

Polokwane Freshmark

Constructing a 10 000m² building on an open site transected by a 100-year stormwater servitude during the global pandemic would be off the radar for many building professionals. However, that is exactly what award-winning Cape Town-based architectural firm, SLT Architects, achieved by designing and project managing a technically challenging state-of-the-art distribution centre (DC) for fresh food distributor, Freshmark.

Johann Walters, Johan Lourens and Gareth Griffiths

Freshmark is part of the highly regarded Shoprite Group and the new DC is located on a greenfields site within Polokwane's N1 Industrial Park.

This new distribution centre is key to the Group's fresh produce strategy in the

booming city and region, also providing a cross-docking point for produce despatched from Gauteng to more far flung areas across the province. The new DC also played a leading role in consolidating the operations of two distinct but smaller sites in the municipal area, meaning that administration

and operations are effectively under one roof. Administrative offices form approximately 1 000m² of the total of 10 000m² floorspace.

According to Shoprite: "The facility caters for future growth and has allowed us to consolidate the supply chain from several buildings in a few locations, into one 'built for purpose' facility. This consolidation naturally leads to improved control and efficiencies in the supply chain, eliminating multiple stock moves and breaks in the cold chain.

"The design resulted from a collaborative professional team including architectural, industrial logistics, property, technical and business. This has ensured all necessary requirements of the customer were incorporated and delivered", the company's media spokesperson said in response to questions sent to them.

Professional team

Architect: Niel Marx - SLT Architects

Contractor: JC Van der Linde & Venter Projects

Project Manager and QS: IQS

Logistics Engineer: Anton Coetzee - Relog Engineers

Structural Engineers: Sebastian Dockter and Leon Ras - WSP Engineers

Refrigeration: WSP Engineers

Mechanical: Lethaba Green Consulting Engineers

Fire Engineers: Tom Esterhuizen and Associates

Civil: KLS Consulting Engineers



The designers & professional team

Niel Marx, the lead architect on the project attributes the highly successful and on-schedule build to a tightly focussed project team, who have worked together for over 10 years on similar projects.

"We were fortunate to have a young construction team who were very dedicated to the job and extremely agile in their approach. We relied heavily on their being on site during the more severe period of South Africa's lockdowns, for example when inter-provincial travel was banned," he says. (The DC is located in Limpopo Province and the contractors are Gauteng-based).

A 'clear and present' danger to progress, however, was the pandemic, which meant that the professional teams had to operate remotely, overcoming this restriction by the innovative use of building information modelling (BIM) technologies and also a remote high resolution camera imaging service called HoloBuilder.

According to Marx, HoloBuilder produces high resolution 360-degree imaging producing 3-D video walkthroughs that are stored on local servers, but are accessible in the cloud. As part of the Autodesk offering, this cloud based technology meant that the designers, engineers, project manager, the developer and client could communicate in real time with site professionals on the ground in Polokwane, even up to the snagging stage of the project when the bulk of the construction had been done.

From the perspective of the contractors, BIM information accessible in the cloud meant that an evolving and highly detailed design was available with updates on demand in real time as the professional team 'walked' the site, accessible from handheld/tablet devices.

According to T'Shana Goosen, Senior Architectural Technologist at SLT Architects on the project: "This project required a large amount of service coordination. Between ourselves as architects and the rest of the team, we were able to view live feeds from each consultant and be warned specifically about clashes between services.

"For a large-scale project where logistics played a big role, this was advantageous. This included the process of documenting and sharing of work from sketch plans to council submission, to RFLs and construction drawings also proved to be more secure and accurate as the software does most of the work for you."

"Lockdown changed everything", says Marx. "Covid-19

severely restricted travelling, human interface (meetings) and without BIM and HoloBuilder we would not have achieved the fasttrack timeline.

"Coupled with that, we also had an extensive nationwide shortage of steel caused by industrial action, but despite all of this, this fast track project reached its practical completion (PC) date on time."



Niel Marx and T'Shana Goosen

Restrictions of the site

The site was an open space in an existing business park, the N1 Industrial Park. As such the space available for development was constrained by the site size as well as the need to accommodate a legacy 100-year stormwater servitude, located near the entrance gate, dividing the property into two sections. The client also has plans for an expansion of the DC via a Phase 2 development which also has to be accommodated in the future on the site's footprint.

A novel approach was adopted in both cases during the planning stage, which had begun just prior to the year 2020, after which the Covid-19 pandemic happened.

Landscape restrictions: The 100-year flood water causeway was landscaped into a swale to handle the possible flood risk by converting a 1.5m drop into a 0.5m swale that could be easily navigated by delivery vehicles and other traffic and used for parking.

Land size restrictions: The entire warehouse is refrigerated (to 1°C) and handles a large number of palletted fresh produce on a limited footprint, leaving the design team with no alternative than to design vertically. Hence, at its apex, the building is close to 30m off the ground.

al considerations

It is visually pleasing. The architect decided that a slightly more approach was required, setting the DC apart from the design used as the award-winning design in Cape Town.

And, the structural steel roofing supported by tilt-up reinforced columns up to 30m in height. The manager, Johann Walters of Linde & Venter Projects adds: "The columns range in height from 20m to 30m. The biggest one was 30 x 900mm in size and 20m high. The contractor, Bedrock, says they have ever picked up anything to them the heaviest in the date."

It describes the roof and its angles as a "modern option", which it indeed is. It has its racy good looks and the use of a pre-painted steel cladding with IFR profile and the white ISO panel walls on the ends of the building. ISO panels within the steel framing. The use of a pre-painted AZ150 AFLOK 700 roofing profile gives it a very modern appearance, and the cladding adding to the effect below the bullnose.

