Calgary Zoo – Canadian Wild’s Bugtopia Park

Calgary, Alberta, Canada

Bugtopia is an interactive nature play space at the Calgary Zoo used to educate children about insects. First opened in 1929, the Calgary Zoo has gradually added exhibits, Bugtopia being the most recent.

The project

The play structure design included a large, artificial tree stump and log theme playground. A new pedestrian walkway was also constructed over a small surface pond to connect the play area to the rest of the zoo. Deep foundations were required to increase the bearing capacity due to the subsurface conditions, which consisted of 5 ft to 7ft (1.5 to 2.1 m) of silty sand; the gravel was encountered below the sand layer and extended to the top of bedrock 13 ft (4m) below the surface. Groundwater was encountered at 6 ft (1.8 m) below grade.

The challenge

The owner required minimal disruption to the environment and undue noise and disturbance to the adjacent wildlife compounds. A tree root and canopy protection plan was also required.

The solution

The geotechnical engineer for the project made several recommendations to support the new play structure and walkway, including drilled shafts or driven steel piles. However, due to the vibrations and noise during installation, driven steel piles were not compatible with environmental constraints and surrounding wildlife exhibits.

In addition, the small pond was the water source for the neighboring wolf exhibit and had to be drained for construction. It was vital to sequence the pond construction first to restore the water supply to the wolves.

To maintain the environmental protection requirements, Keller used rig mats to handle the compressive loads imposed by the drill. A skid steer bucket was used to maneuver the drilled-shaft concrete through the tight drilling areas.

Seventy-one drilled shafts were installed ranging from 16 inches to 24 in. in diameter (405 mm to 610 mm), drilled to competent bedrock up to 26 ft (8 m) below the surface. Due to subsurface conditions, a temporary casing was used for the full depth of the shaft. Reinforcing bars were installed the entire length of the shaft. Careful production sequencing and Keller's field expertise resulted in a successful project completed ahead of schedule with minimal environmental impact.

Project facts

Owner(s)
Calgary Zoo

Keller business unit(s)
Keller

Main contractor(s)
PCL Construction

Solutions
Deep foundations

Markets
Institutional
Sports and entertainment

Techniques
Drilled shafts

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