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Designing and Building a Grain Dryer Test Stand

Client: Dr. Dirk E. Maier, Ph.D, ISU

Problem Statement

The ISU Feed Mill is in need of an operating grain dryer test stand that can accurately represent four different grain mixing styles used in the market today.

Objectives

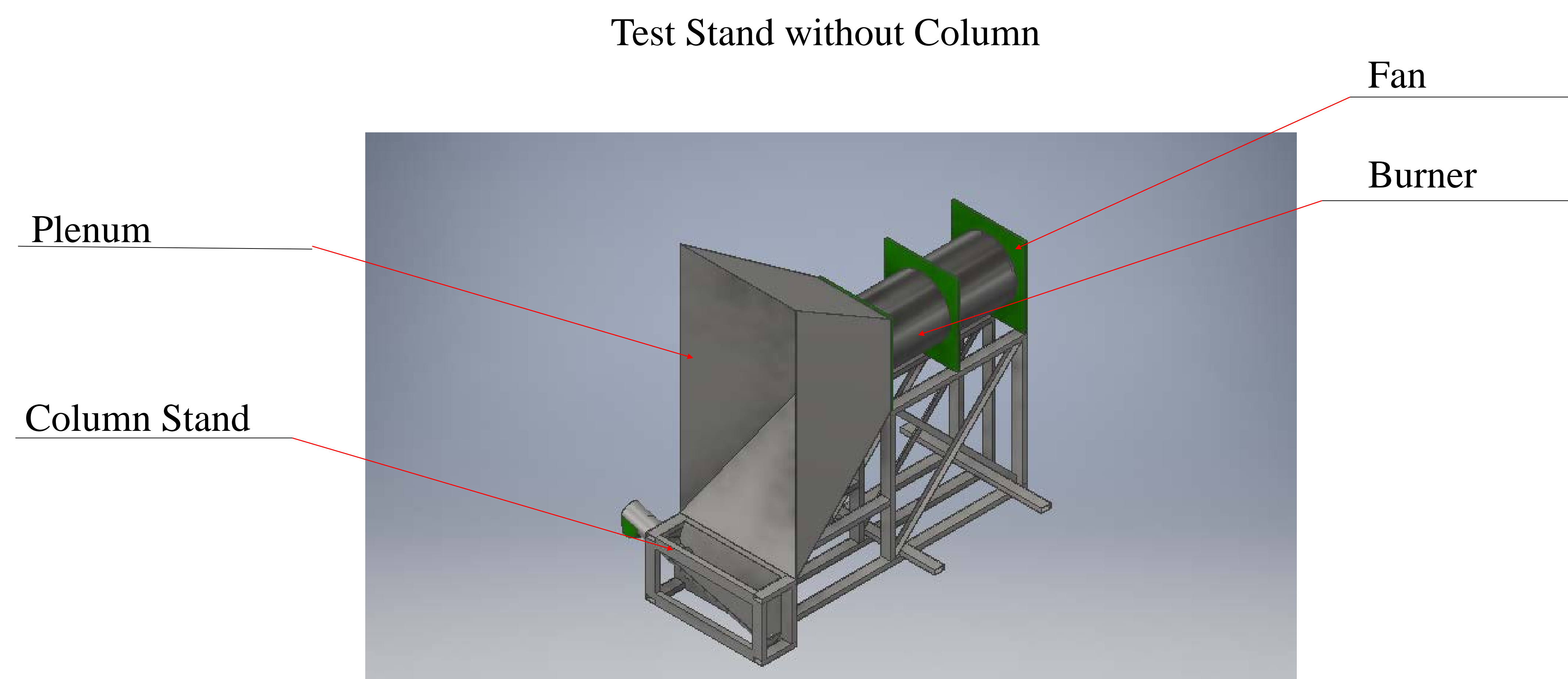
- Design and build a grain dryer test stand that functions like a regular grain dryer.
- Run testing on the stand to compare the mixing styles.

Constraints

- Must be transportable by forklift/skidsteer .
- Must fit through a bay door. (14 ft tall)

Scope

- Be able to run 200 Bu/hour through the test stand.
- Represent four mixing/drying styles.



