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STRUCTURAL


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BISALLOY® steel Wins Popular Vote In Parliament Contract

MARKET: STRUCTURAL

Construction of Northern Territory Parliament House, with views of Darwin Harbour, presented unusual design and time-frame challenges for the civil and structural engineers, Sleeman, Dunkley, Treacy, Maunsell Pty Ltd. Because of its tropical location, the design called for stringent consideration of climatic extremes, especially the ability to withstand cyclones. The speed of steel erection to allow the completion of the roof before the wet season set in, was another major factor.

The Parliament House project was originally designed in Grade 250 and 350 structural steel. Before accepting final tenders the project engineers investigated an alternative design based on BISALLOY® 600 MPa high yield strength structural steel. They found the total tonnage of steel required could be reduced from 575 tonnes of 350 grade to only 358 tonnes of the BISALLOY® steel product.

Construction manager Multiplex proceeded with the new design as significant savings were demonstrated by using BISALLOY® steel. Substituting 16mm BISALLOY® steel for 28mm grade 250 steel, for the webs of plate girders, gave savings of 68 tonnes of steel.

The combination of reduced plate thickness and cross sectional area required less weld pre¬paration, with a saving in consumables and welding time, Lighter mass of columns and girders also meant lighter crane lifts thereby being able to lift longer columns.

High Strength Structural Steel

Functional Design

The new parliament house is bisected by an imposing reception hall with 13.5m ceiling reaching to level five. The main entrance, at level two, is flanked by the library and the parliamentary chamber. Level three has a pedestrian concourse around the reception hall providing access to press, public galleries and offices.

Expert Techniques Utilised

Transcon Pty Ltd. (Darwin) won the contract to supply and erect all structural steelwork and decking. Their spokesman, Mr. Jack Stansfield, said " BISALLOY® steel offered some challenge in the steel preparation and establishment of the WE31d procedure. Initially we used an imported welding wire but we were able to perfect a welding procedure and use an Australian-made welding wire consumable from Lincoln Electric.

The contractor used a total range of welding techniques, minimising manual metal arc and maximising flux cored arc weld. Sub arc welding was used extensively on columns and plate beam girders.

Column corner welding consisted of full and partial penetration welds, achieved by multi-pass sub arc welding. Full penetration welds were used for plate beam girder web to flange connections, with a single pass sub arc both sides of the web.

Meeting The Challenge

The BISALLOY® steel used in the Northern Territory Parliament House was supplied to Transcon through Tubemakers Metalcentre, Darwin. Plate stripping, edge bevelling and final squaring-off of column ends was undertaken at Tubemakers, thus assisting the steel fabricator to meet strict time constraints.

The Winning Team

Gaining approval to supply the high strength structural steel for this project is yet another recognition that the steel industry is able to capably meet challenges of the construction industry both now and in the future.

A big job and a massive effort by all concerned, including the following:

Meldrum Burrows Partners Pty Ltd, Melbourne,(Design Architects) in association with MLE & D Architects, Darwin.

- Tipperary Developments Pty Ltd. (Project Manager).
- Multiplex Constructions (NT) Pty Ltd. (Construction Manager).
- Sleeman, Dunkley, Treacy, Maunsell Pty Ltd., Darwin, (Civil & Structural Engineers).
- Transcon Pty Ltd., Darwin, (Fabrication and steel Erection).
- Tubemakers Metalcentre, Darwin, (Suppliers of BISALLOY® steel).

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