



## **Standard Practice for Rating the Serviceability of a Building or Building-Related Facility<sup>1, 2</sup>**

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### **INTRODUCTION**

This is a definitive procedure for rating the serviceability of a specific building or building-related facility, that is, its capability to perform to any one of a range of levels of serviceability. This procedure takes into account factors such as location, mechanical systems, age, and building shape. It can also be used to compare how well different buildings or building-related facilities can meet any given set of occupant requirements, despite differences in any or all of those factors. Many parts of the procedure can also be used to rate the serviceability of a proposed building, that has been designed but not yet built, remodelled, or rehabilitated.

For each generic type or category of building or building-related facility, many topics of serviceability are rated. For each topic a rating scale is obtained, or prepared. A rating scale contains descriptions of combinations of features, such as materials and design, which may be found in a building or building-related facility. Each combination of features described in the scale is indicative of a certain level of serviceability on that topic, within a predetermined range.

For each topic, the combination of features found in the building, building-related facility, or design are compared with those described in the appropriate rating scale. The combination of features that most closely matches what is physically present in the building, building-related facility, or design, indicates the serviceability level for that topic.

In comparing ratings prepared for one building with ratings for another building, it is essential that the same set of rating scales be used for both buildings. Organizations may use a generic, standardized set of scales. An organization may also adapt the scales for specialized, internal application, or create its own, in which case, it forgoes the possibility of external comparison.

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### **1. Scope**

1.1 This practice covers a definitive procedure for rating the serviceability of a building or building-related facility, that is, for ascertaining its capability to perform the functions for which it is designed, used, or required to be used. A separate scale is used for each topic of serviceability. For each topic, a serviceability level is ascertained. Overall serviceability is

expressed as a profile of levels (that is, not as a single number), and may be presented as a bar chart.

1.2 This practice is not intended to be used for regulatory purposes.

1.3 This practice can be used to rate the serviceability of a building or building-related facility that has been planned but not yet built, or which is about to be remodelled or rehabilitated, for example, for which single-line drawings and outline specifications have been prepared.

1.4 This practice specifies how to ascertain serviceability levels for a specific building, but not what would cause a building to be rated at a given level. That information is found in standard classifications for specific topics of serviceability that contain a set of requirement and rating scales. This practice and one or more such standard classifications are mutually dependent. Each requires the other. The format of such

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standard classifications, and of related information, is described in [Appendix X1](#). An example of the scales written for such classifications is given in [Appendix X3](#).

1.5 This practice does not cover building evaluation, building condition reports, nor diagnosis of performance; nor does it cover instruments, tools or quality of measurements for evaluation, condition reports, or diagnosis of performance.

1.6 This practice applies only to facilities that are building constructions, parts thereof, or building-related. While this practice may be useful in rating the serviceability of facilities that are not building constructions, such facilities are outside the scope of this practice.

1.7 The process for creating or adapting a set of classifications for a specific facility type or category is outside the scope of this practice.

1.8 This practice contains the following information:

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## 2. Referenced Documents

### 2.1 *ASTM Standards*:<sup>3</sup>

[E631 Terminology of Building Constructions](#)

[E1480 Terminology of Facility Management \(Building-Related\)](#)

### 2.2 *ISO Document*:

ISO 6240 International Standard, Performance Standards in Building—Contents and Presentation<sup>4</sup>

## 3. Terminology

3.1 *Definitions*—For standard definitions of additional terms applicable to this practice, see Terminologies [E631](#) and [E1480](#).

3.1.1 *aspect, n—of serviceability*, a broad component of serviceability, comprising several related topics of serviceability.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>4</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

3.1.1.1 *Discussion*—The serviceability of a building or building-related facility can be rated on each topic for which a scale has been prepared, but not for an aspect.

3.1.2 *building, n*—a shelter comprising a partially or totally enclosed space, erected by means of a planned process of forming and combining materials. Compare facility ([E631](#))

3.1.3 *facility, n*—a physical setting used to serve a specific purpose. Compare building ([E631](#))

3.1.3.1 *Discussion*—A facility may be within a building, or a whole building, or a building with its site and surrounding environment; or it may be a construction that is not a building. The term encompasses both the physical object and its use.

