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Lone Star Operations at New Orleans

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Description of Lone Star Cement Corporation Lake Charles Plant

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DESCRIPTION OF LONE STAR CEMENT CORPORATION LAKE CHARLES PLANT

By

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Thirty years ago this summer, Lone Star Cement Corporation, then the Louisiana Portland Cement Company, put into operation a brand new, modern 2,000 bbl. per day cement plant in the city of New Orleans, La.

In the opinion of many persons, demand and marketing conditions for cement hardly justified such a large production at that time, but events proved otherwise. The expansion of the South and the coastal areas had its early beginnings at that time, and Lone Star has grown with and has been a part of this growth, which you know has been tremendously accelerated these past few years.

In keeping with this past practice and to more adequately serve the coastal area, a site was selected on the Calcasieu River near the city of Lake Charles, Louisiana, and a most modern cement plant with a capacity of 7,000 bbls. per day was erected.

The following is a brief description of this plant.

RAW MATERIALS

SHELL. The Lake Charles plant obtains its calcium carbonate from oyster shell dredged from several nearby shell reefs. This shell is supplied under contract with a dredging firm and is transported by barge to the plant's dock on the Calcasieu River. Barges have an average capacity of 3,000 cu. yds. each.

Unloading is accomplished by means of a P & H 4,000 Volt crawler crane equipped with a 90-ft. boom and a 4-cu. yd. bucket. A material hopper receives the shell and deposites it on a 42" wide inclined belt conveyor for transfer to the storage building or proportioning bins.

Enough shell is stock piled for a 15-day supply, some 30,000 cu. yds. Smaller quantities of iron ore and sand are stored within the shell storage area and used as required.

A P. & H. electric overhead crane equipped with a 4-cu. yd. bucket transfers materials from various storages to supply the proportioning bins. The individual proportioning bins feed required amounts of shell, iron ore and sand to a belt conveyor system for delivery to the Raw Grinding Department mill bins as required.

CLAY. Silica, iron and alumina are obtained from clay which is excavated on plant property and transferred to the storage point in standard railroad gondola cars. This clay material is contaminated with free silica sand and a small percentage of clam and reef shell.

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*Superintendent.

The clay is first put through an F. L. Schmidt wash mill to reduce it to a slurry by addition of water. This clay slurry is first pumped by a Wilfley 5" sand pump over a simple oil well shale screen to remove shell and other large foreign matter. The next step, the clay slurry is pumped through a Dorr-Clone classifying system to bring the silica content within desired limits. The finished product is then stored in concrete tanks.

The clay slurry is transferred by Wilfley pumps to individual Allis-Chalmers ferris wheel feeders at each mill as it is required.

RAW GRINDING

Grinding is done in three Allis-Chalmers compartment mills which are 9 feet in diameter and 32 feet long, and each is driven by a 1,000 h.p. synchronous motor.

Proportioned quantities of raw materials, clay slurry and water are fed by Hardinge continuous weigh feeders into the preliminary compartments of the mills, which are 9-feet in diameter and 9-ft. 1" long and charged with 58,000 lbs. of steel balls. This No. 1 compartment is in closed circuit with two Allis-Chalmers electrically operated vibrating screens that sort out any oversize particles for return to the preliminary compartment of the mill for further grinding.

The finer particles of material or slurry which pass through the screens are returned to the finish compartments of the mill. These compartments are 9-feet in diameter and 11-ft. 1" long, and each are charged with 72,000 lbs. and 78,000 lbs. of steel balls respectively.

From the finish compartments of the mills the slurry is pumped by Wilfley pumps to the blending and storage tanks.

BLENDING AND STORAGE TANKS

At this mill are a total of 8 concrete blending and storage tanks with a total capacity of 16,000 bbls. of slurry. Each tank is equipped with mechanical and air agitation manufactured by Manitowoc. Wilfley sand pumps are used for the purpose of blending and transfer.

BURNING AND COOLING

The kilns at this plant are 11-ft. 3" in diameter and 400-feet long, supported on six sets of trunnion rolls. They are equipped with Koppers electrostatic precipitators. The dust from the precipitators is wasted. Ward Leonard controls are used on the D. C. drives. These kilns were manufactured by Allis-Chalmers, and the main girth gear and pinion are helical.

Slurry from kiln feed basins is pumped by Wilfley pumps to Allis-Chalmers ferris wheel feeders.

Clinker passes from the discharge end of the kiln into Fuller grate-type coolers located under the kiln room burner floor. The coolers furnish the kiln with preheated air for combustion. Each cooler has installed at the discharge end a reverse hammermill called a clinker breaker which is used to reduce oversize balls of clinker before it is passed on to storage.

The cool clinker is transferred by a system of drag conveyors and elevators to a covered clinker storage of 90,000 barrel capacity. Within this storage area is also stored gypsum, 2,300 tons. Dried shell is also stored here for masonry cement production. The shell is taken from the raw material storage and passed through a drier before placing in dry shell storage area. This dry shell storage has a capacity of approximately 1,700 tons.

FINISH GRINDING

The clinker is transferred from the storage to proportioning bins by means of a P & H electric overhead crane of 3-cu. yd. capacity. This crane also handles gypsum and dried shell.

A precise mixture of clinker and gypsum, and for the production of masonry cement, clinker, gypsum and dried shell, is delivered to the finish grinding mill bins from the proportioning bins by means of Feedoweight belts, drag conveyors and elevators.

There are three grinding mills in the finish department, each 9-ft. in diameter and 30-ft. long, driven by a 1,000 h.p. synchronous motor. These mills are two compartment units, the preliminary compartment being 8-ft. 1-in. long and charged with 51,000 lbs. of steel balls, and the finish compartment being 22-ft. 3-in. long and charged with 143,000 lbs. of steel balls.

