

Hot dip galvanizing: adding to architectural appeal by successfully combining functionality with aesthetics



Hot dip galvanized steel is elegant, low-maintenance, durable, sustainable and takes up less space – and is becoming increasingly popular in contemporary architecture - according to Executive Director of the Hot Dip Galvanizers Association of South Africa (HDGASA), Robin Clarke.

Because galvanized steel has the unique ability to marry functionality with aesthetics, it has not only become an architectural feature in itself but created a developing market for the galvanizing sector, which the HDGASA represents.

Form and function

Over the past 20 years, architects have used galvanized steel to create steel frames, skeletons and steel facades, designing so that structural steel is left exposed, highlighting the internal elements of buildings.

“The Glass House in Parktown North is an example of this. Designed by architect Karlien Thomashoff and artist/owner Roelof Petrus van Wyk, it was inspired by Johannesburg’s rich gold mining history. The surrounding buildings - and the hot dip galvanized steel electricity pylons located a few metres away from the site - add to this industrial aesthetic,” Clarke explains.

Architecture has also embraced sustainability, smart construction and the reuse of building materials: “Architects have followed trends such as the optimal utilisation of space, and the ability to reuse materials. All of these elements have come together and sparked a move towards designing for sustainability,” Clarke adds.

Steel also highlights other natural materials. Referring to the New Tram Street Offices in Pretoria, Clarke says custom-designed galvanized planters and drain pipes integrated with softer textures and green foliage. A sun control structure on the northern and southern facades of the building was also made out of hot dip galvanized steel.

The highlight, however, is the entrance canopy of the office block: “This is framed with a horizontal hot dip galvanized channel supported from the building, giving the illusion of a floating roof. The design is distinctive in the way that galvanized steel has been used to improve the architectural environmental impact as a modular building element in a soft suburban node. Hot dip galvanized steel - due to its unique properties - is used to bind other materials such as concrete, brick and glass into a coherent whole.”

Steel supply chain collaboration

Clarke and HDGASA Marketing Manager, Anthony Botha, agree that practicality will continue to drive design.

However, achieving the best outcomes requires innovative collaboration across the steel supply chain. Clarke explains that existing standards SANS 124 cover baseline hot dip galvanizing (for corrosion control) requirements. Architects requiring an aesthetic beyond this need to work closely with the fabricator and galvanizer, and the steel sections fabricated need to comply with SANS 14713 Parts 1 and 2.

This is where the HDGASA also fulfils a valuable role in providing guidance, thereby ensuring that the responsibility to fabricate in a compliant manner is shared responsibly across the supply chain.

This includes advising architects and designers on the correct quality of steel selected for galvanizing: “In this regard, support from a fabricator working to a high standard will ensure that a galvanizer can deliver extra smoothness, with no lumps and bumps around the bolt holes, no oxide lines and also adequate provision for drainage holes,” Clarke advises.

He furthermore points out that steel supply chain collaboration between architects, fabricators and galvanizers has produced some impressive results. The Military Health Base Depot, located on an existing military property in Thaba Tshwane municipality, is an excellent example.

This award-winning project was designed by architect Jeremy Malan, tasked with creating a new facility for the improvement and centralising of the SA National Defence Force's medical supply base. This incorporated and integrated five buildings of significant heritage value. Malan therefore created an eclectic, campus-type development which included the restored and creatively repurposed original structures. The historic hanger building - which was originally constructed out of structural steel - provided stark characteristic elements and strong aesthetics for this composite structure.

"All the major structural steel members - as well as a plethora of steel fittings and components intrinsic to the design - were hot dip galvanized. Colour-coated galvanized sheeting was also used on the roof and the side cladding of the large warehouse. A key element of the success of this project was an excellent surface finish. Careful detailing of all the steelwork, braces, joints and footing was done following international best practices. This - together with close liaison between the architect, engineer, building contractor, fabricator and galvanizer - produced the desired results," Clarke reveals.



Award-winning, landmark projects

He remarks that in South Africa, galvanized steel has amassed some "tremendous hot dip galvanizing disciples" in the local architectural and design sector, who have created landmark projects.

The HDGASA has accordingly recognised many of these through the Architectural category of its Hot Dip Galvanizing Awards events. One such award-winning project was the redevelopment of the 116-year-old Tramways Building, which triggered the rejuvenation of Gqeberha's (Port Elizabeth's) central business district (CBD).

Existing steel structures were hot dip galvanized and reused. As the building was close to the harbour, corrosion control was improved through the use of a duplex paint

system, adding colour and texture which contributed to the visual aesthetic of the building.

"Spangling is another element that can be optimised in design. "Galvanizing is a living coating. Architects can use specific elements including the spangle (or 'flowers of zinc' as it is referred to) that develops during the cooling process. In very large spaces - such as the Nelson Mandela Metropolitan University's South Campus Living and Learning Student Housing project designed by Matrix Urban Design - this can very effectively merge with architectural detailing," Botha comments.

A large amount of hot dip galvanized steel was used



throughout this project - from structural columns to balustrades, staircases, bridges, balconies and pergolas. The patina of the natural hot dip galvanized surface finish was aesthetically noticeable, contrasting with the light-coloured wall finish of the buildings.

"In this manner, hot dip galvanizing very successfully blends elements such as steel, glass and concrete into a strong architectural statement: coherent, appealing and sustainable; and also fulfils an accentuating and framing function – over and above its inherent properties of corrosion control and long service life," Clarke concludes.