Component 1: Door

Function Requirement	Design Parameters	Analysis	Resources	Risk	Countermeasures
Needs to withstand any exposure to elements Needs to be able to lift easily - Lightweight	18x9x.25 in	lb = M*V	Physics Solid Mechanics	Material could break Could be too heavy to lift	Sturdy material Gear able to handle stresses Use a sturdy and tested motor

Component 2: Gear

Function Requirement	Design Parameters	Analysis	Resources	Risk	Countermeasures
Gear must be able to support the stress of door to lift	2 inch Pitch Diameter 20 Teeth 20 Degree Pressure angle	F = M*a T = F*r*sin0 Velocity at pitch = Rpm * pi(D) * 1/12in Bending Stress formula for gear = TD/FY * 12000 + V / 120000	Physics Solid Mechanics Gear tooth strength Analysis (sourced in webpage) Engineers Edge Lewis factor Table (Sourced in webpage) McMaster and Carr	Gear could fail Material could break	Sturdy material Gear able to handle stresses Use a sturdy and tested motor

Component 3: Motor

Function Requirement	Design Parameters	Analysis	Resources	Risk	Countermeasures
Motor must be able to lift door Motor must be able to support door at peak height	Holding Torque>2lb*in	F = M*a T = F*r*sin0	Physics Solid Mechanics	Motor Could fail Motor could be too fast/slow	Sturdy material Gear able to handle stresses Use a sturdy and tested motor