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FACT FILE

Owner: **B. Mastan Rao**
Project Consultants:
Sri Harsha Consulting Engineers Pvt Ltd
Contractor: **Dalapathi Constructions**
PEB Contractors: **Metal Scope India Pvt Ltd**
Elevation Contractor: **M Panel**

ARCHITECTURAL MARVEL

BMR FEEDS PLANT, NELLORE

BMR Feed Plant is a manufacturing of a high-quality shrimp feed. The main raw material ingredients are SOYA (up to 50 percent) + Fishmeal/ squid meal / shrimp head meal (up to 30 percent) + filler material like Maida / wheat flour/ broken rice (up to 20 percent) and it will be fortified with minerals, vitamins and proteins. The raw material will be sent to topmost floor through screw conveyers and this will be processed through various machinery and the product comes at ground level in the form of granules of 1mm to 2.5 mm dia. This feed will stay for two hours in the water to enable the shrimp to use it as its feed.

The machinery is supplied by a Switzerland Company called Buhler which is made in China and imported to India. The manufacturing unit to produce this kind of feed consists of a tower of size 36m x 30m in plan and a height of 38m to 40m. The height of each floor is 6m to 6.5 m depending upon the machinery requirement.

Apart from the tower this unit requires a big warehouse to store raw material and another big warehouse to store finished product. The size of warehouses are 30m / 70 m(2 no's). Also, this unit requires a boiler shed, electrical panel room, administrative buildings etc.

ARCHITECTURAL DESIGN

BMR feed plant is an architectural marvel among feed plants. Essentially, this plant was planned in such a way that movement of vehicles is seamless and provision for future expansion is made.

The first unit was planned in 'L' shape which means one leg of 'L' is raw material storage shed and the another leg of L is for storage of finished goods and the central pivot is the manufacturing tower which is well connected with raw material godown and finished goods godown.

A continuous canopy has been provided of 7.5 m cantilever for both the godowns to take care of the huge requirement of intake 200 T/per day and out flow of 200 t/per day. The big cantilever canopy gives freedom of loading and unloading even during rainy season.

In the elevation, Taurus blue colour galvalume sheets for warehouse has been provided and a combination of blue colour glass and Taurus blue colour galvalume sheets. This unique elevation reminds us the unison of sea and sky of the horizon which is very apt for the feed for aqua culture industry.

STRUCTURAL DESIGN

This unit is located at Damavaram village just adjacent to NH-16 between Kavali and Nellore. Being in a proximity to the sea (25km) it is subjected to cyclone wind. They have considered 180 kmph wind load and applied cyclone wind factor while analyzing the structure. Initially received drawings from machinery supplier indicating all the machinery GA and load points and load data. There was a lot of interconnection between the floors with pipeline connections, screw conveyors and hoppers. To maintain these connections there are many cutouts left in the slab area.

By keeping all the above information, framing plans were generated and was sent for approval of machinery supplier. Once, the approval was sorted, a start model in STAAD – PRO and all the machinery loads were applied at appropriate locations. 5KN/sqm load was imposed in all the floors apart from these machinery loads.

After applying the above loads apply wind loads as per IS-875 Part-3 in X and Z directions by keeping height variations intensity and seismic loads was applied. The structure analysed for DL, Machinery Load, imposed load, WL and seismic loads and load combinations as per IS-875.

For warehouse DL, LL and WL and load combinations was considered as per IS-875. After, analyzing the structure, it was found that wind was a predominant force apart from the machinery loads. The designed foundations were found critical for load combinations.

Uniqueness of the Structure and Erection:

As the time is the essence of the project, Jindal UB Sections were used for columns and beams. For columns at lower levels have used some additional plates for the columns to take care of higher loads. Dalapathi Construction made a good effort in completing the tower in four months both fabrication and erection.

The fabrication was done at the site only. As the column sections are relatively heavy, they have fabricated columns for 24m length and providing necessary cleats and brackets for connecting tie runners and beams. They have erected columns of 24m in one go with necessary gyre wires to start with and connected columns at floor level main beams in two directions minimum to counter the wind loads during erection process.

After connecting main beams to the columns up to 24m, the rest of 16m columns are erected in a similar process. Simultaneously another group was working at floor level to fix the secondary beams as per the structural drawings.

After finishing all the floor level beams, tie runners were provided in three sides of the elevation and one side it is kept open. From that open side of the structure, machinery supplier along with erection team erected all the machinery at various levels using a crane. They have finished all the machinery erection and interconnections in two months' time. Later tie runners are fixed in 4th side also. The architectural uniqueness of the structure is blue glass in 'L' shape for the structure at all 4 corners.

ELEVATIONS WORKS

The glass has been fixed by the M. Panel elevation contractor. By providing glass at the corners the whole building inside is well illuminated during the day time. This unique feature gave the people working inside the factory gave a feeling of working in a corporate building and not in the factory.

WAREHOUSE

While completing the tower structure, warehouses were also got completed. The warehouse is also well listed by 5 percent roof transparent sheets and provided with turbovents for wind extraction giving a clean environment inside the warehouse.

TASTE OF SUCCESS

BMR-1 started on 10th September 2015 and was fully operational on 18th June 2016 with 'L' shape in plan. After tasting the success of BMR-1 they started BMR-2 on 8th November 2017 and fully operational in August 2018 with 'E' shape in plan. ■

(Contributed by ***V Sridhar Reddy,***
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