

Owners:

John Ball Zoological Garden

Contact Person Names/Phones:

Ms. Brenda Stringer
Director-John Ball Zoological Society
(616) 336-4303

Mr. Allmon Forrester
Operations Manager-John Ball Zoological Garden

Location of Project:

City of Grand Rapids, Kent County, Michigan

Date Started/Completed:

May 2010 – July 2012

Dollar Value:

\$

Project Team:

Robert E. Bruggink, P.E., Principal in Charge
Timothy Hoffert, P.E. - Project Engineer
Steve Green, P.S. - Survey Chief



Project Description:

The John Ball Zoological Gardens is located on the side of one of the tallest hills within the City of Grand Rapids and is landlocked with a major highway serving as the north and west boundaries, and designated park land serving as the south and east boundary. The areas available for expansion are limited to several forested hillside and hilltop locations on the backside of the existing developed area. Development of these areas has been hindered over the years due to the challenge of providing access and utilities. In 2008, with the prospect of donations for the purpose, Moore & Bruggink analyzed the feasibility and cost estimate of constructing a funicular from the front gate to these areas. Several different locations and multiple routes were analyzed. The study was instrumental in determining the best location for future development and the general alignment of the funicular.



In the spring of 2010, Moore & Bruggink completed the topographic survey of the route, including an extensive tree study. In locating the funicular, the goal was to save as many large trees as possible. Moore & Bruggink helped by field locating the route several times during the design process.

During construction, Moore & Bruggink was responsible for staking the pier foundations. Accuracy in this rugged location was key, as tolerances of less than 1cm were required for installation and proper operation. Areas of unsuitable soil were discovered during construction of the piers and footings, requiring that the stakes be replaced after each operation. In addition, after the piers were constructed, Moore & Bruggink surveyed the in place anchor bolts to verify the design of the track prior to fabrication.

The Idema Funicular opened to the public in July of 2012, and is the only attraction of its kind in Michigan. The funicular provides transportation to the Bissel Tree House indoor event center which provides some of the most spectacular views of the city. Construction of this project provided the utility infrastructure and the pedestrian and vehicular access required to open up an entirely new area to zoo exhibit development.