GeoLock® Wall Anchors

Project: The Engineers Club of St. Louis
Location: St. Louis, MO
Date: January 2017

Challenge:

The building footprint included a wedge-shaped auditorium with a lower stage and stair-stepped seating. The stage and the lower seating areas were generally constructed as slabs-on-grade. Upper and "stage right" seating areas consisted of structural slabs spanning between concrete riser beams and/or between a concrete retaining/basement wall and a second foundation wall. As part of the renovation plan, the auditorium would be partially demolished and filled in to raise the floor elevation to match adjacent common areas. However, the 14-inch thick reinforced concrete retaining/basement walls showed significant cracking and inward deflection (leaning and bowing). These two walls needed to be either stabilized or removed and replaced. A limited soil exploration identified expansive molder sand and brick rubble fill below the floor.

Solution:

Foundation Supportworks by Woods proposed a cost-effective solution to stabilize the basement walls utilizing a variation of the GeoLock® Wall Anchor system. The proposed anchor system consisted of vertically placed, custom fabricated double C8 and C6 steel channel wall braces, steel plate anchors cast within concrete-filled trenches, and high-strength all-thread connecting rods.

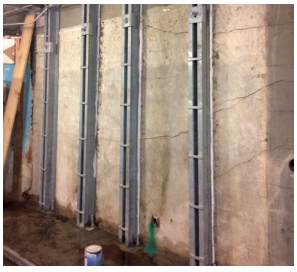
Twenty-nine (29) wall anchors were installed with center to center spacings of 3 to 4.5 feet. The ¾-inch diameter all-thread rods were driven through wall penetrations 3.5 feet below the tops of the walls. The rods were advanced to terminate within excavated trenches made through the auditorium concrete slabs. Steel anchor plates were connected to the ends of the rods and cast into concrete. Given the angles of the auditorium side walls relative to the back wall, the anchor rods had to be carefully positioned and angled to avoid interference with adjacent anchors. The C-channel wall braces were anchored to the floor at the bottoms of the walls. With the anchor plates cast within concrete and the concrete cured, the anchor rod connections at the C-channel braces were tightened to an applied load of 8,000 pounds. All components and hardware were hot-dip galvanized for corrosion protection.

Upper structural slab (left) and lower SOG (right) auditorium seating areas

Trench excavation for anchor plates

Anchor plates attached to rods and set in excavation

Filling trench with concrete



Installed channel braces

Project Summary

Architect: Remiger Design
Structural Engineers: AEdifica Case Engineering & Heideman Associates, Inc.
Geotechnical Engineer: Millennia Professional Services
General Contractor: United Construction Ent. Co.
Anchor Installer: Foundation Supportworks® by Woods
Products Installed: (29) Supportworks® GeoLock® Wall Anchors; Lengths of 18 to 30 feet; (11) Double C6x10.25 and (18) Double C8x11.25 Wall Braces