



Dust Control and Loading Systems Inc

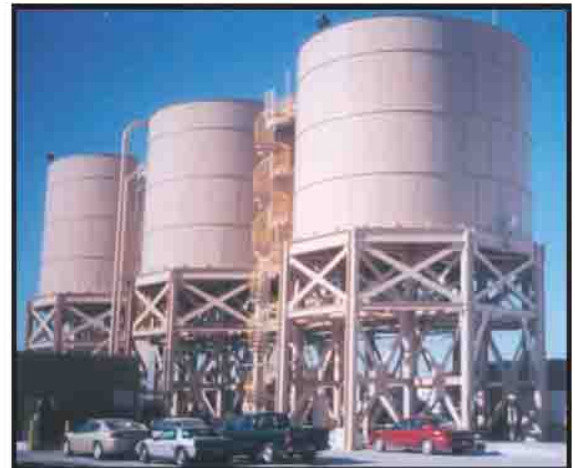
Leaders in Innovative Bulk Loading Systems Design

CASE HISTORY

Flat Bottom Silo Aeration Loadout Terminal

CALIFORNIA PORTLAND CEMENT CASE HISTORY

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, California Portland Cement has 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. The terminal is designed to off load 100 ton railcars at a rate of 200 tons per hour into three 1200 ton steel silos using a pneumatic conveyor system. A dedicated double rail spur will accommodate up to 30 railcars by simply feeding cars from one spur to the other. Three silos permit the handling of more than one product and three adjustable loading spouts accommodate a variety of truck configurations. 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 is designed to blend with the surrounding land use and be aesthetically acceptable to the city and local developers.



California Portland Cement - North Las Vegas, Nevada

STORAGE SILOS

The total storage capacity of the terminal is 91,000 cubic feet. The three silos are identical in size and each have a cement capacity of 1200 tons. The center silo can discharge to either of the loading spouts and can be used for alternate products. The center silo can also be discharged to either of the loading spouts and can be used for alternate products. The center silo can also be discharged to the pneumatic conveyor to recirculate from one silo to the other. In order to accommodate the height restrictions yet accommodate the storage requirements, a 38 feet 6 inch diameter fully aerated 8 degree silo bottom is incorporated. The silo bottom is provided with aeration pads covering 90% of the surface. The pads are segmented and selectively valve controlled to the required location to limit the blower size to 600 CFM. The resultant reclaim capability is 99.6% of the stored product.



Loadout station equipped with two loading spouts and positioners.

LOADING EQUIPMENT

The cement is conveyed from the silo bin bottoms to the loading spouts by aeration conveyors. The two outboard loading spouts incorporate 2 feet by 6 feet horizontal positioners on 53 foot centers. The spouts reach truck hatches from 47 feet to 59 feet apart which satisfies most all trucks using the terminal. A third spout and 2 feet by 2 feet 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. A 130 foot long above ground scale is supplied as two independent platforms allowing the simultaneous loading of each trailer reducing the loading time. Dual trailer 120,000 LB Nevada rigs are loaded in 5 minutes.

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 requirements eliminating cement dribbling from the spout when retracted.

08660 Ance Road
Charlevoix, Michigan 49720

Dust Control and Loading Systems Inc
www.dclinc.com or sales@dclinc.com

Tele: 800-748-0563
231-547-5600



DCL's flat bottom silo aeration configuration, typical for all three silos.



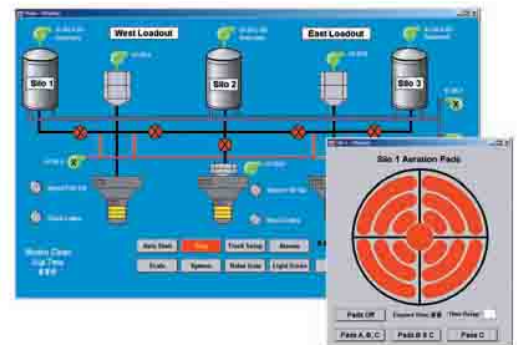
Aerated bin bottom silo discharge.

RAIL UNLOADING

One hundred ton railcars deliver 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.

CONTROLS

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. 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 CPCC offices by data line.





Dust Control and Loading Systems Inc

Leaders in Innovative Bulk Loading Systems Design

CASE HISTORY

Technology Breakthrough Fully Automated Loadout Terminal

BULK LOADOUT AUTOMATION

By Lon Rice - Project Manager, Hanson Cement

Hanson Permanente Cement in Cupertino, California has successfully completed three fully automated bulk cement truck loading systems. This facility loads, hands free, between 150 to 400 trucks per 24 hour period. This new operator free system can load both semi-trucks and tandem trailers in less than 6 minutes from the start of truck entry until the truck exits the scale.

Hanson's upper management wanted to upgrade the bulk loadout to match the rest of the plant. Customer convenience and safety were the key issues in this project.

The goals were to:

- **Clean up the area** -- The area was constantly wet and muddy due to water leaks and poor drainage. There was an old lime plant in the area and the equipment obstructed traffic flow.
- **Reduce the loading time** -- The existing spout system could not be moved to reach the truck position, therefore the trucks had to move back and forth to line up with the spouts.
- **Make the system more customer friendly** -- Customers had to exit their trucks and carry the cement order up a set of stairs to the operator, loading was slow and inaccurate.
- **Increase safety** -- Keeping the drivers in their trucks would make the loading operation safer for the drivers.



Trucks are loaded dust free at rates to 1000 TPH.



Typical equipment arrangement for fully automatic loading.

The ideas were great, but there were many unknowns. So it was decided to do the work in two stages.

First Stage

- Demolish the old plant silos.
- Dig up the lime plant foundations.
- Re-route the gas line.
- Repair the water leaks and remove the mud.
- Lay down a new asphalt staging area.

Second Stage

- Build a fully automatic loading system without interrupting the flow of traffic.

This was the hard part. We knew what we wanted to do. The basic design had been drawn up and approved, but no one had built a fully automatic loadout station before. Most of the software for this endeavor had to be written specifically for the application. The Vision System used to scan the top of the trucks had not yet been adapted to a carriage and spout assembly and every truck is different. Card readers were not new, but using them to run a computer operated system was very complicated.

08660 Ance Road
Charlevoix, Michigan 49720

Dust Control and Loading Systems Inc
www.dclinc.com or sales@dclinc.com

Tele: 800-748-0563
231-547-5600