

## Problem Description

Hole 5 in the Landa Park Mini Golf course currently has no obstacles and is quite plain. The goal of this project is to take this hole and design themed obstacles to make the play experience more enjoyable and appealing.



The hole must comply with standards set out by the Americans with Disabilities Act (ADA).

Currently, there is a concrete path that connects the entrance and exit of the hole allowing for easier ADA compliance.

## Customer Needs

### A Hole Redesign that...

- Incorporates local culture and history
- Ensures accessibility for all players
- Is durable to withstand various weather conditions and high foot-traffic
- Includes a dynamic feature

## Materials

- **Aluminum** – Used for the hinge and lid for its excellent rigidity, low weight, and long-term durability in outdoor heat and weather conditions.
- **Stainless Steel** – Used in the torsion springs and hardware. Provides excellent corrosion resistance and high cycle life.
- **Steel** – Used for the main body, base, and handle due to its high strength and availability. Because of its poor weather resistance, these sections will be powder coated to prevent rust.
- **Paint** - Primer, enamel base coat, and UV resistant clear coat for long-term outdoor durability. Powder coating is also being utilized.

## Acknowledgments

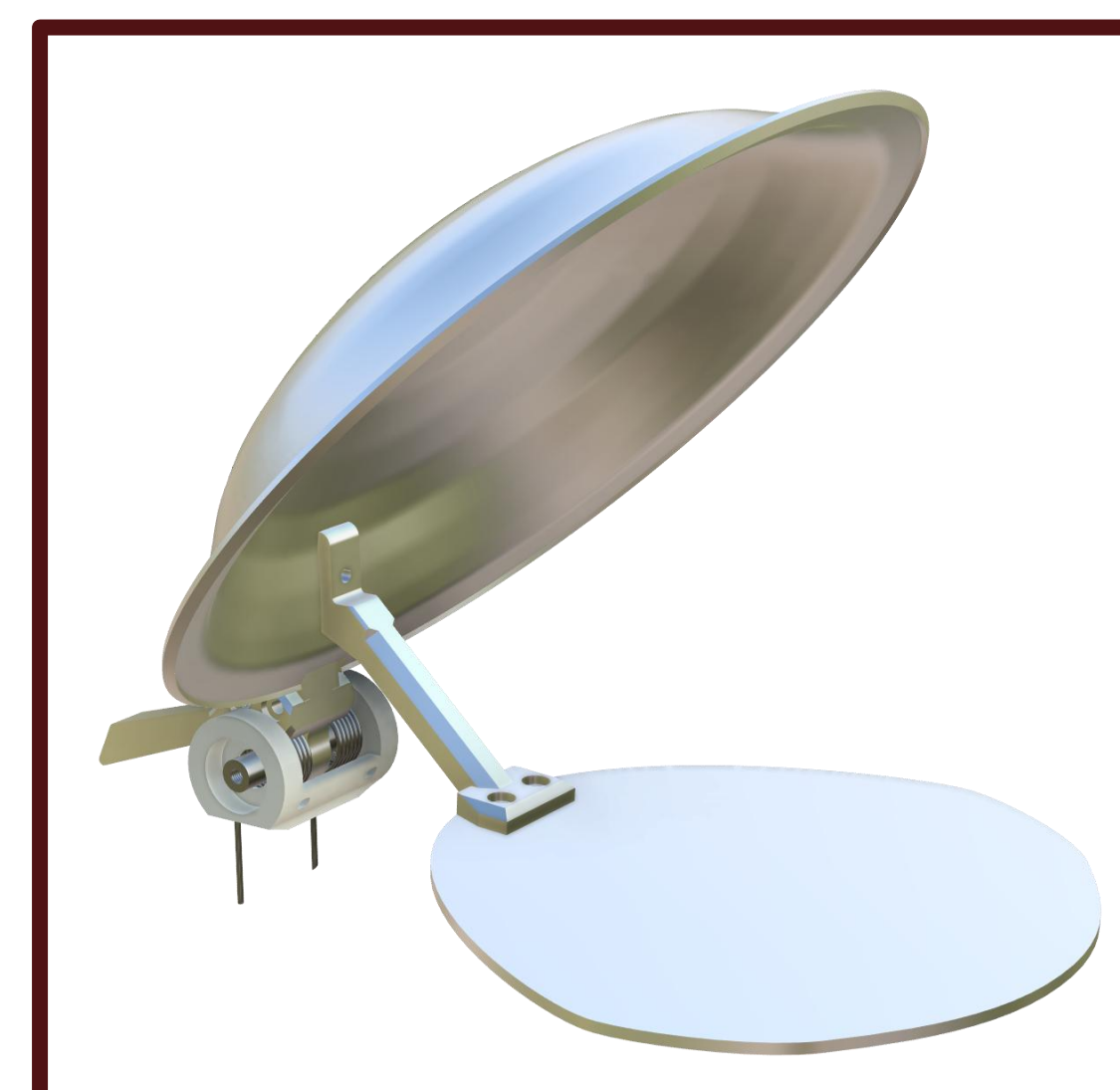
Sponsor: Paddle TX and Wurstfest  
Company Contact: Stacy A. Thigpen  
Faculty Advisor: Mr. Bradley Safranske  
Senior Design Advisor: Dr. Austin Talley

