Big D Metalworks
Dallas Arboretum's Rory Meyers Children's Adventure Garden

Narrative

Rory Meyers Children's Adventure Garden at the Dallas Arboretum is a rambling adventure set on 27 acres of natural wonder in the middle of Dallas. This garden is a wonderful opportunity for children of all ages to explore, play and learn about our Earth. With over 150 individual kid friendly activities tucked within 22 unique galleries of learning, the garden provides fun and adventure for the whole family and is one of the best family friendly attractions in Dallas. With topography as diverse as the galleries themselves, this project provided a back drop for Big D Metalworks (Big D) to showcase its ability to bring alive the architect's design and install one-of-a-kind structures and artisan pieces throughout the Garden.

Complexity of the Project

Big D was contracted to assist with design, fabrication and installation of unique architectural metals throughout a complex learning garden for children. The project was, in fact, 22 smaller complex projects each with its own unique challenges, designs and delivery schedule. The 22 galleries take a guest through the multi-faceted terrain of the Earth. From flat lands to winding hilly paths, then over water and swamp, and up to an observation deck overlooking the Garden, this project required over 4,400 lineal feet of handrails and guardrail systems to keep all patrons safe and secure as they journey through the adventure. A few highlights of this complex project are: the Entry Gate, the Texas Skyway, the Cattail Fence, the Discovery Center Trellis, the Arbor Frames, the Reed Fence, and the Entry Arbor.

The Entry Gate welcomes visitors through a lit archway of undulating forged metal ribbon showcasing the name of the Garden. The wavy band of aluminum is attached to an intricate structure of twisted metal vines with 60 hand forged metal leaves of differing shapes, sizes and types of attachment angles. Big D designed and forged the archway, vine and leaves of metal and artistically hand attached each leaf in place to give the archway the appearance of natural vine.

The entry gate is six panels with an elaborate design throughout each panel. The gate design mimics a natural wind pattern made of thin individually made, bent and attached metal tines. Attached to this intricate metal configuration, at the bottom of the gate, are 32 handmade glass bluebonnet flowers of varying sizes and shapes with 10 butterflies in various stages of flight hovering above the bluebonnets. Big D's artisanship is showcased in the complexity of the design and fabrication of the pieces throughout.

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As a child runs through the welcoming Entry Gate, they are drawn to the striking Texas Skyway to their left. The Texas Skyway is a lighted elevated walkway throughout half the Garden. It continuously changes elevation as it traverses overland to water with the changing radii of curvature throughout the structure. The configuration has guardrails for fall protection.

The Cattail Fence provides an enclosure for a beautiful sitting area that seems to come to life. The fence is located near water and is set in to an area which changes elevation throughout. The design was water jet cut, assembled and then galvanized to minimize corrosion from the elements.

The Discovery Center is near the center of the Garden and provides an enclosed space for all the classroom programs and provided another opportunity for Big D to utilize their artisan touch and creative problem solving in the field. The architect made best use of all the space by designing a garden and seating area on the roof of the structure. Attached to the edge of the rippling roof line is an intricate and elaborate trellis system, which adds to the natural look of the Discovery Center by providing a structure to support the vines, which will eventually cover it. The whimsical looking trellis appears to be a simple ornamental structure attached to the building. In reality the ever changing angle of the roofline provided a need for each of the 53 support blades to be unique in shape, size and pitch. The only two identical blades are double supports evenly spaced throughout the structure. Each blade was required to be attached at an entirely different angle around the roof circumference. The final product appears as a perfectly spaced splay of gleaming metal blades with a simple metal runway of separate metal rods within. The stainless steel rods that mount to the top of the supports are rolled to match the curvature of the building as they flow from end to end.

The Entry Arbor, Reed Fence and Arbor Frames create an organic look to the park with creatively forged artisan metalwork. The Entry Arbor is four arches of rolled steel rods, which appear as stacked wheat. Once through this arbor the children run alongside the Reed Fence. This fence gives the impression of delicate reeds lining the walkways and water features, rolling over rock structures yet remaining sturdy enough to handle weather and maintenance issues. Along the Incredible Edible Gallery is a meandering set of bent steel Arbor Frames creating a structure for vines to crawl over and create a seemingly endless wall of nature as it winds its way to the next learning gallery.

The Reed Fence was created to be decidedly random and appear as reeds appear in nature. The terrain throughout the fence was widely varied. Big D created a specialized three-dimensional template system to use in the field to set the mounting system throughout the fence. The plans did not take into account a stair step in the layout so the reeds had to be lengthened in the field. However when the reeds were lengthened the fence didn't look natural. Using an artistic eye and some patience, a welder stood at the fence while another crew member stood back to point out where the reeds needed to be modified. The welder marked the reeds and made the modifications to make them appear natural.

Maximizing Teamwork

With a schedule of only 18 months to completion and several weeks of rain, ice and snow delays, effective time and schedule management was critical to the success of this project.

