



Designation: E1804 – 07

Standard Practice for Performing and Reporting Cost Analysis During the Design Phase of a Project¹

This standard is issued under the fixed designation E1804; 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 covers an arranged method for providing cost analysis during the design phase of buildings.

1.2 The use of this practice increases the level of communication between the design professional, owner, and the cost professional providing the cost consulting services.

1.3 The practice establishes a structured method to support design decisions.

1.4 The practice provides design and cost professionals with a framework for historically tabulating information to be used on relevant future projects.

2. Referenced Documents

2.1 *ASTM Standards*:²

E631 Terminology of Building Constructions

E833 Terminology of Building Economics

E1369 Guide for Selecting Techniques for Treating Uncertainty and Risk in the Economic Evaluation of Buildings and Building Systems

E1557 Classification for Building Elements and Related Sitework—UNIFORMAT II

3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to Terminologies **E631** and **E833**.

4. Summary of Practice

4.1 This practice provides an organized approach for cost analysis during the design phase of a building project. The practice presents the necessary information for the design professional and owners to make decisions.

4.2 This practice establishes a recommended procedure for formatting the final project information for its use in forecasting the cost of future projects.

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 April 1, 2007. Published April 2007. Originally approved in 1996. Last previous edition approved in 2002 as E1804 – 02. DOI: 10.1520/E1804-07.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

5. Significance and Use

5.1 This practice increases the level of communication, provides an organized approach to cost control during the design of a project, and also provides a means of identifying extraordinary cost items and changes in assumptions between estimates.

5.2 The users of this practice include owners, developers, contractors, cost professionals, estimators, architects, engineers, specification writers, quantity surveyors, and anyone charged with the responsibility of successfully managing the design of a building within a specified budget.

5.3 Use this reporting format during the following:

5.3.1 Contracting for design cost analysis services,

5.3.2 Comparing the current design costs to a previous estimate, and

5.3.3 Responding to each design phase.

5.4 This practice provides a tool for analyzing design options and examining strategies to maintain the building budget.

6. Types of Estimates and Level of Detail

6.1 *Purpose of Estimate*:

6.1.1 The cost analysis procedure consists of providing information in text and estimate form at the completion of each significant phase of the design process: program, schematic, design development, and construction documents. Apply this format for each component when the construction project is comprised of several definable building types.

6.1.2 Comparisons of Uniformat II estimates to a contractor's proposal will require the estimate to be resummarized to MasterFormat.³

6.2 *Program Phase Estimate*:

6.2.1 The program/predesign estimate includes construction costs, construction impact fees, and construction related expenditures. It is prepared from the early stage of the design process to assemble project data in a systematic format from established project criteria. The resulting report provides the baseline criteria and costs for the design team.

6.2.2 The program predesign estimate is prepared in an elemental form using Uniformat II (Classification **E1557**).

³ Available from Construction Specifications Institute, 99 Canal Center Plaza, Suite 300, Alexandria VA 22314.

Elemental analysis allows the estimate to be prepared using basic elements, costs per square foot (meter) of gross floor area, ratios, and, where necessary, lump sum allowances. Calculate the design allowance using risk evaluation techniques as described in 7.7 of Guide **E1369**.

6.3 Schematic Design Phase Estimate:

6.3.1 The schematic design estimate provides for the first cost analysis based on project specific design criteria. Prepare the estimate in Uniformat II, Level 3 (Classification **E1557**) based on preliminary floor plans, preliminary specification outlines, general finish schedule information, and typical structural, mechanical, and electrical information. Use building parameters in establishing the project base line costs. When specific criteria are not yet established, use target costs (allowances). Target costs provide design team guidance during the continuation of the design. Calculate the design allowance using risk evaluation techniques in 7.7 of Guide **E1369**.

6.3.2 Compare the schematic design estimate to the program estimate. The comparison provides information to the design professional on the changes since the last estimate.

6.4 Design Development Phase Estimate:

6.4.1 Preparation of the design development estimate includes the quantifying of key building elements. Quantities of materials are calculated and multiplied by material and labor unit prices to develop the total cost for each element. Use this method to arrive at a total cost for each element. Quantify and price key building systems to replace the building parameters used in the previous estimate. Calculate the design allowance using risk evaluation techniques in 7.7 of Guide **E1369**.

6.4.2 Summarize the design development estimate in MasterFormat. Restructure the design development estimate in Uniformat II (Classification **E1557**) when comparing with the schematic design estimate. The reformatted design development estimate will provide the basics for the translation between the schematic and design development estimates.

6.5 Construction Document Phase Estimate:

6.5.1 The construction document's estimate is the final estimate of a project's construction costs based on detailed project information. Prepare quantity information in MasterFormat. Subdivide pricing into material, labor, and equipment costs.

6.5.2 Use MasterFormat to compare the final construction document's estimate to the design development estimate. Calculate the design allowance using risk evaluation techniques in 7.7 of Guide **E1369**.

6.5.3 Reformat the construction document's estimate to Uniformat II, Level 2 (Classification **E1557**) to provide historical data for future building costs.

6.6 Reconciliation of Estimate with General Contractor:

6.6.1 *Reconciliation*—Comparison of independent estimates for the project. Summarize estimates using MasterFormat to facilitate comparison with the general contractor's format.

6.6.2 Reconciliation of estimates can be required at any design phase.

7. Report Format

7.1 Use this standard format for every cost report and expand as necessary to respond to project requirements.

7.1.1 Title Page—Report the following information:

- 7.1.1.1 Name of the project,
- 7.1.1.2 Location of the project,
- 7.1.1.3 Type of estimate,
- 7.1.1.4 Date of the estimate report,
- 7.1.1.5 Design team name and address,
- 7.1.1.6 Cost consulting firm's name and address, and
- 7.1.1.7 Owner name and address (unless confidential).

7.1.2 *Table of Contents*—Include the name of each section and page number.

7.1.3 *Task Outline*—Briefly describe the cost assignment undertaken by the firm.

7.1.4 *Project Description*—Briefly describe the project location, site area, site development, building size and function, exterior materials, interior finishes, and special functions of the facility.

7.1.5 *Notes Concerning the Estimate*—Include observations, assumptions, and information obtained from the design professionals, site observations, and research conducted for this project. Include opinions and project documentation obtained from sources other than the current construction documents. The following outline is a basis for organizing the notes section.

7.1.5.1 General notes include discussion of general conditions of the project, profit/fee projections, and general comments about the proposed construction project or local economy where applicable.

7.1.5.2 Site work notes include discussion of site related items and concerns.

7.1.5.3 Building notes are organized per the Uniformat II structure (Classification **E1557**) or MasterFormat specification divisions.

7.1.5.4 Provide analysis for degree of risk used to establish the design allowance, construction contingency (Guide **E1369**), and escalation values.

7.1.6 *Summaries* are presented from the most global to the specific. Reduce costs to a commonly understood element for the overall report (for example, cost/sf, cost/key, cost/acre, cost/bed). Include the following:

- 7.1.6.1 Overall summary,
- 7.1.6.2 Site development summary,
- 7.1.6.3 Building work summary,
- 7.1.6.4 Special structures summary (when appropriate), and
- 7.1.6.5 Uniformat II summary (contract document estimate only).

7.1.7 *Cost Comparison Summaries* shall include information and opinions on how the project has changed from the previous cost estimate. When the report is the first estimate, the program design shall be used as the initial benchmark for comparison.

7.1.7.1 Costs are compared in Uniformat II for program, schematic design, and design development estimates. The construction documents estimate is compared to the design development estimate using major specification divisions. Format the cost comparison summary report as follows: