



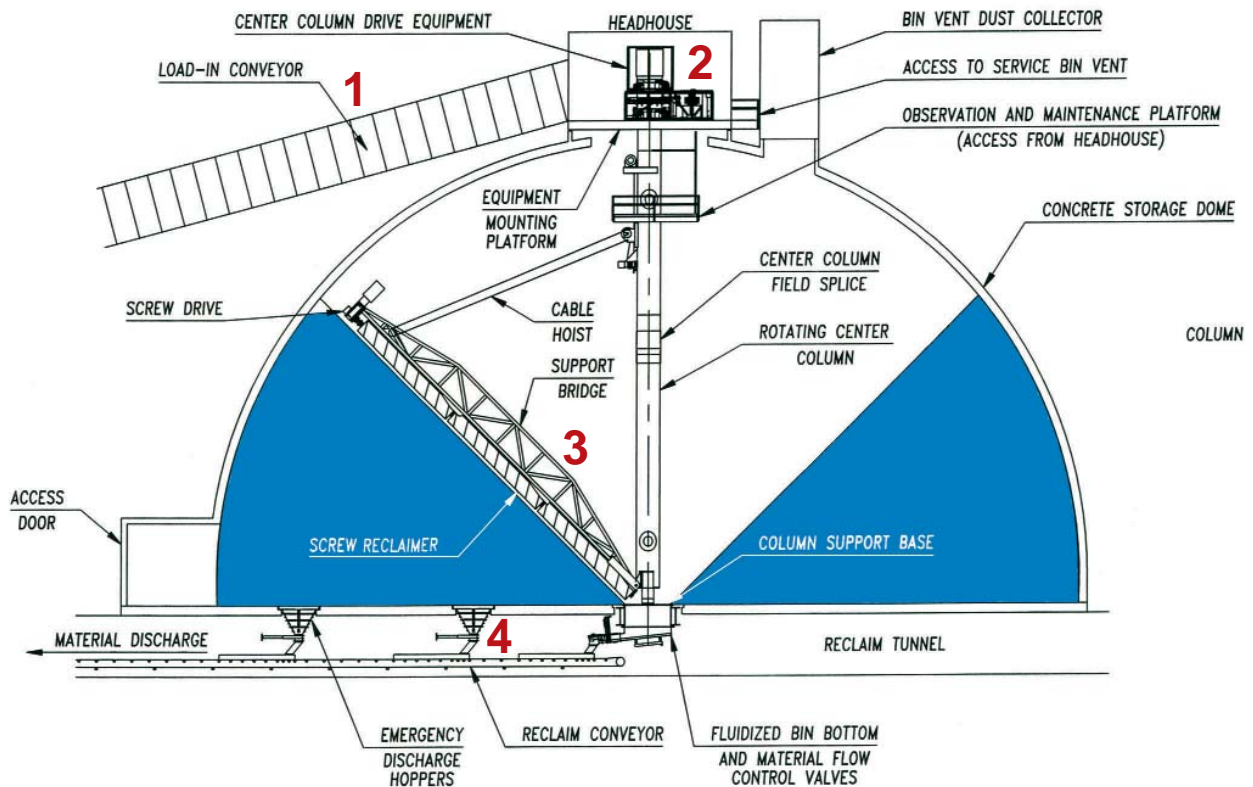
automated dome
reclaim systems





Rio Tinto Minerals - Boron, California

■ TRADITIONAL RECLAIMING SYSTEM



The automated reclaiming equipment normally consists of:

- | | |
|---|--|
| 1 Mechanical or pneumatic load-in | 3 Rotating screw reclaimer |
| 2 Headhouse column drive equipment | 4 Controlled discharge and mechanical or pneumatic load-out |



