

FACILITY LAYOUT EXERCISE

DUE: NEXT CLASS PERIOD, ONE REPORT / TEAM

- 1. COVER PAGE – NAMES OF STUDENT ON TEAM + TEAM NAME**
- 2. CURRENT PLAN LAYOUT**
 - TOTAL FLOW DISTANCE (FEET)
 - TOTAL LEAD TIME (HOURS)
 - LIST PROBLEMS WITH LAYOUT “AS IS”
- 3. DEVELOP NEW “IMPROVED” LAYOUT**
 - LIST NEW EQUIPMENT TO BE PURCHASED ✓
 - LIST NEW EMPLOYEES TO BE HIRED
 - TOTAL FLOW DISTANCE (FEET) ✓
 - TOTAL LEAD TIME (HOURS) ✓
 - LIST NEW IMPROVEMENTS OVER “OLD” FACILITY LAYOUT
 - LIST COSTS & BENEFITS
- 4. SHOW TABLE COMPARISON OF “OLD” VS. NEW FACILITY LAYOUT**
- 5. LIST INTANGIBLE BENEFITS OF LAYOUT**
- 6. SUMMARY & CONCLUSIONS**

PLANT LAYOUT EXERCISE
IET 500 PRODUCTION CONCEPTS

YOU ARE TO WORK IN TEAMS OF 2 – 3 STUDENTS TO ANSWER THE FOLLOWING QUESTIONS AND PROBLEMS. YOUR GROUP WILL TURN IN ONE REPORT PER TEAM FOR GRADING AT THE NEXT CLASS PERIOD. PUT A COVER PAGE ON YOUR REPORT AND LABEL ALL SHEETS NEATLY AND CLEARLY!

1. Calculate the total flow distance parts travel through the plant and the total cycle time for each operation for the existing plant layout. See sheet attached. Show all your calculations.
2. Make a list of at least five problems you identify in the present plant layout. Explain why your team believes that these are problems.
3. Implement a brand new plant layout by improving the existing layout using the concept of “cellular” manufacturing as shown in class. Do this by “cutting up” the existing plant layout and creating your new plant layout.

Rules and Assumptions:

- A. A total batch of 2,400 parts are to be moved into this plant on Monday morning at 8:00 am and put into the first operation. All parts in this job of 2,400 pieces must move together! The sequence that the 2,400 parts move through the plant must not be changed!
 - B. Assume that the movement time from operation to operation is zero.
 - C. Assume that once the parts move from one work center to another work center, work immediately starts on the 2,400 pieces. No waiting!
 - D. You may purchase additional equipment & hire more works as needed in the new plant layout that your team designs.
4. Calculate the total flow distance parts travel through the “new” plant and the total cycle time for each operation for the new plant layout. Show all your calculations clearly.
 5. Make a list of at least five improvements that your team can identify in the “new” plant layout. Explain why your team believes that these improvements are important and significant.
 6. Write-up a short paragraph explaining and justifying why the company should change it's existing layout and change to your new plant layout. This paragraph should be less than 500 words in length.

PLANT LAYOUT EXERCISE
IET 500 PRODUCTION CONCEPTS

- 1. YOU ARE TO WORK IN TEAMS OF 2-3 STUDENTS TO ANSWER THESE QUESTIONS AND PROBLEMS. TURN-IN ONE ANSWER SHEET PER TEAM.**

- 2. CALCULATE THE TOTAL FLOW DISTANCE AND LEAD TIME FOR THE PLANT LAYOUT SHOWN. SHOW ALL CALCULATIONS AND HOW YOU OBTAINED YOUR NUMBERS.**

- 3. IMPLEMENT A NEW AND IMPROVED LAYOUT USING JIT PRINCIPLES, WITH MINIMUM TRAVEL, SPACE, PEOPLE AND INVENTORY. YOU MAY 'CUT-OUT' THE ORIGINAL LAYOUT TO SHOW YOUR TEAMS CHANGES.**

- 4. LIST THE PLANT LAYOUT ISSUES THAT WILL ARISE OUT OF SUGGESTED CHANGES. WHAT ARE COSTS AND BENEFITS YOU'RE YOUR NEW LAYOUT.**

Plant Layout Exercise

- **Background Information:**

- Plant operates one shift (8 hours) 5 days per week
- Current demand is 2400 units per week
- Current production is in one week lots
- Heat treating in batches of 700 pieces per hour

- **Exercise Objectives**

- Determine the total flow distance space and lead time for the product being produced
- Implement most efficient layout on flip chart using JIT principles with minimum travel, space, people and WIP inventory
- List the issues that arise out of this change

- **Scale:** One inch = Ten feet

Plant Layout Exercise (Cont'd)

- **Activity**

- Prepare a new plant layout (on flip chart) that utilizes minimum:
 - Floor space
 - Operators
 - WIP inventory
 - Lead time
- Calculate the differences between the existing and your proposed layout for each of the items above
- Consider implications on:
 - Material handling
 - Operator training
 - Quality
 - Machine efficiency

24002

- Saw, Drill, Degrease, Store, Weld, Heat Treat, Turn, Grind, Gun Drill, Inspect, Pack



Lead-time Worksheet

Production Lot = 2400 Pieces

Saw (210/hr)		
Drill (86/hr)		
Degrease (515/hr)		
Store (8 steps x 6 hrs)		48 hrs.
Weld (170/hr)		
Heat Treat (700/hr)		
Turn (128/hr)		
Grind (170/hr)		
Gun Drill (109/hr)		
Inspect (200/hr)		
Pack (120/hr)		
Total Lead Time		

PLANT LAYOUT ISSUES- OLD VS. NEW

ISSUES

OLD LAYOUT

NEW LAYOUT

LEAD TIME (HOURS)

LEAD TIME (DAYS)

LEAD TIME (WORK WEEKS)

DISTANCE TRAVELED (FEET)

TOTAL AREA NEEDED

OF MACHINES/AREAS

OF EMPLOYEES NEEDED

INTANGIBLE BENEFITS:

1.

2.

3.

4.

5.