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.

Designation: E1660 – 95a (Reapproved 2018)

An American National Standard

Standard Classification for Serviceability of an Office Facility for Support for Office Work[1,2]

This standard is issued under the fixed designation E1660; 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 performance to support typical office work.

1.2 Within that aspect of serviceability, each pair of scales, shown in Fig. 1 through Fig. 6, are for classifying one topic of serviceability. Each paragraph in an Occupant Requirement Scale (see Fig. 1 through Fig. 6) summarizes one level of serviceability on that topic, which occupants might require. The matching entry in the Facility Rating Scale (see Fig. 1 through Fig. 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 Fig. 1 through Fig. 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.

1.6.1 *Exception*—Inch-pound units are used in Fig. 6.

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 *ASHRAE Standards:*[5]

ASHRAE Standard 55 Thermal Environmental Conditions for Human Occupancy

ASHRAE Standard 62 Ventilation for Acceptable Indoor Air Quality

2.3 *ISO Standard:*[6]

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

[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 copyright 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 Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 1791 Tullie Circle, NE, Atlanta, GA 30329, http://www.ashrae.org.

[6] 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.1. Support for Office Work

Scale A.1.1. Photocopying

Occupant Requirement Scale		Facility Rating Scale
9 ❑ ❍ **ACCESS TO COPIERS:** Have sufficient copiers that staff do not need to wait for access to an appropriate machine. ❍ **LOCATION OF COPIERS:** Must be able to use small convenience copiers in open plan, and large copiers in rooms, without causing problems of distraction, pollution or power surges. ❍ **MINIMIZE DISRUPTION FROM COPIERS:** In open plan, fitup policy is to provide spaces dedicated to copiers, with 5 m minimum distance to nearest individual workstation, to minimize noise, distraction and pollution.	**8** ❑	**9** ❑ ❍ **Power supply:** Each copier is on a dedicated circuit. ❍ **Small table-top copiers:** Air exhaust from locations with table-top copiers, whether in small rooms or in open plan (e.g. by hood over copies), is not recirculated within the building. Such exhaust can easily and at low cost be provided to any location in the building. There is ample separation, e.g. minimum 5 m, from nearest workstation in open plan to a table-top copier in open plan, or to entrance of room containing a table-top copier. ❍ **Convenience copiers:** Located in separate rooms, with air exhaust not recirculated within the building. Added exhaust for copier rooms for convenience copiers is easily available in any location. There is ample separation, e.g. minimum 5 m, from entrance to copier rooms to the nearest workstation. ❍ **Large copiers:** Rooms for large copiers are provided and conveniently located. Exhaust air from the copier room is not recirculated within the building and the room is sound isolated from the nearest workstations. If rooms for large copiers are not provided, fitup to this level would be at minimal effort and cost.
7 ❑ ❍ **ACCESS TO COPIERS:** Have sufficient copiers that staff rarely wait more than one minute to use an appropriate machine. ❍ **LOCATION OF COPIERS:** Need small convenience copiers in open plan, and large copiers in rooms, without causing problems of pollution or power surges. Can tolerate specified locations if centralized and adjacent to circulation. ❍ **MINIMIZE DISRUPTION FROM COPIERS:** Can tolerate minor disruption to nearby workers. In open plan, fitup policy is to provide spaces dedicated to copiers, with 3 m minimum distance to nearest individual workstation, to reduce noise, distraction and pollution.	**6** ❑	**7** ❑ ❍ **Power supply:** Each copier is on a dedicated circuit. ❍ **Small table-top copiers:** Air exhaust from small rooms with table-top copiers is not recirculated within the building but is recirculated from copiers in open plan areas. Added exhaust ventilation to the outside exists or is readily available in specific locations or zones; but elsewhere, added exhaust would be mixed with return air. There is at least 3 m separation from nearest workstation in open plan to a table-top copier in open plan or to entrance to a room containing a table-top copier. ❍ **Convenience copiers:** Located in separate rooms or separated from the nearest individual workstations by at least 3 m, or a wall, or equivalent separation. For convenience copiers, added exhaust ventilation to the outside exists or is readily available in specific locations or zones; but elsewhere, added exhaust would be mixed with return air. ❍ **Large copiers:** Rooms for large copiers are provided and well located for most people. Air from the copier room is exhausted to the outside (not recirculated) and noise is not heard in adjacent workplaces. If copier rooms are not provided, fitup to this level would be at moderate effort and cost.

