

Problem Definition

Our concept seeks to develop a robust and user-friendly **wheelchair accessible locking mechanism** universally tailored for all playground environments.



Provides **equal access** to play opportunities for children with mobility disabilities



Promotes **social inclusion** and **positive peer interactions**

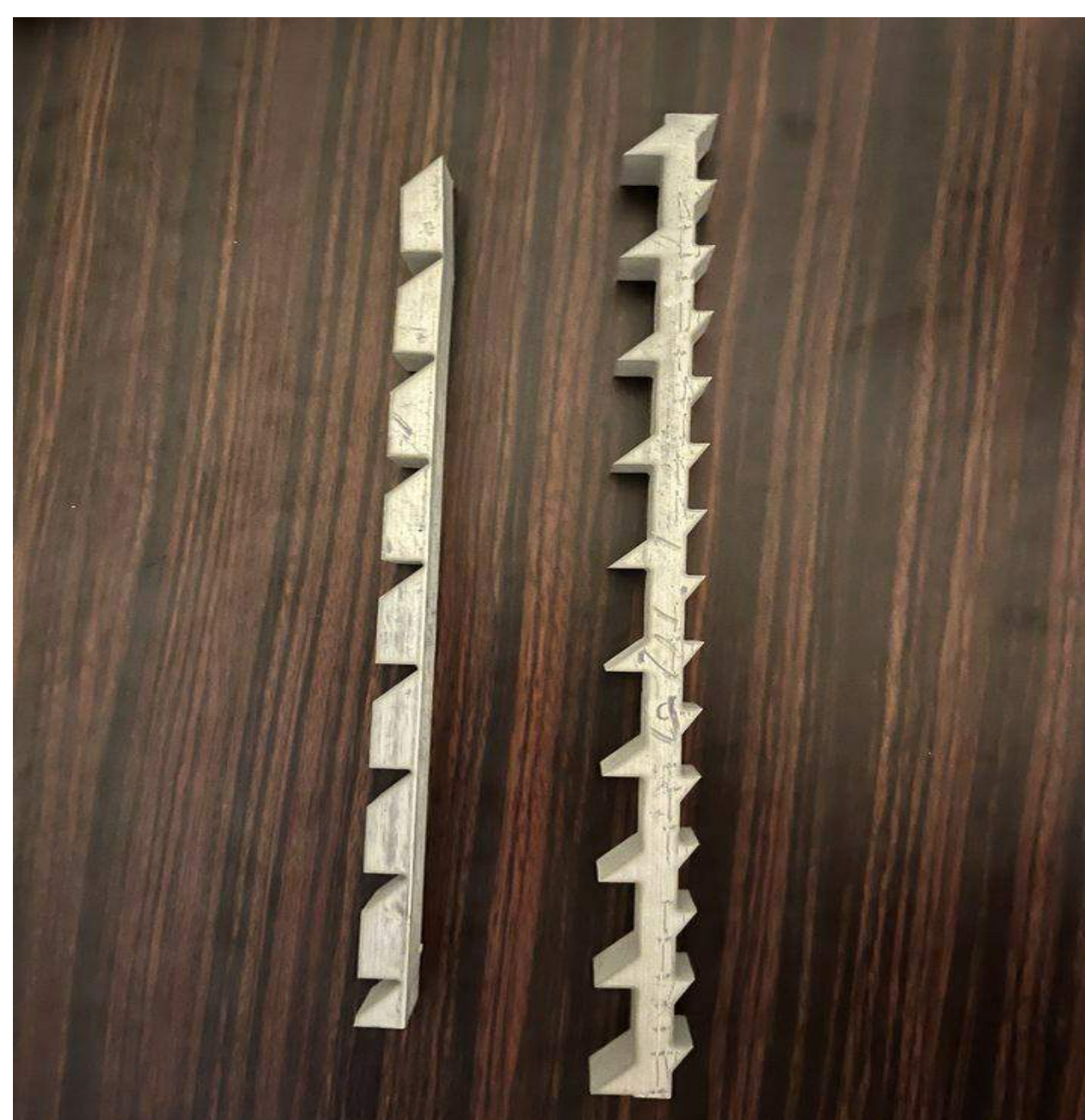


Enhance the overall **safety** and **enjoyment** of playground experiences for children of all abilities



