CONSTRUCTION PERIOD
August to November 2013

CLIENT
Owner: ATT Lloyd District, LLC
General Contractor: Turner Construction

SERVICES
182 Soldier Piles
489 Tiebacks
46,700 Sq. Ft. of Nontreated Lagging

BENEFITS OF SHORING SYSTEM
• Fast and cost-effective shoring system when groundwater is low
• Beam placement in drilled hole through very dense gravels only possible with cased hole drilling
• No vibration during beam installation ensured that the light-rail tracks running parallel to the jobsite would not be compromised

Project Overview
The Lloyd Block development includes four structures occupying three city blocks. The Lloyd Block site (Block 101) contains a 17-story building of concrete construction. In addition, the site contains a 2-story parking garage that sits in a natural depression in the middle of a surface parking lot. The Lloyd Block expansion consisted of removing the existing parking garage and constructing a three-story below-grade parking structure across the entire site. The new below-grade parking structure would tie into the existing building access points from the old garage. After completion of the below-grade parking garage, office and condominium towers would be constructed above grade.

CONTACT MALCOLM
This job was managed by our Northwest Division in Seattle, Washington.

For a complete list of office locations and technologies, visit malcolmdrilling.com
Construction Details

The shoring system for the Lloyd Block development consisted of soldier piles, temporary tiebacks, pressure treated lagging, and underpinning piles. Soldier piles were placed along the perimeter of the site in drilled shafts with structural concrete toes and lean concrete backfill. For the underpinning work, 64 temporary tiebacks were drilled through an existing retaining wall from inside the existing parking garage to hold the retaining wall in place while the parking garage was demolished. After demolition of the parking garage, soldier piles were installed at the base of the retaining wall so that an additional level below grade could be excavated for the new 3-story parking garage. The remainder of the site was traditionally shored to the bottom of the excavation.

Ground Conditions

The site is located east of the Tualatin Mountains and the Willamette River and consists of fill ranging in depths up to 15 feet below grade. Light brown alluvial silt was encountered below the fill ranging in depths of 5 to 24 feet below grade. Alluvial sand was extended to depths of 38 to 45 feet below grade. A gravel unit that consisted of gray-brown gravel was encountered uniformly across the site, toward the bottom of the excavation. All of the soldier piles were designed to be drilled into the gravel layer; however, during excavation the gravel layer extended below the bottom of the excavation.

Quality Control

Three tiebacks were performance-tested to 150% design load and all others were proof tested to 133% design load. After the successful performance testing, the strand to design load was reduced. As-built drawings were produced to document the construction of the entire shoring wall.