yes
	Tel-Screw Products	MS/HT	DIN 601	Lay – 520	M8 – M39	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS			M8 – M36		Yes

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TYPE OF FASTENER	COMPANY	STEEL GRADE	SPECIFICATION	SPECIFICATION	AVAILABLE SIZES	HOT DIP GALVANIZED TO ORDER	HOT DIP GALVANIZED EX STOCK
BOLTS AND SCREWS continued							
Hex Head Bolts and OS Nuts (High tensile)	Bolt Fast	MS/Gr: 8 & 10			M8 – M52		Yes
	CBC Fasteners	Gr: 8.8/10.9	DIN 931	ISO 4014	M8 – M30	Yes	Yes
	Impala Bolt & Nut	Gr: 8.8	DIN 931		M8 – M30	Yes	Yes
	WLS Fastener Manufacturing Co. cc	HT			M8 – M36		Yes
Large Dia Bolts & OS Nuts	Bolt Fast	Gr: 8			M30 – M76	Yes	
	New Aloe Fastening Systems	Gr: 8			M30 – M42	Yes	
	Tel-Screw Products	Gr: MS/8.8			M36 – M76	Yes	
	WLS Fastener Manufacturing Co. cc	MS/HT			M39 – M76	Yes	
Cup Head Square Neck Bolts & OS Nuts	Bolt Fast	MS			M8 – M30	Yes	
	CBC Fasteners	MS	SABS 1143		M8 – M20	Yes	Selected
	Impala Bolt & Nut	MS	DIN 603		M8 – M16	Yes	Certain sizes
	New Aloe Fastening Systems	MS			M8 – M16	Yes	
	Rawlplug South Africa	MS	DIN 603	SEE WEBSITE: www.rawlplug.co.za	M8 – M12	Yes	
	Tel-Screw Products	MS	SABS1143/DIN 603		M8 – M30	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS			M8 – M20	Yes	
C/Sunk Square Neck Bolts & OS Nuts	Bolt Fast	MS			M10 – M24	Yes	
	CBC Fasteners	MS	SABS 1143		M10 – M20	Yes	
	Impala Bolt & Nut	MS	DIN 605		M10 – M16	Yes	
	New Aloe Fastening Systems	MS			M10 – M24	Yes	
	Tel-Screw Products	MS/HT	SABS 1143		M8 – M30	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS			M10 – M20	Yes	
C/Sunk Nib Bolts & OS Nuts	Bolt Fast	MS			M10 – M24	Yes	
	CBC Fasteners	MS	SABS 1143		M12 – M24	Yes	
	Impala Bolt & Nut	MS	DIN 604		M10 – M20	Yes	
	Tel-Screw Products	MS	SABS 1143		M8 – M24	Yes	
	WLS Fastener Manufacturing Co. cc	MS			M12 – M24	Yes	
Friction Grip Bolts & Nuts	CBC Fasteners	Gr: 8.8S/10.9		EN 14399	M16 – M30	Yes	
	CBC Fasteners	Gr: 8.8S/10.9S	SABS 1282	ISO 7411	M12 – M30	Yes	
	Impala Bolt & Nut	Gr. 8.8S/10.9S			M12 – M30	Yes	Yes
	S.A. Bolt Manufacturers	Gr: 8.8/10.9S			M12 – M30	Yes	
Hex Socket C/Sunk Head Screws	Bolt Fast	MS			M8 – M39	Yes	
	New Aloe Fastening Systems	Gr: 10.9/12.9			M8 – M30	Yes	
	S.A. Bolt Manufacturers	Gr: 10.9/12.9			M8 – M48	Yes	
	WLS Fastener Manufacturing Co. cc	HT			M8 – M24	Yes	
Lockbolts	Impala Bolt & Nut Pins & Collars $^1/_2$" – $^7/_8$"	8.8 Pins/6.8 Collars			$^1/_2$" - $^7/_8$" (imperial)	Yes	
	New Aloe Fastening Systems	8.8 Pins/6.8 Collars			M8 – M20	Yes	
	S.A. Bolt Manufacturers	8.8 Pins/6.8 Collars			$^1/_2$" - $^7/_8$" (imperial)	Yes	
Pigtails – 1 & $1^1/_2$ Turn	New Aloe Fastening Systems	MS/HT			M8 – M24		
	Tel-Screw Products	MS/HT			M8 – M76	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS			M8 – M24	Yes	
3m – Threaded Rod	Bolt Fast	MS/Gr: 8			M8 – M30		Yes
	CBC Fasteners	MS	DIN 975		Various diameters		Yes
	Impala Bolt & Nut	MS/HT	DIN 975		M8 – M24	Yes	
	New Aloe Fastening Systems	MS/Gr: 8			M8 – M30		Yes
	Tel-Screw Products	MS/HT			M8 – M76	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS			M8 – M36		Yes
1m – Threaded Rod	Bolt Fast	MS/Gr: 8 & 10			M8 – M52		Yes
	CBC Fasteners	MS	DIN 975		Various diameters	Yes	Yes
	Impala Bolt & Nut	MS/HT	DIN 975		M8 – M24	Yes	Selected
	New Aloe Fastening Systems	MS/Gr: 8			M8 – M52		Yes
	Rawlplug South Africa	HT	SEE WEBSITE: www.rawlplug.co.za		M8 –M30	Yes	
	Tel-Screw Products	MS/HT			M8 – M36	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS			M8 – M36		Yes
HD Bolts (Foundation Bolts) & OS Nuts	Bolt Fast	MS/EN8			M8 – M72		Yes
	Impala Bolt & Nut	M/S 350WA			M8 – M72	Yes	
	New Aloe Fastening Systems	MS/EN8			M12 – M36		Yes
	Rawlplug South Africa	MS/HT	SEE WEBSITE: www.rawlplug.co.za		M8 – M36	Yes	
	Tel-Screw Products	MS/HT			M8 – M72	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS			M8 – M72	Yes	

TYPE OF FASTENER	COMPANY	STEEL GRADE	SPECIFICATION	SPECIFICATION	AVAILABLE SIZES	HOT DIP GALVANIZED TO ORDER	HOT DIP GALVANIZED EX STOCK
CONCRETE ANCHOR BOLTS							
Rawlbolts	Rawlplug South Africa	5.8	SEE WEBSITE: www.rawlplug.co.za	International	M8 – M24	Yes	
SPT Throughbolts	Rawlplug South Africa			EU	M8 – M20	Yes	Yes
R-Cas Chemical Spin-in Anchors	Rawlplug South Africa	5.8/HT		BBA	M8 – M30	Yes	Yes
R-Hac Chemical Hammer-in Anchors	Rawlplug South Africa	5.8/HT		BBA	M8 – M30	Yes	Yes
R-Kem Chemical Cartridge System	Rawlplug South Africa	5.8/HT		BBA	M8 – M30	Yes	Yes
R-Ker Chemical Cartridge System	Rawlplug South Africa	5.8/HT		EU	M8 – M30	Yes	Yes
R-KeX Chemical Slow Cure Cartridge System	Rawlplug South Africa	5.8/HT		BBA	M8 – M30	Yes	Yes
Express Anchors	Rawlplug South Africa	5.8/HT		EU	M8 – M20	Yes	Yes
Rawl Kemfix Chemical Anchor Studs – for use with all chemical anchoring (capsule and/or cartridge systems)	Rawlplug South Africa	5.8/HT		BBA	M8 – M30	Yes	Yes
Chemical Anchors with Studs	Bolt Fast	MS/EN8			Various	Yes	
	New Aloe Fastening Systems	MS/EN8			Various	Yes	
	Rawlplug South Africa	5.8/HT	SEE WEBSITE: www.rawlplug.co.za	BBA	M8 – M30	Yes	Yes
	Tel-Screw Products	MS/HT			M8 – M36	Yes	Yes
	WLS Fastener Manufacturing Co. cc	EN8			M8 – M30	Yes	Yes