Glacier Northwest - Portland, Oregon

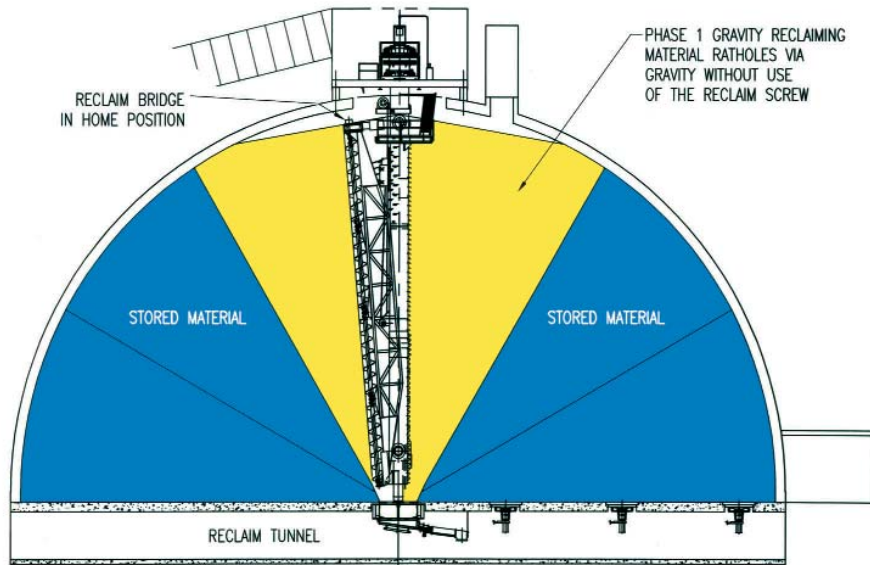
■ *CAMBELT MEANS PROVEN PERFORMANCE*

Cambelt International's Automated Dome Reclaim Systems are in operation in concrete storage domes throughout the world. This proven technology allows the dome and its superior strength to be more fully utilized in storing large quantities of bulk materials. This unique storage concept provides the following advantages:

- **Lower Investment**
- **Reduced manpower**
- **Lower operating costs**
- **Lower maintenance costs**
- **Full utilization of dome volume**
- **High reclaim capacity**
- **Blending of product**
- **Operational safety**
- **Minimal product degradation**
- **Simple foundation requirements**

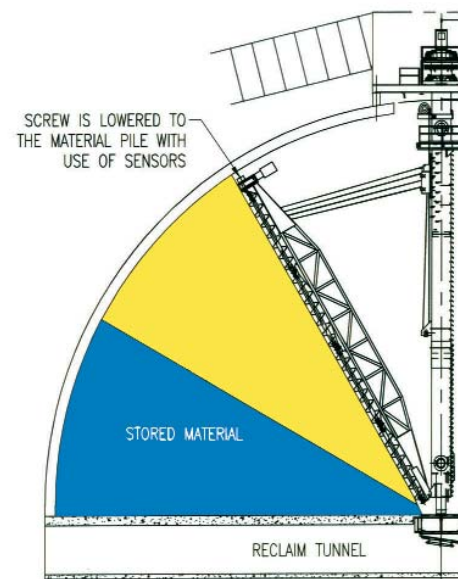


Phase 1



Gravity Reclaiming

Phase



Gravity and Screw

■ AUTOMATED RECLAIMING

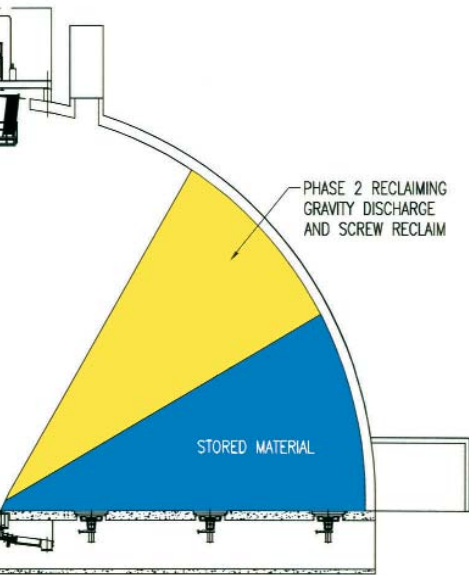
The reclaiming system pulls the stored material to the center of the dome and discharges to the load-out conveying system through a 72" to 96" diameter opening. Initially, the stored material will gravity discharge without the use of the screw, until it approaches its angle of repose. The reclaim screw is then lowered to the pile and the screw begins to cut into the pile, gently assisting the material to the discharge opening. Only during the final phase of reclaim of material from the dome does the "open" screw perform all of the work of drawing the material to the discharge opening.

- 1** Load-in conveyor featuring Cambelt's enclosed CamSpan Gallery (alternate in-flow conveying systems are available).
- 2** Drive assembly mounted in the headhouse at the apex of the dome rotates the center support column.
- 3** Rotating vertical center column with open reclaiming screw attached to support bridge.
- 4** Reclaimed material is discharged to a load-out conveyor or pneumatic take away system.