Proposed Solutions

- Create three interchangeable columns to represent the different mixing styles.
- Have one solid column, but have interchangeable parts to represent the different mixing styles.

Methods

- Autodesk inventor will be used for the CAD files to give us a rough schematic on how to build the test stand.
- Ordering specific parts we can't build. (Fan, Burner, Controller, Sensors)
- Building the grain dryer test stand from scratch next semester.

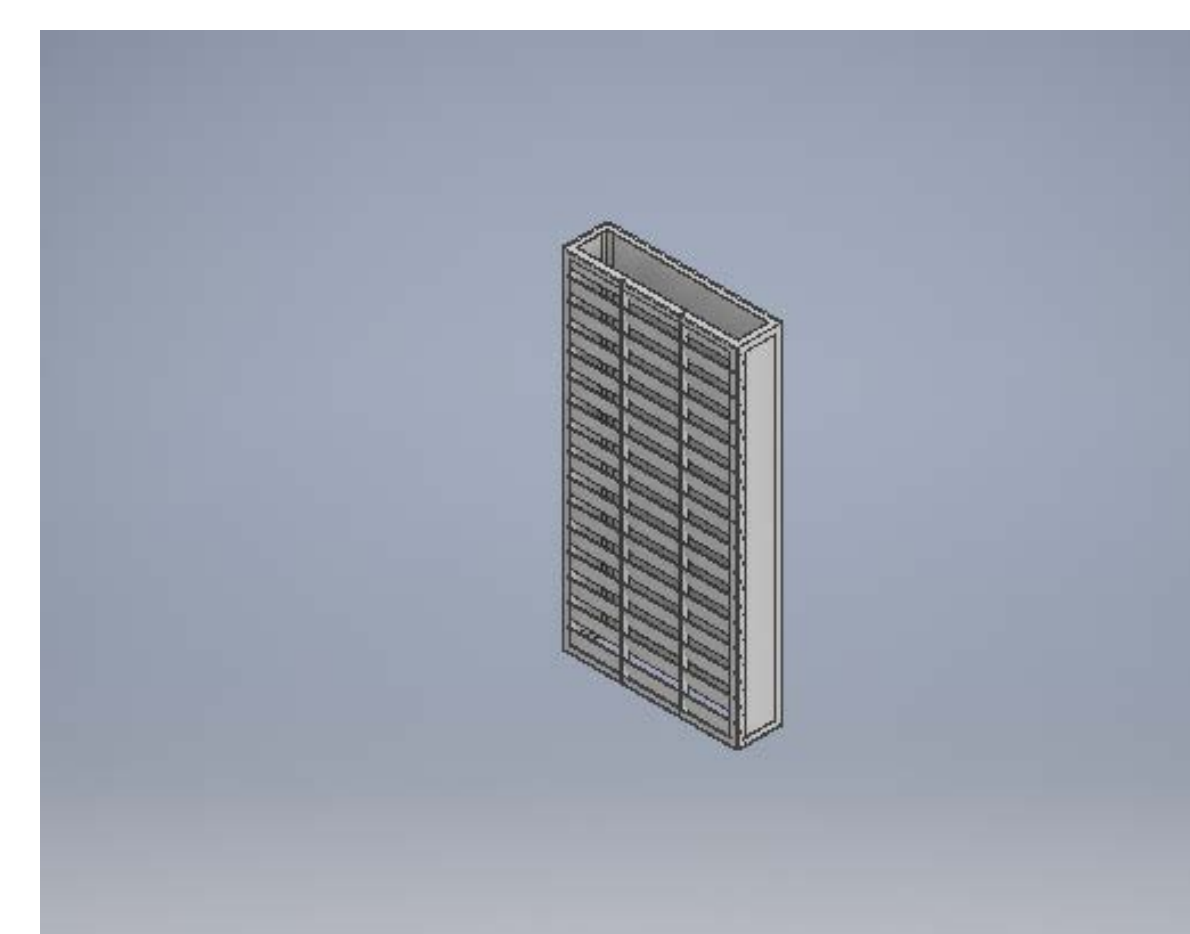
Major Outcomes

- Materials/parts list for Dr. Maier to order.
- Finished CAD files.
- A turn key, grain drying test stand that can represent 4 different mixing styles.

