Minimising costs and maximizing benefits with multi-purpose heritage site 3D model

KANE was commissioned to complete a partial restoration and refit of the Victorian Police Stables building. This heritage site is being redeveloped to create art studios, staff offices and a performance and exhibition space for the Victorian College of the Arts, located in the University of Melbourne. Some of the site's heritage features will be preserved such as its red brick façade and it unique octagonal roof and skylight.

The Challenge

Updating old and inaccurate data to save time and money during redevelopment

The Police Stables were constructed in 1912 and there is little existing spatial information. Inevitable changes over time, such as bows and deflections in its steel structure need to be surveyed to support good design. The building – also referred to as the "octagon" - has a unique octagonal shape, requiring the support of a complex steel structure.

KANE therefore required:

- Access to more accurate and up-to-date spatial data of the site and a cost-effective method for capturing the new spatial data;

- The production of pre-fabricated steel for the building's steel reinforcement design - a process that would also rely on the new, more precise and up-to-date spatial data; and

- Delivery of the spatial data in a format that could be used by multiple consultants, such as architects, engineers, designers, fabricators etc.

The Results

Delivering spatially accurate data to maximise efficiency of design and construction

The provision of spatially accurate data and its delivery in the format of a 3D model benefits KANE in numerous ways including:

- Minimising the potential costs of on-site fabrication and edits of the structural steel support, as the precise spatial data extracted from the 3D model enabled the steel to be pre-fabricated with a high level of accuracy;

- Maximising the use of time and resources; the data was captured in just one visit yet still yielded a model that could be used multiple times by multiple users; and

- Delivers additional valuable information not specifically requested, through further data extraction. For example, KANE requested more detail of the steel gusset connections after the initial model was supplied. AAM extracted these attributes from the original point cloud data capture and therefore did not need to revisit the site or conduct further scanning.

The Solution

Laser scanning the site and producing a 3D model

AAM conducted a complete laser scan of the site.

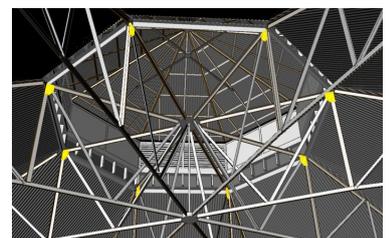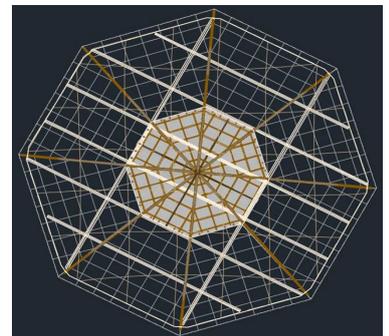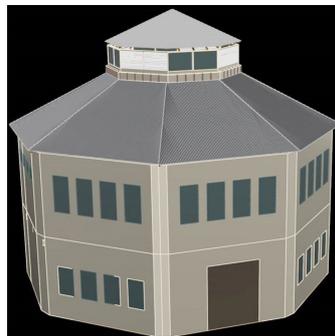The captured data from the scan was then used to produce a 3D AutoCAD model. This process entailed:

- Scanning from the outside, underneath and internally to obtain all the data necessary to model the trusses, walls, beams, window openings and structural elements, all at LOD200; and

- Modelling the steel structure as a 'live' object due to its distortion and the fact that it was not consistent in shape or size.

To find out more - email info@aamgroup.com

The data captured from the 3D laser scan was used to produce all of the above 3D AutoCAD images, which were integral in the design and construction phases of the site's redevelopment.