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TYPE OF FASTENER	COMPANY	STEEL GRADE	SPECIFICATION	SPECIFICATION	AVAILABLE SIZES	HOT DIP GALVANIZED TO ORDER	HOT DIP GALVANIZED EX STOCK
CONCRETE ANCHOR BOLTS continued							
Concrete Expansion Bolts	Bolt Fast	MS			M8 – M24	Yes	
	Bolt Fast - single collar wedge type anchor				M8 – M30	Yes	
	Bolt Fast - nail plug hammer in anchors				M8		Yes
	Bolt Fast - mortar cartridge system				300, 345 & 380mm		Yes
	Bolt Fast - double collar anchors				M8 – M30		Yes
	New Aloe Fastening Systems	5.8/EN8			M10 – M30	Yes	
MISCELLANEOUS							
Type 17 Self Tapping Screws	New Aloe Fastening Systems	1022	* – also applicable		#8 – #14	Yes	
	New Aloe Fastening Systems	1022			#10 & #14	Yes	
Gutter or Veranda Bolts	New Aloe Fastening Systems	1006			M8 x 12 to 75mm	Yes	
Self Drilling Screws	Bolt Fast	MS	SDS can be successfully hot dip galvanized but due to a slight thread softening a smaller diameter pilot hole must first be drilled. *			Yes	
	Rawlplug South Africa	MS				Yes	
	WLS Fastener Manufacturing Co. cc	MS				Yes	
Cast-In Lifting Sockets	Rawlplug South Africa	5.8HT	SEE WEBSITE: www.rawlplug.co.za	BBA	M10 – M24	Yes	
Insulation Fixings	Rawlplug South Africa			BBA	Various	Yes	
SPECIAL FASTENERS							
Countersunk Machine Screws	Bolt Fast	MS			M8 – M24	Yes	
	Tel-Screw Products	MS/HT	DIN 963 & 965		M8 – M36	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS/HT			M8 – M36	Yes	
Round U-Bolts	Bolt Fast	MS			M8 – M72	Yes	
	New Aloe Fastening Systems	MS			M8 – M30	Yes	
	Tel-Screw Products	MS/HT			M8 – M76	Yes	Yes
	Tel-Screw Products	HT			M8 – M76	Yes	
Square U-Bolts	Bolt Fast	MS			M8 – M76	Yes	
	New Aloe Fastening Systems	MS/HT			Various	Yes	
	Tel-Screw Products	MS/HT			M8 – M76	Yes	
	WLS Fastener Manufacturing Co. cc	MS/HT			M8 – M36	Yes	
TV U- Bolts	Bolt Fast	MS			M8 – M76	Yes	
	Tel-Screw Products	MS/HT			M8 – M76	Yes	Yes
Hook Bolts	Bolt Fast	MS			M8 – M76	Yes	
	New Aloe Fastening Systems	MS			M8 – M10	Yes	
	Rawlplug South Africa	MS	SEE WEBSITE: www.rawlplug.co.za		M8 – M12	Yes	
	Tel-Screw Products	MS/HT			M8 – M76	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS/HT			M8 – M76	Yes	
Channel Bolts	Bolt Fast	MS			M8 – M76	Yes	
	New Aloe Fastening Systems	MS			M8 – M12	Yes	
	Tel-Screw Products	MS/HT			M8 – M76	Yes	
	WLS Fastener Manufacturing Co. cc	MS/HT			M8 – M76	Yes	
J-Bolts	Bolt Fast	MS			M8 – M76	Yes	
	New Aloe Fastening Systems	MS			M8 – M12	Yes	
	Rawlplug South Africa	MS	SEE WEBSITE: www.rawlplug.co.za		M8 – M12	Yes	
	Tel-Screw Products	MS/HT			M8 – M76	Yes	
	WLS Fastener Manufacturing Co. cc	MS/HT			M8 – M76	Yes	
Eye-Bolts	New Aloe Fastening Systems	MS			M8 – M36	Yes	
	Rawlplug South Africa	MS	SEE WEBSITE: www.rawlplug.co.za		M8 – M16	Yes	
	Tel-Screw Products	MS/HT			M8 – M76	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS			M8 – M76	Yes	
Straining Eye-Bolts	New Aloe Fastening Systems	MS/HT			M8 – M30	Yes	
	Tel-Screw Products	MS/HT			M8 – M76	Yes	Yes
	WLS Fastener Manufacturing Co. cc	MS			M8 – M24	Yes	
Linked Eye Bolts	Bolt Fast	MS/HT			M8 – M76	Yes	
Linked Eye Nuts	Bolt Fast	MS/HT			M8 – M76	Yes	
	Rawlplug South Africa		SEE WEBSITE: www.rawlplug.co.za		M8 – M16	Yes	

TYPE OF FASTENER	COMPANY	STEEL GRADE	SPECIFICATION	SPECIFICATION	AVAILABLE SIZES	HOT DIP GALVANIZED TO ORDER	HOT DIP GALVANIZED EX STOCK
SPECIAL FASTENERS continued							
Linked Eye Rods	Bolt Fast	MS/HT			M8 – M76	Yes	
	Tel-Screw Products	MS/HT			M8 – M76	Yes	
Forged Eyebolts	Rawlplug South Africa		SEE WEBSITE: www.rawlplug.co.za		M8 – M16	Yes	
	Tel-Screw Products	MS/HT			M8 – M30	Yes	
Welded Eyebolts	Rawlplug South Africa	MS	SEE WEBSITE: www.rawlplug.co.za		M8 – M16	Yes	
Scaffold Rings	Bolt Fast	MS			M8 – M16	Yes	
	Rawlplug South Africa	MS	SEE WEBSITE: www.rawlplug.co.za		M8 – M16	Yes	
Threaded Studs	Bolt Fast	MS/EN8			M8 – M76	Yes	
	New Aloe Fastening Systems	MS/EN8			M8 – M30	Yes	
	Rawlplug South Africa	MS/HT	SEE WEBSITE: www.rawlplug.co.za		M8 – M30	Yes	
	Tel-Screw Products	MS/HT			M8 – M76	Yes	
	WLS Fastener Manufacturing Co. cc	MS/HT			M8 – M76	Yes	Yes
Tie Rods	Bolt Fast	MS/EN8			M8 – M76	Yes	
	New Aloe Fastening Systems	MS/EN8			M8 – M36	Yes	
	Tel-Screw Products	MS/HT			M8 – M76	Yes	
	WLS Fastener Manufacturing Co. cc	MS/HT			M8 – M76	Yes	
Other specials	Bolt Fast	Any special manufacturing				Yes	
	Impala Bolt & Nut	All specials relating to fasteners			M8 – M72	Yes	
	Rawlplug South Africa	Special application chemical and/or mechanical anchor bolts as required				Yes	
	Tel-Screw Products	Specials manufactured to order			M8 – M76	Yes	
	WLS Fastener Manufacturing Co. cc	MS/HT			M8 – M76	Yes	
Domed Head or Cap Nuts	New Aloe Fastening Systems	MS/HT			M8 – M16	Yes	
	Tel-Screw Products	MS/HT	DIN 1587		M8 – M76	Yes	
	WLS Fastener Manufacturing Co. cc	MS/HT			M8 – M36	Yes	

continued on page 10...

TYPE OF FASTENER	COMPANY	STEEL GRADE	SPECIFICATION	SPECIFICATION	AVAILABLE SIZES	HOT DIP GALVANIZED TO ORDER	HOT DIP GALVANIZED EX STOCK
SPECIAL FASTENERS continued							
Hex Coach Screws	Bolt Fast	MS	HCS can be successfully hot dip galvanized but due to a slight thread softening a smaller diameter pilot hole must first be drilled.		M6 – M20	Yes	
	New Aloe Fastening Systems	MS			M6 – M12	Yes	
	Rawlplug South Africa	MS – DIN 7976			M5 – M12	Yes	
	Tel-Screw Products	MS – DIN 7976			M6 – M12	Yes	Yes

OS – Over Sized / MS – Mild Steel / HT – High Tensile

THE ABOVE FASTENER AVAILABILITY MATRIX IS NOT NECESSARILY COMPREHENSIVE AND TOTALLY REPRESENTATIVE OF THE FASTENER SUPPLY INDUSTRY BUT INCLUDES PARTICIPATING MANUFACTURERS AND STOCKISTS.

THE ASSOCIATION ASSUMES THAT ALL PARTICIPATING COMPANIES IN THE MATRIX, DO IN FACT STOCK OR ORDER HOT DIP GALVANIZED FASTENERS WHEN REQUESTED TO DO SO. THE ASSOCIATION THEREFORE, EXCLUDES ITSELF FROM THE RESPONSIBILITY OF ENSURING THAT ALL FASTENERS OFFERED WILL IN FACT BE HOT DIP GALVANIZED, BY THESE COMPANIES.

SHOULD ANYONE USING THIS MATRIX FIND INACCURACIES OR ERRORS OR HAVE ADDITIONAL SUGGESTIONS, KINDLY CONTACT THE EDITOR.

PARTICIPATING FASTENER SUPPLIERS CONTACT DETAILS			
COMPANY	**TELEPHONE**	**EMAIL**	**WEBSITE**
Bolt Fast	021 505 1000	ShaunD@boltfast.co.za	www.boltfast.co.za
CBC Fasteners	011 767 0000	tech@cbc.co.za	www.cbc.co.za
Impala Bolt & Nut	011 824 3925	adiamond@impalasa.co.za	www.impalabolt.co.za
New Aloe Fastening Systems	011 835 2171	newaloef@iburst.co.za	–
Rawlplug	011 894 7147	rmuller@infodoor.co.za	www.rawlplug.co.za
SA Bolt Manufacturers	011 814 2240	info@sabolt.co.za	www.sabolt.co.za
Tel-Screw Products (Pty) Ltd	011 898 3200	info@telscrew.co.za	www.telscrew.co.za
WLS Fasteners	011 882 1150	wlsandrew@telkomsa.net	www.kalm.de

SANS 1273 – setting a new standard for roofing fasteners

After many years under revision, amendments to the SANS 1273 standard "*Fasteners for roof and wall coverings in the form of sheeting*" have been finalised and the standard was published late in 2009.

The main changes to the revised standard relate to the corrosion resistance requirements of roofing fasteners and the introduction of self drilling screws and bonded roofing washers which were not incorporated in the old standard.

