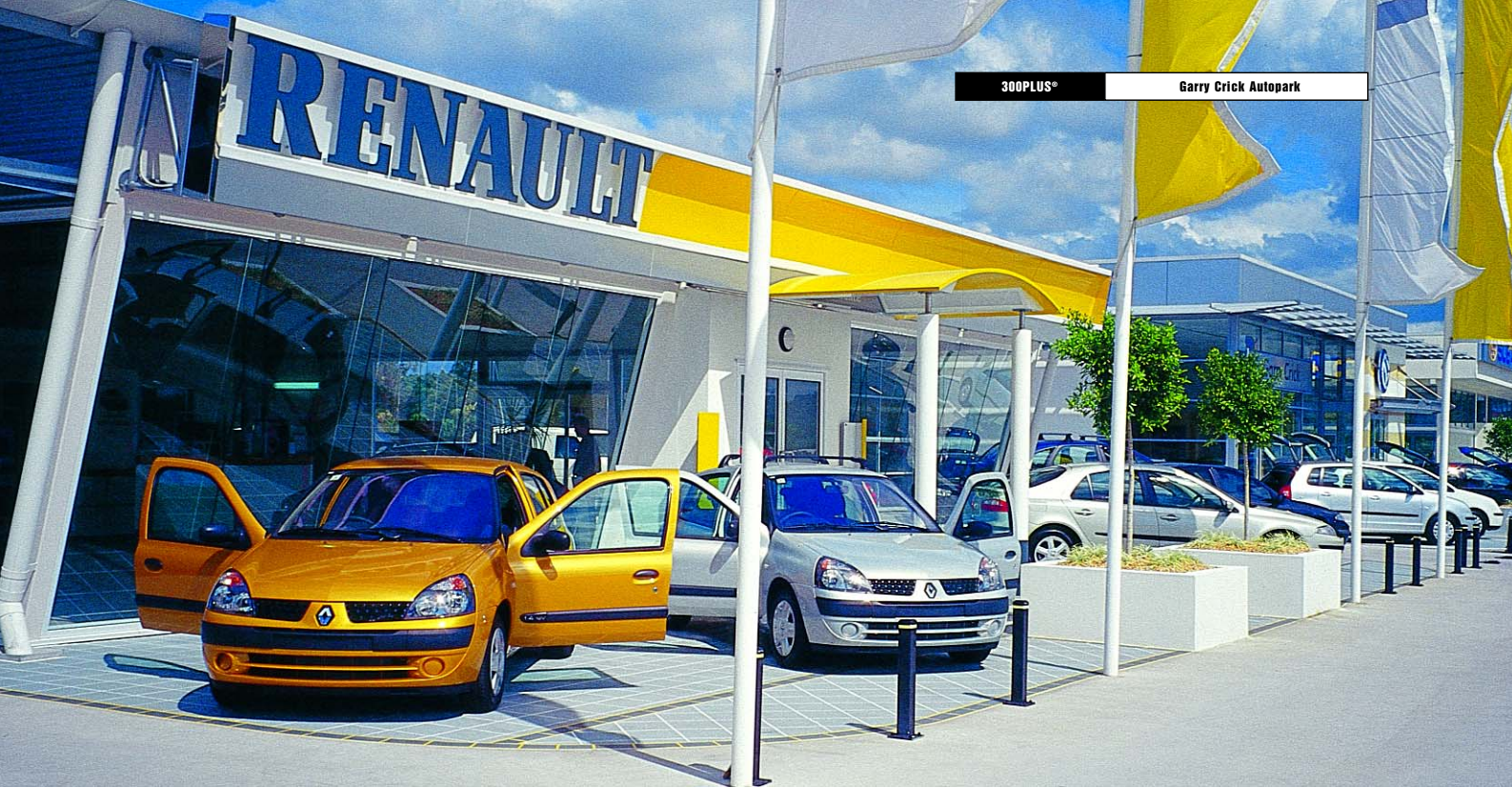


Gary Crick Autopark Queensland

July 2003

This case study was written at the time when InfraBuild (formerly Liberty OneSteel) was part of OneSteel. In that context, in some instances within this case study reference may be made to OneSteel.



Garry Crick Autopark

SLEEK PROPERTIES OF STEEL DELIVERS ECONOMY AND STYLE

The colourful corporate logos of Renault, Volkswagen, Subaru and Mitsubishi flutter at the top of the flagpoles of the new Garry Crick AutoPark and headquarters in Sugar Road, Maroochydore, on Queensland's Sunshine Coast.

Style regulates the new car market, so when the Garry Crick Auto Group needed a new Maroochydore showcase for their prestige car sales and service centre they wanted to reflect the image of the quality cars they sell. But they also needed a building that would house administration and a service centre for the vehicles as well.

