



CIMALIT's new versatile cement terminal at Bordeaux

Introduction

In September this year, Fuller-Kovako B.V. completed a turnkey cement terminal project in the Port of Bordeaux for Ciment du Littoral S.A. (Cimalit).

Cimalit is a new player in the French cement market; a market that has to date been dominated by domestic cement producers.

The aim was to establish a cement terminal to handle the required import volume of cement and distribute it in bulk and in bags.

The secondary goal was to keep the investment as low as possible and to keep the terminal flexible and highly versatile to minimise the risk. The concept that was developed between Cimalit and Fuller-Kovako was a flat storage type cement terminal, simple but sturdy cement handling equipment and road mobile shipunloading, bagging and palletizing machines. The result is a highly effective cement terminal with a low investment level in respect to its capabilities.

The road mobile shipunloading and bagging equipment makes it possible for this equipment to serve more than one cement terminal and therefore it can be very economical. If the import of cement ceased, the terminal would be suitable not only to store any type of dry bulk commodities but also a large variety of general cargo products.

The turnkey contract for the supply, erection and commission of the terminal was awarded to Fuller-Kovako. The main subcontractors used for this project were:

- Juan Mulet S.A., Barcelona, Spain
Supplier of storage buildings
- Spie Citra S.A., Bordeaux, France
Civil works, installation and erection of equipment, piping etc., office and bagging building
- Ventomatic S.A., Mendrisio, Switzerland
Bagging and palletizing equipment.

Fuller-Kovako provided the overall terminal design, project management, supervision, cement handling equipment and through its service company ENBO, the shipunloading system. A description of the terminal follows hereafter.

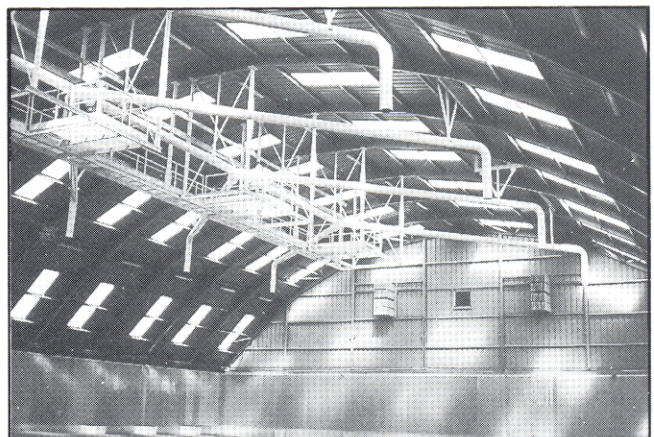
Shipunloading

Shipunloading for the cement import terminal is carried out by a Fuller-Kovako road mobile shipunloader. This facility unloads ships up to 6000 dwt at a capacity of 130 tph. The unloading system vacuums the cement from the holds of the ship through a highly manoeuvrable suction arm. The unloaded cement is then blown pneumatically through a pipeline to the storage facility. All of the equipment for the shipunloading and conveying process is located on a trailer making it fully road mobile.

The shipunloader at the Bordeaux terminal is a machine from ENBO of Holland which operates a fleet of 14 Fuller-Kovako shipunloaders. A new road mobile unit for ENBO is currently under construction.

Piping system

The pneumatic shipunloader is connected, by means of a flexible rubber hose, to the conveyor pipeline which transports the material from the dock to the silos. Three connection points are provided along the dock. From these connection points, an underground pipeline runs to the storage facility. Here the pipeline emerges above the



An inside view of the cement warehouse. Clearly visible are the piping system, the reinforced sidewalls, the filters located high in the rear gable and the pressure equalising valve in between the filters.

ground, and splits with one line feeding the warehouse and the other the buffer silo from which the bulktrucks are loaded and the bagging machine is fed.

Inside the warehouse, the pipeline runs under the roof along the centre line of the building. Diverter points ensure that the cement can be directed to 7 dropping points spread evenly over the building.

At each diverter point, pneumatically activated butterfly valves are located. These valves are controlled by the central control system of the terminal. In this way the building can be automatically and evenly filled during the shipunloading operation.

The cement storage warehouse

A special warehouse suitable for storing bulk materials has been constructed. The dimensions are 55 x 35 m. Roof height is 12.5 m. The building can hold in excess of 8000 t. The storage height of the cement ranges from 3.5 m at the side walls to 7 m below the dropping points.