The amended standard specifies the corrosion resistance and mechanical properties of the following fastener types:

- Hook bolts; Channel bolts; "U" bolts and "J" bolts
- Slotted mushroom head roofing bolts (also known as gutter bolts or veranda bolts)
- Slotted mushroom head roofing screws with rolled thread
- Mushroom head drive screws with rolled thread
- Cross recessed pan head self tapping roofing screw
- Indented hexagon head self tapping roofing screw
- Self drilling screws for steel or timber

Corrosion resistance and protective coatings

Irrespective of what fastener type is used, the appropriate protective coating on the fastener must be determined by identifying the corrosive characteristics of the environment in which the fasteners will be used, according to the ISO 9223 classification (*see table below*).

Corrosion resistance class	Atmosphere of intended use
1	General use in internal application
2	General use in other than external applications but where significant levels of condensation occur.
3	External use in mild, moderate industrial or marine environments
4	External use in severe marine and industrial environments

At all times the corrosion resistance of the roofing fastener must equal or exceed the corrosion resistance of the roof sheeting. This will ensure that the roofing fasteners will not become "the weakest link" in the roofing system (as they have so often been in the past).

Once the correct corrosion resistance class has been identified the Standard specifies the following plating / coating requirements:

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All Class 2 fasteners:

Coating Type	Minimum local metallic coating thickness	Passivation
Electroplated zinc	12µm	Type C
Mechanically plated zinc	17µm	Type C
Mechanically plated zinc/tin	12µm	Type C

All Class 3 fasteners:

Coating Type	Minimum local metallic coating thickness	Passivation
Electroplated zinc	30µm	Type A
Hot dip galvanized	30µm	Type A
Mechanically plated zinc	40µm	Type A
Mechanically plated zinc/tin	25µm	Type A

All Class 4 fasteners:

Coating Type	Minimum local metallic coating thickness	Passivation
Hot dip galvanized	50µm	Type A
Mechanically plated zinc/tin	45µm	Type A

In addition to the plating / coating types and thicknesses listed above, fasteners can be protected with a sheradized zinc coating EXCEPT for self tapping roofing screws and self drilling roofing screws. These cannot be sheradized as the cooling process which forms part of the sheradizing process has a detrimental effect on the drilling and tapping performance of the screws.

Where the fastener can be hot dip galvanized, this can be applied according to SANS 121 (ISO 1461).

The big advantage of the classification of the environment and associated plating / coating specifications is that the expected life span of the fasteners can be calculated.

Example:

An electroplated self drilling screw (Class 2) with 12µm zinc is used in a rural environment with low corrosivity (zinc loss maximum 0.7µm per year as per ISO9223). The expected life span of the fastener is 12µm ÷ 0.7µm = 17.14 years.

If the same fastener is used in a Class 3 moderate industrial environment (zinc loss maximum 2.1µm zinc per year as per ISO9223) the expected life span of the fastener will only be 12µm ÷ 2.1µm = 5.7 years. This would clearly be an unacceptable situation and a Class 3 fastener which would offer between 14 to 19 years corrosion protection should be used.

Examples of Class 2 electroplated screws.

: Examples of Class 3 mechanically plated screws.

Examples of Class 4 mechanically plated screws.

The short comings of the old SABS 1273 standard made it virtually impossible for architects and specifiers to specify roofing fasteners according to a South African standard. Self drilling screws are by far the most commonly fasteners used to fix roof sheeting and cladding on commercial, industrial and other large projects.

As these screws were not specified in the old SABS 1273 standard, the quality and especially the corrosion protection of the self drilling screws used in South Africa was of a very poor quality. It is hoped that the revised standard will go a long way in ensuring that the correct type of fasteners and the correct corrosion protection will be specified and that the standard will be embraced by the roofing industry.

The introduction of Galfan coated wire at Cape Gate, Vanderbijlpark

Cape Gate added Galfan coated wire to its product range in 2007. They have the capacity to produce twenty wires at a time, and the diameters range between 1.80mm and 4.00mm, with coating weights of anything from 145gm^2 to 275gm^2 depending on the customer's requirements. Some of the products that Galfan coated wire can be used to manufacture are Gabions, Welded Mesh and Chain Link. It can also be used for any application where better corrosion properties than ordinary galvanized wire is required.

The origin of Galfan

The name Galfan originated in July 1981 at a business meeting held at the Ziegler S.A. factory in Mouzon, France. At the time J.L.Pagniez was the head of the "French Coated Steel Information Centre," and he used the two French words "Galvanisation Fantastique," to describe the product. These two words were later abbreviated to the first three letters of each word, which when combined form the name Galfan.

Galfan is a registered trade mark and a licensed product. It is produced according to stringent regulations and annual royalties are payable to the Galfan Technology Centre at the University of Pittsburgh in the United States. If the criteria laid down by this institution are not met then the product is not licensed and cannot be sold under the Galfan trademark.

Composition and qualities of Galfan

The molten Galfan mixture consists of about 95% Zinc and 5% Aluminium. About 0.05% of rare earth mischmetals consisting of a combination of Lanthanum and Cerium are added to the molten alloy, to improve the fluidity and wetting properties. Galfan coated wire has superior corrosion resistance to galvanized wire because of the passive corrosion preventative properties of aluminium, combined with the active and passive properties of

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zinc, though its cosmetic appearance tends to dull and grey quicker than zinc coated wire. Galfan coated wire is more ductile than normal galvanized wire and therefore can be redrawn easier and placed under more strenuous twisting and bending.

Looking back at the zinc bath from the Galfan bath..

The production process

The conventional method of manufacturing ordinary galvanized wire is done by pulling wires through a continuous line using motorised take-ups. The wire is pulled from the payoffs, through an in line annealing process, then an in line acid cleaning and fluxing tank, and finally an in line zinc bath containing molten zinc. A wiping system is mounted at the exit of the zinc bath to control the coating thickness on the wires.

View of Galfan bath and zinc bath from the side.

A similar method is used to manufacture Galfan, though double dipping is employed, because normal galvanizing fluxes, such as zinc ammonium chloride, are not compatible to molten Galfan. To overcome this problem, the first dip is done as in an ordinary wire galvanizing process, with a normal galvanizing flux. The wires are pad wiped to form a lightly galvanized coating, thus forming a zinc-iron alloy layer, with a very thin layer of free zinc on the surface.

In the second dip, the lightly galvanized wires are pulled through the Galfan tank. The free zinc melts away from the surface of the wires and the alloy layer changes to an aluminium-zinc-iron layer thus bonding the Galfan to the surface of the wires. The excess Galfan is removed from the wires by nitrogen jet wiping, in accordance with the customer's requirements.

Galfan take-ups.

The concentration of zinc, aluminium and mischmetals in the Galfan tank must be carefully monitored by regular analysis, to determine if the product meets the license specifications laid down by the Galfan Technology Centre.

By I.R.Zoellner

SANS 675:2009 Zinc coated fencing wire, has been revised

We have outlined the differences, particularly those that are related to coating thickness and hence coating life, between the 1999 and 2009 editions. Also included from the 2009 version is *Annex A "Notes to purchasers".*

Scope

This standard specifies the characteristics of drawn steel wire, zinc-coated by the hot dip process, to be used for line fencing or barbed fencing wire for general purposes. (The scope for the two editions remains the same).

Tensile strength

SANS 675:1993 (Old)		SANS 675:2009 (New)	
1	2	1	2
Grade of steel Mpa	Tensile strength Mpa	Grade of steel	Tensile strength Mpa
Mild steel (MS)	350 – 575	Mild steel (MS)	350 – 575
High tensile (HT)	1 050 min	High tensile (HT)	950 min
Very high tensile (VHT)	1 400 min	Very high tensile (VHT)	1 250 min

SANS 675:2009 *Annex A*

A.1 The following requirements shall be specified in tender invitations and in each order or contract:

a) The grade of the line wire(s) (*see* 4.1) and, in the case of barbed wire, of the wire used for barbs;

b) Whether information about the steel manufacturing process is required;

c) The nominal diameter(s) of the zinc coated wire (*see* 4.6)

d) The type of wire (line or barbed wire) and in the case of barbed wire, the pattern (*see* 4.9);

e) The length of the barbs if other than as specified (*see* 4.9.3.4);

f) The spacing between the barb units if other than as specified (*see* 4.9.3.5);

g) The mass of the wire on a reel or in a coil (*see* 5.2.1 *and* 5.2.2);

h) Mass of coating (*see table* 3).

A.2 The following requirement shall be agreed upon between the manufacturer and the purchaser: whether the steel manufacturing process is to be left to the discretion of the manufacturer (*see* 4.2).

Editor's Comment: Figures in parenthesis refer to specification.

Mass of coating per unit area.

