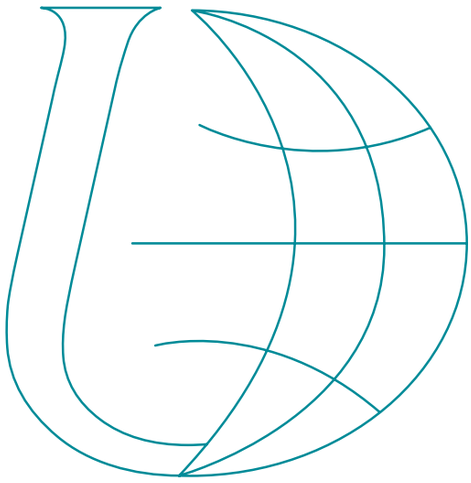
CANADIAN HUMAN RIGHTS COMMISSION



International Best Practices in Universal Design

A Global Review

March 2006

In Partnership with:

Agriculture and Agri-Food Canada
Human Resources and Social Development Canada
Treasury Board of Canada
Handisam, The Swedish Agency for Disability Policy
National Disability Authority of Ireland
Rehabilitation International

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August 2007

Canada

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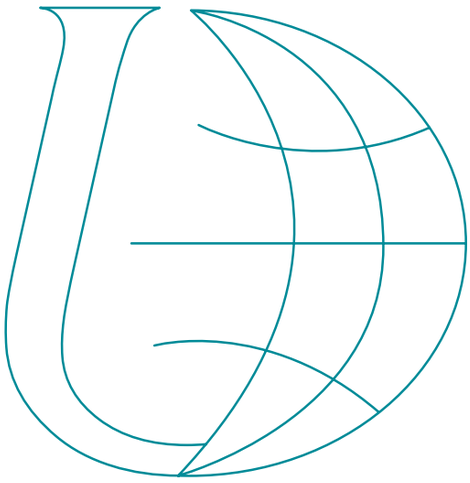

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Art work courtesy of Philip Dion

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1] INTRODUCTION AND BACKGROUND

In 2000, the first comparative study of accessibility criteria in codes and standards from around the world was published. *The International Best Practices in Universal Design: A Comparative Study* was prepared by Betty Dion Enterprises Ltd. for Agriculture and Agri-Food Canada. The study compared the Canadian B651-M95 Barrier-Free Design Standard, the National Building Code of Canada with other international codes and standards. This research compared accessibility codes and standards from the United Kingdom, the U.S., China, Japan, Australia, the Nordic countries and Fiji. The study examined selected national accessibility codes and standards for both buildings and landscapes, in order to determine best practices based upon universal design principles. In addition, examples of best practices and product information, cost and availability was included.

This study has been widely distributed to organizations of people with disabilities, governments, code developers and standards organizations in over 40 countries and has been well received. It has triggered an interest in a second broader study of accessibility design codes, standards and practices.

The number of people worldwide living with at least one disability is exponentially increasing. This increase is the result of a multitude of factors; national disasters, standards of health care are increasing, the survival rates of infants born with a disability and new medical procedures are saving people with traumatic injuries. As the population is aging and medical technology improves, an increasing percentage of the worldwide population are living independently with an accompanying growth in the number of people.

ICTA Global

The International Commission on Technology and Accessibility, or ICTA Global, is a commission under the auspices of Rehabilitation International, an international not for profit non-governmental organization. ICTA is concerned with all areas of accessibility: primarily habitat, transportation, and communications, assistive technologies and accessible web design. The International Commission on Technology and Accessibility (ICTA) Global plays a leadership role in supporting and promoting "Universal Design – Inclusive Design – Design for All" around the world.

Best Practices

Best practices in universal design is defined as building practices and procedures that comply with universal design principles and provide affordable design practices that meet the needs of the widest possible range of people who use of facility.

Not all best practices apply in the same situation and therefore all technical specifications must be carefully considered and discussed together with local authorities, architects and building owners. One best practice cannot always be applicable to people in different countries around the world. That is the reason for the development of local standards that respect and recognize local conditions, both geographic and political. These "best practices" are only a guideline that should be used in conjunction with local expertise. These are provided to enhance public understanding of accessibility issues, and where relevant, they may be used as resources in the development of other national or local standards.

This document is not intended as an international standard but rather as a compilation of existing technical specifications. At the international level, the International Standards Organization (ISO) is working to develop ISO TC 59/SC 16 *Accessibility and Usability of the Built Environment*.

Process and Methodology

The ambitious goal of this document is to compare accessibility codes and standards from around the world to provide a compendium of research data and insight into the latest trends in accessible design.

Building code specifications provide the mandatory minimum technical specifications for the built environment. In some cases, the minimum code requirements are supplemented by comments and suggestions and voluntary accessibility standards which provide a higher standard for architects and builders to achieve.

Universal Design, Design for All and Inclusive Design all provide guiding principles that promote design that considers the needs of everyone. These principles seek to create an environment that is usable by the greatest number of users, regardless of ability. Implementing these design principles results in a higher level of performance than the requirements found in building codes and standards.

Code Selection and Review

Only half of the countries around the work have developed accessibility criteria in their building codes and standards, as reported by the Special Rapporteur to the United Nations. While some countries have well developed technical specifications, others are still introducing accessibility into their building codes.

To ensure that this document would be representative of all regions of the world, a geographic representation of both developed and developing countries was selected.

In some jurisdictions there are multiple documents which cover accessibility requirements for the built environment. Accessibility requirements may be integrated in the national building code of some countries, while in others, there may be a separate accessibility standard which is a requirement in selected jurisdictions.

The most current accessibility code or standard available for the selected country was examined, utilizing the mandatory code to facilitate a fair comparison of the minimum requirements for each country. Only the adopted standard or code was selected. All of the documents used in this comparison study are available to the public, either through contacting the code or standard regulatory authority or via the internet.

Each code or standard was thoroughly reviewed and analyzed for inclusion in the tables representing thirty one design elements. If multiple dimensions were provided, the mandatory minimum was selected to ensure a fair comparison of common elements.

The Expert Panel

The Expert Panel is comprised of leading internationally recognized experts in the field of universal design and the built environment. These individuals have participated in the development of both domestic and international accessibility codes and standards, and are experts in designing for the wide range of human functioning, including people with disabilities. They represent experts in both the developed and developing regions of the world.

The raw data was sent to the Expert Panel for analysis and they were invited to select the best practice of the technical specifications from the selected countries. The best practice was not necessarily the largest dimension, as considerations such as cost, construction and implementation were all considerations. Determination of best universal design practices was based upon a process of consensus. Results from the Expert Panel were aggregated and compiled to complete the task of determining best practices.

Expert Panel

Eduardo Álvarez

Eduardo Álvarez is the Chair of the International Organization for Standardization Technical Committee ISO TC 59/SC 16 *Accessibility and Usability of the Built Environment*. The Technical Secretariat has been held by AENOR (Spain Standards Institute) since its creation in 2001.

He is the coordinator of the Technical Committee CT143 Accessibility of the Pan American Standards Commission (COPANT), Technical Secretariat held by UNIT (Uruguay Standards Institute), since its creation in 1992. He is the past president of ICTA-LA (RI International Commission of Technology and Accessibility – Latin America) 2000-2004.

Eduardo is a professor and co-author of the Basic Course to Accessibility of the "Real Patronato sobre Discapacidad de España" since 1989. He has presented courses on accessibility throughout South and Central America (Brazil, Chile, México, Argentina, Venezuela and Uruguay among many others).

Eduardo is a Head Member of AyA (Accessibility and Architecture) International Consultant integrated by professionals from Spain, Brazil, Colombia and Uruguay. He is a consultant architect of the Inter-American Development Bank and completed work with the World Bank and the Pan American Health Organization.

Andrés Balcázar de la Cruz

Andrés Balcázar de la Cruz is an architect who has been involved in the disability movement since 1995. He is an independent accessibility consultant and has conducted accessibility audits for several private and governmental facilities, including Mexico's Congress Building.

