



Himalayan Bungy Takes Adventure Tourism to New Heights in Rishikesh

Skeleton Consultants Overcome Structural Challenges to Design India's Tallest Bungee Tower

Located on the Ganges River's right bank in the foothills of the Himalayas, the Indian city of Rishikesh is a holy site for Hindus, many of whom pilgrimage to the city. It is also broadly known as the yoga capital of the world and attracts yogis from around the globe every year for its annual International Yoga Festival.

But alongside these spiritual draws, a growing number of tourists travel to Rishikesh in pursuit of an adrenaline rush. The city holds the title of India's adventure capital, with sundry opportunities for whitewater rafting, ziplining, and bungee jumping.

Engineers at the Noida, India-based firm Skeleton Consultants set out to make their mark on the adventure capital by designing the tallest bungee-jumping tower in India. To eclipse the attraction that formerly held this record—Jumpin' Heights, also located in Rishikesh—the new tower needed to have a drop of at least 83 meters.

Himalayan Bungy, located within Hikers Adventure Park, blew past this threshold. The tower, which opened to the public in April, sits atop a steep hill with panoramic views of the Ganges River. It features a 27-meter-long boom arm that extends over the slope below, adding the effect of additional height and creating a 107-meter drop.

But designing a stable structure on this site was a tall order.

“We had to be very careful not only for architectural functionality, but also for the safety of the design,” said Abhay Gupta, director at Skeleton Consultants. “The biggest challenge was with the site conditions.”

The park is situated on rocky terrain in an earthquake-prone area, so Gupta's team had to create a structure that could withstand powerful seismic activity. Additionally, strong winds of up to 180 kilometers per hour often sweep through the site.

Gupta's team created a 3D model using Bentley's structural analysis software to consider how a tower of this height would be affected by these forces. With insight from this digital analysis, they decided that a lattice structure with cross-bracings at key points would best optimize the

design for windy conditions. The team also selected wire ropes to brace the tower's boom arm to prevent it from twisting in the wind. To create more stability and prevent landslides on the hill where the tower is located, they planned a retaining wall at the hill's base and two stone masonry walls along the slope.

Software analysis also revealed that the structure needed to be lighter to eliminate drag, so the tower's overall weight was cut by nearly 25%, saving five tons of steel in the process.

Battling the Elements

Gupta also had to engage in creative problem-solving to deliver large parts to the park's relatively remote location for assembly. Pieces that made up the tower were manufactured at a workshop about 40 kilometers away and had to be transported down narrow roads leading to the park. As a result, Gupta had to tweak his design to use smaller pieces, although larger pieces would have been ideal once on site.

Khushbu Davda, the founder of M/s Studio Emergence Mumbai, which was the project architect and provided master planning for various other additions to Hikers Adventure Park, said that this adjustment was creative and necessary on Gupta's part.

"It was a matter of how it would be possible to build in an environment like that," Davda said. "And it was also time-sensitive—because when it rains, it pours in Rishikesh."

Work on the tower began in early 2022, and the pressure was on to have a stable foundation for the tower in place before monsoon season began in June, bringing with it the risk of landslides.

Even ahead of the rainy season, the project was confronted with difficult conditions. As the tower grew in height, wind became an increasing hindrance, and it grew more dangerous for the crew responsible for tightening each nut and bolt by hand. For a more streamlined and safe process, the team strategically planned the precise order that each component should be raised and assembled.

Gupta said that construction was delayed by around two months due to rain, but the holdup was offset in part by his team's choice to lean on innovative digital solutions during the design process. Overall, they saved about 200 hours of work by using 3D visualization software to optimize the tower's design before beginning construction.

The Bungee Experience

While structural integrity was a priority, a comfortable design that would allow jumpers to feel safe was also paramount. Visitors enter a ground-floor lobby and have the option of taking stairs or an elevator to the tower's main platform, where bungee masters are there to assist jumpers.

For people who come to support friends and family planning to jump—or those who decide to back out when faced with the 107-meter plunge—there is a viewing lounge available.

Videos on Himalayan Bungy’s social media accounts show footage of the thrill-seekers who have crossed “India’s Tallest Bungy” off their bucket lists since the tower opened to the public in April. Some confidently somersault off the platform, others lean backward into empty space, and some fling themselves with arms spread wide against the sky like flying squirrels.

Regardless of style, these adrenaline junkies might be surprised to know that the team that designed and built the tower considered their work to be a task just as audacious as jumping from the platform itself.

“Right from day one to the finishing day, it was an exciting experience,” said Gupta.

##

Spotlight on Abhay Gupta

Skeleton Consultants Director Pursues the Challenge of Designing Unusual Structures

From his early days in school, Abhay Gupta was fascinated by construction. He saw it as a discipline with the potential both to create art and solve complex problems. As he developed his skills as a civil and structural engineer, he became interested in testing the limits of materials, such as concrete and steel, by designing structures as challenging as they were striking.

“Designing is [never] an issue; the challenge is only in execution,” Gupta said. “On paper, I can do anything.”

After more than two decades of teaching engineering at the university level, Gupta took a leap of faith and launched his own firm in 2007. As the director and principal structural design consultant at Skeleton Consultants in Noida, India, Gupta has overseen the design of over 500 structures, including plenty of traditional buildings.

However, his favorite projects have been more outside the box, such as the Statue of Belief located in Nathdwara, India. At 351 feet tall, it is the largest statue of the Hindu deity Lord Shiva and the fourth-tallest statue in the world. Gupta consulted on the statue’s design, which includes an internal steel framework, a concrete outer cast, and a distinctive copper surface coating.

“I want to make very different, unique structures,” Gupta said. “Understanding [the structures’] behavior, then modeling them using software and constructing them and seeing them erected—that gives me a very satisfying feeling.”

Gupta believes that this pursuit of innovation has given him a reputation as someone who is willing to take a chance on a challenging project, such as the Himalayan Bungee tower that opened in Rishikesh in April. From the seismic hazards at the site to the tower’s record-breaking 107-meter drop, it was a commitment that required nimble thinking from start to finish.

“It was a challenge from the foundation design, to the structure, to the fabrication, the erection—everything,” he said. “But in the end, it has come out so well, and people are really enjoying the jump.”

Next up, Gupta plans to take the plunge himself. While many first-time bungee jumpers might feel last-minute panic while staring down from the tower platform, he is not worried.

“I’m not scared because I have full confidence in my structure,” he said. “I’ll be jumping from that platform with great excitement and without giving a second thought.”



[Image link](#)

Image caption/courtesy: Skeleton Consultants saved about 200 hours of work by using 3D visualization software to optimize the tower’s design before beginning construction. *Image courtesy of Skeleton Consultants.*

Author: Jana Miller serves as the senior manager of product marketing for structural analysis at Bentley Systems. She is responsible for creating consistent messaging, content, and programs promoting software for Bentley's structural analysis and design, pipe and vessel design and analysis, and offshore wind structural analysis and design offerings. She can be reached at jana.miller@bentley.com.

2023 *Going Digital* Awards Nominee

© 2023 Bentley Systems, Incorporated. Bentley and the Bentley logo are either registered or unregistered trademarks or service marks of Bentley Systems, Incorporated or one of its direct or indirect wholly owned subsidiaries. All other brands and product names are trademarks of their respective owners.