

2020 Honorable Mention

Chihuahuan Desert, El Paso Zoo

By Steve Kanoza

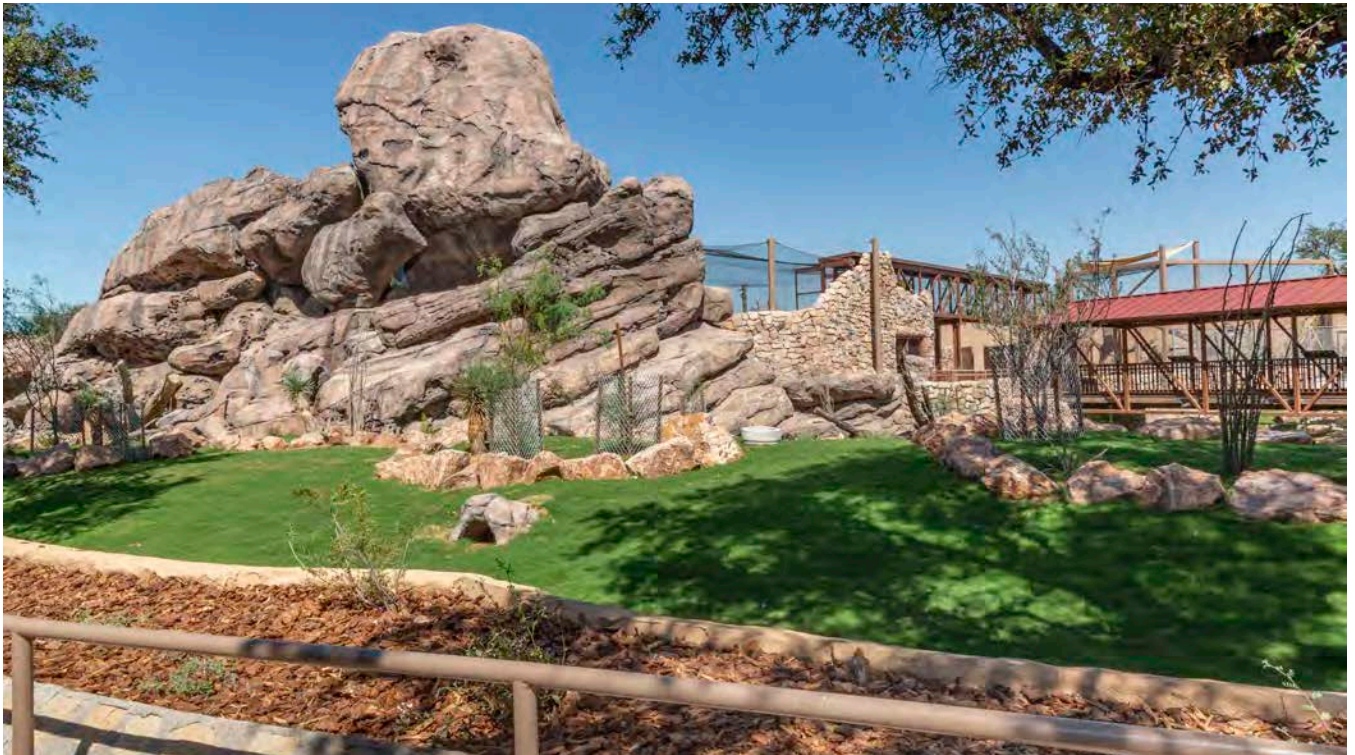


Fig. 1: Back of 45ft Rock Mountain and theming

Located in El Paso, TX, the El Paso Zoo sits on 35 acres (1400 m²) of land and houses over 220 animal species from around the world. Accredited by the Association of Zoos & Aquariums (AZA), the El Paso Zoo's mission is *to celebrate the value of animals and natural resources and create opportunities for people to rediscover their connection to nature*. Locally recognized as the "Best Place to Take Your Kiddos," the El Paso Zoo features family favorite attractions like African Star Train, Foster Tree House Playground, and now home to the award winning Chihuahuan Desert exhibit.