## Dynamic Mechanical Design



### Tipping Stein

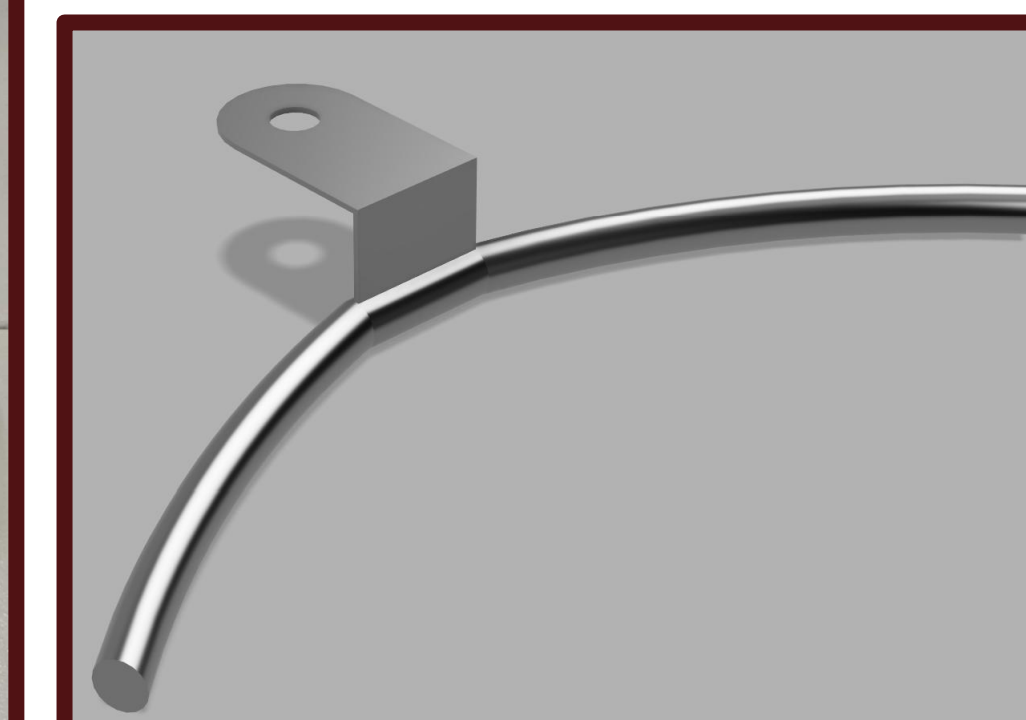
- Adds a dynamic visual element to the play of the course
- The hinged paddle and lid assembly is held up by a spring when a ball lands on the paddle, its weight causes the lid to close until the ball drops into the stein and out the bottom
- The base is secured to the course using several concrete bolts
- The main steel body is fully powder coated and the aluminum hinge section is anodized



