

FACT FILE

Client: **Cargill India Pvt. Ltd.**
 Architect: **L&T Integrated Engineering Services**
 Structural Consultant: **L&T Integrated Engineering S**
 Steel Solution Provider: **Kirby Building Systems India**
 Tonnage: **3,700 MT approx.**
 Sections: **Built-up sections**
 Status: **Construction completed**

ALPHONSO PROJECT, DAVANGERE

generating faster return on investment using steel

Cargill Incorporated is a 150-year old US-based privately held conglomerate with major business interest in food processing commodity. The company's Rs. 600-crore corn milling plant near Bengaluru is going to become operational this year, catering to food processing and pharma industries. Pre-Engineered Steel Buildings concept is used in this project due to higher span requirement considering heavy equipment loadings, and because of advantage of faster construction which is not possible with RCC construction, thereby, generating faster return on investment.

Steel is used for constructing all the buildings and utility supports including conventional roofing system and mezzanines. Kirby India is involved in design, manufacture, supply and construction of pre-engineered steel buildings covering the complete superstructure. Kirby India designed all the 10 buildings as per the client's requirements.



Wet Mill and Refinery buildings are connected by Services Building. Both these buildings are having two mezzanine floors each, with each floor in both the buildings loaded with heavy equipments ranging from 20 MT to 100 MT with dynamic operations, and collateral load of 100 kg per square meter



Project Description

The design standards used in the project are as per IS 800:1984 Working Stress Method and Serviceability Criteria as per IS 800:2007. All the 10 buildings are process buildings interconnected with each other for corn mill processing. These buildings namely include Refinery Building, Wet Mill Building, Services Building, Maintenance Building, MDX Glucose Storage Building, Co-Product Packing & Storage Building, Malto Packing Building, Malto Spray Dryer Building and Corn Intake Cleaning Tower Building.

Structural Elements

Wet Mill and Refinery buildings are connected by Services Building. Both these buildings are having two mezzanine floors each, with each floor in both the buildings loaded with heavy equipments ranging from

20 MT to 100 MT with dynamic operations, and collateral load of 100 kg per square meter.

These two buildings are equipped with monorails and pipe racks running along the length and width of the buildings. The maximum height for both the buildings is 21 m connected with external staircase up to roof level. Corn Intake Building is a multi-storied building consisting of lift supporting structure and load of 1 MT mono rail crane.

All the buildings are supplied with galvanized secondaries with shot blasting and 1 coat of zinc phosphate and 2 coats of enamel paint applied at our facility. Pre-galvanized purlins/girts are 275 gsm cold formed sections with adequate provisions of sag rods and sag angles and knee bracing. The roofing area for all the buildings is provided with 5 per

cent translucent FRP sheets for skylights. The buildings are provided with necessary accessories such as skylights, wall lights, roof curbs, roof jacks, louvers, side gutters, valley gutters, down take pipes, ventilators, etc. All the buildings consist of 345 MPa steel star columns and I-sections with tube bracings between each floor as most of them are multi-storied consisting of more than one floor each.

Erecting Techniques

Boom lifts are used for erection of all the buildings including internal and external staircases, lift supporting structure and other utilities. For heights above 5 m only boom lifts are used and scaffoldings are used only up to 5 m height which is one of the major safety initiative taken for this project.



Kirby was able to successfully complete 2 million safe man hours during the erection of the project which is in it a remarkable achievement citing the difficulties and challenges faced during execution of this project.

Challenges Faced

Erection of multiple process buildings, especially, for the food industry is always one of the major challenge and the same was overcome by Kirby India's construction management team through proper and strategic planning, scheduling, efficient project management, management of available skilled and unskilled manpower, etc. and the completion time which is of most primary importance for the erection team.

There are multiple other challenges faced during erection of any building be it direct or indirect and the erection team implemented innovative technologies and skilled project handling strategies. Construction as such, is a complex array of interdependent activities which in itself throws up multitude of challenges which is not encountered in any other industry. The work involves functioning in remote sites with accessibility problems as there are difficulties in applying automation and requires adoption of technical innovation besides cost control.

The project involves size, cost, and complexity and also the work is also not performed in controlled conditions as it is highly impacted by weather and other environmental conditions. Kirby India erection team overcame all the challenges through its experience of handling and successfully completing such large and mega projects over the last 16+ years in India.

Safety Measures

Kirby India implemented and recorded all the safety measures right from beginning of the project till final completion and handover to the client which is a regular practice and followed across all the projects. Safety was

given primary most importance both by Kirby India and the client and was strictly adhered to each and every person visiting the jobsite.

The project is executed with high quality workmanship and highest safety. This was celebrated at the site and was well appreciated by the client who rewarded Kirby erection team with excellence performance certificate for meeting all the safety norms and completing the buildings with all the aesthetics specified by the client. The company also awarded its certified builder's team with gifts for best performance in their respective areas of operations. Kirby was able to successfully complete 2 million safe man hours during the erection of the project which is in it a remarkable achievement citing the difficulties and challenges faced during execution of this project.

All the safety measures such as PPE for all personnel at the site location, safety net, use of life line, tool box training, height work safety training, firefighting training, training on safe handling of construction equipment and tools & tackles, safety postures and many other measures are implemented and to be strictly adhered to by all the people working at the jobsite.

All the elements of the building are double side welded as per the AWS standards with high end electrodes to have the highest precision, consistency and efficiency during welding. Over 3,700 MT of steel is involved in construction of different buildings spread over an area of 9,250 sqm. Most of the raw material such as coils, plates, etc. used in fabrication for this project was procured from JSW Steel, Tata Steel, etc. ■