The Chihuahuan Desert project is a state of the art, 2.3 acre (9300 m²) development that is part of the El Paso Zoo's 15 year Bigger and Better than Ever master plan campaign. Cemrock's goal for the project was to create artificial rockwork and theming that represented the true geology and landscape of the region surrounding El Paso. A large, 45 ft

(14 m) tall rock mountain (Fig. 1) with monsoon flood water crashing through a railroad track to simulate a desert arroyo (Fig. 2), is the center piece of this magnificent design. Artificial boulders, fallen tree trunks (Fig. 3), rustic rock walls (Fig. 4) and other features of the Chihuahuan Desert are weaved throughout the exhibits for Mexican grey wolves, mountain lions, jaguars, and other animals who call North America's largest desert, home.

DESIGN & CONSTRUCTION

To ensure the recreation of the desert's organic realism, Cemrock's project superintendent, artisan, and team traveled to southwest Texas to study the colors, shapes, textures, and beauty of the Chihuahuan Desert to incorporate into the final design. The resulting artistic rendering, physical clay 3-D model, and construction documents were used as specifications and guidelines for this project.

Production of the artificial Chihuahuan exhibition started with shaping reinforced steel armature, i.e. the application of the backing material and the rough shaping of the shotcrete structure coat. Without the realistic shaping of the reinforcing bars and proper application of the structure coat, the final naturalistic outcome would not be achievable. Design intent and structural aspects of all formations needed to be engineered with frequent inspections. The finished product may be artistic in nature, but the requirements for foundations, reinforcing steel schedules and shotcrete mixture designs are as arduous as any concrete building or bridge foundation. Full encasement of the reinforcing steel, per calculations, must be followed at this stage to achieve specified structural strength.

SHOTCRETE SOLUTIONS

When a rockwork contractor, like Cemrock, is brought in to build a project like the Chihuahuan Desert, only artisans with many combined years of hands-on experience and expertise can make the design come to life. The intimate knowledge about how shotcrete is made, transported, pumped, placed, worked, and cured is key to creating an excellent product. The Chihuahuan Desert project took more than a year for Cemrock to complete onsite. In that time, our team experienced extreme heat and freezing wet weather. With these

