

**PRODUCT INFORMATION**



**The timbers facing the wall below a tennis court had failed. The owner wanted the wall repaired while the tennis court was in use. By using the Landmark<sup>®</sup> direct-anchorage system, the wall was refaced, and play was uninterrupted.**



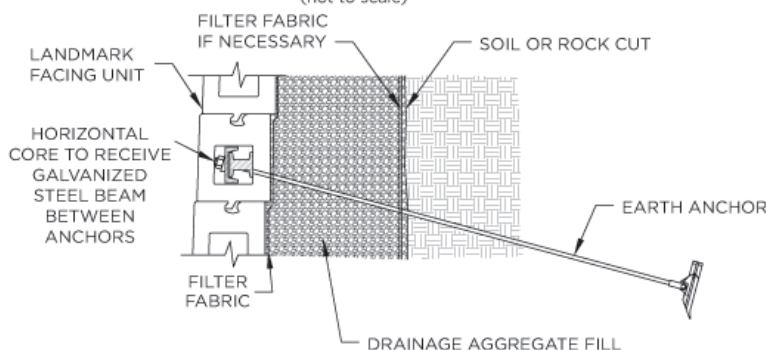
In many retaining wall applications, sufficient space does not exist behind the face units to allow excavation and subsequent placement of geosynthetic reinforcement. In these applications, retaining wall systems - such as driven H-pile with wood or concrete lagging or soil nailing with a temporary or permanent facing - are generally used. The permanent facing for these types of walls has typically been cast-in-place concrete. The Landmark<sup>®</sup> direct-anchorage system is a less costly alternative that is also more aesthetically pleasing than conventional cast-in-place concrete.

This system consists of an anchor installed into the ground and connected to galvanized steel beams (walers) placed within the specifically designed horizontal cavity in the full-height

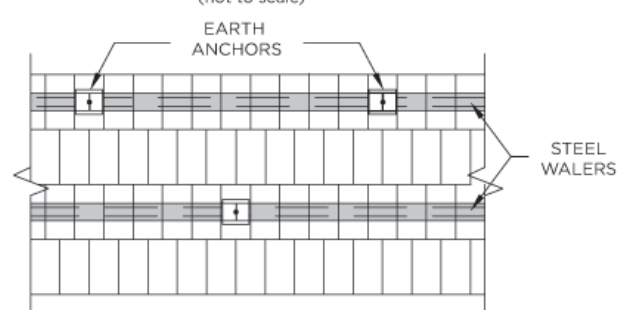
Landmark blocks. This unique design allows the walers to be directly attached to soil nails, rock bolts or soil tieback systems. Each steel beam spans two adjacent anchors, transferring the load from the wall units to the anchors.

The space between the excavated face and the Landmark units is filled with free-draining aggregate. In addition to transferring stresses from the retained soil to the block units, the fill is selected to provide drainage between the excavated surface and the wall face. Since the Landmark units are not mortared, but interlocked, hydrostatic pressure is released through the joints in the blocks as well as the drain outlets typically placed along the bottom of the wall.

**LANDMARK<sup>®</sup> PRODUCT/EARTH ANCHOR CONNECTION SECTION VIEW**  
(not to scale)



**LANDMARK PRODUCT/EARTH ANCHOR FRONT ELEVATION VIEW**  
(not to scale)



TYPICAL CONNECTION AND WALL DETAIL FOR DIRECT-ANCHORAGE APPLICATIONS

PRODUCT INFORMATION



**After a wall was constructed, concerns with the stability of the completed structure led the owners to solicit bids for tear-down and replacement. A contractor submitted a lower-cost alternative that left the existing wall in place with a Landmark® direct-anchorage system installed in front of the wall. Soil anchors were used to assure stability of the new wall for the bottom two-thirds of its height. For the balance, conventional geosynthetic reinforcement was employed.**

Typical applications for the Landmark® direct-anchorage system include earth retention structures where limited space prevents excavation of soil behind the retention structure (e.g., lane-widening under an overpass).

Another application of the Landmark direct-anchorage system is the repair of existing earth retention systems. Retaining walls that have experienced internal, external or facing instability may be repaired with this system. The soil nails or tieback anchors are designed to address the internal and external failure modes. The Landmark units transfer the load from soil to walers and earth anchors and provide a structurally sound solution.

The exposed face of many earth retention structures deteriorates without affecting internal and external stability. Facing stability is the only issue requiring remediation for these existing structures. The Landmark direct-anchorage system is ideally suited for correcting this problem. Working from the bottom to the top of the structure, soil nails may be installed and connected to Landmark units, creating a new stable face in front of the old face.

Rock cuts are often susceptible to weathering of the exposed rock and local instabilities. The Landmark units, in combination with rock bolts, may be used as permanent facing for this condition, protecting the rock face from weathering and strength loss.

In summary, the Landmark direct-anchorage system provides project owners an alternative earth retention system for new construction where space is limited and right-of-way restrictions prohibit overexcavation and replacement with conventional retaining walls; a tool to repair existing deteriorated earth retention structures; and a permanent facing for excavations in rock.

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