Increasing productivity at Receiving and Sorting area with the implementation of an Automatic Sorter

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Abstract: The Sorting Department of the Distribution Center of a major chain of stores was too labor intensive, impacting safety, accuracy and production KPI's. After some minor processes improvement projects, the cost-benefit was not significant enough. Implementation of an Automated Sorter led to the re-engineering of the receiving and sorting processes. The velocity of freight flow to the shipping department improved said department's productivities. The projected annual savings are of $937,359.

Introduction: Process improvement efforts were focused on the Sorting Department of the Distribution Center (DC) of a major chain of stores. After some minor improvement projects, it was evident that the cost-benefit was not significant enough to meet the business needs. Therefore, it was decided to pursue mechanization in the form of conveyors and an Automatic Sorter.

Problem: DC Sorting Department is considered the bottleneck of the operation due to its poor productivity capacity of *78 cases per man hour* and it's labor intensive nature, which impacted the *safety*, *accuracy* and *production KPI's*. Also, the area will not be able to support the store growth on the island. The goals are: increase sorting department productivity, support store growth on the island, reduce accidents by minimizing labor intensive task's and create a process driven accurate environment.

Methodology

Receiving
Unload pallets, label cases on REC dock, transfer onto empty pallet & haul pallet to sorting staging area.

US Floor Loaded
Manually unload freight onto individual store pallets.

Processing
Cases are placed onto carousel and sorted manually.

Figure 1: Old Process Flow

Design Criteria's:
- **FY16 Average Day, Peak Month :** Daily Volume and Sorter Throughput
- **Operation schedule:** 5 Days/ WK; 2 Shifts/Day
- **Volume by Store Formats and Distribution Channel Flow**
  Format 1: 74%, Format 2: 20%, Format 3 : 6%
- **Optimal Staffing Model**
- **Store Counts** by format
- **Building Lay & Characteristics @ 130,000** sq/ft

Table 1: Operational Capacity (manpower)

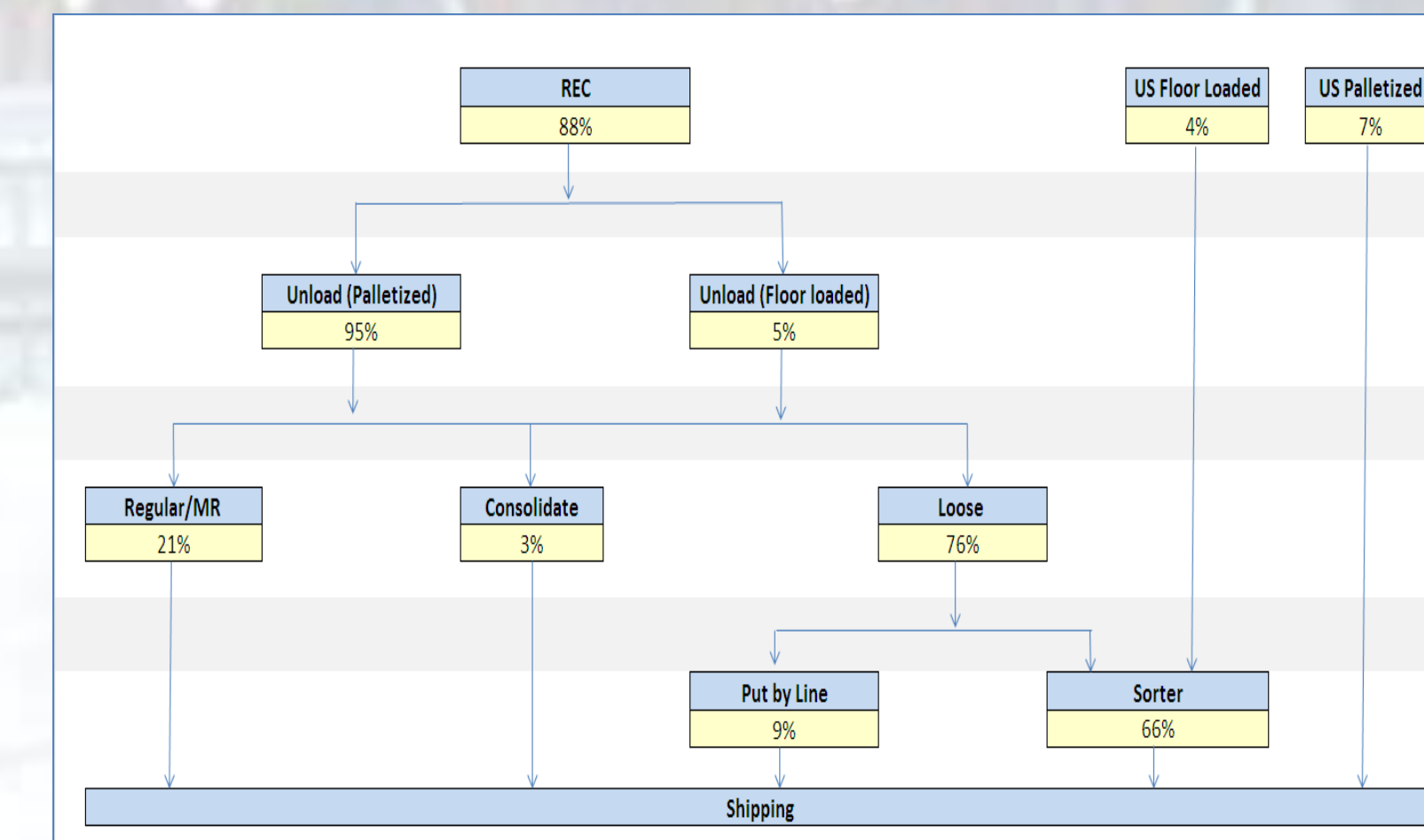|	Receiving	Sorting	Shipping
Associates/ Day	117	81	33
Cases / Day	>115,000	>105,000	>441,000

