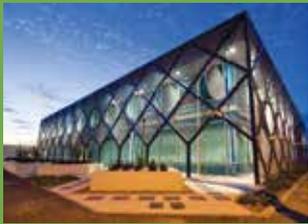




Associate of International Zinc Association

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galvanize
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HOT DIP GALVANIZED STEEL = FREEDOM FOR FLAIR



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= Freedom for flair

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Image credit: Christopher Frederick Jones

The galvanized finish has long been associated with highly functional structures, a readily recognisable appearance and a long reliable treatment, yet it can be overlooked that it is frequently intrinsic in the development of some striking built structures. In essence, the high level of steelwork protection offered by modern galvanizing allows architects more freedom to design intricate and complex profiles confident they will stand the test of time.

Galvanize spoke with a number of prominent architects to find that rather than an afterthought, they are well apprised of the finish's ability to release new design possibilities and take a keen interest in specifying it on a wide array of building applications engaging local member galvanizers of the Galvanizers Association of Australia (GAA).

John Whittingham, director of Allen Jack+Cottier Architects, involved in the design of the multi-award winning Milson Island Indoor Sports Centre that was also highly commended in the GAA's most recent Sorel Awards, said his practice regularly relied on the treatment for a range of buildings.

The sports centre was one for which galvanizing's helpful attributes particularly came to the fore to meet the challenge of building a facility for rugged use at a totally water-locked site, requiring all materials to be barged over.

He said the ability of the galvanized sections to withstand surface damage during transit to site was a boon for this type of application intended for spirited indoor play.

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FREEDOM FOR FLAIR

"We have specified galvanized finishes many times over the years on an array of projects including other similar sports halls throughout regional NSW, a number of which have also gained design excellence awards," he said.

"Out of these projects only one has had trouble with corrosion, which coincidentally was the only one that wasn't galvanized.

"You just need to look at the longevity of the high voltage transmission towers scattered all over the State to know that galvanizing lasts. These towers are in exposed locations, they are unprotected and undergo little or minimal maintenance.

"This is the sort of robust finish we required, able to withstand a belting from both the environment and the kids and yet still stand strong."

Similarly, Bark Design Architects principal **Stephen Guthrie**, one of the architects behind the design of the new Noosa Junction Station that received a 2012 Queensland Australian Institute of Architects (AIA) State Commendation for Urban Design, is also a galvanizing fan.

The most distinctive design elements of the railway station are the steel framed skillion roofs over its central pavilions, much of which is galvanized. And like the indoor sports stadium, the project is located in a coastal environment with high levels of sea salt and also required components which could be easily fabricated, hot dip galvanized, transported and erected, and arrive onsite ready to erect with no additional cutting, welding or adjustment required.

"The selection of hot dip galvanizing is specified on many of our public and residential projects in challenging coastal environments," he said.

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"Unlike steel protected with paint finishes, hot dip galvanizing offers an 'unconcealed' natural appearance where any potential areas requiring maintenance can be easily seen and addressed in the early stages.

"Our own studio utilised a series of hot dip galvanized steel portal frames which were able to be erected onsite within a week and now 12 years later look as contemporary and fresh as they were when the building was new and without any need for maintenance during that time.

"Many of our high end residential properties in harsh coastal environments also utilise galvanized steel as a material of choice for its durability, performance and aesthetic characteristics."

Managing Principal Queensland of DWP Sutera architects, **Geoff Street** concurred.

"Galvanizing is the traditional way of treating steel exposed to constant outside air flow in our state," he said. "We have used expressed galvanized steel in many projects including schools, storage warehouses, universities and hospitals."

Collins and Turner architects principal, **Huw Turner** has drawn from extensive experience with the corrosion prevention approach from both here and overseas for his Sydney-based practice.

"Two of our first-built projects were on neighbouring rural properties on the Monaro in regional NSW. They are shed-like structures that sit comfortably in an open landscape in close proximity to existing farm sheds and dwellings," he said.