Level detectors, mounted on the side walls and connected to the central control system, prevent overfilling of the building. The sidewalls are reinforced up to a height of 3.7 m to withstand the outward force of the cement. The roofbeam construction is designed to support not only the roof but also the sidewalls.

The existing pavement was capable of carrying the vertical forces of the cement, and thus only a ring type foundation was required to support the walls of the building. The whole building is of prefab construction, enabling simple erection. The building is equipped with filter systems to clean the air used for the shipunloading and conveying operation and has safety relief valves for excessive over or under pressure.

Reclaim system

The stored cement is reclaimed by means of a front end loader. This pushes the cement into a recessed hopper. A grid above the hopper prevents large foreign objects entering the reclaim system. A Fuller-Kinyon pump is located beneath the hopper which pumps the cement, by means of an airlock screw conveyor into a pressure chamber from which it is blown through a short pipeline to the buffer silo. The capacity of the pump is 100 tph. Both the hopper and the pump are located beside the warehouse in a sound damping enclosure.

Buffer silo and bulktruck loading system

The buffer silo is located between the cement storage building and the bagging building. This buffer silo has a storage capacity of 100 t. Two outlets are provided. The first is connected to the bulktruck loading equipment, the other to the 60 tph screw conveyor that feeds the bagging installation. The silo can be fed from the reclaim installation but also directly from the shipunloader. This is because it is not possible to reclaim from the warehouse building at the moment that it is being filled by the shipunloading installation. A filter on the silo takes care of the cleaning of the air used to convey the cement into the silo and to load the bulktrucks.

The silo is equipped with level detectors connected to



The buffer silo.

the central terminal control system which prevents overfilling of the warehouse and prompts filling of the silo when a low level is reached.

The truck loading equipment consists of a flow regulating valve, lump catcher, open close valve and double walled truck loading bellows. The trucks are loaded whilst standing on a truckscale. The truck driver lowers the loading bellows onto the open hatch of the truck and starts the loading operation.

The terminal control system ensures that the truck loading stops at the moment that the truck is filled to its legal maximum weight. To prevent the truck overfilling, a level detector is located in the loading bellows. After filling the truck, the ticket is automatically printed and collected by the driver.

Bagging and palletizing equipment

Cement for the bagging machine is transported from the buffer silo by a screw conveyor. A building of approximately 45 x 25 m was constructed for the bagging and palletizing operation and for the storage of the palletized cement.

The bagging machine has a maximum capacity of 60 tph or 1200 bags per hour of 50 kg. The bagging machine feeds an automatic palletizer. Both of these machines are unique as they are trailer mounted and fully road mobile. Although the cost of road mobile equipment is higher than for stationary equipment this is offset by the fact that they do not require installation costs.

Moreover the road mobile equipment can be used on more than one terminal. As soon as it has built up a stock of bagged and palletized cement the equipment can be moved to a second terminal to do the same there.

Control system

The whole facility is managed by a PLC operated control system which monitors and controls all equipment in the terminal. This includes automatic and equal filling of the warehouse, automatic filling of the buffersilo, automatic loading of bulktrucks to their maximum level and a coordination between the terminal operations.

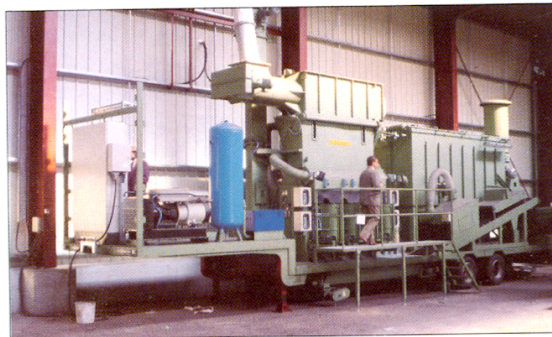
All the functions of the terminal are depicted on a CRT screen. The control system also consists of the electrical installations and the control air installation. The latter provides the air used for the cleaning of the filter and the actuation of the butterfly valves in the pipeline system.

Project execution

Cement terminal projects, often simple in concept, invariably have hidden difficulties. In Bordeaux these turned out to be an underground river below the building site, difficult soil conditions, changed requirements for the bagging operation and a restricted area for the cement terminal.

Through co-operation between Cimalit, Fuller-Kovako and its subcontractors, each of these problems were resolved successfully. The result is a cement terminal which will set a trend in terminal design for the future.

Fuller-Kovako is presently working on terminals in Guatemala (flat storage 20 000 t), Belgium, (silo terminal 56 000 t) and Greece (flat storage 6000 t) and has 7 ship-unloaders on order.



The road mobile bagging installation.