Figure 2: Actual Distribution Channel Flow

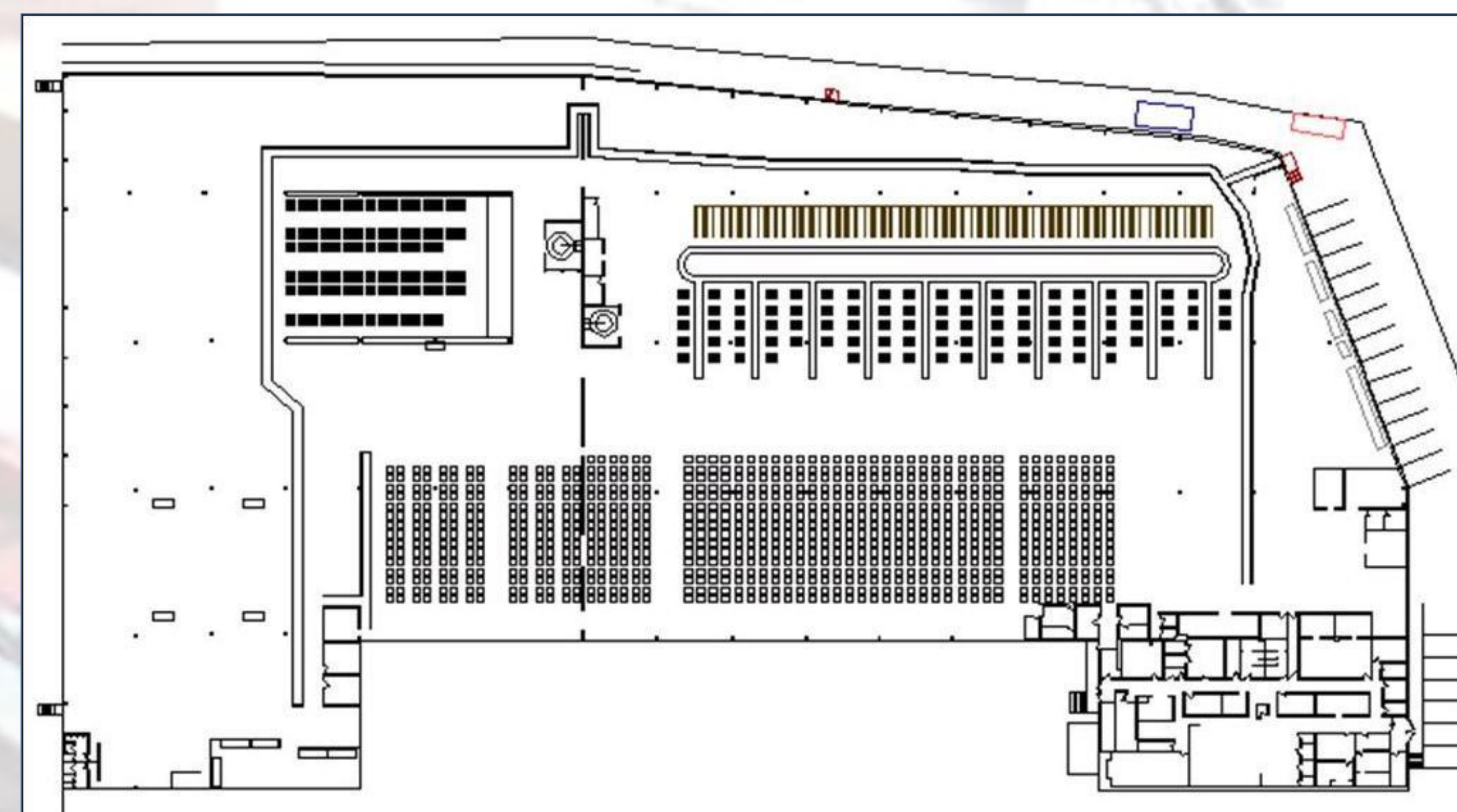### Old Building Layout & Operation

Figure 3: Old Building Layout

Figure 4: Old Receiving Process

Figure 5: US Floor Loaded

Figure 6: View from Old Sorting area