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"Several contemporary projects in Europe served as examples of new building forms defined by entirely galvanized surface finishes, particularly two in Switzerland - the traffic museum extension in Zurich by Gigon Guyer architects and the Uetliberg house by **Andreas Fuhrman** and **Gabrielle Hachler**.

"Both projects celebrate the beauty of the galvanizing process in ways that we hadn't previously experienced. And each gave us comfort that an entirely galvanized structure would be a fine looking thing."

Galvanizing was hence the obvious choice when it came to Mr Turner's practice designing the redevelopment of an amenities block into a modern community centre to fit an inner-city parkland setting recently.

The intensive application of galvanizing allowed the new centre to be sited virtually as part of the landscape for it eventually to be shrouded by planted vegetation confident of retaining the structure's integrity despite increasingly more humid conditions.

Giordano & Associates Senior Architect, **Anthony Giordano** has also taken heed of overseas galvanizing applications as impressive.

"I have been fortunate enough to see some great examples of galvanizing in Norway and can attest to their outstanding performance in harsh arctic conditions," he said.

The architects designed the new head office and factory for prominent South Australian steel fabricator Manuele Engineers just three kilometres from the coast.

The fabricator wanted to make a more prominent statement about its business by highlighting the intricate steel fabrication of the new facility enhanced by contrasting hot dip galvanized in-fill panels against a painted RHS support frame, creating a distinctive design aspect.

"Galvanizing has also come to the fore for us on a town square development in the McLaren Vale wine region for the City of Onkaparinga required steel balustrades, shade structures and seating that would pick up on the original rural origins of the region.

"Galvanized steel was chosen to make this link," Mr Giordano said.

Scott Hardcastle of BVN Donovan Hill who designed Stage Four of Lavarack Barracks redevelopment near tropical Townsville, has specified galvanizing for both structural and general applications and was equally cognisant of the freedom afforded in creating more intricate building designs.

"Hot dip galvanizing has the advantage of full steel coverage including internally within steel sections, paint applications can't achieve this extent of coverage."

"Hot dip galvanizing has the advantage of full steel coverage including internally within steel sections," he said. "Paint applications can't achieve this extent of coverage."

CASE STUDIES



Image credit: Nic Bailey

Erection-ready for remote site

Milson Island Indoor Sports Centre, NSW

The call for a multi-purpose building to accommodate a variety of sporting and social activities on a water-locked site on the Hawkesbury River was met with a totally lightweight modular building designed to be extended, reduced in size, or even moved with relative ease.

This ensured that most of the work could be completed off-site, barged to site in pieces and simply bolted together. A structural frame consisting of duplex (galvanized and painted) coated primary steel framing members were specified to help ensure the building is relatively maintenance-free.

Director at Allen Jack+Cottier Architects, **John Whittingham** said the client was very keen to minimise ongoing maintenance and galvanizing "fit the bill".

"Building in remote locations is expensive and problematic. It's hard for sub-contractors to come and go. If you've forgotten a tool, a water taxi is required to retrieve it," he said.

"Galvanizing was an obvious choice, providing a prefinished protective coat completed off-site, meaning the steel is protected from the moment it leaves the plant."

Prefabrication off-site for the most part meant the steel frame erection was completed in days, allowing other trades to contribute without delay. Due to the tough galvanized coating, the building could be quickly assembled once the components arrive on site as little or no touch-up was required at the building site.

"Its tough electrochemical finish is self-healing which also speeds up the construction as there is minimal touching up required from transportation and erection," Mr Whittingham said.

"Galvanizing comes into its own when used in rural locations with other raw, rustic type finishes. It weathers well and the initial bright silver finish gradually softens to become a softer grey, which blends into surrounding natural tones."

By coordinating the production requirements with the galvanizer and utilising their superior logistic capabilities, the project team enabled the sub-components to be delivered on time, in full and in a controlled manner. The galvanized surface also protects the base steel from the everyday wear and tear of the boisterous activities occurring within.