3.1.4 *facility performance*—the behavior in service of a facility for a specified use. ([E631](#))

3.1.4.1 *Discussion*—The scope of this performance is of the facility as a system, including its subsystems, components, and materials and their interactions, such as acoustical, hydrothermal, air purity, and economic; and of the relative importance of each performance requirement.

3.1.5 *facility serviceability*—capability of a facility to perform the function(s) for which it is designed, used, or required to be used. ([E631](#))

3.1.6 *facility serviceability profile, n*—a graphic representation, usually as a bar chart, of the level of serviceability for each topic of serviceability.

3.1.7 *feature, n—of a facility*, a physical element of a building, building component, building subsystem, unit of design, arrangement, form or color, which helps or hinders the satisfaction of a requirement for serviceability.

3.1.7.1 *Discussion*—A feature may be a physical feature or design feature, or both. For example, a particular sound absorbency in a ceiling may be adequate in a carpeted space but may be inadequate in a space with a hard floor covering.

3.1.8 *combination of features, n—of a facility*, two or more features which, when present together in a facility, affect a level of serviceability of that facility.

3.1.9 *functionality, adj—of a building*, being suitable for a particular use or function. ([E1480](#))

3.1.10 *knowledgeable person, n*—an individual who has technical knowledge about the building or facility, for example, about occupant requirements, building design, mechanical systems, operation, and maintenance.

3.1.10.1 *Discussion*—In larger facilities, the senior person who is at a facility full time to manage its operation may be best qualified to participate, as knowledgeable person, in the process of rating that facility.

3.1.11 *level, n—of serviceability*, a number indicating the relative serviceability of a building for one topic on a predetermined range, for example, a range from 1 to 9.

3.1.12 *occupant, n—of a facility*, a group, department, agency or corporation, or other organization, or a part thereof, or an individual or individuals thereof, that is or will be occupying space in a particular facility.

3.1.12.1 *Discussion*—Persons who are authorized to be present only temporarily, or in special circumstances as those permitted to pass through during an emergency, are visitors.

