

GE Johnson Construction Company

Cheyenne Mountain Zoo – Water’s Edge: Africa

Category 3: Meeting the Challenge of a Difficult Job – General Contractor

Overview

It began with a daring vision: create a South African beach and a replica of the Nile River... in Colorado. While the idea may have been rather ambitious, the motivation for an update was certainly justified. It had been nearly 60 years since the Cheyenne Mountain Zoo’s aquatic exhibit was built. The facility no longer met the needs of the hippos and penguins who lived there.

So in 2018, after a successful fundraising campaign, Cheyenne Mountain Zoo partnered with GE Johnson to turn their African dream into a reality.

Water’s Edge: Africa is an exciting and critical update to the Cheyenne Mountain Zoo to provide a new home for their hippopotamuses and penguins. The project entailed reproducing the Nile River and a South African beach in the middle of the Rocky Mountains, on the side of a steep mountain at an altitude of 6,800 feet. Replacing an aging facility that no longer supported the zoo’s commitment to conservation and education, it also offers visitors the exciting opportunity to interact with these fascinating, exotic creatures in a new way.

The exhibit incorporates a new, innovative approach to back-of-the-house management, allowing visitors to observe animals in a semi-realistic environment. Both buildings have been creatively positioned on a sloping site to maximize views and visual space.

The hippo area features a knife-edge pool that lets guests view animals at eye level. There is also a pedestrian bridge stretching over the pond, offering a bird’s-eye view of the habitat. The penguin section includes an upper pool with a penguin slide to a lower pool, along with an area for the flightless, playful birds to roam.

In addition to hippos and penguins, the exhibit has an island populated by lemurs, as well as a space for warthogs and guinea fowl. The hippo section provides a training area where zoo workers examine and tend to animals, along with a special, in-ground scale where visitors can determine how many people equal the weight of one hippo. The exhibit also features a hay elevator for feeding the hippos and a manure chute for easy cleanup.

Beyond the great spaces for the animals to live and play, the new exhibit space has improved areas for breeding. A new filtration and recycling system that occupies most of the facility's basement dramatically reduces water waste.

Solutions of Special Projects

Successfully building a new exhibit in an operating zoo, poised on the side of a mountain at 6,800 feet elevation, is all about overcoming challenges.

The first obstacle presented itself during the excavation: the ground was filled with boulders. More than 20 loads of boulders were taken up Cheyenne Mountain to the nearby Will Rogers Shrine, and another 100+ truck loads were sent off the site.

Another hurdle was the weather. Cheyenne Mountain typically gets more snow and experiences colder temperatures than the rest of Colorado Springs. A very cold and snowy spring in 2019 impacted construction with snowfall occurring into early June. The zoo was also hit by a major hailstorm that caused damage to many of its facilities. Maintaining the schedule meant finding ways to make up time when inclement weather slowed progress.

Working in an operational zoo posed yet another challenge. Maintaining safety and public access to the rest of the exhibits during construction required careful planning and teamwork. GE Johnson collaborated with the zoo, design team, and subcontractors to strategize and determine how to stay on schedule while also making allowances for visitors – from parking to deliveries. Other exhibits and zoo activities had to be considered and planned around to ensure there were no interruptions or unanticipated delays to the zoo schedule, and that animals were not disturbed.

While progress was important, the top priorities were safety, providing support for zoo operations, and making sure visitors had a great experience – unimpeded by construction.

Excellence in Project Execution and Management/Team Approach

The Cheyenne Mountain Zoo project is a testament to the power of teamwork and the dramatic effect collaboration can have on quality. Working under difficult circumstances, the team successfully pooled their experience and expertise to overcome challenges and discover innovative solutions to each obstacle.

The team had the opportunity to work with subcontractors who specialize in zoo and exhibit construction. While they brought expertise in creating natural habitats for animals, most had not worked at altitude, in a zoo positioned on the side of a steep mountain. This required adjustments in technique and design.

Preplanning was the norm throughout preconstruction and construction. Models and mockups were submitted and discussed by the zoo, GE Johnson, and the subcontractors in a truly collaborative environment. As many decisions as possible were made before construction started. The mud banks, for instance, were carefully preplanned, with mockups created and submitted to the zoo for review and approval well in advance of installation. A clay model for the penguin area was provided to show zoo officials what the design would look like and to allow for changes and refinements before any shotcrete was installed.

Construction Innovations/State-of-the-Art Advancement

The water filtration system installed in this new exhibit (comprising most of the basement) sets the standard for zoos worldwide. The old system used tremendous amounts of water — about 60,000 gallons per day — simply disposing of it when it got dirty. The new system circulates the water through a series of filters, removing impurities, and allowing the water to be reused. This is a huge environmental improvement. Additionally separate air handlers ensure the new environments maintain the appropriate climate.

The creation of the river banks meant to replicate an African environment was an example of both innovation and state of the art technology. This unique landscape was painstakingly developed by experts in a three-step process that involved tying rebar and filling molds with shotcrete, shaping and texturing the resulting rocks, and painting them to resemble something out of Africa.

Recreating the Nile River and a South African beach was an ambitious goal. In addition to an authentic look and feel for both animals and visitors, the project was expected to create an environment in which the animals could be successfully bred. For the penguins, that involved not only realistic-looking boulders, but small caves for the flightless birds to crawl into and nest. The design incorporated information gleaned from the study of African penguins in the wild and was accurately replicated in order to successfully support the zoo's breeding efforts.

Environment/Safety

Cheyenne Mountain Zoo is ranked among the top six zoos in America by a variety of sources. Its popularity is evidenced by a yearly attendance of nearly 800,000 people. Working in this environment required intense and meticulous planning and logistics. The site itself, located between the Rocky Mountain Wild Exhibit and Primate World, requiring guests to walk directly past active construction, always had to be properly secured. The zoo requested that see-through fencing, rather than privacy fencing, be erected to allow patrons to get a glimpse of the progress being made on the new home for the hippos and penguins. With the constant flow of visitors, the presence of zoo staff, and the assortment of animals living nearby, the team had to act as if they were working in an occupied hospital; deliveries were scheduled for early morning before the public arrived; traffic and laydowns were carefully managed; and the welfare of the zoo inhabitants were always top of mind.

The GE Johnson safety culture involves site-specific safety orientations for everyone on the job. This was especially critical for those subcontractors who had never worked on a project at an operating zoo. Workers were briefed and instructed on how to interact with the public and the need to constantly be aware of the zoo animals when performing activities.

During a special week-long emphasis on site safety, members of the team were instructed in the appropriate use of cell phones, the risks involved in multi-tasking, potential hazards regarding housekeeping. The team celebrated their exemplary safety record of zero lost time injuries for more than 27,000 labor hours.

Excellence in Client Service and/or Contribution to Community

In addition to always being on display to the public, the team participated in Cheyenne Mountain Zoo's "Keeper Talks." These involved addressing the public, explaining the plans and progress of the Water's Edge project, and answering questions. The team enjoyed the interaction and the zoo visitors were truly excited to learn more about the upcoming attraction. The team also gave site tours to the Cheyenne Mountain Zoo board of directors, zoo staff, and a variety of other groups.

The entire project evidenced a commitment to animal welfare through the creation of spaces that allow animals to choose whether to be inside or outside – with roll-up doors and indoor/outdoor pools.

The Cheyenne Mountain Zoo seeks to be a leader in conservation, captive breeding and animal care, and connecting people with wildlife through experiences that inspire action. The Water's Edge: Africa exhibit, with its advanced water filtration system, improved spaces for animal breeding and training, and enhanced visitor experience, supports this mission.









