

Great Bear Wilderness at the Brookfield Zoo

CleanFlo™ Monoscreen®



CASE STUDY

Location: Brookfield, IL
Engineer: TJP Engineering, San Diego

When the polar bears at the Brookfield Zoo were introduced to their new habitats at the Great Bear Wilderness, they had no idea how much more fulfilling their life would become. The upgrades to the new exhibit impacted not only the quality of life for the bears, but the upkeep of the facility as well.

The original bear exhibit at the "Bear Grottos" had become outdated and difficult to maintain. It housed grizzly bears and polar bears with limited natural substrates, and unfiltered pools with no viewing areas for the zoogoers to watch the bears underwater.

Unclogging the Grotto

When the "Bear Grottos" were constructed in the early 1930's, exhibit pools were only designed to be emptied and refilled without consideration for filtration. A surprising amount of bear hair shed in the spring. This, combined with leaves falling from nearby trees, and enrichment items, such as branches and bones, all created a remarkable amount of debris in the pools. Debris had to be manually removed to prevent clogging the downstream plumbing. The number of man-hours spent removing the debris

was not an efficient work practice. So when the zoo set the plans for the new Great Bear Wilderness exhibit, they realized they needed to develop a new life-support facility design that would eliminate the stagnant, labor-intense pools and create a more healthy, natural aquatic habitat for the bears. The zoo also wanted to provide guests with aesthetically pleasing water while they viewed the bears in the underwater viewing area.

Dave Derk, Life Support/Water Quality Lead for the Chicago Zoological Society which manages the Brookfield Zoo, enlisted the help of Terri Johnson, President and CEO of TJP Engineering in Imperial Beach California, whose zoological dossier is quite extensive.

Based on the construction design, which called for three pools (approx. 80,000 gal. each) to filter out into four sand filters and return to the pools, Johnson recommended an in-channel fine screen that would capture the debris at the front end of the system. In reviewing several different brands, the WesTech CleanFlo™ Monoscreen® fine screen was chosen.

As Johnson indicated, "We chose the Monoscreen® based on flow-rate, particle size and the availability of an in-channel model." She also stated that the Monoscreen® installed at Brookfield Zoo's Great Bear Wilderness is currently running continuously

with 3000 GPM of water running through it. Ultra-sonic water level sensors engage and disengage the running of the Monoscreen® based on water height entering and leaving the channel.

CleanFlo™ Monoscreen®

The Monoscreen® uses a progressive step shape screen design and motion that



CleanFlo™ Monoscreen® Installation

WESTECH®

minimizes flow surges during operation and more evenly distributes the screenings on the face of the unit. The result is a screenings capture ratio (SCR) of 82.5%, one of the highest solids removal efficiencies available for enhanced protection of downstream pumps and equipment. The durable drive system uses few moving parts with no chains or submerged bearings to minimize maintenance. Its low-profile, in-channel design allows easy access and inspection, especially in enclosed screening systems.

Brookfield Zoo CleanFlo™ Monoscreen®	
Model	RSM38-65-1
Flow Rate	3,000 gpm
Channel Width	30"
Overall Discharge Height	12.5' from the bottom of the channel
Screen Lamella Spacing	1mm

Retiring the Rake

Since its installation in 2010, Derk has eliminated the need for manually removing the bear's fur and debris from the pools so filters and drains remain clean. The



Providing crystal clear water for admiring zoogoers

keepers have also expanded the variety of enrichment items they offer the bears. In fact, when designing the new exhibit, they added areas within the habitat, like natural substrate, fallen trees, rocks, hidden pockets and vegetation where they can hide food to encourage natural foraging. This also encourages more pool activity in the polar bears. Zookeepers have also introduced a more varied diet to the bears.

Derk noted that he's seen crayfish carcasses and minnows among the fur and debris in the screenings discharge. He's reported the screenings capture rate to be over 95%.

Derk and Johnson said, "The amount of hair the Monoscreen® removes from the water looks like a wool blanket," (in reference to the screenings discharge from the fine screen). Derk also indicated that he only has to empty the trash bin once a week. "Because of the reduction in the raking of the pools; we now have time to attend to the other things that need our attention."

CleanFlo™ Monoscreen®	
Flow Rate	Up to 60 MGD through a single screen
Channel Width	12" up to 6.25'
Overall Discharge Height	2' up to 14.5' from the base of the unit
Screen Lamella Spacing	1, 2, 3 or 5mm

Wonderful Wilderness

The new exhibit pools and the associated filtration have greatly improved the guest's viewing and appreciation of bears, according to Jay Petersen, curator of mammals for the Chicago Zoological Society. "The bears increased use of pools has enriched their lives, and zoo staff appreciate the efficiency of maintaining water clarity and of providing cool water in hotter weather."



Efficient screenings capture protects the downstream sand filters

Two of the pools have large viewing windows that zoogoers enjoy. The underwater viewing area is also open after hours for private functions, meetings and activities.

The next expansion in the zoo's future could be the "Seascape" exhibit, which is home to harbor seals, grey seals, and sea lions. Derk indicated that he would like to use the CleanFlo™ Monoscreen® in this exhibit, as well. "This was the first exhibit I've recommended the Monoscreen® for, but I will definitely use it in other aquatic LSS installations" remarked Johnson.