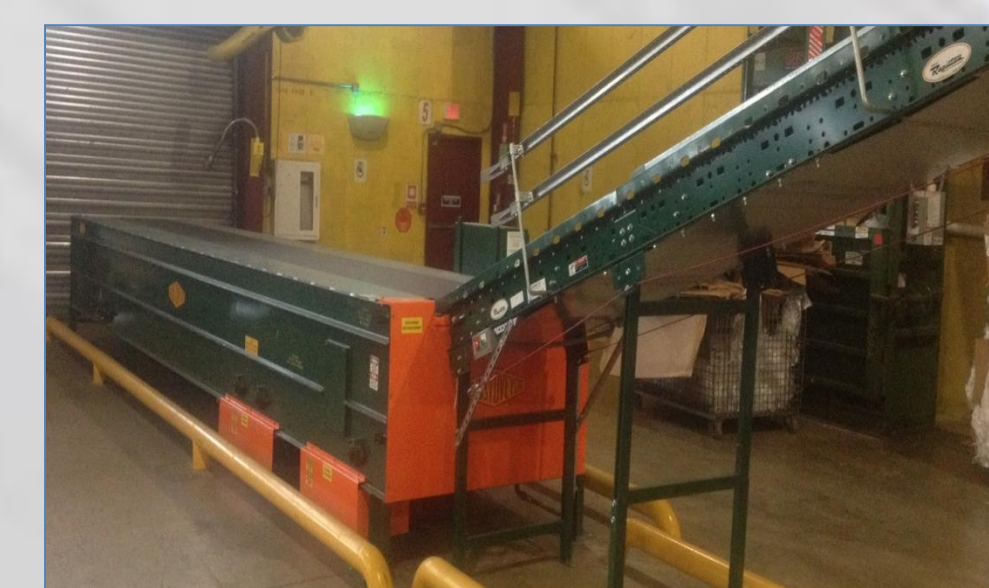
Actual Building Layout & Operation

Figure 7: Extendable to unload floor load

Figure 8: Receiving lines
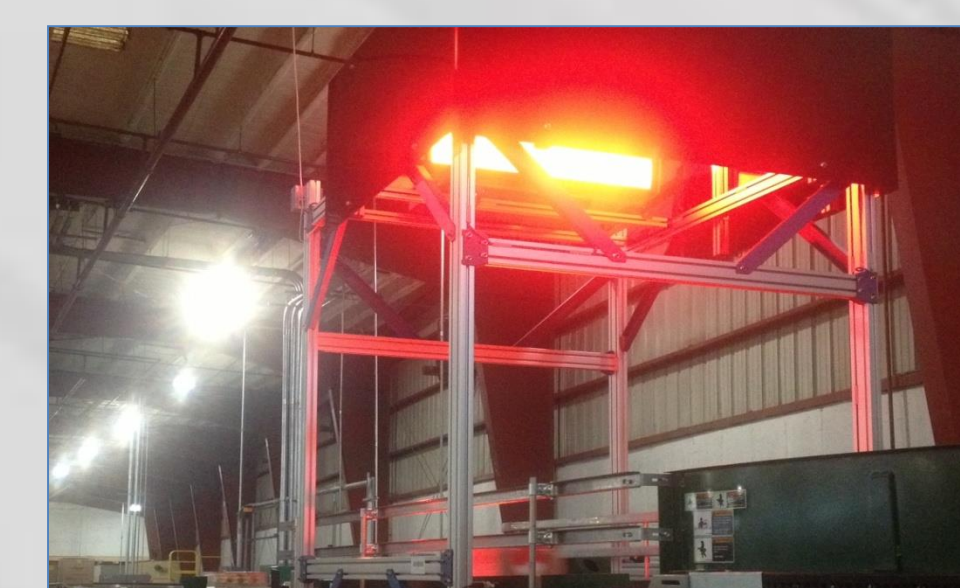
Figure 9: Receiving process