SANS 675:1993 (Old)		
1	2	3
Nominal diameter of zinc coated wire (mm)	Minimum mass per unit area of zinc coating (g/m²)	Approximate equivalent average coating thickness (μm)
1.20 – 1.50	215	30
1.51 – 1.80	230	32
1.81 – 2.20	245	34
2.21 – 2.50	260	36
2.51 – 3.50	275	38
3.51 – 5.00	290	40

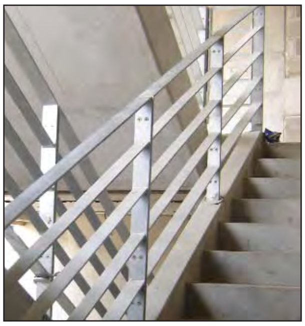
Table 3: SANS 675:2009 (New)				
1	2		3	
Diameter d mm	Mass of coating (see annex A) g/m² Class #		Approximate equivalent average coating thickness μm	
	A	D	A	D
0.15 ≤ d < 0.20	-	10	-	1.42
0.20 ≤ d < 0.25	30	15	4.28	2.14
0.25 ≤ d < 0.32	45	15	6.42	2.14
0.32 ≤ d < 0.40	60	15	8.57	2.14
0.40 ≤ d < 0.50	85	15	12.14	2.14
0.50 ≤ d < 0.60	100	20	14.29	2.86
0.60 ≤ d < 0.70	115	20	16.42	2.86
0.70 ≤ d < 0.80	130	20	18.57	2.86
0.80 ≤ d < 0.90	145	20	20.71	2.86
0.90 ≤ d < 1.00	155	25	22.14	3.57
1.00 ≤ d < 1.20	165	25	23.57	3.57
1.20 ≤ d < 1.40	180	25	25.71	3.57
1.40 ≤ d < 1.65	195	30	27.86	4.29
1.65 ≤ d < 1.85	205	30	29.29	4.29
1.85 ≤ d < 2.15	215	40	30.71	5.71
2.15 ≤ d < 2.50	230	45	32.86	6.43
2.50 ≤ d < 2.80	245	45	32.86	6.43
2.80 ≤ d < 3.20	255	50	36.43	7.14
3.20 ≤ d < 3.80	265	60	37.86	8.57
3.80 ≤ d < 4.40	275	60	39.29	8.57
4.40 ≤ d < 5.20	280	70	40.00	10.00
5.20 ≤ d < 8.20	290	80	41.43	11.43
8.20 ≤ d <10.00	300	80	42.86	11.43

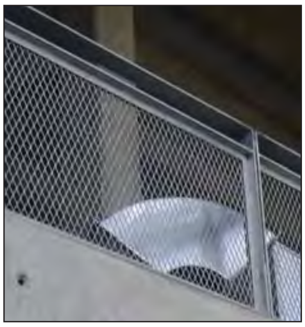
- The coating class with a designation starting with A relates to thick coatings (generally final coating). Class D is the standard class for low mass coating which is usually produced but not exclusively, by hot zinc dipping and then wiping.

Reviewing the corrosion protection provided by hot dip galvanizing of the stadia for the 2010 Soccer World Cup

During the construction of the four main stadia, Cape Town, Port Elizabeth, Moses Mabhida and Soccer City - Johannesburg, we visited the stadiums for a number of reasons. While there were some issues relating to coating quality (many of which were as a result of pre-conceived misconceptions), it was enlightening to see how the designers and fabricators have used the modular concept in many of the handrail sections, to good effect. Components have been fabricated, taking into account the size of the local galvanizing baths, minimising potential repair on site, ease of installation by handling and fixing, etc. Many of the connection and holding down fasteners were also hot dip galvanized. We did however, observe in a number of instances, the undesirable use of zinc spray paint for small reparation work and a number of zinc electroplated fasteners.

MOSES MABHIDA STADIUM









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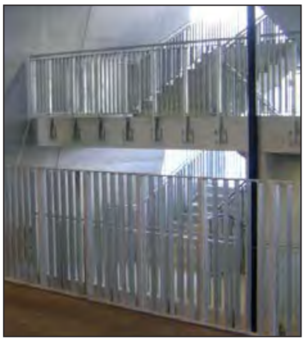
CAPE TOWN STADIUM

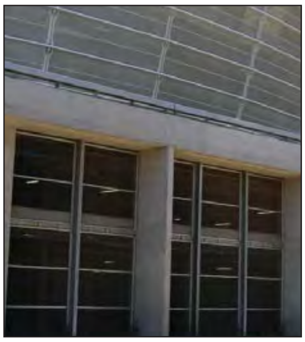




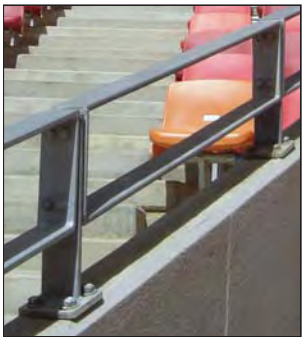


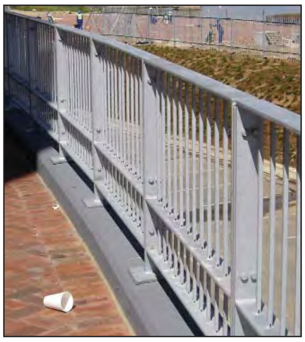



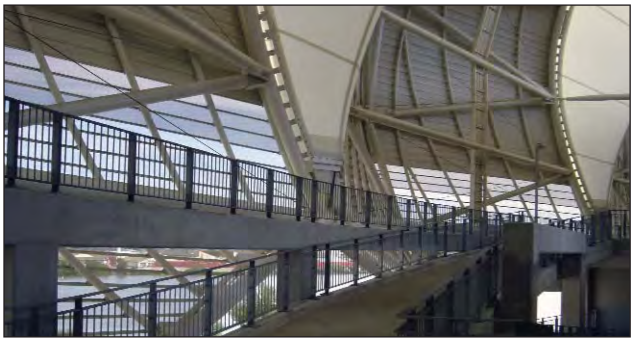


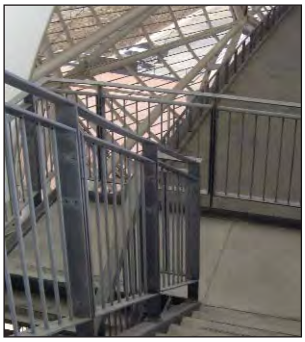



PORT ELIZABETH STADIUM









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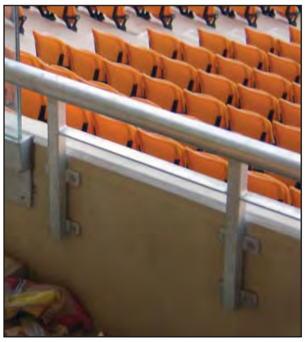
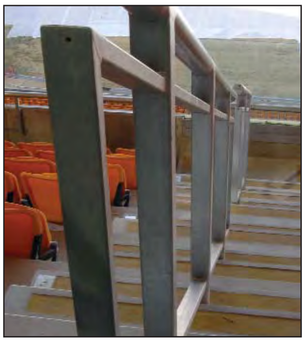
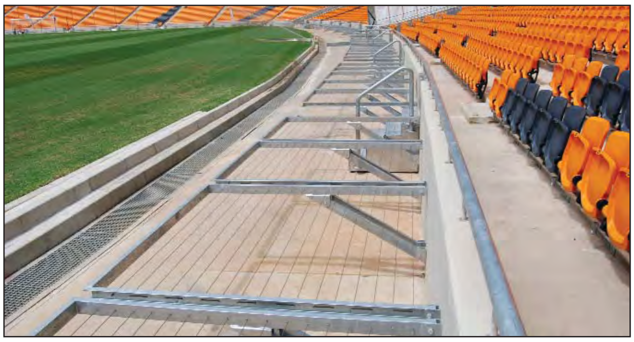
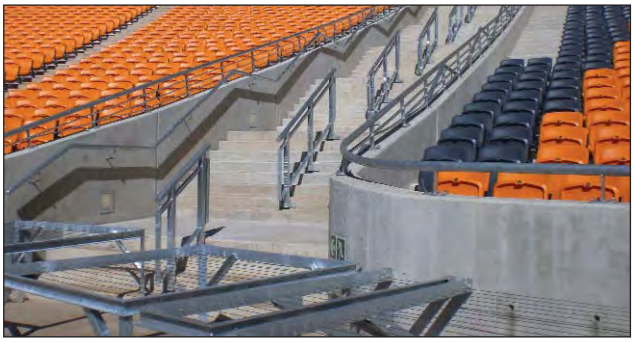
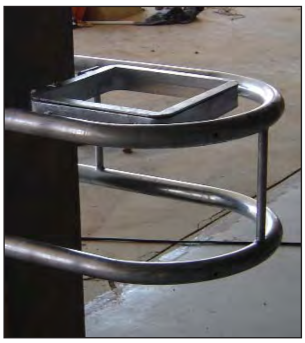
SOCCER CITY











Innovative use of Mentis grating at Soccer City

Typically used in horizontal industrial and mining flooring applications, Gripweld grating is being used as part of the 'Pit of Fire' at Soccer City Stadium, south of Johannesburg. What makes this application so unusual is that the grating will be placed within a framework, produced by Spiral Engineering, in a vertical orientation. Some 1 100 running metres of B-100 Gripweld grating has been supplied by Andrew Mentis to Spiral Engineering.

The design of the stadium is based on the calabash or African pot which is constructed on a raised podium, referred to as the 'pit of fire', to lend the impression of the pot being fired. The 'fiery pit' demarcates the security and turnstiles line, separating the outer areas and the secure inner areas.