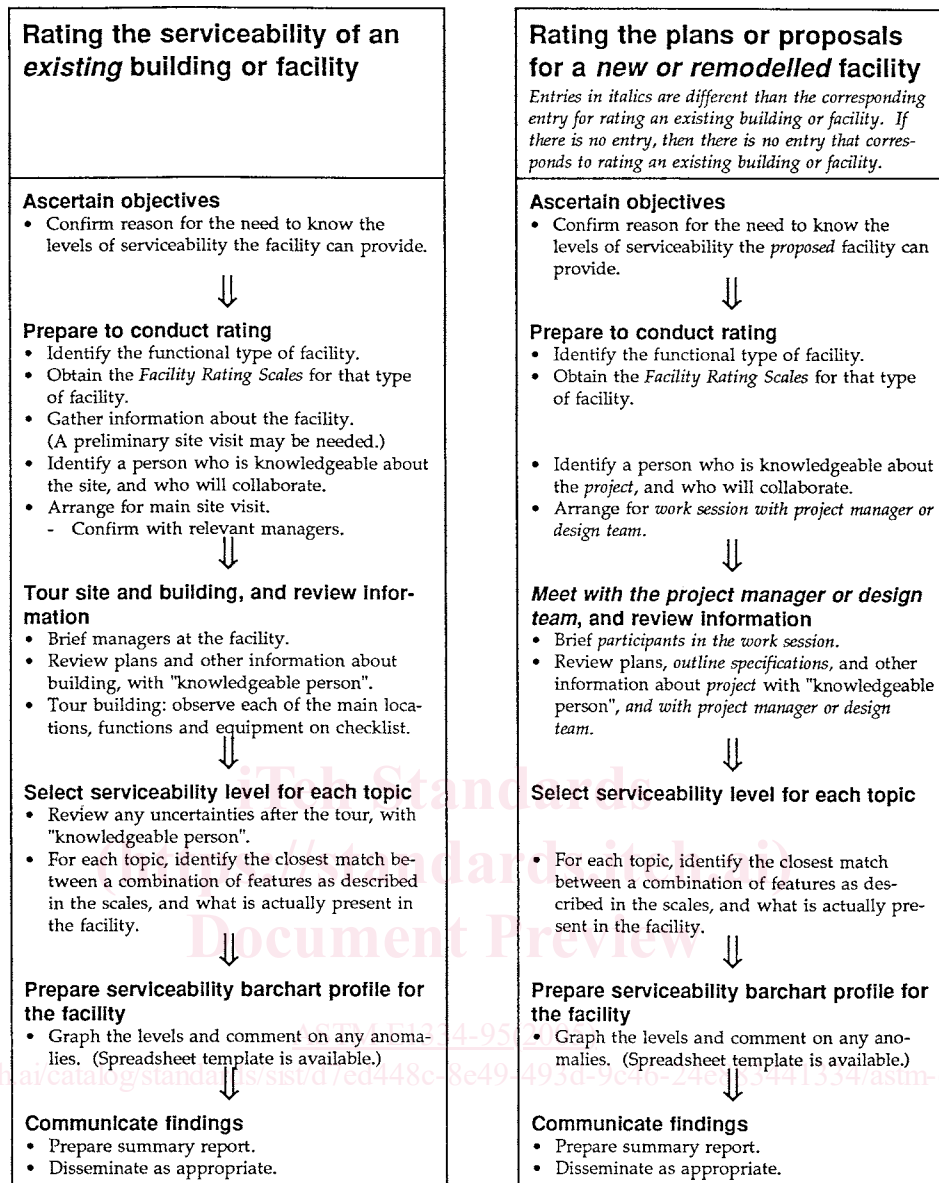


FIG. 1 Summary Diagram of Procedure for Rating the Serviceability of a Building or Building-Related Facility

3.1.13 *office, n*—a place, such as an open workspace, room, suite, or building, in which business, clerical, or professional activities are conducted.

3.1.14 *rater, n*—a person having primary responsibility for organizing and conducting the rating process for a building or building-related facility.

3.1.15 *rating process, n*—the process of determining the serviceability of a facility for a specified purpose. (E1480)

3.1.16 *rating scale, n*—for a topic of facility serviceability, a set of descriptions of combinations of features, in which each combination has been selected to indicate a specific level of serviceability on a scale from the lowest to the highest level likely to be encountered. (E1480)

3.1.17 *serviceability*—see *facility serviceability*.

3.1.18 *topic, n*—of *serviceability*, a part of the serviceability of a facility, for which a paired set of requirement and rating scales can be prepared.

3.1.18.1 *Discussion*—At any level of serviceability, a topic can be expressed in two ways: (1) a statement of requirement in the normal language of occupants or owners, and (2) a statement in technical performance language describing the combination of features which meet that requirement. Each statement is a translation of the other. Several related topics, taken together, typically comprise one aspect of serviceability.

3.2 *Description Of Term Specific to This Standard:*

3.2.1 In this practice, unless otherwise indicated, the term building is used to encompass, building, building-related facility, and proposed design for a building. The term facility is

used to mean building-related facility. Use of the singular in this practice does not exclude the plural (and vice versa) when the sense allows.

#### 4. Summary of Practice

4.1 This practice is summarized in **Fig. 1**, which provides a flow chart for rating the serviceability of a building for a specific purpose.

4.2 For rating its own buildings, an organization may choose among these options:

4.2.1 The organization may use an existing ASTM standard set of classifications for the type(s) of facility used by the organization.

4.2.2 It may prepare a set of classifications containing requirement and rating scales, and rules for adjustment, all consistent with its own internal standards for facilities.

**NOTE 1**—Serviceability ratings prepared with such internal standards would not be directly comparable to ratings prepared using an ASTM standard set of classifications.

4.2.3 It may support the development of a new set of standard classifications through the ASTM voluntary consensus process. The recommended format of such classifications is described in **Appendix X1**.

#### 5. Significance and Use

5.1 This practice provides a means of rating the serviceability levels of any building.

5.2 This practice provides a method for comparing how well different buildings meet a particular set of requirements for serviceability, despite differences such as location, structure, mechanical systems, age, and building shape.

5.3 This practice is not affected by the complexity of the requirements for serviceability.

5.4 This practice provides a framework within which design professionals and managers can select the most cost-effective means to achieve a target level of serviceability.

5.5 This practice can be used by any individual with sufficient knowledge of buildings to identify the features that are present.

