Designation: E 1700 – 95 (Reapproved 1999)

An American National Standard

Standard Classification for Serviceability of an Office Facility for Structure and Building Envelope[1,2]

This standard is issued under the fixed designation E 1700; 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 classification contains pairs of scales (see Figs. 1-6) for classifying an aspect of the serviceability of an office facility, that is, the capability of an office facility to meet certain possible requirements for structure and building envelope.

1.2 Within that aspect of serviceability, each pair of scales (see Figs. 1-6) are for classifying one topic of serviceability. Each paragraph in an Occupant Requirement Scale summarizes one level of serviceability on that topic, which occupants might require. The matching entry in the Facility Rating Scale is a translation of the requirement into a description of certain features of a facility which, taken in combination, indicate that the facility is likely to meet that level of required serviceability.

1.3 The entries in the Facility Rating Scale (see Figs. 1-6) are indicative and not comprehensive. They are for quick scanning, to estimate approximately, quickly, and economically, how well an office facility is likely to meet the needs of one or another type of occupant group, over time. The entries are not for measuring, knowing, or evaluating how an office facility is performing.

1.4 This classification can be used to estimate the level of serviceability of an existing facility. It can also be used to estimate the serviceability of a facility that has been planned but not yet built, such as one for which single-line drawings and outline specifications have been prepared.

1.5 This classification indicates what would cause a facility to be rated at a certain level of serviceability, but does not state how to conduct a serviceability rating nor how to assign a serviceability score. That information is found in Practice E 1334. The scales in Figs. 1-6 are complimentary to and compatible with Practice E 1334. Each requires the other.

2. Referenced Documents

2.1 *ASTM Standards:*

E 631 Terminology of Building Constructions[3]

E 1334 Practice for Rating Serviceability of a Building or Building-Related Facility[3]

E 1679 Practice for Setting Requirements for Serviceability of a Building or Building-Related Facility[3]

2.2 *ISO Documents*:[4]

ISO 6240 International Standard, Performance Standards in Building—Contents and Presentation

ISO/DIS 7162 Draft International Standard, Performance Standards in Building—Contents and Format of Standards for Evaluation of Performance

ISO/DIS 7164 Draft International Standard, Performance Standards in Building—Definitions and Means of Expression for the Performance of a Whole Building

3. Terminology

3.1 *Definitions:*

3.1.1 *facility*, *n*—a physical setting used to serve a specific purpose.

3.1.1.1 *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.

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

3.1.2.1 *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.

3.1.3 *office*—a place, such as a room, suite, or building, in which business, clerical, or professional activities are conducted.

[1] This classification is under the jurisdiction of ASTM Committee E-6 on Performance of Buildings and is the direct responsibility of Subcommittee E06.25 on Whole Buildings and Facilities.

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[2] Portions of this document are based on material originally prepared by the International Centre for Facilities (ICF) and © 1993 by ICF and Minister of Public Works and Government Services Canada. Their cooperation in the development of this standard is acknowledged.

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

[4] Available from American National Standards Institute, 11 W. 42nd St., 13 Floor, New York, NY, 10036.

3.1.4 For standard definitions of additional terms applicable to this classification, as well as those in 3.1.1-3.1.3, see Terminology E 631.

4. Significance and Use

4.1 Each Facility Rating Scale in this classification (see Figs. 1-6) provides a means to estimate the level of serviceability of a building or facility for one topic of serviceability, and to compare that level against the level of any other building or facility.

4.2 This classification can be used for comparing how well different buildings or facilities meet a particular requirement for serviceability. It is applicable despite differences such as location, structure, mechanical systems, age, and building shape.

4.3 This classification can be used to estimate the amount of variance of serviceability from target or from requirement, for a single office facility, or within a group of office facilities.

4.4 This classification can be used to estimate the following:

4.4.1 Serviceability of an existing facility for uses other than its present use.

4.4.2 Serviceability (potential) of a facility that has been planned but not yet built.

4.4.3 Serviceability (potential) of a facility for which a remodeling has been planned.

4.5 Use of this classification does not result in building evaluation or diagnosis. Building evaluation or diagnosis generally requires a special expertise in building engineering or technology, and the use of instruments, tools, or measurements.

4.6 This classification applies only to facilities that are building constructions, or parts thereof. (While this classification may be useful in rating the serviceability of facilities that are not building constructions, such facilities are outside the scope of this classification.)