"As a result of our reputation of producing architecturally pleasing, functional objects, we were selected by construction contractor Grinaker-LTA to design and manufacture a hot dip galvanized framework that would have both aesthetic appeal and uncompromising strength," Les Steel-Smith, director at Spiral Engineering, says.

"In essence, the framework with incorporated grating, forms an architectural column, complete with a roof and entails clipping the panels into rectangular tubular framework engineered and manufactured by ourselves and hot dip galvanized locally," Steel-Smith explains.

"The Andrew Mentis B-100 Gripweld was specified by the contractor. We have built up a very close working relationship with Andrew Mentis over the years so the successful incorporation of our conceptualisation and the Gripweld product was made that much easier by working with a reputable supplier," Steel-Smith adds.

The grating was selected over traditional fencing material because of its integral strength and inflexibility. Steel-Smith points out that in order to eliminate unauthorised removal of panels, Spiral Engineering has used 5 000 tamper-proof bolts and sheer nuts to secure the Gripweld panels into the framework.

"Probably our biggest obstacle is that each panel was a different size so we needed to first produce a mock-up of our requirements, then get Andrew Mentis to produce exact sizing for the 260 double gates and 180 single gates," Steel-Smith says.

The contract was awarded at the end of 2008, with supply of the panels having commenced in February and the complete project delivered by Spiral Engineering at the end of 2009.

PROPOSED FEATURES FOR 2010

May/June (No 43):

- Tubes, pipes and scaffolding
- Masts and poles
- Water storage
- Heat exchangers and cooling fans

August/September (No 44):

- Awards
- Cable ladders and trays

November/December (No 45):

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

NOTE: FEATURES MAY BE SUBJECT TO CHANGE

2010 HOT DIP GALVANIZING AWARDS

NOMINATIONS NOW OPEN FOR CONSIDERATION IN THE 2010 HOT DIP GALVANIZING AWARDS

Each accepted nomination must comply with the following:

- Each winning project should have the potential to be used as a case study in the future
- Every accepted submission should add to market development
- Awards are specifically aimed at market development

The submission process for 2010 is as follows:

1. Call for Nominations (closing date is 31 March 2010).

   Please complete the nomination form and submit, together with photos and an overview of the project, to the Association via e-mail or by hand.
2. Screen Possible Projects for Consideration
3. The Nominator / Project Team Owner will be responsible for the completion of the submission; however Association staff will be on hand to assist.
4. The submission deadline is 28 May 2010. However, you may submit earlier.
5. The submission will be made available on the website for peer review and comment.
6. Assessment of Final Entries. The various categories will be agreed on.

The Conditions of Entry are as follows:

- All nominations to be submitted to the HDGASA by 31 March 2010.
- All submissions to be submitted to the HDGASA by 28 May 2010.
- The Judge's decision is final and no correspondence will be entered into.
- By submission of an entry, the nominator assumes responsibility for the accuracy of all information and provides the HDGASA with assurance that permission has been obtained and that the information and photos may be used in the magazine, on the Association's website and for promotional purposes.
- Submissions to be completed according to template (available on website or on request).
- Only new submissions will be accepted, other than previous projects now qualifying as a possible Vintage submission.
- The project or product must be complete before 28 May 2010 (deadline date for submissions). Please note that you may nominate it for consideration if it is not complete by 31 March 2010, but the project must be completed by 28 May 2010.

Material to be submitted:

- A motivation as to why your project should be chosen as a winner is essential. Does it have the WOW factor? Will it have an impact on the market by aiding development of the hot dip galvanizing industry? Is it a new application or difficult to galvanize?
- Technical information is extremely important. Motivation, numbers and facts will assist with the adjudication.
- The professional standard of the submission forms an integral part of the judging criteria.
- Submissions should include a minimum of 5 full colour photographs. If digital photographs are to be supplied, please ensure that they are taken at 300dpi for reproduction purposes.
- Kindly ensure that electronic copies of the digital photographs are supplied with entry.

THE OBJECTIVE OF THE HOT DIP GALVANIZING AWARDS IS TO RECOGNISE AND PROMOTE THE DEVELOPMENT, APPLICATION AND USE OF HOT DIP GALVANIZING AND RELATED TECHNOLOGY AS A CORROSION PROTECTION SYSTEM.

please contact the Association for further details on (011) 456-7960 or hdgasa@icon.co.za

The new features for the Elcometer 456 Coating Thickness Gauge

Introduction

Elcometer Limited has an updated version of perhaps the most advanced hand-held coating thickness gauge available for general coating applications including the measurement of hot dip galvanizing, the Elcometer 456 Coating Thickness Gauge.

Now with Bluetooth™ wireless communications, the Elcometer 456 Standard and Top versions have full menu-driven operation and graphics display, in 25 languages, with the capability to measure on ferrous metal substrates using a wide range of probe options. The gauge also has probe options for coatings on non-ferrous metals and the FNF probe option allows dual operation with automatic substrate determination and display.

The Elcometer 456 in the Basic, Standard and Top options also have many new features:

- Choice of separate or integral probe: integral probes offer single hand operation; separate probes offer flexibility of access and thickness ranges.
- Simplified Menu Structure: Simple and extended menus.
- Calibration Lock: Prevents accidental resetting.
- On-screen Help: Definitions of screen icons.
- Improved Data Management Software: ElcoMaster Software™ with reading upload, report generator and data archiving capability.
- Calibration Review: Check settings without data storage.
- User Definable welcome screen: To personalise your gauge.

ElcoMaster Software™

The Elcometer 456 Standard and Top versions have memory for readings, which can be taken on site and then uploaded to a PC running the ElcoMaster Software™. The software supports Bluetooth™ communication for up to 7 different 456 gauges at the same time and will also support RS 232 communication for all gauges with this data output format.

The 456 Standard version has memory formatted for a single batch with up to 250 readings. The Top version has memory capacity for up to a total of 40 000 readings in up to 999 live batches. These batches can be closed and re-opened to add further readings where the total memory consumption allows.

ElcoMaster™ features include:

- Creation of professional reports in seconds.
- Report export to spreadsheets, text files or save as PDF or JPEG files.

Elcometer 456 Coating Thickness Gauges Showing the Measurement of a Coated Surface, Bluetooth® Operating with a PDA.

- Copy and paste reports into other documents.
- Combination of reports in order to easily compare different batches of data.
- E-mail reports directly from ElcoMaster™.
- Assignment of batch identification tags.
- Renaming of batches to clear the inspection batch.
- Wide range of standard reports include:
  - Individual measurements

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- Statistics
- Histograms
- Individual line or bar charts
- Log normal
- Pie charts

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Conclusions

Measurement of coating thickness is made simple and convenient by the use of the Elcometer 456 Coating Thickness Gauge for inspecting coatings in many different applications.

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Newlands Rugby Stadium – Railway Stand

The application

The decision to buy the ground the stadium stands on was made by the Western Province Rugby and Football Union in 1888. The first official match at Newlands took place on 31 May 1890 when Stellenbosch defeated Villagers there in front of a crowd of about 2 400 people. The following year the stadium hosted its first rugby test when the British Lions toured South Africa.

It wasn't until 1919 that the first permanent concrete stands were erected on the grounds. Later, in 1927, the new grandstand was erected and the field layout was changed to run from North-South. Yet more changes came in 1931 when the South stand was also enlarged to make it bigger.

In the 1950s parts of a new grandstand as well as South stand were completed, facilities such as lifts and a Presidential room were added, a fourth bay was added to the grandstand, and an extension was added to the lower gallery.

The 1970s saw the stadium change once again as the headquarters of SA Rugby moved to Newlands, and several stands including the Eastern Railway Stand were built (1979) or renovated, while the 1980s saw private suites and function rooms erected on top of the North stands as well as demolition of the old South stand and inauguration of the new Danie Craven stand (also with private suites and function rooms). The 1980s also saw 10 253 seats added to the stadium.

Between 1990 and 1995 the stadium was under constant renovation, adding technology, increasing capacity, and upgrading facilities, as part of a 3-phase redevelopment plan in anticipation of the 1995 Rugby World Cup, when Newlands hosted the opening match of the tournament.

After the World Cup, development continued with several redevelopment and expansion projects to make the stadium more modern and increase capacity.

The stadium's name was changed several times by various sponsors, first from Newlands to Norwich Park Newlands in 1996, then to Fedsure Park Newlands in 2000 due to a merger between Fedsure and Norwich, and finally back to simply Newlands by Investec when they became the main sponsor in 2002. In late 2005, Vodacom became the stadium's main sponsor, but followed Investec's precedent and kept the stadium name as Newlands.

The environmental conditions

Newlands Rugby stadium is situated at the foot of Table Mountain about 6km from Table Bay, 15km from False Bay and over the mountain about 10km from Camps Bay. Conditions are most probably mild coastal. In accordance with ISO 9223-Corrosion of Metals and Alloys – Corrosivity of Atmospheres – Classification, the slow rate of corrosion achieved suggests that the micro-climatic environment on the East side of the Railway Stand, inside the stadium falls within the Corrosion Category C3. (Corrosion rate of about 2μm/year).