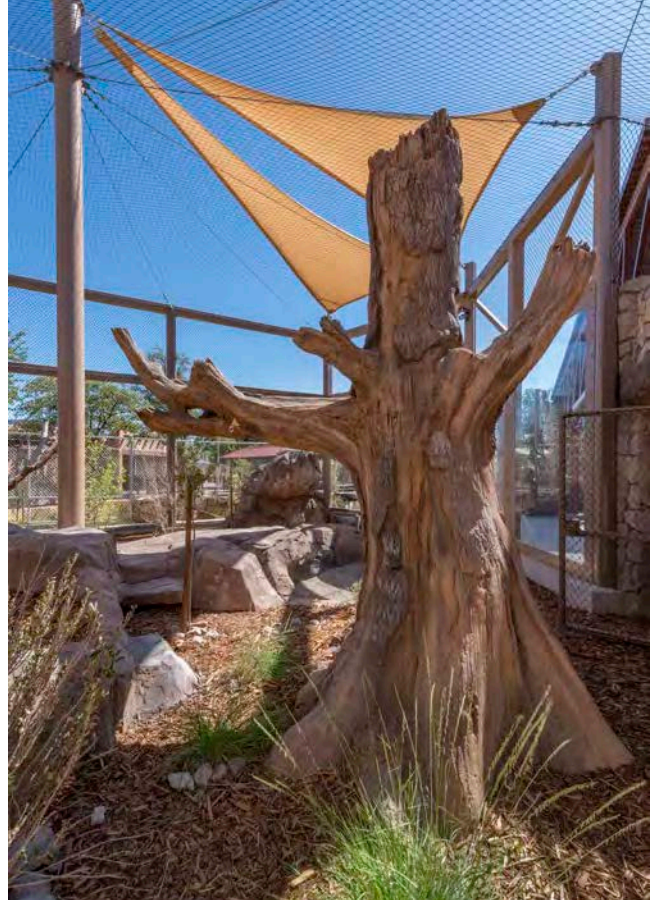


Fig. 3: Chihuahuan Desert Arroyo

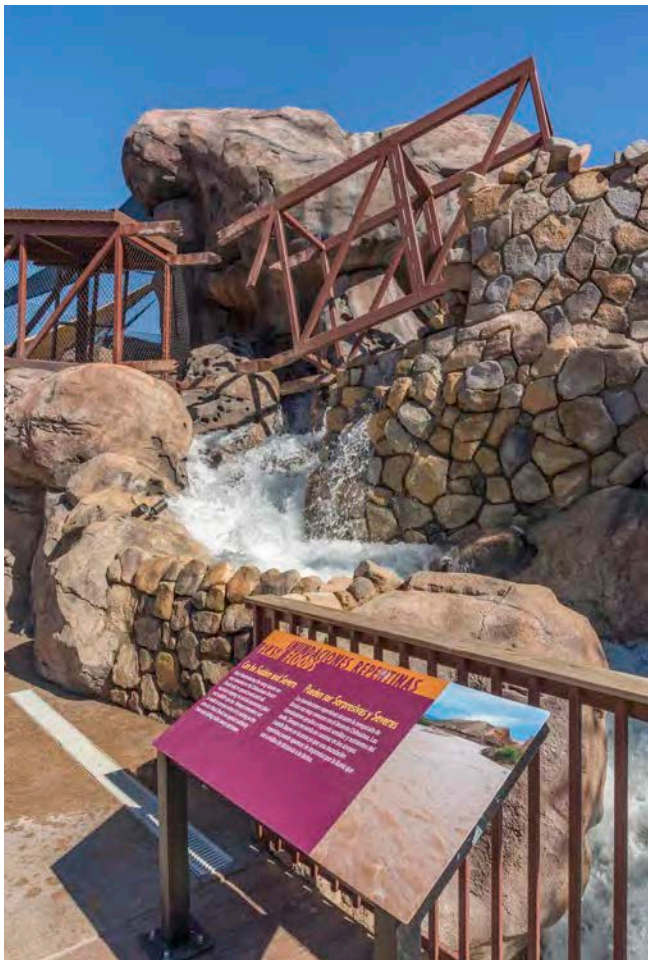


Fig. 2: Chihuahuan Desert theming weaved through animal exhibits



Fig. 4: Rustic Rock Wall and animal exhibit theming



Fig. 5: Cemrock's Chihuahuan Desert Team



Fig. 6: Chihuahuan Entry Way



Fig. 7: Rock Exhibit and Chihuahuan Desert Theming

varying conditions, we knew that an adaptable material like shotcrete would provide the strength and durability needed to withstand harsh desert conditions. Depending on the weather, additives were used to lengthen the workable life, accelerate the cure time, as well as cool off or heat up the concrete mixture. Each ready-mix delivery truck was checked for temperature and slump before and during pumping.

SHOTCRETE EXPERTISE

Another key factor in the overall success of the project was the utilization of ACI-certified nozzlemen. With a project like this, the structures are organic in shape. It takes an expert nozzleman (Fig. 5) with specialized training to operate a shotcrete nozzle that shoots material that is both thick enough to trowel, yet thin enough to hang, without sagging. The ACI certification process and ASA education that our nozzlemen receive enhances their ability to perform this task efficiently and creatively. Present during the Chihuahuan Desert project were our fully ACI-certified nozzlemen, as well as ACI nozzlemen-in-training. The training and expertise of each nozzlemen ensured that the outcome of our project mirrored that of the designer's renderings, Zoo Executive desires and truly showcased the natural beauty of the Chihuahuan Desert (Fig. 6 & 7)

2020 HONORABLE MENTION

Project Name
Chihuahuan Desert, El Paso Zoo

Location
El Paso, TX

Shotcrete Contractor
Cemrock Landscapes, Inc.

Architect/Engineer
**PGAV Destinations Peckham Guyton
Albers & Viets, Inc**

Material Supplier
GCC Ready Mix

Equipment Manufacturer
REED Concrete Pumps* and Sunbelt Rentals

General Contractor
Jordan Foster Construction, LLC

Project Owner
City of El Paso - El Paso Zoo

*ASA Sustaining Corporate or Corporate Member



Steve Kanoza is a Project Manager for Cemrock Landscapes, Inc. based in Tucson, AZ. With over 21 years of industry knowledge and expertise, Kanoza is highly skilled in estimating, field management and shop project execution. Kanoza is a member of the American Shotcrete Association (ASA) and earned his BAA in Outdoor Environmental Education from Central Michigan University.