Soil Nail Shoring and Deep Foundations

UCSF IRM Building
San Francisco, CA

MALCOLM
Retention Systems

CONSTRUCTION PERIOD
September 2008 to July 2009

CLIENT
Owner: Regents of the University of California
General Contractor: DPR Construction, Inc.

SERVICES
23,500 LF Soil Nails
19,300 SF Shotcrete Wall Facing
106 EA Drilled Shafts (5,324 LF)
600 SF Soldier Pile & Lagging Shoring
23 EA Micropiles

Benefits of Soil Nail Shoring and Top Drive Drilling

- Cost effective system for providing excavation support in area with very difficult access.
- Limited access equipment employed for soil nail drilling on steep slopes.
- Rotary top drive drill rig efficiently penetrates hard rock for foundation pier installation.

Project Overview

Malcolm Drilling Company provided design/build retaining walls and drilled foundation piers for the new Stem Cell Research Facility at the UCSF Institute of Regeneration located in San Francisco, CA. The challenging foundation and earth retention design was required since the new facility was located on a steep slope adjacent to the existing hospital. Malcolm Drilling constructed permanent multi-tiered soil nail shotcrete retaining walls, benching into the steep San Francisco hillside. Next, with extremely limited workspace, Malcolm drilled piers 3 to 5 feet in diameter up to 95 feet deep into hard fractured sandstone rock. Malcolm installed micropile foundations for a new overhead bridge which connects the existing hospital to the new facility. MDCI had to use a 200-ton crane to hoist the micropile equipment into a very limited courtyard space next to the existing UCSF building.

CONTACT MALCOLM
This job was managed by
our Northern California Division
in Hayward, California.
For a complete list of office
locations and technologies,
visit **Malcolmdrilling.com**

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Construction Details

Malcolm Drilling provided retaining walls, drilled shafts and micropiles for the new UCSF IRM building. The construction site was located behind the existing UC San Francisco Hospital on an extremely steep slope that historically experienced landslides and was prone to future sliding conditions. Malcolm installed multiple tiers of 20-25 ft high shoring systems, which consisted of soil nails at lengths up to 55 ft to provide stability. The benches created by the retaining walls were 20 ft wide, stabilized the hillside, and simultaneously created access to complete the building pier foundation. Drilled shafts were constructed for the foundation of the new building. The shafts were up to 95 ft deep and had diameters up to 5 ft. Each drilled shaft was advanced through hard rock beneath the slide debris. Micropiles were installed in the last phase to support a new pedestrian bridge that would connect the existing hospital to the new Research Facility.

Ground Conditions

The steep slope of the Sutro Tower hillside posed a challenge for every aspect of the UCSF job. The surficial soil consisted of colluvium, which is unstable and prone to landslides. 10 ft. below the existing grade there is hard sandstone rock. The location, due to the urban medical campus, presented daily constraints getting equipment and materials to the site.

Quality Control

Malcolm Drilling provided experience and expertise to ensure the quality of construction exceeded the design and construction requirements. Periodic testing was performed for ground anchors and micropiles. Malcolm Drilling also installed slope inclinometers to monitor movement of the retaining walls. Finally, the piers were drilled using post tension (DSI) bars to add another level of support and prevent the building from “pulling” away from the hillside.

Look to the blue at Malcolmdrilling.com