Designed for evolving markets

As cement demand redraws its map across the USA, the industry is confronting a fundamental shift: competitive advantage is no longer defined at the kiln, but at the point of delivery. In this new landscape, cement terminals are emerging as the industry's quiet powerhouses. No longer simple storage and transfer points, they are strategically engineered hubs that connect supply with opportunity. Silvi Materials' expansion into Morehead City, North Carolina, and central Ohio illustrates how terminal design, logistics planning, and market insight are converging to redefine how cement moves – and who wins – in a fragmented, fast-evolving market.

■ *by **Silvi Materials**, USA*

As cement demand shifts across the USA, the challenge for suppliers is no longer simply adding capacity, it is positioning supply where it can be delivered reliably and at a competitive delivered cost. Population migration, business relocation and uneven regional development have created a landscape where logistics, not just production, determine market advantage.

In this environment, modern cement terminals, particularly import and rail-served facilities, have become critical infrastructure. Silvi Materials' expansion into Morehead City, North Carolina, and central Ohio provides a practical example of how terminal design, logistics, and market strategy are increasingly interconnected.

Market drivers shaping terminal investment

Terminal development is being shaped by distinct regional dynamics rather than a single national trend.

In the southeastern USA, continued population migration and a business-friendly environment have sustained construction activity. The Carolinas, in particular, have benefitted from ongoing corporate relocation and infrastructure investment, driving steady increases in cement demand.

Meanwhile, central Ohio presents a different profile. Industrial investment in the region has created a rapidly growing construction market. Additionally, Silvi Materials' sales team notes that some ready-mix producers in central Ohio have expressed concerns with the performance characteristics of Type IL cement. These conditions create opportunities for alternative supply, including Type I/II low-alkali material, supported by rail-served distribution.

Changes in vessel size, supply distance and throughput expectations have forced a shift in terminal design

These differences underline a key point: terminal expansion is not simply about adding tonnage. It is about aligning supply with the specific structural characteristics of each market.

Rethinking what "modern" means

The fundamental functions of a cement terminal – unloading, storage, and load-out – have not changed. What has changed is the scale at which those functions must operate and the level of integration required between them.

"When you think about opening a modern cement terminal today, the fundamentals are similar," says Laurence J Silvi II, co-president of Silvi Materials. "But everything is larger, more automated and more integrated, from unloading through to load-out."

That shift is being driven by changes in vessel size, supply distance and throughput expectations. Terminal design is increasingly informed by operating experience at scale, including large import facilities such as Silvi Materials' flagship terminal in Bristol, Pennsylvania.

Modern terminals must be capable of handling larger shipments, operating with minimal downtime and maintaining consistent output under variable conditions.

Logistics considerations now drive design decisions

Designing around logistics, not just infrastructure

One of the clearest distinctions in modern terminal development is that logistics considerations now drive design decisions from the outset.

"The first item we look at is rail service and capacity," explains Andrew Mino, director of national construction at Silvi Materials. "We need to make sure the site can be accessed and serviced from the rail supplier, then we optimise the site to handle as many cars as possible."

This approach is particularly important in inland markets such as central Ohio, where rail access determines both reach and competitiveness. A site's ability to efficiently receive and distribute cement can be the deciding factor in whether it can serve a market effectively.

Once rail access is established, site layout is optimised for traffic flow, truck access and throughput. The goal is to eliminate bottlenecks and maintain steady movement of material through the terminal, even under peak demand conditions.

Storage as a cost and risk management tool

For Silvi Materials, storage capacity is not solely about matching local demand. It is a critical lever in managing both cost and supply risk.

Earlier terminal designs often reflected smaller vessel sizes and shorter supply routes. Today, larger vessels and longer transit times have changed that equation. Storage must now accommodate higher volumes while providing a buffer against disruptions such as weather delays or variability in delivery schedules. It must also support a range of cementitious materials, including products such as slag, which are increasingly incorporated into modern mix designs.

"We try to maximise storage capacity while adhering to site constraints," Mr Mino says. "That allows us to grow the customer base and provides a buffer if there are any disruptions in supply."

This approach reflects a broader operational reality: insufficient storage does not just limit capacity, it increases exposure to demurrage, supply interruptions and price volatility. In that context, storage becomes a strategic asset rather than a passive component of the terminal.

Equipment selection and material flow

Equipment selection plays a central role in achieving the throughput and reliability required of modern terminals. Pneumatic unloading systems are increasingly preferred due to their efficiency, environmental control, and reduced maintenance requirements.

"We are installing pneumatic unloading systems due to their performance, closed design to prevent air quality issues, and lower maintenance requirements," Mr Mino explains.

