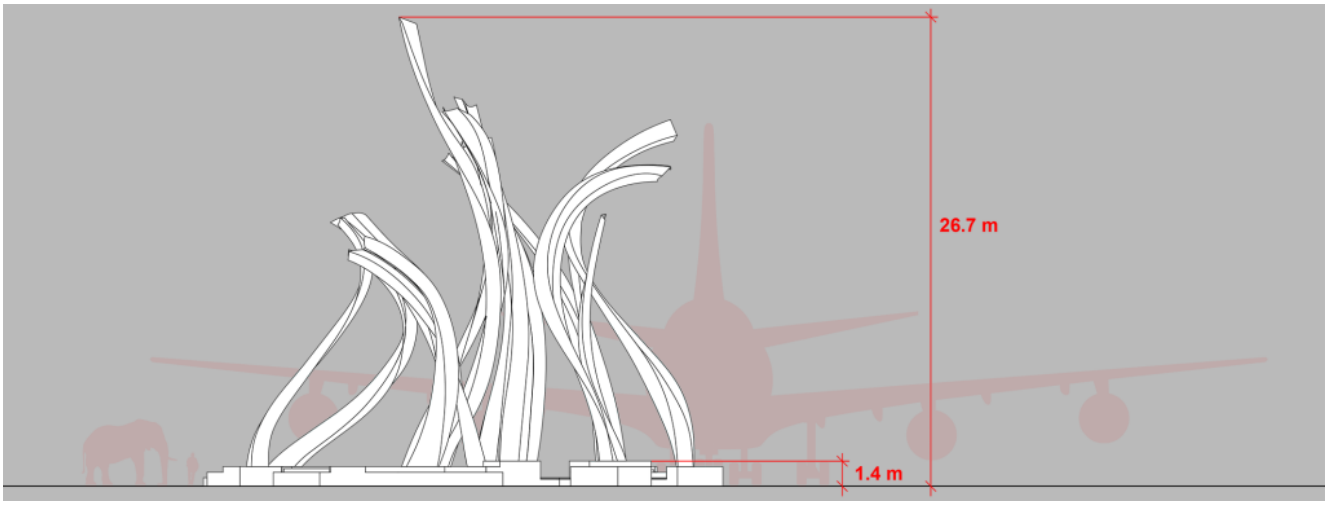
Mangrove: A Record-Breaking Glass Sculpture by Nikolas Weinstein

Mangrove, a monumental glass installation by sculptor Nikolas Weinstein, has redefined architectural glass art with its debut at the Solaire Resort North in Manila, Philippines. Spanning over four years of meticulous design, engineering, and fabrication, this groundbreaking project is the world's largest glass sculpture. It exemplifies the power of interdisciplinary collaboration, advanced digital tools, and the fusion of art and architecture.

A VISION ROOTED IN NATURE

Commissioned by Bloomberry Resorts Corp. Chairman Enrique Razon Jr., the sculpture draws inspiration from the intricate root systems of native mangrove trees. At 28 meters long, 35 meters wide, and soaring 27 meters high, Mangrove transforms the resort's atrium into an immersive sanctuary. Designed to echo the resort's "Urban Oasis" theme envisioned by Samantha Drummond of Habitus Design Group, the artwork bridges the natural and built environments.

Drummond's global search for an artist capable of realizing her vision led her to Weinstein. As she reflected, "No one else had the talent or skill to create it." The installation's dynamic presence has since captivated guests, dignitaries, and diplomats alike, becoming an iconic centerpiece of the resort.