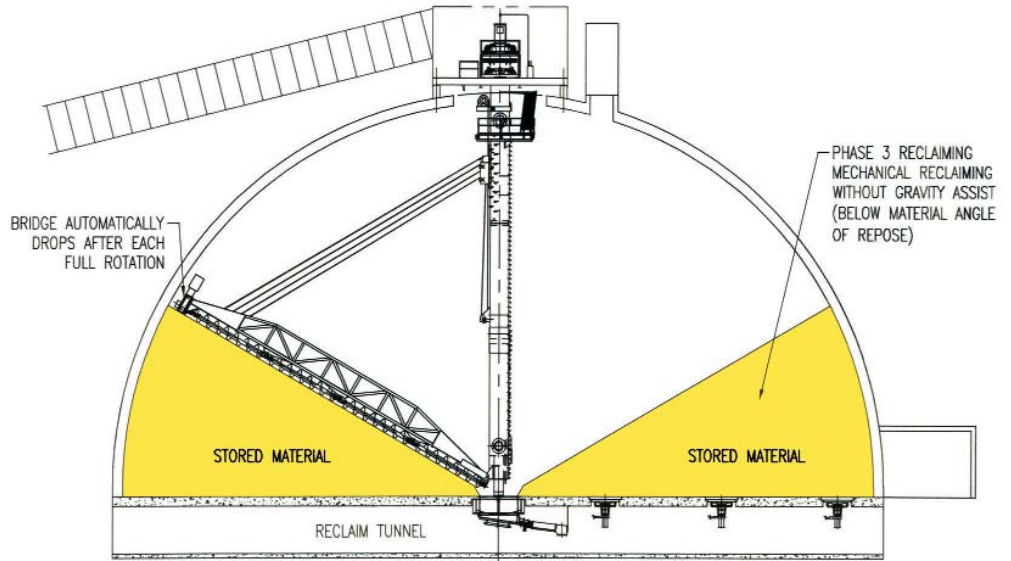
Column drive equipment and enclosed electrical slip ring assembly.

