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**PROBLEM STATEMENT**

Archer Daniels Midland is in need of a fully functional training facility to help employees and students understand the operations involved in processing edible beans. We have designed a small scale processing facility to be later installed by future capstone students in the ADM Ag Innovation Center. In addition to designing a facility layout, we will demonstrate the operation of the processing equipment through the use of video and product samples focusing on the education, design, and promotion of edible bean processing facilities.

**BUDGET & SPONSOR INFORMATION**

Item	
Display Board	\$250
Leg Sensor System	\$5,100
<b>Total:</b>	<b>\$5,350</b>



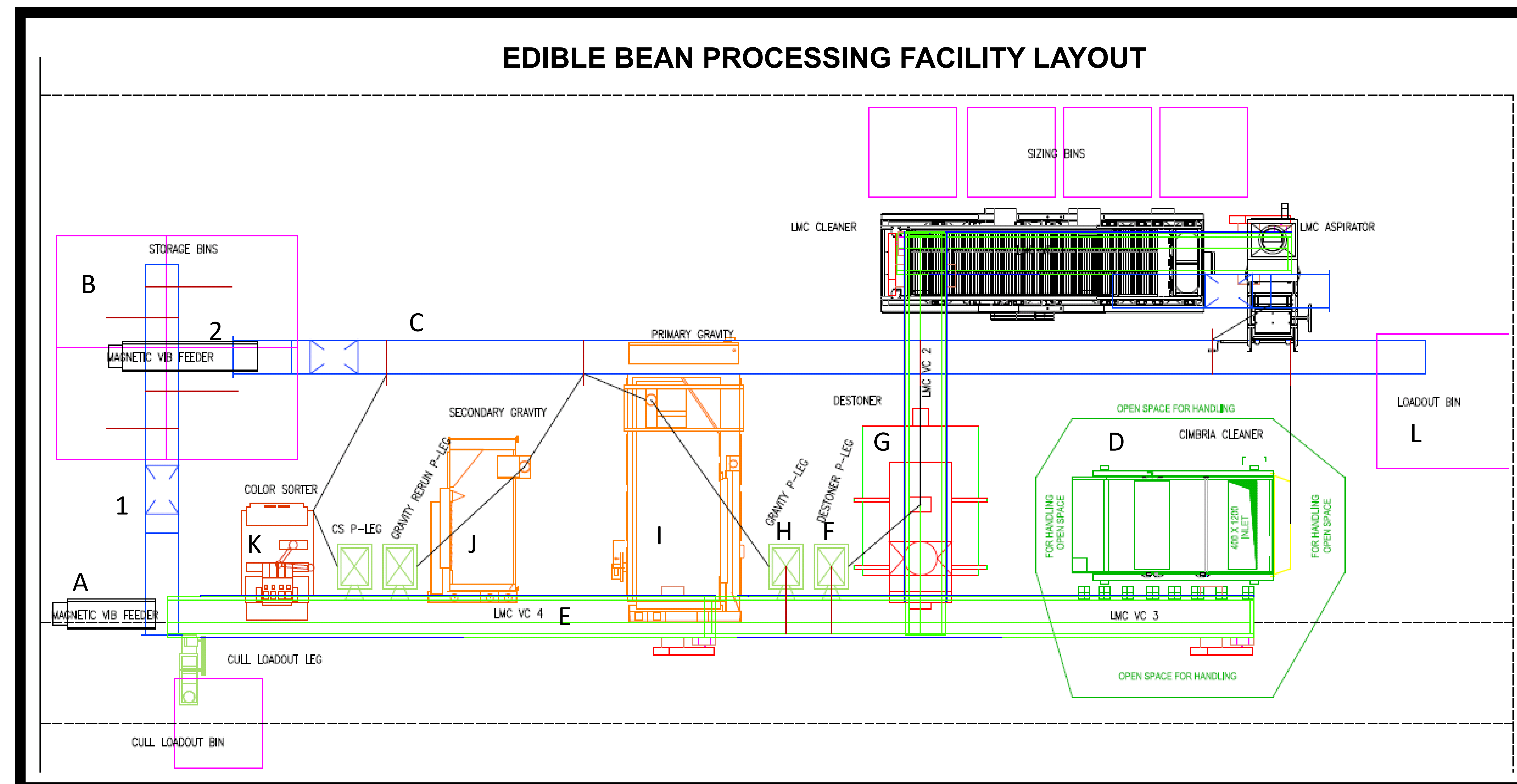
**Sponsor:**  
Adam Schmidt  
Archer Daniels Midland Company



**FIGURE 1. COLLECTING SAMPLES**



**FIGURE 2. LMC DESTONER**



**CHALLENGES FACED**

Challenges with the construction of this facility we incurred were:

- Time constraints
- University construction rules and regulations
- Certification for welding and wiring

**ALTERNATE SOLUTIONS**

Other options considered included:

- Mini scale facility
- 3D model of planned facility
- Education of edible bean facilities

**EDUCATION**

In addition to a facility layout design, the following were created to provide students with edible bean processing facility knowledge:

- Grain flow display board
- Equipment video demonstrations
- Hazard monitoring demonstrations
- Equipment descriptions

**FACILITY LAYOUT EXPLANATION**

**Constraints:**

Facility needs to fit in building size length 60', width 30', height 16'  
Equipment required: Cleaner, destoner, gravity table, color sorter, conveyance, elevating, and storage equipment

**Product Flow:**

- A. Grain entry point from truck
  - grain is unloaded then elevated by a continuous cup elevator (1)
- B. Storage bins
  - 4 product storage bins emptied by magnetic vibratory conveyor (2)

- C. Continuous cup elevator
  - Elevates grain above equipment
- D. Cimbria cleaner
  - Separates stalks, pods, and splits from good product
- E. Vibratory conveyor
- F. Destoner p-leg
  - Elevates grain from vibratory conveyor
- G. Destoner
  - Removes unwanted high weight material (dirtballs, rocks, glass, etc.)
- H. Primary gravity p-leg
- I. Primary Gravity
  - Separates product into 3 cuts based on density
- J. Secondary Gravity
  - Re-runs the middle product from the primary gravity to increase efficiency
- K. Color sorter
  - Removes off colored beans
- L. Loadout bin
  - Product emptied off CCE into storage bins for packaging or reprocessing

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