



Standard Practice for Setting the Requirements for the Serviceability of a Building or Building-Related Facility^{1,2}

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INTRODUCTION

Most organizations and work groups have only a few generic types of functions, such as general purpose office functions, or office functions requiring special security provisions, receiving many visitors, or having a mix of office and “dry” laboratory functions. For each type of function, facilities are required to have a different mix of functional capabilities to support the activities of those who use, own, or manage that function.

This is a definitive procedure to (1) identify and record any variations from the generic profile of requirements for a functional type of activity and (2) present the profile of required serviceability levels for a specific occupant group.

For each topic of serviceability, the user of this practice employs a classification scale called a “requirement scale” to set the level of serviceability that is required. Each requirement scale contains several descriptions of required serviceability for that topic, classified in a range from low to high, for example, from Level 1 to Level 9.

Each such scale is used like a multiple choice questionnaire to select the required level of serviceability. Overall required serviceability is displayed as a profile of required levels (that is, not as a single number) and may be presented as a bar chart.

When comparing the requirement profile prepared by one organization with that by another organization, it is essential that both use the same set of requirement scales. Organizations may use an ASTM standard set of scales; they may create their own; or they may adapt ASTM standard classification scales for specialized, internal application. The organization forgoes the possibility of external comparison in the latter two cases.

1. Scope

1.1 This practice is a definitive procedure for setting requirements for the serviceability of a building or building-related facility.

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

1.3 This practice can be used for setting the profile of serviceability requirements of an occupant group in an existing building or building-related facility or of a group planning to move and looking at new accommodations to rent, buy, or build.

1.4 This practice can be used for setting the profile of serviceability requirements of an owner, facility manager, lender, or other investor.

1.5 The process of creating or adapting a set of classifications for establishing the levels of serviceability required by an occupant group or organization is outside the scope of the practice.

1.6 This practice contains the following information, in the sections indicated:

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2. Referenced Documents

2.1 ASTM Standards:

- E 631 Terminology of Building Constructions³
- E 632 Practice for Developing Accelerated Tests to Aid Prediction of the Service Life of Building Components and Materials⁴
- E 917 Practice for Measuring Life-Cycle Costs of Buildings and Building Systems³
- E 1334 Practice for Rating Serviceability of a Building or Building-Related Facility³
- E 1480 Terminology of Facility Management (Building Related)³

2.2 ISO Documents:⁵

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

3. Terminology

3.1 Definitions:

3.1.1 Unless otherwise indicated, the term “building” is used in this practice to encompass building, building-related facility, and proposed design for a building. The term “facility” is used to mean building-related facility.

3.1.2 Use of the singular in this practice does not exclude the plural (and vice versa) when the sense allows.

3.1.3 For standard definitions of additional terms applicable to this practice, see Terminologies E 631 and E 1480.

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

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

3.1.5 *building, n*—a shelter comprising a partially or totally enclosed space, erected by means of a planned process of forming and combining materials. Compare with *facility*.
(E 631)

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

3.1.7 *facility, n*—a physical setting used to serve a specific purpose. Compare with *building*.

3.1.7.1 *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.
(E 631)

3.1.8 *facility performance, n*—the behavior in service of a facility for a specified use.

3.1.8.1 *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.
(E 631)

3.1.9 *facility serviceability, n*—the capability of a facility to perform the function(s) for which it is designed, used, or required to be used.
(E 631)

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

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

3.1.11.1 *Discussion*—A feature may be a physical feature or design feature, or both. 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.

3.1.12 *functionality, adj—of a building*, being suitable for a particular use or function.
(E 1480)

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

3.1.13.1 *Discussion*—In larger facilities, the senior person who is at a facility full time to manage its operation is unlikely to be an appropriate person to facilitate the setting of required levels of serviceability by the occupant because of that role, but he may be well qualified and appropriate to participate as a knowledgeable person in the process of rating that facility.

3.1.14 *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.

3.1.15 *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.

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

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

3.1.17 *rating process, n*—the process of determining the serviceability of a facility for a specified purpose.
(E 1480)

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

3.1.19 *requirement scale, n—for a topic of facility serviceability*, a set of descriptions of requirements for serviceability in which each description has been selected to indicate a specific level of serviceability on a scale from the lowest to the highest level likely to be encountered.

3.1.20 *serviceability*—see *facility serviceability*.

³ Annual Book of ASTM Standards, Vol 04.11.

⁴ Annual Book of ASTM Standards, Vol 14.02.