Scale A.1.1. continued on next page

FIG. 1 Scale A.1.1 for Photocopying

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

3.1.2.1 *Discussion*—The scope of this performance is not the

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A.1. Support for Office Work

Scale A.1.1. Photocopying (continued)

Occupant Requirement Scale		Facility Rating Scale
5 ❑ ❍ **ACCESS TO COPIERS:** Have sufficient copiers that staff rarely wait more than 2 or 3 minutes to use an appropriate machine. ❍ **LOCATION OF COPIERS:** Need convenience copiers in open plan, and large copiers in rooms spaced throughout the work area, without causing power surges. Can tolerate specified locations if centralized and adjacent to circulation. ❍ **MINIMIZE DISRUPTION FROM COPIERS:** Can tolerate minor disruption to nearby workers. Can tolerate added heat and some recirculation of exhaust air if compensating features are provided, e.g. openable windows. In open plan, fitup policy is to provide spaces dedicated to copiers, with 3 m minimum distance to nearest individual workstation, to reduce noise, distraction and pollution.	**4** ❑	**5** ❑ ❍ **Power supply:** There are separate circuits for copiers, not shared with other office machines, e.g. computers, but may have two small copiers on one circuit. ❍ **Small table-top copiers:** Workstations in open plan can have separation from a table-top copier by a wall, or at least 3 m distance to copier or to entrance to a room containing a copier. ❍ **Convenience copiers:** Added exhaust ventilation for copiers exists, or is readily available in specific locations. This exhaust is diluted with extra outdoor air before recirculation, or outdoor air is available through openable windows. There is adequate separation, e.g. minimum 3 m, from the nearest workstation. ❍ **Large copiers:** Rooms for large copiers are provided, but only to a basic quality. If copier rooms are not provided, building layout and services are capable, at substantial effort or cost, of providing dedicated rooms for large copiers to a basic quality, e.g. air from the copier room is exhausted directly into the return air system. Noise can just be heard at adjacent workplaces. The location of copiers is adequate for most people.
3 ❑ ❍ **ACCESS TO COPIERS:** Minimal need for convenience photocopiers, e.g. one copier per 100 people. ❍ **LOCATION OF COPIERS:** Located well away from areas where most people work. ❍ **MINIMIZE DISRUPTION FROM COPIERS:** If more copiers are required, say one copier per 50 people, then need compensating features, e.g. get added ventilation to copier room by openable windows, or by putting copier in poor location.	**2** ❑	**3** ❑ ❍ **Power supply:** Copiers are on the same circuits as other machines, e.g. computers. There is capacity for added dedicated circuits at moderate effort and cost. ❍ **Small table-top copiers:** Workstations in open plan cannot be separated from a table-top copier by a wall, and these copiers cause noticeable heat gain, odours and noise. ❍ **Convenience copiers:** Added exhaust ventilation for copiers does not exist. Added ventilation is possible but only by mixing with return air, and it is difficult and costly. Noise control is not feasible. Convenience copiers cause noticeable heat gain, odours, and noise. ❍ **Large copiers:** Rooms for copiers are not provided, or if provided, are not to basic quality. The building layout and services are not capable of providing copier rooms to a basic quality except at prohibitive cost, e.g. air exhausted from copier space is recirculated to the rest of the building. Noise of the copier is heard at many workplaces in the general area.

Scale A.1.1. continued on next page

FIG. 1 Scale A.1.1 for Photocopying *(continued)*

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 *convenience copiers*—medium-size photocopy machines, typically on a stand or worktable, located in or near work areas and used on a self-help basis. They typically accommodate two or more sizes of paper trays and copy larger

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A.1. Support for Office Work

Scale A.1.1. Photocopying (continued)

Occupant Requirement Scale	Facility Rating Scale
1 ❑ ❍ **ACCESS TO COPIERS:** No need for photocopiers, or only one copier required for occasional use. ❍ **LOCATION OF COPIERS:** Located away from densely populated office areas, or other arrangements, e.g. can use commercial copying service, or copy centre located elsewhere.	1 ❑ ❍ **Power supply:** Copiers are on the same circuits as other machines, e.g. computers, with no potential for dedicated power, or it is very difficult. ❍ **Small table-top copiers:** Table-top copiers cause problems, e.g. heat gain, pollution, odours and noise. ❍ **Convenience Copiers:** No added exhaust ventilation is possible and copiers cannot be in separate rooms. No noise control is possible. Convenience copiers cause problems, e.g. heat gain, pollution, odours, and noise. ❍ **Large copiers:** No added exhaust ventilation is possible and all exhaust air from spaces with copiers is treated like other air from office areas. All possible locations for copiers are also near workplaces, e.g. within 3 m. There is negligible noise control and large copiers cause serious problems, e.g. heat, noise, and pollution.

❑ 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.1.1 for Photocopying *(continued)*

and smaller than the original. Many have collating bins for ten or twenty copies or automatic feeding of originals, or both.

3.2.2 *enclosure*—floor-to-ceiling (full height) partitions around a space.