2

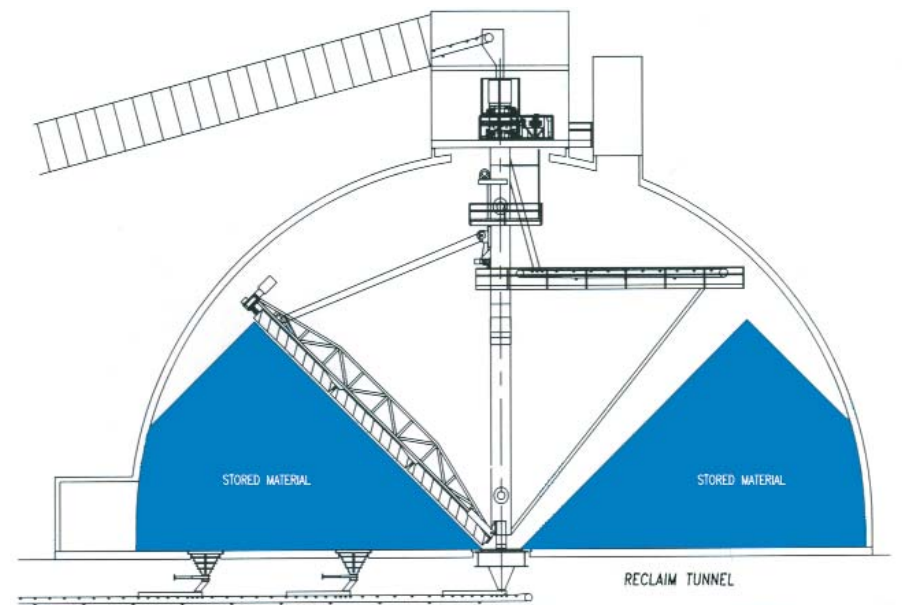


Reclaiming

Phase 3



Screw Reclaiming to Dome Floor



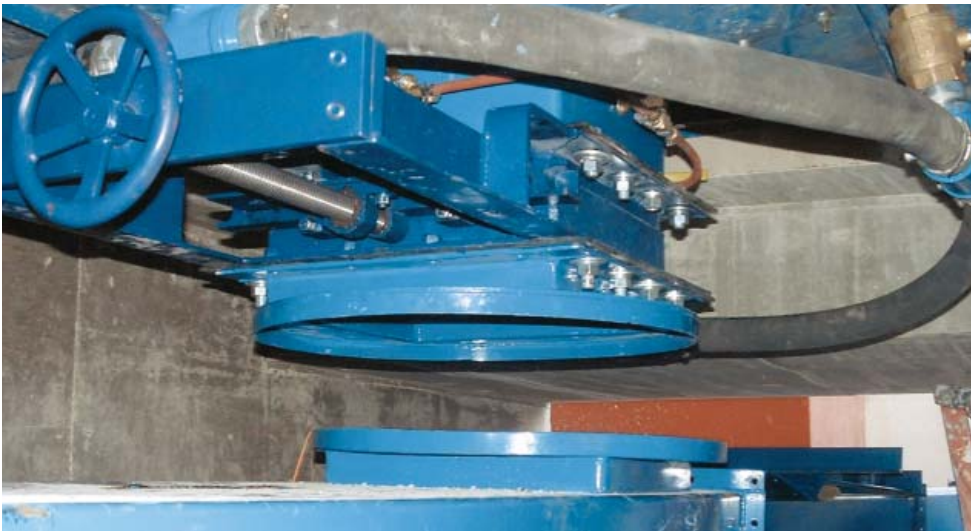
Non-Free-Flowing Material Reclaim System (See Pg 9)



FALK column rotation drive with sprocket, chain and load cell



Lifting Equipment Mounting Platform



Emergency discharge with manual gate



Tubular shaped bridge and screw near

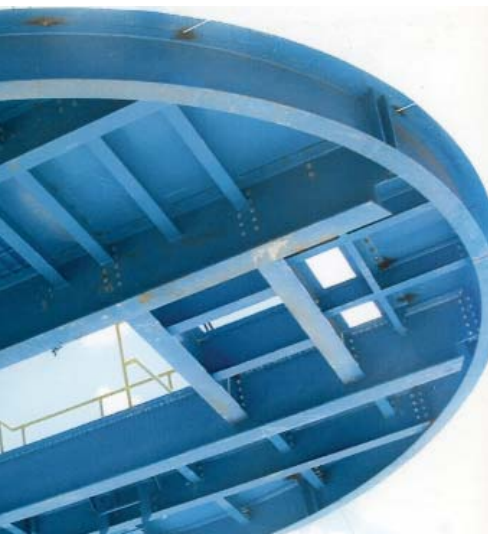


Tag Screw Assembly

■ LESS-TUNNEL SYS

Elimination of below grade tunnel
Above grade construction reduces
potential high water problems.

- Reduced “live loads” into soils
- Redesigned tubular screw bridge reduces vertical loads by 30-40%
- Lower overall system costs
- Increased dome storage capacity in a dome with the same site footprint.