Hot dip galvanizing is specified primarily for corrosion protection. For this reason the two requirements to satisfy this, are coating thickness and continuity.

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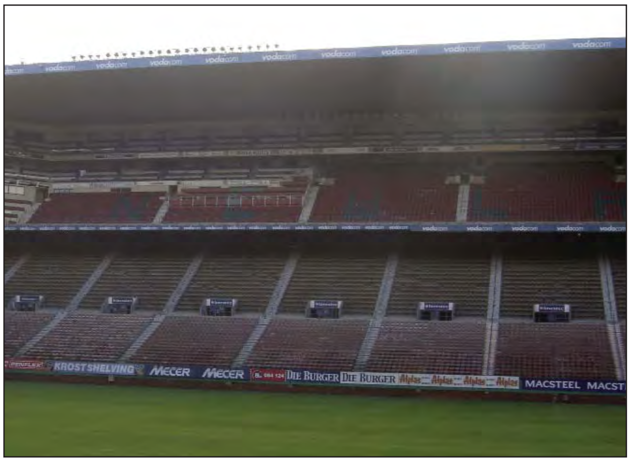

General view of the Newlands Rugby Stadium (left) and the stadium seats (right).

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Coating thickness readings on the round bar of the seat (152µm) (left), on the side support (117µm) (middle) and on the seat support (114µm) (right).

Coating thickness readings on the handrails (above left - 96.2µm and right - 89µm).

Removal of contaminants prior to taking coating thickness readings on seat side bracket.

The seat brackets were hot dip galvanized by the general process which was then specified by the previous national standard, SABS 763. Similarly, SANS 121 (ISO 1461) requires that for steel thickness greater than and equal to 1,5mm and less than 3mm, the local coating thickness shall be 45µm and the mean be 55µm.

Coating thickness readings of seat side bracket (above left - 92.1µm and right - 97.6µm).

The coating thickness readings taken on the seat bracket, seat support bracket and handrail, in accordance with the photos, still generously exceed this requirement.

Coating thickness readings on seat side support (above left - 149µm and right - 143µm).

Conclusion and recommendation

The Railway Stand at Newland Rugby Stadium is already 31 years old and the hot dip galvanized steel seat brackets and handrails has proved to be the correct material of choice notwithstanding effects of a common corrosion problem, known as differential aeration (or necking corrosion) that can be seen on some of the handrail/concrete interfaces.

View of cast in non-galvanized bottom rail showing corrosion products.

Corrosion products removed and residual coating thickness (13.1µm) taken on bottom rail.

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Like bacteria, the business community needs a common immune system

The widespread use of antibiotics over the last fifty years has resulted in many bacteria being resistant to one or more types of antibiotics. Speculation is rife that in a few years we may not have any more effective antibiotics.

The spread of immunity to antibiotics is enhanced by bacteria of different species being able to swap useful genes with each other in a process known as conjugation. Thus as one strain develops a resistance to a particular drug others then develop it as well. Bacteria recognise the importance of having a common immune system which works co-operatively to resist harmful intrusions.

The ability to share 'life and survival skills' by conjugation has also been the main reason for the longevity and abundance of bacteria. For the first half of our geological time our ancestors were bacteria and most creatures on our planet still are bacteria. Their instinct for survival enables them to inhabit virtually every corner of the earth, including inside the human body. Fully ten percent of our own dry body weight consists of bacteria, some of which we cannot live without. It is a sobering thought that the number of E. coli in the human gut far exceeds the total number of people that now live or who have ever lived.

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As bacteria do, all human societies and cultures emphasise the essential value of helping others. Most will agree that co-operation is in general advantageous, even though it may curb some individuals' freedom and personal objectives. The benefits achieved by co-operation are generally believed to exceed those from individual selfishness. Co-operation can increase the fitness of the co-operators, when the co-operators together can collect more resources than the sum of the resources collected by each of them individually. The difference is that bacteria unequivocally accept this philosophy and do not waste valuable time debating it or applying it.

Unlike bacteria, businesses are not in a position to swap their genes to increase their resistance to pending disasters. What they can do, however, is to share useful knowledge with other companies.

Many observers believe that worldwide we are in the midst of a sweeping skills and knowledge crisis that threatens to bring to an end any form of economic expansion. A recent survey of high growth companies in America showed that a lack of highly skilled employees was cited as the number one barrier to growth by 70% of the respondents. In South Africa, particularly, the shortage of skilled employees and the lack of resources to provide skills training could become the major reason for a stagnating or declining economy. Empowerment without providing for skills and knowledge is surely meaningless.

Co-operation between competing companies has usually been viewed with a great deal of suspicion by both business and consumers alike. Losing competitive advantages and the possibility of cartels and monopolies are seen as the major risks of such co-operation. Fortunately, many progressive companies and regulatory bodies are looking past these apparent obstacles and beginning to see the many benefits that co-operation can bring. Partnerships and alliances are gaining in popularity as a means of providing synergy that a small and emerging economy like ours needs for job and wealth creation.

Unfortunately, many partnerships and alliances exist at the 'boardroom' level only. Transferring equity, joint financial ventures and outsourcing are indeed valuable forms of co-operation. What is also needed, however, is to allow these relationships to move down to much 'lower' levels where relevant and practical skills and knowledge can be shared between people from different companies and backgrounds.

The key to co-operation, both in the immune system of bacteria and in organisations, is the co-operative management of knowledge. Appropriate knowledge has to become embedded in all the organisms so that strategies to resist common negative influences are available on a broad front. Instead of training their own employees, companies should perhaps be investing in wide knowledge 'networks' that enable individuals from similar companies to share expertise, exchange knowledge and learn on demand. In this way 'communities of learning' would develop which, by learning how to continually adjust to new and changing ideas, would benefit business and the country as a whole.

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.

The merits of using hot dip galvanized steel reinforcement in concrete structures

Professor Stephen Yeomans was invited to South Africa during February to give presentations countrywide on the merits of using hot dip galvanized steel reinforcement in concrete structures.

Professor Yeomans was Head of the School of Civil Engineering of the University of New South Wales at the Australian Defence Force Academy in Canberra over the period 1993 - 2003. He recently retired from his position as Associate Dean (Education) and is presently a Senior Visiting Fellow in the School of Engineering and Information Technology at the University of New South Wales at the Air Force Defence Academy. Prof. Yeomans' principal research interests are the corrosion of reinforcement in concrete and in particular the use of galvanized reinforcement for corrosion protection. Since 1987 he has worked closely with the International Lead Zinc Research Organisation (ILZRO) and in 2004 edited a compilation volume on the current knowledge available on galvanized steel reinforcement. This book has become the definitive resource on hot dip galvanized steel reinforcement. Copies can be ordered through the Association.

The week of seminars started in Johannesburg with a morning presentation to invited industry leaders at Robor Galvanizers on Monday 22 February. Over 25 delegates attended. This was followed by a presentation to the Joint Structural Division of the South African Institute of Consulting Engineers in the afternoon. Again some 25+ attendees were present.

On Tuesday presentations were given at the University of Johannesburg to 22 students studying final year metallurgy and in the afternoon 16 chemical and metallurgy students of the University of the Witwatersrand.

On Wednesday a seminar was hosted by Phoenix Galvanizers in Durban with 19 consulting engineers and specifiers, attending.

On Thursday morning a Workshop was organised by the Association in conjunction with IZASA at the Breakwater Lodge in Cape Town. This workshop targeted practicing

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From left: Prof. Stephen Yeomans, Keith Mackie and Prof. Mark Alexander.

engineers and specifiers. A full program comprised two presentations by Prof Yeomans with additional presentations by Prof Mark Alexander (from the Civil Engineering Department of UCT who is a well known authority in concrete, concrete degradation and concrete rehabilitation) and Keith Mackie (Consulting Coastal and Harbour Engineer).

Prof Yeomans completed his week with a presentation to 20 post-graduate students in the Department of Civil Engineering at UCT.

By the end of the week some 170 people had been able to listen to and question Prof Yeomans on the benefits of hot dip galvanized steel reinforcement and challenge the hypotheses and assumptions in his presentations. It is hoped that this will result in an ongoing debate over the use of longer life structures for infrastructure development where tax Rands should be spent wisely and effectively.

South Africa already has some well known examples of the use of hot dip galvanizing for reinforcement of concrete. These exist in Cape Town (Groote Schuur Hospital, Seapoint seawall amongst others), Durban (Gateway Shopping Centre and others), Port Elizabeth, Johannesburg and other cities around South Africa. The visit by Prof Yeomans certainly stimulated the audience in terms of widening awareness but in addition, it will result in the development of a local case histories file for future reference and as an added incentive to aid future market development.

A group of students listen attentively to Prof. Stephen Yeomans.

The IZA started its high profile campaign to develop the galvanized reinforcement steel market in 2005. This has resulted in the development of a resource site *www.galvanizedrebar.com* in addition to the production of the book by Prof Yeomans. Papers have been given worldwide at relevant conferences and industry working groups established to identify the challenges to be overcome in further development of the market. Clearly, the IZA in its mission to further develop markets for zinc needs to focus on sizeable markets. Estimates of the global market for reinforcement in concrete exceeds 100m tonnes per annum. It is clear that even a small market penetration would result in a significantly increased consumption of zinc.