5.6 This practice can be applied to many functional types of buildings, provided that an appropriate set of classifications, including rating scales, has been established for each type (see **Appendix X1**).

5.7 This practice can be used to determine (1) the serviceability (present capability) of an existing building for uses other than its present use; (2) the serviceability (potential capability) of a building that has been planned but not yet built; and (3) the serviceability (potential capability) of a building for which a remodeling or rehabilitation has been planned.

5.8 This practice can be used to determine how well a building is capable of meeting some social objective and requirement, such as the impact of its location on the transportation needs of its present or future occupants, the need for water and energy conservation, the impact of the building systems, and materials on green building issues.

5.9 Use of this practice will help the user understand how various subsystems and materials used in a building interact to provide an overall level of serviceability, and how various

combination of features interact to determine the overall serviceability of the building.

##### 5.10 *Examples of Potential Applications:*

5.10.1 *Project Feasibility*, For example, when the owner of an older building considers remodelling it into apartments, or needs to rehabilitate it to bring it up to current market demand.

5.10.2 *Select Option Before Leasing*, For example, a corporate real estate and facility manager compares ratings of several office facilities before selecting which to lease.

5.10.3 *Compare Serviceability of Design Options*, For example, an architect rates various designs to select the most effective way of achieving design objectives within a fixed construction budget.

5.10.4 *Marketing*, For example, an owner rates a building for several potential uses to identify target markets that would find the building most serviceable in its present condition, or when remodelled for another use.

5.10.5 *Suitability of Existing or Proposed Use*, For example, a potential buyer assesses the suitability of a facility for multi-tenant office use.

5.10.6 *Cost Reduction*, For example, the owner rates various design options to select the most cost-effective means for achieving a target serviceability profile.

5.10.7 *Financial Analysis*, For example, the owner or potential buyer assesses likely benefits of a proposed remodel and conversion from a warehouse to a highly technical manufacturing building.

5.10.8 *Energy and Water Conservation*, The owner or potential buyer compares the likely relative levels of energy or water consumption of a facility, or the likely cost-effectiveness of options to reduce energy and water consumption, or improve indoor air quality.

5.11 This practice is not intended for, and is not suitable for, use for regulatory purposes nor for fire hazard assessment nor for fire risk assessment.

#### 6. Procedure

6.1 This practice covers a process for setting the serviceability profile for a building. The steps to be followed are summarized in **Fig. 1**.

6.2 *Start the Process of Rating the Serviceability of an Existing Building*—The rating process is initiated when someone in authority requires a building rating. Rating the serviceability of a building is usually done by a single individual, the rater, who should have experience or training in the rating process, or at most by a team of two. The rater(s) will have primary responsibility for organizing the rating, going to the site, conducting the rating, deciding what levels of serviceability the building provides, and producing the serviceability rating as a bar chart profile. The person in authority will provide authorization and directives so the rater(s) will have the collaboration of a knowledgeable person, authorization to enter the building to be rated, and permission to enter occupant space as necessary.

6.2.1 *Ascertain the Objectives*—Confirm the reason for the need to know the levels of serviceability the building can provide. This is necessary to ensure that the correct set of

serviceability classifications will be used. Knowing the objectives will also enable the rater(s) to make best use of limited time at the site.

6.2.2 *Prepare to Conduct the Rating*—A total of about one person-day, spread over several days or weeks, is typically required for the rater to prepare for the rating and to make arrangements and appointments as needed.

6.2.2.1 Identify the correct functional type of building from the most common generic types such as those listed and described in [Appendix X6](#).

6.2.2.2 Obtain a set of serviceability classifications for that type of building. Verify that a set of classifications has been prepared for that facility type by the organization requesting the rating, or has been standardized by ASTM. If no set of classifications exist, then it is necessary to create a set of relevant classifications. For information, the format of a classification is included in [Appendix X1](#), and an example of a pair of serviceability scales for one topic is included in [Appendix X3](#).

6.2.2.3 Gather information about the building. Arrange for reference information to be available during the visit to the site. This information typically includes a description of the building; its occupants and their functions; diagrammatic or simplified floorplans of the building; building condition report; access to construction drawings and specifications, and to any drawings or specifications revised due to modifications, repairs, remodel, and so forth; information about floor load capacity, roof maintenance and repair history, energy use, and date last reviewed; total population in the building; building statistics including rentable and usable floor area; and any special target(s) for compliance applicable to this building.