It is functional also and the receiving end of the roof protects goods receipt and operations from the elements.

A canopy protrudes from the side of the building with a sloped roof.

The design was purposefully used to this section and make it stand out from the rest of the building. This is an alibi canopy and it is virtually the same as the rest of the structure. The design reflects its uniqueness," adds Marx.

The architect worked closely with the client and the engineer as to the actual design of the building. The first 32m high face on the floor is used for loading, receipt and despatch from the building. Stacking heights on pallets are 12m. These serve limited truck heights.

Towards the back, the apex, various sections, were placed in order of

height. Highest racking and long term storage were placed at the back of the building. We then followed this natural progression/line and adopted the shape of the roof accordingly", he explains.

Says the Shoprite Group media team: "The racking heights required for Freshmark necessitated the roof shape being adapted to accommodate them, while visually retaining the striking overall architectural motif of the rest of the facility. PV panel installation was also catered for in the roof design to reduce the energy footprint.

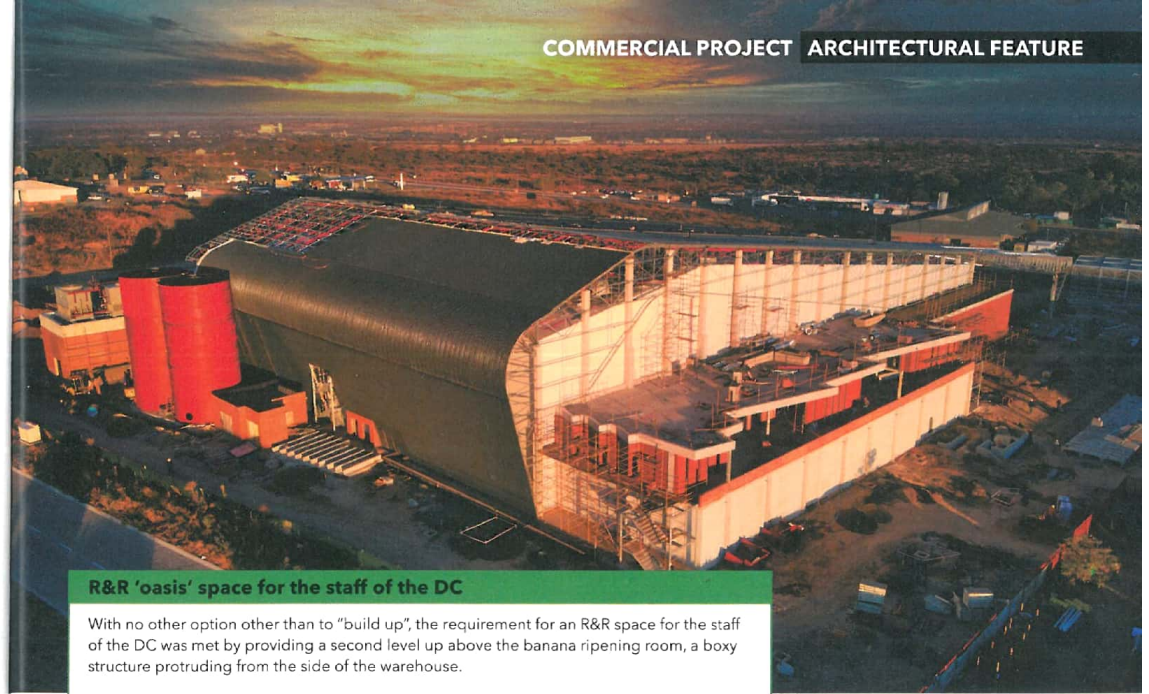
"We also created a returns centre to receive and manage returnable equipment from stores where it is sorted, cleaned, and staged ready for collection by suppliers or for use on the next outbound loads. The site has value added facilities such as a truck servicing area, truck washing area and underground diesel storage and pumps.



Having these facilities available on one site has resulted in a more efficient operation when it comes to Fleet management and the flow of pallets of goods throughout the process."

Another noteworthy element of the design and an example of the architectural team's original thinking was the optimal use of vertical space not required for pallet stacking inside the warehouse for functional purposes, allowing multiple use of the volume.

Hence, a sloped roof, allowing for a maximum height of 30m at the back of the building to facilitate maximum pallet racking heights to 23.5m, and then sloped off to the working receiving and despatch area of the floor where the greater height is not needed for the regular depot operations, but conveniently providing an opportunity for a functional second level.



R&R 'oasis' space for the staff of the DC

With no other option other than to "build up", the requirement for an R&R space for the staff of the DC was met by providing a second level up above the banana ripening room, a boxy structure protruding from the side of the warehouse.

The banana room provides an isolated, stable environment for the Freshmark storage of bananas, a major product of SA's northernmost provinces. The architects decided to locate the staff room 6m above the banana room, accessed via two flights of stairs.

This space has been rendered as a green area (so-called 'oasis') with maximum use of plant life, recreational facilities and an attractive balcony which also has the dual function of being an approved fire escape landing. Administrative working spaces of close to 1 000m² are provided to a modern standard, including administrative offices, a kitchen, canteen, lockers and bathrooms.



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Environmental considerations of the new design

- The Shoprite Group has a standing commitment to the use of renewable energy, as evidenced by a number of retail stores being fitted with PV panels, so the medium term plan is for the roof of the DC to be used to support a PV array. Services for such an installation are already in place.
- Heating was an interesting feature. Thermal energy is harvested from the mechanical plant room and via heat transfer is used to warm water that is used in the washing of crates.
- Water handling: The site has a borehole and storm water is directed to services drains, this being a high rainfall area.
- Security enclosures around access and egress points are fashioned from 'green steel' mesh, that is planted and will eventually be overgrown with vegetation. T