On a final note, the New York State Thruway Authority has now adopted hot dip galvanized rebar for all of its current bridge decks. Within the US it is estimated that there are over 600 000 bridges requiring some form of rehabilitation. Clearly, recognition has occurred that hot dip galvanizing does offer additional benefits to concrete works. Perhaps this should have been used for the coastal bridges in KwaZulu-Natal. It is better than the use of the words – Beware of falling concrete!

Editor's Comment

*As stated by Keith Mackie at the seminar, "**hot dip galvanized reinforcement for concrete only works when you don't need it**". To this end and warranted by the general interest in the hot dip galvanized reinforcement for concrete, we will be publishing a series of papers in subsequent issues of the magazine on this subject.*

The Association would like to acknowledge the advertisers and thank them for their support

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Professor Stephen R Yeomans presented a series of presentations and seminars in South Africa in February 2010

The presentations/seminars provided an overview of the corrosion of steel reinforcement in concrete construction and strategies that can be adopted to avoid this insidious problem, especially so in building and general RC construction. Corrosion of reinforcement is the most likely cause of the lack of durability of concrete and represents a significant expense in the maintenance and repair of concrete structures of all types. In buildings in particular, the early stages of cracking, rust staining and spalling of concrete represents a significant challenge to building owners in the long-term maintenance of the structure. If such deterioration is allowed to progress, reinforcement corrosion may also affect the structural integrity of the concrete elements of the building itself.

Hot dip galvanizing is a well-known and widely-utilised method for the protection of steel reinforcement embedded in concrete in a range of building and construction activities. The history of the use of galvanizing steel in concrete extends over a period of more than 70 years. Recent experience indicates an increasing use of galvanized steel in a wide variety of concrete structures exposed to differing environmental conditions including severe topical marine and industrial environments.

Presentations and seminars reviewed the characteristics and use of hot dip galvanized reinforcement with particular emphasis on buildings and similar forms of construction. It covered the characteristics and processing of galvanized reinforcement as well as its corrosion performance, mechanical behaviour and considerations in design, fabrication and construction. A wide range of world-wide applications of galvanized reinforcement were presented. A key source of reference information on this topic is *Galvanized Steel Reinforcement in Concrete*, SR Yeomans (Editor),Elsevier, 2004. A supporting document for the seminar entitled *Galvanized Steel Reinforcement in Concrete: An Overview* is available from the HDGASA.

Capricorn Park – "Are the two coatings the same?"

Photos 1: The South Easterly winds off the coast in combination with high wave action with chlorides, relatively high humidity, distance from the sea, low lying land mass, etc. make the conditions along this coastline extremely corrosive.

Photos 2: A guard rail adjacent to the sea that has lost its coating over time and is now corroding.

"Wamosha" which in Zulu means inappropriate use, misuse or messing about, is the name for this column. The column will feature articles where we find hot dip galvanizing misused or where other zinc coatings that are often inappropriately specified when general hot dip galvanizing is preferred, have been inappropriately used.

The Hot Dip Galvanizers Association was requested to inspect and comment on the performance of continuous and general hot dip galvanized roofing members on an industrial building (No. 1) in Capricorn Park (*photo* 3), exposed to the atmosphere for two and a half years. The components were inspected on Tuesday 26 January 2010 and I report as follows:

Capricorn Park off False Bay on the coast side is situated about 1km from the sea, with the M5 entrance being about 2 - 2.5km from the sea.

In our experience wind driven chlorides can be found up to 3km of the sea along this coast line from and including Glencairn through to just west of the Strand, whereas areas such as Simonstown and Gordons Bay are considerably less corrosive due mainly to the exclusion of the direct onslaught of the South Easterly chloride carrying winds.

Conditions within Capricorn Park from the M5 gate (*photo* 4 *and* 5) through to the coastal gate off False Bay are corrosive.

The conditions at the coastal gate off False Bay are extremely corrosive, *photo* 6 shows the entrance, *photo* 7 shows a badly painted (now failed) angle welded to a failed duplex coated gate and *photo* 8 a failed powder coated wire mesh fence.

This security intercom sign (*photos* 9 - 11) was most probably installed at the time Capricorn Park was established (December 2000) see label on back of sign. While the pre-galvanized bracket and unistrut and zinc electroplated fasteners are corroding, the hot dip galvanized post shows some interesting observations.

Photos 12 - 14 show, after scraping the surface to remove chloride

Photo 3.

Photo 4.

Photo 5.

Photo 6.


Photo 7.


Photo 8.

Photo 9.

Photo 10.

Photo 11: Installed December 2000.

contaminants, coating thickness readings of 57.6; 43.4 and 50.8µm respectively, on the landside of the post.

Photos 15 - 17 show, after scraping the surface to remove chloride contaminants, coating thickness readings of 32.6; 8.4 and 8.6µm respectively, on the coastal side of the post.

While removal of the contaminants may not be 100% effective, the resultant coating thickness readings do indicate that there is a considerable coating thickness reduction on the coastal side versus the landside over the 10 odd years.

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Photo 12.

Photo 13.

Photo 14.

Photo 15.

Photo 16.

Photo 17.

Tube hot dip galvanizing is generally done to SANS 32 (EN10240) which requires a minimum coating thickness of 55µm and because the process generally includes non-reactive steel tubing and an exit air-ring. As the tube exits the zinc bath, via the air-ring, it is mechanically wiped on the outer surface and this ensures that coating thicknesses far greater than 55µm are unlikely.

The specific building (No. 1) in this park (*photo* 19) is situated alongside Capricorn Drive and is reported to be 2½ years old, while another building (No. 2) is closer to the coast and is 4½ years old (*photo* 20).

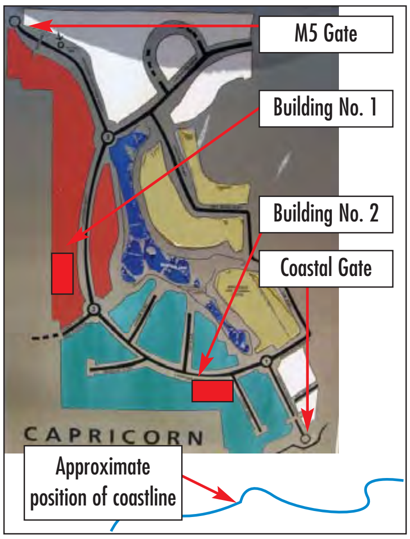

Photo 18.

Note: The location and position (relative to the coast line) of the two buildings shown on the plan (*photo* 18) are not necessarily 100% accurate but have been shown merely to illustrate the corrosivity of the area with respect to the coast line and use of hot dip galvanized steel.

Building No. 2

Photo 21 shows the raker support arms for the roof on Capricorn Road side. *Photo* 22 shows the hot dip galvanized rafters and purlins. The only corrosion is on the painted barge plate (circled). *Photo* 23 shows the residual coating thickness (177µm) on the raker support arm wall plate.

Photo 24 shows the appearance of the tubular raker support arm on seaward side (note the chloride deposit) while *photo* 25 shows the appearance landward side (note less chloride deposit). *Photo* 26 (179µm) and *photo* 27 (149µm) show the landward side coating thickness. *Photos* 28 *and* 29 (119 and 121µm, respectively) show the seaward side coating thickness. Note the significant residual coating thickness difference between the two faces after 4½ years.

Photo 19.

Building No. 1

As expected the hot dip galvanized steel components on the South East and South West face of the building appear to be the worst affected, with considerable performance differences between the hot dip galvanized roof rafters and bracing (to SANS 121) (*see photos* 36 - 40 *and* 47 - 50) and the continuously hot dip galvanized purlins (to SANS 3575 or 4998) (*see photos* 30 - 35 *and* 41 - 46).

South east corner and eaves

Purlins

Photo 30 is general, *photo* 31 shows the concerns on the purlins and *photos* 32

Photo 20.

Photo 21.

Photo 22.

Photo 23.

Photo 24.

Photo 25.

Photo 26.

- 35 show where the chlorides have been scraped off and residual coating thicknesses (5.4 and 9.5µm respectively) have been taken.

Rafters

The close up appearance of the rafter (*photo* 36); coating thickness readings of 161 and 165µm on the rafter (*photos* 37 *and* 38) and 179 and 175µm (*photos* 39 *and* 40), respectively on the roof bracings.

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Photo 27.

Photo 28.

Photo 29.

South west corner and eaves

Purlins

Photo 41 is a general view of the south west end of the building, *photo* 42 shows the corrosion concerns on the purlins. Surfaces scraped and residual coating thickness measured on the rafters and purlins.

The purlins have been manufactured using a continuously hot dip galvanized sheet to SANS 3575/4998. Two places on the inside of the purlin were scraped as clean as possible and residual coating thickness readings taken, measuring 18.3 and 24.6µm respectively (*photos* 43 - 46).

The horizontal and areas adjacent to this on the purlins have due to the corrosivity of the atmosphere and time of wetness, shown a marked degradation and subsequent red rust.

Rafters

The rafters have been hot dip galvanized to SANS 121. Two areas of the exposed web of the I-Beam were scraped as clean as possible and residual coating thickness readings taken, measuring 241 and 237µm respectively (*photos* 47 - 50).