to apex of dome



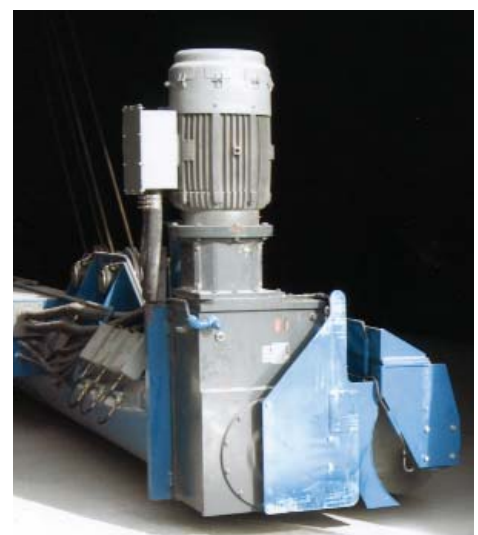
Optional Torque Assist



ring completion



Bridge hinge and electrical transfer

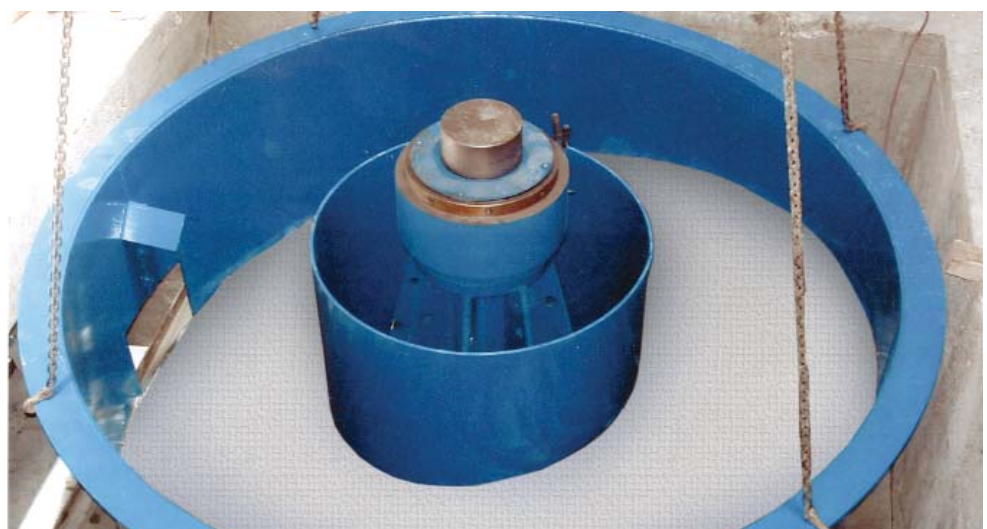


Reclaim Screw gearbox and motor

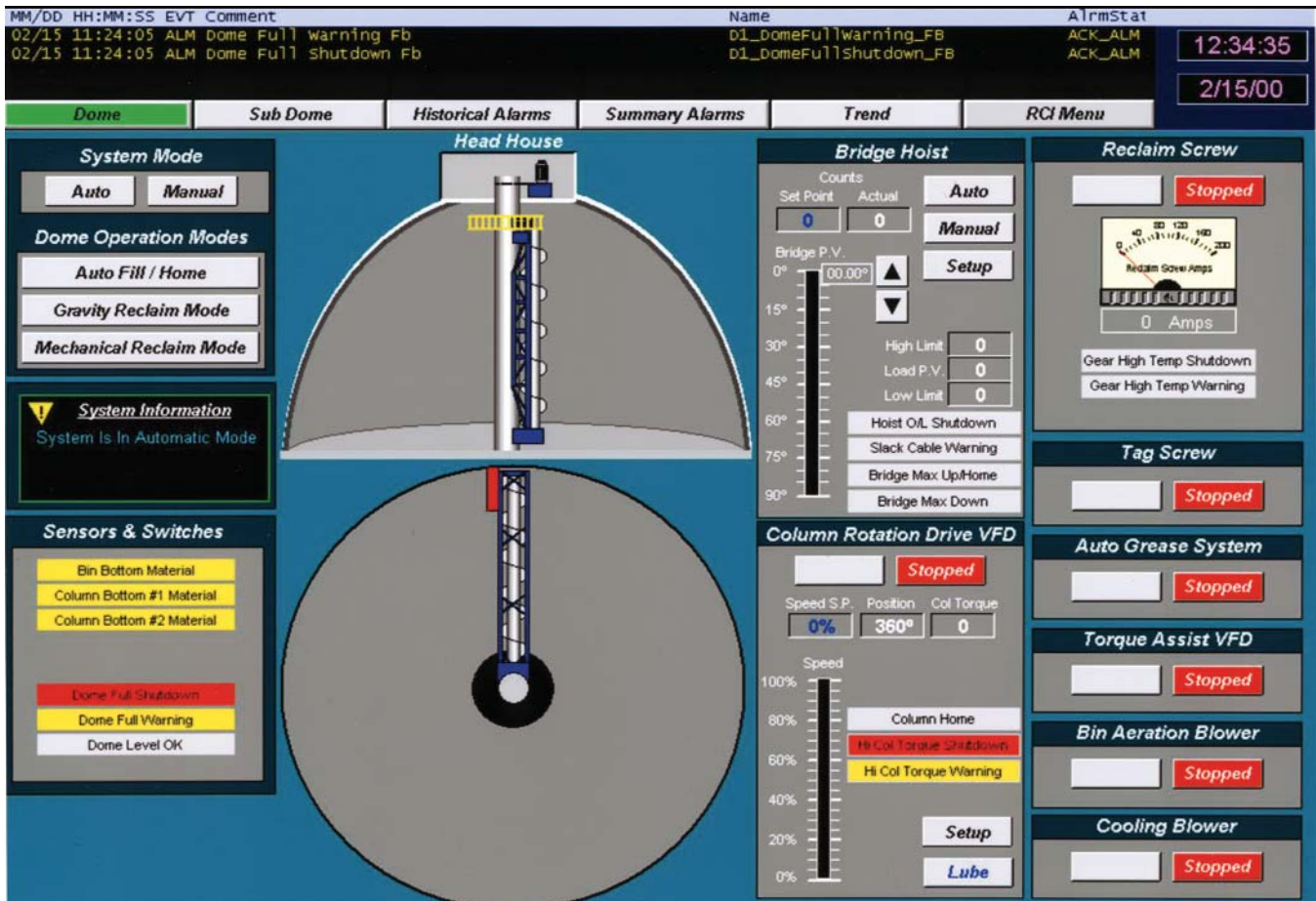
TEM

- Uses the same proven Cambelt technology and maintains the advantages of mechanical reclaim.

