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An American National Standard

Standard Practice for Measuring Life-Cycle Costs of Buildings and Building Systems[1]

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INTRODUCTION

Several methods of economic evaluation are available to measure the economic performance of a building or building system over a specified time period. These methods include, but are not limited to, life-cycle cost (LCC) analysis, the benefit-to-cost ratio, internal rate of return, net benefits, payback, multiattribute decision analysis, risk analysis, and related measures (see Practices E 964, E 1057, E 1074, E 1121, E 1765, and E 1946). These methods differ in their measure and, to some extent, in their applicability to particular types of problems. Guide E 1185 directs you to the appropriate method for a particular economic problem. One of these methods, life-cycle cost (LCC) analysis, is the subject of this practice. The LCC method sums, in either present-value or annual-value terms, all relevant costs associated with a building or building system over a specified time period. Alternative (mutually exclusive) designs or systems for a given functional requirement can be compared on the basis of their LCCs to determine which is the least-cost means of satisfying that requirement over a specified study period.

1. Scope

1.1 This practice establishes a procedure for evaluating the life-cycle cost (LCC) of a building or building system and comparing the LCCs of alternative building designs or systems that satisfy the same functional requirements.

1.2 The LCC method measures, in present-value or annual-value terms, the sum of all relevant costs associated with owning and operating a building or building system over a specified time period.

1.3 The basic premise of the LCC method is that to an investor or decision maker all costs arising from an investment decision are potentially important to that decision, including future as well as present costs. Applied to buildings or building systems, the LCC encompasses all relevant costs over a designated study period, including the costs of designing, purchasing/leasing, constructing/installing, operating, maintaining, repairing, replacing, and disposing of a particular building design or system.

2. Referenced Documents

2.1 *ASTM Standards:*

E 833 Terminology of Building Economics[2]

E 964 Practice for Measuring Benefit-to-Cost and Savings-to-Investment Ratios for Buildings and Building Systems[2]

E 1057 Practice for Measuring Internal Rate of Return and Adjusted Internal Rate of Return for Investments in Buildings and Building Systems[2]

E 1074 Practice for Measuring Net Benefits for Investments in Buildings and Building Systems[2]

E 1121 Practice for Measuring Payback for Investments in Buildings and Building Systems[2]

E 1185 Guide for Selecting Economic Methods for Evaluating Investments in Buildings and Building Systems[2]

E 1765 Practice for Applying the Analytical Hierarchy Process (AHP) to Multiattribute Decision Analysis of Investments Related to Buildings and Building Systems[3]

E 1946 Practice for Measuring Cost Risk of Building and Building Systems[3]

2.2 *ASTM Adjuncts:*

[1] This practice is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.81 on Building Economics.

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[2] *Annual Book of ASTM Standards*, Vol 04.11.

[3] *Annual Book of ASTM Standards*, Vol 04.12.

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