6.2.2.4 Identify a knowledgeable person. The rater will need the collaboration of a knowledgeable person, someone with extensive knowledge of the building and its systems and who will participate in the rating. Ensure that the knowledgeable person has a copy of the rating scales and reviews them prior to the site visit.

6.2.2.5 Arrange for main site visit. The rater and knowledgeable person agree on the date and time of the main site visit and for making any necessary arrangements. This schedule is confirmed with relevant managers. If the building is occupied, the rater should, before starting the actual rating of the building, brief the relevant top manager(s) responsible at the site about the rating process and ensure that the rating process will not be disruptive to the activity of the occupants.

6.2.3 *Tour Site and Building, and Review Information:*

6.2.3.1 Before entering the building, the rater does a quick scan of the exterior of the building, site conditions, and nearby amenities.

6.2.3.2 The rater enters the building and briefs the relevant manager(s) and knowledgeable person.

6.2.3.3 The rater reviews plans and other information about the building with the knowledgeable person. The rater receives a briefing from the knowledgeable person. The rater reviews plans and other documents as appropriate.

6.2.3.4 Tour the building. The knowledgeable person guides the rater through the building, visiting each of the main

locations listed in the building checklist in [Appendix X2](#). Any uncertainties are reviewed after the tour, with the knowledgeable person.

6.2.4 *Select Serviceability Level for Each Topic*—Different sets of scales may have different ranges of levels. This practice uses a range from 1 to 9 as an example of how to go about selecting the appropriate level of serviceability. See [Appendix X3](#) for an actual example.

6.2.4.1 The rater, with the collaboration of the knowledgeable person, establishes the serviceability level for each topic. Typically this process will take up to 4 h. More time may be required depending on the experience of the rater, the complexity of the building, and availability of required information.

6.2.4.2 For each classification and group of scales, first read the introductory material to the group of scales printed on the first page or pages. Then turn to the first topic and read through the rating scale.

6.2.4.3 Read the text of the rating scale for Level 5. If each feature is a good description of what is physically present in the building, or of the building's capability then blacken the small circle at the beginning of each feature. If each feature has been selected within Level 5, then blacken the small square next to Number 5.

6.2.4.4 If the description of a feature or features that best match the building is at a level other than Level 5, blacken the small circles next to the features that apply. They may all be at the same level, in which case that level is the applicable level, or they may be a mix from different levels. If the features selected are all within one level, blacken the small square at that level, for example, 1, 3, 7, 9. If the features selected are a mix of levels, select and blacken an in-between level, for example, Level 2, 4, 6, or 8 by doing an arithmetic averaging.

6.2.4.5 If Level 5 is not the level of serviceability for the building, or if there is some special requirement or feature which makes a level particularly important, explain briefly in the "Notes" area at the bottom of that scale.

6.2.4.6 If it is hard to decide what level the building is capable of providing because some information is not available, or some assumptions have to be made, then briefly explain what information is missing or what assumptions were made by writing in the "Notes" area at the bottom of that scale.

6.2.5 *Prepare the Serviceability Bar Chart Profile for the Building*—To create a serviceability rating profile, the rater graphs the levels selected for each topic of serviceability onto a form by hand or electronically. This can be used to create a bar chart. Any anomalies that were found are recorded.

6.2.6 *Communicate Findings:*

6.2.6.1 Prepare a summary report. The rater prepares the report documents. The report normally includes the building rating scales for that type of building, the bar chart profile showing the level found for each topic of serviceability, with abbreviated notes, and a memorandum presenting the findings, including a summary of the key weaknesses and strengths of the building that have been uncovered in the rating process. Other elements may be included in the findings, such as

recommendations for further in-depth evaluation of the building on specific topics, or estimates for cost-to-cure, and so forth.

6.2.6.2 Disseminate as appropriate. The rater transmits a copy of the report documents that include the facility serviceability profile with comments as necessary, to an appropriate distribution. A copy normally will go into the asset management file, located at the site. A copy will normally also be given to the authority who requested the rating and to the person having portfolio or management responsibility for the asset.