His latest works include: A study of the situation of school accessibility in Mexico and the development of accessibility guidelines for the Ministry of Public Education. He has also been working on a Diagnostic on the Situation and Monitoring of Human Rights of Persons with Disabilities in Mexico for the Japan International Cooperation Agency (JICA).

Andrés has collaborated with Tom Rickert from Access Exchange International translating the AEI Newsletter, and translating into Spanish the accessibility guidelines for the Colombian Bus Rapid Transit System. He has also been an international speaker about accessibility and universal design.

Pierre Legault

Pierre Legault is a registered engineer in several Canadian provinces. He has been involved with accessibility and related activities for persons with disabilities since the early 1990's, and has extensive experience in institutional and industrial projects.

Pierre has considerable experience dealing with both policy development and the technical implementation of issues related to accessibility in the built environment. He was the Chair of the Canadian Federal Government's Treasury Board Committee responsible for updating the 1993 edition of the Federal Accessibility Policy for employees with disabilities and was the federal project lead in the development of the 2000 Best Practices Study on Universal Design.

Pierre is currently with the Canadian Department of Agriculture and Agri-Food Canada as the coordinator for accessibility retrofits and universal design projects.

Elisabet Svensson

Elisabet Svensson graduated as an architect from Lund Institute of Technology at Lund University in 1970. She was employed from 1970 to 1975 as a consulting architect and from 1975 to 1977 at a governmental institute for building research.

She has worked with accessibility issues since 1977; from 1977 to 2001 at the Swedish Handicap Institute, from 2002 to 2005 at the National Accessibility Centre at the Office of the Disability Ombudsman, and since 2006 at Handisam (the Agency for Handicap policy).

Elisabet is the author of several books and manuals about accessibility, including the handbook *Bygg ikapp handikapp* (published 1989, 2nd revision 2001) and *Museum för alla – I Norden* (published 2000). She is the co-author to the *Guidelines for an Accessible Public Administration* (published 2003) and participated in the European project PRESCO (Practical Recommendation on Sustainable Constructions).

Elisabet is a member of EIDD Sweden (European Institute for design and disability), the network ECA (European Concept of Accessibility), and a member of ISO TC 59/SC 16 Standard on the Accessibility and Usability of Built Environment.

Riadh R. Tappuni, Ph.D. Arch

Riadh Tappuni is currently the Chief, Social Development Division, UN Economic and Social Commission for Western Asia. In 1994 he was delegated to advise on the reconstruction of downtown Beirut, which resulted in devising standards, applying them and publishing a manual on barrier free design. In 1999 he undertook a one year assignment as the housing reconstruction coordinator in Western Kosovo.

In addition to a long career in international development, Riadh Tappuni has since the early nineties, promoted the importance of the social dimension in urban planning and architecture, addressing the crucial link between social development and urban design. Leading a program on urban development at UN-ESCWA, Mr. Tappuni assists countries of the region in devising policies for the development of cities.

Mr. Tappuni's publications have recently focused on urban inclusion as a rationale for the development of cities, especially those suffering from conflict. He presently coordinates UNESCWA post conflict reconstruction projects. Published works include: *The Reconstruction of South Lebanon, Assessing Needs and Defining Priorities*, *Planning for Accessibility for the Disabled in Palestine*, in a monograph on *Urban and Rural Reconstruction in Palestine: Issues, Options, Policies and Strategies, Access for the Disabled in the Urban Environment*.

C. J. Walsh

By profession an architect, fire engineer and technical controller, C.J.Walsh is a Consultant Architect with Sustainable Design International Ltd. – a multi-disciplinary design, research and consultancy practice based in Ireland, Italy and Turkey.

In 2003, European Year of People with Disabilities, he was a Member of the European Union Expert Group on Accessibility. The following year, 2004, he was a Member of the European Union Working Group of Experts on Urban Environment Research. He is an active and long-standing Member of International Council for Research and Innovation in Building and Construction (CIB) Working Commission 14: Fire.

He is author of the 1998 *European Charter on Sustainable Design and Construction*, and the 2004 *Rio de Janeiro Declaration on Sustainable Social Development, Disability and Ageing*.

Glossary of terms

Access Aisle – Clear, level area parallel to a parking space for people with mobility disabilities to get in or out of a car or van.

Accessible Parking – Parking spaces which are useable by people with mobility and stamina limitations.

Accessible Route – A continuous, unobstructed path connecting all accessible elements and spaces of a building or facility.

Adaptable Design – Easily renovated to create a barrier-free environment.

Areas of Refuge – An area separate from the general floor area by a fire separation having a fire-resistance rating at least equal to that required for an exit, that is smoke protected and served by an exit or a firefighters elevator. It should also be a size that allows a minimum floor space of 850 x 1200 mm per non-ambulatory occupant, with no fewer than 2 such spaces.

Assistive Device – A device assists users in accomplishing day-to-day functions. For example: a wheelchair, walker, cane.

Assistive Listening Systems – Improves sound reception for persons with hearing disabilities by providing amplification while blocking out unwanted background noise.

Barrier Free-Design – Creating environments that are approachable and useable by people with disabilities.

Bollard – Usually a 900 mm high post to mark pedestrian path from vehicular traffic.

Clear Width – Horizontal opening with no obstructions.

Curb Ramps – Sloped area cut into curb.

Detectable Indicator/Directional Indicator – A tactile surface feature built in or applied to walking surfaces to act as a wayfinding guide or orientation cue for people who are visually impaired. (Often a paver insert composed of tactile raised lines applied in the direction of pedestrian travel.)

Detectable Warning – A standardized tactile surface feature built in or applied to walking surfaces or other elements to warn visually impaired people of upcoming hazards. (Often a paver insert composed of tactile raised truncated domes, applied perpendicular to the hazard.)

Edge Protection – To ensure that the wheels of a wheelchair do not veer off a ramp or landing when the sides of ramps and landings are not at grade or adjacent to a wall.

Flare – A sloped surface that flanks a curb ramp and provides a graded transition between the ramp and the sidewalk. Flares bridge differences in elevation and are intended to prevent ambulatory pedestrians from tripping. Flares are not considered part of the accessible route.

Grade – The slope parallel to the direction of travel that is calculated by dividing the vertical change in elevation by the horizontal distance covered.

Guard – Protective barrier to prevent accidental falls at openings in floors and at the open sides of stairs, landings, balconies, mezzanines and ramps. Handrail supports often act as guards.

Infrared System – Specialized sound system that converts sound into infrared light; the light is reconverted into sound by a portable receiver.

Luminance Contrast – Occurs when there is not only a contrast in colour between a surface and it's background, but there is a luminance factor to the surface which provides a slightly reflective quality, further highlighting an area from the background.

Multiple Leaf Doors – Two or more doors separated only by a door frame. Each door is called a leaf.

Nosing – Overhanging edge of a stair tread, usually half rounded.

Obstacle – An object that limits the vertical passage space, protrudes into the circulation route, or reduces the clearance width of a sidewalk or trail.

Principal Entrance – An entrance used most frequently by the public and building occupants.

Ramp – Any slope greater than 1:20 (5%).

Riser – Vertical portion of a step.

Run – Horizontal distance of a stair or ramp.

Roll-in Shower – To be used while staying in a wheelchair, standing, or sitting (by adding a seat to the shower stall).

Slope – The slope of a ramp is expressed as the height to the length (i.e. 1:16 indicates for each 1 m in height, there is 16 m in length).

Tactile Cuing/Warning – A change in surface condition that provides a tactile cue to alert pedestrians of a hazardous situation.

Tactile Signs – Signs having raised letters which are interpreted or read by tracing with fingers over the surfaces.

Text Telephone or Teletypewriter (TT/TTY) – Incorporates a keyboard that is connected to the telephone to allow communication through typed messages.

Tread – Horizontal surface of a step.

Truncated Domes – Small domes with flattened tops that are used as tactile detectable warning indicators at transit platforms, vertical drops and curb edges.

Universal Design – Concept used to create environments that respond to the widest range of the population possible.

Visual Warnings – The use of contrasting surface colours to indicate a change in environment, such as at a curb ramp where the sidewalk changes to the street.

