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Abstract

Several studies suggest green construction can result in significant economic savings by improving employee productivity, increasing benefits from improvements in health and safety, and providing savings from energy, maintenance, and operational costs. This article quantifies these benefits by establishing a set of measurable performance and building attribute variables, collecting longitudinal data, statistically analyzing the results, and performing sensitivity analyses for a precast concrete manufacturing facility located near Pittsburgh, Pennsylvania. Productivity, absenteeism, energy, and financial data are presented and an engineering economic analysis is reported. Results

show that in the new facility manufacturing productivity increased by about 25%; statistically significant absenteeism results varied; and energy usage decreased by about 30% on a square foot basis. Considering all aspects, the economic analysis showed that the company made the correct decision to build a new green facility.

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Notes

[1]New and old facility based on square foot comparison. There is one utility meter for both office and plant.

[1]Total absences do not include excused with doctor's excuse or workers' compensation.

[1]The ratio used to extrapolate data was changed to 25% building related and 75% production related.

[2]The ratio used to extrapolate data was changed to 75% building related and 25% production related.

[3]The productivity was changed to 270 pounds/hour for the new facility; and to 180 pounds/hour for the old facility.

[4]The production of both facilities were modeled at 70% of capacity.

[1]Center for Building Performance and Diagnostics, Carnegie Mellon University, Workplace Satisfaction Survey

[2]Center for Built Environment at Berkeley, Occupant Indoor Environmental Quality Survey

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