

Category: 5 - Best Building Project – Specialty Contractor (\$2 - \$6 Million)

Contractor: KHS&S Contractors

Project Name: Meow Wolf, Convergence Station: Numina

Themed Rockwork and Construction Transports Guests Into Realms of Story and Exploration

Meow Wolf believes in the power of creativity to change the world. KHS&S artisans and craftsman helped fulfill this mission transforming the five-story, 90,000 square foot Downtown Denver Meow Wolf into an immersive experience. A collection of three main portals showcases interactive art from more than 110 Denver-based and Meow Wolf artists. One of the most complex projects undertaken for such a compact area, Meow Wolf Denver challenged the KHS&S team. Work extended over eight months with multiple hurdles to overcome. Designed as a massive, psychedelic, 6-dimensional swamp, the rockwork's fluid shapes transform into organic vines that look alive and moving through lighting and sound. The exhibit interconnects with passageways, caves and portals telling vibrant stories through non-traditional art.

Project Scope:

- 3D Rockwork Plaster
- Molding Cloth
- Perforated Wall Panels
- Scenic Paint
- Direct Apply Plaster
- Wall and Ceiling Mirrors
- Unistrut Grid at Ceiling
- Framing/Fabric for Light Boxes at Ceiling
- Reflective Film
- Fabricate and Install Artwork in Swamp
- GFRC & FRP for Select Artwork
- Polygem Sculpting and Scenic Paint
- Acoustical Carpet

By the Numbers

- 30,000 square feet of interior rockwork
- 24,000 square feet plaster
- 71,960 linear feet rebar
- 5 plaster finishes
- 18 themed paint colors
- 36,000 work hours to complete

Building a Team with KHS&S and Local Workforce

The job was initially awarded to another company completing interior specialty work. As construction progressed, the Meow Wolf creative director requested KHS&S and its network of resources complete the Swamp, also known as Numina. Having worked on Meow Wolf Las Vegas, KHS&S had the specialty skill set required for the high level of intricate detail.

KHS&S then engaged the local Denver workforce to complete the team, cross-training carpenters and craftsman on the specialty techniques of rockwork, theme painting and plastering. For rebar and lath, a local apprentice was trained on the unique skill of working on curved surfaces. While contributing to the local economy, KHS&S built a labor force they could call on for future Denver area projects requiring these specialized talents.

Integrating Electrical and Air Venting Systems into Artistic Design

KHS&S walked into a drywalled and framed workspace encompassing a 6,000 square foot lower-level flat surface with 35-foot walls. Multilevel catwalks supported by columns meandered throughout the towering three-story chamber.

While there was a partially completed small-scale model for the overall design, electrical lines and junction boxes, HVAC system and mounts for artistic elements had not yet been placed. The team methodically worked backwards to maintain the pattern while determining the specific placement of the electrical and air venting system. Elements had to be strategically placed and visually hidden within the contours and angles of 30,000 square feet of rockwork.

From the partially completed scale model, KHS&S artisans completed the model to approval status. The model was scanned inhouse and 3D photos were sent to the site as a guide for installation. From the scale model, rockwork and other artistic elements were broken into a grid pattern and completed in sections starting from the ceiling on down. Rebar was shaped and prefabricated by KHS&S Archetype master artisans, measuring and bending the rebar to fit the intent. In this case digitized and manipulated by hand.

For the 6,000 square foot ceiling, KHS&S fabricated the rebar and rockwork to meander around light boxes, chrome and mirror ACT pools and the HVAC system that required a certain percentage of gaps for necessary air flow.

Delivering Specialty Plaster and Painting to Capture Artistic Vision

Materials management was critical as on-site storage was limited. Partnering with Denver-based Dutch's Masonry to supply the plaster pump and related manpower allowed the KHS&S artisans to focus on their craft. A large outside pump fed two smaller pumps that could be maneuvered around the tight catwalks and limited floor space. Five texture techniques including gun texture, molding cloth, paint on drywall, direct apply plaster and 3D plaster were required to create the desired look. Molding Cloth was adapted into gigantic mushrooms to become its own art element adding to the ceiling to wall transitions.

Numina features ten custom paint techniques in various colors with greens being the main theme. Other areas incorporated cotton candy blues and neon pinks to mimic caves and offshoots of other artists' work.

The KHS&S team worked closely with Denver and Meow Wolf artists during the placement of their imaginative art elements. During installation in one of the offshoot caves, panels with gems, mirrors and marbles of various sizes, shapes and colors were delicately transported by KHS&S to the jobsite from the artist's studio. The panels were set in place with plaster to form a seamless transition. Working six feet apart following COVID-19 protocol, the artist followed the plaster team to add elements, but was concerned the plaster was drying too fast. The KHS&S team quickly assisted the artist to set the mirrors, gems and marbles into place.

One of the larger work scopes added was the fabrication, installation and theme painting of the Cosmohedron, a three-story spaceship-like statue at the center of Numina. KHS&S produced three main elements of metal frame, glass walls and a GFRG decahedron to be placed amid the overall three-story elements constructed by the Meow Wolf artist. Installed near project completion, extensive care was required to not impact the floor to ceiling vines formed from KHS&S rockwork.

Coordination Using Pull Planning and Schedule Planning

KHS&S became the driving force at maintaining the schedule and managing the workforce using Lean Construction practices of Schedule Planning and Pull Planning. Eight Stand-Up Boards identified work sequences and timelines. KHS&S initially conducted weekly meetings with the Meow Wolf project team and soon the general contractor Turner Construction and Tower Electric joined the meetings as they saw the value of working collectively. These Lean tools helped the team analyze and determine new completion dates quickly, organize work crews and identify any anticipated added costs, up to three months in advance to ensure deadlines were met.

Leading by example, the KHS&S project superintendent, senior project manager, art director and paint supervisor collaborated with other trades and internal craftsmen daily. Each Friday, they walked the site to determine if weekend work was required to stay on schedule. Using the project management platform Trello, the project manager had real-time information and access to files to manage people, deliveries and materials.

Following Safety Protocol and Strict COVID-19 Policy

No time was lost due to work-related injury, which is significant on a project of this magnitude. Workers were given the tools and knowledge to remain safe, including understanding the inherent risks of working at great heights and in a confined space. To ensure the workspace remained uncluttered and safe, a storage and laydown area outside the loading dock and space within the building was designated for materials such as paint that could not be left in the freezing temperatures.

KHS&S's regional safety director was on-site weekly to ensure all protocols were followed. Focus was placed on high-risk materials and tasks, such as working with 72,000 square feet of rebar. Scaffolding reaching 35 feet was spaced every six feet around shapes and art elements so workers could be as close to the walls and ceiling as possible, with crew members tied off using a harness. Below the scaffolding, red tape zones prevented other trades from working near the KHS&S platforms.

Environmental procedures were also developed to contain toxins created from plaster pumps and additional site practices ensured there was no stormwater runoff into nearby South Platte River.

Adding to these extraordinary project challenges, this major undertaking took place during the pandemic. In an already tight work environment, a strict COVID-19 policy with testing, sanitization and distancing was adhered to. With up to four trades working in a confined space, labor planning between trades was essential to maintain required six-foot distancing.

As Meow Wolf Denver guests experience a surreal journey of the senses through light, music and art, the rockwork and theme finishes created by KHS&S artisans are also on display adding to this immersive non-traditional art installation.









