



ZINC

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galvanize
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Galvanizing in Architecture

FEDERATION SQUARE MELBOURNE

The essence of the city, it is said, is embraced in the architecture of Federation Square. *Whether defined as encompassing the basic nature, or an indispensable quality, much of it is to be found in these visionary structures.* Melbourne has been nominated the world's most liveable city and has now gained a futuristic precinct, which defines both its appeal and its welcome.

Taking the city to the river

The Atrium from Flinders Street



Vision "Federation Square is one of the most ambitious and complex projects ever undertaken in Victoria. It is a complete new city block, the first ever to physically connect the central business district with the Yarra River. Situated at the heart of central Melbourne, Federation Square will be a fusion of arts and events, leisure, hospitality and promenading."

Federation Square Management – The State Government of Victoria has established a management company, Federation Square Management Pty Ltd, to act as client and director of the project and run Federation Square in perpetuity on a commercial basis. The company comprises of a board of three directors, its management team and staff.

Three main cladding materials have been used



Atrium courtyard looking south



DESIGN: Federation Square's design is the product of an international architectural competition won in July 1997 by Lab architecture studio of London in association with Bates Smart Architecture of Melbourne. Atelier One were appointed Project Structural Engineers. The judging panel said of the winning design: "It draws its inspiration from the unique characteristics of Melbourne's arcades and laneways, and transforms these elements into a new form of organization, celebrating the city. The design will invite pedestrians to explore a complex and urban linkage of open and closed spaces, a set of different amenities brought together in the architectural equivalent of Federation"



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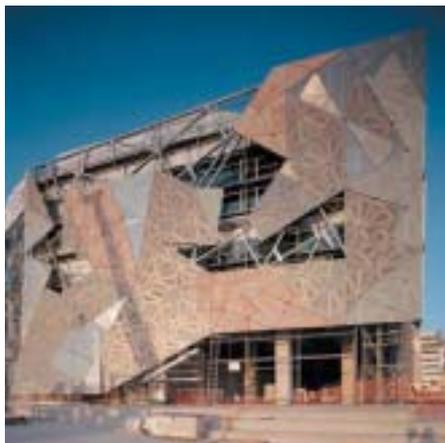
As Federation Square Management describes, "The area is designed with extensive flow, integrating activities across the site, and forming links within it, as well as with the Yarra River, Arts Centre, Southgate and the Central Business District. Federation Square's architectural intent is to generate visual harmony for the site while maintaining differences between its civic, cultural and commercial buildings. The approach creates distinctions through a high degree of surface and material variation. The creative use of the 'pin wheel' triangular grid, in which every panel is exactly the same size with only the orientation changing, as the modular basis for this system allows both façade cladding and frame shapes to be treated in a continually changing visually dynamic way. On the main buildings three cladding materials have been used – sandstone, zinc and glass.



Forming a north-south link from Flinders Street to the Yarra River, the Atrium is a large, high volume public thoroughfare and covered meeting space. This glass-enclosed galleria provides a sheltered extension of the Plaza, and acts as the forecourt to the National Gallery of Victoria: Australian Art. Open at the northern end, the Atrium allows 24-hour access across Federation Square linking the city to the river. The southern half of the Atrium steps down from the elevated level of the riverside promenade, and has been designed to operate as a casual chamber amphitheatre, with an acoustic tuned interior. The open-frame structure of the Atrium has been developed using parts of the same triangular geometry as the facades, but forms a three-dimensional framing system, glazed both inside and outside. The 7,500m² Plaza has been designed as the new civic focus for Melbourne, capable of holding about 10,000 people. The Plaza will be paved with sandstone from the Kimberley region of Western Australia, featuring striking reds, maroons, purple and gold surfaces. Federation Square utilises an environmentally sensitive building design. Innovative air-conditioning has been integrated within the building design to achieve significant, long term cost savings. Underneath the Plaza, traditional passive cooling technologies on a large scale eliminate the need for energy-hungry air-conditioning for the glazed Atrium.”