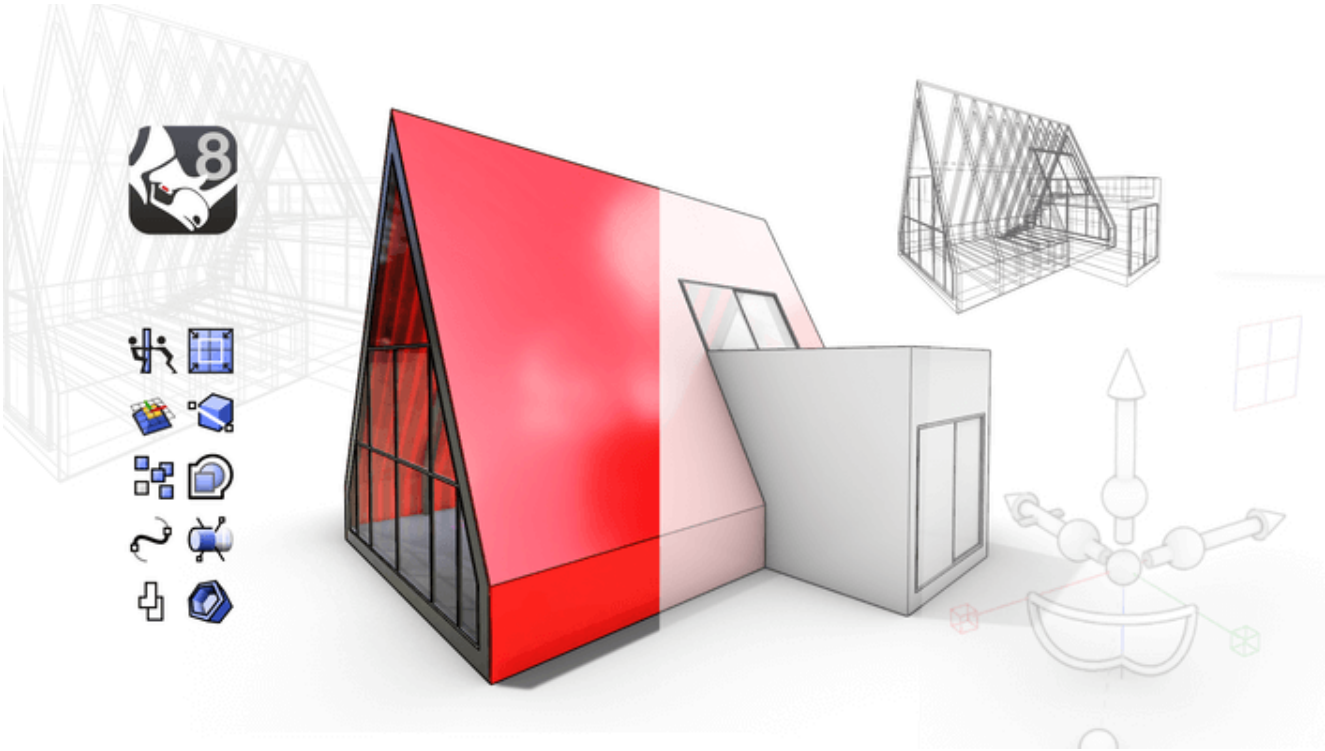


FROM CONCEPT TO REALITY: INNOVATIONS IN DESIGN

Weinstein's groundbreaking approach to glass sculpture at an architectural scale required developing a continuous and flexible glass matrix that functioned like a textile. Unlike traditional methods that assemble smaller elements, this innovation enabled the creation of cohesive, large-scale systems.

The design process began with hand-sculpted models digitized using scanning arms and imported into Rhinoceros. Grasshopper played a pivotal role throughout the project. Extensive scripting transformed

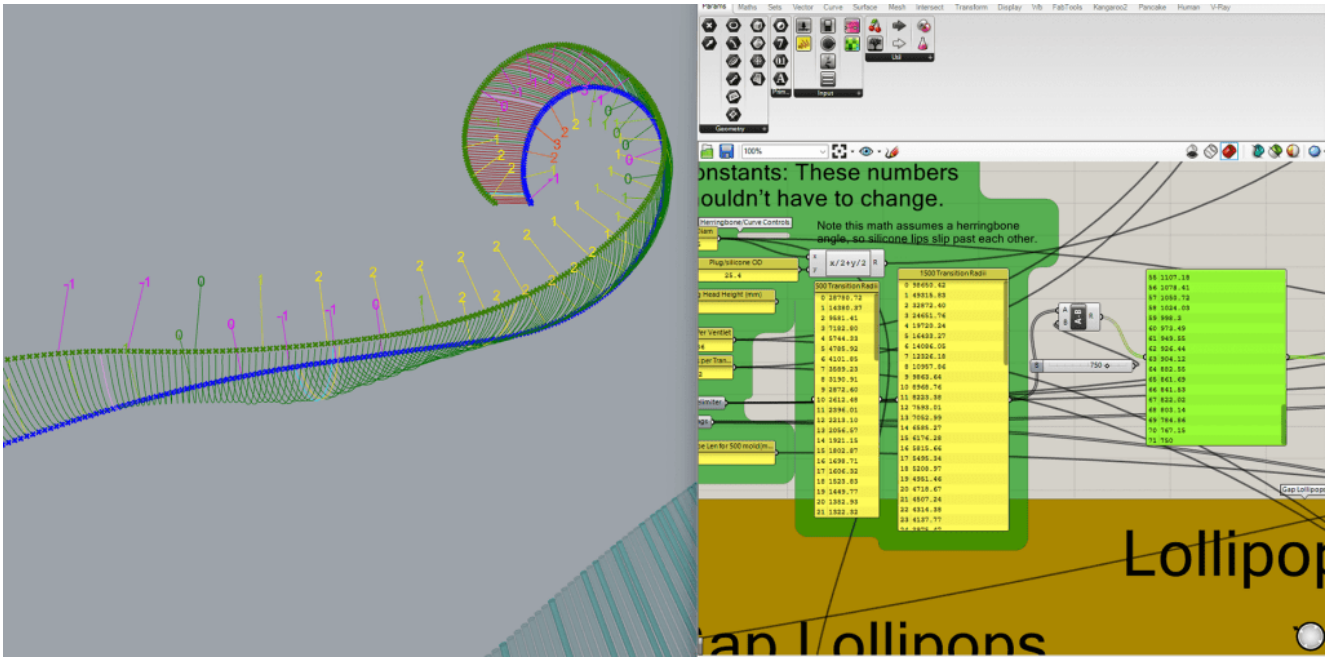
initial perimeter curves into fully enumerated models, where every glass tube and structural element was precisely named, numbered, and located. This digital foundation allowed for iterative refinements, addressing challenges such as mold radii and spacing to avoid gaps or collisions.