The Entry Gate design and installation took a coordinated effort working with the artist who handmade each blue bonnet and butterfly from cake glass. To compress the schedule for the Entry Gate process, Big D fabricated one template for each sized flower and butterfly that was to be incorporated in the gate structure. These templates were shipped to the glass artisan's shop and were used to manufacture each glass piece incorporated in the gate. While the glass artist used the templates that Big D provided to him to make the glass, Big D Metalworks fabricated the gate using identically sized templates. This innovative process allowed us to simultaneously fabricate the gate while the glass was being fabricated. After the gates were installed and all of the welding was completed, the glass artisan was able to install his glass. Simultaneously fabricating the glass and gates allowed us to compress the schedule by approximately 12 weeks.

Throughout the Garden, the concrete work is ever changing. From stamped concrete appearing as dinosaur tracks to hand-inlaid pebbles creating the look of a babbling brook bed, the concrete vendor and Big D coordinated their work throughout each of the 22 galleries. The Texas Skyway, the Cattail Fence, the Arbor Frames, the Reed Fence, and the Entry Arbor each required large poured concrete pylons before Big D could install any of their complex architectural metal structures. The majority of the barrier rails and handrails on the project were set in concrete piers, steps and ramps that were poured in place by the concrete contractor. Adding to the complexity of the Texas Skywalk was the involvement of 10 different subcontractors in this portion of the work. Between cold weather delays not allowing for concrete pours, and the lack of materials to pour concrete, Big D remained flexible in our skilled labor scheduling and resource management. Big D stayed ahead of schedule and met all deadlines and contract obligations.

Another area which required significant teamwork was the Discovery Center Trellis. The trellis was not only a challenge to design, fabricate and install, but also demanded significant coordination with the electrical contractor. The architectural design of the Trellis has integrated lighting. The stainless metals needed raceways and holes in the imbeds for wires. Ongoing teamwork between Big D and the electrical contractor brought the installation to completion.

Creative Delivery Systems

As the schedule complexity and weather issues began to delay Big D's work, it became evident we were going to need to significantly and quickly compress our planned schedule through effective collaboration and creative problem solving. We identified three main target areas: maximum preparedness and flexibility in the field, a mechanism to compress the lead time on the Manufacturer's delivery on the custom woven wire mesh, and the need to save labor hours on the Walkway.

To maximize field flexibility, our team quickly identified and produced all those products which could be produced without field measurements and delivered products as various pieces of the project became available for installation. Our Assistant Project Manager worked daily with the concrete contractor to adjust as necessary to keep the field personnel productive and the project progressing.

At the beginning of the project, the selected mesh supplier for all the woven stainless throughout the Garden indicated that custom-sized mesh would require approximately eight weeks for production and delivery to the site from Germany. To eliminate this lead time, we ordered the material in standard sizes and then conducted specialized training from the supplier to enable us to modify the mesh in the field and further compress the revised schedule durations.

Finding ways to compress the schedule on the Texas Skyway pushed us to design specialized equipment to use on the ever changing project site terrain. (The Texas Skyway is 700 feet of stainless steel guardrail with a stainless steel mesh infill and a 7" X 3" stainless steel custom fabricated edge angle along both edges of the entire length of the wood and steel walkway structure.) This walkway begins near ground level; however, the ground quickly slopes away with the walkway now suspended above the surface approximately 20 feet at its highest point. Since the ground elevation and walkway curvature changes throughout the Skyway, installation of the rail and the stainless edge angle was a challenge, especially when contending with the mud and inclement conditions of the terrain.

To bolster productivity and provide a safe process for installing the rails and edge angle, Big D designed and built a specialized cart system with guide rollers to stage materials for installation. This cart rolled along on the steel structure of the walkway like a railroad maintenance trolley and provided a safe and time-saving method for moving materials along the walkway. In addition, Big D also built a suspended rolling ladder with a platform that the craftsman could easily access for attaching the custom edge angle and the base of the post to the edge angle. By tying off to the structure, the craftsmen were protected from falls and had excellent access to attach the edge angle and posts.

Big D became well known among the other contractors for their creative approach to problem solving. We were asked to help one contractor with a beautiful metal fabricated tree whose canopy was too short for adults to walk under. Big D designed, forged and helped install a metal piece to elevate the trunk to raise the structure enough for the "Big Kids" to safely walk under. Big D also helped determine where extra barriers could be added to keep patrons on a safe path. One month before opening, Big D was asked to install more stainless steel mesh to be part of the exhibit. Unfortunately the mesh delivery from the specialty supplier was 30 days after the requested install date. Big D had extra mesh in their shop, but not the correct kind for the area. After brain storming they came up with a creative way to modify the available mesh since the specified mesh would take 60 days to deliver. As a result, the added work was completed before the opening date.

Crafting a showpiece project for the City of Dallas and the Rory Meyers family, the General Contractor hired an artisan architectural metal company. What they received was a creative, problem solving subcontractor and trusted advisor for the duration of the project who helped bring the work in on time and on budget. Throughout this large complex garden exhibit, comprised of 22 individually unique projects, Big D utilized creative resource management, problem solving, and delivery systems while working within the confines of multiple subcontractor's schedules and evolving challenges.

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