⁵ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

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

3.1.21.1 *Discussion*—At any level of serviceability, a topic can be expressed in two ways: a statement of a requirement in the normal language of occupants or owners; and a statement in technical performance language describing the combination of features that meet that requirement. Each statement is a translation of the other. Taken together, several related topics typically comprise one aspect of serviceability.

3.2 Descriptions of Terms Specific to This Standard:

3.2.1 *generic requirements package, n*—a set of statements giving the typical requirements for serviceability of a building or building-related facility, for one generic type of functions or an occupant group or organization, together with information concerning such occupants' typical functions and operations.

3.2.1.1 *Discussion*—The information is typically presented in the following ways: a text profile describing the typical occupant organization for this functional type of facility; a profile of required levels of serviceability, illustrated as a set of bar charts; and a numeric profile of occupant space and quantity requirements.

3.2.2 *numeric profile, n*—an occupant's space and quantity requirements, displayed in spreadsheet or table format.

4. Summary of Practice

4.1 This practice is summarized in Fig. 1, which provides a flowchart for setting the levels of serviceability required by an occupant group or organization.

4.2 The user of this practice may choose among the following options for setting the levels of serviceability required:

4.2.1 Use an ASTM standard set of classifications.

4.2.2 Create a new set of classifications or adapt an existing set of serviceability requirement scales, with rules for adjustment, consistent with an organization's own internal standards.

NOTE 1—Serviceability requirement levels set with such internal stan-

dards would not be directly comparable to requirements set using an ASTM standard classification.

4.2.3 Support the development of a new standard classification through the ASTM voluntary consensus process.

5. Significance and Use

5.1 This practice can be applied to the requirements for serviceability of many functional occupant groups, provided that an appropriate set of requirement classifications for each type has been established.

5.2 This practice can be used to ascertain the requirements of a group or organization at the time when the group (1) needs to ascertain the serviceability of the facility it occupies; (2) is contemplating a move and needs to assess the relative capability of several existing facilities to perform as required, before deciding to rent, lease, or buy; (3) needs to compare its requirements to the serviceability of a facility that is being planned, or is designed but is not yet built; (4) is planning to remodel or rehabilitate the space it occupies and needs to establish the required level of serviceability that the remodeled or rehabilitated facility will have to meet.

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

5.4 This practice can be used by any individual with sufficient organizational, functional, and technical knowledge to act as an informed facilitator. The individual charged with the task of leading the process of establishing the serviceability requirements of an occupant group or organization needs basic facilitation and interviewing skills.

5.5 This practice provides a means of setting typical required serviceability levels for any serviceability topic, and of comparing the required serviceability levels for one occupant group or organization against levels set by others.

5.6 This practice provides a means for organizations to set a profile of requirements for serviceability for each generic type of occupant group within that organization.

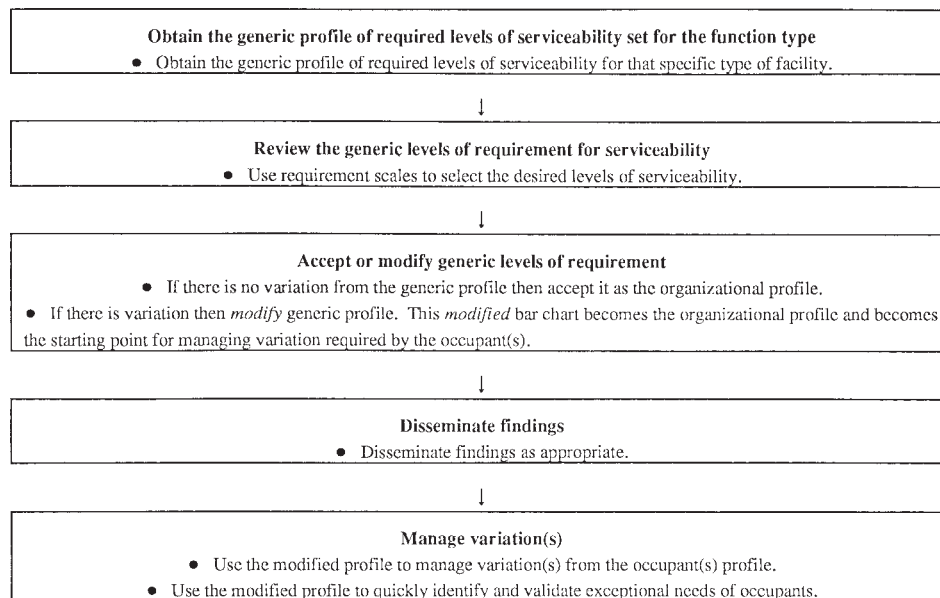


FIG. 1 Flowchart for Setting a Profile of Serviceability Requirements (for a Building or Building-Related Facility)

5.6.1 This practice enables an organization to compare an occupant's profile to a generic profile rapidly.

5.6.2 This practice provides a means for organizations to identify and validate exceptional needs of their occupants rapidly.

