

Walchandnagar Industries - Commissioned State of the Art Cement Grinding Terminal for ZUARI CEMENT (ITALCEMENTI GROUP) in India.

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Introduction:

Italcementi Group entered the Indian market in January 2001, through the acquisition of Yerraguntla cement plant, located in the southern part of Andhra Pradesh State. This investment was initially made through a 50/50 joint-venture with the KK Birla Group; then, in May 2006, Italcementi Group acquired the full control of the company Zuari Cement. Later in January 2002, Zuari Cement took over another company Shree Vishnu Cement Limited in South India.

ITALCEMENTI is the fifth largest cement producer in the world and the biggest in the Mediterranean region.

Further ITALCEMENTI has strengthened its presence in India with a strong industrial investment plan by setting up second line in Yerraguntla and one clinker grinding terminal in Chennai.

In August 2006, ITALCEMENTI has entrusted Walchandnagar Industries Ltd (WIL) by awarding the contract on EP basis for setting up 120 tph clinker grinding unit at Chennai, a capital city of Tamilnadu state in Southern part of India.

The contract involves design & engineering, manufacturing, supply, supervision to erection & commissioning of clinker grinding unit.

The project has successfully commissioned in end 2011 with the WIL's long term & sustained commitment along with ITALCEMENTI's consistent efforts towards completion of the project.

With the commissioning of this project, WIL has achieved benchmark in the cement industry with their very efficient and reliable ball mill technology, which is very proven and well established in various cement plants across India and abroad.

Major Challenges in the Project:

The project has slowdown for quite long time during execution due to change in plant layout for reason of changes in railway siding layout, which results inadequacy of the acquired land and thus ITALCEMENTI had to acquire the additional land to accommodate the plant easily.

Another reason for slowdown was due to the inadequate budget for civil work. The location of the project is just 4km away from the Ennore Sea Port. All the buildings were required piling in the foundations since the soil bearing capacity is very less. The piling in foundation was not envisaged in original budget for civil.

This has put extensive pressure on project management team of ITALCEMENTI to acquire the additional land and to arrange the additional budget for civil. The project was kept on hold for approximately 6 months.

Due to sudden hold on the project, WIL had to restructure all the commitments given to their

vendors in terms of engineering completion & delivery. At the same time ITALCEMENTI required all the engineering to be completed to enable them to work out the budget for civil work. WIL has extended their full co-operation to complete the engineering of the project and thus enabled ITALCEMENTI to work out the budget required for civil work.

Project Description:

Cement grinding terminal is located in a very hot, humid & tropical climate location; the plant is situated around 40km from Chennai, the capital city of Tamilnadu in Southern of part of India. The site is served by rail way line. WIL supplied all equipment for the 120 tph clinker grinding unit project.

1.0 Clinker Unloading:

The clinker is brought to the plant site by railway wagons from ITALCEMENTI's existing cement plant located at Yerraguntla in Andhra Pradesh, the Southern state of India. The unloading of wagons is facilitated by wagon tippler and side arm charger.

Table- 1: Wagon Tippler

- Type of wagon tippler- Side discharge type
- Capacity of wagon tippler- 20 tips/hr.
- Net weight of each wagon- 60 tons
- Approx. Cycle time of tipping- 150 seconds
- Clamping- 4 No. Hydraulic Clamps
- Tilting angle- 150 Deg.
- Side arm charger- Hydro-electric
- Integrated electronic weigh bridge- Provided for weighing gross and net weight of each wagon

Clinker is unloaded into unloading hopper of capacity 120 tons. The liners are provided on the inside surfaces of the hoppers to avoid wear of hopper walls. The hoppers extraction is facilitated by 4 nos. AUMUND make clam gates. In order to ensure clean dust free atmosphere in clinker unloading area, the bag house of capacity 2, 10,000 M3/hr is provided for very efficient de-dusting of unloading hopper.

