

# M2.02: Sustainable Heritage in Landa Park Miniature Golf

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## Objective

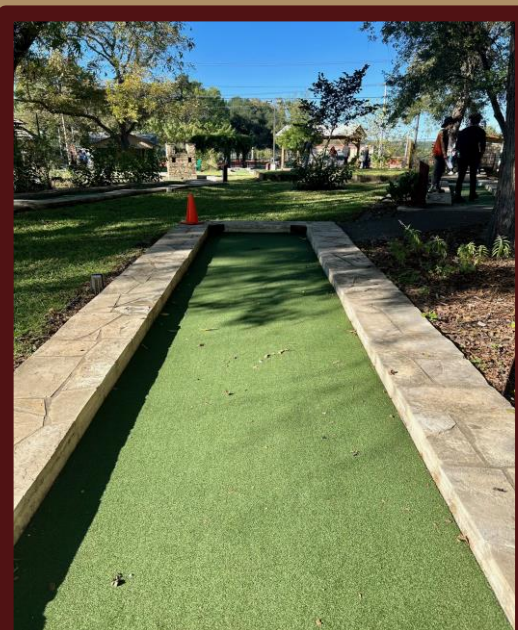
- ❖ Design a new hole feature for Landa Park Minigolf Course
- ❖ Needs to have minimal to no maintenance and be long lasting.
- ❖ Must clearly reflect New Braunfels Heritage & Culture

## History

- ❖ Used several sources of research such as: New Braunfels' Historic Landa Park 'It's Springs and its People' By Gregory Seals
- ❖ Water powered gristmill built in 1878 for commerce
- ❖ Early settlers found the land desirable due to the confluence of the Comal and Guadalupe
- ❖ Tubing first became popular as early 1968 and quickly became a thriving industry for New Braunfels