Approximately 2.25% of the United States population use a wheelchair daily, which equates to roughly 5.5 million people

Design Calculations & Analysis



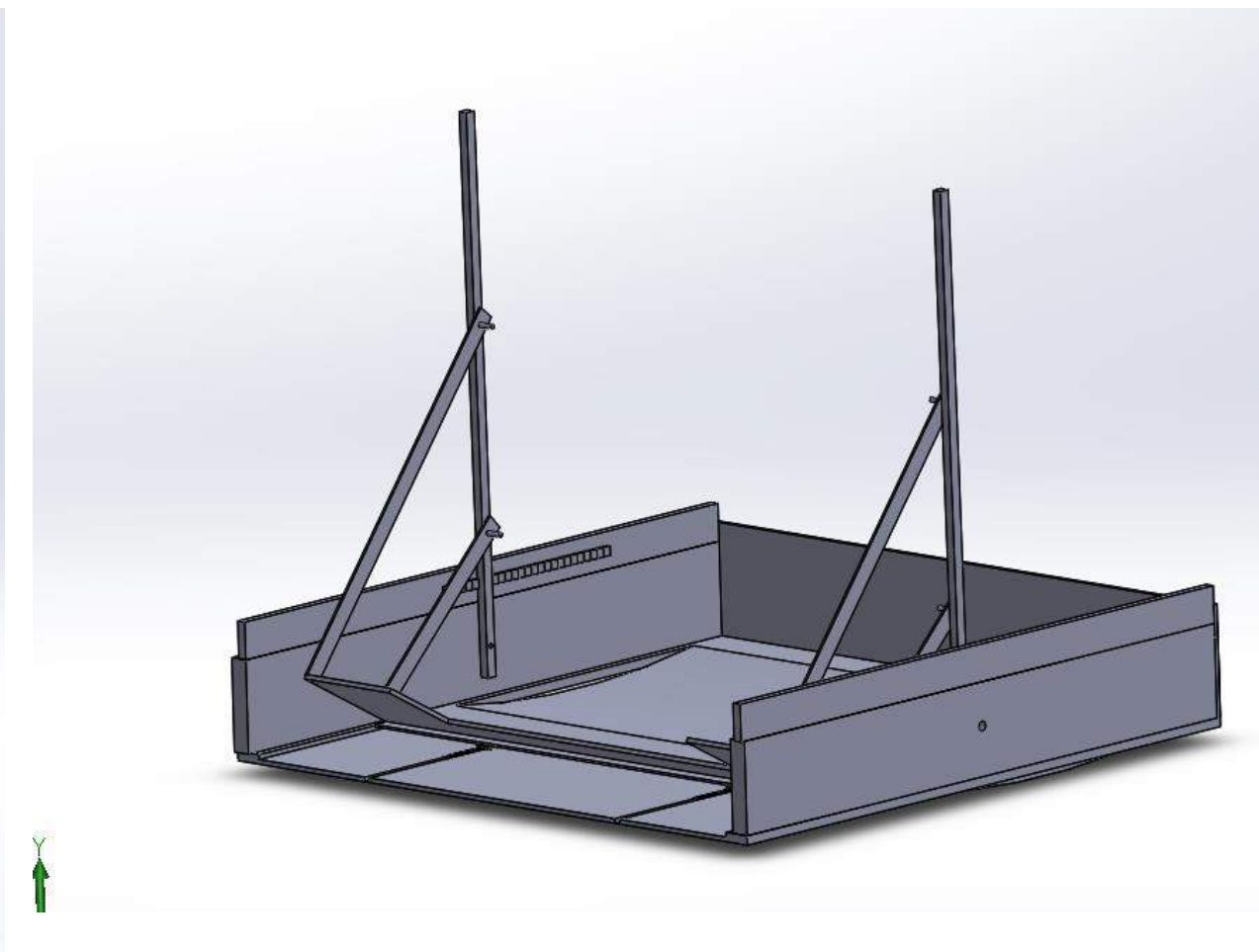
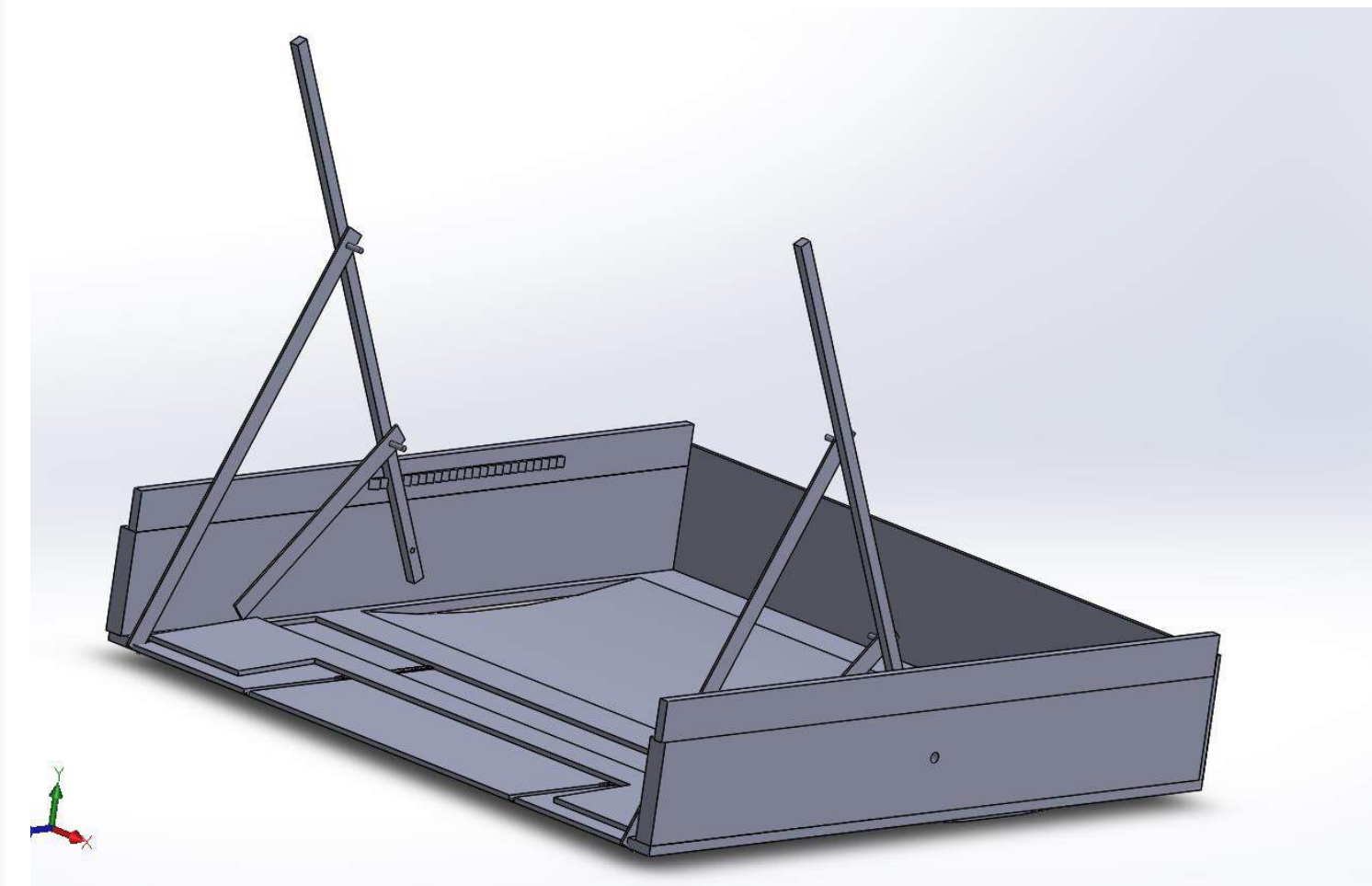
Sliders:

