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# Zinc Galvanizing in Mining

58  
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## WORSLEY ALUMINA EXPANSION PROJECT



### FEATURED IN THIS ISSUE:

WORSLEY ALUMINA  
EXPANSION PROJECT  
Western Australia

2002 PASMINGO SOREL AWARD  
FOR INDUSTRY ACHIEVEMENT

DECORATIVE GALVANIZED  
STEEL—THE IMPACT OF COLOUR

After-fabrication galvanizing plays a critical role in value engineering design by influencing:

- schedules
- quality
- project control
- contract co-ordination
- risk reduction

**galvanizers**  
ASSOCIATION OF AUSTRALIA



# WORSLEY ALUMINA EXPANSION PROJECT Western Australia

## Outline of Objectives

The purpose of the Worsley Joint Venture extension was to increase refinery capacity from 1.88mt/pa to 3.1mt/pa at minimal cost, within the shortest project duration. To achieve the objectives required innovative process and plant design, creating an obvious opportunity to introduce the latest technology.

During the feasibility study for the new plant, existing construction practices were carefully scrutinized with the object of finding maximum efficiencies to establish economic justification.

Existing methods and materials were re-examined and previous industry standards challenged to find the optimum specification.

## Planning and Construction

As reported by the Australian Steel Institute's Manager for Western Australia and South Australia, Rupert Grayston,

"The construction manager for the project was the Kaiser Bechtel Joint Venture (KBJV) with United Constructions, the main steel fabricator, being part of the integrated team.

The project was completed without interrupting the operation of the existing plant where work included extension of currently operating units.

Accurate and timely supply was critical to meet the tight requirements of the program, which included the delivery of 8000 tonnes of structural steel work over a 12-month period.

The success of this planning was confirmed by achievement of a series of key performance measures ranging from high quality fieldwork through to time and material savings.

KBJV used 3D structural modelling software coordinating with detailing and fabricator's software to manage stocks and for numeric controlled process machinery".

According to Chief Structural Engineer, Paul Rushton, "The 3D technology applied simultaneously to design and detailing allowed the structures to be built in 'virtual reality' in the design office, with concurrent referencing of the models from the other disciplines. In this way no surprises occurred later on-site, and fit-up to existing structures was excellent."

"The design process was completed by re-importing the steel detail model back into the 3D process. In this way, clashes with the components of other

disciplines such as chutes, equipment, piping etc were eliminated," said Rushton.

## Steel Protection

In the context of the design upgrade, past practice had been to avoid metallic coatings for steel protection. This had been done on a precautionary basis and with respect to the chemicals used in the alumina process.

However on examination of existing galvanized items dispersed throughout the plant, such as cable trays and other steel auxiliaries, excellent service life was proven, prompting its consideration in the reassessment.

Particular value was found in galvanized steel handling capability, solar radiation (UV) immunity, sharp edge protection and other characteristics complementary to the design capability of steel.

Also of significance, after-fabrication galvanized coating confers environmental cleanliness, sustainability and a wholly Australian content system.

Collectively these contributed to construction efficiency and to low life cycle cost and led to its adoption for the project.

## Summary

Rupert Grayston commented that "The Worsley experience has shown that an intense focus on Total Installed Cost is the meaningful project management parametric of the new workflow.

In addition to the cost benefits, this new approach offers:

- Schedule improvements
- Quality improvements
- Improved project control
- Contracting flexibility
- Reduced risk

The Worsley Expansion Project has represented a significant step forward in new technology utilisation for the steel construction industry. As software products and integration techniques continue to advance, and as subsequent projects further push the boundaries, the performances of Australian projects and industry will continue to improve."

## Acknowledgements:

Paul Rushton, Chief Structural Engineer, Kaiser Bechtel Joint Venture (KBJV)

Rupert Grayston, Western Australia and South Australia State Manager, Australian Steel Institute

