

PLANT LAYOUT

Plant layout refers to the *arrangement of physical facilities* such as machines, equipment, tools, furniture etc. in such a manner so as to have *quickest flow* of material at the *lowest cost* and with the least amount of handling in processing the product from the receipt of raw material to the delivery of the final product.

The principal factors are:

- Location, with respect to the marketing area
- Raw material supply
- Transport facilities
- Availability of labor
- Availability of suitable land
- Environmental impact and effluent disposal
- Local community consideration
- Climate
- Political and strategic consideration

Objectives of good Plant Layout:

A well designed plant layout is one that can be beneficial in achieving the following objectives:

- Proper and efficient utilization of available floor space
- Transportation of work from one point to another point without any delay
- Proper utilization of production capacity.
- Reduce material handling costs
- Utilize labor efficiently
- Reduce accidents
- Provide for volume and product flexibility
- Provide ease of supervision and control
- Provide for employee safety and health
- Allow easy maintenance of machines and plant.
- Improve productivity

Types of Layouts

➤ **Process layouts (Job shop):**

- **Process layout** (also called a *job-shop* or *functional layout*) is a format in which similar equipment or functions are grouped together, such as all lathes in one area and all stamping machines in another.
- A part being worked on then travels, according to the established sequence of operations, from area to area, where the proper machines are located for each operation.
- This type of layout is typical of hospitals, for example, where areas are dedicated to particular types of medical care, such as intensive care units.

➤ **Product layouts (Flow shop):**

- A **product layout** (also called a *flow-shop layout*) is one in which equipment or work processes are arranged according to the progressive steps by which the product is made.
- The path for each part is, in effect, a straight line. Production lines for shoes, chemical plants, and car washes are all product layouts.

➤ **Hybrid layouts (Cellular):**

- A **Hybrid (cellular) layout** groups dissimilar machines into work centers (or cells) to work on products that have similar shapes and processing requirements.
- A group technology (GT) layout is similar to a process layout in that cells are designed to perform a specific set of processes, and it is similar to a product layout in that the cells are dedicated to a limited range of products.

➤ **Fixed-Position layouts:**

- In a **fixed-position layout**, the product (by virtue of its bulk or weight) remains at one location.
- Manufacturing equipment is moved to the product rather than vice versa.
- Construction sites and movie lots are examples of this format

SIGNIFICANCE:

- Location of a plant is an important decision because it influences the cost of production and distribution to a great extent.
- Location may contribute to even 10% of cost of manufacturing and marketing.
- A firm may fail due to bad location or its growth and efficiency may be restricted.

FOUNDING: (*or casting*) is the process of forming metal objects by melting metal and pouring it into molds.

FOUNDRY: A commercial establishment for founding or producing casting.

Or

A facility that melts metals in special furnaces and pours the molten metal into molds to make products.

- Foundries are usually specified according to the type of metal dealt with, as iron foundry, brass foundry, etc
- Foundries are also classified according to the nature of their work and their organizational framework.
 - A **JOBGING Foundry** is one having a physical plant that usually contracts to produce a casting or a small number of castings of a given kind.

- A PRODUCTION Foundry is a highly mechanized shop which requires that large numbers of a given kind of casting be made in order to produce them at a low cost.
- A SEMI PRODUCTION Foundry are those in which a portion of the work is of a jobbing nature and the balance is production casting.
- A CAPTIVE Foundry is one which is an integral of some manufacturing company and whose castings are mainly for the parent organization.
- An INDEPENDENT Foundry is one which is a separate entity to produce castings for any number of customers.

TYPICAL FOUNDRY LAYOUT