3.2.3 *interview room*—place for meetings at which one or two staff interview or meet with one or two others, typically from outside the organization, for example: staff to be hired, clients with questions, clients who are filing a report or application, contractors or suppliers, and so forth.

3.2.4 *large copiers*—includes larger photocopy machines, typically floor mounted, with large collating and stapling functions, and so forth, located centrally and operated by trained personnel; or copiers for large sheets or drawings.

3.2.5 *small table-top copiers*—small personal copiers with limited features. They are typically placed on a work surface and used for low-volume copying.

4. Significance and Use

4.1 Each Facility Rating Scale (see Fig. 1 through Fig. 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 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.

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A.1. Support for Office Work

Scale A.1.2. Training rooms, general

Occupant Requirement Scale		Facility Rating Scale
9 ❑ ❍ **ROOM SIZES:** Require training sessions (without computers) to run for various group sizes, sometimes concurrently. Need breakout rooms nearby, accessible to trainees. ❍ **OCCUPANT COMFORT:** Need excellent ventilation, lighting and sound control for concentration. ❍ **LOCATION OF ROOMS:** Need to locate training rooms in any part of the office, e.g. to be close to trainees, or convenient for trainees from outside the facility. Need to let trainees go from building entry to training rooms, toilet and food service, without compromising security zones.	**8** ❑	**9** ❑ ❍ **Mix, quantity, future capability:** Suitable mix of capacities of dedicated training rooms exist, e.g. for 12, 25 and 35 people. Sufficient quantity. Adjacent meeting rooms are easy to enhance to meet requirements for a training room, if more training rooms become needed. ❍ **Environment:** Excellent, e.g. ventilation rates and volume of air entering the space exceed or meet target (current ASHRAE Standards 62 and 55) at all times that the training rooms are in use. Rooms are comfortable for full-day use. Local control of lighting, ventilation and temperature exists in all training rooms. Separate illumination for wall-wash, for presentation at end of the room, and for work surfaces, all under instructor control. Instructor can augment ventilation, including 100% outdoor air, on demand. ❍ **Acoustic control:** Excellent, e.g. raised voices or amplified sounds are not heard in adjacent spaces, and sounds from adjacent spaces are never distracting. It is easy to understand soft-spoken speech from across the room, and no echo or reverberation from loud or abrupt sounds. ❍ **Fixtures and fixed equipment:** There is provision for full audio-visual presentations, including projection of TV and computer images with quality sound system. Large screens with rear projection are installed in existing training rooms, with sufficient ceiling height at screen end of room to provide good visibility, e.g. 2.7 m for capacity of up to 10 trainees and 3 m for larger rooms. The present high-quality standards for training rooms is achievable in any location on the floor. ❍ **Breakout/syndicate rooms:** Adjacent cluster of small and medium meeting rooms has capacity for all trainees. ❍ **Floorplate and access:** No wayfinding difficulties for visitors. There is sufficient space to add or enlarge a training room.
7 ❑ ❍ **ROOM SIZES:** Need to run concurrent training sessions for two different group sizes, the larger up to about 25 trainees. Need several breakout rooms nearby. ❍ **OCCUPANT COMFORT:** Need high quality ventilation, lighting and sound control for concentration. ❍ **LOCATION OF ROOMS:** For some courses, some or most of the trainees come from outside the facility so access from building entry must not compromise security zones.	**6** ❑	**7** ❑ ❍ **Mix, quantity, future capability:** Suitable number and capacities of dedicated training rooms exist, e.g. for 12 and 25 people. Sufficient quantity. Additional training rooms can be installed with moderate cost and difficulty. ❍ **Environment:** Good, e.g. ventilation rates per person reach target (current ASHRAE Standards 62 and 55) for training rooms, making them comfortable for full-day use. There is a thermostat for occupant control of ventilation and temperature. Local control of lighting exists in all training rooms. Instructor can augment ventilation, on demand. ❍ **Acoustic control:** Good, e.g. never hear sounds from outside the room. Raised voices or amplified sounds are not understood in adjacent spaces. Soft-spoken speech from across the room can be understood. Only slight echo or reverberation from loud or abrupt sounds; or, only slight muffling of speech and loud sounds. ❍ **Fixtures and fixed equipment:** There is provision for full audio-visual presentations, using built-in projection of TV and computer images, and extra ceiling height, e.g. 3 m at screen end of room, for training rooms for more than 20 people. ❍ **Breakout/syndicate rooms:** Adjacent to training room cluster is cluster of small and medium meeting rooms with at least half capacity of training rooms. ❍ **Floorplate and access:** No wayfinding difficulties for visitors.

Scale A.1.2. continued on next page

FIG. 2 Scale A.1.2 for Training Rooms, General

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