

ANALYSIS OF THE INFLUENCE OF LEAN CONSTRUCTION AND LEED CERTIFICATION ON THE QUALITY OF CONSTRUCTION SITES

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1 BACKGROUND AND IDENTIFICATION OF PROBLEM /KNOWLEDGE GAP

- A construction site with a high-quality planning diminishes worker's travel time, promotes safety, improves the handling of materials and equipment. That, in turn, increases efficiency and reduces cost, especially for large constructions.
- The LEED Certification might have a big influence on the logistics in construction sites, especially in material handling and storage.
- LC can have a direct influence on material handling, on the quality of temporary facilities and on safety at the construction site.

2 RESEARCH AIM AND METHODOLOGY

- It is hypothesized that there is a direct relationship between LC and LEED Certification, and the quality of the construction site. So, this paper objective is to verify this relationship between LC and the LEED Certification, and the quality of construction sites.
- An analysis was made using the same criteria for 40 different construction sites from 19 different companies in the Metropolitan Region of Fortaleza (MRF), Brazil.
- It is used a check list to obtain the overall grade for each site and grades for each category: Temporary Facilities, Safety at Construction Sites, and Material Handling and Storage. These categories are divided into items, and these into elements, totalizing 128 elements in the complete checklist. These grades vary from 0 to 10.
- A comparative analysis was made regarding the performance of these sites related to the LEED certification and to the presence of LC. The division was made into 3 levels: level 1 sites, the ones whose their companies have LEED certification and LC (8 analyzed sites); Level 2 sites, the ones with LC only (10 analyzed sites); and sites with none of the two elements being considered (22 analyzed sites).