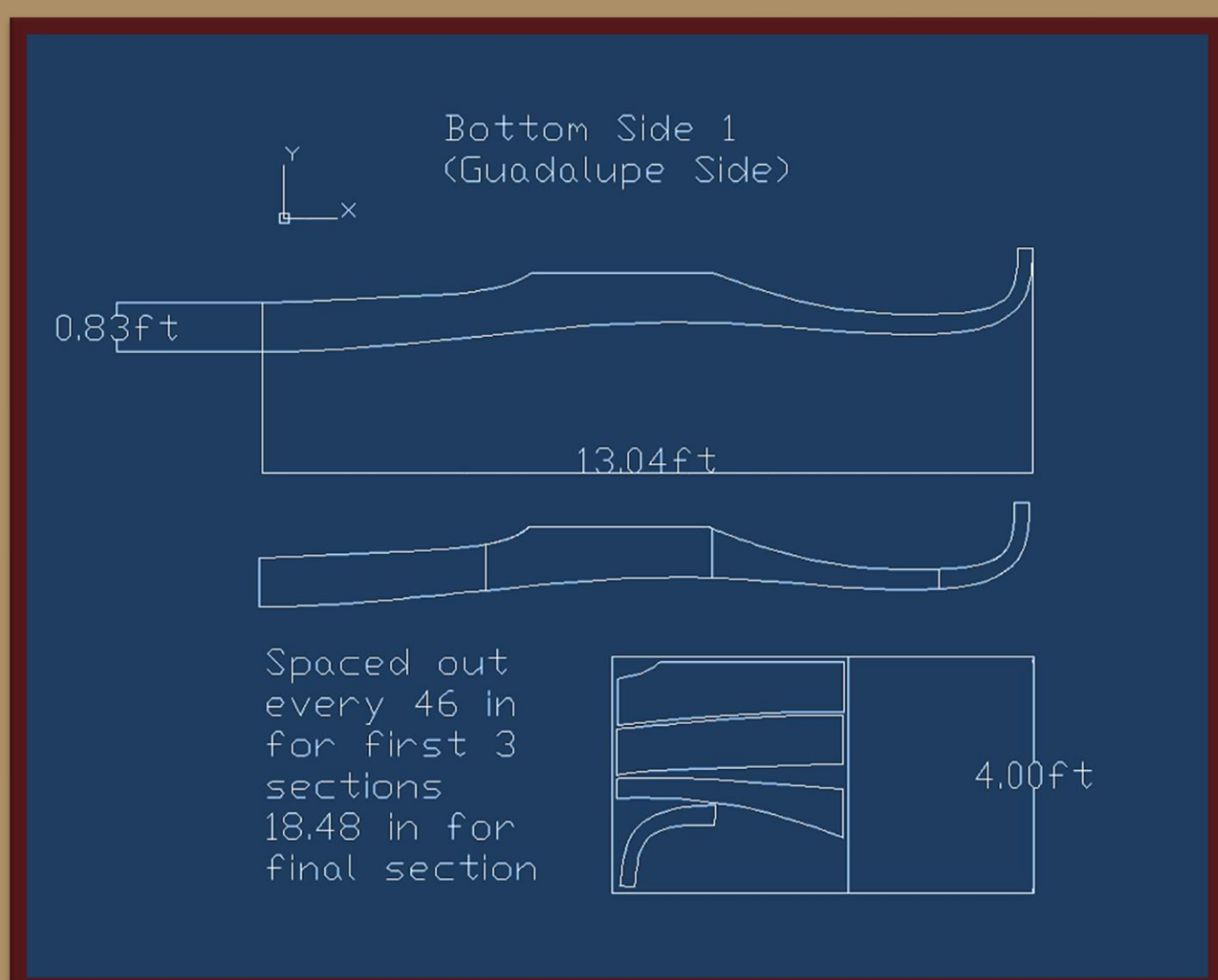
## Hole Selection

- ❖ Selected Hole 14
- ❖ Dimensions: 33.5' x 4.5'
- ❖ Hole 14 currently
- ❖ Advantageous to creating a feature.



## Manufacturing

- ❖ Converted 3D *SolidWorks* Design into a 2D flattened .dxf file.
- ❖ Optimized location of each 2D section using *AutoCAD*.
- ❖ Utilizing the *Torchmate 4400*, each part was cut precisely within the designated 4' x4' envelope.
- ❖ Bonded structure together using a *Miller 220 MIG* welder.



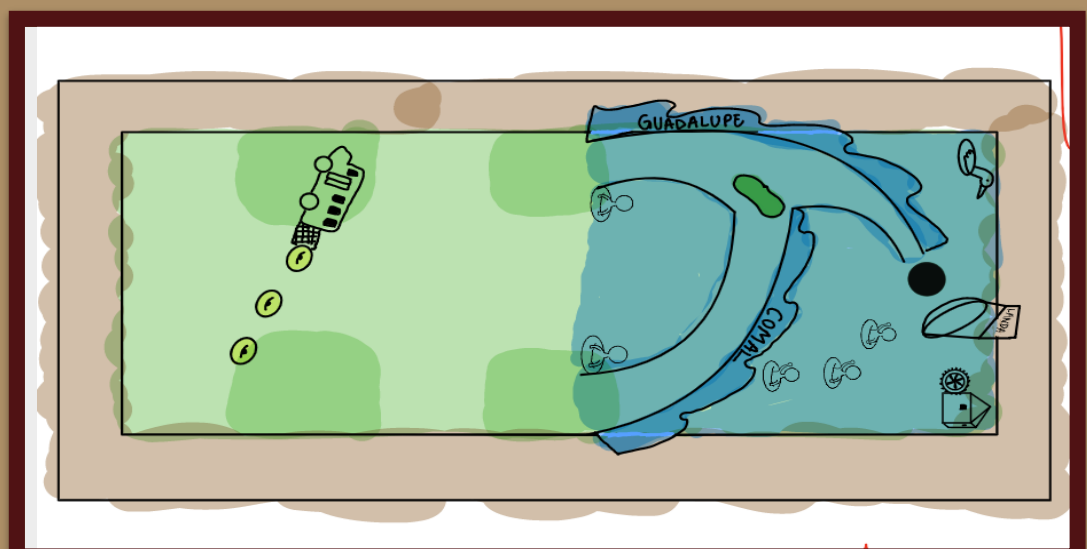
Part Optimization

## The Comal and Guadalupe Rivers Design Concept

### Concept Generation

#### Conceptualization

- ❖ Themed after the confluence of the Comal and Guadalupe Rivers featuring themed obstacles and a ramp



#### Modeling

- ❖ Designed main feature through *Solidworks*
- ❖ Themed obstacles designed with *AutoCAD*



#### Rapid Prototyping

- ❖ Created various 3D models for testing to make necessary adjustments to the design



