



FEATURE:

PROJECTS TO BE PROUD OF







- ▲ Secondary trusses span between primary trusses and cantilever over the northern and southern buildings.

Award-winning ETFE atrium roof

96 RISSIK STREET, JOHANNESBURG

This Johannesburg central business district (CBD) refurbishment project masterfully blends heritage preservation with cutting-edge engineering.

The refurbishment of the historic 96 Rissik Street building in Johannesburg's CBD presented a unique engineering challenge – integrating a contemporary atrium roof onto an existing heritage structure.

Now home to Transnet's head office, this project earned top honours at the 2025 Steel Awards in the tubular and innovation and sustainability categories.

RESTORATION OF HISTORIC SPACE

96 Rissik Street in Johannesburg was originally designed by Thomas Moodie as the administrative headquarters for Central African Railways.

Constructed in the early 1900s in several phases, the development ultimately created four building blocks surrounding a central atrium space.

A key component of the building refurbishment was the reinstatement of the central atrium space. To maintain the open-air character of the original courtyard and protect the space from the elements, a transparent cladding material was required.

PROJECT OVERVIEW

The objective was to create a lightweight curved roof spanning the entire courtyard atrium, supported on four columns.

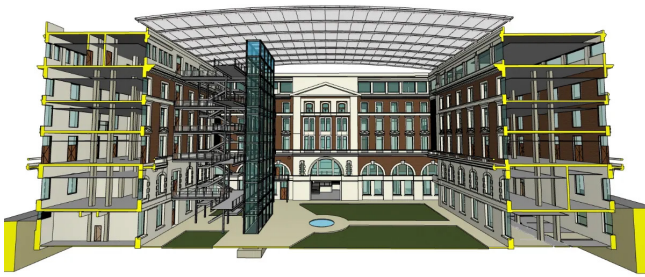


Lightweight
Engineered
Architectural
Features

A leading design build specialist for clad architectural feature elements. Africa's no.1 resource and expert on structural glazing and ETFE cladding.

- ▀ Providing a full range of services from Concept Development through
- ▀ Engineering + Fabrication to Supply + Installation.
- ▀ This single source approach ensures the feature elements on new and refurbishment projects are well executed and are built within a budget.

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- ▲ The structural design called for a predominantly self-supporting steel structure to transfer minimal load to the existing building. Rendering: Osmond Lange Architects & Planners

Due to the weight limitations on the existing building, four tree columns were introduced to carry the new roof loads. The atrium roof is 40m wide by 50m long in plan and comprises a series of orthogonal primary and secondary 2D steel trusses.



- ▲ The roof plan is supported by striking steel “tree columns”.

Each primary truss spans 50m in the east-west direction and is supported at 10m intervals by branching tree columns, which connect to one of four 23m-long primary steel columns.

The secondary trusses span between the primary trusses and, at either end, cantilever over the northern and southern buildings. Horizontal in-plane bracing was incorporated to stiffen the structure and facilitate the transfer of lateral loads to the columns and existing eastern and western buildings.

CLADDING MATERIAL

The existing building could not carry much load. As a result, the original glass roof concept with a thrusting design was changed to lighter ethylene tetrafluoroethylene (ETFE) cladding with a non-thrusting design.



- ▲ The original design of a glass roof was changed to lighter ETFE cladding with a non-thrusting design.

Atriums



Canopies



Skylights



Façades



ETFE weighs approximately 1% of what glass does, which significantly reduced the dead load imposed on the existing structure. Engineering and ETFE design specialist, LEAF Structures, noted its superior strength-to-weight ratio, ultraviolet (UV) stability and thermal performance characteristics.

Additionally, its high tensile strength enabled longer spans, which resulted in a lighter steel structure and fewer joints between individual ETFE cladding panels.



- ▲ The long-span, lightweight structure has minimal on-site connections.

WEIGHTY CHALLENGES

The new atrium roof required the structural design of a predominantly self-supporting steel structure to transfer minimal load to the existing building. Four primary steel columns were therefore introduced to carry the majority of the atrium roof loads.

The primary columns are 23m long and were fabricated as a single continuous piece without splices, with non-destructive testing ensuring full penetration welds met specified standards. These columns had to be made by using 2 x 12m standard lengths to shop join and weld before being sent to the site.

The full length of the tube had to be placed on specially made supports, with rubber wheels perfectly aligned to keep the tube straight when rolling the pipe slowly while welding. Due to the size of the columns, Rissik Street needed to be closed for the installation of these columns.



- ▲ Installation required closing Rissik Street due to the size of the columns.

FABRICATION PROCESS

The majority of the steelwork was fabricated into 10m long sections at Tass Engineering's factory. The truss internal tubes were laser-cut with a tube laser to ensure a perfect, clean fit.

Once the individual roof components were fabricated, each of the four main roof quadrants was pre-assembled upside down at the workshop by means of purpose-made jigs supporting the structure. The roof was pre-assembled, complete with the primary branch columns and main column cap plates to ensure correct alignment.

The rotation between the base plate and the cap plate had to be perfect to ensure the branch columns fit snugly to the gusset plates when erected. Special scribe lines, locating holes and



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slots were used to make sure the steelwork lined up perfectly.

The cap plate and gussets were laser-cut with special holes and unique nibs to ensure the plates are all in the correct position.



- ▲ Most components were manufactured into 10m sections at Tass Engineering's factory.

PROJECT SNAPSHOT

- Location: 96 Rissik Street (heritage office building, early 1900s)
- Current use: Transnet Head Office
- Location: Johannesburg CBD, Gauteng
- Awards: 2025 Steel Awards – Tubular and Innovation & Sustainability categories
- System: Lightweight steel atrium roof with ETFE cladding
- Tonnage: 82 t structural steel
- Cladding area: 1 840 m²
- Detailing and project management: LEAF Structures.
- Architect: Osmond Lange Architects.
- Structural steelwork contractor: Tass Engineering.

ATRIUM & STRUCTURAL STATS

- Atrium courtyard covered: approx. 47,8 m × 31,6 m
- Roof in plan: approx. 40 m wide × 50 m long
- Primary truss span: 50 m (east-west)
- Support pattern: primary trusses supported every 10 m on branching "tree columns"

MAIN COLUMNS:

- 4 primary steel columns
- Approx. 23–24 m long
- Founded on new concrete pile foundations



- ▲ Andrew Spottiswoode MD of LEAF Structures receiving the 2025 Steel Award – Tubular and Innovation & Sustainability categories.

A STEEL SOLUTION

Using steel, the team could create a lightweight, long-span structure with a high degree of accuracy and limited on-site connections. This thoughtful, lightweight steel solution created an elegant structure that enhances a prominent Edwardian landmark.

Acknowledgement and thanks go to [SAISC](#) and [LEAF Structures](#) for the information in this article.

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