

Designation: E1694 - 22

Standard Classification for Serviceability of an Office Facility for Special Facilities and Technologies^{1,2}

This standard is issued under the fixed designation E1694; 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 special facilities and technologies.
- 1.2 Each pair of scales, shown in Figs. 1-4, is for classifying one topic of serviceability. Each paragraph in an Occupant Requirement Scale (DEMAND Scale see Figs. 1-4) summarizes one level of requirement for serviceability on which occupants might require. The matching paragraph in the Facility Rating Scale (SUPPLY Scale see Figs. 1-4) is an interpretation 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. 1-4) 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, and 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 it does not state how to conduct a serviceability rating nor how to assign a serviceability score. That information is found in Practice E1679. The scales in this classification are complementary to and compatible with Practice E1679. Each requires the other.
- 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.
- Current edition approved Oct. 1, 2022. Published December 2022. Originally approved in 1995. Last previous edition approved in 2018 as E1694 95a (2018). DOI: 10.1520/E1694-22.
- 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.

- 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

E1663 Classification for Serviceability of an Office Facility for Typical Office Information Technology

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 E1836/E1836M Practice for Building Floor Area Measure-

ments for Facility Management

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 For standard definitions of terms applicable to this classification, see Terminology E631.
- 3.1.2 *facility, n*—a physical setting used to serve a specific purpose. **E631**

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

A.13.1 Group or shared conference center Subject Matter: location and capacity of needed conference rooms or spaces 1. Amenity area (ASTM E1836/E1836M-09 (2016)), item 3.2.1: "portion of a building that provides a convenience to an occupant or occupants of a building or group of buildings" relating directly to group and shared conference center spaces. 2. Service area (ASTM E1836/E1836M-09 (2016)), item 3.2.24; "portion of a building that provides services that enable occupants to work in a building" relating directly to group and shared conference center spaces. From the options below, please select the level that best describes the REQUIREMENT Rating DEMAND A.13.1 Group or shared conference center Level 9 0 **Location of meeting space:** A conference center for the organization is provided in the same building. Size of meetings: Space is provided for a variety of small groups plus large meetings, for example, 25 to 200 Amenities: A full range of convenience functions are contiguous and readily available. Services: Comfortable building environment (that is, temperature, humidity, ventilation) for all occupant load situations. Conveniently located adjustable lighting controls. Frequent electrical outlets plus charging stations. 8 0 7 0 Location of meeting space: A conference center for the organization is provided in the same building or complex. Size of meetings: Space for large meetings in the same building, for example, 100 people, plus group meeting spaces. Amenities: A full range of convenience functions are readily available within a short walking distance. Services: Comfortable building environment (that is, temperature, humidity, ventilation) for most occupant load situations. Multiple switched lighting controls are conveniently located. Frequent electrical outlets and some charging locations. 6 0 **5** O Location of meeting space: Can utilize company conference space or open plan space adjacent to main circulation areas in the same building or complex. Size of meetings: Space for large meetings in the same building, for example, 100 people. Amenities: Most convenience functions are readily available, but some are at a substantial walking distance. Services: Comfortable building environment (that is, temperature, humidity, ventilation) for main meeting spaces. Conveniently located electrical outlets. Multiple switched lighting controls are located within the space. 4 0 Location of meeting space: No perceived present or future need for a company or departmental 3 0 conference in the same building or complex. **Size of meetings:** Space for small meetings is limited in the same building. **Amenities**: Convenience functions can be established through makeshift temporary arrangements. Services: Comfortable building temperatures. Lighting controls are not readily available and are controlled in large banks of fixtures. Electrical outlets are provided. 2 0 1 0 **Location of meeting space:** There is no requirement at this level. Size of meetings: There is no requirement at this level. Amenities: There is no requirement at this level. Services: There are no requirements at this level. 0 0 No information is available. If unable to choose scale level, select OTHER and indicate reason below: □ Lack Information ☐ Postpone decision □In-depth evaluation required □ Not applicable ☐ Refer question to someone else: Whom? e-mail or phone?