See Also

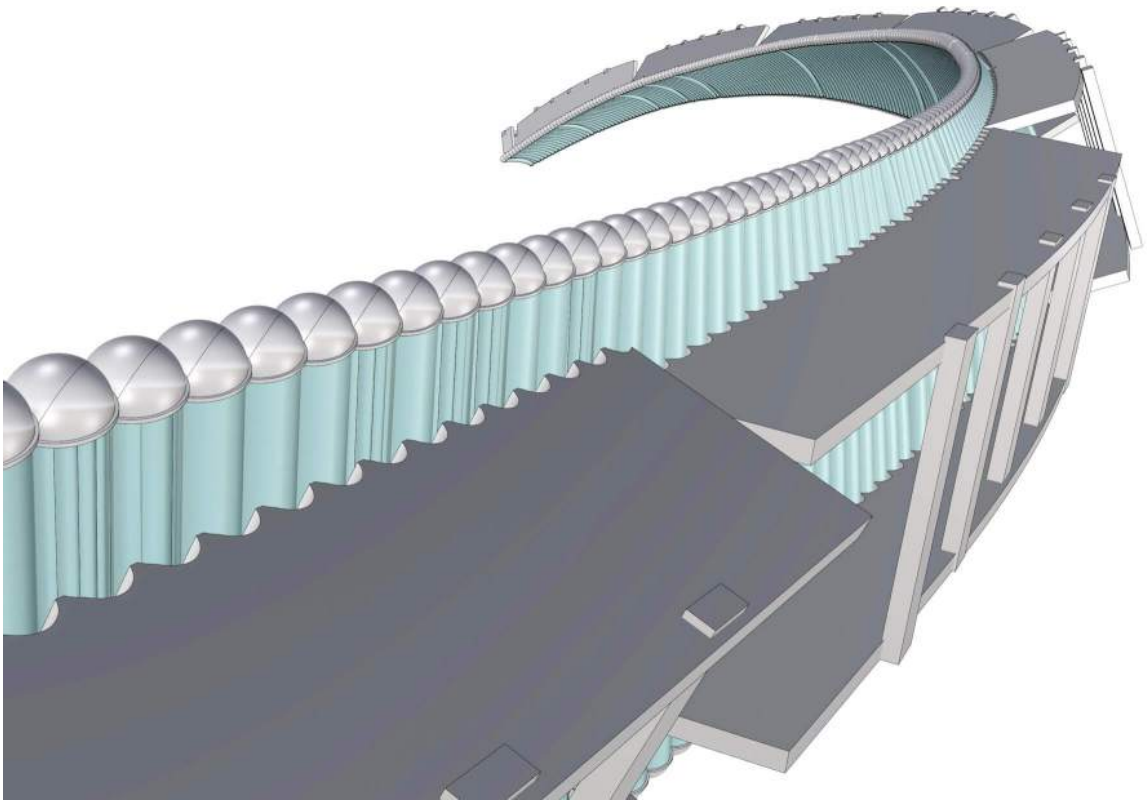
INTRODUCTION TO RHINO 8

Grasshopper's real-time visualizations also provided critical insights during the design phase. Color-coded models flagged potential conflicts, enabling immediate adjustments. This iterative methodology ensured the sculpture's visual harmony and constructability while balancing aesthetic and structural considerations.