5.6.3 This practice provides a means of comparing the requirement levels of various occupant groups within an organization.

5.7 This practice provides a method for comparing how well an occupant's requirements for serviceability match the capabilities of different buildings or facilities, despite differences such as location, structure, mechanical systems, age, and building shape.

5.8 This practice provides a framework that allows design professionals and facility managers to select the most cost-effective means of providing a facility that will best provide the required levels of serviceability.

5.9 This practice helps the occupants to understand how various serviceability requirements interact and impact on the overall functionality of a building or building-related facility and on its level of serviceability for each topic.

5.10 By providing a direct link between the features of a facility and its level of serviceability on any topic, the descriptions of each level clarify how various subsystems and materials used in a facility interact to provide that level of serviceability.

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 The steps to be followed in setting the requirements of an occupant group for the serviceability of a building are summarized in Fig. 1. The procedure describes the steps an organization will take to set organization-wide requirements for a generic type of function using the set of requirements contained in a generic requirements package.

6.1.1 Once an organization has set the organizational levels required for a function and established its profile, an occupant group in that organization may use the same procedure to set their occupant requirements that the organization has used to set the organizational requirements, using the organizational profile in 6.1.3 as their starting point.

6.1.2 Alternatively, an occupant group may set its profile of requirements without the intermediate step of setting organizational levels of requirement.

6.1.3 Obtain the generic requirements package for the specific type of function.

6.1.4 Use the generic set of requirements and bar chart profile as the starting point in development of requirements for a specific organization.

6.1.5 Ascertain the extent to which data gathering will be needed to set any required variation from the generic requirements and profile.

6.1.5.1 While requirements can be set by one individual, if that person has a thorough knowledge of the organization's functional requirements, the preferred method is to arrange focus group interviews with individuals who have the most

relevant understanding of how the organization functions and what it needs to function.

6.1.5.2 Approximately one day is required for a focus group to set requirement levels for all topics in a set of requirement scales.

6.1.5.3 If a focus group(s) is required, provide each participant with the generic bar chart profile and a copy of each of the requirement scales.

6.1.5.4 Ensure that participants have an accurate understanding of the generic requirement scales and generic bar chart profile before determining or deciding whether any variation(s) is required.

6.1.6 Set the levels of requirement for serviceability. Use the requirement scales to select the desired levels of serviceability.

6.1.6.1 Refer to Appendix X1 for an example of a requirement scale. First read the introductory material for each group of scales. Then turn to the first topic and read the requirement scale.

6.1.6.2 Read the text of the requirement for Level 5. If Level 5 is a good description of what level of serviceability is required, scan the text for Levels 7 and 3 to be certain. If the description for Level 5 is still appropriate, black-in the little square next to the large Number 5. If not certain, scan the text for Levels 9 and 1. If one of these levels is a good description of which level of serviceability is required, black-in the little square next to that number.

6.1.6.3 If the required serviceability is a mix of statements from two or more levels, mark or underline the portions of text that apply from each level, and, if appropriate, select and black-in an in-between level, for example Level 2, 4, 6, or 8.

6.1.6.4 If Level 5 is not the level required, or if there is some special factor that makes a requirement particularly important, explain briefly in the "notes" area at the bottom of each scale.

6.1.6.5 If it is difficult to decide which level is required because some information is not available, or some assumptions have to be made, then explain briefly which assumptions were made or which information is missing by writing in the "notes" area at the bottom of each scale.

6.1.6.6 Check off the appropriate items in the two-layer box that appears below each scale.

(1) The relative importance of a requirement is indicated by checking one of the three boxes: "exceptionally important", "important", or "minor importance". Check one of these topics unless the topic is not applicable or not required.

(2) If there is a minimum acceptable threshold level for the topic, check the box "minimum (threshold) = " and write in what that level is. The minimum acceptable threshold levels need *not* be the same as the requirement level. How high or low this minimum acceptable threshold level is will depend on which options exist. If an assumption is made concerning other options, or concerning possible tradeoffs, indicate the assumptions in the "notes" space at the bottom of the page.

