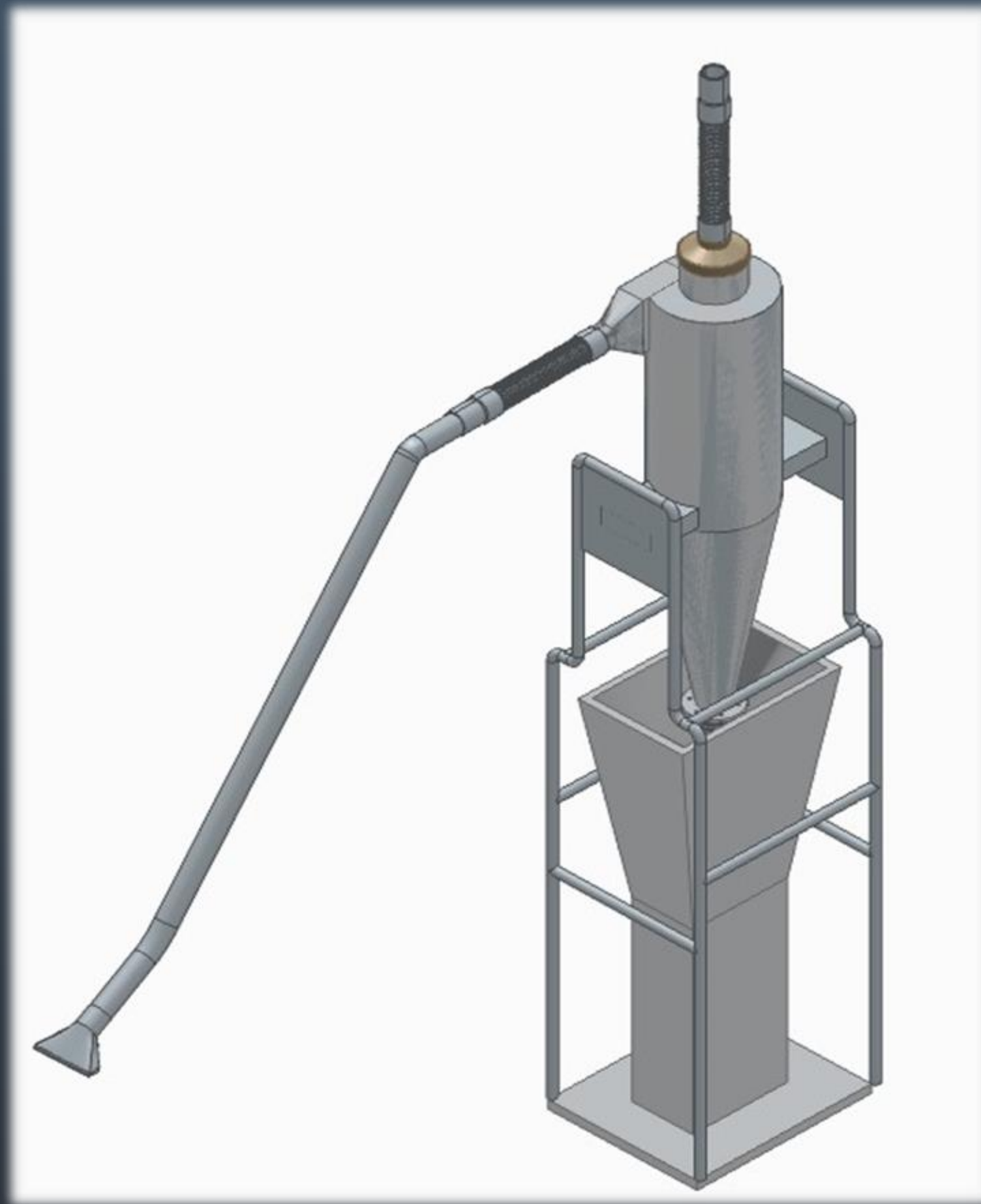
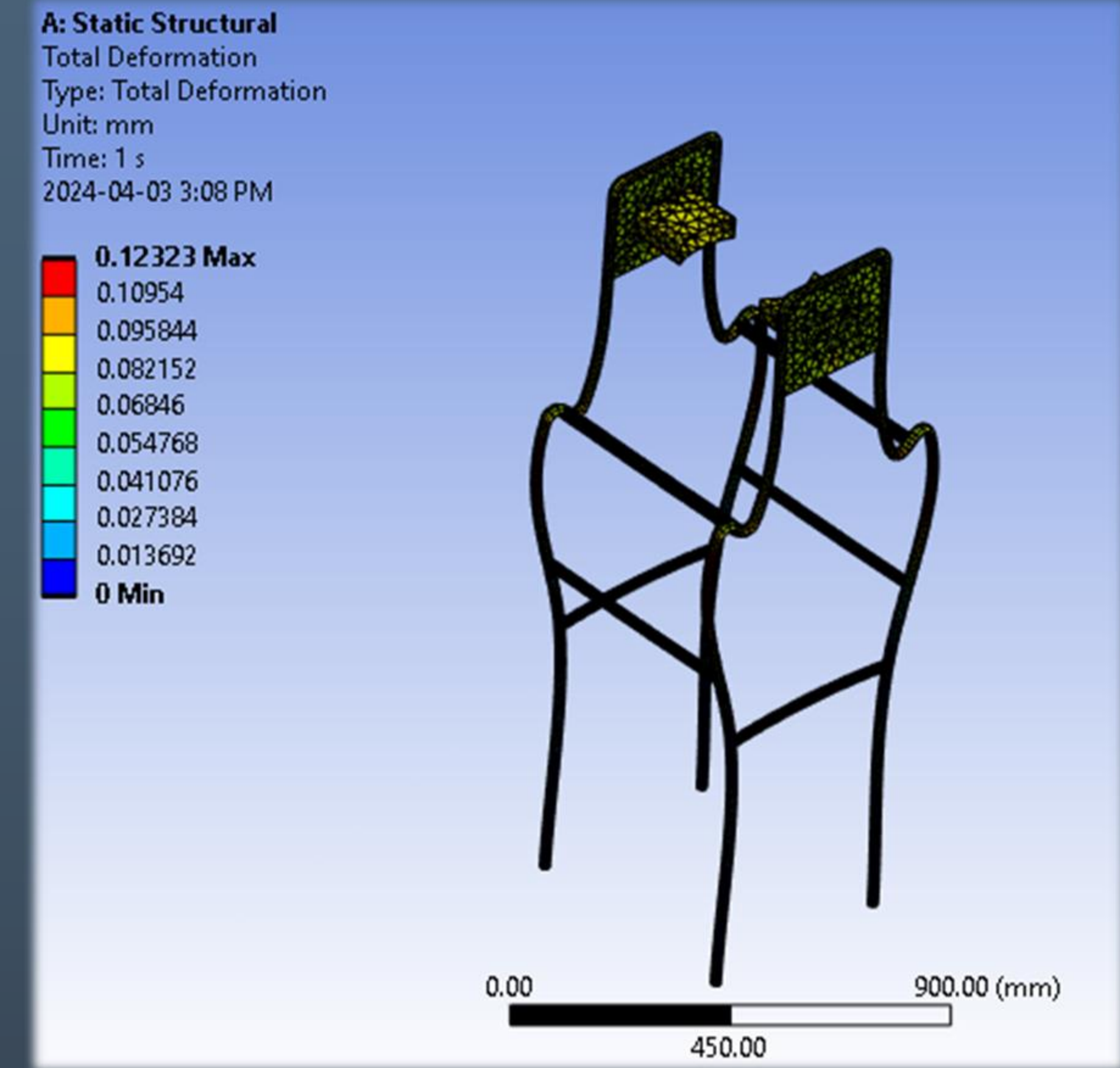


### Project Background

The Wheelabrator unit at CNH leaks abrasive material which accumulates in the basement. The abrasive is heavy and flammable. The abrasive (steel shot) is shoveled manually once per year, causing strain on employees involved



### Vacuum/Cyclone Design Methodology

- Methodology is to determine "Pickup Velocity", then work backwards finding all sources of loss before selecting a vacuum that can overcome the loss
- There are three types of Cyclonic Separators. High throughput, high efficiency and low pressure drop. We selected efficiency due to our large particle size

### Project Goals/Objectives

- Quick collection of the abrasive.
- Collection of abrasive (steel shot) with minimal body strain.
- Redirecting the collected shot to the hopper for recycling.
- Reduce likelihood of fire due to metal dust

### Results/Outcomes

- Pickup speed calculated: 18.16 m/s
- Overall efficiency calculated for the cyclone separator: 85.6%
- Ease of use requirements met
- Required flowrate for the model is 150CFM, the selected vacuum unit has a rating of 158 CFM.

### Acknowledgments

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