

## Providing a Mathematical Relationship for Estimating Maintenance Costs of Schools

Amir Lamei Javan\*, Maryam Parvaresh\*

1. The M.Sc. of Civil Engineering, Organization for Development, Renovation and Equipping Schools of Iran, Ardebil, [amirlamei@yahoo.com](mailto:amirlamei@yahoo.com)
2. The M.Sc. of Civil Engineering, University of Mohaghegh Ardabili, Iran, Ardebil, [Maryam\\_parvaresh@yahoo.com](mailto:Maryam_parvaresh@yahoo.com)

### Abstract

Educational buildings must be maintained from operation date to the end of their service life to provide safe and efficient services. This issue is one of the main concerns for managers of education. Estimating maintenance costs of schools is an essential need for planning and prioritizing works. Regarding dispersal and frequency of schools, providing a mathematical relationship in which maintenance cost is related to the service life, geographic location and built-up area of the building will facilitate the issue resulting in lower costs and improved satisfaction of user. Considering the number of schools and significance of buildings' quality for the quality improvement of education as well as the direct impact of environment on students, importance of financial resources management and having an economic and prioritized plan for the maintenance of educational buildings have been highlighted. In this study, using field surveys and referring available statistics as well as regarding parameters such as structure of the school and its strength, heating system, distance from the center of province, number of stories and built-up area, construction quality, operating conditions and time intervals of past repairs, a simplified mathematical relation has been provided so that the user can easily plan to increase the efficiency of repairs. The method used to formulate this mathematical relation is based on the use of coefficients and information provided by Management and Planning Organization of Iran and the list price of disciplines related to educational buildings. Use of experiences related to the rehabilitation and maintenance of educational buildings and comparison of financial estimations and wages through actual inquiries have also been considered. Results of this mathematical relation shows that if continuous maintenance is done during the service life of the building in the appropriate return periods, the cumulative cost of maintenance of the educational buildings is easily reduced.

**Keywords:** Repair and Maintenance, Productivity, Mathematical Relationship, School