- Moves the ramp locking mechanism to accommodate for different wheel diameters and wheelchair sizes.
- Heavy duty sliders and carriages needed in order to move the ramp and maintain durability of this function.

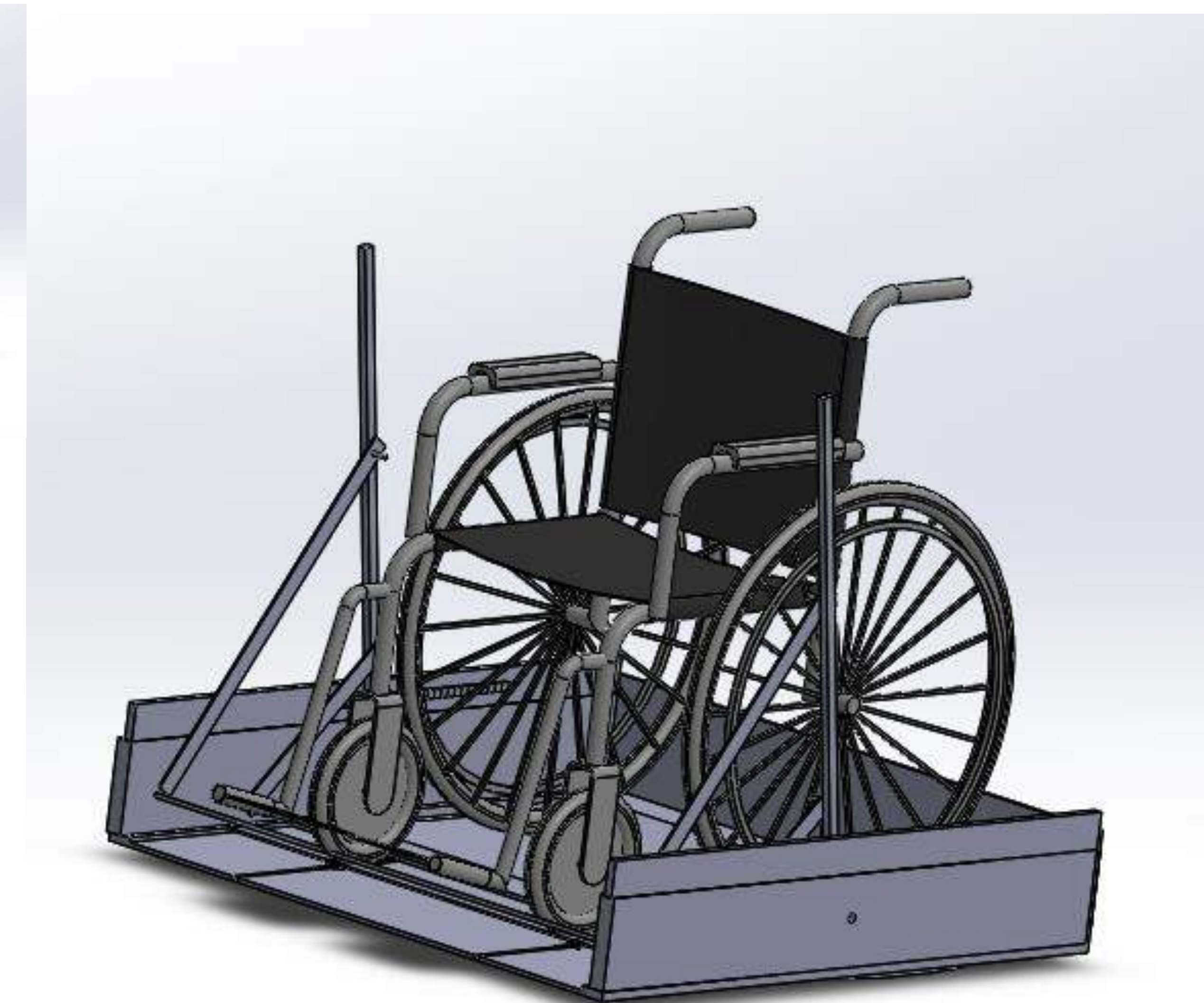
Notches/Selection Teeth:

- Used to lock the lever in place for the desired size of the specific wheelchair diameters.
- Notches spaced out evenly with the size of the lever to properly function for wheelchairs with diameters of 23"-30".
- Custom part made with waterjet cutting manufacturing process for the various different settings needed.