Architect: Allen Jack+Cottier Architects

Structural Engineer: Taylor Thomson Whitting Consulting Engineers

Building Contractor: Inten Constructions



Image credit: Christopher Frederick Jones

Landmark look enabled

Noosa Junction Station, Queensland

Aiming to create an integrated transit hub to service the greater Noosa area and help revitalise the area's commercial precinct, an eye catching civic facility with distinctive steel framed skillion roofs over its central pavilions resulted.

The project is located in a coastal environment with high levels of sea salt, detrimental to the long-term life of steel. Exposed, easily accessible members and simple bolted connections used hot dip galvanizing as the corrosion protection system, which showcased the natural 'silver' characteristic of steel.

The building's sustainable design has since received a 2012 Queensland Australian Institute of Architects State Commendation for Urban Design and the 2012 Queensland 'Great Place' Excellence Award from the Planning Institute of Australia.

The Sinclair Knight Merz (SKM) and Bark design team worked closely together to create a series of components which could be easily fabricated, transported and hot dip galvanized and would arrive onsite ready to erect with no additional cutting, welding or adjustment required.

Alongside SKM, Principal of project architects Bark Design Architects, **Stephen Guthrie** said they were looking for a natural steel finish which had inbuilt protection but also enabled a level of patina to develop to contrast with the painted steel components of the project.

"Unlike steel protected with paint finishes, hot dip galvanizing offers an 'unconcealed' natural appearance where any potential areas requiring maintenance can be easily seen and addressed in the early stages of any corrosion," he said.

"Hot dip galvanizing is also specified on many of our public and residential projects in challenging coastal environments like the Noosa Visitor Information and Mission Beach Community Arts Centre.

"Being able to use steel confidently enabled a faster construction phase, ease of erection with limited labour, minimising safety issues, controlling costs and minimal impact on the existing local transport infrastructure and also allowed for long spans and uninterrupted open spaces."

Architect: Bark Design Architects

Structural Engineer: Sinclair Knight Merz

Building Contractor: Goldings

Steel Fabricator: Scott & Ensell

Metal Building Contractor: Gamlin Roofing



Image credit: Phill Pike

Façade showcases top fabricator

Manuele Engineers office and factory, Adelaide

Manuele Engineers successfully used hot dip galvanizing on the steel façade of their former main office at Clovelly Park but wanted their new main facility comprising around 2,500m² of office and amenities space over two levels alongside a 16,000m² factory to make a similar, but stronger statement about their business.

This was achieved by highlighting the intricate steel fabrication of the new building's façade, enhanced by contrasting hot dip galvanized in-fill panels against dark gloss painted RHS support frame using the same architects.

Senior Architect of project architects Giordano & Associates, **Anthony Giordano** said that as an architectural feature, it was vital the finish was consistent, requiring selection of domestic equivalent steel chemistry from the same steel supplier which also helped to reduce office mass.

"The excellent performance and durability of the previous offices using a similar combination of painted and galvanized steel screen in front of extensive glazing led to it being employed again for the company's new offices," he said.

"For this project for the premier steel fabricator in South Australia sited within three kilometres of the coast in an industrial area close by an airport, we were naturally guided by their 40 years of experience in the supply and erection of steel structures.

"They were responsible for the specification, supply, delivery and erection of all the steel elements and naturally had a major hand in the decision to use galvanized steel.

"The durability and maintenance-free nature of hot dip galvanizing on very complex and intricate fabrications will continue to enhance the surrounding environment long into the future by preventing unsightly rust staining.

"Galvanized, the screen infill elements allowed the items to be pre-made, stored onsite, erected and completed without the need for scaffolding."

The project has since won the Steel Clad Structures category of the Australian Steel Design Awards for its State and was highly commended at the prestigious Intergalva Awards 2012.

Architect: Giordano & Associates

Structural Engineer: Wallbridge & Gilbert

Building Contractor: Pike Constructions

Steel Fabricator: Manuele Engineers



Image credit: Christopher Frederick Jones

Tough digs for Defence

Lavarack Barracks redevelopment (Stage Four), Queensland

Stage Four of the Lavarack Army Barracks upgrade completed in 2010 continued the tradition of award winning designs utilising hot dip galvanizing. The buildings have attracted 14 awards to date including the 2011 RAIA Walter and Oliver Tunbridge Award for Building of the Year for BVN Donovan Hill.

