

Ask Joe! Column

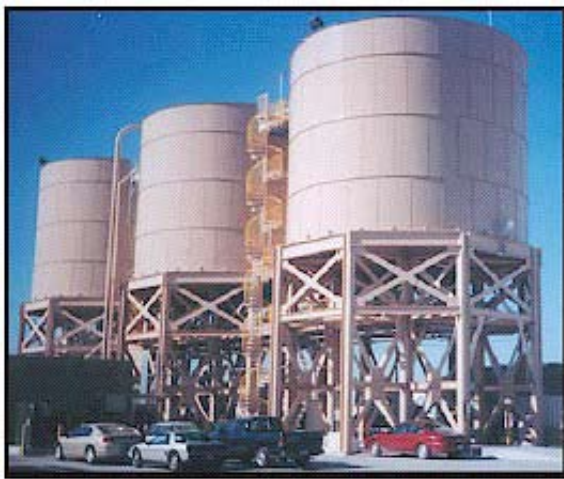
Low-Profile, Bin-Bottom Design Suits Cement

Guest article by Reinhardt Matye, President, DCL Inc.

Introduction

Southern Nevada is one of the fastest growing areas in the United States and is expected to grow for the next 20 years. In response to increasing demand for cement and cement-products, California Portland Cement constructed a transfer terminal in the city of North Las Vegas capable of transferring 500,000 tons of cement per year to the Nevada market.

Operational Requirements



The terminal was designed to off load 100 ton railcars at a rate of 200 tons per hour of cement which is then loaded into three 1,200 ton capacity steel silos using a pneumatic conveyor system. A dedicated double rail spur was specified to accommodate up to 30 railcars by simply feeding cars from one spur to the other. The three silos permit the handling of more than one cement product and three adjustable loading spouts were included in this arrangement to accommodate a variety of truck configurations.

Additionally, the city of North Las Vegas, surrounding landowners, and developers required that the terminal height be minimized to mitigate the visual impact of the terminal on other developments.

A maximum overall height of 62 feet was considered acceptable. The terminal configuration was designed to blend with the surrounding land use and be aesthetically acceptable to the city and local developers.

Railcar Unloading

Railcars containing 100 tons of cement each deliver the cement to the terminal. The cement is unloaded through two unloading boots which seal against the rail car discharge doors. The cement is discharged into two inclined drag conveyors and conveyed to a dilute phase dual pod conveying system that delivers the cement to one of the three selected silos. The pneumatic conveyor was chosen to maintain a low elevation profile on top of the silos and to allow for the future expansion of the conveying system.

Low Profile Design Storage Silos

The total storage capacity of the terminal is 91,000 cubic feet. The three silos are identical in size and have a cement capacity of 1,200 tons each.

The center silo can discharge to either of two loading spouts and can be used for alternate products. Also, the center silo can also be discharged to a pneumatic conveyor to transfer cement from one silo to the others, allowing more operational flexibility.



To accommodate the local height restrictions and accommodate the storage requirements, a +38 feet diameter fully aerated 8° silo bottom was designed. The silo bottom incorporates special aeration pads covering 90% of the bin-bottom surface. The pads are segmented and selectively valve controlled, this reduced the blower size to only 600 CFM. The resultant design offers the ability to reclaim 99.6% of the stored product from any given silo.

Dust-Free, Quick-Loading Truck Spouts

The cement is conveyed from the silo bin bottoms to the loading spouts by aeration conveyors.

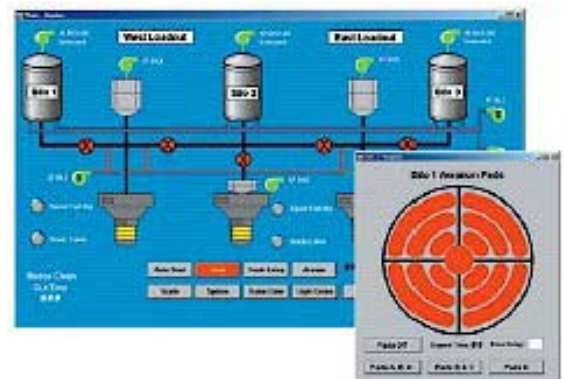


The two outboard loading spouts incorporate horizontal positioners. A third spout and positioner is used in the center to accommodate “triple trailer” rigs. Each loading point is provided with an integral dust collector eliminating the need for duct and maintenance associated with a remotely mounted dust collector.

Dual trailer 120,000 LB Nevada rigs are loaded in 5 minutes. A 130 feet long above ground scale is supplied as two independent platforms allowing the simultaneous loading of each trailer reducing the loading time. The loading spouts are fitted with self sealing cones which close the discharge when not seated in the hatch. The self sealing cones reduce housekeeping by eliminating cement dust dribbling from the spout when it is retracted.

Unified Control System

The operator aligns the spouts to the hatches with the aide of video cameras. The filling as well as the silo aeration sequence is automatic once initiated through the start button. The scale is of a twin platform design allowing the filling of two trailers simultaneously reducing the filling time while maintaining control of each trailer weight. Inventory and shipping data is transmitted to the cement company’s offices via data line.



The control building is of a block structure and houses the managers office, operators control room, motor control center and spare parts storage with workshop. The terminal is controlled through an Allen Bradley PLC SLC 500 with a PC interface. The truck filling is PLC controlled with a manual override.

For more information, contact our author:

Mr. Reinhardt Matye
DCL Inc.
P.O. Box 125
Charlevoix, MI 49720
Telephone: 800-748-0563 or +1-231-547-5600
Fax: +1-231-547-3343
Email: rmatye@dclinc.com
Web site: <http://www.dclinc.com/>

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Welcome to Ask Joe!, a monthly column by our resident materials handling guru, Joe Marinelli of Solids Handling Technologies. Joe addresses the issues that bug you the most. And Joe knows!! Formerly with Jenike & Johanson, Solids Flow and Peabody TecTank, Joe is an expert on materials handling.

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Guest articles for the **Ask Joe!** Column are always welcome, for more information please contact Joe Marinelli directly at his email address: joe@solidshandlingtech.com.

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