Wayfinding – Finding one's way to a destination.

Winder – Tread wider at one end than the other, as in circular stairs.

Acronyms and Documents

ADAAG – *Americans with Disabilities Act Accessibility Guidelines (ADAAG) and Architectural Barrier Act (ABA) Accessibility Guidelines*. U.S. Architectural and Transportation Barriers Compliance Board. (Access Board).

Australia – *Design for Access and Mobility. Part 1: General Requirements for Access – New Building Work. AS 1428.1 – 2001*. and *Design for Access and Mobility. Part 2: Enhanced and Additional Requirements – Buildings and Facilities. AS 1428.2 – 1992*. Council of Standards Australia.

Bangladesh – *Bangladesh National Building Code*. Housing and Building Research Institute and Bangladesh Standards and Testing Institute.

CSA – *CAN/CSA B651-04, Accessible Design for the Built Environment*. Canadian Standards Association.

NBC – *National Building Code of Canada*. National Research Council.

Ireland – *Building Regulations: Technical Guidance Document M – Access for People with Disabilities*. Ireland.

Lebanon UN – *Accessibility for the Disabled: A Design Manual for a Barrier Free Environment*. Ministry of Social Affairs; National Committee for the Disabled and United Nations Economic and Social Commission for Western Asia (ESCWA).

London AFG – *Accessible Facilities Guidelines*. City of London, ON, Canada.

Malaysia – *Malaysian Code of Practice on the Accessibility and Mobility of Persons with Disabilities*. Malaysia.

Mexico – *Recomendaciones de Accesibilidad*. Oficina de Representación para la Promoción e Integración Social para Personas con Discapacidad, de la Presidencia de la República.

Philippines – *Implementing Rules and Regulations as Amended of Batas Pambansa Bilang 344 (Accessibility Law): An Act to Enhance the Mobility of Disabled Persons by Requiring Certain Buildings, Institutions, Establishments, and Other Public Utilities To Install Facilities and Other Devices".* Department of Public Works and Highways and the Department of Transportation and Communications.

Singapore – *Code on Barrier-Free Accessibility in Buildings*. (ver. 1.0). Building Plan Department, Building and Construction Authority.

Spain – *Guía técnica de accesibilidad en la edificación 2001*. Ministerio de Fomento, Centro de Publicaciones.

South Africa – *South Africa Standard – Code of Practice – Accessibility of Buildings to Disabled Persons, SABS 0246 Edition 1, and South African Standard – Code of Practice for the Application of the National Building Regulations, SABS 0400-1990, first revision*. The Council of the South African Bureau of Standards.

Sweden – *Building Regulation. Mandatory Provisions and General Recommendations*. The Swedish Board of Housing, Building and Planning.

Uruguay – *GUIA UNIT 200:2004 Accesibilidad de las personas al entorno edificado – Niveles de accesibilidad recomendados*. Instituto Uruguayo de Normas Técnicas, Comité Especializado de Normalización, sobre Accesibilidad al Medio Físico.

2] BUILDING ELEMENTS

ANTHROPOMETRICS

Anthropometrics provide a range of "building blocks" of specific dimensions detailed for people with various mobility devices. These building blocks vary considerably, for example, the specification for the eye level of persons seated in a wheelchair (3) ranges from 1000 mm (Spain) to 1330 mm (Lebanon), quite a wide range. Research is increasingly demonstrating the wide range in the length of different types of mobility devices.

The seat height of a person sitting in a wheelchair (5) is in the range of 450 - 500 mm (Lebanon) with armrests (8) ranging between 660 to 760 mm. **The length of a wheelchair (9) as specified by Canada, Spain and Singapore is 1200 mm with Mexico and the Philippines providing a longer dimension, while the Canada AFG Guideline specifies 1370 mm, as they include the length of both scooters and power wheelchairs in this dimension.**

The minimum clear floor area of a manual wheelchair (10) ranges from 700 x 1200 mm in Spain to 760 x 1370 mm in the AFG Guideline, while the Expert Panel judges the best practice to be 800 x 1300 mm. The minimum clear floor area (11) to allow access for people using manual wheelchairs is consistently reported at 1500 x 1500 mm.

The minimum diameter for turning a wheelchair (19) is generally 1500 mm with 2250 mm required for turning a power wheelchair (20), and 1350 mm required for turning a scooter (21). These larger dimensions reflect the wide range of mobility devices that are increasingly posing a challenge to designers around the world.

Obstructions or protrusions (25) that could be hazardous to persons with visual impairments who use a white cane or guide dog for mobility should be avoided, although Canada, Singapore and Lebanon are the only countries that specify that protrusions are not permissible in the pedestrian path of travel.

The clear width for someone walking with crutches (14) ranges from 900 mm (Lebanon) to 1200 mm (Mexico), with 1200 mm accommodating the widest ranges. Similarly for a person walking with a guide dog (16), it is estimated to require a similar clear width of 1200 mm.

The maximum forward reach range (25) for a person seated in a wheelchair is 1200 mm, and the minimum forward reach (26) ranges in height from 250 mm specified by Australia to 700 mm specified by the Philippines. The maximum forward reach over an obstruction (28) is 500 mm.

The side reach above the floor (29) for someone seated in a wheelchair ranges from 1220 mm specified by the U.S. to 1700 mm specified by Lebanon, with the minimum side reach (30) ranging from 230 to 450 mm. There is a great variety in anthropometric data for people seated in wheelchairs.

The height of controls at operating mechanisms (34) range from 400 - 1250 mm. **An interesting addition to criteria for operating controls is the requirement for tactile and or auditory information (37) to ensure that the devices are universally accessible to all users now required by both Canada and Sweden.**

Counter height (41) ranges from 730 to 915 mm, with the Expert Panel selecting 730 - 850 mm to meet the widest range of users. The clear floor area for a forward approach to a counter or table (46) or a side approach is 800 x 1300 mm.

A comment from CSA regarding the size of all of the larger mobility devices is a recommendation that a 1500 mm long footprint be used as a best practice.

ANTHROPOMETRICS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Wheelchair Dimension																		
1	Folded wheelchair width	300												300				300
2	Wheelchair open width	660			600				700			600 - 750		680		600 - 750	760	600 - 750
3	Height of eyes of persons sitting in a wheelchair	1100 - 1300			1090 - 1290				1005 - 1245					1100 - 1300	1220	1160 - 1330		1000 - 1300
4	Lap height of a person sitting in a wheelchair	675			600				555 - 705					675		600 - 640		555 - 705
5	Seat height of a person sitting in a wheelchair	480			480				530					480		450 - 500		450 - 500
6	Toe height of a person sitting in a wheelchair	200			205				168 - 190					200		180 - 220		180 - 220
7	Handle height of a wheelchair	920			930				1090					920		900 - 1100		900 - 1100
8	Armrest height of a wheelchair	760			730 - 760				700					760		660 - 690		700 - 760
9	Length of wheelchair	1200			1030 - 1220				1200			1100 - 1300		1200		1100	1370	1100 - 1300
Floor Area																		
10	Minimum clear floor area to accommodate a single stationary manual wheelchair and occupant	750 x 1200		760 x 1220	870 x 1220				700 x 1200			750 x 1300		900 x 1200	800 x 1300	700 x 1250	760 x 1370	800 x 1300
11	Minimum clear floor area to accommodate a single stationary manual wheelchair and occupant for a U-turn	1500 x 1500		1525 x 1525	1500 x 1500				1500 x 1500			1500 x 1500		1800 x 1800			2440 x 2440	1500 x 1500
12	Minimum clear area to allow access for both forward and side approaches	1200 x 1200		1220 x 1220								1300 x 1300		1200 x 1200	1300 x 1300		1370 x 1370	1370 x 1370
13	The floor area for an approach may include part of the knee clearance under an element	yes												yes			yes	yes
14	Comfortable walking width for persons using crutches	920			1200				1290					920	1000	900		1200
15	Comfortable forward detection range for a person using a long white cane	900 - 1500			1200				1770							700		900 - 1500