## Static Designs

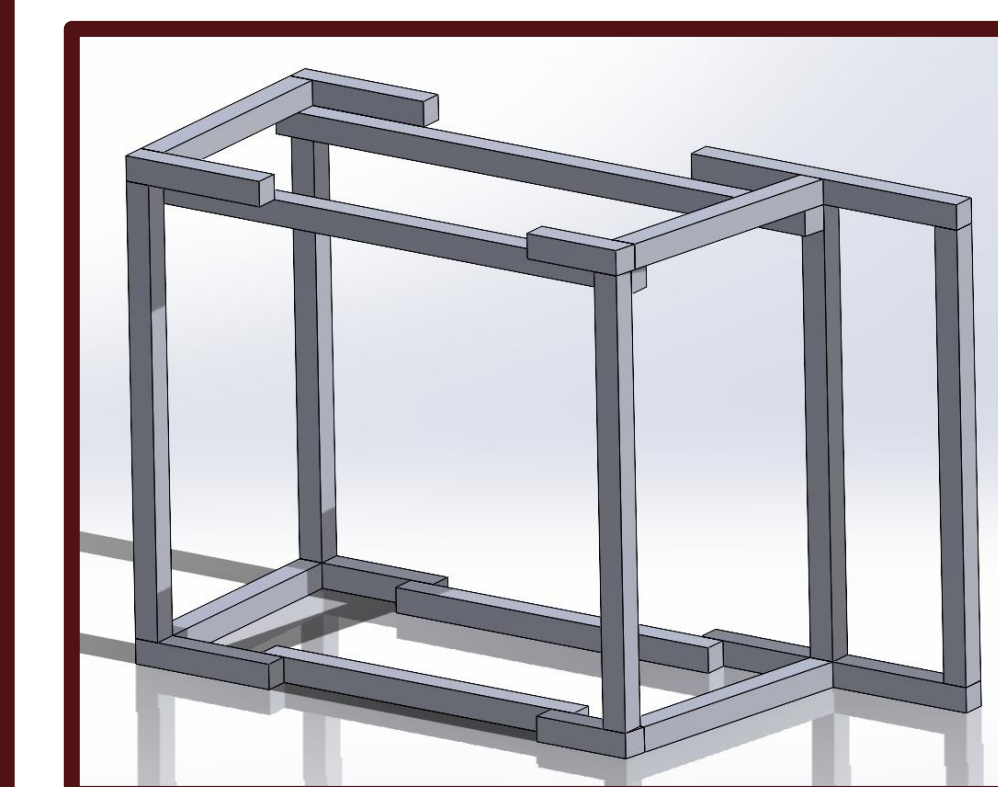
### Bratwurst Corner Bumpers

- Represents the traditional German food served at Wurstfest
- Designed to prevent balls from being stuck in corners
- Cast from concrete in a 3D printed mold
- Includes Integrated rebar support and mounting bracket
- Primed and painted using outdoor rated paints



### Accordion Blocking Wall

- Represents the live music of Wurstfest
- Main body is cut and bent from sheet metal
- Sheets are welded to a square tubing frame for strength
- Painted to resemble an accordion and prevent rust