Part of a liveable city



Steel structures and window spaces

Lab + Bates Smart – Architects Federation Square

Architects: Donald L. Bates – Director

Peter Davidson – Director

Lab architecture studio was founded in London, UK in 1994 by architects Peter Davidson and Donald L. Bates (both directors having first moved to London between 1981-3). Upon being awarded the project for Federation Square (July 1997), Lab established a studio in Melbourne, Australia, to design, document and supervise the construction of this large project, which is now in the last year of its construction.

GAA would like to thank the following companies for their assistance and content: Federation Square Management Pty Ltd, Lab + Bates Smart Pty Ltd and Riband Steel Pty Ltd.

ARCHITECTURAL INTENT

Zinc Galvanizing Interest in the appearance of galvanizing is its appeal as a naturally occurring cast coating with a distinctive metal character. Greater uniformity within certain parameters can be achieved by concerted attention to steel detailing and fabrication.

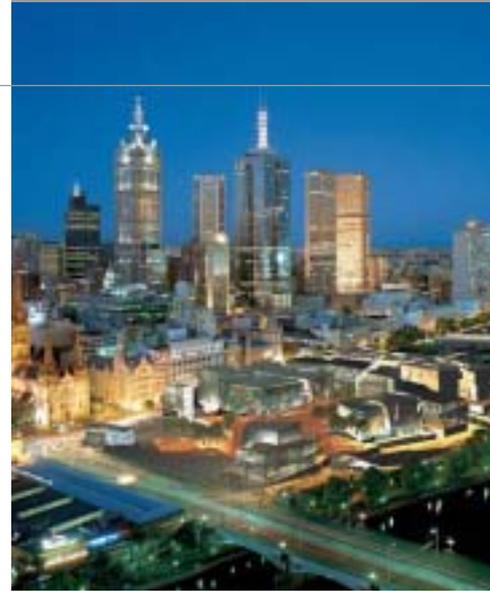
Use of Galvanized Steel A number of buildings form the complex with significant steel involvement in the principle buildings. These are clad in stone, zinc and glass panels of 'pinwheel' shapes fixed to galvanized steel frames usually exposed to view from within the buildings but also occasionally visible from outside through exposed unclad holes.

South and North Atrium Buildings These public interactive buildings are framed in an exposed web of raw galvanized steel, clad internally and externally in 'pinwheel' shaped glass. The South Atrium will provide an amphitheatre, while the North Atrium provides public access to the National Gallery. Arguably this will become one of the most unique buildings in the world. The South Atrium is approx. 50m by 25m by 15m high. The North Atrium is approx 70m by 25m by 20m high with the Northern end at Flinders Street cantilevering 5m above street level for the last 15m of its length. The primary frames and members are fabricated from 200mm square hollow sections with the inner and outer walls a 'web' like structure, non parallel and approximately 1200mm to 1500mm apart. The pinwheel shaped glass is fixed to light secondary steel galvanized exposed frames of the same shape. The primary steel is similarly shaped with more than 250 special individual frames coupled with more than 1000 straight pieces different and individually numbered.

Pre Production and Prototyping Consultations were held with all parties to discuss every aspect of the galvanizing process and its potential impact on the visual and structural criteria of the project. Galvanizing colour and sheen variance between hollow, plate and strip sections were considered. Detailing, such as drain hole frequency, size and location, weld growth and dimensional stability within product design tolerance, were addressed. Steel composition was critical to the appearance outcome and was closely monitored. A disciplined quality assurance program was a common interest and responsibility. As all frames were double dipped due to their size, the galvanizer instituted special procedures at their plant to ensure that all offered standards were maintained under a strict production quality system.

Fabricator Delivery After galvanizing, members were returned to the fabricators' factory for checking and stock piling ready for despatch to site in the required erection sequence. As of October 2001 approximately 90% of the primary steel has been erected into the unique web without the need for any remedial work to any member. In excess of 1,000 tonnes of galvanized steel will be used.

Riband Steel Pty Ltd Riband Steel Pty Ltd of Clayton Victoria was appointed in September 1999 to fabricate and install the Atrium Steelwork and for the facades to the National Gallery of Victoria and SBS Buildings. Riband Steel assembled an in-house team of skilled computer modellers and draftsmen working with the consultants.



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