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SOUTHERN AFRICAN INSTITUTE
OF STEEL CONSTRUCTION



B&T Steel Construction

Riverfield Shoprite

THE PROJECT BRIEF

CLIENT: Equites Property group

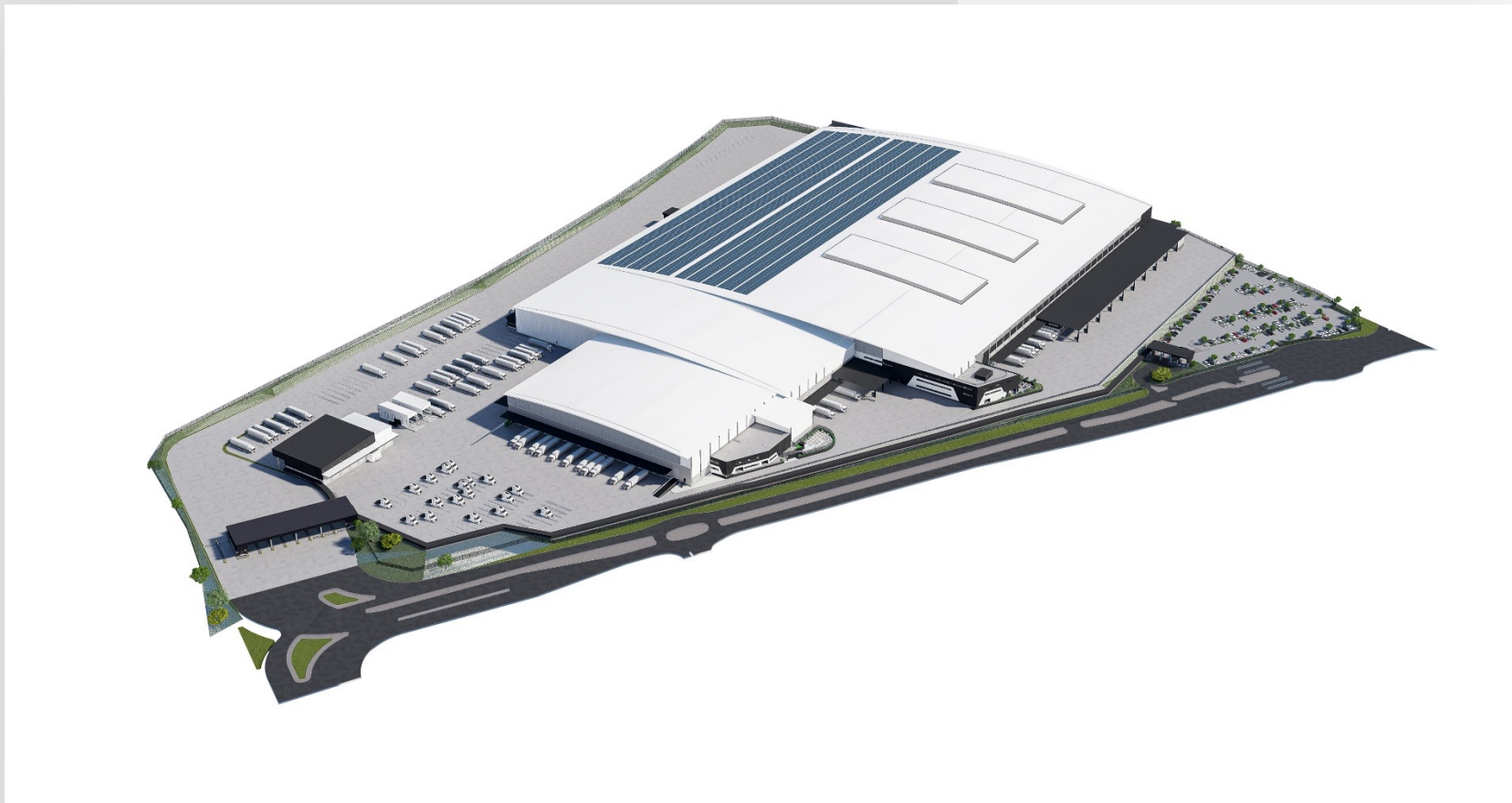
ARCHITECTS: Empowered Space Architects

MAIN CONTRACTOR: Abbeydale



- ARCHITECTS MODELS

- To provide a state of the art storage facility.
- There is a returns area, Freshmark area and dry goods area within the building.







THE PROJECT OVERVIEW



PROJECT OVERVIEW

STRUCTURAL STEELWORK

Project Completed: May 2024

Steelwork Completed: October 2023

Tonnage: 2100

Profiles used: UB, UC, PFC, Castellated Beams, CHS,
Angles



PROJECT OVERVIEW

STRUCTURAL STEELWORK

Structural Engineer: DG Consulting Engineers

Steelwork Contractor: B&T Steel Construction

Steel Detailer: CND Structural Services

Steel Merchant/s: Stewards & Lloyds, Macsteel BSI steel Clotan



FABRICATION

STEELWORK CONTRACTOR: B&T Steel

Fabrication challenge

- Fast pace program showed fabrication program to fabricate and deliver between 30 to 40 tons per day.
- Blessed to have had a workshop @ full capacity and had to implement night shifts for 4 months

Logistics for offloading

- We had scheduled 5-7 truck loads a day to keep up with the demand for site erectors
- We had dedicated 2 teams to offload steel daily and also move steel into position for erection sequence.