Note: Cambelt components can be interchanged between Cambelt's "standard", "alternate", and "less tunnel" systems, to achieve maximum efficiency and reduced cost. Please consult with a Cambelt Sales Engineer or your local representative.



Fluidized Bin Bottom at base of center column



STATE-OF-THE-ART PROCESS CONTROL SYSTEM

Cambelt International includes a fully automated central control with each reclaiming system. An Allen Bradley Control Logix PLC is used to control the mechanical reclaiming equipment. It is interfaced with a PC using WonderWare GUI software, to provide an easy to operate graphics control package.

Meeting Your Needs

- Standardized format with the flexibility to meet specialized needs.
- Control systems designed for maximum reliability with minimum down time

Cost Analysis

- Capability of information systems, that could provide customized reports such as a detailed cost analysis.
- Provide the most beneficial system with an eye for initial cost, performance and lowest operational cost, over time.

Key Benefits

- Most beneficial, reliable control system with the capability of meeting your specialized needs, with standard features of alarm logging, event logging and security protection
- Modem/Internet support service adds the extra security of knowing that technical support is just a phone call away.

Program Strengths

- Modem/Internet support service, you can rest easy, knowing 24/7 someone is available to assist in all aspects of daily operations from trouble shooting to training.
- If training is needed, on-line training while your plant is running. Learn from the experts.
- With Modem/Internet support, necessary changes or additions to the system can be made from any worldwide, off-site location.
- Alarm logging allows traceability back to the original problem.
- Event logging, provides a history of what happened, and in what order, which is critical in trouble-shooting a problem.
- 999 levels of security protection. You can truly customize authorization and access.

■ *CAMBELT'S COMMITMENT TO EXCELLENCE RESULTS IN CONTINUOUS IMPROVEMENT PROCESS FOR AUTOMATED DOME RECLAIM SYSTEM*

As the automated dome reclaim system has matured and evolved, Cambelt's continuous improvement process has identified, re-engineered and implemented improvements that have kept the Cambelt Automated Dome Reclaim System on the cutting edge of innovation in bulk handling equipment. Some Key improvements are:

Hoist modifications that include:

- Encoder style VFD Motor
- Hoist load cell relocated to the column
- Increased number of cable falls and increased drum diameter

Improved flow control gate arrangement

- Redesigned and custom built aerated pad style emergency discharge points
- Improved design for the primary discharge aeration system

Improved Auto Lubrication System

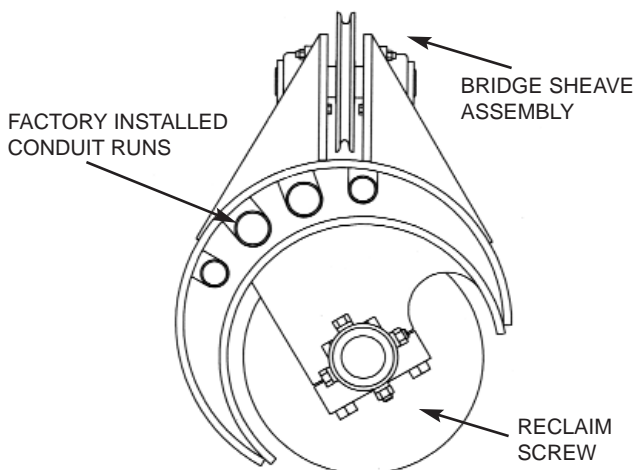
Revamped enclosed slip-ring assembly with NEMA 4 rating