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
16	A person who uses a guide dog requires a comfortable clear walkway width of	1200			760 - 800				760									1200
17	Minimum clear floor area to accommodate a single stationary powerchair or scooter and occupant	750 x 1500															660 x 1370	800 x 1300
18	Minimum clear floor area to accommodate a single stationary walker and occupant	635 x 710																635 x 710
Turning Diameter																		
19	Minimum diameter for clear turning space at toe level for a wheelchair to turn 180/360˚	1500	1500	1525	1600		1300		1500			1500		1800	2070 x 1540 (180 turn), 2250 x 2250 (360 turn)	1500	2440	1500
20	Minimum diameter for clear turning space at toe level for a power wheelchair to turn 180/360˚	2250					1500 - 2000											2250
21	Minimum diameter for clear turning space at toe level for a scooter to turn 180/360˚	3150																3150
Obstruction																		
22	No obstruction shall project into the comfortable walking width for a person using a white cane greater than	100												100		no obstructions allowed	100	no obstructions allowed
23	For a person using crutches, no obstruction shall project into the clear of the path of travel below a minimum height of	300												300		no obstructions allowed		no obstructions allowed
24	To be cane detectable, obstructions shall be no higher off the floor than	680					100 - 350									no obstructions allowed	680	350
Reach																		
25	From a wheelchair, the maximum forward reach height above the floor without obstructions is	1200		1220								1200		1200	1220	1400	1200	1200

Continued on next page

ANTHROPOMETRICS (from page 11)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
26	From a wheelchair, the minimum forward reach height above the floor without obstructions is	400		380								700		400	250	260 - 450	400	400
27	From a wheelchair, the maximum forward reach over an obstruction for touch is	600		635										500		710 - 920	635	500
28	From a wheelchair, the maximum forward reach over an obstruction for grasp is	500														500 - 680		500
29	From a wheelchair, the maximum side reach height above the floor without an obstruction is	1400		1220	1600				1350					1300	1350	1700	1370	1220
30	From a wheelchair, the minimum side reach height above the floor, without an obstruction is	230		380	300				254					250	230	260 - 450	230	300
31	From a wheelchair, the maximum side reach over an obstruction for touch is	600		610										500	600		610	500
32	From a wheelchair, the maximum side reach over an obstruction for grasp is	500																500
Controls																		
33	At the controls and operating mechanisms for dispensing machines the minimum clear level floor space shall be	750 x 1200		760 x 1220										900 x 1200	800 x 1300		760 x 1370	800 x 1300
34	The centreline of operating controls shall be located above the floor between	400 - 1200		380 - 1220	1200		suitably located		700 - 1200	500 - 1200				600 - 1200	900 - 1100 grasp/turn, 900 - 1200 push, 900 - 1250 touch		400 - 1200	400 - 1200
35	Controls shall be operable with one hand and without tight grasping, pinching or twisting of the wrist	yes		yes			suitable design			yes				yes	prefer		yes	yes
36	Controls shall be operable with a force of no more than	22 N		22.2 N			25.5 N							22 N	19.5 N		22 N	19.5 N

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
37	Control settings shall provide tactile and/or auditory information, including function and position of controls	yes					yes											yes
38	Operating controls shall be illuminated to a level of at least	100 lx												100 lx	150 lx		100 lx	150 lx
39	Operating controls or visual displays where reading is necessary shall be illuminated to a level of at least	200 lx								200 lx					200 lx		100 lx	200 lx
40	The operating controls shall be colour contrasted with their background	yes					contrast		yes					yes			yes	yes
Footprint and Kneespace Requirements at Counters, Tables, Workstations, Lavatories																		
41	The top of counter, table and work surface or similar surface heights are between	730 - 860	865 max.	915 max.	760	800			850					800 max.	730 - 850	900	710 - 865	730 - 850
42	Where a forward approach is used at a counter or table there shall be a clear knee height above the floor of at least	680		685		700			700					680			685	700
43	Where a forward approach is used at a counter or table there shall be a clear knee width of at least	750		760	1000	800			800					750			760	800
44	Where a forward approach is used at a counter or table there shall be a clear knee depth of at least	480		205	400				600					480			480	480
45	Where a forward approach is used at a counter or table the clear knee depth may overlap the clear floor area by not more than	480												480			480	480
46	The clear floor area width and depth for a forward approach at a counter or table shall be at least	750 x 1200		760 x 1220	750 x 1200									750 x 1200			760 x 1370	800 x 1300

Continued on next page

ANTHROPOMETRICS (from page 13)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
47	The clear floor area width and depth for a side approach (the long side parallel to the counter or table) at a counter or table shall be at least	1200 X 750		1200 X 760										1200 x 900			1370 x 760	1300 x 800
Other																		
48	For any other spatial requirements, see section on ACCESS ROUTES	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

ACCESS ROUTES

Access routes include all pedestrian areas through a facility, areas serving the public as well as work areas. The degree to which access routes are required to be accessible is determined by the area having jurisdiction over the application of the codes and standards.

Canada and Singapore (3) specify that the ground surface should not be heavily patterned. Sweden specifies **that the accessible route should be even, and (5) free of any rise**, but the Philippines allows a rise up to 25 mm, and Malaysia allowing a maximum rise of 10 mm. Canada and the U.S. allow a rise of 13 mm, but require that it be beveled at a slope of 1:2. Carpeted areas (16) can create a tripping hazard if the pile is too high, thus the U.S., Sweden and Canada specify that the edge be beveled, while Singapore allows a rise of 15 mm, with a bevel of 1:2.

The running slope is generally considered to be a ramp when it exceeds a slope of 1:20, although Uruguay specifies 1:16 and Mexico specifies 1:12.

The illumination level (17) for the access route is specified by Spain, South Africa and Singapore at 150 lux. This is considered a best practice.

An important consideration is to ensure that there are no protruding overhangs that might be hazardous to people who are blind or visually impaired as they make their way through a building interior. The height for clear headroom along the pedestrian route varies considerably with 2400 mm specified in South Africa, 2000 mm in the Philippines and Australia and 2200 mm in Uruguay.

The minimum clear width requirements also vary considerably with 900 mm in Lebanon, 1050 mm in Spain and 1300 mm in Sweden. **The best practice was selected by the Expert Panel to be 1200 mm for the clear width, however, in high traffic areas, it is recommended to be 1830 mm.**

The clear floor area for a manual wheelchair varies slightly as building standards have begun to grapple with the increased size of some wheelchairs. The design of wheelchairs has evolved to accommodate users who are increasingly taller, broader or are equipped with ventilators or other equipment. The U.S. specified 760 x 1220 mm, Singapore 900 x 1200 mm and Australia 800 x 1300 mm. The size of wheelchairs varies from country to country, dependent of the human anthropometrics and the various manufacturers.

Clear width requirement **for line-up guides or queing guides** have been introduced in various standards, specifying 900 to 1060 mm, with manoeuvring space of 1500 x 1500 mm (Canada) at the beginning, end and where there is a change in direction. Also noteworthy is the requirement that **line-up guides are required to be detectable by a blind person using a cane** (41) with the requirement that the bottom edge should be at a cane detectable maximum height of 350 mm.

Detectable hazard indicators (a noticeable change in texture) are required at the edge of drop-offs in Canada, Sweden, and Singapore.

