Manufacturing Plant Design and Layout

Crane Equipment & Services, Inc. - Eureka, IL

Client Contact: Annette Handing - Operations Manager

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Client

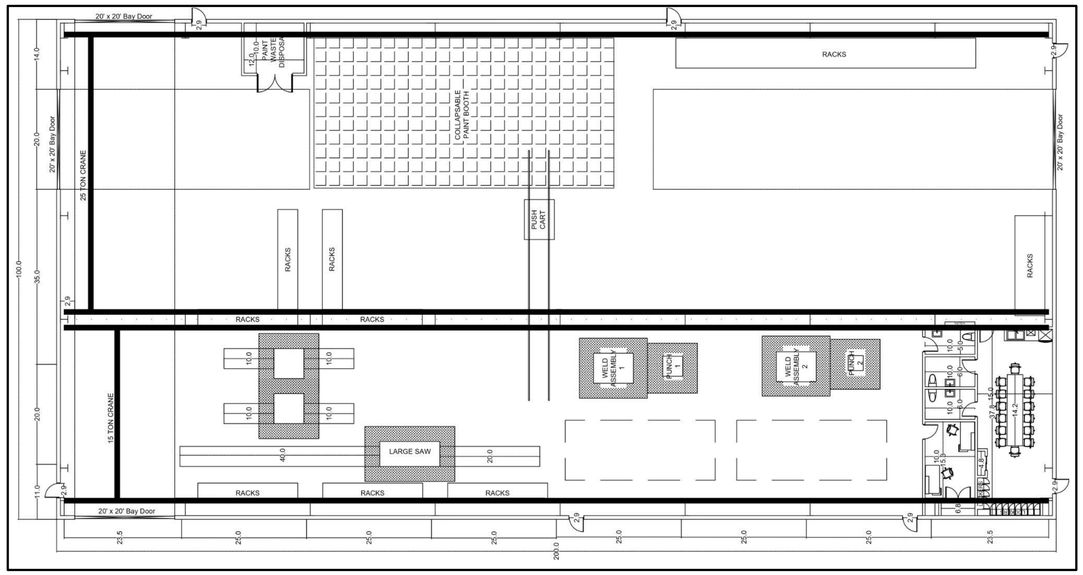
- **Crane Equipment & Service, Inc. (CES)** produces Abell-Howe Cranes, overhead bridge and jib cranes, and hoists
- They provide **production, repairs, maintenance,** and **training** since 1917.

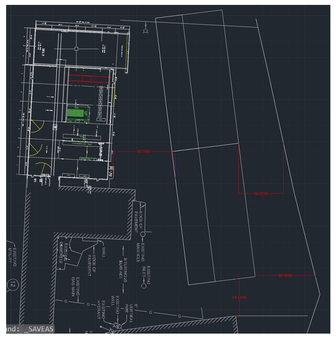
Problem Statement

Crane Equipment and Service Inc. currently **lacks a plant to fulfill the demands** for new government contracts due to the size constraints of their existing facilities, therefore a **new plant must be designed**. The company **does not have an existing processes, material flow, or data** for manufacturing available for **gantry crane production**.

Results

- Development of a new, **streamlined** facility that enables our client to handle **larger government contracts and projects**.
- Current capacity will allow for **all expected orders to be met**, with **room for expansion** to other crane products (100' x 200' building)





- Location based on the interaction of **trucking** flows between **buildings**, **property lines**, and existing immovable structures.
- Allows for **future expansions** as shown on the CAD model to the left (the upper half of the building)

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References:
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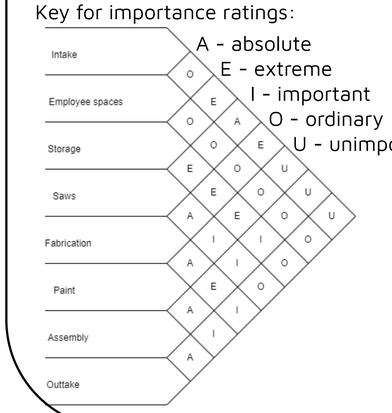
Discussion