The proportioned mixture of clinker and gypsum is fed to the mills by Feedoweight to assure proper feed and grinding control, and the mill discharge is conveyed to 16-ft. Sturtevant air separators through Christian water-cooled screw conveyors. These cooling screws remove some of the heat generated by the grinding process and serve to lower the temperature of the cement.

Each grinding mill and its companion air separator is cooled by a large volume of air sweeping through them. After picking up heat generated by grinding action, this air is exhausted through Norblo dust collectors where suspended particles of fine cement are received and returned to the mill stream.

The manufacturing process is now complete and the cement is conveyed by a Fuller-Kinyon system and screw conveyors to storage silos.

CEMENT STORAGE

There are two batteries of 10 silos each at the Lake Charles plant with a total capacity of 160,000 bbls. From these silos the cement is conveyed pneumatically to the packing machines and barge bulk loading station at the wharf for shipment.

PACKING AND LOADING

Cement to be packed in bags is transferred from the storage silos to four St. Regis packing machines, each of which has four bag valves. The bags are then dropped onto a wire mesh belt conveyor.

Bulk cement railroad cars are loaded by gravity directly from the storage silos.

Bulk cement for shipment by water is weighed on a continuous integrating conveyor scale and then transported pneumatically to the wharf bulk loading station for loading into barges.

POWER

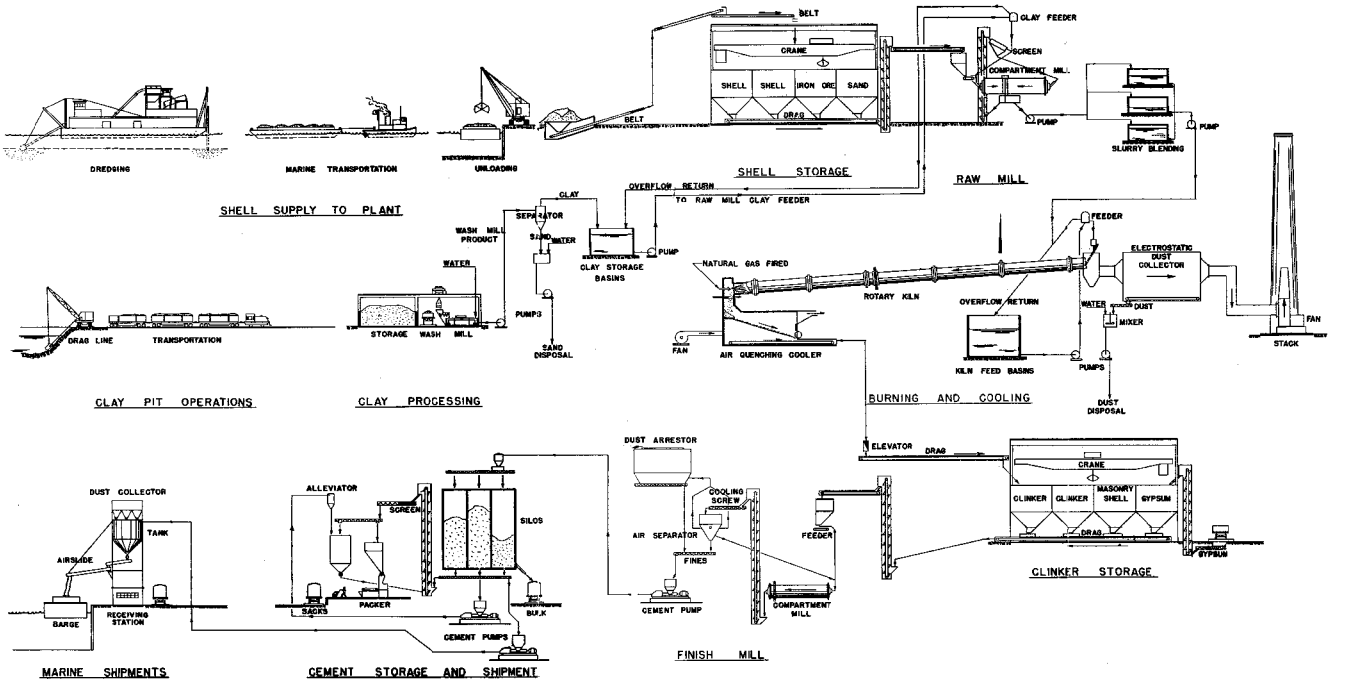
Powerwise, the plant is served with 69,000 volts primary, energizing two 5,000 KVA transformers where the voltage is reduced to the medium range and transmitted underground to a central control station. From the central control station feeders fan out through seven miles of underground duct and 18 precast concrete manholes strategically located to serve eleven substations. The medium voltage is then reduced to low voltage requirements.

Our mill motors are the conventional synchronous type of the latest design, rated at 1,000 h.p., 1,000 KVA, wound for above normal torque across the line starting at 4,000 volts. With six such motors, power factor is no longer a problem.

Embodied in the electrical layout is the most modern and up to date equipment, linked and interlocked for the protection of man as well as machinery. The greater part of this equipment, such as motors and heavy switchgear, is General Electric.

In the early part of this description no mention was made of the arrangement of this plant to allow for expansion. The Lake Charles mill is a big two kiln plant because of provisions incorporated in the original job to expand it to three times its present capacity. This expansion can, in the future, be accomplished with minimum expense.

There were many unusual and varied conditions encountered during construction of this plant. Parts are built on pile foundation using Raymond concrete piles. This occurs under the kilns and mill departments. Under the silos we have used a simple spread footing.



Material Flow Sheet - Manufacture of Lone Star Cements - Lake Charles, La.