An interesting comment from Singapore relating to the Access Route includes the recommendation that open jointed pavers or aeration concrete blocks be avoided in open areas as they may cause a tripping hazard. **Valuable wayfinding recommendations include the use of ceiling lights to orient people along walkways and the use of contrasting colour luminance at base boards, walls and doors. These recommendations assist everyone in delineating the access route and will be particularly useful to people with limited vision and people with autism or cognitive disabilities.**

ACCESS ROUTES

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Surfaces																		
1	The floor and ground surfaces shall be stable, firm and slip resistant	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes	yes
2	The floor and ground surfaces shall produce minimal glare	yes			yes				yes					yes			yes	yes
3	The floor and ground surfaces shall not be heavily patterned	yes												yes				yes
4	A change in level or rise between 0 - 6 mm on accessible routes may be vertical. (Except for elevators, elevating devices, and curb ramps)	yes	bevel at slope of up to 1:2	yes			should be even		bevel at 1:2			yes	10 mm max.	0 - 15, max. gradient of 1:2			yes	yes
5	A vertical rise between 7 - 13 mm on accessible routes, (except for elevators, elevating devices, and curb ramps) shall be	bevelled at slope of up to 1:2	bevelled at slope of up to 1:2	bevelled at slope of up to 1:2			should be even					up to 25 permitted, with ramp preferred	10 mm max.	0 - 15 bevel at slope of up to 1:2			bevelled at slope of up to 1:2	bevelled at slope of up to 1:2
6	For a vertical rise over 13 mm on accessible routes (except for elevators, elevating devices, and curb ramps)	not steeper than the ratio of 1:12	treat as a ramp or curb ramp	treat as a ramp or curb ramp			should be even		treat as ramp	changes in level greater than 25 permitted, a suitable ramp to be provided		vertical rise of up to 25 permitted, with ramp preferred		rise 0 - 15 grade of 1:2, rise 15 - 50 grade 1:5, rise 50 - 200 grade 1:10, rise 200 + grade 1:12		should be ramped	treat as a ramp	treat as a ramp, not steeper than 1:12
7	Cross slope of an accessible route not to exceed the ratio of	1:50 (2%)		1:48		1:50	1:50	1:50		1:40		1:100			1:40	1:50	1:50	1:50
8	Running slope of an accessible route not to exceed the ratio of	1:20 (5%)		1:20	1:12	1:16	1:12 interior, 1:20 exterior					1:20			1:20	1:20	1:25	1:20
9	The running slope of an accessible route becomes designated as a ramp or curb ramp if steeper than	1:20		1:20			1:20	1:20							1:20	1:20	1:25	1:20
10	Gratings in a pedestrian area shall be in one direction, and have spacing widths no greater than	13		13	13	15	10					13		12	13	13	13	10

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
11	Gratings shall be placed so that the long dimension is perpendicular to the primary direction of travel	yes		yes			yes							yes	yes	yes	yes	yes
12	Carpet or carpet tile are securely fastened	yes		yes			not be a trip risk							yes	yes	yes	yes	yes
13	Carpet or carpet tiles shall have a firm cushion, under padding, or backing where provided	yes		yes			not be a trip risk							yes	yes		yes	yes
14	Carpet or carpet tiles shall have a combined carpet and pad height of no more than	13		13 (carpet only, pad not permitted)			not be a trip risk			avoid thick pile carpets					6 (pile height)		13	6 (pile height)
15	Carpet or carpet tile shall have a low, firm, and level pile or loop	yes		level loop, textured loop, level cut pile or level cut/ uncut pile			not be a trip risk			thick pile carpets shall be strictly avoided				a firm cushion, pad or backing	level loop, textured loop, level cut pile or level cut/ uncut pile		level loop, textured loop, level cut pile or level cut/ uncut pile	level loop, textured loop, level cut pile or level cut/ uncut pile
16	The exposed edges of carpet or carpet tile shall have trim on the exposed edge, where trim; 0 - 6 mm may be vertical, 7 - 13 mm bevelled but not steeper than the ratio of 1:2	yes		yes			yes							yes and if between 0 - 15 a max. gradient of 1:2			yes	yes
17	Building elements such as circulation routes and rest areas shall be illuminated at ground level to a level of at least	100 lx							150 lx	150 lx				150 lx			50 lx	150 lx
Head Room																		
18	The clear headroom height in pedestrian areas such as walkways, halls, corridors, or aisles shall be at least	2030	1980	2030	1800	2200	2200, 2000 stairs, escape routes	2200, 2000 stairs	2100	2400, 2000 escape routes	2150 interior, 2500 exterior, 2100 stairs, 2030 service areas	2000	2000	2000	2000	2000, 1950 in highly restricted spaces	2100	2030
19	Where headroom in a pedestrian area is less than 2030 mm from the floor, a guardrail or other barrier shall be provided with its leading edge no higher above the floor than	680	680	685	there shall be a barrier		100 - 350	yes		detectable by a person using a cane				580			680	350

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ACCESS ROUTES (from page 17)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Protruding Objects																		
20	The leading edge of a guard, barrier or protruding object shall be at a height of	680	680	685			100 - 350						protrusions not allowed	580			680	350
21	For a protruding object at a height between 680 - 2030, the maximum allowable protrusion into the accessible route shall be	100	100	100					150	300, with barrier at 300 from floor				100			100	100
22	Protruding objects at a height below 680 shall protrude into the accessible route a maximum of	any amount	any amount	any amount					150				protrusions not allowed				any amount	any amount
23	Protruding objects shall not reduce clear width of an accessible route	yes		yes					yes	yes		yes	yes	yes			yes	yes
24	Minimum clear width of interior accessible routes	920	920	915	1200	900	1300	1200	1050	1100		1200	1200	1200	1000	900	1060	1200
25	Minimum clear width for short indentations of up to 600 mm in length, (including doorways)	810		815			800										950	815
Clear Width/Clear Area																		
26	Minimum clear width at U-turns around an obstacle less than 1200 mm wide	1100		1065, 1220 during turn					1200				1200			1200	1220	1200
27	Minimum clear width at turns around an obstacle greater than 1200 mm wide	920		915					1050								1060	1060
28	Minimum clear width in high traffic areas shall be at least	1500	1100	1525					1200				1200			1500	1830	1830
29	Minimum clear width on exterior accessible routes shall be at least	1500			1500	900	1300, 2000 exterior pathways				1000, 1250 if walls on both sides	1200	1200		1000	900	1060	1500
30	Minimum clear width on exterior accessible routes that are adjacent to a curb ramp shall be at least	920					1300, 2000 exterior pathways						1200	900			950	1200

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
31	Exterior accessible routes adjacent to a vehicular route, shall be separated by a curb with a curb ramp, a railing or barrier, or a detectable hazard indicator	yes					yes						yes	yes		yes, or bollards		yes
32	Minimum clear width required on accessible routes for two wheelchairs to pass	1500		1525			1800		1800			1500	1200	1800	1800	1500, 1800 preferred	1830	1800
33	Minimum clear width required on accessible routes for one wheelchair and one walking person to pass	1500	1500	1525			1500		1500				1200	1200	1500	1200	1370	1525
34	Minimum clear width required for a wheelchair and a person using a white cane to pass in opposite directions	1500							1800				1200					1800
35	The minimum clear width for an accessible route except for short indentations of up to 600 mm in length	810		915			1300					1200					950	1200
36	The clear floor area to accommodate a single person using a wheelchair (including area in front of operating controls and accessible signage) shall have a width by depth of at least	750 x 1200		760 x 1220								750 x 1300		900 x 1200	800 x 1300		760 x 1370	800 x 1300
37	For long paths of travel, resting areas shall be provided off the path of travel at approximate intervals of	30 000			30 000									30 000 max.				30 000
Controls																		
38	For additional requirements on controls, see section on ANTHROPOMETRICS	yes	yes	yes	yes		yes		yes			yes		yes	yes	yes	yes	yes
Line-up Guides/Queuing Guides																		
39	Line-up guides shall have a clear width of at least	920		915										900			1060	920