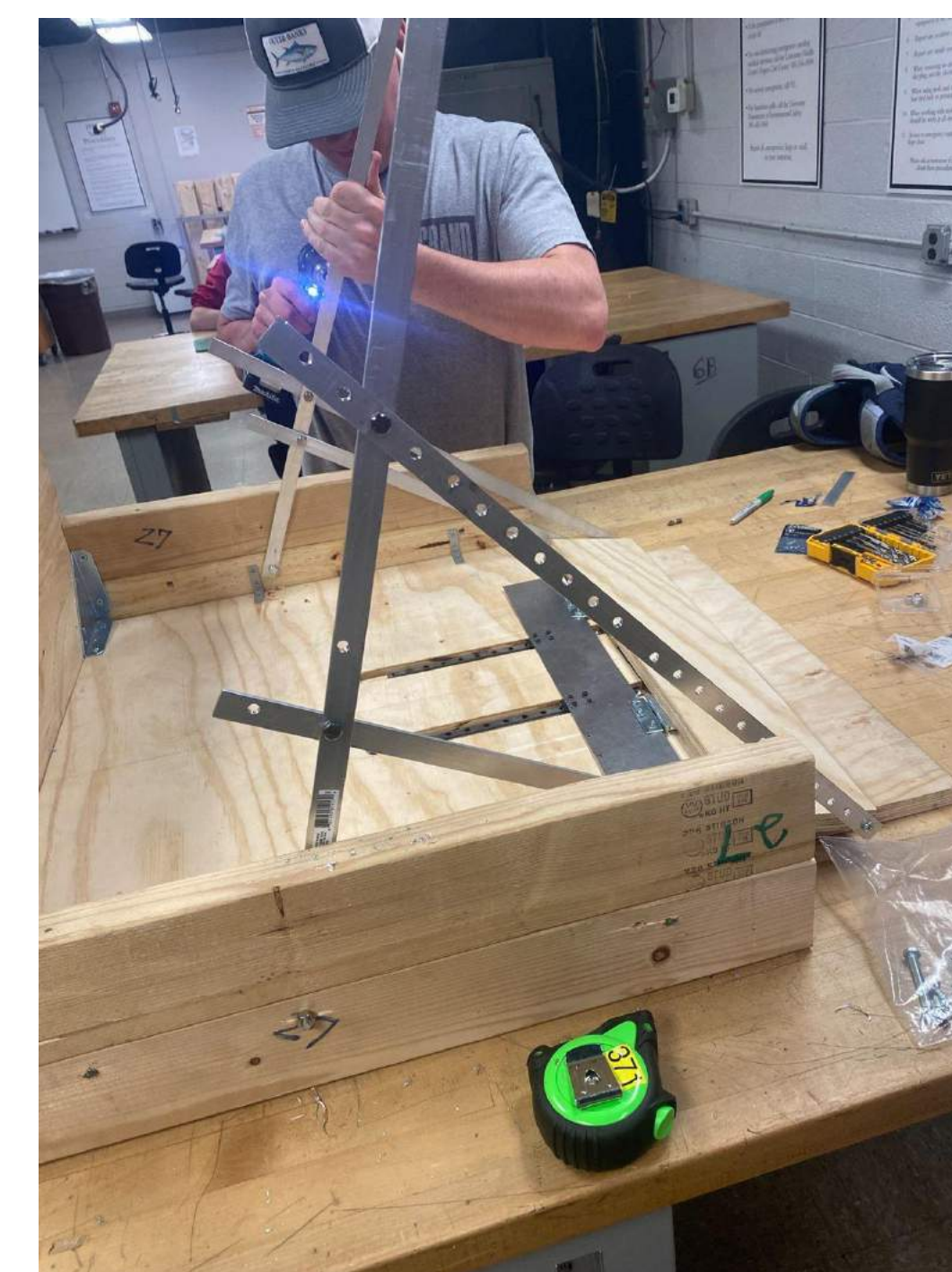
Final Design



- Our final design consists of a wheelchair locking mechanism which can be used in a variety of different playground equipment
- The locking mechanism consists of sliders, a ramp to lock the front wheels, dual levers on the sides, notches to lock the levers in place, and rigid connections between the ramp and levers.
- The parts are a mix of standard and custom components
 - Most components are made of steel for durability and positive sustainability impacts.



Prototype & Test Results



- Experimented with multiple ways to move and lock the ramp mechanism
 - Use of chain, bar selector in early prototyping
 - Switch to rigid connections and selection wall
- Use of wheelchair in multiple positions
- Rigid connections and selection wall were much better to adapt to multiple wheel diameters