ENGINEERING CHALLENGES & SOLUTIONS

Collaborating with Arup's engineering team, Weinstein's studio overcame the challenges posed by the sculpture's unprecedented scale and seismic resilience requirements. The Philippines' location in the Pacific Ring of Fire demanded innovative structural solutions. Over 11 kilometers of borosilicate glass tubing were interwoven onsite with aircraft cables and modular stainless steel spines, creating a dynamic yet structurally robust form.



Arup’s materials science leader Graham Dodd noted the project’s complexity, highlighting that the Mangrove’s computational model was 70 times larger than those used for skyscrapers like London’s Gherkin.

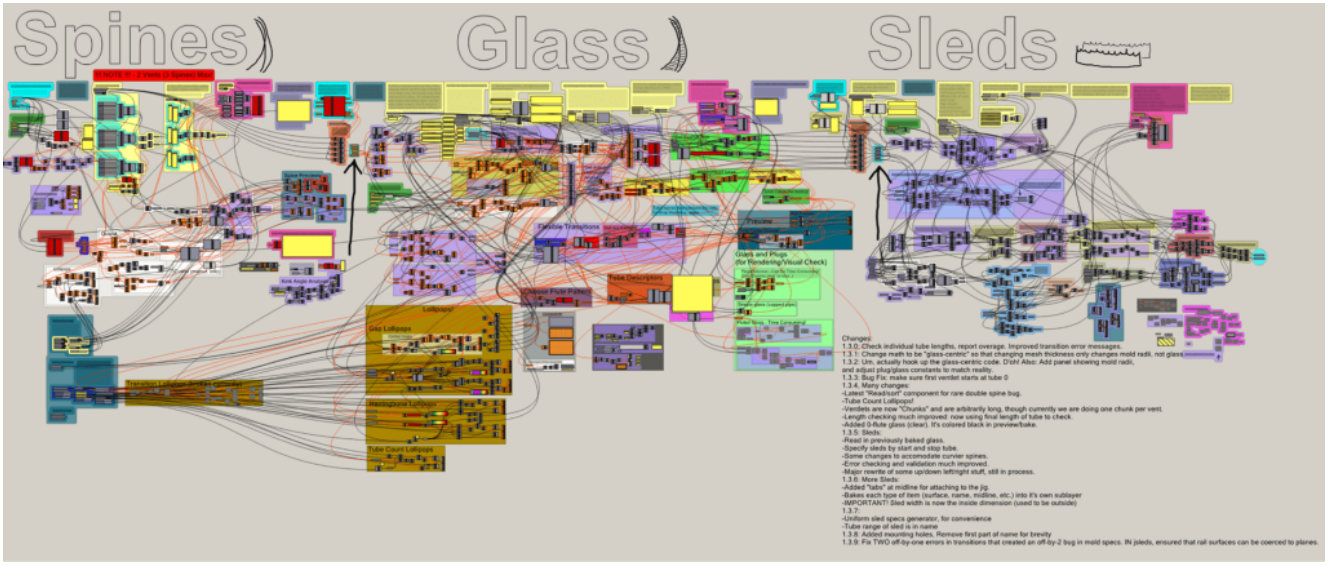
FABRICATION & INSTALLATION

The sculpture was fabricated in Weinstein’s studios in New York and San Francisco. Custom-built kilns and machinery enabled the precise manipulation of glass into “textiles.” Each of the 16,385 glass tubes was uniquely cut, polished, fired, and woven by hand. Due to the artwork’s vast scale, it was crafted in modular sections and then transported to Manila in five 40-foot containers.

Onsite installation was a feat of engineering and coordination. A team of 40 craftsmen spent six months weaving the intricate glass fabric into its final form. Visitors can now interact with the sculpture by walking through its archways, riding escalators alongside its curves, and relaxing beneath its flowing, trunk-like sections.

RHINO & GRASSHOPPER: DIGITAL BRIDGES BETWEEN CONCEPT & REALITY

At every stage of Mangrove’s creation, Rhino and Grasshopper were indispensable tools. Beyond design refinement, Grasshopper’s parametric flexibility enabled the generation of production data, including spreadsheets for over 16,000 glass tubes and profiles for CNC jigwork. This digital infrastructure streamlined fabrication, transport, and assembly, maintaining a seamless dialogue between the physical and digital realms.



REDEFINING GLASS STRUCTURE

Mangrove’s debut marks a new chapter in architectural glass art. By pushing the boundaries of scale, technical complexity, and interdisciplinary collaboration, Nikolas Weinstein has created not only a breathtaking sculpture but also a testament to the possibilities of merging advanced technology with traditional craftsmanship. Visitors to the Solaire Resort North can now experience this awe-inspiring work, a true intersection of nature, art, and innovation.

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