Difference between continuously hot dip galvanized sheeting to SANS 3575 (commercial grade) or SANS 4998 (structural grade) and general hot dip galvanizing to SANS 121

Continuously hot dip galvanized sheeting

This is manufactured by ArcelorMittal in Vanderbijlpark or Durfuco in the Western Cape. Continuous sheeting travelling at about 140m/min runs through a reducing atmosphere at about 950°C, the sheet travels into a hot dip galvanizing bath under a mandrel and as the sheet exits the bath, it runs through a series of air or gas knives where the excess coating, according to the grade of coating required, is mechanically removed.

Various coating grades are available from Z100 to Z700, with the most available grade being Z275. The 275 represents the mass of zinc in grams/sqm. To convert the coating mass to coating thickness 275 must be divided by 7 (Specific Gravity of zinc) and by 2 (includes both faces), ie. 275/2x7 = 19,6µm. The fine print in the specification allows not less than 40% of the individual value (235 gm/sqm) to be found on one surface, ie. 13.4µm.

General hot dip galvanized steel

This process is available in most large centres and in Cape Town there are 6 hot dip galvanizers, 5 of which are members of the HDGASA, with varying bath sizes.

Pre-cleaned components are dipped into a bath of molten zinc at about 450°C. A metallurgical reaction between the steel and zinc results in a coating comprising a series of

Photo 30.

Photo 31.

Photo 32.

Photo 33.

Photo 34.

Photo 35.

Photo 36.

Photo 37.

Photo 38.

iron/zinc alloys which are generally overcoated with a layer of pure zinc.

A number of things influence the coating thickness and appearance, with the chemical composition of the steel as in silicon and phosphorus playing the major role. Steel thickness and surface roughness also have a major influence.

SANS 121, requires that for steel 6mm thick and above, the minimum local coating thickness must be 70µm with the minimum mean being 85µm.

Photo 39.

As can be seen from the photos, due to reactive steels, this minimum coating thickness is generally exceeded by upwards of 50%.

Photo 40.

For further differences on the two types of hot dip galvanized coatings, refer to *Magazine* No. 37 or back issue

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Photo 41.

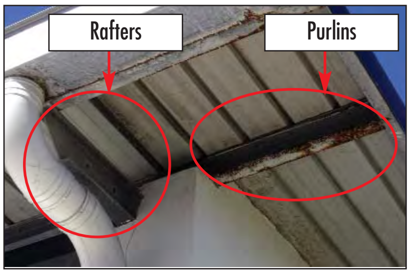

Photo 42.

Photo 43.

Photo 44.

Photo 45.

Photo 46.

Photo 47.

Photo 48.

Photo 49.

magazines on *www.hdgasa.org.za*.

***Conclusion and recommendation*:**

Due to the prevailing off sea chloride carrying winds (South Easterly), high wave action, humidity, low lying land mass and lack of rainfall from the sea side, the False Bay coastline from and including Glencairn to just west of the Strand up to about 2 to 3km from the sea is considered to be extremely corrosive.

The specifying and use of a material significantly inferior (for corrosion resistance purposes), is unacceptable and although our organisation, has for the past 13 years tried to educate users and specifiers in all the major centres as to the differences, there are still many who innocently mis- specify, accept the incorrect materials and when they fail prematurely are significantly embarrassed by the situation.

As discussed previously, to comprehensively remove the tenacious zinc chloride layer on the galvanized purlins, abrade the red rust areas (many of which are directly below the sheeting and in inaccessible areas –shape of the purlin), followed up by patch priming of the latter surfaces, with subsequent layers of paint, within a short period of cleaning, will in my opinion be extremely difficult and expensive to successfully achieve.

Most of the fasteners, which have also failed are only zinc-electroplated. They can often be confused by uninformed persons with hot dip galvanized equivalents.

The difference essentially between the two methods of coating is in the coating thickness and appearance, where the zinc electroplated fasteners would have a coating thickness of about 5 to 15µm and be shiny whereas, by the hot dip galvanized method will rarely be less than 55 to 65µm and matt grey in colour. As life is proportional to thickness, it stands

Photo 50.

to reason that a thicker coating will last that much longer.

My recommendation would be that the purlins be removed and replaced with hot dip galvanized purlins to SANS 121.

As stated this area off the False Bay coastline is extremely corrosive and if our opinion was sought at the outset of the project, we would have specified a duplex coating (hot dip galvanizing plus an appropriately thick paint coating system) for all external components to achieve a durable service free life.

Terry Smith

HOT DIP GALVANIZERS ASSOCIATION EXECUTIVE COMMITTEE 2010

Front row, left to right – Kim Guest (Metsep); Terry Smith (HDGASA); Bob Wilmot (HDGASA); Nelis Pienaar (Lianru Galvanisers); Nick van der Mescht (Africa Cellular Towers); Werner Petrick (Macsteel Tube & Pipe); Saskia Salvatori (HDGASA);.

Back row, left to right – Hendrik Stenkamp (HDGASA); Tat Greyvenstein (Supergalv); Tom Loughran (Armco Galvanizers); Don Voysey (Bay Galvanizers); Nico Schoeman (Robor Galvanizers); Mike Book (Bulldog Projects); Iain Dodds (Cape Galvanising); Owen Tennant (Exxaro Base Metals – Zincor Ltd.); Michael West (Cape Gate); and Anni Ramkisson (Phoenix Galvanizing).

Robor restructuring enhances offering

Robor, the largest manufacturer of steel tube and pipe in southern Africa, has announced a restructuring of its operations in order to expand its service offering and deliver a comprehensive, simplified approach to projects.

Spearheaded by a new R80 million facility and the purchase of state-of-the-art laser cutting and high definition plasma cutting equipment, the initiative sees all value added services grouped under one division with one management structure for improved efficiency.

The Microstep HD Plasma Cutter is idea for providing tube for structural applications and features a three dimensional head.

According to Andrew Winter, Managing Director, Robor Steel Services, the value added service offering, used with much success in its Pipe Systems business unit for the supply of conveyance systems, is being vertically integrated into the entire Elandsfontein operation. "This move enables Robor to offer customers a more comprehensive service from one supplier, essentially backing our products from start to finish. We are taking advantage of our established systems and logistics to roll out these services, in effect becoming part of our customers' supply chain," says Winter.

In addition to the conventional services, such as cutting, ring rolling, bending, hot dip galvanizing, painting and drilling, Robor is able to take a customer's requirements or drawings and convert them into a solution that is transported to site ready to assemble.

"We are supplying components for projects, ready to be installed once on site. The benefit for our customers is cost-effectiveness and improved efficiency. As the only supplier, we can ensure better lead times, simplified logistics, less administration and better co-ordination. There are no delays on a project while waiting for other components from other suppliers."

Winter notes that further benefits include better yield and fewer stock losses. "While a customer can cut or bend our tube themselves, mistakes are often made and more items need to be ordered. This obviously increases their costs and causes delays. We take that risk away from the customer by delivering precisely what they order, in the state in which they need it and, most importantly, on time," says Winter.

Robor has established solid relationships with sub-contractors that are able to offer complementary equipment and skills should they be required. "If we don't have those specific resources we use our trusted sub-contractors while still managing the process to ensure that it is seamless."

The value added service facility is also available for fabricators and distributors to use.

The company's resources, established systems and logistics capabilities allow Robor to supply to a number of projects on a just-in-time (JIT) basis. This reduces a customer's stock holding and assists in making the project more efficient.

"We have established ourselves in the market as a reliable company that offers consistently good quality products. The addition of these services means that we are meeting customer demands for a comprehensive supplier and will be delivering them with the same high standards," Winter concludes.

The Trumpf TruLaser Tube 7000 laser cutting machine is the first of its kind in South Africa.

Armco Galvanizers hot dip galvanizes steel for the "ring of fire" at Soccer City, Johannesburg

Armco Galvanizers hot dip galvanized some 280 ton of steel for Omni Struct which was used in the "ring of fire" at Soccer City.

Due to minor imperfections in the coating (normally acceptable in terms of the specification SANS 121 (ISO 1461), most of the vertical components were cleaned using an industrial orbital sanding disc to increase the aesthetical acceptability and smoothness of the coating.

The final coating was acceptable but shortly would convert to a uniform dull matt grey colour as the final zinc carbonate patina appeared.

Galvadip chosen as hot dip galvanizer for FIFA World Cup Soccer stadium turnstiles

A total of 35 470kg of turnstiles has been hot dip galvanized by Pretoria-based Galvadip, for Turnstar Systems.

Turnstar, a specialist supplier of turnstiles for various sporting stadia around Africa including the 2003 ICC Cricket World Cup in 2003 and the 2008 Africa Cup of Nations in Nigeria, is the sole supplier of turnstiles for all the 2010 soccer stadia.

Galvadip has galvanized approximately 70% (105 turnstiles) at Soccer City, all 77 turnstiles and 10 gates at Nelspruit's Mbombela Stadium, 14 turnstiles for the Princess Magogo Stadium in KZN and 16 turnstiles for the Philippi stadium in Cape Town (*for photo of turnstiles see front cover*).