

Construction Site Layout Planning Kuwait International Airport Expansion- Terminal 2

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Abstract

The importance of occupational safety and health is one of the subjects that cannot be neglected. In our project, we focused on ensuring a safe work environment for the workers and designing a better layout that smooths the flow between the areas in a construction site. That was done by considering safety concepts and layout optimization concepts. The main aim of this project is to develop a site layout that insures better safety conditions for the workers. Kuwait International Airport Expansion- Terminal 2 which is one of the huge projects of “New Kuwait Vision” was chosen to apply this project. The terminal is expected to be completed in 2023 and only 36% of the project has been completed yet, thus it needs an improved layout for their construction site. The study proposes a modified SLP (Systematic Layout Planning) approach for generating layout alternatives by considering both material flow data and safety risk factors. The alternatives were generated using MCRAFT algorithm based on closeness ratings obtained from material flows between areas of the construction site. The risk factor related to each site area is determined using (FMEA). The layout alternatives are then simulated to determine the material handling utilization using (TECNOMATIX) software. In the evaluation step of the SLP approach, a multi-objective point rating method is used to consider, risk priority number, material handling cost, safety risk factor and utilization criteria with different weights. All alternatives are evaluated based on the values obtained for each criterion and the highest lowest index is suggested for implementation.

Keywords

Systematic Layout Planning (SLP), Risk Priority Number (RPN), Safety Risk Assessment Model, Risk Factor, Failure Mode and Effects Analysis (FMEA).

Biographies

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