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Benefits of Pre-Construction Analysis: CET Senior Capstone Expands Understanding of an Urban Refuge at GallopNYC Sunrise Stables

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Abstract

For any construction project, there exists a phase of planning known as “pre-construction.” This initial phase of the project provides a definition of the project, identification of potential issues, planning and scheduling, scope, cost estimation, and analysis of needs for the job. My research analyzes a pre-construction case study conducted for Gallop NYC’s Stable in Howard Beach, Queens. The findings suggest that the practice of construction planning is effective in order to avoid delays in construction itself and ensure successful project completion. Supporting literature examines some of the best practices for pre-construction analysis. These include but are not limited to: timing and extent of the survey, identification of vulnerable areas that fall within close proximity of the adjacent structure, and substantial field notes that document the existing conditions prior to the start of demolition, excavation, and construction. This paper contributes to research on pre-construction analysis effectiveness through consideration of City Tech’s CET Capstone project developed with GallopNYC at Sunrise Stables in Queens, NY. Over a course of fifteen weeks, students were able to create a design concept, budget, and schedule based on site visits and interviews conducted with clients. With this data, they put together schematic design documents and linked design work to conceptual budgeting and scheduling. My methodology consisted of conducting a review of literature on pre-construction analysis effectiveness and analyzing the case study for common patterns.

Methodology

- 1 Reviewed literature to identify key themes and best practices in pre-construction site analysis.
- 2 Reviewed pre-construction analysis documents for GallopNYC case study to identify areas of concern.
- 3 Compared case study findings against key themes from literature.

Introduction

Supporting research states that poor design and negligence of the owner, change orders, weather condition, site condition, late delivery, economic conditions, and increase in quantities are the main causes, of delay in a construction project. Laufer expresses that controlling costs within budget is widely used in decision making and is an essential part of successful management. Dolhon also emphasizes issues in the construction process that may result due to a lack of knowledge of the common types of damage that may occur due to adjacent construction and the various construction activities that may cause the damage. The case study consisted of the expansion of GallopNYC Sunrise Stables Howard Beach facility as studied by CMCE 4800 Senior Capstone students.

Results

Students worked with the client, site, and project documents. Pre-construction analysis by different teams consistently identified several areas of concern. My key findings from the case study documents were as follows:

- 1 Site layout is an essential factor to pre-construction analysis.
- 2 Determining cost estimates for materials and building service systems to be used prior to construction assists in lowering risk and minimizing alterations.
- 3 A structure should be designed with the goal of achieving factors such as accessibility, sustainability, and comfort.
- 4 Site water management design is necessary to protect structures from water damage, minimize storm water pooling and flooding, and prevent safety/health hazards.

Literature Themes That Appeared in Case Study Reports



Figure 1: Pre-construction analysis themes that were mentioned in relevant literature and the number of times each appeared in any of the 4 case study reports.

Emphasis on Pre-Construction Concerns In Case Study

Figure 2: Common pre-construction ideas that were emphasized in the case study reports.



Discussion

It is crucial to preform pre-construction analysis for any site before construction of the project begins. Doing so can assist in further managing site water, identifying existing conditions, maintaining flow of operations and ensuring efficient road work. Without pre-construction analysis, a project is less likely to go smoothly and as planned. Incorporating these tasks are the preliminary steps before proceeding into other phases of the project.

Conclusion

Pre-construction planning helps in streamlining tasks, which results in smooth and successful project execution. It also helps identify the associated risks and issues, beforehand. The pre-construction phase addresses a wide range of concerns such as permit requirements, site evaluation, selection and requirements of building material, equipment analysis and selection, and scheduling obstacles. Pre-construction analysis allows for identification of the scope, scheduling and planning in the project that will help draw a clear picture for everyone to see and follow and is necessary to recognize risks and/or obstacles before project initiation. This preconstruction analysis can help GallopNYC and other clients uncover and address these typical site conditions and problems in order to allow future projects to flow more smoothly and further improve their budget.

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