Factors to consider when shaping your plant layout

Here are some valuable guidelines you can easily adopt when deciding where to put things.

- Start with the customer

  Understand the needs of your customers now and in the future, not by the output of your machinery or your existing production rates. Will there be new product introductions or developments?

  This means working out the rate of customer demand for your process. For example, if your business plan projects annual sales of your products will be 100,000 units and your plant works one shift of 7.5 hours, then you can calculate the takt time to be approximately one minute. That means, on average you need to make one product every minute of every shift all year.

  Every machine and each process step in your factory needs to be able to process one product in just under one minute. The takt time therefore provides an effective yardstick to use when working out the size of machinery and the number of work stations you need.

- Map the process

  Use value stream maps to identify your key production flows and eliminate unnecessary production steps and waste. This helps you take a birds eye view of your operation and make sure that every step of the process is adding value for the customer before you build those steps into your layout. It may also reveal opportunities to combine process steps, reducing waste even further.

- Don’t have to use all the space

  Keep things close together and design U-shaped cells if possible to minimise walking and transport distances. This also improves productivity by enabling operators to switch easily between neighbouring functions when underutilised. Don’t worry about not using all the space, it is more important that your operation is efficient rather than filling up the building. Also don’t always place equipment at the walls as this can restrict access and utilisation.

- Operations first, storage second

  If you are building a factory then achieving good, safe production flow must be the number one consideration. Design a good production flow first to minimise waste and then any space left over can be left for storage. If you do not think you will not have enough storage space focus on storing less, not on rearranging the plant layout to put in more pallet racks.

- Minimise or eliminate forklifts

  Forklifts are expensive to run, present a major hazard around people and need lots of space for aisles and turning circles. Challenge yourself to minimise forklift movements and find other ways to move products safety between processes.

This will lead you to move processes together and potentially link them into “one piece flow”.

You may still end up needing forklifts for some tasks, but you will surprise yourself what can be achieved without them.

- Involve the workers

  Make sure that you consult widely and involve the operators, team leaders and maintenance teams. They will have to live with the layout and if they don’t like it they will remind you about it for the rest of your working life!!

  Make sure that your value stream mapping team has representation of team leaders and front line people and that the draft layout is shared with all the team to give them a chance to offer their input. Hanging the plan on the lunch room wall is a good way to solicit feedback.

- Pilot new ways

  If you have followed our advice and developed a new layout concept from the ground up, it is likely that it will represent a big change from your current way of operating. Therefore it makes sense to trial these ideas in your existing plant before you move to the new plant or make changes to the existing layout. Trying things out on a small scale gives you a chance to iron out any bugs and to build experience and confidence in the new systems before you move things.

- Plan the move carefully

  Moving your operation or changing your layout is likely to be a complex exercise that brings with it a high risk of disruption to your business and your customers. Therefore thorough planning and allocating the correct resources are essential.

    - Inherent safety. Dangerous processes should not be accessible without authorisation. Fire exits should be clearly marked with uninhibited access. Pathways should be clearly defined and not cluttered.
    - Length of flow. The flow of materials and information should be channelled by the layout to best fit the objectives of the operation. This generally means minimising the distance travelled by materials.
    - Clarity of flow. All flow of materials should be clearly signposted, for example using clearly marked routes.
    - Staff comfort. The layout should provide for a well ventilated, well-lit and, where possible, pleasant working environment.
    - Management co-ordination. Supervision and communication should be assisted by the location of staff and communication equipment.
    - Accessibility. All machines, plant and equipment should be easily accessible for cleaning and maintenance.
    - Use of space. All layouts should make best use of the total space available (including height as well as floor space). This usually means minimising the space for a particular process.

- Long-term flexibility. Layouts need to be changed periodically. Future needs (such as expansion) should be taken into account when designing the layout.