Continuous Software Improvement

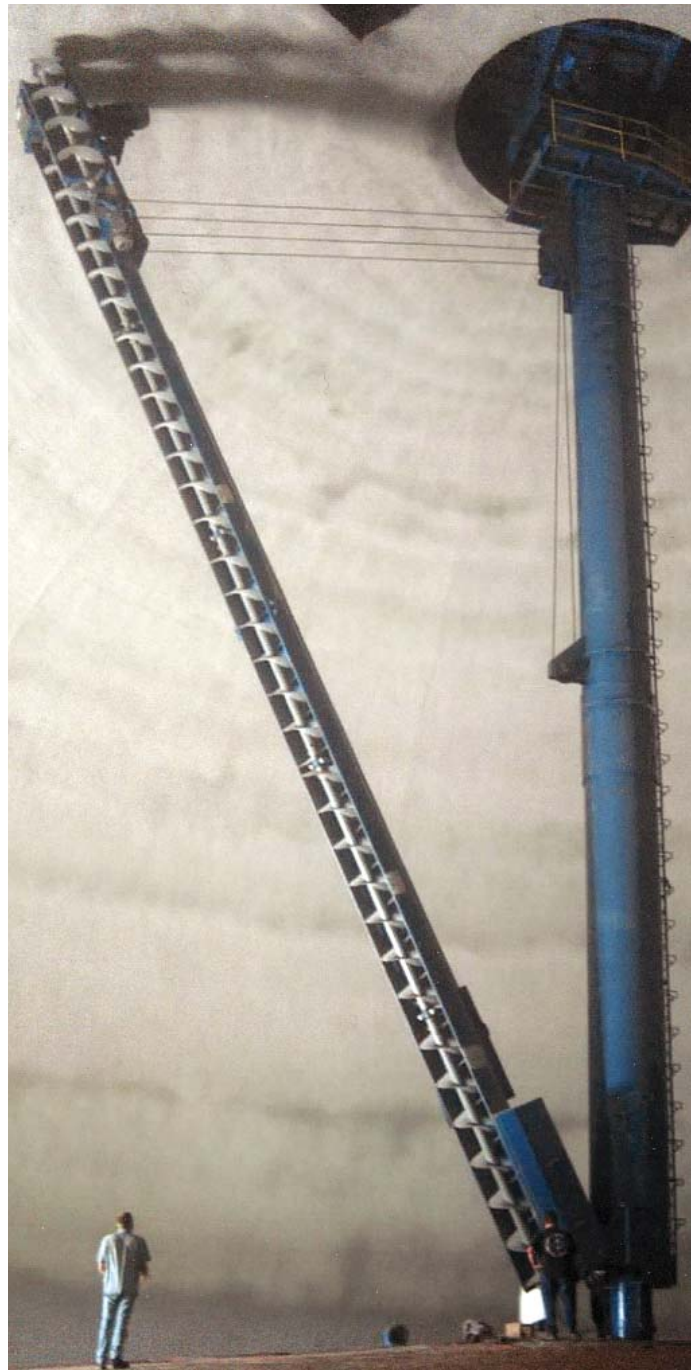
- Modification of sensors and load cells to give better information feedback to the HMI system

Column Rotation Drive

- Improved column roller design in the headhouse
- Eliminated column rotation gear box lube pump



