Designation: E 1121 – 02

An American National Standard

Standard Practice for Measuring Payback for Investments in Buildings and Building Systems[1]

This standard is issued under the fixed designation E 1121; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice provides a recommended procedure for calculating and applying the payback method in evaluating building designs and building systems.

2. Referenced Documents

2.1 *ASTM Standards:*

E 833 Terminology of Building Economics[2]

E 917 Practice for Measuring Life-Cycle Costs of Buildings and Building Systems[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 1185 Guide for Selecting Economic Methods for Evaluating Investments in Buildings and Building Systems[2]

2.2 *ASTM Adjuncts:*

Discount Factor Tables, Adjunct to Practice E 917[3]

3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to Terminology E 833.

4. Summary of Practice

4.1 This practice is organized as follows:

4.1.1 *Section* 2, *Referenced Documents*—Lists ASTM standards and adjuncts referenced in this practice.

4.1.2 *Section* 3, *Definitions*—Addresses definitions of terms used in this practice.

4.1.3 *Section* 4, *Summary of Practice*—Outlines the contents of the practice.

4.1.4 *Section* 5, *Significance and Use*—Explains the significance and use of this practice.

4.1.5 *Section* 6, *Procedures*—Describes step-by-step the procedures for making economic evaluations of buildings.

4.1.6 *Section* 7, *Objectives, Alternatives, and Constraints*—Identifies and gives examples of objectives, alternatives, and constraints for a payback evaluation.

4.1.7 *Section* 8, *Data and Assumptions*—Identifies data needed and assumptions that may be required in a payback evaluation.

4.1.8 *Section* 9, *Compute Payback Period*—Presents alternative approaches for finding the payback period.

4.1.9 *Section* 10, *Applications*—Explains the circumstances for which the payback method is appropriate.

4.1.10 *Section* 11, *Limitations*—Discusses the limitations of the payback method.

5. Significance and Use

5.1 The payback method is part of a family of economic evaluation methods that provide measures of economic performance of an investment. Included in this family of evaluation methods are life-cycle costing, benefit-to-cost and savings-to-investment ratios, net benefits, and internal rates of return.

5.2 The payback method accounts for all monetary values associated with an investment up to the time at which cumulative net benefits, discounted to present value, just pay off initial investment costs.

5.3 Use the method to find if a project recovers its investment cost and other accrued costs within its service life or within a specified maximum acceptable payback period (MAPP) less than its service life. It is important to note that the decision to use the payback method should be made with care. (See Section 11 on Limitations.)

6. Procedures

6.1 The recommended steps for making an economic evaluation of buildings or building components are summarized as follows:

6.1.1 Identify objectives, alternatives, and constraints,

6.1.2 Select an economic evaluation method,

6.1.3 Compile data and establish assumptions,

6.1.4 Convert cash flows to a common time basis, and

[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.

Current edition approved Oct. 10, 2002. Published November 2002. Originally published as E 1121 – 86. Last previous edition E 1121 – 98.

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

[3] Available from ASTM Headquarters. Order ADJE091703.

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States.