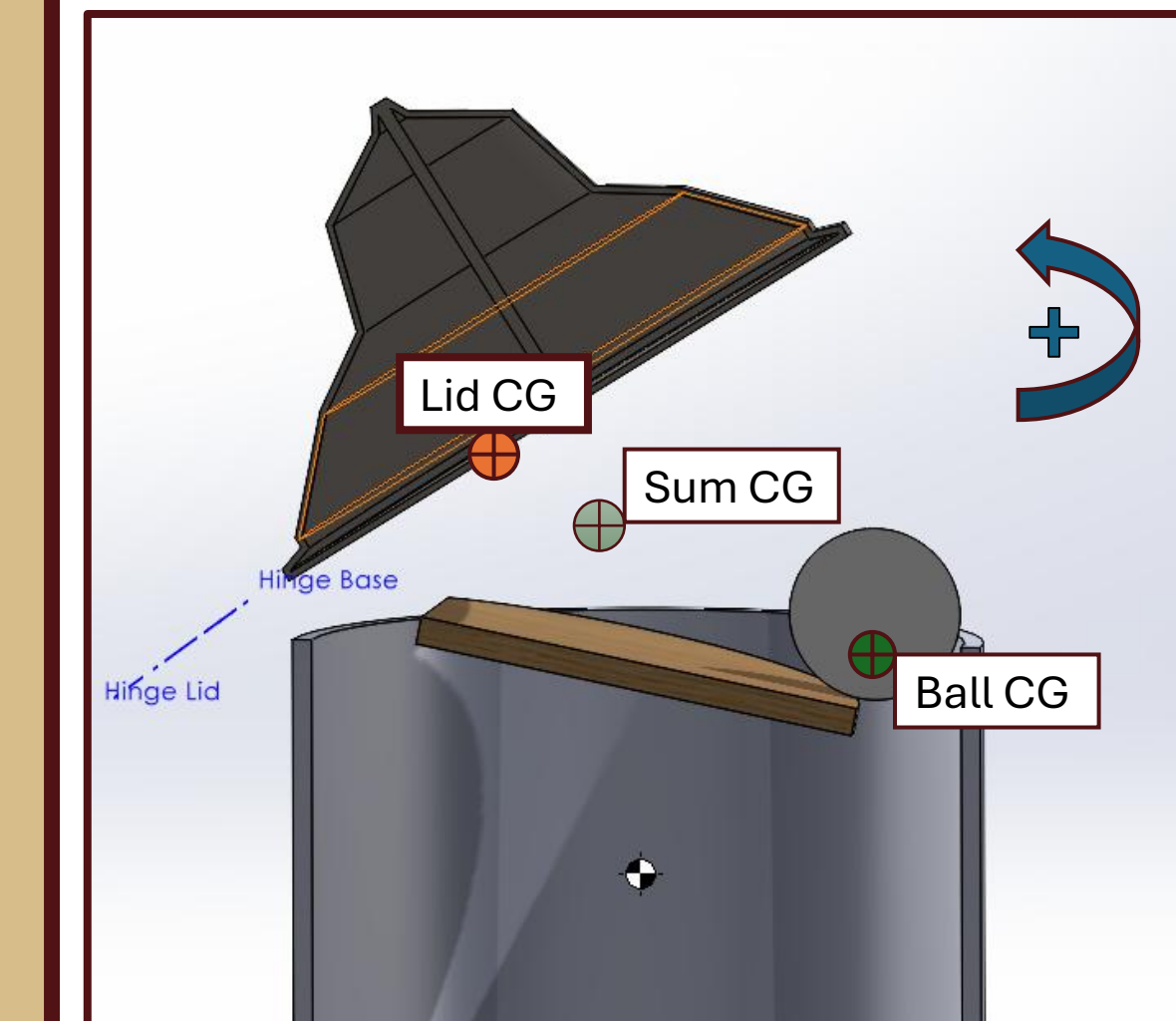


### Sausage Tube Ramp

- Also represents the food served at Wurstfest
- Designed to allow for the easiest shot into the stein
- The main body is made from a custom bent PVC tube
- A custom bracket was fabricated to support the ramp
- Painted to resemble a sausage and prevent weathering