FIG. 1 Demand Scale A.13.1 for Group or Shared Conference Center

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

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

E631

A.1	3.1	Group or shared conference center					
	From the options below, please select the level that best describes the RATING.						
	rement evel	SUPPLY A.13.1. Group or shared conference center					
9		PRESENT PROVISION: A departmental conference center exists. For example, large enough to handle a main plenary session of 200 people plus several breakout groups of 25 to 50 people at tables in adjacent meeting rooms.					
		AMENITIES: Security, coat-check area, food services, adequate washrooms, and agile small group meeting areas are contiguous to conferencing spaces and readily available. All amenities are fully accessible. SERVICES: Temperature and ventilation levels quickly adjust to varying occupant loads. Ventilation is very quiet in operation. Electrical outlets and charging stations are readily available for occupant use. Lighting control is quickly adjustable to occupant requirements.					
8	0	contains quickly adjustable to occupant requirements					
1	0	PRESENT PROVISION: A departmental conference center is provided. For example, large enough to handle meetings of 100 people. Several breakout groups can be handled in meeting rooms, display areas, or work areas, or in a portion of a food service eating area is utilized without disruption. AMENITIES: Security, coat-check area, food services, full accessibility, adequate washrooms, and agile small group meeting areas are readily available within a short walking distance. SERVICES: Temperature and ventilation levels adjust to varying occupant loads. Ventilation is reasonably quiet in operation. Electrical outlets are readily available for occupant use but may require extension cords. Lighting control is adjustable to occupant requirements.					
6	0						
	0	PRESENT PROVISION: A company-shared conference center is provided. For example, large enough to handle meetings of 100 people. Several breakout groups can be handled in meeting rooms, display areas, or work areas, or in a portion of a food service eating area is utilized with only minimal disruption to their function. AMENITIES: Security, coat-check area or space, food services, adequate washrooms, and agile small group meeting areas are readily available but can be at a substantial walking distance. All features are fully accessible. SERVICES: Temperature, humidity, and ventilation can be adjusted to varying occupant loads. Ventilation noise is apparent. Electrical outlets are in excess of local codes, but minimal use of extension cords may be required. Lighting control is located within the space.					
1	0	required. Lighting control is located within the space.					
	0	PRESENT PROVISION: No current provision of designated conference space. A large enough space to handle meetings of 25 people in work areas or underutilized areas such as a lunchroom is only possible with substantial disruption to furniture and work functions. AMENITIES: Amenity services such as a coat-check area or space, are not available without makeshift temporary arrangements. Adequate accessible washrooms can be at a very substantial walking distance. SERVICES: Temperature and ventilation provide varying hot and cold areas. Ventilation noise is very evident.					
		Electrical outlets are to local codes. Lighting control is specifically switched for original space function.					
ı	0						
1	0	PRESENT PROVISION: No current provision of designated conference space and it is difficult to arrange group meeting space without disruption to work areas. AMENITIES: Convenience functions are not provided. SERVICES: Comfortable building temperature in most spaces. Lighting controls are not readily available without assistance. Only Code required electrical outlets for intended function are provided.					
0	0	No requirement.					
Select	Relativ	e Importance of scale = OOOO Extremely Important Important Minor Importance					
	Select Threshold Level of Scale: First, indicate whether Threshold Level of scale is a O Minimum OR O Maximum OR, if there is NO Maximum or Minimum Threshold level, then select O None.						
	Then, (unless there is none) select the Threshold Level of this scale						
<u> </u>		09 08 07 06 05 04 03 02 01					
If unable to choose scale level, select OTHER and indicate reason below:							
	□ Lack Information □ Postpone decision □ In-depth evaluation required □ Not applicable □ Refer question to someone else: Whom? e-mail or phone?						

FIG. 1 Supply Scale A.13.1 for Group or Shared Conference Center (continued)

A.13.2

Video Conferencing Provision

Subject Matter: quality of video conferencing.