6.3 *Rating the Plans or Proposals for a New Building or for a Remodel or Rehabilitation Project:*

6.3.1 Ascertain objectives. Confirm the reason for the need to know the levels of serviceability the building will provide. This is necessary so that the rater can ensure that the correct set of serviceability classifications will be used.

6.3.2 *Prepare to Conduct Rating:*

6.3.2.1 Identify the correct functional type of building from the most common generic types, such as those listed and described in **Appendix X6**.

6.3.2.2 Obtain a set of serviceability classifications for that type of building. See **6.2.2.2**.

6.3.2.3 Identify a person who is knowledgeable about the project and who will participate in the rating.

6.3.2.4 Provide the knowledgeable person with a copy of the rating scales and brief the person about the rating process.

6.3.2.5 Arrange for a work session with the knowledgeable person and the project manager. Arrange for information about the plans, outline specifications, and so forth, to be available during the work session.

6.3.3 *Work Session With the Project Manager and the Knowledgeable Person, and Review of the Information:*

6.3.3.1 Brief participants in the work session.

6.3.3.2 Review plans, outline specifications, and other information about the project with the knowledgeable person, and with the project manager.

6.3.4 *Select Serviceability Level for Each Topic:*

6.3.4.1 For each topic, identify the closest match between a combination of features as described in the scales, and what is found in the plans or proposals. (Section **6.2.4** describes how to pick a rating level for each topic).

6.3.5 *Prepare Serviceability Profile for the Building:*

6.3.5.1 See **6.2.5**

6.3.6 *Communicate Findings:*

6.3.6.1 Prepare a summary report. See **6.2.6.1**

6.3.6.2 Disseminate as appropriate. See **6.2.6.2**

## 7. Keywords

7.1 building; design (of building); facility; function; facility occupants; office; performance; rating; rating scale; remodel; rehabilitation; requirements; serviceability; use

## APPENDIXES

(Nonmandatory Information)

### X1. FORMAT OF A CLASSIFICATION FOR THE SERVICEABILITY OF A FACILITY TYPE OR CATEGORY

#### X1.1 Section Requirements

X1.1.1 Listed as follows are typical sections for a serviceability classification, in preferred sequence:

X1.1.1.1 *Title* (mandatory).

X1.1.1.2 *Designation* (mandatory).

X1.1.1.3 *Introduction*, including:

(1) Context for the classification and its role in the rating process.

(2) Relevant and related serviceability topics to consider.

(3) Reasons for selecting the topics, and related combinations of features, in this classification.

(4) Purpose(s) for which this classification is likely to be applicable.

(5) Identification of any required expertise for conducting the rating of serviceability of the building for specific purpose or use.

X1.1.1.4 *Scope* (mandatory).

X1.1.1.5 *Referenced Documents* (mandatory).

X1.1.1.6 *Terminology*.

X1.1.1.7 *Significance and Use* (mandatory).

X1.1.1.8 *Basis for Classification* (mandatory).

X1.1.1.9 *Serviceability Topics (mandatory)*—Provide a list of the topics that need to be included in order to obtain a valid match of ratings and requirements for the intended purpose.

X1.1.1.10 *Serviceability Scale(s) (mandatory)*—For each topic include a pair of matching scales. In one of the scales, requirements are stated in layman's language and described for each of several levels within a range from low to high. Each statement of requirement is matched by a statement of required serviceability at the same level in the rating scale, which describes in technical performance language the combinations of features which make the facility capable of delivering the required serviceability.

(1) *Requirement Scale(s)* (mandatory)—Include a requirement scale for each serviceability topic. Provide a statement of requirement appropriate for each level within the chosen range.

(2) *Rating Scale(s)* (mandatory)—Include a rating scale for each serviceability topic. Provide a statement of the combinations of features which best describe each level of each topic of serviceability. The rating scale for a topic of serviceability is a tool for assigning a rating level to the combinations of relevant features found in the building.

(3) *Examples*—For example, regarding an occupant requirement for appropriate visual conditions to perform a certain type of task, the matching rating scale would describe a series of typical features for providing illuminance, together with other features of a building that would affect illuminance. The description of the physical and design features for each