(3) If the topic is not applicable or not required, check the box "NA or NR".

6.1.6.7 Record the results from the focus group(s), and produce a draft of the organization's bar chart profile.

6.1.6.8 If there is no variation from the generic levels, simply adopt the generic bar chart profile. If there is variation between the responses from the focus group(s), obtain consensus on the variations from the participants. Once consensus is obtained, modify the generic bar chart profile to include the variation(s). This modified profile becomes the organization's bar chart profile of requirements.

6.1.6.9 Disseminate the findings as appropriate.

6.2 Management of Variation(s):

6.2.1 The modified profile will show variation(s) from the generic profile. This modified profile is used to manage variation from occupants of that organization.

6.2.2 The modified profile allows the organization to identify and validate exceptional needs of its occupants rapidly.

6.2.3 The modified profile also provides a means of comparing the requirement levels of various occupants within the organization.

7. Keywords

7.1 building; facility; facility occupants; function; generic requirements package; office; performance; rating; rating scale; requirements; serviceability; use

APPENDIXES

(Nonmandatory Information)

X1. EXAMPLE OF A PAIR OF SERVICEABILITY SCALES FOR ONE TOPIC

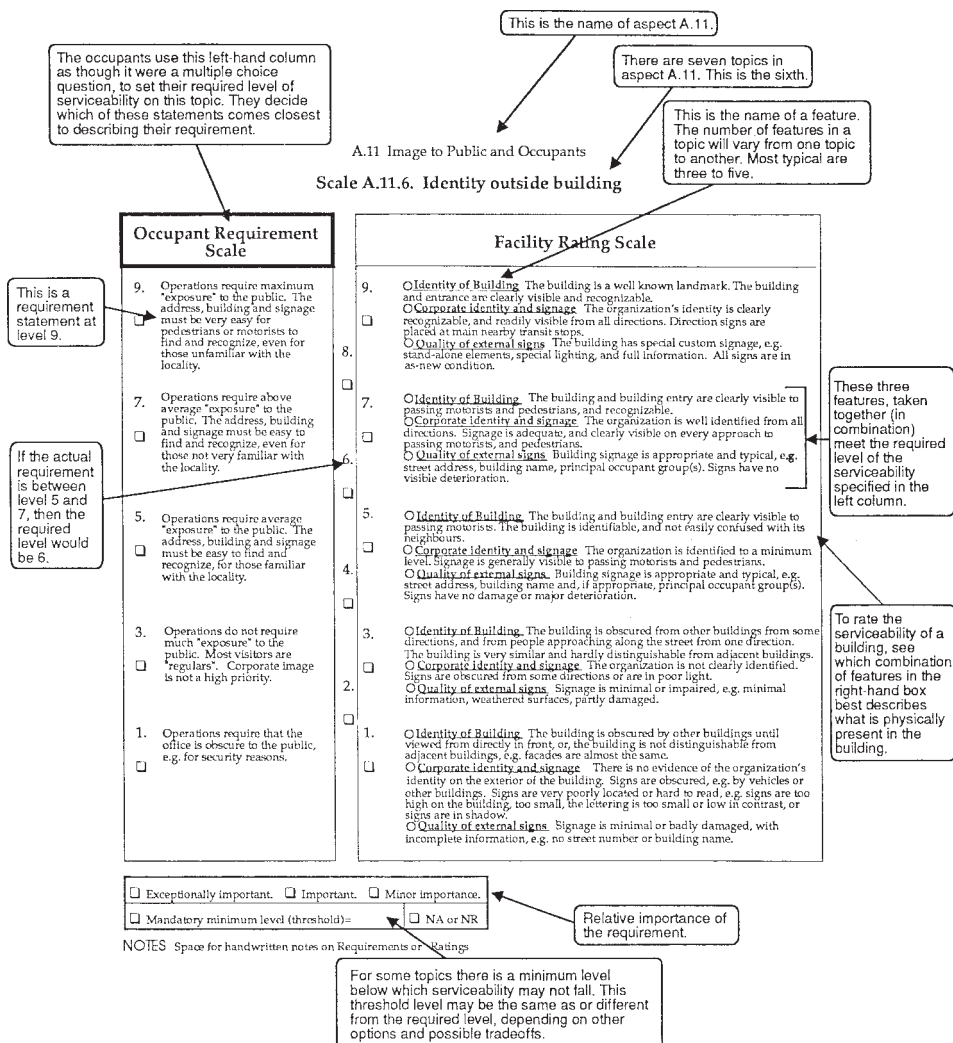
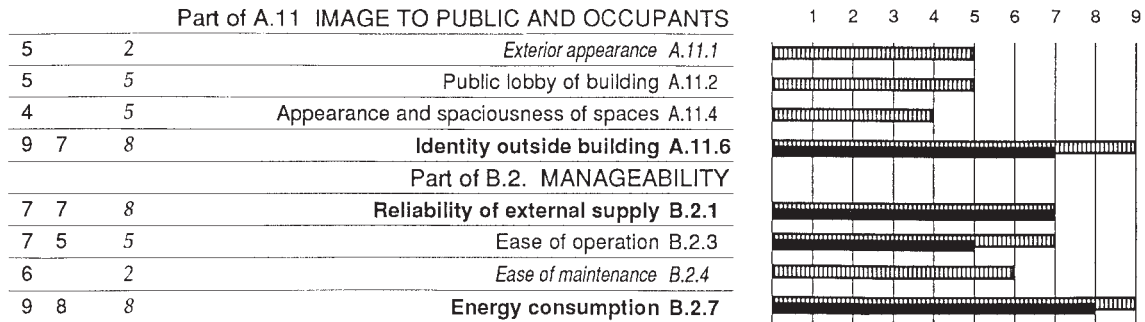