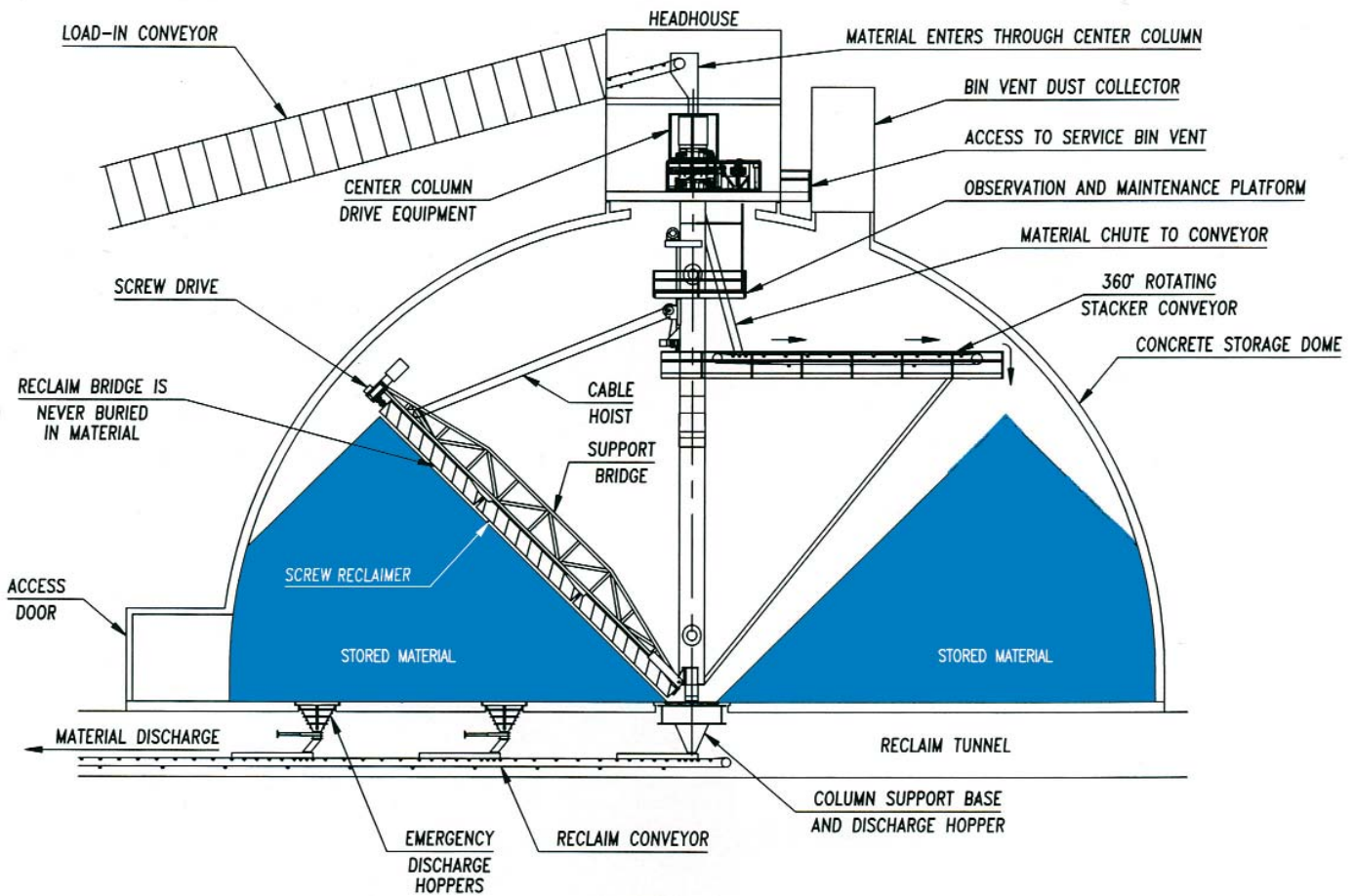
RECLAIM SCREW CROSS-SECTION



Cambelt's Tubular designed bridge

ALTERNATE DOME LOADING AND UNLOADING

Cambelt's Alternate Loading and Unloading System is used for storing and reclaiming materials that are not free-flowing



THE CAMBELT DIFFERENCE

At Cambelt, we work together to identify customer needs, develop effective solutions, formalize plant engineering and fabricate equipment in a modern, quality-controlled environment.

We are committed to excellence in all we do, with a genuine understanding that our company exists to satisfy customers. As a business organization, we are committed to this philosophy and constantly refocus on this basic premise.



Lafarge/Kinder Morgan - Charleston, South Carolina



Ash Grove Cement Company - Chanute, Kansas



Lafarge/Kinder Morgan - Charleston, South Carolina



Ssang Yong Cement - Mokpo, South Korea



Hawaiian Cement - Barbers Point, Oahu, Hawaii



Jordan Cement Factories - Aqaba, Jordan



Ash Grove Cement Company - Seattle, Washington



California Portland Cement - Stockton, California



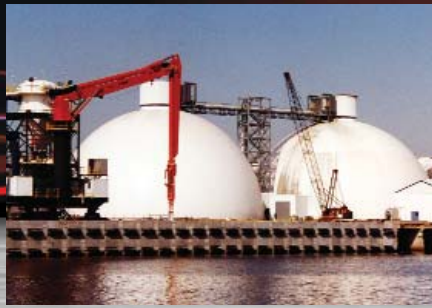
Illinois Cement Company - La Salle, Illinois



Holcim Inc. - Holly Hill, South Carolina



Holcim - Lagerdorf, Germany



Houston Cement Co. - Houston, Texas



Holcim Cement - Operated by Kinder Morgan - Reserve, Louisiana



Ontario Power Generation - Ontario, Canada



Grupo Carmelo - San Juan, Puerto Rico



Holcim Cement - Clarksville, Missouri



Lafarge Cement - Alpena, Michigan

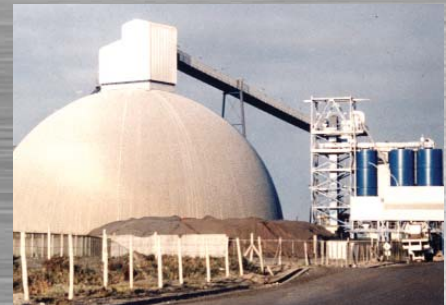


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Societe Miniere Raglan Du Quebec - Quebec, Can



Ash Grove Cement Co. - Louisville, Nebraska



Cementos del Archipelago - Canary Islands