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ACCESS ROUTES (from page 19)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
40	Line-up guides shall have a clear floor area where line-ups change direction, and where they begin and end, of at least	1500 x 1500		1065 x 1220														1500 x 1500
41	Line-up guides shall be cane detectable from the floor at or below	680					100 - 350											350
42	Line-up guides shall be stable and not move easily	yes															mounted to the floor	yes
43	Line-up guides shall be colour contrasted with their surroundings	yes															yes	yes
44	Line-up guides shall have a glare-free surface	yes															yes	yes
Other Requirements																		
45	Detectable hazard indicators shall be located at curb ramps (see the section on CURB RAMPS for further requirements)	yes			yes							yes		yes			yes	yes
46	Where a curb ramp, a pedestrian street crossing, or a pedestrian crossing at a traffic island/ median becomes part of an accessible path of travel, see section on CURB RAMPS for requirements	yes	yes	yes	yes	yes	yes					yes		yes	yes	yes	yes	yes
47	Detectable hazard indicators shall be located at an unprotected drop-off edge (such as a transit platform) where there is a change in elevation greater than	250					where there is a risk of falling down							yes				50
48	Detectable hazard indicators shall be located at an unprotected drop-off edge (such as a transit platform) where the slope is steeper than the ratio of 1:3 (33.3%)	yes																yes
49	Detectable hazard indicators shall be located at an unprotected drop-off edge of a reflecting pool	yes												yes				yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
50	Detectable hazard indicators shall be located at an entry into a vehicular route or area where no curbs or other elements separate it from the pedestrian route of travel	yes												yes				yes
51	For additional requirements on detectable warnings, detectable hazards, and detectable directional surfaces along an access route, see section on DETECTABLE WARNING SURFACES	yes		yes		yes				yes		yes		yes			yes	yes
52	For additional requirements on handrails, see section on HANDRAILS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
53	For requirements on benches, picnic tables, see section on BENCHES and PICNIC TABLES	yes		yes			yes							yes	yes	yes	yes	yes
54	Where there are doors along the clear path of travel, see section on DOORS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
55	Where there is signage along an accessible route, see section on SIGNAGE for requirements	yes	yes	yes		yes	yes		yes	yes		yes		yes	yes	yes	yes	yes
56	Where a ramp becomes part of an accessible path of travel, see section on RAMPS for requirements	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

ACCESS ROUTES COMMENTS

No.	Document	Comments
1	CSA	Cutting the corners of an obstacle greater than 1200 mm wide will provide additional manoeuvring space.
2	CSA	Walls at the end of corridors should be contrasted in colour or brightness from the other walls and floor.
3	CSA	Where windows are located at the end of a corridor, means should be used to minimize glare.
4	CSA	Using a floor surface that contrasts in colour and texture with the surrounding area helps to define line-up areas.
5	CSA	There should be a seating area near the line-up location.
6	CSA	Carpets without under padding are preferred.
7	CSA	New carpets can produce off-gassing, which can affect everyone, but especially people with environmental sensitivities. Suppliers can provide carpets that have been off-gassed prior to installation.
8	CSA	It is preferable that gratings not be located in the accessible path of travel, especially at the bottom of the ramp.
9	CSA	Exterior walkways should have adequate drainage to avoid the accumulation of water.
10	CSA	Irregular surfaces such as cobblestone and large exposed aggregate paving make walking or wheeling difficult and should be avoided.
11	CSA	Highly reflective surfaces can result in glare, which is a problem for many people and should be avoided.
12	CSA	Recessing an object into a wall (ie: drinking fountains, public telephone enclosures, fire extinguishers) avoids creating a protrusion hazard.
13	CSA	Guy wires, awnings, and vegetation (ie: tree branches, etc) should not obstruct any part of the accessible route.
14	CSA	Colour contrasted bollards or curbs should be used to prevent parked vehicles from entering the accessible circulation route.
15	CSA	The distance between bollards or parking curbs should allow the passage of a wheelchair user.
16	CSA	Detectable direction indicators should be located in large open floor areas (such as shopping malls or transportation terminals) to facilitate wayfinding by indicating the primary routes of travel.
17	Sweden	Wayfinding can be facilitated in various ways such as: planning layouts with a simple and logical circulation plan with easy access to information. Also through orientation points, by using colour, form or extra illumination that stand out against their surroundings, or by giving floors on different levels different colours or characterizing them by a symbol that is shown on signs, lift panels, orientation maps, etc.
18	Sweden	Access routes have to be well illuminated with no glare, no confusing shadows or pools of light, and no visible or invisible flickering, sound or UV radiation.
19	Sweden	Large glass areas that could be mistaken for openings close to access routes should be marked with bands or frames with different luminance from the background.
20	South Africa	For visually impaired people and those with finger or hand disabilities, rocker action, toggle or push pad switches that operate in the vertical plane should be used. Push buttons of light switches shall project clear of the switch plate and shall have a width of at least 10 mm.
21	South Africa	Windows and doors shall not open across a walkway, corridor, stair or ramp so that they obstruct circulation.
22	Singapore	Wherever possible, exterior walkways should be protected from the elements.
23	Singapore	An accessible path shall not incorporate any step, drop, stairway, turnstile, revolving door, escalator or other impediment which would prevent it from being safely negotiated.
24	Singapore	The wall finish shall be smooth or in the case of rough walls have handrails.
25	Singapore	On accessible routes lighting shall be uniform. Extreme differences in the level of brightness should be avoided.
26	Singapore	Free standing objects placed between 580 - 2000 mm from the floor level, shall have an overhang of not more than 300 mm.
27	Singapore	The maximum height of the bottom edge of free standing objects with a space of more than 300 mm between supports shall be 580 mm from the floor level.
28	Singapore	Open jointed pavers or aeration concrete blocks should be avoided in open spaces or vehicle parks where users may pass. The voids in aeration concrete blocks can catch the foot or walking aids and are difficult to traverse for wheelchair users.
29	Singapore	Light switches, coat hooks and similar items should contrast strongly with their backgrounds.
30	Singapore	Walls and ceilings should be finished in plain colours of light tones (to help diffuse light around the room or area) and a matte finish (to avoid unwanted glare or reflection).
31	ICTA	Use a contrasting surface to delineate a safe route through a plaza or parking lot.
32	ICTA	High visual contrast between floors, walls, corners and doors are recommended.
33	ICTA	Provide textured path of travel for better wayfinding throughout the building.
34	ICTA	Use ceiling lights to direct people along walkways in open areas.

No.	Document	Comments
35	ICTA	Use diffused lighting sources to reduce glare.
36	ICTA	Lighting transitions should be used between dark and light areas.
37	ICTA	To distinguish pathways and locations, use clues that include changes in illumination levels, bright colours, unique floor patterns and the location of special equipment and other architectural features.
38	ICTA	Access routes should continue to all work stations and incorporate wheelchair turn around points at all entry points to work areas.
39	ICTA	Avoid sound masking as it can cause disorientation and make an area seem more uniform than it is.
40	ICTA	Contrasting base boards help define the boundaries of a space.
41	ICTA	Protect corners with recessed metal or plastic corner guards.
42	ICTA	Contrast carpet with the wall and the furniture to distinguish edges of the room and furniture.
43	ICTA	Allow enough manoeuvrability in the design for scooter and power wheelchair turns.
44	UN	The edges of an outdoor pathway should be bevelled wherever changes in level between 6 - 13 mm exist between the pathway and the surrounding area.
45	UN	Thorny and poisonous plants should not be used immediately adjacent to pedestrian paths.
46	Malaysia	Isolated pillars should be avoided, and the corners of walls and pillars both inside and outside the building should be rounded off to reduce the risk of injury.
47	Malaysia	Any danger areas (i.e.: electrical rooms) not protected by a locked door should be indicated by a warning sign which is tactile.

AUDITORIUM, ARENA AND ASSEMBLY AREAS

Accessible seating areas in auditoriums, arenas and assembly areas are required in most codes and standards. Canada, Spain and South Africa require that the accessible viewing areas adjoin the accessible circulation route. South Africa points out that accessible seating areas are not permitted to block any aisle or exit door (1).

The size of the viewing area for people who use wheelchairs (6) varies from 750 x 1300 mm in the Philippines to 900 x 1400 mm in Ireland. **For two adjacent wheelchairs, 1700 x 1900 mm was selected as the best practice.** Many countries mention the requirement that this space be level, an important consideration, as it is most uncomfortable to stay seated on a sloped surface.

Many codes recognize that wheelchair viewing areas be an integral part (11) of the seating plan and that wheelchair viewing areas be dispersed (12) throughout the seating area and at all levels. This is an important criteria to ensure that people who use wheelchairs are not relegated to the rear or front of the auditorium.

Australia, Lebanon, the U.S. and Canada all require that **people seated in wheelchair viewing areas have lines of sight (17) that are comparable to those for all viewing positions.** Many codes address the number of wheelchair viewing positions with 2 recommended where there are 4 - 25 seats and Lebanon requires a minimum of 2, with 1 per 100 or part thereof for spaces of up to 600 seats.

