



» ON SITE

ROOFING «

FUTURE ROOFING



The construction of Newtown Junction required a roofing solution that would connect some of Johannesburg's oldest commercial structures, with a 21st century retail concept.

Newtown Junction is situated in the cultural district of the suburb Newtown in the heart of Johannesburg, next to the Museum of Africa and the striking 1913 Edwardian building that was redeveloped into the popular Market Theatre. This multi-level development offers a vibrant 36 000m² shopping centre, 30 000m² of office space, gymnasium and four basement levels providing a total of 2 400 parking bays. Newtown Junction signals both the growth of Johannesburg's city centre as well as the renewal and revival of the city in a way that preserves its heritage and history.

The project team met with three major challenges during the refurbishment: maintaining the integrity of the 'potato sheds' structure; careful consideration of heritage structures and the inputs of multiple stakeholders; and accommodating existing steel structures. The design team

adopted a hybrid approach consisting of partial restoration, partial replacement and partial additional strengthening.

An integral part of this development was the restoration of the long-neglected 'potato sheds' and old railway pedestrian bridge. Both were granted heritage status by the SAHRA. These steel structures were originally designed and built in 1910 for the purpose of storing vegetables and fodder that were distributed to fresh produce markets across the country by rail. The integrity of these historic structures was kept intact by creating a structure that connects the past, present and future.

The decision to re-use and restore the potato shed steel structure proved the least intrusive construction method with all the structural steel repairs and manufacturing, taking place off-site. The existing steel structure was kept largely intact with the

addition of new steel sub-elements to stiffen the trusses to suit the adaptive re-use of the sheds to that of a contemporary shopping centre.

The building is partly situated under the elevated M1 Highway, which required a very unique geometry in order to accommodate the existing highway piers. Some sections of the structure's roof are only three to four metres below the highway.

Furthermore, the floor level of the lower retail level is up to 3m below the founding levels of the highway piers and columns. This meant the construction had to be isolated while building around these existing piers and columns.

A lateral support system was designed to protect the bridge piers, to ensure that the safety of motorists was not jeopardised. A roofing system was also developed to cater for storm water flooding from the highway in these areas.

While the architectural restoration approach was simple in its intent, the careful and time-consuming process of surveying, documenting, dismantling, auditing, restoring and re-assembling proved extremely challenging to achieve, requiring considerable care and commitment from all of the role-players.

Although not so widely used on modern retail developments nowadays, the use of corrugated steel sheeting conformed and aided in capturing the heritage nature of the 'potato sheds' by maintaining the original look and feel of the structure.

The roof structure comprises of 13m long double-pitched steel trusses covering a total of 4 600m². The reinstated old railway pedestrian bridge was adapted to serve as a fire escape for the adjacent Market Theatre.

The development feasibility demanded several levels of underground basement parking, which placed the 'potato sheds' structures at risk. The heritage authorities approved the application to dismantle the sheds in order to construct the basement - provided they were restored and re-assembled in their precise location afterwards.

Continued next page »

The structures were carefully surveyed on site through a complex auditing process that saw each element numbered, labeled and documented, so that it could be identified and re-installed in its correct location later. Following the dismantling process, the structures were transported to a workshop facility for storage and restoration.

An initial desk-top structural analysis revealed that most of the steel truss lacing members exceeded the slenderness requirements stated in SANS10162. The increase in live load and dead load from added required services and materials would also contribute to the structure's load tolerance requirements. To strengthen the steel structures, a stiffening procedure was implemented, which entailed the strategic positioning of flat bars welded onto the existing steel elements. These flat bars improved the structural properties of the elements without impairing the heritage nature and aesthetics of the steel trusses.

With the potato sheds being repositioned onto a reinforced concrete floor at a new level, a number of the existing steel columns had to be extended to offset the previous sloped geometry of the structure. To draw a distinction between old and new the joining connections were kept visible. The 'potato sheds' were originally designed as a shade structure and was not weather proof. New down pipes were fitted strategically into the expressed structure of the old sheds trusses and steel column system.

Lightweight stiffened steel framed drywalls and glass shop-fronts were used for the vertical facades along the perimeter of the potato sheds. The facades were designed in such a manner to maximise the visual impact of the overhead potato shed trusses while ensuring a safe and weather-tight structure for its occupants. This heritage-inspired project will make Newtown Junction a go-to destination for the people of Johannesburg as well as visitors to the city.



Project Team

Client: Atterbury Property Developments (Pty) Ltd

Architect (Heritage): MRA Architects (Pty) Ltd

Architect (Retail): LPA Architects (Pty) Ltd

Architect (Principal): DHK Architects (Pty) Ltd

Structural Engineer: Aurecon South Africa (Pty) Ltd

Quantity Surveyor: Norval Wentzel Steinberg (Pty) Ltd

Project Manager: Metrum Project Management (Pty) Ltd

Main Contractor: WBHO construction (Pty) Ltd

Steelwork Contractor: Braam Staal

Detailing Company: Braam Staal

DOING THE RIGHT THING

Marley Building Systems is redefining building methodology with innovative, sustainable and complete building solutions as South Africa and the rest of the continent transitions from traditional construction to more economical and environmentally friendly lightweight building technology.

"Doing the right things for the right reasons is the message and philosophy we want to drive home," said Mark Irving, Managing Director of Marley Building Systems in South Africa.

Marley Building Systems is geared towards the future of alternative building technology as part of the company's commitment to creating long-term value in a sustainable and responsible way.

Marley Building Systems is the South African subsidiary of Belgian-industrial group, Etex, incorporating the local Lafarge Gypsum business

since November 2015. The 100-year-old history of Etex is ambitious and marked by focused diversification both geographically and in product range. Their dry construction solutions are 100% recyclable or recoverable.

"We go to great lengths to continuously improve our business structures, processes and tools to achieve operational excellence," Mark said.

"This includes our ISO14001 certification and environmentally friendly practices that minimise wastage and ensure sustainability. The amount of raw materials, water and energy used by our products is constantly decreasing."

A prime example is Marley Building Systems' Siniat plasterboard solution which significantly increases a structure's energy efficiency. Siniat plasterboards have a Global Green Tag GBCSA

Level B and LCARate Bronze certification and Marley Building Systems remains the only local manufacturer with the SANS266 SABS mark for all its plasterboard products.

The company's Equitone decorative façade panels are manufactured in accordance with the requirements of the EN12467 for fibre cement flat sheets while the Kalsi fibre cement flat sheets are SABS803 certified. Marley Fibre Cement roofing products adhere to SANS10409.

Sustainability and innovation are two sides of the same coin for Marley Building Systems as the company pushes forward to exceed industry standards in the anticipation of new trends.

Marley Building Systems creates a unique and competitive offer that capitalises on today's alternative building trends.

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