5. Basis of Classification

5.1 The scales in Figs. 1-6 contain the basis for classification.

5.2 Instructions for use of this classification are contained in Practices E 1334 and E 1679.

6. Keywords

6.1 basement; serviceability of; building; building envelope and structure; facility; facility occupants; function; office; performance; rating; rating scale; requirements; roofs; serviceability of; serviceability; structure and building envelope; walls (external) and projections; serviceability of

B.1. Structure and Building Envelope

Scale B.1.1. Typical office floors

Facility Management Requirement Scale		Facility Rating Scale
9 ❑ ○ **AREAS FOR HEAVY LOADS:** Heavy loading is necessary in large areas, e.g. safes or compact filing. ○ **REQUIREMENT FOR LEVEL FLOORS:** Floors must be so consistently level and even that no adjustments to furniture or screens are needed.	8 ❑	9 ❑ ○ **Information on allowable loading**: Information is readily available at the site, e.g. on drawings available to occupants. ○ **Floor load capacity**: Floor load capacity meets or exceeds 7.2 kPa (150 psf) for office loads, plus 1 kPa (20 psf) for partitions in all office areas. Heavy loads of 12 kPa (250 psf) for office loads, plus 1 kPa (20 psf) for partitions are possible in generous-size zones (each at least one column bay between 4 columns), for at least 20% of each office floor. ○ **Levelness and evenness**: Floors are superior, e.g. tall screens need no adjustment.
7 ❑ ○ **AREAS FOR HEAVY LOADS:** Operations require some areas for heavy loads. ○ **REQUIREMENT FOR LEVEL FLOORS:** Overall, floors must be level and even.	6 ❑	7 ❑ ○ **Information on allowable loading**: Information is readily available, e.g. in Asset Management Plan. ○ **Floor load capacity**: Floor load capacity meets or exceeds 2.9 kPa (60 psf) for office loads, plus 1 kPa (20 psf) for partitions. There are designated zones for heavy loads of 7.2 kPa (150 psf) for office loads, plus 1 kPa (20 psf) for partitions, equal to at least 10% of floor area. ○ **Levelness and evenness**: Floors are good, e.g. furniture and screens seldom need adjustment.
5 ❑ ○ **AREAS FOR HEAVY LOADS:** Require a standard level of floor load capacity, with no designated areas for heavy loads necessary. ○ **REQUIREMENT FOR LEVEL FLOORS:** Floors must be generally level and even; can tolerate making minor adjustments to screens, partitions and furniture.	4 ❑	5 ❑ ○ **Information on allowable loading**: Information is difficult to obtain, e.g. only from original specifications. ○ **Floor load capacity**: Floor load capacity is standard, e.g. it meets local code requirements for normal loads. There is no designated zone for heavy loads, e.g. a safe or compact filing. ○ **Levelness and evenness**: Floors are acceptable, e.g. screens, furniture and partitions need minor adjustments in some areas.
3 ❑ ○ **AREAS FOR HEAVY LOADS:** No designated areas for heavy loads are needed. ○ **REQUIREMENT FOR LEVEL FLOORS:** Occupants are willing to tolerate problems with levelling furniture and screens.	2 ❑	3 ❑ ○ **Information on allowable loading**: Information is very difficult to obtain, e.g. requires an engineer's report. ○ **Floor load capacity**: Floor load capacity is limited, due to a lack of information, or, it marginally meets local code requirements for older buildings, e.g. 2.4 kPa (50 psf), plus 1 kPa (20 psf) for partitions. There is no designated zone for heavy loads, e.g. a safe or compact filing. ○ **Levelness and evenness**: Floors are marginal, e.g. furniture and screens are difficult to level in some areas.

Scale B.1.1 continued on next page

FIG. 1 Scale B.1.1 for Typical Office Floors

B.1. Structure and Building Envelope

Scale B.1.1. Typical office floors (continued)

Facility Management Requirement Scale	
1 ❑	○ **AREAS FOR HEAVY LOADS**: Occupants have absolutely no requirement for heavy loading of floors. ○ **REQUIREMENT FOR LEVEL FLOORS**: Levelness and evenness of floors does not affect operations.

Facility Rating Scale	
1 ❑	○ **Information on allowable loading**: No information is available despite an extensive search. ○ **Floor load capacity**: Floor load capacity is limited, due to a lack of information, or, it is well below 2.4 kPa (50 psf), plus 1 kPa (20 psf) for partitions, and below current local code requirements for new construction. ○ **Levelness and evenness**: It is unacceptable, e.g. furniture, screens cannot be leveled. Relocatable partitions are not usable.