To ensure that auditorium, arena and assembly areas are accessible to people who are hard of hearing, the U.S, Sweden, Ireland, Malaysia and Australia all require that **an assistive listening device be provided**, with the excellent recommendation that the stage area also be served by the assistive listening system.

Additional comments to address accessibility include one from the CSA which recommends that accent lighting be provided along the edges of the aisle seats. Australia points out **the importance of making the stage area accessible and ensuring that all controls can be operated by the speaker.** The boundaries of the podium or stage should be defined by barriers or contrasting floor surface colour and texture. These are **excellent requirements to ensure that everyone is able to use the stage area.** Sweden emphasizes inclusiveness in mentioning that the stage, podium and spaces behind the stage, dressing rooms and playing surface in sports facilities must all be accessible.

AUDITORIUM, ARENA AND ASSEMBLY AREAS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Accessible Circulation Routes																		
1	Accessible routes shall not overlap wheelchair sitting/ waiting spaces			yes						yes and not block any aisle or exit door							yes	yes
2	Access to any wheelchair space shall not be through another wheelchair space			yes														may be permitted
3	Wheelchair (sitting/waiting) spaces shall not overlap circulation paths			yes	yes				yes						may overlap by 250		yes	may overlap by 250
4	Wheelchair viewing areas shall adjoin the accessible circulation routes	yes, next to egress		yes	yes	yes		yes	yes, next to egress	yes, next to egress		yes			yes		yes	yes, next to egress
5	A wheelchair space may encroach into the portion of the circulation route in excess of the required aisle width			yes													yes	yes
Floor Space																		
6	Each wheelchair viewing position to be clear, firm and level and at least	850 x 1200			800 x 1250			900 x 1400	firm and level			750 x 1300			850 x 1900	level	clear and level	900 x 1400
7	Minimum footprint for a single wheelchair seating space (front or rear entry)			915 x 1220	800 x 1250	800 x 1200			800 x 1200					900 x 1200		750 x 1100	920 x 1370	800 x 1300
8	Minimum footprint for a single wheelchair seating space (side entry)			915 x 1525										900 x 1200			920 x 1525	915 x 1525
9	Minimum area for 2 adjacent wheelchairs shall be			1680 x 1220 (front/rear entry) 1680 x 1525 (side entry)	1250 x 1600				1600 x 1200 (front/rear entry) 1680 x 1500 (side entry)						1700 x 1900			1700 x 1900

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AUDITORIUM, ARENA AND ASSEMBLY AREAS (from page 25)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Viewing Areas General																		
10	Where designated aisle seats with armrests are provided, folding or retractable armrests shall be provided on the aisle side of the seat			yes					yes							yes	yes, 1 min. or 1%	yes
11	Wheelchair viewing areas shall be an integral part of the seating plan	yes		yes				yes	yes							yes	yes	yes
12	Wheelchair viewing areas shall be dispersed throughout the seating area on all levels	yes		yes	yes			yes						at the rear	yes	yes	yes	yes
13	Wheelchair viewing areas shall be located adjacent to other seating	yes		yes	yes			yes						yes	yes	yes	yes	yes
14	Companion seating shall be provided			yes				yes						yes			yes	yes
15	Companion seats shall be equivalent in size, quality, comfort and amenities to the seating in the immediate area			yes													yes	yes
16	At least half of the wheelchair viewing areas shall have spaces placed side by side (paired)	yes		yes													at least 2 locations	yes
17	Wheelchair viewing areas shall have lines of sight that are comparable to those for all viewing positions	yes		yes				yes							yes	yes	yes	yes
18	Wheelchair viewing areas shall have lines of sight that are not reduced or obstructed by standing members of the audience	yes		yes												yes		yes
Viewing Position Numbers																		
19	Wheelchair viewing positions for fixed seats between 4-25			1				6 or 1 per 50, up to 1000 seats				2 for 4-50		1 per 150 or part thereof		2 min., 1 per 100 or part thereof up to 600	2	2
20	Wheelchair viewing positions for fixed seats between 26-50			2													2	2

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
21	Wheelchair viewing positions for fixed seats between 2-50									1 per 50 +							2	2
22	Wheelchair viewing positions for fixed seats between 51-150			4								4 for 51-300		1 per 150 or part thereof			2	4
23	Wheelchair viewing positions for fixed seats between 151-300			5								4 for 51-300						5
24	Wheelchair viewing positions for fixed seats between 301-400									2 for 50-400							5	5
25	Wheelchair viewing positions for fixed seats between 301-500			6						6						2 min., 1 per 100 or part thereof up to 600		5
26	Wheelchair viewing positions for fixed seats between 401-500									3 or 0.5% of the number of seats which ever is greater for + 400						6		6
27	Wheelchair viewing positions for fixed seats between 401-600																6	6
28	Wheelchair viewing positions for fixed seats over 500 (increments of 100)			6 + 1 for each 150 or part thereof				20 or 1 per 100 for over 1000 seats				6 + 1 for each 100 or part thereof				1 per 100	not less than 1% of capacity	2 min., 1 per 100 up to 600, 2 per 100 for the next 400, 1 for each additional 1000
Assistive Listening Devices																		
29	Is there an assistive listening device			yes			yes	yes					yes, induction loop		yes		yes, where audio is integral to the use of the space	yes, for viewing areas, as well as on the stage area

AUDITORIUM, ARENA AND ASSEMBLY AREAS COMMENTS

No.	Document	Comments
1	CSA	A variety in seating location is necessary to provide choices for people using wheelchairs and to accommodate a companion who may be a wheelchair user or an ambulatory person.
2	CSA	Guard rails protecting viewing spaces should not interfere with viewing sight lines.
3	CSA	Accent lighting should be provided along the edges of the aisle steps.
4	ADAAG	Readily removable or folding seating units may be installed in lieu of providing an open space for wheelchair users. Folding seating units are usually two fixed seats that can be easily folded into a fixed center bar to allow for one or two open spaces for wheelchair spaces.
5	ADAAG	Either a sign or a marker placed on the seating with removable or folding armrests is required. Consideration should be given to ensuring identification of such seats when the room or area is darkened.
6	ADAAG	Assistive listening systems are required where audible communication is integral to the use of the space. Assistive listening systems are not required where no audio amplification is offered.
7	Australia	It is recommended that 10% of each classification/range of seating within an auditorium be provided with a listening system.
8	Australia	The stage area shall allow space for wheelchair turning.
9	Australia	All controls to be operated by a speaker shall be operable by a seated person, in accordance with accepted reach ranges.
10	Australia	The boundaries of a podium or stage area should be defined by barriers or contrast in floor surface colour and texture.
11	Australia	A range of choices of seating positions in terms of location, level and sight lines should be provided for all users.
12	Australia	A continuous path of travel should be provided to the seating spaces and seats identified for use by people with disabilities and from those seats to points of egress and amenities such as toilets.
13	Australia	Fixed seating venues should provide for continuous accessible paths of travel to fixed seating which may be used by people with mobility aids or who may wish to transfer from wheelchairs.
14	Australia	Access to the podium should be via a continuous accessible path of travel, which may include the use of ramps or automated vertical transport systems.
15	Sweden	It is not necessary for all seats in cinemas, theatres, sport facilities and other large places of assembly to be accessible for a person in a wheelchair, but there has to be some accessible wheelchair viewing areas. In addition, the stage, podium and the spaces behind the stage for use by the actors has to be accessible, as well as the dressing rooms and playing surface in sport facilities has to be accessible.
16	Sweden	It should also be possible to use the assistive listening system on the stage.
17	Sweden	The design of the hall and its lighting facilitate lip-reading and sign language interpreting, for example, in the case of a darkened room, it is possible to spotlight the speaker and sign language interpreter.