FIG. X1.1 Example of a Pair of Serviceability Scales

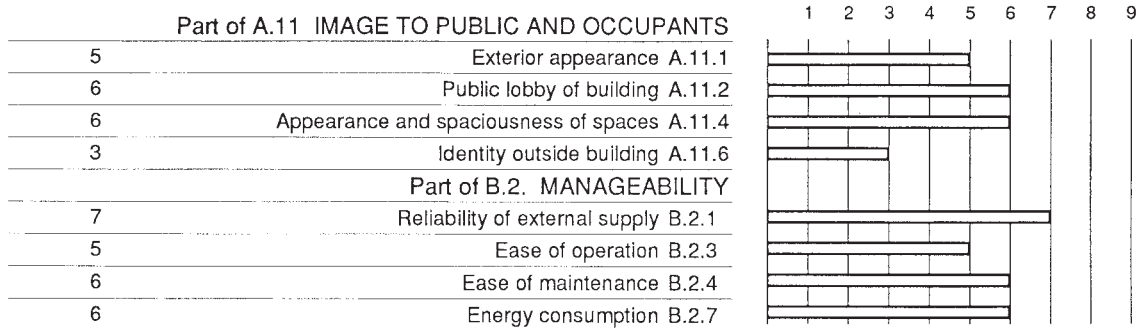
X2. EXAMPLE OF PART OF A PAIR OF MATCHING PROFILES PRESENTED AS BAR CHARTS

Requirement
Threshold
Rating
Importance

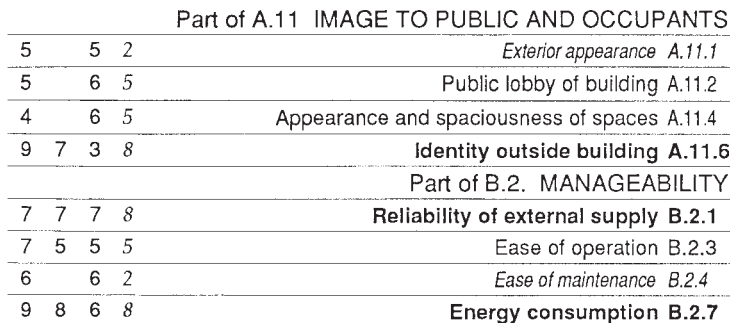
The first example shows only excerpts from the requirements profile (demand). The second example shows only excerpts from the serviceability rating (supply). In the third example, the rating is superimposed on the requirement, to see how well the facility meets that requirement.



1. Part of required levels of functionality, with minimum threshold levels in black



2. Part of a serviceability rating of a facility.



3. Comparing the facility rating to the required functionality.

For text above, relative importance is indicated as follows:
Extremely important=7-9 Important=4-6 Minor importance=1-3

Legend for the bar charts:
Requirement = striped. Threshold = black. Rating = white

FIG. X2.1 Example: Part of a Requirement Profile Presented as a Bar Chart and Compared to a Rating Profile