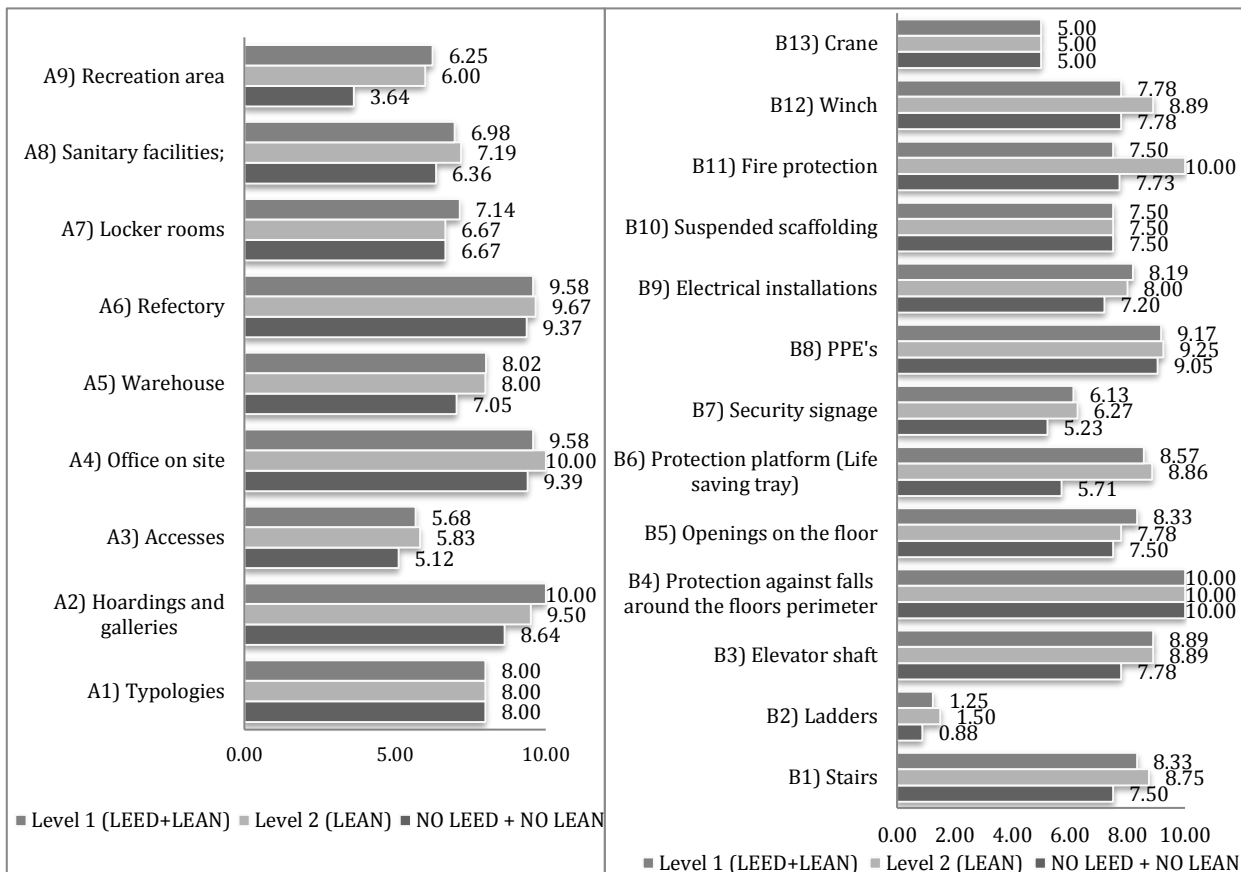
3 RESEARCH FINDINGS

- Levels 1 and 2 constructions show better results in Temporary Facilities and Safety at Construction Sites. In some items, level 2 constructions presented higher grades than level 1 constructions.
- Unlike this, all grades for material handling and storage were superior for level 1 sites.

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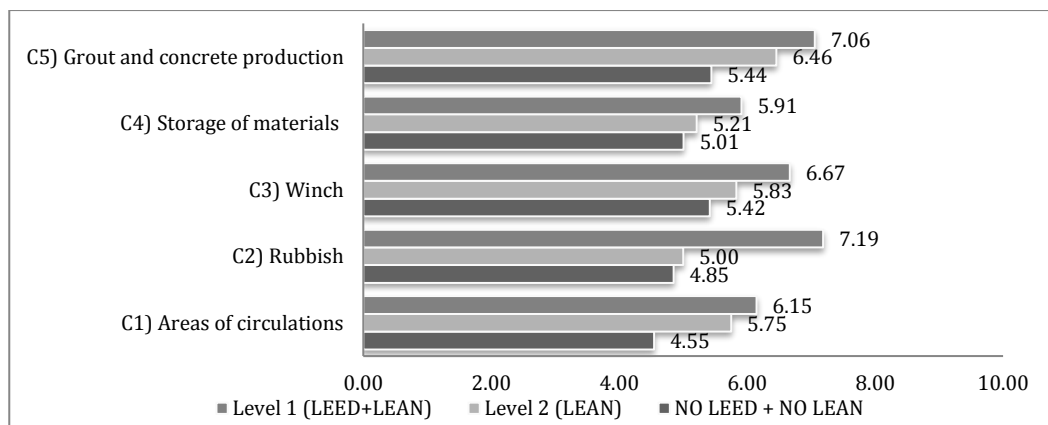
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Graph 1: Results to temporary facilities

Graph 2: Results to Safety at Sites



Graph 3: Results related to Material Handling and Storage

- LC has a direct influence on Temporary Facilities, to better serve the production, adding value to the process and the client; on Safety, avoiding extra costs caused by workplace accidents, resulting in a safer and more efficient, in addition to affecting directly the clients' satisfaction; and Material Handling and Storage, since it generates a reduction in waste and costs and an increase in productivity.
- As a consequence of the LEED certification being more focused on the environment and sustainability, it does not influence, in a significant way, on Safety and Temporary Facilities for not addressing it, and has a more influence on material handling and storage.
- Suggestions: adding some elements to the checklist; the options of filling the checklist with fractioned grades from 0 to 1, instead of with “yes”, “no” and “not applicable”, makes the evaluation fairer; a more representative study, with more than 40 construction sites in different states or countries.

