

ABSTRACT

Facility layout design is a crucial aspect of logistics management, especially in Cross Docking Center (CDC) areas where high-intensity loading and unloading activities occur. PT XYZ, the subject of this study, faces issues such as high Material Handling Costs (OMH), long waiting times for heavy equipment, and inefficient checker workflows due to unstructured container arrangement. This research aims to design a proposed layout that minimizes OMH and improves the flow of materials and information within the CDC area. The method used in this study is class based, which groups containers based on size and usage frequency. Primary data was collected through direct field observations and interviews with checker personnel, while secondary data included area dimensions, stacking capacities, and the operational costs of equipment and labor. All data were analyzed to generate an optimal layout based on a from-to matrix that reflects the actual movement patterns between areas. The results show that the proposed layout can reduce total OMH by Rp3,660,336 or approximately 21.54%, and significantly decrease the container transfer distance from 8004 to 7011. High-frequency areas such as receiving and storage are placed closer to the entrance and checker lanes, accelerating inspection and distribution processes. The new layout also improves the movement flow of heavy equipment and minimizes conflict points between activities. Thus, the implementation of class based proves effective in designing a layout that is both efficient and adaptive to the operational needs of the CDC. This study is expected to serve as a reference for developing facility layout systems in other logistics operations with similar characteristics.

Keywords: Facility Layout, Cross Docking, Class based, Material Handling Cost (MHC)