- Video conferencing can now occur anywhere from a mobile device to a conference center consequently the scale now
 focuses on telecommunications systems.
- 2. Mean Opinion Score (MOS), International Telecommunications Union, Methods for objective and subjective assessment of speech and video quality Union (ITU-T, P.800.2 (07/2016) is a scale of the user's opinion of the quality of the internet to provide communications. This rating Scale is a simple 1- to 5-point scale and can be described as 1 BAD very difficult to maintain communication; 2 POOR unreliable communication; 3 Fair various issues or a persistent issue makes the communication difficult to follow; 4 Good clear like a typical mobile phone; and 5 Excellent similar to inperson.
- Lag is described as a delay in any aspect of the audio or visual media. Retrieved from https://www.ibm.com/cloud/blog/network-latency?mhsrc=ibmsearch_a&mhq=latency
- 4. Megabytes per second rating (Mbps) rating based on TechTarget E-Guide, "Video Conferencing Buyer Guide.pdf", April 24, 2017, page 7 for bandwidth and resolution quality.
- 5. Bandwidth is the amount of data that can be transmitted in a given period of time or speed.
- 6. Telephone references any type of direct wired or handheld communication device.

From the options below, please select the level that best describes the REQUIREMENT.

Requirement Level		DE	MAND	A.13.2 Video Conferencing Provision			
9	0	1.	VIDEO QUALITY: Must be sh	narp, no fragmentation (blurriness) of information.			
		2.	LAG (delay): seems like an in	n-person conversation and screen rarely freezes.			
		3.	MEAN OPINION SCORE : 5 -	- similar to in-person communication.			
8	0						
7	0			ninor fragmentation of information.			
		2.	LAG (delay): seems like a typ	oical mobile phone conversation and screen rarely freezes.			
		3.	MEAN OPINION SCORE: 4 -	- clear similar to a typical mobile phone.			
6	0			andards.iten.ai)			
5	0	1.	VIDEO QUALITY: becoming	fragmented. Viewer becoming distracted.			
				ords or phrases causing the need to repeat parts of the discussion. The gth of time causing the need to repeat parts of the communication.			
		3.	MEAN OPINION SCORE: 3 - communication.	- bothersome to communicate, routine need to repeat aspects of the			
4	0			TM E1694-22			
	_	alh a	VIDEO QUALITY: is fragmen	ted. Information difficult to follow. Viewer stops engaging. 1-e 1694-22			
, sta s t	. CO.II	2.		repeat or miss parts of the communication. Screen repeatedly			
2	0	3.	MEAN OPINION SCORE: 2 -	- difficult to communicate efficiently.			
1	0	1.	VIDEO QUALITY: non-existe	nt. Viewer disconnects.			
				o routinely repeat or miss parts of the communication. Screen repeatedly n issues and occasionally needs to reconnect the communication.			
		3.	MEAN OPINION SCORE: of	1 – difficult to maintain the communication connection.			
0	0	No r	requirement.				
		_		0 0 0			
Select I	Relativ	e In	nportance of scale =	Extremely Important Important Minor Importance			
				ate whether Threshold Level of scale is a NO Maximum or Minimum Threshold level, then select O None.			
Then	(unless	ther	e is none) select the Thres	hold Level of this scale			
	(GIIIC33	aici	09 08 07				
If unat	If unable to choose scale level, select OTHER and indicate reason below:						
□ Lack Information □ Postpone decision □ In-depth evaluation required □ Not applicable □ Refer question to someone else: Whom? e-mail or phone?							
				A.13.2 for Video Conferencing Provision			

