This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

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An American National Standard

Standard Classification for Serviceability of an Office Facility for Sound and Visual Environment[1,2]

This standard is issued under the fixed designation E1662; 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 covers pairs of scales 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 suitable sound and visual conditions.

1.2 Within that aspect of serviceability, each pair of scales, shown in Figs. 1-6, are for classifying one topic of serviceability. Each paragraph in an Occupant Requirement Scale (see Figs. 1-6) summarizes one level of serviceability on that topic, which occupants might require. The matching entry in the Facility Rating Scale (see Figs. 1-6) 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 E1334. The scales in this classification are complimentary to and compatible with Practice E1334. Each requires the other.

1.6 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[3]

E631 Terminology of Building Constructions

E1334 Practice for Rating the Serviceability of a Building or Building-Related Facility (Withdrawn 2013)[4]

E1679 Practice for Setting the Requirements for the Serviceability of a Building or Building-Related Facility, and for Determining What Serviceability is Provided or Proposed

2.2 *ISO Standard:*[5]

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

3. Terminology

3.1 *Definitions:*

3.1.1 *facility*—a physical setting used to serve a specific purpose. **E631**

3.1.1.1 *Discussion*—A facility may be within a building, 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. **E631**

[1] This classification is under the jurisdiction of ASTM Committee E06 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] 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.

[4] The last approved version of this historical standard is referenced on www.astm.org.

[5] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

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A.3. Sound and Visual Environment

Scale A.3.1. Privacy and speech intelligibility

Occupant Requirement Scale		Facility Rating Scale
9 ❑ ❍ **SPEECH PRIVACY IN WORKSTATION:** Many staff, in individual workstations located anywhere on the office floor, require excellent speech privacy so that content of discussions are confidential, even with raised voices. ❍ **UNDERSTANDING SPEECH IN WORKSTATION:** Within each workstation, must be able to easily understand quiet speech, so background sound must not interfere.	9 ❑ 8 ❑	❍ **Confidentiality:** Confidentiality in enclosed offices is maintained, even with very high voice levels. Rooms can be located anywhere in the space without the need for costly acoustic treatment in the ceiling. ❍ **Background sound for speech privacy:** A background sound system can be zoned and tuned to reliably provide speech privacy in open plan, if combined with appropriate design and layout of workstations. ❍ **Speech intelligibility:** When in open areas, i.e. not in an enclosed office, easily able to understand quiet conversation, and quiet telephone conversations.
7 ❑ ❍ **SPEECH PRIVACY IN WORKSTATION:** Require good speech privacy in individual workstations located anywhere on the office floor, so that content of discussions are confidential with slightly raised voices. Some people require speech privacy much of the time. ❍ **UNDERSTANDING SPEECH IN WORKSTATION:** Need to easily understand normal speech within each workstation.	7 ❑ 6 ❑	❍ **Confidentiality:** Confidentiality in enclosed offices is maintained, even with slightly raised voice levels. The ceiling system has or can have baffles, or does not need baffles between rooms. Confidentiality in open plan workstations requires lowered voices. ❍ **Background sound for speech privacy:** Background sound is sufficient to provide privacy by masking speech in all but the quietest periods of the day. ❍ **Speech intelligibility:** When in open areas, i.e. not in an enclosed office, easily able to understand normal conversation, and normal telephone conversations.
5 ❑ ❍ **SPEECH PRIVACY IN WORKSTATION:** In individual enclosed offices located anywhere on the floor, require speech confidentiality with normal voice levels. In open plan areas, staff are prepared to lower voice to get speech privacy. ❍ **UNDERSTANDING SPEECH IN WORKSTATION:** Within open plan workstations, need to understand normal speech without strain.	5 ❑ 4 ❑	❍ **Confidentiality:** Confidentiality in enclosed offices is maintained with normal voice levels. The ceiling system has or can have baffles. Confidentiality in open plan workstations requires lowered voices. ❍ **Background sound for speech privacy:** Background sound is variable and therefore not reliable as a means of masking speech to achieve privacy. Sometimes it is sufficient, and sometimes not. ❍ **Speech intelligibility:** When in open areas, i.e. not in an enclosed office, without straining to hear, normal conversation and telephone calls are understood.
3 ❑ ❍ **SPEECH PRIVACY IN WORKSTATION:** Few situations require confidentiality. When speech privacy is needed, staff are prepared to close the office door and lower voices. No need for speech privacy in open plan areas. ❍ **UNDERSTANDING SPEECH IN WORKSTATION:** Operations require few conversations at workplace, so speech intelligibility is not critical.	3 ❑ 2 ❑	❍ **Confidentiality:** Confidentiality requires lowered voices in rooms, even with the door closed. The ceiling system/design, e.g. plenum system, is not capable of preventing normal speech from being heard in adjacent spaces without major effort and fitup cost. ❍ **Background sound for speech privacy:** Background sound is not adequate or reliable enough to mask speech for privacy. ❍ **Speech intelligibility:** Speech intelligibility is poor, e.g. noise sometimes makes normal conversation difficult to understand in discussions, meetings, or on the telephone.