Architectural interest was a key requirement to draw in clients. To display the cars to their best advantage and cater for the corporate variations of four different car manufacturers, the showrooms needed high, open column free spaces and lots of light while below in the service centre, floor to floor heights of at least five metres were needed to meet car servicing and delivery operations.

LOCATION

The sloping Maroochydore site lent itself to a two level structure. The land is flat for about 40 metres at Sugar Road but then slopes steeply down an incline and flattens out again to the rear of the property. This enabled one suspended slab to be built back from the road at the point where the land starts to slope. The showrooms are at road level and the service area is underneath. Some fill was needed adjacent to the ramp area.

“Steel provided the ideal material both architecturally and structurally, it also delivered economies over alternative material of up to \$100,000 on the project”



To display the cars to their best advantage and cater for the corporate variations of different car manufactures four distinct showrooms were needed.



(L) A suspended slab at street level accommodates four showrooms with the service area accessed via a ramp to the lower level.

(R) The building from the rear showing the extent of the deck. One suspended slab was built from the point where the land slopes.

“The column free spaces and floor to ceiling heights, large spans and fast construction particularly favoured steel”

CLIENT

Garry Crick
Auto Group

Architect

Unistyle

Engineer

Covey & Associates

Builder

Unistyle

Fabricator

Precision Welding
and Fabrication



Efficient connection
detail contributed significantly to the construction
cost saving.



DESIGN

Tony Schofield, Unistyle's designer on the project has developed an impressive aesthetic structure, both inside and out of the showrooms. “The curved roof structure over the Mitsubishi and Renault showrooms has curved RHS rafters at six metre intervals. Unusually the purlins are on the same plane as the rafters and together form a support grid for the exposed pressed steel roofing. We angled the external support columns for design affect”.

Below the logo outside the Volkswagen showroom a curved steel portico supports the glazing cover. “On this project we used fully galvanised steel framed awnings as they were more cost effective than any of the other material alternatives”

Tony Schofield said that: “Early in the concept and design of the project it became evident that a steel framed structure could not only deliver architectural interest but would be cheaper and faster to construct than pre-stressed in-situ concrete. Steel could also accommodate design changes during construction. The column free spaces and floor to ceiling heights, large spans and fast construction particularly favoured steel.”

As the design developed, Unistyle formed a working group with the engineers, Covey and Associates, BHP Building Products, OneSteel Market Mills and Precision Welding and Fabrication to develop and assess the steel framed option for the project.

Precision Welding and Fabrication, costed the various steel options during design, and their shop drawings and erection capabilities became key factors contributing to savings and a successful project.

This teamwork at the early stage of the design was a major factor in the successful completion of this project.

What evolved is a purpose built car sales and service centre designed so that the structure has the least impact on the movement and servicing of cars. This was achieved by locating the columns in between the car bays on the lower level and at either the front or rear of the car bays.

Tony Schofield said that: “While steel provided the ideal material both architecturally and structurally, it also delivered economies over alternative material of up to \$100,000 on the project.”

Chris Camp, the Covey and Associates Engineer on the project said that: “The plan of the steel framing layout combined the strength and deflection efficiencies of continuous composite construction with stock length beam sizes. This reduced wastage and/or supply lead times. The maximum primary beam span is 11.5 metres and the typical simple supported secondary beam span is 12 metres. These beams were designed as composite beams.”

Commenting on the design process Chris Camp said that: “The costs factored into choosing whether to use a composite or non-composite beam were: steel supply, surface treatment, camber, shear studs and shear reinforcement. For secondary beams with less than a 9 metre span, it was more economical to use non-composite design, as the savings in shear studs, reinforcement and eliminating camber outweighed the extra steel supply and surface treatment cost for the bigger beams”. Carefully planned, economical connection details also contributed significantly to the construction cost saving.

The 610UB 300PLUS® continuous composite beams were compared in the design phase to the simply supported alternative. The design team identified the following advantages of the continuous option:

- 1 Reduced deflection negating the requirement to camber the beams
- 2 Provides a shallow section reducing the façade costs
- 3 Results in a lighter more economical section.

Structural steel – delivering architectural freedom and significant cost savings

Normally these benefits would be offset by additional fabrication costs associated with continuous beams, however, as this was the top floor of the building the continuous beams were designed to simply run over the top of the columns.

The unpropped Bondek II slab is 130mm thick (compared to the usual 120mm) to more easily achieve the required cover to reinforcement. The floor is approximately 119 metres long by 35.5 metres wide with an expansion joint 48 metres from one end of the floor.

Diagonal bracing and masonry walls provide the necessary resistance to lateral loading.

Because of its location, 1km from the surf, a coating of inorganic zinc silicate was applied to the steel.