A.13.2		Video Conferencing Provision			
	From the options	below, please select the level that best describes the RATING.			
Rating Level	SUPPLY	A.13.2 Video Conferencing Provision			
9 0	 Viewing resolution: Can provide a high definition 1080 (HD1080) viewing resolution. Bandwidth: Provides a bandwidth of 6 Mbps (megabytes per second) per user. Internet connection: Facility has provision of direct connected internet network and wireless internet (Wi-Fi) within all work and common areas. 				
8 0	4. Telephone serv	rice: Very rarely requires a telephone service to facilitate audio.			
7 0	 Viewing resolution: Can provide a high-definition 720 (HD720) viewing resolution. Bandwidth: Provides a bandwidth of 4 Mbps per user. Internet connection: Facility has provision of direct connected internet network and Wi-Fi in all work areas and most common areas. Telephone service: Rarely requires telephone service to facilitate audio. 				
6 0	4. <u>Telephone serv</u>	nce. Raiely requires teleprione service to facilitate addio.			
5 0	 Viewing resolution: Can provide a high definition 720 (HD720) viewing resolution. Bandwidth: Provides a bandwidth of 1 Mbps user. Internet connection: Facility has provision of direct connected internet network and Wi-Fi in work areas and some common areas 				
	4. Telephone serv	rice: Occasionally requires telephone service to facilitate audio.			
4 0 3 0	 Viewing resolution: Can provide a viewing resolution of < (less than) 720 (HD720). Bandwidth: Provides a bandwidth of 768 Kbps (kilobits per second) per user. Internet connection: Facility has provision of direct connected internet network or Wi-Fi in most work areas. Telephone service: Frequently requires telephone service to facilitate audio and video. 				
2 0	i. <u>Telephone ser</u>	Trequently requires telephone service to radintate additional video.			
1 0	 Bandwidth: Pro Internet conne 	tion: Can provide a very low-quality viewing resolution. vides a bandwidth of 384 Kbps per user ction: Facility has limited provision of plugin internet network or Wi-Fi vice: Very frequently requires telephone service to facilitate audio and video.			
0 0	No information is ava				
If unable to c	hoose scale level, select	☐ OTHERand indicate reason below:			
□Lack Infor □Refer que		one decision In-depth evaluation required Not applicable Whom? e-mail or phone?			

FIG. 2 Supply Scale A.13.2 for Video Conferencing Provision (continued)

- 3.1.3.1 *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.
- 3.1.4 *office*, *n*—a place, such as a room, suite, or building, in which business, clerical, or professional activities are conducted. **E631**

4. Significance and Use

4.1 Each Facility Rating Scale in this classification provides a means for estimating the level of serviceability of a building

- or facility for one topic of serviceability, and for comparing 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.



A.13.3 Simultaneous interpretation Subject Matter: provision and possible accommodation of interpretation services. Notes: For quality of video conferencing reference A.13.2 Supply scale for Video Conferencing Provision From the options below, please select the level that best describes the RATING. Rating A.13.3 Simultaneous interpretation **DEMAND** Level 9 0 Present need for interpretation facility: Operations require permanent interpretation facilities in at least one large conference or meeting room. Future need for facility: Currently provides facilities for interpretation is determined to meet known future needs. 8 0 Present need for interpretation facility: Occasional need for permanent interpretation 7 0 facilities. Can tolerate using meeting rooms with portable booths for translators. Future need for facility: There is a certain future need for permanent interpretation facilities in the building or complex. 6 0 Present need for interpretation facility; No present need for permanent interpretation **5** O facilities. Can tolerate using meeting rooms with portable booths for interpreters. Future need for facility: There is a conceivable future need for permanent interpretation facilities in the building or complex. 4 0 **Present need for interpretation facility**: No present need for permanent interpretation 3 0 facilities. Can tolerate makeshift arrangements for interpreters. Future need for facility: There is no predictable need for permanent interpretation facilities in the building or complex. 2 0 Present need for interpretation facility: No current need for interpretation facilities. 1 0 Future need for facility: There is no perceived future need for permanent interpretation facilities in the building or complex. **No** information is available. If unable to choose scale level, select \(\subseteq \text{OTHER} \) and indicate reason below:

FIG. 3 Demand Scale A.13.3 for Simultaneous Interpretation

4.4 This classification can be used to estimate the following: (I) serviceability of an existing facility for uses other than its present use; (2) the serviceability (potential) of a facility that has been planned but not yet built; and (3) the serviceability (potential) of a facility for which a remodelling has been planned.

