Case Library, Colgate University

Hamilton, New York, USA

Keller designed and constructed an earth retention and groundwater control system to support the expansion of an existing building.

The project

The proposed 51,000 square ft. expansion of Colgate University's Case Library involved an excavation that varied in depth from 24 ft to 27 ft into an adjacent slope. The subsurface profile at the site consisted of 25 ft of fine to medium coarse sand and gravel with some cobbles and large boulders, overlying fine to coarse sand. Groundwater was encountered at 10 ft to 12 ft above the proposed new subgrade.

The challenge

- Numerous critical utilities ran parallel to and through the retaining wall alignment.
- A streambed was encountered in the northeast corner of the excavation. Considerable groundwater runoff from the slope resulted in saturated ground conditions.
- Limited site ingress/egress for hauling material.
- A very tight schedule required work to be completed during summer break.

The solution

Keller designed and constructed:

- A temporary, anchored soldier pile and lagging system to support the excavation.
- A wellpoint system to maintain groundwater level below excavation grade for lagging installation and subgrade preparation.

Mud rotary drilling was selected for the soldier pile installation due to the proximity of the existing building's large, plate glass windows. During the work, immediate engineered adjustment to the original wall design was necessary to accommodate the large boulders that were encountered. When excavation and installation of the earth retention reached the groundwater level, the wellpoint system was installed to draw the groundwater down below the proposed footing subgrade. Piezometers were installed to monitor water levels during dewatering operations. Given the wet summer and unanticipated stream bed, four 20-in. sumps were also installed to ensure that the northeast corner of the excavation remained dry. With the dewatering system fully operational, excavation to subgrade was achieved.

Project facts

Owner(s)
Colgate University

Keller business unit(s)
Keller

Main contractor(s)
JJ Lane Construction Inc.

Engineer(s)
Keller

Solutions
Support of excavation
Groundwater control and dewatering

Markets
Institutional
Education

Techniques
Soldier piles and lagging
Dewatering

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