Located on 400 hectares in Townsville, the upgrade involved replacing 1960s era accommodation with modern, well designed facilities to support around 600 Army personnel incorporating more than 80 new and refitted buildings.

The region's tropical conditions made it vital to BVN that the buildings were fast and economical to construct. Off-site application of hot dip galvanizing was preferred for speed, quality and less labour onsite than for painted in-situ applications.

Hot dip galvanizing provides a number of unique advantages for the protection of steel, particularly in an environment like Townsville, where nearly 1.2 metres of rain falls every year delaying many construction projects.

Project architect at BVN Donovan Hill, **Scott Hardcastle** said that the simple robust application, hard wearing, good whole-of-life properties and low maintenance properties made galvanizing the best choice of corrosion protection for this project.

"There were a number of benefits for this specific type of development, including hard wearing for potentially rough use by the Defence force and, in some cases, self-healing where steelwork is scratched/lightly damaged," he said.

"Defence had a mandate on the project to minimise ongoing maintenance and we generally followed hot dip galvanized finish recommendations made locally that require no need for ongoing maintenance or repainting for an extended period.

"It gives a robust finish that resists intense steel rigging onsite where simple paint or powder coat type finishes might be damaged. And the simple, timeless colour pallet of the exposed silver galvanizing matches neatly with the zinc and aluminium wall and roof cladding. Coloured paint systems were likely to date quickly and look tired."

Developer/Owner: Department of Defence

Architects: BVN Donovan Hill, Troppo Architects

Specifier: MPN Consulting

Project Manager: Thiess

Steel Contractor: Cairns Steel Fabrications



Image credit: Richard Glover Photography



Image credit: Richard Glover Photography

Upholding very green park build

Waterloo Youth and Community Centre, NSW

The liberal use of galvanized steel has enabled a former amenities block at Waterloo Oval near Sydney's inner-city suburb of Redfern to be transformed into a built form to resist the corrosive effects of creeping vegetation it is designed to support - smart enough for the building to win the 2013 Sir John Sulman Medal, NSW's highest architectural award for public buildings.

Appearing almost at one with its parkland setting to house a modern workspace and counselling facility, its steel canopy structure was designed as an interlocking, but self-supported element also allowing for the future demounting and relocation of the structure.

Building materials were pared back and simply detailed, the building designed to be robust, low maintenance and long lasting. The steelwork not only needed to support the estimated weight of the 'creepers', but also to withstand the structure being climbed upon for maintenance, imposing greater than just maintenance loads.

"There was need for a long-term, maintenance-free finish for structural steel members and surfaces that will be unreachable for servicing of any kind once the plants have taken over the majority of the structure."

Principal of project architects Collins and Turner, **Huw Turner** said the building was conceived as a kind of collage between architecture, landscape and urbanism with the choice of galvanizing as both corrosion protection system and finish driven by two factors.

"Firstly, there was need for a long-term, maintenance-free finish for structural steel members and surfaces that will be unreachable for servicing of any kind once the plants have taken over the majority of the structure," he said.

"But equally the desire for the building to feel very much part of an urban inner-city environment was important and we took inspiration from common things like crash barriers, railings, roller doors, security fences. We felt that such a building would feel right at home in the middle of the city on the junction of some busy streets and on the edge of a skate park.

"Parts of the building receive a daily punishing from young people using the skate park so the new building needed to be as robust and resilient as possible and take more than a few hard knocks. Given this, a galvanized finish was our first and only consideration.

"The need for speed and ease of erection were also clear factors in the choice."

Client: City of Sydney

Architect and Lead Consultant: Collins and Turner

Structural Engineer: Arup

Builder: Projectcorp Australia

Steelwork Contractors: Performance Engineering Group, LDG Engineering, Woody's Metalwork, E-space Engineering

galvanizers

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We provide information, publications and assistance on all aspects of design, performance and applications of hot dip galvanizing.
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