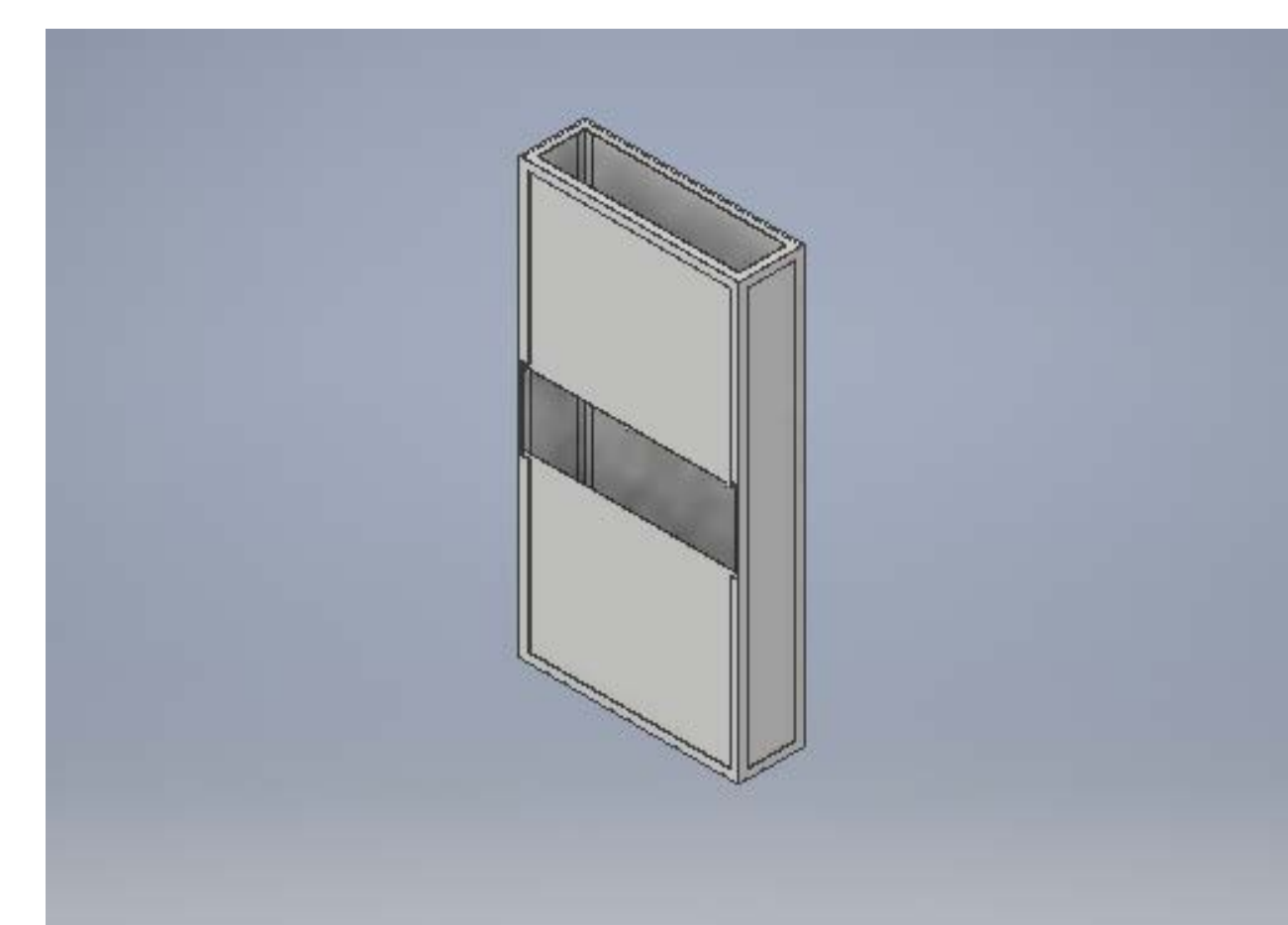
Benefit to Client

Dr. Maier will be able to utilize the stand in the future to teach other students grain mixing and drying techniques.

QED Column



Metering Roll & Inverter Column



Mega Column



This column will represent two styles. Having the gap in the middle will allow us to change out parts and represent the two different styles.