**Project 2 – Facility Layout**

Due December 3, 2023 by 11:59pm

One submission per group via Blackboard

Based on the assessment of the company’s supply chain, the new production facility will be in North Carolina. A majority of the raw materials and parts for production are imported through the Port of New Jersey/New York and Port of Virginia, and the company’s suppliers are mostly along the East Coast.

The company has decided to purchase a building just outside Charlotte, NC. This facility needs to be designed in such a manner that it is stable for 3 years. The sales department forecasted for the next year. Growth is expected, however, the demand will be re-forecasted every quarter for continuous improvement. The facility is 350 ft by 450 ft and can be remodeled to fit our needs. Figure 1 shows a schematic of the facility. Currently, the main entrance to the facility is on the Southwest corner with the doors facing South. This should be where the front desk/check-in area should be.



^ Entrance is here. Standard 2 door entrance.

Figure 1. Outline of New Facility (1 grid box is 25ft by 25ft)

The objective of this project is to determine whether the facility should be designed to have

(1) a U shape flow, with inbound and outbound product on one side of the building, or

(2) a flow through design where inbound and outbound product are on opposite sides of the building.

For each possibility, create at least 2 alternative designs. Compare them and include the advantages and disadvantages. Also provide a detailed layout that includes, but is not limited to, the size of each department, walls, storage of forklift equipment, cafeteria for workers, bathrooms for workers, staging areas for the receiving and shipping, and other relevant information. The focus is for material and personnel to move efficiently through the facility. Cost is not a concern at this moment.

An Excel file will be provide with the following information:

* The production area machine requirements and each machine’s dimensions and required clearance
* The material flow between departments
* The minimum required departments with capacity and notes; some have “Unknown” because it depends on the layout design

Every product can be packed into 10-inch by 12-inch boxes or cases in the Packaging area. The boxes are arranged on pallets and each pallet can handle at most 4 layers of fully packed layers. Pallets cover a 40-inch by 48-inch area of floor space. The facility will need a minimum of 8 trailer truck dock doors of 10 feet high with a width of 8 feet and 6 inches.

Aisles for the facility should allow for two-way traffic. Movement of the product between departments must be done by a standard forklift, which can carry only 1 pallet at a time due to its weight. Assume a worker can carry 1 case of product at a time. Other methods of transportation can be used if the consultants feel that needs to be considered. The movement of product within a department can be done manually or with a forklift.

The report must contain the following:

* Title Page – with an appropriate title, group members, date, course
* Table of Contents
* List of Figures and List of Tables, if applicable
* Executive Summary
* The body of the report must have
  + Introduction – Describe the purpose of the project
  + Data Description - Summarize the data. The purpose of this is to make sure that you understand the data correctly.
    - Descriptive analytics on the data (average, standard deviation, range)
    - Issues in the data and how you decided to resolve it
  + Methodology – Describe all the methods you used
    - **Use at least 2 algorithms**: Submit relevant files showing all the work you did. Details of steps can be shown in an Appendix
    - You do not need to detail the steps of any algorithms. You do need to describe the techniques your group decided to use
    - For each algorithm, you must describe the parameters or data you needed and whether there were any transformations of the data
  + Analysis of Results – Describe and interpret the results
    - Recommendations - Clearly identify your recommendations and the reasons why
* Appendix (if applicable)
  + This section can contain extra information that you can reference to
* Times New Roman, 11pt or 12pt font
* 1.5 or double spacing, 1 inch margins
* Page limit: 15 pages (does not include Appendix, title page, executive summary, table of contents, list of figures/tables)
* Use appropriate graphs and tables to summarize or display your data or analysis.