

AAM Industrial Surveyors deploy award winning precise methods for a 'Measure, Monitor, Mapping' campaign at BlueScope Steel.

AAM Industrial Surveyors are tasked with a variety of projects that involve measuring accurate 3D as-built information about a structure, deformation monitoring of surfaces subject to wear and mapping objects in motion. This case study describes a package of works, 'Measure, Monitor, Mapping', undertaken on BlueScope Steel's Number 5 Blast Furnace Reline Project at Port Kembla. This case study demonstrates some of the methods that AAM regularly deploys across other sites where accurate 3D as-built information, surface deformation monitoring or just generally difficult surveys are required.

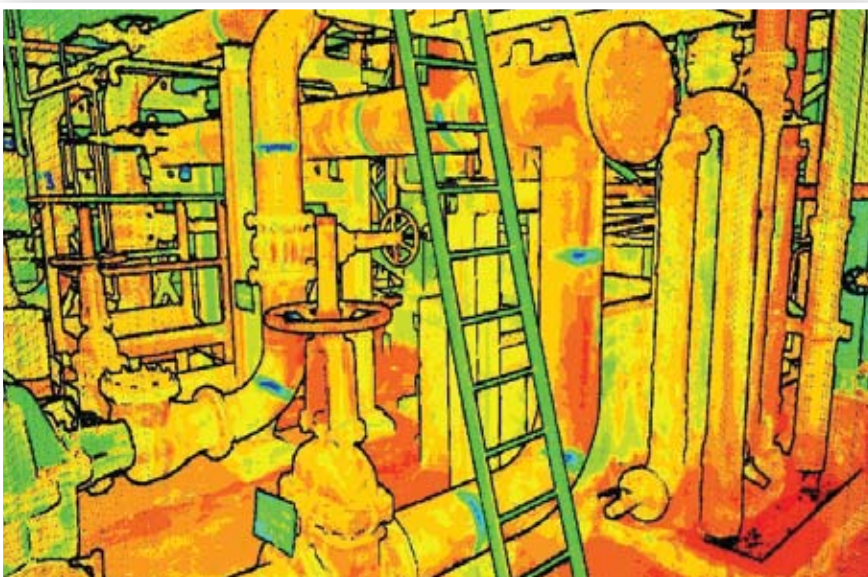
Key Project Features and Benefits of AAM's Industrial Measurement:

- Multiple instruments for performing millimetre-level measurements to a variety of surfaces
- Terrestrial laser scanners (TLS) for fast 3D 'as-builts' at $\pm 5\text{mm}$ that easily integrated into common CAD packages
- Close-range photogrammetry for remote measurement at $\pm 0.1\text{mm}$
- Industrial metrology software for fast turn-around deformation analysis and
- Over 120 scans, one billion points, 7000 conventional survey measurements, 728 photographs

Measure

The 'Measure' component of the project describes a large TLS campaign to create a high-accuracy 3D as-built of the furnace from top-to-bottom while the furnace was operating. Multiple terrestrial laser scanners were deployed for a fast 3D survey of the entire Number 5 Blast Furnace.

Over 120 scans were captured during furnace operation. The accurate and dense point data was used with CAD design software as an as-built reference. It was hot, gaseous and dusty with limited access, however, it was executed without incident.



Above: High-resolution 3D point cloud.



Above: Scanning in tight and complex environments.

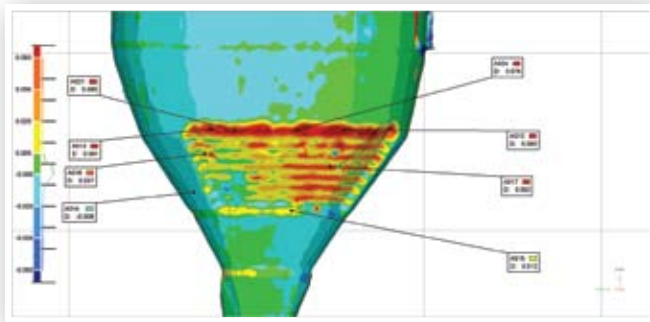
'Measure, Monitor, Mapping' Project Industrial Measurement Case Study



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Monitor

'Monitor' was the part of the project whereby deformation monitoring of some key structures and computation of wear using digital close-range photogrammetry and TLS techniques were executed.



Above: Surface deformation analysis of the interior of a material bin and impact bars using specialised metrology software and dense 3D point cloud data.

Right: A pair of digital cameras installed to photograph the raw material as it enters the furnace.

Mapping

'Mapping' was the final survey task of the Reline Project; an innovative digital close-range photogrammetric activity to map the trajectory of hundreds of tonnes of raw materials entering the furnace over a 36-hour period. There was only one opportunity to get this right.



An Award Winning Project

AAM's innovative capabilities have been recognised with the receipt of two awards at the 7th Asia-Pacific Spatial Excellence Awards. These Awards celebrate the pinnacle of success for the spatial industry and are jointly hosted each year by the Surveying and Spatial Sciences Institute and the Spatial Industries Business Association. The industry Awards focus on the excellence of organisations throughout the Asia-Pacific region during 2010.

AAM was the recipient of both the 'J.K. Barrie Award: Best Industry Project of the Year' and the 'Infrastructure and Construction Award'. The J.K. Barrie Award represents the pinnacle of achievement in the spatial industry and is the highest award the judges can confer. The 'Measure, Monitor, Mapping' project was considered by the judges to be one of the more complex tasks undertaken in its field. The judges commented that this winning project was an excellent demonstration of how surveyors have adapted their knowledge and experience to capture high quality measurements within a short time frame under hazardous conditions. In the state-based, lead-up awards, AAM also won the category and overall prize, the Sir Thomas Mitchell Award at the 2010 New South Wales EISSI Awards.



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