Activity Relationship Chart

- All can be near each other **(no Xs)**
- **Employee spaces** can be located **anywhere** that is convenient
- Intake and outtake have **fewer important relationships** than the other departments

Key for importance ratings:

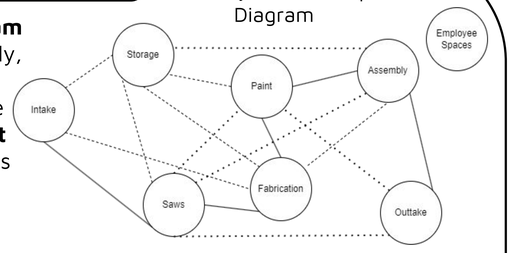


Activity Relationship Diagram

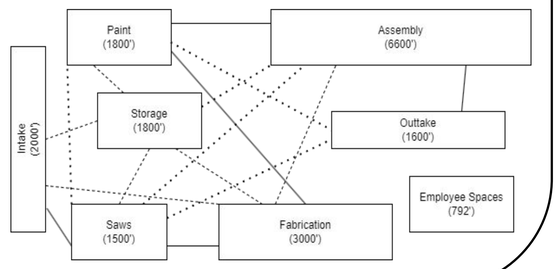
- Saws, Fabrication, Assembly, and Paint have the **most** relationships of importance
- Fabrication has the **highest importance** of relationships

Key
- Solid lines: A importance
- Dashed lines: E importance
- Dotted lines: I importance
- Remaining relationships: less important and therefore not shown

Activity Relationship Diagram



Spatial Relationship Diagram



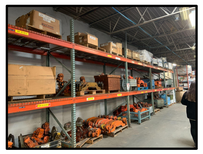
Spatial Relationship Diagram

- **Largest** sections are Fabrication and Assembly, need to have **access** to the rest with high relationship importances

System Model

Our system model maintains a flow of material and processed throughout the facility:

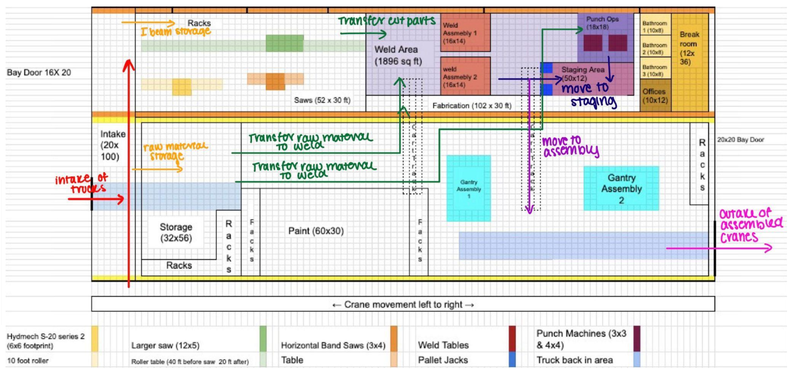
Drive Through **Intake**

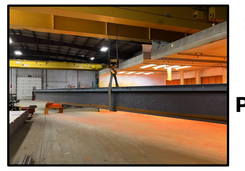


Storage and Racking: large and small parts & beams

Separate **Punch** Operations Section

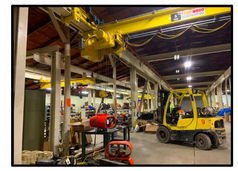
Small and Large **Weld** Assemblies

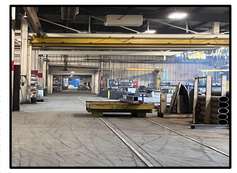




Collapsible and adjustable **Paint Booth**

4 story **Assembly Area** for full builds and tests





Cart system to move parts across the crane tracks

Separate **Outtake** area to reduce congestion