

Henry Doorly Zoo Upgrade Proposal

Detailed scans help create powerful fund raising tool

Scope	Survey of existing site and conceptual design of new, enclosed walkway & gorilla building expansion; 800' L x 500' W ground area, 5 buildings, 3 animal enclosures; deliverables were as-built plans of existing buildings and terrain, 3D model of proposed upgrades and additions, and 7-minute 'fly-around' and 'walk through' CD/video
Owner	Henry Doorly Zoo
Date	2001



"With Cyrax we quickly obtained details that made our 3D model more accurate and realistic."
V.P. Surveying, Lamp Rynearson & Associates

"There is no question in my mind that having animation really made a difference in our fundraising"

Dr. Lee G. Simmons, DMV, Director, Henry Doorly Zoo

Project Facts

Field: 2 days; 2-person crew; 20 scans

Office: Cyra software – 2 days;
3D rendering & animation software – 4 weeks

Deliverables: 2D plan drawings; 3D DTM; 7-minute animated movie/CD with walk-through and fly-through

Customer Benefits

- More accurate and complete as-built information yielded better model for video
- Sign and poster information in habitat area captured by scans improved model reality
- Ability to accurately model otherwise obscured building edges and eaves
- Faster collection of field geometry and completion of as-built model
- Assured safety via remote scanning of wild animal enclosures

Background: Officials of the Henry Doorly Zoo in Omaha, Nebraska wanted to solicit funding for a major upgrade of their world-class facilities. They planned to double the size of the gorilla building and add an enclosed 550' long walkway between the expanded gorilla building and the existing orangutan building. They thought an eye-catching yet realistic digital 'video' of their proposal on a CD would be a valuable aid in promoting the project and soliciting funding. Zoo officials contracted with Lamp, Rynearson & Associates, a consulting engineering firm with over 100 employees in Omaha, Nebraska, to produce project drawings, 3D models and a digital video.

Project Description: The area of the zoo to be surveyed included five (5) existing buildings and the terrain enclosed by them. Three of these buildings are habitats for gorillas, orangutans and large cats and each has walled enclosures adjacent to the buildings. The ground area measured approximately 800 feet long by 500 feet wide, with an elevation difference of about 50 feet between the two end buildings.

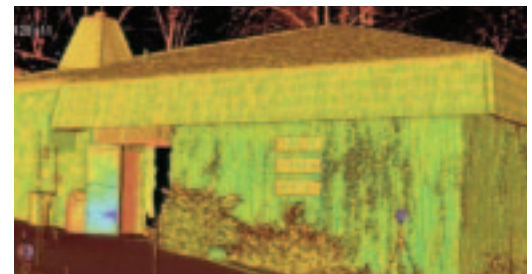
Conventional surveying equipment was neither accurate enough nor fast enough to economically collect the amount of data needed for a detailed model of the buildings. Using conventional equipment would also be hazardous to the operators, since they would have had to enter the animal enclosures. Also, the line of sight to some building edges and eaves was obstructed, making data collection very difficult with conventional equipment.

Project Workflow: A two-man crew used a Cyrax® 3D Laser Scanner to complete about 20 scans of the zoo buildings and adjacent landscape in two days. They achieved ¼ inch accuracy where a proposed walkway would tie into the buildings. Steep terrain was quickly scanned with a six-inch scan resolution, to yield an acceptable lower accuracy point cloud. They also used a total station and survey pole to collect topo data in an area where the ground was covered with deep grass and knee-deep weeds.

Following the scan, point clouds were processed with Cyra software. By using the software's region growing and planar intersection tools, building edges and

eaves were accurately defined even where trees, walls or other buildings obscured the surfaces. A wire-frame model of the buildings, wall surfaces, and terrain was produced in Cyra software. Cut sections of the point cloud were combined with total station topo data in LISCAD and used to develop a 3D CAD model of the existing terrain, including contours. This will be used in the future to design footings for the enclosed walkway. Also, 2D plan drawings were produced in AutoCAD using Cyra software plan views and total station topo data.

To produce the promotional CD/video, the Cyra wire-frame model and total station topo data (from LISCAD) were loaded into a 3D rendering and animation software package (3D Studio). After four weeks, a 7-minute video featuring a 3D computer model of the proposed zoo upgrade was completed. The viewer could 'fly around' a 3D model of the site and 'walk through' the existing and proposed gorilla building and the enclosed walkway. Video production required many iterations of color, surfaces, lighting and texture. This video was distributed worldwide to solicit funds for the project.



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