ERECTION / CONSTRUCTION / INSTALLATION

CONTRACTOR: B&T Steel



Erection program was always a tight program from tender stage. The program was based on 25 tons a day for a 6 day work week.

What made the assembly of the boxes even tougher was that we had to work in 6 bays next to each other daily. This caused challenges with moving of steel and plant between the different bays





The erection team set themselves a target in erecting the first 4 truss assembly in one go. This meant a lot of time was gained on the ground by not working up in the air.



B&T had a bet with Abbeydale that the steel erectors will catch them up on the tiltup columns on the last gridlines.

It was the best feeling to be able to achieve this and the erection team won a fantastic site braai from the main contractor.

Both B&T and Abbeydale site staff worked great together and we created very good relationships that will help for the foreseeable future.



The original program and sequence that was discussed and agreed had to change for sign off and this meant we had to erect steel from one elevation to the other.

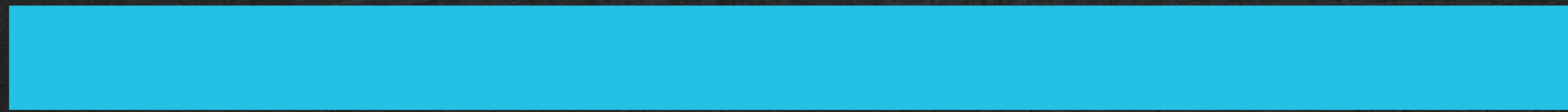
This caused some problems within the supply of the steel work and caused the erection team to slip with one week at the most critical stage within the program.

But due to the great team (main contractor, Engineer and erection teams) We managed to catch up the program.

The biggest challenge we had was that during the erection of the main building we received new drawings showing a gantry and dividing wall in the Freshmark building. This was a whopping 200 tons of steelwork that had to happen within 25 days on the program. The most challenging of this was that it was all suspended from the roof.



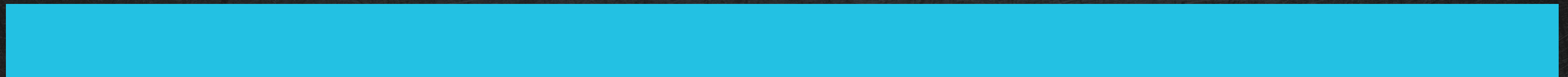
CHALLENGES AND SOLUTIONS



The following is a high-level list of challenges and solution:

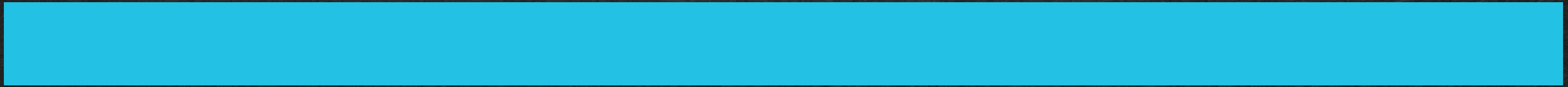
- **Given the width of the building, designing a structure with a straight sloped roof was not an option, as the height of the building would not make financial sense. The only way to reduce the overall height of the building, while still providing the minimum height requirements for racking and storage, was to design a curved steel roof structure.**
- **The curved roof structure across the width of the building has an arc length of 242,3m, which is too long to roll as a single roof sheet. The solution was to introduce small vertical steps in the steel roof structure, at third points along the width of the project, to split the arch length in three sections, allowing three separate roof sheets to be installed instead of one long sheet.**
- **The steel roof structure over the temperature controlled Freshmark area in the middle of the warehouse, had to support all the heavy refrigeration equipment, as well as the insulated roof panels that covers the area. To assist in keeping the roof structure as light as possible, while still ensuring that all the loads can be supported, the girder truss column spacing in this area was reduced to between 16m and 24m. The columns are placed in line with insulated walls to minimize the impact on operations, and this allowed for the design of a light and cost-effective steel roof structure.**
- **The refrigeration equipment and piping above the Freshmark area required structural steel support and walkways to service and access all equipment and piping. An intricate walkway and equipment support structure was designed and incorporated in the steel roof structure design.**
- **B&T to add challenges faced in terms of installation etc.**

THE BENEFITS OF STEEL IN THIS APPLICATION



Without the use of structural steel, one would not be able to erect and complete such a large facility, in the time that it was completed. Structural steel allows for endless possibilities when it comes to the design of large far spanning structures, where other building materials are limited in their capabilities. The entire steel roof structure is designed a modular building system, which was manufactured off site and simply bolted together and erected on site. This allowed the steel contractor to erect ... tonnes of steel per day, and to complete the entire steel roof structure in a time of.... Steel also allows for flexibility on site, should any challenges arise that requires urgent resolution. Steel allows us to extend, modify and strengthen elements easily and quickly should any problems be encountered on site. This flexibility is crucial for the successful completion of facilities on this scale.

WHAT WE'RE PROUD OF



From a design point of view, we are extremely proud of providing the developer and the tenant with a facility that was completed on time, and within in budget. The success is attributed to the use of structural steel as one of the main building materials used for the construction of the facility. The steel roof structure is on the critical path for completion on all industrial type facilities. The speed of erection of the steel roof structure meant that the floors could be poured as early as possible, which in turn meant that the tenant could start installing their racking and moving stock.