CASE STUDY

DHL SECURED FACILITY

Fence Post Foundation Integration delivers results to DHL

Owner:	DHL Allentown, PA
Wall Design Engineer:	Shippee Engineering, Inc. Doylestown, PA
Construction Manager:	Opus Corporation Minnetonka, MN
Contractor:	Pickering Valley Landscape, Inc. Glenmoore, PA
Structure Geometry:	Segmental Retaining Wall (SRW), Sleeve-It™ Fence Integration System

Sleeve-It's Fence Post Integration system installed at the DHL Facility

Sleeve-It 1224R installation behind SRW

Sleeve-It Product integration with SRW construction

The Project:

Security is a top priority in the shipping industry. So when plans for DHL's new 290,000 square foot distribution facility in Allentown, Pennsylvania called for 3,450 linear feet of retaining wall along the perimeter of the 72 acre site, the chain link fencing above the walls quickly became a topic of concern for the wall contractor and construction manager. "It is rarely understood by the client that fencing cannot be installed on top of perimeter walls without careful design considerations," states Andres DeCarville, Vice President of Pickering Valley Landscape, Inc. "The grading plan noted a fence above every wall but did not provide a structural detail showing how to integrate our work with that of the fence contractor."

Segmental retaining walls most appealing quality is how the dry stacked block face and geosynthetic reinforcement (geogrid) combine to form a retention system capable of holding back steep slopes and handle heavy loads.

A limitation, however is that the dry stacked wall face has minimal resistance to overturning in the upper two or three courses when a point load is applied to the block. This is precisely what happens when a load is placed on a fence post in close proximity to the wall face. Two options that are often considered to address fence post foundations:

SLEEVE-IT

FENCE POST INTEGRATION SYSTEM FOR SRW

"The Sleeve-It Product test data translates exceptionally well addressing the IBC load criteria for railings in commercial applications."

Option 1 Offset the fence post 36" from the dry stack wall face and install conventional fence post foundation.

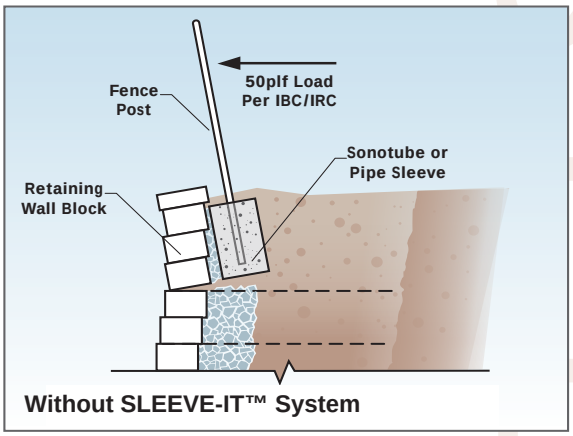
Option 2 Design and install a structural foundation system directly behind the dry stack wall face.

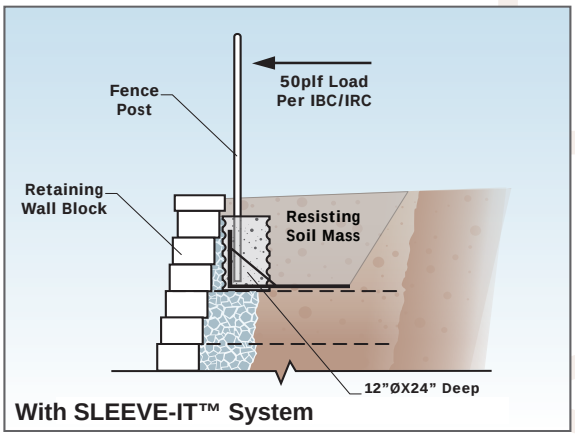
Option 2 was selected and Strata Systems, the manufacturer of an advanced pre-engineered product called Sleeve-It™ 1224R was contacted. This fence-ready and International Building Code (IBC) compliant design was created to address the very issues the construction team was concerned about. Strata provided test reports and additional calculations to the engineer of record explaining how the Sleeve-It approach meets or exceeds the building code requirements for railing along the sides of elevated walking surfaces. A Strata technical representative was also made available for further on-site consultation.

With only 10 days from the bid award date to provide a final wall design and 120 days from ground breaking for the new facility to be fully operational, there was no time to waste. "We recommended the use of the pre-engineered Sleeve-It system to the construction manager, Opus Corporation, for integrating the chain link fence with the SRWs" says wall design engineer Bart Shippee PE. "The Sleeve-It product test data translates exceptionally well for a 6'tall chain link fence with 10' post spacing addressing the IBC (Section 1607.7.1) load criteria for railings in commercial applications."

A Simple and Effective Installation Process

In all, over 350 Sleeve-It units were installed during wall construction. Sleeve-It 1224R is typically pre-assembled at the material staging area for the wall, then set in place with desired post spacing when the wall has reached approximately 24" from the top of wall. When the wall construction was completed, the fence installer arrived to complete the perimeter fencing. The Sleeve-It 1224R lids were removed, which prevented topsoil from filling the holes and the fence post were placed and set.





The face of a SRW consists of dry stacked, mortarless concrete units. These units cannot resist an overturning moment generated when a load is applied to a fence post. The Sleeve-It System uses a traditional cantilever design to engage the overlying soil mass, thereby providing resistance to the fence load.

Results

Strata's Sleeve-It design negated the need for a 36" offset of the fence on top of the wall. This 3-foot real estate savings actually translated into a total area saving of 10,000 square feet for the entire project. The end result was a well secured facility completed on time, within budget and able to deliver the peace of mind that goes with it.

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