❑ Exceptionally important. ❑ Important. ❑ Minor Importance.	
Minimum Threshold level =	❑ NA ❑ NR ❑ Zero ❑ DP

NOTES *Space for handwritten notes on Requirements or Ratings*

FIG. 1 Scale B.1.1 for Typical Office Floors *(continued)*

B.1. Structure and Building Envelope

Scale B.1.2. External walls and projections

Facility Management Requirement Scale		Facility Rating Scale
9 ❑ ○ **CONDITION OF BUILDING EXTERIOR WALLS**: The exterior of the building needs to be in like-new condition. ○ **EVIDENCE OF WATER PENETRATION**: No interior evidence of water penetration.	9 ❑	○ **Permanence of exterior finishes**: All finishes are permanent with no exterior painting needed. ○ **Water penetration**: Sealants in wall joints are in new or as-new watertight condition. There is no evidence of moisture penetration to inside surfaces of exterior walls. ○ **Signs of deterioration**: There are no visible signs of deterioration or failure in external walls. ○ **Exterior projections**: Exterior features and projections are structurally sound, and the condition has been verified within the last 12 months.
7 ❑ ○ **CONDITION OF BUILDING EXTERIOR WALLS**: The exterior of the building needs to be in good condition. ○ **EVIDENCE OF WATER PENETRATION**: No interior evidence of water penetration.	8 ❑ 7 ❑	○ **Permanence of exterior finishes**: Most finishes are of the type that do not require periodic refinishing, e.g. painting. ○ **Water penetration**: Sealants in surface-sealed joints are watertight. There is no evidence of moisture penetration to inside surfaces of exterior walls. ○ **Signs of deterioration**: There are minor defects, e.g. minor discoloration, stains or efflorescence, indicating past problems that have been corrected. Some minor repair is needed to sealants in external wall joints. ○ **Exterior projections**: Exterior features and projections are understood by the building manager to be structurally sound.
5 ❑ ○ **CONDITION OF BUILDING EXTERIOR WALLS**: Occupants can accept exterior with some minor signs of deterioration. ○ **EVIDENCE OF WATER PENETRATION**: History of occasional minor water stains on inside surfaces of exterior walls.	6 ❑ 5 ❑	○ **Permanence of exterior finishes**: Some, e.g. about half, exterior surfaces are of the type that require periodic refinishing, e.g. painted walls and elements. ○ **Water penetration**: Sealants in surface-sealed joints in walls are generally watertight. There is evidence of minor moisture penetration to inside surfaces of exterior walls. ○ **Signs of deterioration**: Some defects, e.g. minor discoloration, stains or efflorescence. Some repair or periodic replacement is needed to sealants in external wall joints. ○ **Exterior projections**: There is localized evidence of structural distress, e.g. canopies and cornices are starting to sag or crack, or otherwise require maintenance.
3 ❑ ○ **CONDITION OF BUILDING EXTERIOR WALLS**: Occupants can tolerate exterior surfaces which are in a deteriorated condition. ○ **EVIDENCE OF WATER PENETRATION**: Some water stains on inside surfaces of exterior walls.	4 ❑ 3 ❑	○ **Permanence of exterior finishes**: Most exterior surfaces require periodic refinishing, e.g. painting. ○ **Water penetration**: Surface-sealed joints in walls are not fully watertight and need repair. A few locations give evidence of localized moisture penetration to inside surfaces of exterior walls. ○ **Signs of deterioration**: There are many defects, e.g. stains, discoloration, efflorescence. ○ **Exterior projections**: There is localized evidence of structural distress, e.g. canopies and cornices are starting to sag or crack and require maintenance. There is localized seismic risk.
	2 ❑	

Scale B.1.2. continued on next page

FIG. 2 Scale B.1.2 for External Walls and Projections

B.1. Structure and Building Envelope

Scale B.1.2. External walls and projections (continued)

Facility Management Requirement Scale	Facility Rating Scale
1 ❑ ○ **CONDITION OF BUILDING EXTERIOR WALLS**: Condition of exterior walls is either completely irrelevant or completely unimportant to occupants.	1 ❑ ○ **Permanence of exterior finishes**: All exterior surfaces require periodic refinishing, e.g. painting. ○ **Water penetration**: Surface-sealed joints in walls are not watertight and need replacement. There is evidence of extensive moisture penetration. ○ **Signs of deterioration**: There are extensive defects, e.g. many areas of staining, discoloration, efflorescence, or, in cold winter conditions, icicles and moisture on outside walls. ○ **Exterior projections**: There is widespread evidence of structural distress, e.g. canopies and cornices are sagging and cracked, and anchors are rusted or loose. There is widespread seismic risk.

❑ Exceptionally important. ❑ Important. ❑ Minor Importance.	
Minimum Threshold level =	❑ NA ❑ NR ❑ Zero ❑ DP

NOTES *Space for handwritten notes on Requirements or Ratings*

FIG. 2 Scale B.1.2 for External Walls and Projections *(continued)*