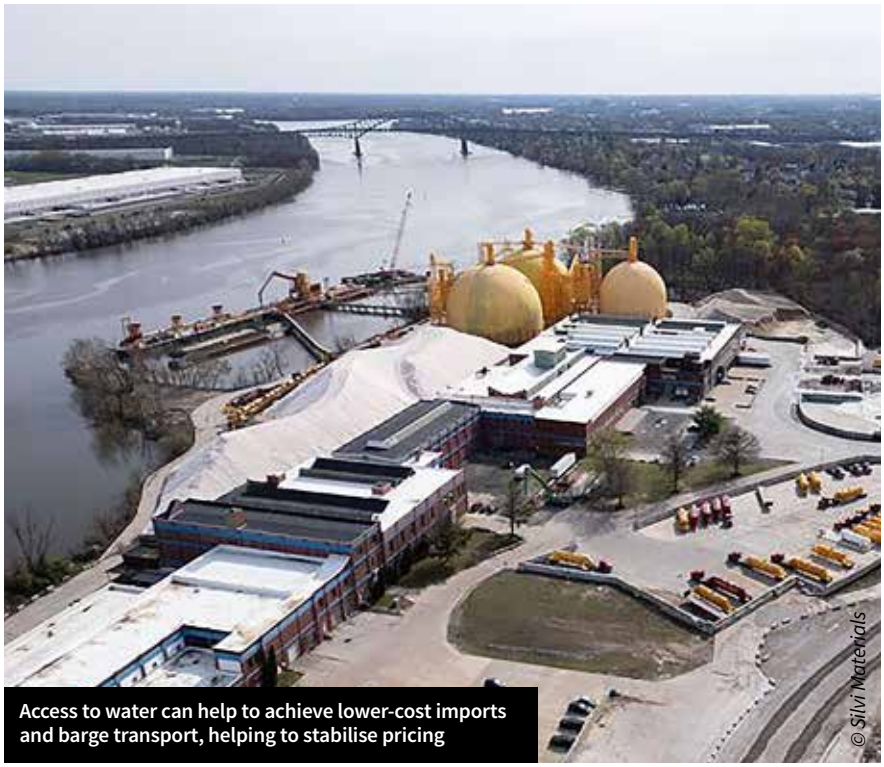
The internal material flow of the terminal is designed to support continuous, controlled movement from unloading to final delivery.

At rail-served facilities, cement is discharged from rail cars and pneumatically conveyed into overhead storage silos. From there, it is loaded into trucks via gravity-fed systems positioned over truck scales, allowing for rapid and accurate load-out.

At import terminals, cement is pneumatically extracted from a vessel's holds and conveyed directly to load-out silos. When additional capacity is required, material is transferred to dome storage, which replenishes the load-out silos after vessel unloading is complete.

This layered storage and distribution approach allows terminals to maintain flexibility while supporting both immediate demand and longer-term supply continuity.

Storage capacity is a critical lever in managing both cost and supply risk



Access to water can help to achieve lower-cost imports and barge transport, helping to stabilise pricing

Throughput, load-out and automation

Terminal performance ultimately depends on how efficiently material can be moved out to customers.

"The load-out equipment at the discharge of the silo is critical," says Mr Mino. "It not only moves material quickly and in a dust-free manner, but also helps align trucks under the spout, which reduces load time."

Automation has become an important component of this process. Systems that assist with truck positioning and loading reduce variability, minimise equipment wear and increase overall throughput.

"The automation of a cement terminal helps haulers move in and out of the site as quickly as possible," he adds. "That directly increases throughput."

These improvements may appear incremental, but at scale they have a measurable impact on daily output and customer experience.

Logistics and delivered cost

The effectiveness of a terminal is ultimately measured by its ability to deliver cement to market at a competitive cost.

"Logistics is everything," says Mr Silvi II. "You can have a great product, but if others are closer to the market, you will be taking a lesser net to subsidise the freight."

This dynamic is particularly visible when comparing coastal and inland markets. Access to waterways can enable lower-cost imports and barge transport, helping to stabilise pricing. In contrast, inland markets rely more heavily on rail or long-distance trucking, increasing the importance of terminal location and logistics efficiency.

For operators, this reinforces a central principle: terminal design must be evaluated in terms of delivered cost, not just theoretical capacity.

Beyond cost, location also has implications for environmental performance. Positioning supply closer to end markets can reduce overall transportation distances, while the use of marine and rail logistics generally offers lower emissions per tonne-mile compared with long-haul trucking. Although the precise impact varies by market and delivery profile, these factors contribute to a more efficient distribution network with the potential to reduce the overall carbon intensity of cement supply.

Commercial implications and market acceptance

From a commercial perspective, the value of modern terminal infrastructure is closely tied to reliability and consistency of supply.

"Customers evaluate imported cement the same way they evaluate domestically produced cement: through testing, performance, and supply reliability," says Kelly Ican, national cement sales manager at Silvi Materials.

Concerns about imported material are often linked to historical handling practices rather than inherent product quality. Modern bulk handling systems and improved logistics have largely addressed many of these issues, allowing imported cement to meet the same performance standards as domestic supply.

Terminal design also has a direct impact on customer experience. Facilities that prioritise accessibility, efficient load-out and reliable logistics reduce wait times and improve delivery consistency.

In central Ohio, for example, terminal location and infrastructure have been configured to provide access to a broad segment of the ready-mix market. Extensive rail capacity, vertical storage and multiple truck scales contribute to shorter loading times and improved operational efficiency.

Building flexibility into the network

As markets continue to evolve, flexibility has become a defining characteristic of effective terminal networks.

"A broader terminal network allows us to move cement where demand is strongest and maintain consistent service," Ms Ican explains.

This ability to reposition supply provides a measure of resilience in the face of shifting demand, supply disruptions and economic cycles. It also allows operators to respond more quickly to regional imbalances, reinforcing both market position and customer relationships.

Closing perspective

The development of modern cement terminals reflects a shift in how supply is planned and delivered. Capacity alone is no longer sufficient. Terminals must be designed to manage variability in supply, reduce delivered cost and support consistent service across multiple markets.

From site selection and storage capacity to equipment choice and load-out efficiency, each element of a terminal contributes to that objective.

In practical terms, a well-designed terminal is one that can move material efficiently, operate reliably under changing conditions, and deliver cement to market in a way that strengthens both margin and customer confidence.

In an increasingly competitive and geographically fragmented market, those capabilities are no longer optional – they are essential. ■