

Sketch Model Presentation: People Lift

Team Red A

Market

- 500,000 people a year are injured by ladders
- Approximately 300 ladder related deaths a year
- In 2006, there were 732,175 construction companies in the US
- In 2006, over 126 billion households in the US

Sources:

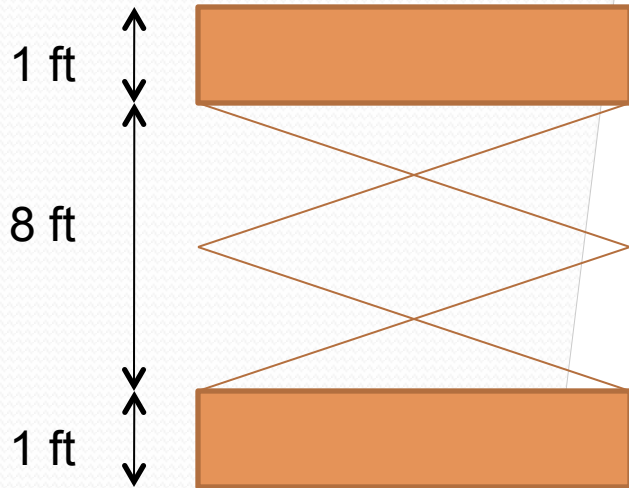
- On the House (Sept 24, 2008) www.onthehouse.com/wp/20020527
- U.S. Bureau of Labor Statistics www.constructionweblinks.com/Resources/Industry_Reports_Newsletters/Feb_2_2004/us_investors.htm
- US Census Bureau <http://www.census.gov/popest/housing/HU-EST2006.html>

Customer Needs

- Safe alternative to a ladder
- Ability to be up high and move around
 - Painting
 - Decorating
 - Cleaning windows
 - Reaching elevated ceilings
 - Cleaning gutters
- Rentals for a one time job (painting outside of house)
- Lightweight and easy to store away

Technical Feasibility

Basic Dimensioned Design:



Linkages are Al box extrusions



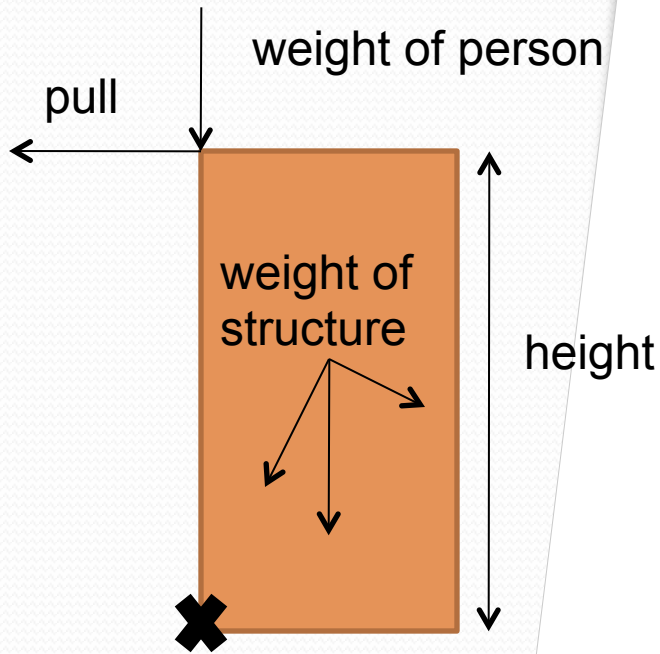
2" x 54" X 0.8" bar
cutout 0.2" in from each side