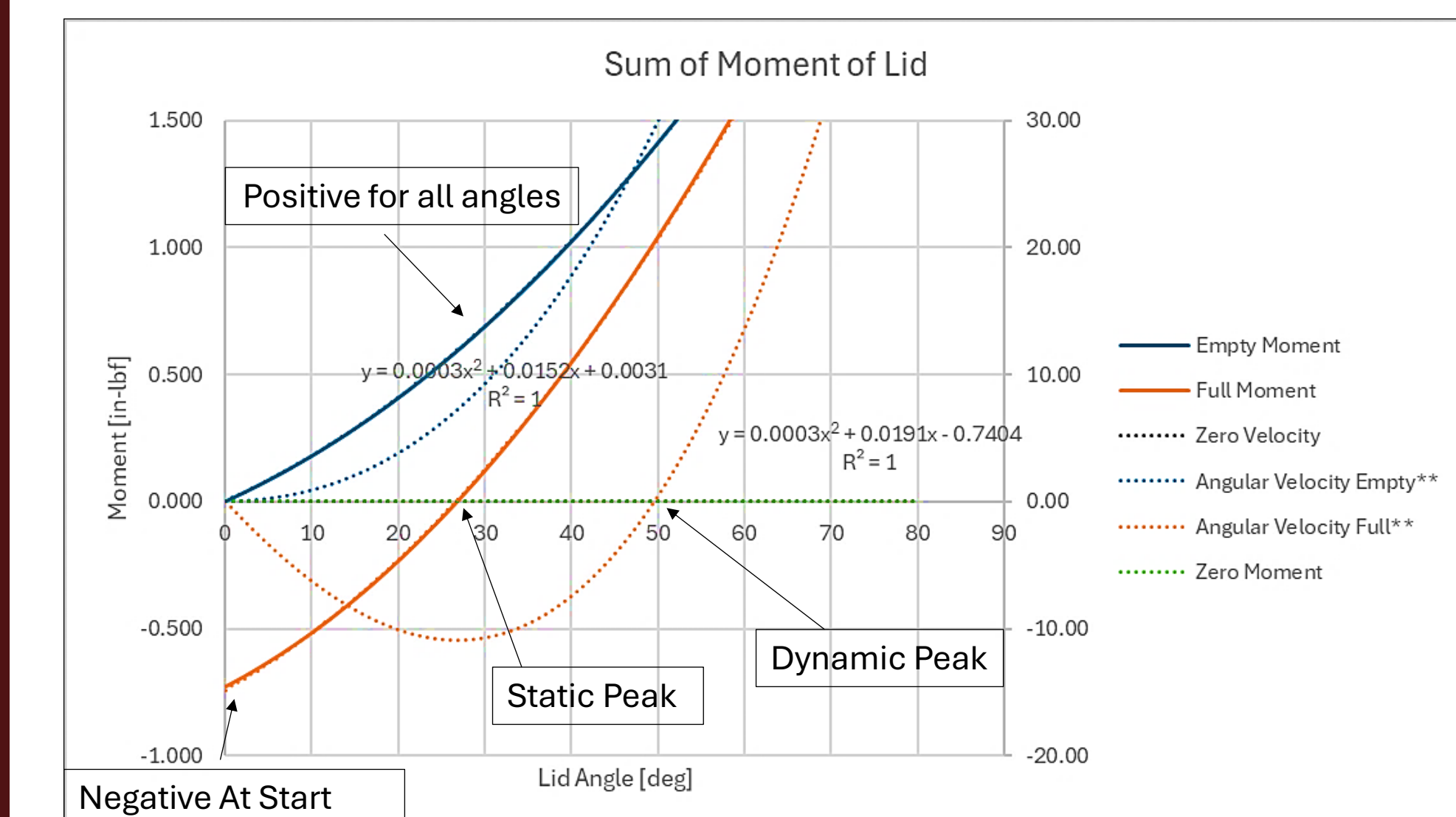
## Working Principle



When the sum of moments is positive the lid is kept open.