Various position of wagon tippler is illustrated with the following figures:

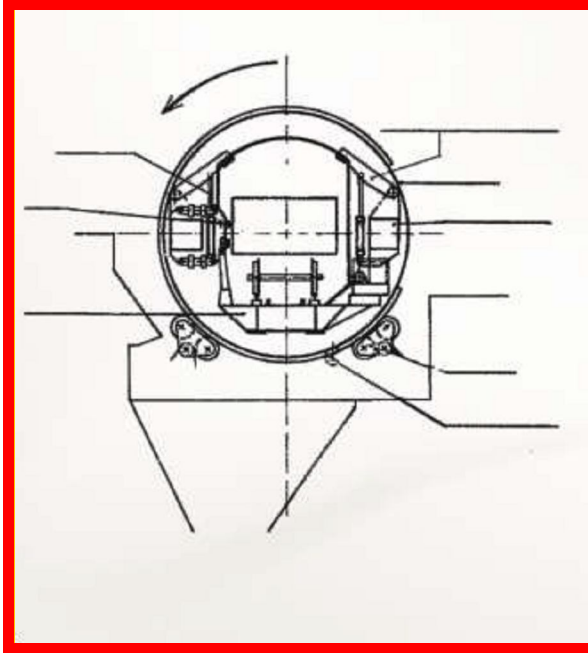


Fig.1- Tippler at Normal Position with Wagon Placed on Table

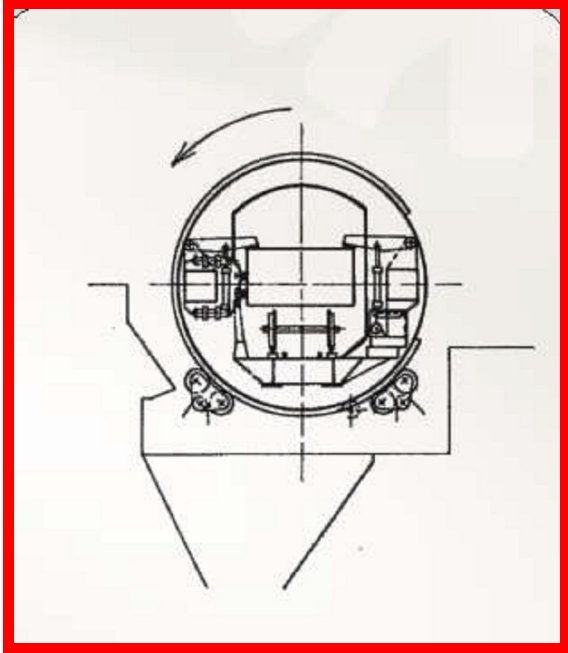


Fig.2- Tippler at Normal Position with Wagon in Clamped Position

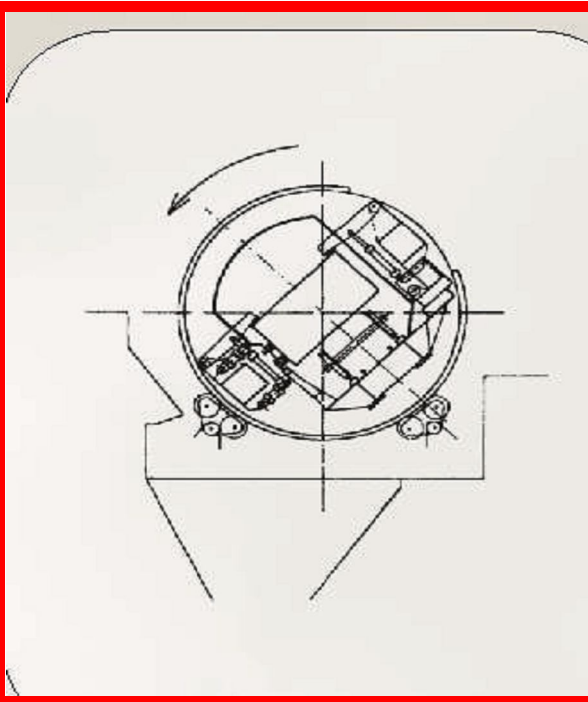


Fig.3- Tippler in Rotation

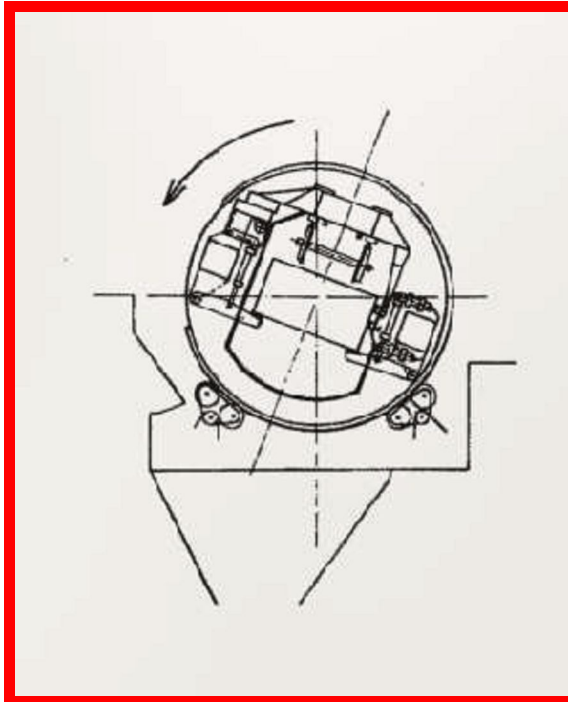


Fig.4- Tippler in Tilted Position



2.0 Clinker- Gypsum Storage and Transportation:

The clinker from wagon unloading hoppers is further transported by long steel cord belt conveyor up to clinker storage silo. The size of clinker silo is $\Phi 16\text{m}$ and capacity is 14000 M^3 . Clinker silo has 3 no. extraction points with weigh belt feeder installed below it. The gypsum being used is chemical gypsum is very sticky in nature having 27% moisture content. Separate shed is planned for storage of gypsum. The gypsum is then loaded into specially designed dump hopper and then further extracted by SCHENK design apron weigh feeder to ensure positive extraction of stick gypsum from the hopper bottom.



3.0 Fly Ash Storage, Metering and Dosing System:

The fly ash being used is dry fly ash and is brought to the plant site by bulkers. The fly ash from the bulkers is transported into fly ash silo by pneumatic system. The storage capacity fly ash silo is 1000 M³. The fly ash is then extracted, weighed and metered by SCHENK latest technology of CORIOLIS system having very fine accuracy and best for metering fly ash. The capacity of CORIOLIS system is 30 tph. The fly ash is then fed to screw pump and facility has been made to pump the fly ash either to mill inlet or dynamic separator inlet.

4.0 Cement Grinding:

Cement grinding is with the slide shoe bearing ball mill technology designed by WIL, following its technical collaboration with Germany-based Polysius in the past (year 1969-79). The mill is designed for producing 120 tph fly ash based PPC cement at fineness of 3200 Cm²/gm as per Blaine. The dynamic separator offered by WIL is original design of Sturtevant (USA) design for which WIL has ongoing technology collaboration with Belgium-based Magotteaux.