Person: 6ft male, 120 kg

$$\text{COM}_{\text{person}} = 3.36 \text{ ft}$$

$$\text{COM}_{\text{system}} = 8 \text{ ft}$$

Technical Feasibility A



Torque = pull * height –
weight of structure * COM

Height = 8 ft

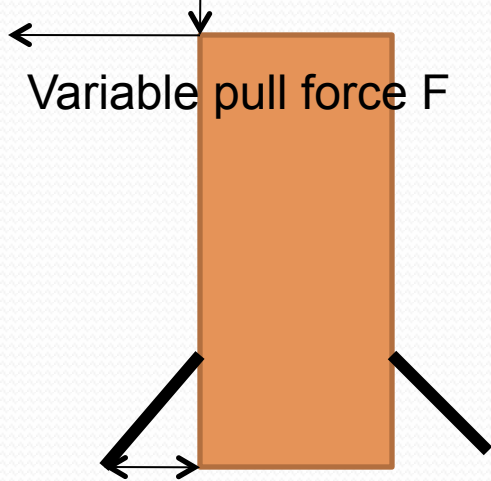
Weight of structure = 75 kg

COM = 2.63 ft

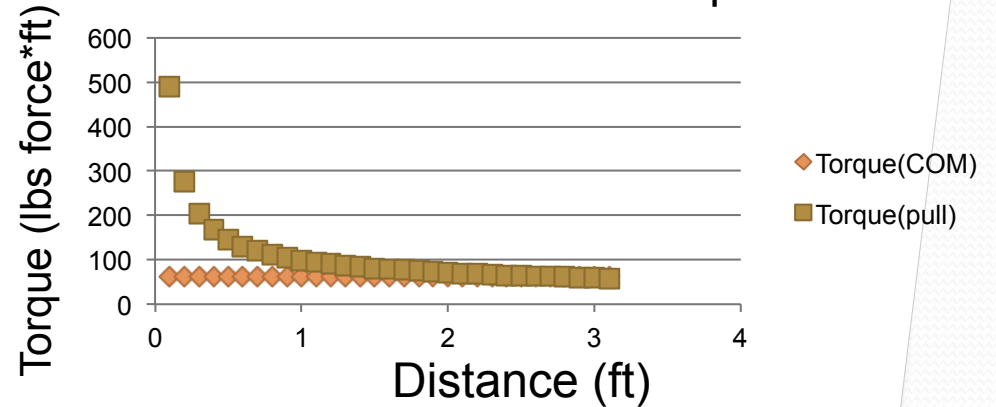
**Maximum Force =
52.6 pounds force**

Technical Feasibility B

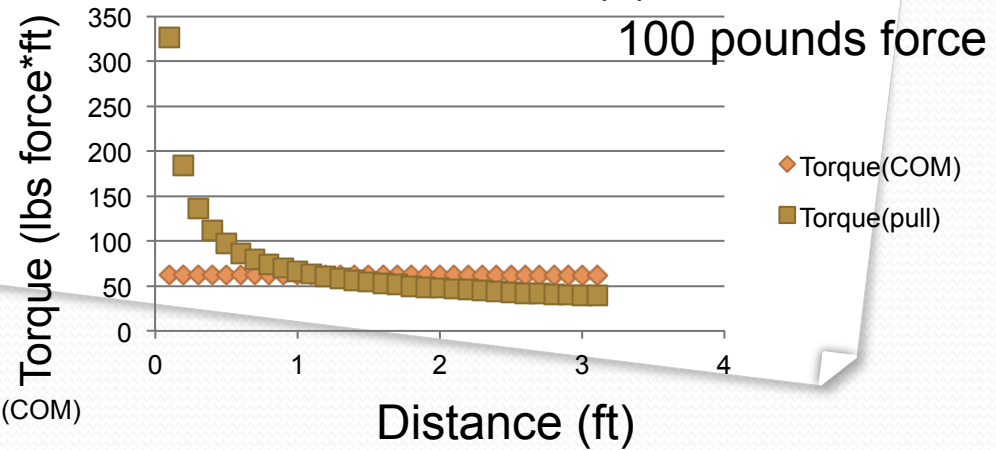
What would happen if we used supports?



150 pounds force



100 pounds force



200 pounds force

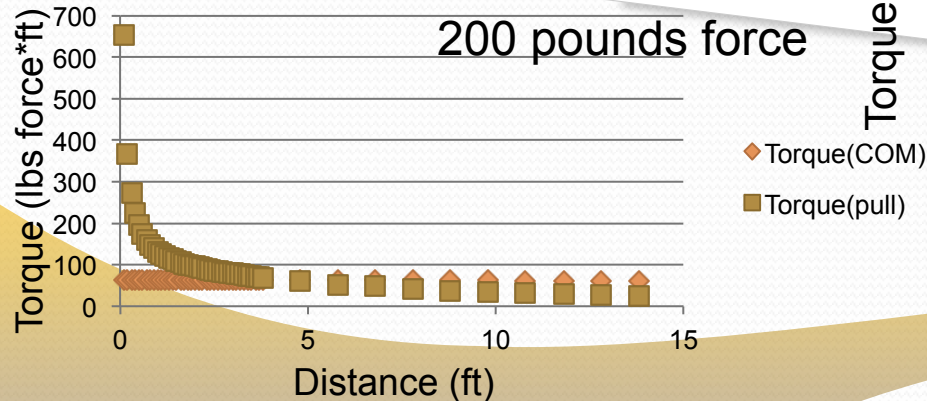


Illustration of Model