## Final Product

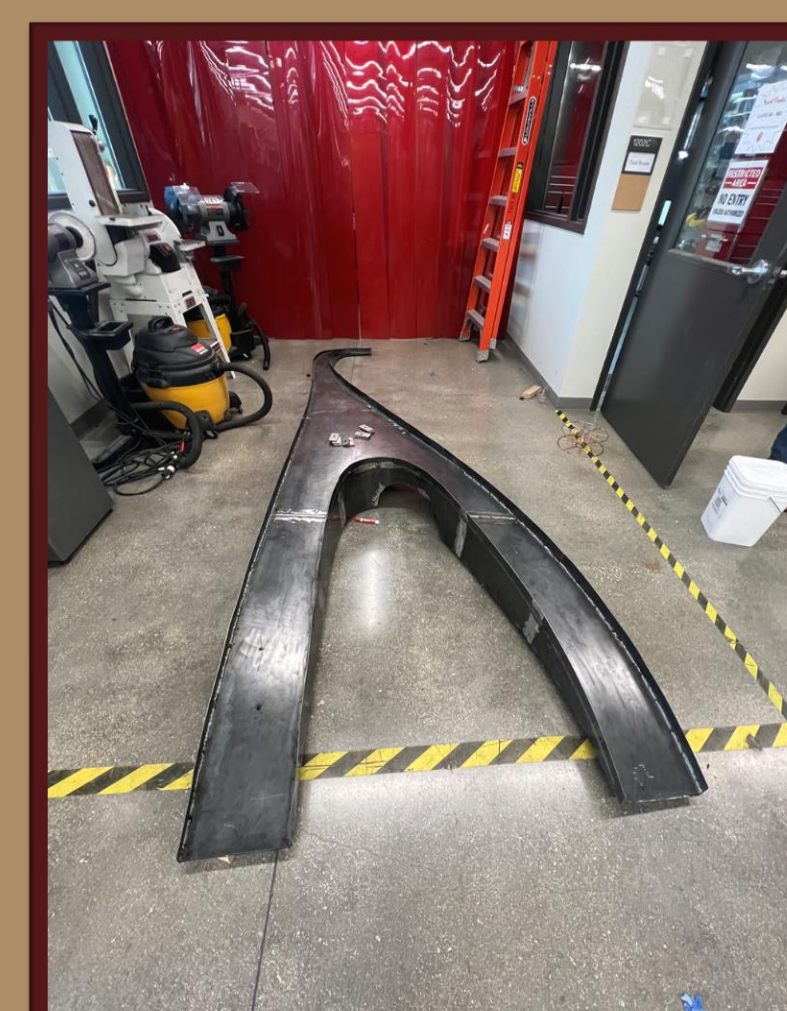
### Fabrication Process



Rolled 6" Radial Tunnel



Support System



Completed Welded Structure



Tabs for Installation

## Materials

### Ramp:

Base of Structure – 1/8" A36  
 Side Panels – 1/16" A36  
 Top of Structure – 1/8" A36  
 Thru Hole – 6" radius, rolled 1/16" A36 sheet  
 Internals of Structure

– 1/4" and 1/8" A36 skeletonized support system  
 – Polyurethane Spray Foam for noise deadening properties

### Obstacles:

All Designs – 1/4" A36 sheet metal

### Hardware for Installation:

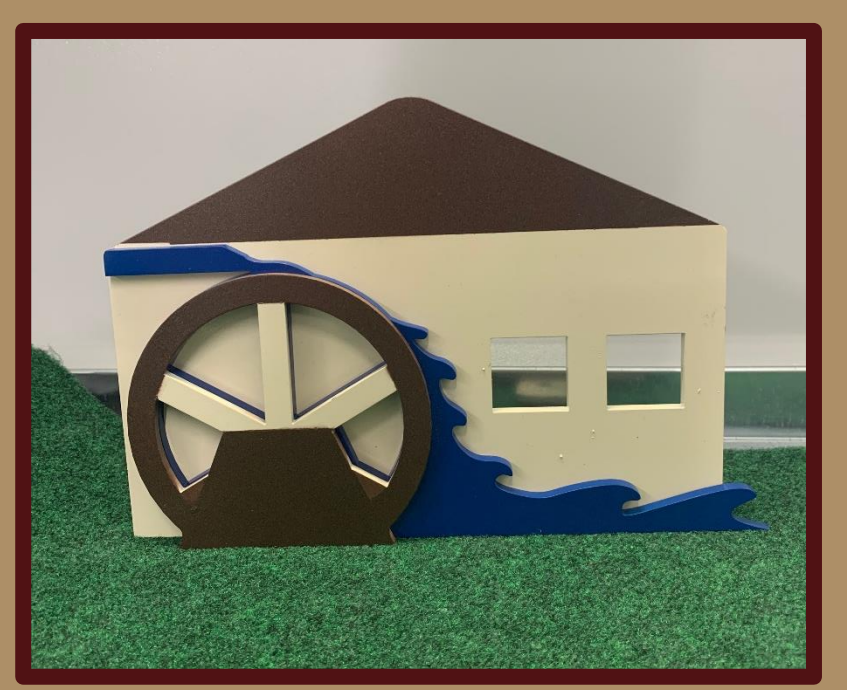
3/8"x3" Sleeve Anchors

## Themed Obstacle Designs

### River Float



### The Mill



### Tubing Bus



### Mallard Ducks



### Tubing Models



### Powder Coat Colors



## Challenges with Build

### Obstacles

- ❖ Obstacle layers were originally welded together first, causing masking and paint errors
- ❖ Extra processing time due to downed machines
- ❖ Some original designs were not within child safety regulations.
- ❖ Difficulty learning the powder coating process

### Ramp

- ❖ Deciding between filling internal structure with cement vs. metal skeletonized structure.
- ❖ Decreasing size of thru hole for child protection.
- ❖ Extreme warping of material caused structure to sit unevenly on the ground.
- ❖ Difficulty learning the welding process