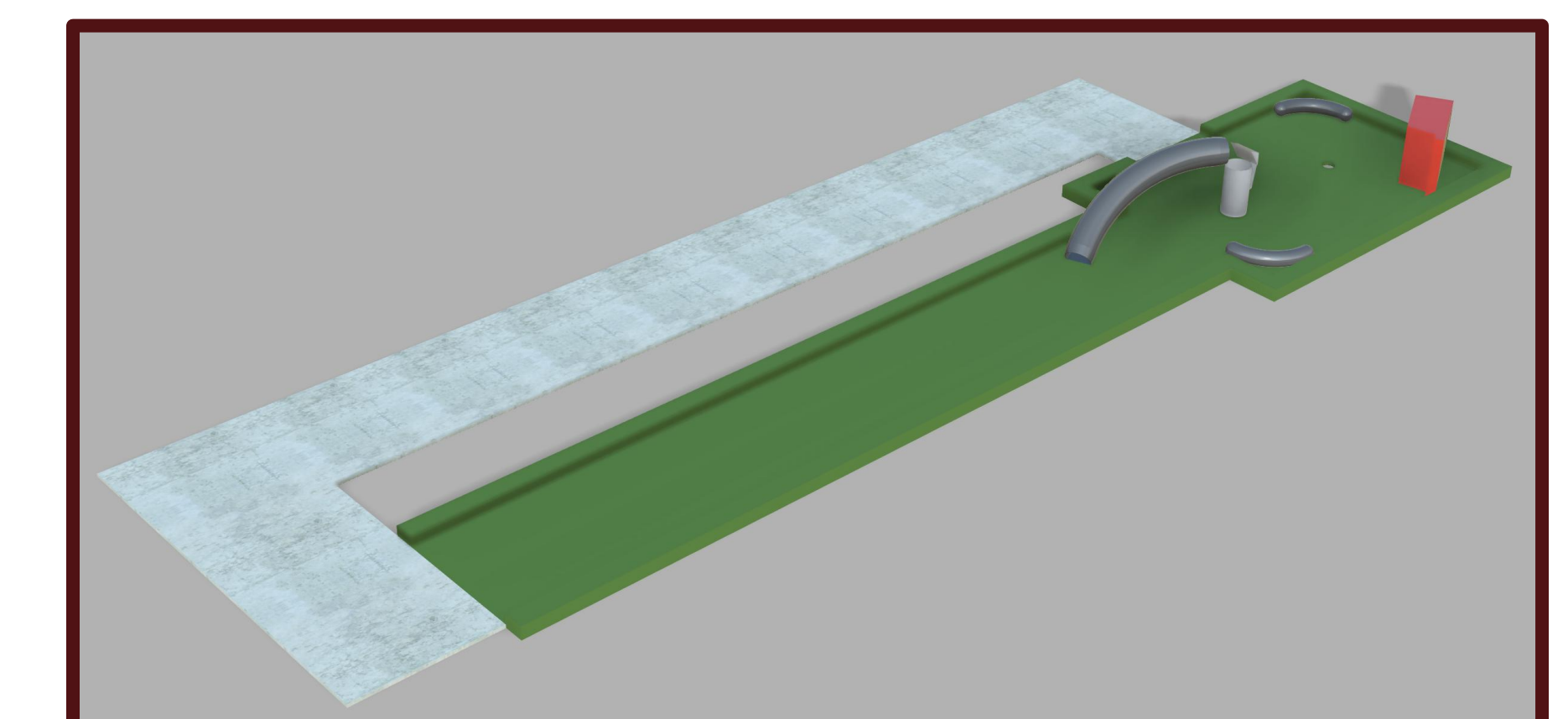
When a ball is in the stein lid, the sum of moments is negative which closes the lid and releases the ball.

## Testing



- A graph was created to model the moments and velocity of the ball as the angle changes.
- The max dynamic angle should be at least 50 degrees to ensure full movement range.

## Full Hole Design Layout



- Fully ADA compliant with 36" clearance for walkways.
- Concrete pathway can be used to avoid walking or rolling over the ramp.
- No major tripping or fall hazards.
- Course is themed around Wurstfest, an event celebrating the German culture of New Braunfels
- Includes obstacles decorated to resemble a large stein, accordion, and bratwurst.