

## CHAPTER 1:

# INTRODUCTION

**T**he consequences of poor planning and design is often costly. Even small oversights, such as inadequately sized dock doors or improperly positioned rack beams, can snowball into large, head-pounding problems. The only way to avoid or counteract this downward spiral is by getting back to the basics: Reassess the current operation, then properly plan and design — or re-design — the facility to create a world-class warehouse.

How does one go about designing a world-class warehouse? Begin by understanding the qualities that make a warehouse world class. It must offer consistent high-quality service in a facility that is economical to build, efficient to operate, and flexible enough to adapt to changing business conditions. Its operational components must consist of a complex but balanced array of facility, people, equipment, information systems, and product, which work as a cohesive unit to maximize the utilization of space while optimizing throughput. It must also perform all of these tasks under an inflexible trio of constraints: limited time, finite available space, and bottom-line costs.

These dimensions of time, space, and costs are the three cornerstones by which an efficient and effective warehouse is measured. A warehouse that is able to accomplish its mission while saving time, space, and costs in the process is on its way to world-class status. Knowing how to use these measures in warehouse design becomes a definite advantage to a warehouse manager. It is also the primary subject of this book.

The chapter on warehouse time standards discusses the use of time to measure work, estimate labor requirements, evaluate alternative designs, improve operations and benchmark operations, as well as its use as input in simulation analysis. By measuring time in the warehouse, one can identify opportunities in the design where time can be saved, subsequently reducing labor costs and increasing throughput. This chapter also includes a collection of common warehouse time standards that can be used in planning and design.

The chapter on warehouse space calculations goes beyond just calculating space requirements for the different operational areas of a warehouse. It also includes an introduction to the basic components of warehouse space from the receiving to the shipping docks. It discusses how to design these functions in the least amount of space.

The chapter on warehouse cost calculations focuses on the conversion of time and space requirements into their bottom-line costs. It summarizes the different warehouse cost centers with the latest cost figures, spreadsheets, and techniques to analyze these costs. It also discusses how cost calculations are used to justify and evaluate alternative designs.

Throughout this book, the authors have made an effort to combine a theoretical yet practical approach that is applicable to both conventional and “state of the art” warehouses. The broad scope of information is useful to both experienced and inexperienced managers. For the experienced warehouse manager, this book will serve as a tool for improving productivity. It can also be used as a guide for preliminary design and operations analysis. This book will also acquaint the less experienced manager with the basics of warehousing.