Figure 10: Merge area

Figure 11: Scanner

Figure 12: Shipping lines
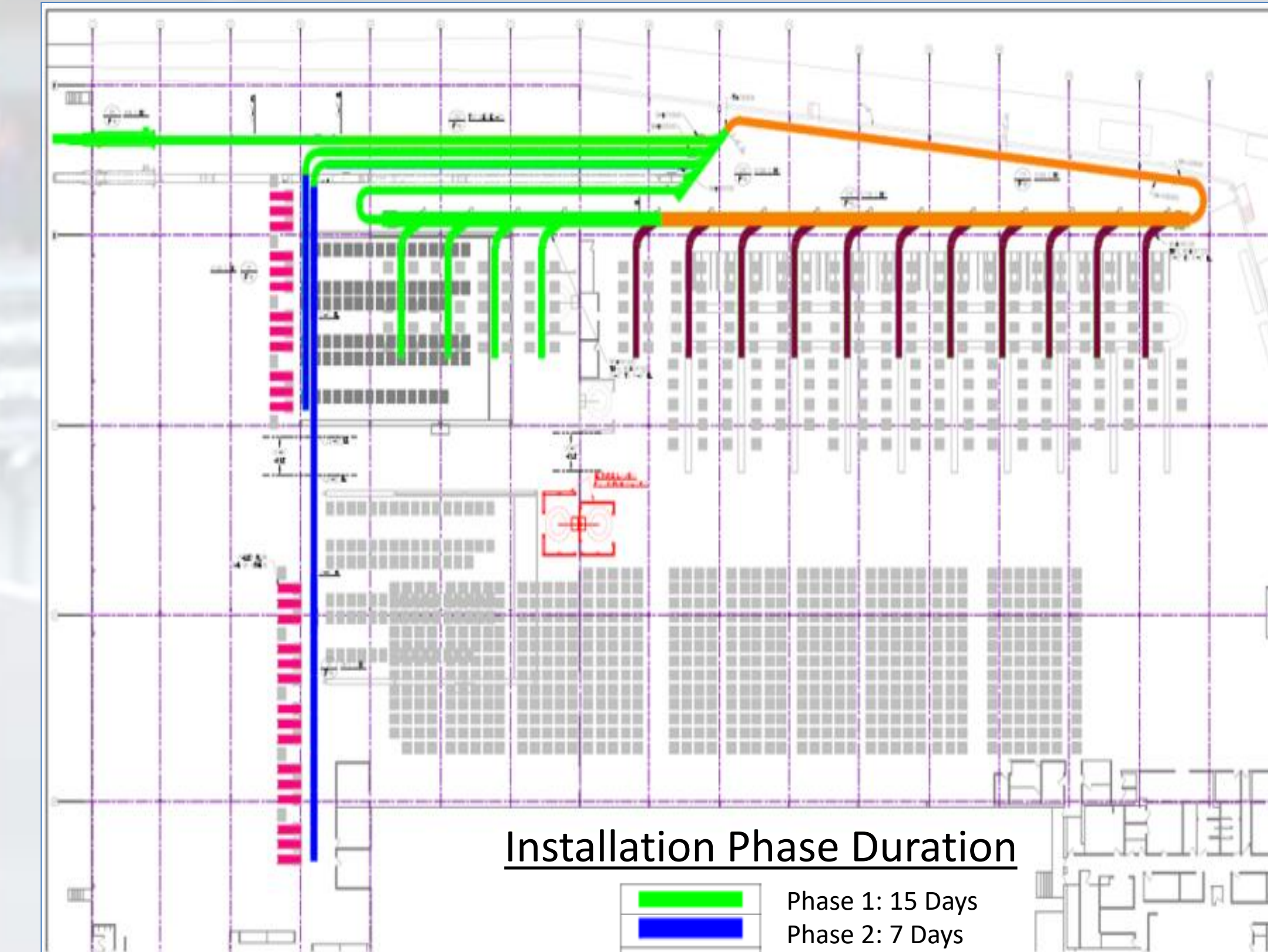

Installation Phase

Figure 13 Installation Phase Diagram

Installation Phase Duration
- Phase 1: 15 Days
- Phase 2: 7 Days
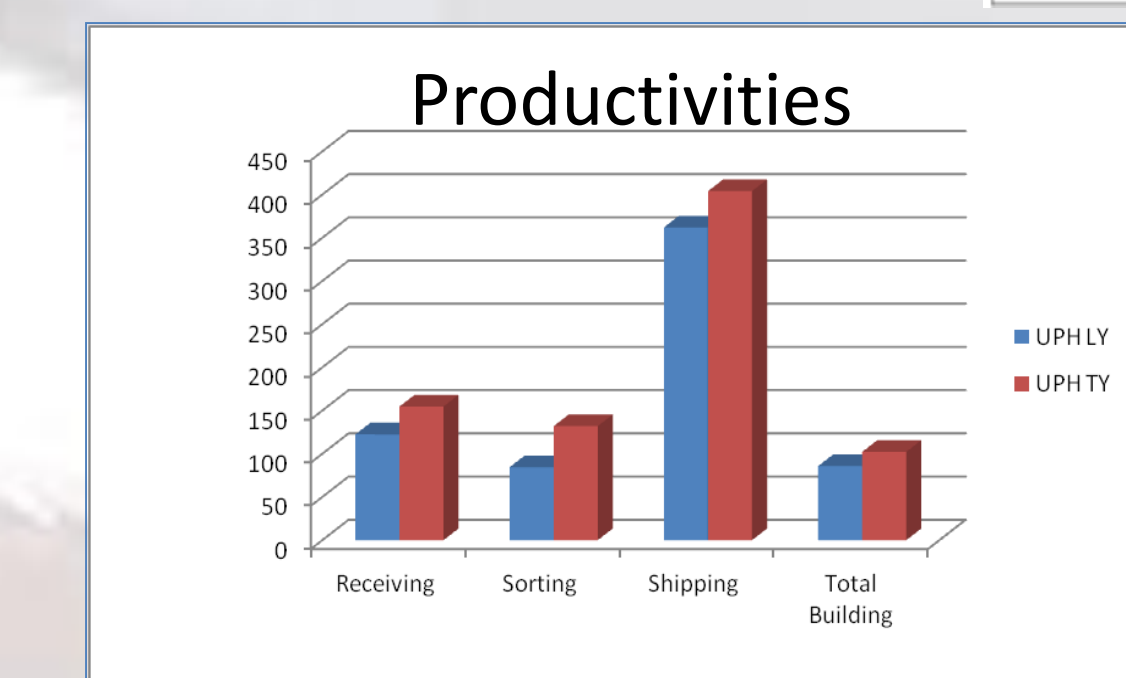- Phase 3: 8 Days
- Phase 4: 3 Days
- Phase 5: 4 Days
- Total 37 Days

Saved hours: @16,000

Note: Saved hours are from 2 months

Figure 14 Productivities Graph

Objectives Results	Other benefits
• **Increased** Receiving CPMH in **27%**	• **Increased** Shipping CPMH in **12%**
• **Increased** Sorting CPMH in **58%**	• **Increased** Total Building CPMH in **22%**
• **Reduce** accidents from **3 LY** vs. **0 TY**	• **Reduce** DC Lead-time
• **Improve** process accuracy by **42%**	• **Improve** associate morale
	• **Decrease** non-conveyable freight

Conclusion: The implementation of an Automatic Sorter provided expected and unexpected benefits with a projection higher than the projected annual savings of **$937,359**.

Future Work: Implement Phase 2 of the project in case that is required due to an increase of product centralization through the DC to avoid Direct to Store Deliveries.