



Smart way to transform trash to transport base

Willawong Bus Depot, Brisbane

Deft project planning allowed a major new bus servicing centre on the site of the former Willawong Waste Disposal to be constructed taking advantage of economies of scale particularly with regards to steelwork detailing to deliver the project to budget and on schedule.

The bus depot development comprises several different buildings spread over a six hectare site including a 3500sqm workshop to service buses, an administration depot, a vehicle refuelling and detailing facility, a generator building, a natural gas storage building and refuelling building for over 200 buses.

All of the buildings within the depot were either braced frames in both directions or braced frames in one direction with portal frames in the other. This allowed for straightforward erection using minimal temporary propping with the buildings installed and connected using small forklifts and cherry pickers.

The garage refuelling building consists of a lightweight structure comprising a steel braced frame and portal frame combination and the administration building has a lightweight steel braced frame.

Other structures such as the generator and CNG gas storage building include load bearing blockwork walls with a lightweight steel framed roof over. Some small ancillary shelter and canteen structures use lightweight steel braced frames.

The 3500sqm floor area for the workshop building gave the opportunity to provide as much symmetry and repetitive framework as possible, resulting in enhanced economy of steelwork detailing and fabrication.

The majority of joints were simple cleat and bolt connections which reduced steel fabrication costs. An example of this is a typical 27 metre by 14 metre wide garage bay which was repeated another eight times along the 150 metre long building. This typical bay

comprised two portal frames with two perimeter cross beams and a simple intermediate rafter which reduced the continuous purlin span to an economical 6.5 metres in length.

The gas tank change platform within the garage building was detailed with a repetitive framework of SHS columns and PFC beams braced with rods. The decking used was steel gridmesh and CHS tube hand rails.

The design of the administration depot buildings focused on using simple consistent connections to form a series of Meccano-style buildings. With suitable steelwork shop detailed it was able to be fabricated and erected easily with no site welding or other rectification required.

The administration building within the main garage structure incorporated a braced frame formed with tubular sections and angle cross bracing.

Another innovative structural steel solution delivered on all buildings at the bus depot was the use of a typical corner cantilever assembly.

This assembly detail involved the use of back-to-back steel purlins as structural members to support regular purlins at the corners of the buildings. This reduced the total depth of structure as requested by the architect to provide an aesthetically pleasing edge detail used throughout the project.

All external connections were specifically detailed to minimise corrosion and water ponding. An example of this was using a 50mm recessed mortar bed for all base plates with additional 50mm non-shrink high-strength grout over. This detail ensures water proofing and long-term corrosion protection.



Future proofing the development was a foremost consideration. The depot's efficient modular layout and purpose-built design also paves the way for the design of future depots.

With the amount of simple, cleated connections utilised on the various buildings within the bus depot there is a real option for reuse through easy demountability. This will also be useful for any future extensions that may be requested by the users and clients alike.

"Through the use of such measures as sensible selection of lightweight materials and cladding, the project team has produced an impressive and functional facility that will require minimal long-term maintenance to the primary structural elements," said Brisbane City Council Design Manager, **Brian Mahon**.

Project Team

Architect: City Design, Brisbane City Council

Structural Engineer: Arup

Head Building Contractor: Laing O'Rourke

ASI Steel Manufacturer: OneSteel

ASI Steel Distributors: OneSteel Steel and Tube, Stramit Building Products (purlins)

Steel Fabricators: Brown Steel, Craig's Engineering

Steel Detailer: Draftology

Coatings Supplier: International Paint

Galvanising: Industrial Galvanizers

