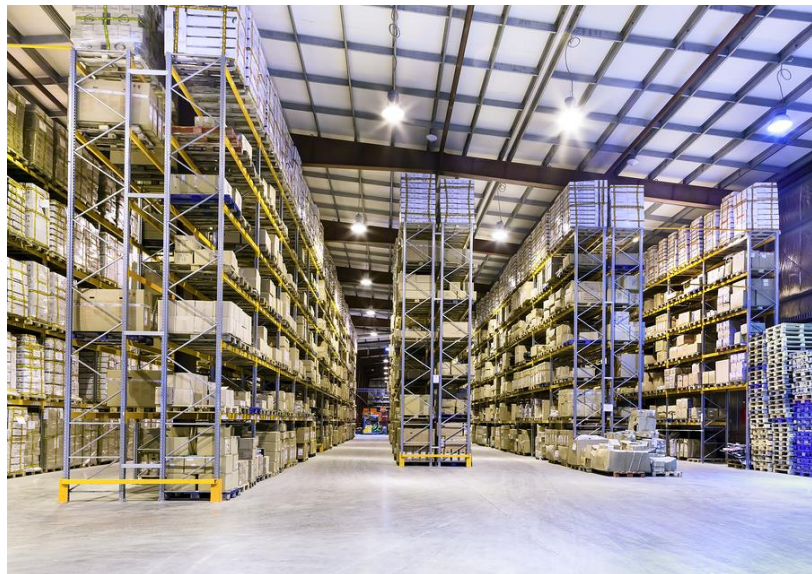
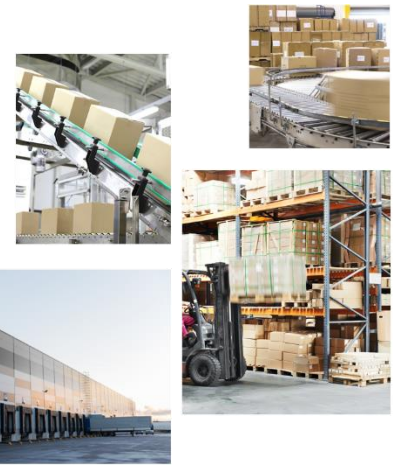


*F. Curtis Barry & Company*

# 27 WAREHOUSE LAYOUT, DESIGN & EFFICIENCY PRINCIPLES



There are several basic principles that apply to warehouse layout design, and running an effective distribution center operation. Without the proper layout and design of your distribution center, no matter the square footage, you will be facing capacity issues, decrease in productivity, and storage inadequacies. This is a short list of these areas that should be addressed in your warehouse operations planning and facility layout.



- 1 Use the cube.** Make sure you are utilizing the potential storage space/cube of the distribution center. Ensure that vertical space as well as individual location cubic capacity is fully utilized. Maximize cube as well as ground level square feet.
- 2 Focus on slotting, replenishment, and location control system.** These three activities form the backbone of the operation and should be given the appropriate attention. If they are cared for, much of the rest of the operation will run effectively.
- 3 Maintain flexibility in the operation and layout.** Planning for unknown future changes to the business or fulfillment model is a necessity to avoid unnecessary costs to make unplanned changes to the facility and operation. Don't develop a layout or process that is inflexible or not scalable.
- 4 Minimize congestion and interference with smooth flow.** Avoid unnecessary congestion or overcrowding in the distribution center. The time lost due to overcrowding or congestion is significant.
- 5 Use a variety of location storage media for slotting and reserve as dictated by item cubic velocity.** The "one size fits all" approach rarely works to maximize efficiency in space and labor performance.
- 6 Minimize travel walking time.** Since more than half of the total labor time you pay for in the distribution center is spent walking, any efforts to reduce travel distance and time will pay off in reduced labor costs. Effective layout and slotting processes can help reduce walking time.
- 7 Use conveyors for horizontal transport of product.** Whenever possible, the use of a simple transfer conveyor system can improve operating efficiencies by reducing handlings and walk time. Make sure the cost of the equipment is justified. Conveyor selection is based on the size and weight of the product and the throughput volume. Accumulation has to be planned for in any conveyor design.

- 8 Provide adequate accumulation and storage space on docks.** Inefficiencies caused by lack of space on docks gets the operation off to a bad start and not only cause's inefficiencies in the operations on the dock but ripples down to and can negatively affect other distribution center functions.
- 9 Have enough dock doors.** Since the expense of providing enough dock doors for inbound and outbound use is relatively small, and the impact of not having enough doors large, invest to make sure you are not slowing down the operation.
- 10 Cross dock where possible.** The ability to omit steps in the fulfillment process and take receipts directly to the packing and shipping function will save time. Consider using cross docking for backorder processing as the item is received.
- 11 Use bar codes as much as possible.** Consider applications to reduce labor and improve efficiency in as many areas of the fulfillment process as possible.
- 12 Keep 15% of locations open and available.** This may not be possible 100% of the time, but having space available to store inventory in picking and reserve locations is a key factor.
- 13 Measure and report productivity to employees.** The fact that most employees want to know what's expected of them and how they are measuring up to those expectations should guide the reporting process in the warehouse to improve performance.
- 14 Move as much product at one time as possible.** Maximizing the product per trip will reduce the total trips and time required. Applications can be found in the picking, putaway, replenishment, etc. distribution center functions.
- 15 Single line orders.** Batch-pick singles as much as possible.
- 16 Staff involvement.** Involve your distribution center staff in decision making relating to facility layout or operations planning. Those closest to the process usually understand it best.
- 17 Slotting procedures are critical.** Try to provide primary pick space for one week's average unit sales for each SKU. Focus on the top 10% of fast selling SKUs to ensure that they are properly slotted. Make sure the slotting process is maintained as a dynamic, ongoing process.
- 18 Have well-designed pack station.** Since the majority of distribution center labor is spent in the packing function, it makes sense to ensure that all of the required materials are available for the packer and that adequate workspace is provided.
- 19 Stagger shift start times.** Make sure that your schedule for distribution center staff coincides with work being available. Consider off shift activities to minimize interference with other distribution center functions.

- 20 Aisle mapping.** A simple process that validates that the correct item is in the assigned location will save headaches in other distribution center activities.
- 21 80 - 20 rule.** Indicates that 20% of your SKUs usually account for 80% of your unit sales, and as such should receive the attention of the distribution center staff to ensure that they are processed as efficiently as possible. Create a “Hot Pick” zone for the fastest sellers.
- 22 Automation.** Provide for the level of automation that can be cost-justified based on your particular operation and cost structure. Look for 18-month payback as a guideline.
- 23 Flow charts.** Develop a process flow chart that tracks a receipt through the putaway process and an order from replenishment to shipping, showing the path and number of times the product is touched.

**24 Staff involvement.** Involve your distribution center staff in decision making relating to facility layout or operations planning. Those closest to the process usually understand it best

**25 Plan for an appropriate level of inspection.** Don't over inspect where not required. Pick the best function and inspection level to set quality requirements.

**26 Make sure that you provide adequate lighting levels based on the type function to be performed.** Processes requiring detailed inspection of documents should have a higher light level than a bulk storage zone in the distribution center.

**27 Aisle widths in the distribution center:**

- Conventional - 10-12 feet
- Narrow aisle - 8-9 feet
- Very Narrow Aisle - 44-66 inches

## Need Help?

If you'd like an expert assessment of your multichannel business to identify ways to reduce costs and improve productivity, we're here to help. I'd invite you to use the link below to request a time for us to have an introductory phone conversation where we can explore your questions and situation.