

## **A Method to Identify the Critical Delay Factors for Building Maintenance Projects of Institutional Buildings: Case Study of Eastern India**

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**Abstract :** In general building repair and renovation projects are minor in nature. It requires less attention as the primary cost involvement is relatively small. Although the building repair and maintenance projects look simple, it involves much complexity during execution. Many of the present research indicate that few uncertain situations are usually linked with maintenance projects. Those may not be read properly in the planning stage of the projects, and finally, lead to time overrun. Building repair and maintenance become essential and periodical after commissioning of the building. In Institutional buildings, the regular maintenance projects also include addition -alteration, modification activities. Increase in the student admission, new departments, and sections, new laboratories and workshops, up gradation of existing laboratories are very common in the institutional buildings in the developing nations like India. The project becomes very critical because it undergoes space problem, architectural design issues, structural modification, etc. One of the prime factors in the institutional building maintenance and modification project is the time constraint. Mostly it required being executed a specific non-work time period. The present research considered only the institutional buildings of the Eastern part of India to analyse the repair and maintenance project delay. A general survey was conducted among the technical institutes to find the causes and corresponding nature of construction delay factors. Five technical institutes are considered in the present study with repair, renovation, modification and extension type of projects. Construction delay factors are categorically subdivided into four groups namely, material, manpower (works), Contract and Site. The survey data are collected for the nature of delay responsible for a specific project and the absolute amount of delay through proposed and actual duration of work. In the first stage of the paper, a relative importance index (RII) is proposed for the delay factors. The occurrence of the delay factors is also judged by its frequency-severity nature. Finally, the delay factors are then rated and linked with the type of work. In the second stage, a regression analysis is executed to establish an empirical relationship between the actual time of a project and the percentage of delay. It also indicates the impact of the factors for delay responsibility. Ultimately, the present paper makes an effort to identify the critical delay factors for the repair and renovation type project in the Eastern Indian Institutional building.

**Keywords :** delay factor, institutional building, maintenance, relative importance index, regression analysis, repair

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