Scale A.3.1. continued on next page

FIG. 1 Scale A.3.1 for Privacy and Speech Intelligibility

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A.3. Sound and Visual Environment

Scale A.3.1. Privacy and speech intelligibility (continued)

Occupant Requirement Scale	Facility Rating Scale
1 ❑ ○ **SPEECH PRIVACY IN WORKSTATION:** There is no requirement at this level. ○ **UNDERSTANDING SPEECH IN WORKSTATION:** There is no requirement at this level.	1 ❑ ○ **Confidentiality:** Because of building design, what is said in one room is clearly understood in adjacent rooms. Fixing this would require major effort and fitup cost. ○ **Background sound for speech privacy:** Background sound, if any, does not mask speech for privacy. ○ **Speech intelligibility:** Speech intelligibility is very poor, e.g. noise often makes normal conversation difficult to understand in the workplace, or on the telephone.

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

NOTES ***Space for handwritten notes on Requirements or Ratings***

FIG. 1 Scale A.3.1 for Privacy and Speech Intelligibility *(continued)*

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. **E631**

3.1.4 For standard definitions of additional terms applicable to this classification, see Terminology E631.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *fit-up*—alterations and improvements to the base building and to the building systems, including demolition where required, to prepare the facility for occupancy.

4. Significance and Use

4.1 Each Facility Rating Scale (see Figs. 1-6) in this classification 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.)

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

5. Basis of Classification

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

5.2 Instructions for the use of this classification are contained in Practices E1334 and E1679.

6. Keywords

6.1 building; facility; facility occupants; function; office performance; rating; rating scale; requirements; serviceability; sound environment; visual environment

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A.3. Sound and Visual Environment

Scale A.3.2. Distraction and disturbance

Occupant Requirement Scale		Facility Rating Scale
9 ❑ ❍ **CONCENTRATION ON WORK:** Operations require that individuals throughout the office, including those in open plan areas, can easily concentrate on their work. ❍ **FREEDOM FROM DISTRACTIONS:** At all times, free from distraction due to noise from within or outside the office, or due to the movement of people in the office. ❍ **TOLERANCE FOR OVERHEARD CONVERSATIONS:** Conversations occurring in adjacent open plan workstation must not be easily understood and therefore not distracting.	**8** ❑	**9** ❑ ❍ **Office noise:** There is no reported distraction from office sounds, e.g. from printers or ringing phones. ❍ **Background sound as a means of masking distracting noise:** Background sound reliably provides masking of speech and noise from beyond individual workstations and group work areas and does not, itself, cause fatigue. ❍ **External noise:** There is no problem due to noise from outside the building or from other floors. ❍ **Distracting conversations:** In open plan offices, speech is heard but is not generally understood in adjacent workstations. ❍ **Reflected sound:** Reflected sound from one workstation to another is avoided, e.g. by added sound absorption materials on walls and columns, by shape of space, and by shape or placement of surfaces, including window glass. ❍ **Movement of people:** There is no distraction in open offices from movement of people or carts in main aisles, even without the use of high screens as visual shields.
7 ❑ ❍ **CONCENTRATION ON WORK:** Operations require that individuals throughout the office, including those in open plan areas, can concentrate on their work at all but a few times a week, or in all but a few localized parts of the office. ❍ **FREEDOM FROM DISTRACTIONS:** Must be free from all but the occasional distraction due to noise from within or outside the office, or due to the movement of people in the office. ❍ **TOLERANCE FOR OVERHEARD CONVERSATIONS:** Conversations in open plan areas occurring two or more workstations away must not be easily understood and therefore not distracting.	**6** ❑	**7** ❑ ❍ **Office noise:** Sounds, e.g. from printers or ringing phones, are only reported as being distracting a few times a week for a few occupants, or in localized areas. ❍ **Background sound as a means of masking distracting noise:** Background sound level provides masking of distracting noise at all but the quietest times of day and does not, itself, cause fatigue. ❍ **External noise:** Noise from outside the building or from other floors is rarely a disturbance. ❍ **Distracting conversations:** In open plan offices, speech on the telephone or in animated discussion is heard and mostly understood in adjacent workstations, but rarely up to two workstations away. ❍ **Reflected sound:** Although some sound is reflected from one workstation to another by hard, flat surfaces such as walls and columns, this is not a significant distraction because most such surfaces are treated with absorbent material or so placed or shaped to not reflect sound from one workstation to another. ❍ **Movement of people:** The layout and width of main aisles result in only occasional or localized disturbance from movement of people or carts.
5 ❑ ❍ **CONCENTRATION ON WORK:** Operations do not require special levels of concentration by individuals in open plan areas. ❍ **FREEDOM FROM DISTRACTIONS:** Work is such that most people can tolerate some internal office noise, external noise, nearby conversations, and movement of people. Temporary use of an office or other enclosed room is required when an individual whose workstation is in open plan needs a place in which to concentrate. (continued)		**5** ❑ ❍ **Office noise:** Sounds, e.g. from printers or ringing phones, are only sometimes distracting for most occupants. ❍ **Background sound as a means of masking distracting noise:** Background sound is sufficient to provide masking of distracting noise in some parts of the space, and at some times of the day. ❍ **External noise:** Noise from outside the building or from other floors is not generally intrusive or disturbing, usually less than 10 minutes per day. ❍ **Distracting conversations:** In open plan offices, someone talking on the telephone or in animated discussion with a colleague is heard and mostly understood in adjacent workstations, sometimes up to two workstations away. (continued)

Scale A.3.2. continued on next page

FIG. 2 Scale A.3.2 for Distraction and Disturbance

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