X3. EXAMPLE: TITLES OF SERVICEABILITY ASPECTS, TOPICS, AND FEATURES

A.2 Meetings and Group Effectiveness = <i>an aspect</i>	A.5 Typical Office Information Technology	A.6 Change and Churn by Occupants
<p>A.2.1 Meeting and conference rooms = <i>a topic</i></p> <ol style="list-style-type: none"> 1. Mix, quantity = <i>a feature</i> 2. Floorplate and access 3. Acoustic control 4. Environment 5. Fixtures and fixed equipment <p>A.2.2 Informal meetings and interaction</p> <ol style="list-style-type: none"> 1. Internal circulation node(s) 2. Entrance node(s) 3. Pause area(s) 4. Food and public facilities <p>A.2.3 Group layout and territory</p> <ol style="list-style-type: none"> 1. Layout for efficient group work 2. Layout for various group sizes 3. Environmental control 4. Separation 5. Legibility of boundaries and territory <p>A.2.4 Group workrooms</p> <ol style="list-style-type: none"> 1. Group or project workroom(s) 2. Acoustic control for information security 3. Environment 4. Fixtures and fixed equipment 5. Access from individual workstations 	<p>A.5.1 Office computers and related equipment</p> <ol style="list-style-type: none"> 1. Zones for high density of equipment 2. HVAC services 3. Illumination 4. Acoustic control <p>A.5.2 Power at workplace</p> <ol style="list-style-type: none"> 1. Power distribution 2. Plug-in points per workplace 3. Uninterruptible power supply (UPS) <p>A.5.3 Building power</p> <ol style="list-style-type: none"> 1. Present capacity 2. Potential increase 3. Reliability and quality of supply <p>A.5.4 Data and telephone systems</p> <ol style="list-style-type: none"> 1. Distribution 2. Future capacity 3. Shielding of data cables 4. Local area network 5. Rooms for data and telephone connections <p>A.5.5 Cable plant</p> <ol style="list-style-type: none"> 1. Unshielded twisted pair 2. Distance to cable connection rooms 3. Coaxial cable 4. Fibre optic cable <p>A.5.6 Cooling</p> <ol style="list-style-type: none"> 1. Increased capacity 	<p>A.6.1 Disruption due to physical change</p> <ol style="list-style-type: none"> 1. Disruption during relocation 2. Disruption to neighbouring occupants <p>A.6.2 Illumination, HVAC and sprinklers</p> <ol style="list-style-type: none"> 1. Relocating light fixtures 2. Relocating air diffusers 3. Special air exhaust 4. Relocating sprinkler heads <p>A.6.3 Minor changes to layout</p> <ol style="list-style-type: none"> 1. Changes in workplace layouts 2. Consequences of minor changes <p>A.6.4 Partition wall relocations</p> <ol style="list-style-type: none"> 1. Floor to ceiling partition walls 2. Extent of salvage <p>A.6.5 Lead time for facilities group</p> <ol style="list-style-type: none"> 1. Planning major realignment 2. Ordering and installation

FIG. X3.1 Titles of Serviceability Aspects, Topics, and Features

X4. EXAMPLE OF A LIST OF COMMON GENERIC TYPES OF FUNCTION

In offices the most common generic types of functions are:

- **Basic general**, such as many headquarters, regional offices, and head offices of strategic business units (SBUs).
- **Much public contact**, such as sales offices, client or customer service offices, and government and corporate employment centres.
- **Shared conference and training**, such as the conference centres in some of the largest corporate and government buildings.
- **Basic secure**, such as regional offices where cheques are written or the offices where petroleum or mining geologists analyze exploration data, or where people work on product development or other confidential or private information.
- **Secure and prestige**, such as offices of some law firms, special government commissions, and some offices of the Finance or Treasury Department, etc.
- **Quasi-judicial and courts**, such as legislative hearings, commissions that hold public hearings, Federal Courts, Tax Courts, and Citizenship Courts.

In addition to those six types of functions which are normally thought of as offices, many large office organizations also need **production and warehouse**, or **storage and warehouse**, or **food service**, and some have all three. Some, such as banks, and even a few government departments, also have **commercial retail**.

- **Production and warehouse**, such as the portion of a regional office where the machines for cheque writing and envelope stuffing are installed, and the portion of bulk mailings are prepared and mailed, and the storage areas of paper, envelopes, and other materials required for each of these facilities.
- **Storage and warehouse**, where office supplies, surplus furniture, and other property is stored pending use or disposition.
- **Food and beverage service**, such as cafeterias and restaurants, and their kitchens and refrigerated storage.
- **Commercial retail**, such as the shops on the ground floor of an office building, whether they open to the street, to the building lobby, or to an interior commercial shopping mall.

FIG. X4.1 List of Common Generic Types of Function

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