☐ Postpone decision

☐ Refer question to someone else: Whom? e-mail or phone?

□ Lack Information

- 4.5 The use of this classification does not result in building evaluation or diagnosis. Building evaluation or diagnosis generally requires 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.

□Not applicable

5. Basis of Classification

- 5.1 The scales shown in Figs. 1-4 contain the basis for classification.
- 5.2 Instructions for the use of this classification are contained in Practice E1679.

6. Keywords

□In-depth evaluation required

6.1 building; computer center; conference center; facility; facility occupants; function; mainframe; microwave communication; office; performance; rating; rating scale; requirements; serviceability; simultaneous translation; telecommunications center; use; video teleconference

A.13.3		Simultaneous interpretation					
	From the options below	w, please select the level that best describes the REQUIREMENT.					
Requirement Level	SUPPLY	A.13.3 Simultaneous interpretation					
	PRESENT PROVISION: Permanent interpretation facilities are provided in one or two of the largest conference and meeting rooms. Space is available in several meeting rooms for portable booths. Cables a electronic equipment are installed to "supply" a conferencing provision of Level 9 based on A.13.2 Video conferencing Provision.						
		RPRETER FACILITIES: The building provides permanent facilities to a high roperly ventilated and good acoustics.					
8 0							
	PRESENT PROVISION: Permanent interpretation booths are provided in one or two of the largest conference and meeting rooms. Translators bring their own equipment and cabling. Some existing meeting rooms are suitable for portable booths for interpreters. Cables and electronic equipment are installed to "supply" a conferencing provision of Level 7 based on A.13.2 Video conferencing Provision. POTENTIAL FOR INTERPRETER FACILITIES: The building could easily be fitted up to provide permanent facilities to a high standard, at a low cost, for example, fit cable under carpet tile, enhanced ventilation, and good acoustics.						
6 0	remaderly and good acc						
5 0	No permanent accommodation exists for on-site simultaneous interpretation. Some re suitable for portable booths for interpreters. Cables and electronic equipment are inferencing provision of Level 5 based on A.13.2 Video conferencing Provision. Structure should be adequate for remote simultaneous interpretation. RPRETER FACILITIES: The building could be fitted up to provide permanent at moderate cost and difficulty to provide adequate quality; for example, cables in conduit and ceiling space, and booth ventilation the same as for meeting rooms.						
4 0							
	PRESENT PROVISION: No permanent accommodation exists for simultaneous interpretation. Some existing meeting rooms are marginally suitable for portable booths for interpreters. Cables and electronic equipment are installed to "supply" a conferencing provision of Level 3 based on A.13.2 and may not support video conferencing. Video conferencing infrastructure may not support efficient remote simultaneous interpretation resulting in the need for the use of the local cellular (mobile) telephone network. POTENTIAL FOR INTERPRETER FACILITIES: The building could be fitted up to provide technical facilities for translators, but with marginal quality, for example, surface run cables, ventilation the same as for open office, or, very costly and difficult.						
2 0							
	rooms exist, they are not installed to "supply" a cor	No permanent accommodation exists for simultaneous interpretation. If meeting suitable for portable booths for interpreters. Cables and electronic equipment are inferencing provision of Level 1 based on A.13.2 Video Conferencing Provision. The difficulty maintaining the connection for remote simultaneous interpretation requiring telephone network.					
		RPRETER FACILITIES: No capability exists to provide technical facilities for , a booth with ventilation and cables.					
0 0	No requirement.						
Select Relati	ive Importance of sc	c ale = O O O Extremely Important Important Minor Important					
		First, indicate whether Threshold Level of scale is a if there is NO Maximum or Minimum Threshold level, then select O None.					
		the Threshold Level of this scale O8 O7 O6 O5 O4 O3 O2 O1					
If unable to o		ect OTHER and indicate reason below:					
□Lack Inform	-						

FIG. 3 Supply Scale A.13.3 for Simultaneous Interpretation (continued)