Table- 2: Cement Grinding Ball Mill

- Type of mill – Slide shoe design ball mill
- Capacity of mill- 120 tph @ 3200 Cm²/gm as per Blaine of PPC
- Size of ball mill: Φ 4.4m x 15m
- Installed Power- 2 x 2200 KW
- Separator- SD-130
- Separator fan volume- 240,000 M³/hr @ 450 mmWG
- Separator drive motor power- 132 KW
- Capacity of recirculation bucket elevator- 420 tph
- Bucket elevator drive motor power- 110 KW

4.0 Cement Silo & Packing:

Cement from cement mill is transported to cement storage silo by belt type bucket elevator of capacity 150tph. Cement is stored in two flat bottom cement storage silos with individual capacities of 8000t. The diameter of each cement silo is Φ16m having 2 no. extraction points for each silo. The capacity of each extraction point is 700 tph. The cement from cement silo is transported by set of air slides for bag packing and bulk loading. Two number roto packing machines each of 12 spout (10 working + 2 dummy) and two number bulk loading spouts are provided for cement packing. Four truck loading station facilitate loading of open and close trucks from top and rear.



In spite of several ups and downs during the execution, WIL has received extensive co-operation from ITALCEMENTI during execution of the project, which along with consistent efforts, excellence in engineering and manufacturing as well as more efficient project management of WIL helped to realise this project completion benchmark.

In spite of several ups and downs during the project execution, ITALCEMENTI & WIL has jointly put their best efforts and extended their fullest co-operation, which along with best project management practises and very strong leadership of both companies helped to realise this project completion.