STEENDYK HOME + STUDIO

ARCHITECTURAL STEEL BUILDING AWARD 2010 (QLD)

Steendyk

Design

With an existing 1875 workers cottage retained, the philosophy behind the addition was to respect the old through contrast, while adapting the building for a new millennium. Steel was the logical choice in illustrating this contrast. From HW350 fencing and laser cut gate, mirrored stainless steel awnings, steel staircase, to the main house structure and rear awning, steel was an integral component in the realisation of this home and studio.

Blurring the distinction between outdoor and indoor on this constrained site, an expanded living space was achieved through the use of a cantilevered steel rear facade and a rear awning that projects 2.7m towards the rear courtyard. The lower section symbolically connects the building to its site, while the delicacy of the steel framed perimeter clerestory punctuates the old and new additions. Steel was highly effective in realising this design criteria.

Innovation in the use of steel

On a tight inner city residential block measuring 10x20 metres, the 1875 worker's cottage has been re-engineered to accommodate 21st century living whilst preserving the historic nature of Spring Hill. In the adaptation, the weatherboard and timber cottage was raised on a bed of steel half a storey. Weathered steel (HW350) was used to earth the composition and to tie disparate elements together such as the entry mail box, the front gate, the rear fence and the main staircase. The main staircase at almost 900kg in weight is supported of two 50x6 equal angles at its base and innovatively affords the studio considerably more working space below the staircase. Mirrored stainless steel has been used as a ceiling surface to bounce and reflect light deep into the studio and entry space. Mirrored stainless steel was also used for exterior awnings that reflect the existing timber weatherboards giving the illusion that the weatherboard wall is continuous.

Efficient use of steel products

The timber perimeter beam of the existing structure was replaced with a 200PFC section with cleats welded to connect to the vertical timber framing. This perimeter 200mm datum was maintained throughout extending to the innovative use of a 200UC beam to span the 7.2m across the living space. Below the perimeter beam, seemingly miniscule steel plate sections and EA sections were used to created a unique clerestorey window. To the rear 100x100 cruciform columns extend up 6m to support the steel framed projecting rear awning. The use of cruciform steel columns also allowed for the 200PFC perimeter structure to cantilever above the northern corner and for the interior space to extend unencumbered when the sliding glass doors open.

Practicality of fabrication

On a constrained inner city site it was imperative that the construction sequence was thought through thoroughly from the outset with the frame divided into sections that could be slid into position and lifted into place. The main staircase was fabricated off-site and craned from the street into position with millimetres to spare. Steel RHS sections were used for the rear awning to capture the corrugated Zincalume roof sheet fixings within the RHS section so they were invisible from below. To tie the steel structure into the concrete base, steel plates with welded ligatures attached were cast into the concrete. This was done to great effect on the carport side where a steel box acts as column, window frame and cantilever support simultaneously.

Aesthetics and attention to details

The slenderness of the steel structure allowed for the maximisation of the aesthetic contrast with the mass of the 1875 workers cottage. The connections were orchestrated to maximise the design life of the structure with appropriate drainage and concealed fixing points. Cruciform, PFC and EA sections were employed externally to create elegant edges, depth and contrast through shadow (RHS sections would not have created any shadow depth or fine edges).

Attention to corrosion protection

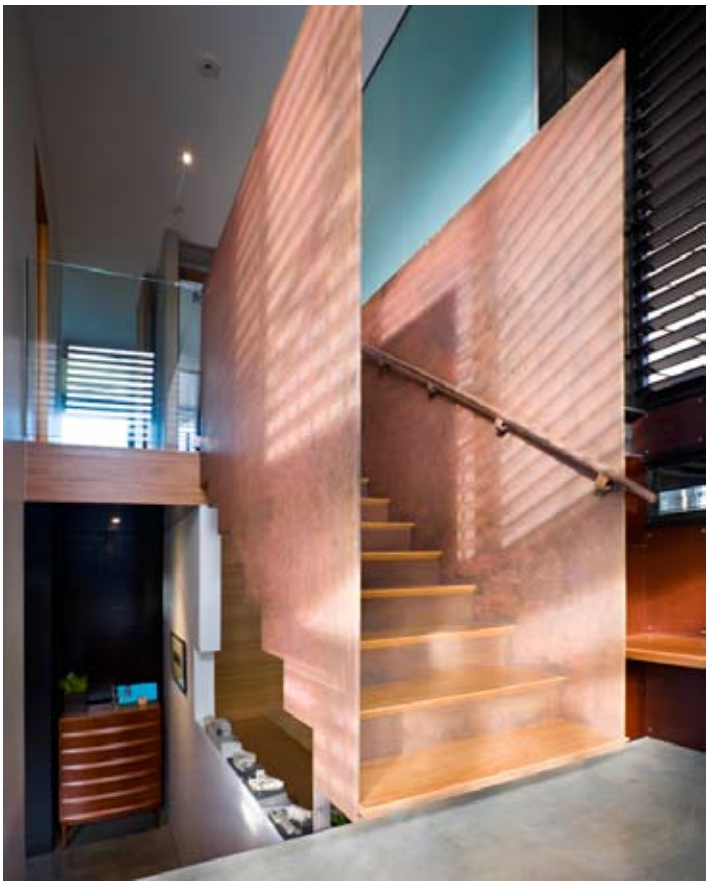
The external coating used in this urban, inner city environment was micacious oxide. To prolong the design life of the steel the detailing of all steel components took into consideration the life of the structure and allowed access to key components for future maintenance/painting. Junctions were carefully considered to encourage appropriate water drainage, in particular the large 300mm wide lintel to the rear that is connected to the bottom flange of the rear 200PFC.

Sustainability

Primary to the embodied sustainability of the project was the life cycle and appropriateness of the material selections, and pivotal to this was the use of steel. To achieve the sustainability requirements of this project, steel is an appropriate material that can be readily recycled in the future, or demounted and reused should that ever be required.

Summary

The project is an innovative application of steel to the domestic environment, creating a dwelling combining industrial construction technology with a fine level of detail and a high quality finish. Steel is utilised both structural and aesthetically to a high degree, maximising floor space and avoiding superfluous structural bulk.



Project team

Architects:	Steendyk (Brian Steendyk and Luke Townsley)
Engineering:	Bligh Tanner Consulting Engineers
Landscaping + Interiors:	Steendyk
ASI Distributor:	OneSteel
Steel Fabricators:	Accurate Welding
	Stanford Stainless Steel
Coating Supplier:	Orica/Dulux