BATHTUBS

The space requirements in front of a bathtub are important considerations in bathtub safety. The **clear width ranges** (1) from 750 - 1540 mm, and the length (2) varies from 1500 - 1600 mm. **At least two grab bars** (7) are recommended by the CSA Standard, while at least 3 are required by the U.S. and Australia. The Expert Panel recommends **at least 2 grab bars, with one being an L-shaped bar.**

The height of the horizontal grab bar (10) varies from 840 - 915 mm in the U.S. and 650 - 750 mm from Australia. A preference was indicated by the Expert Panel for the lower height to assist people while they are seated in the bathtub. In addition, **a vertical grab bar** (12) was recommended by the U.S., Canada, Singapore and Australia. This vertical grab bar provides support to people as they enter and exit the bathtub, thus preventing the possibility of a fall.

Both Canada and Singapore require that the faucet and other controls (20) be located on the foot end of the bathtub. Australia suggests either the foot or back wall for the controls and the U.S. says either end is acceptable.

A shower hose at least 1500 mm long (26) is recommended that can be used in either a fixed position or hand-held. The maximum height of the shower head (28) is 1200 mm in Canada while Singapore recommends it at a minimum of 1000 mm above the floor.

An important new addition to accessibility codes and standards is **the maximum temperature allowable in order to prevent scalding while still preventing the growth of bacteria**, with 55˚C recommended in Canada, 40˚C in Spain, and 49˚C in the U.S.

Safety comments relating to bathtubs include that **non-slip flooring** be used in the main area of the tub room and outside of the bathtub, and that bathtub enclosures not be used. CSA recommends that **hot and cold faucets be consistently oriented to assist people to identify them.**

BATHTUBS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
General/Spatial																		
1	The width to be provided along the whole length of the bathtub shall be at least	750		760										750	1540	750	760	760
2	A bathtub shall have a length of at least	1500														1600		1600
3	Sliding doors shall not be provided on bathtubs	yes		yes										yes			yes	yes
4	Bathtubs shall have a slip resistant base	yes												or rubber mat	yes			yes
Grab Bars																		
5	The structural support areas in the walls shall be capable of supporting grab bars and resist a force applied in any direction of at least	1.3 kN		1.112 kN										1.3 kN	1.1 kN	yes	1.3 kN	1.3 kN
6	The structural support areas shall be continuous in the three walls surrounding the bathtub from the rim to the ceiling	yes		yes														yes
7	At least two grab bars shall be mounted in the bathtub area	yes		3 min., (4 with removable seat)						back/side grab bars may be one unit				yes	at least 3	1	2 min. (one is "L" shaped)	2 min. (one is "L" shaped)
8	One horizontal grab bar shall be located along the length of the bathtub on the side wall	yes		yes					yes	back/side grab bars may be one unit				yes	yes	yes		yes
9	The horizontal grab bar located along the length of the bathtub on the back wall shall be mounted a height above the rim of	180 - 280		205 - 255					200					180 - 280	70 - 290	200 - 250	150 - 200	200 - 250
10	The horizontal grab bar located along the length of the bathtub on the back wall shall be at a height above the floor of			840 - 915					700 - 750	800					650 - 750	850 - 950		650 - 750

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
11	The horizontal grab bar located along the length of the bathtub on the back wall shall have a length of at least	1200		380 max. from the head end wall, 305 max. from the control end wall										1200		1200	900	1200
12	Is there a vertical grab bar located at the foot of the bathtub adjacent to the clear floor area	yes		yes										yes	yes			yes
13	The vertical grab bar on the control end wall at the front edge of the bathtub shall have a minimum length of			610													1220	1220
14	The vertical grab bar at the foot of the bathtub shall have its lower end above the bathtub rim between	180 - 280												180 - 280	700 - 850 from floor			180 - 280
15	The vertical grab bar at the foot of the bathtub shall have a minimum length of	1200												1200	top of bar to be 1400 - 1500 from floor			1200
16	The vertical grab bar at the foot of the bathtub shall be set back from the outside edge of the bathtub between	80 - 120																80 - 120
17	Grab bars shall be slip-resistant	yes	yes						yes					yes		yes	yes	yes
18	For grab bar requirements, see section in WASHROOMS	yes	yes	yes	yes				yes	yes	yes		yes	yes	yes	yes	yes	yes
Controls/Faucets																		
19	Faucets and other controls shall be located at the foot end of the bathtub	yes		either end										yes	yes, or back wall	yes		yes
20	Faucets and other controls shall be located between the centreline of the bathtub and the exterior edge of the bathtub rim	yes												yes	yes, or back wall			yes

Continued on next page

BATHTUBS (from page 31)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
21	Faucets and other controls shall be at a maximum height above the rim of	450												450 max.			450	450
22	Faucets and other controls shall have lever-type handles	yes							yes					with one hand			yes	yes
23	Lever-type handles shall have a minimum length from the centre of rotation to the handle tip of	75																75
24	Faucets and other controls shall not be spring loaded	yes												with one hand			yes	yes
Shower Head																		
25	A shower head shall be of a hand-held type	yes							yes					yes			yes	yes
26	A shower head hose shall have a minimum length of	1500		1500										1500			1525	1500
27	A shower head shall be allowed to be used in a fixed position	yes		yes										yes			yes	yes
28	A shower head shall be mounted to be adjustable between the floor and upwards to	1200												lower end a min. 1000 above the floor				lower end a min. 1000 above the floor
29	A shower head where mounted on a vertical bar shall not obstruct the use of the grab bars	yes		yes										yes			yes	yes
Water Temperature																		
30	The water temperature shall be thermostatically controlled or have a pressure equalizing valve	yes															yes	yes
31	The water temperature of the water supply shall not exceed	55°C		49°C					40°C									55°C

BATHTUBS COMMENTS

No.	Document	Comments
1	CSA	To allow easier access to the bathtub, it is desirable to have a seat located at the end of the bathtub that runs the width of the bathtub, is 400 mm deep and is flush with the tub edges.
2	CSA	The vertical grab bar shall not interfere with the shower curtain.
3	CSA	The faucet lever in the off position should be angled to the front. Hot and cold faucets for bathtubs should be consistently oriented.
4	South Africa	Grab bars to be of stainless steel.
5	Singapore	Non-slip flooring should be used in the main area of the tub room outside the bathtub.
6	Singapore	Faucets and controls shall have clearly visible colour contrasted and embossed signs indicating the hot and cold water supply.
7	Singapore	Bathtub enclosures shall not obstruct controls, or interfere with a person transferring from a wheelchair.

BENCHES AND PICNIC AREAS

Quite a few of the countries included in this study **require that a bench or seat be provided adjacent to the accessible route** (1), with Australia specifying that it should not be more than 500 mm away from the path of travel. The minimum clear space beside a bench (4) is required by Singapore, Australia, Lebanon and Sweden to accommodate a wheelchair. Lebanon points out that it **is important to provide a mix of different kinds of seating options** whereas Sweden specifies that armrests be provided at a height of 700 mm from the ground (11).

Picnic tables should be at the same height as a counter (16), 750 - 850 mm preferred, with adequate kneespace and clearance to approach the picnic table. It is important to remember that the picnic table must be placed on the accessible route.

CSA warns that if the picnic table or seat is located beside a downward slope, a curb should be provided. Singapore points out that in large department stores, supermarkets and transit stations seating should be provided for persons with disabilities, an excellent recommendation.

Australia reminds us that **street furniture should be positioned on one side of the accessible path of travel, without creating a protrusion hazard.** Australia comments that seats should generally be at a height of 450 mm but where they are designed for elderly users, a height of 520 mm is preferred.

BENCHES AND PICNIC AREAS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Location/Grade																		
1	A bench or seat is located adjacent to an accessible route	yes		yes			yes							900 min. clear space in front of seat/bench	yes 500 away from path of travel	yes	yes	yes
2	The bench or seat is stable	yes		yes														yes
3	Bench or seating area has a level and firm surface	yes		yes														yes
4	The minimum clear space beside a bench for wheelchair pull up and that is not part of the route of travel is (width x depth)	850 x 1200		760 x 1220			suitable space should be provided							an empty space, 900 min.	800 x 1300	1200 x 1200	920 x 1370	800 x 1300
5	Area beside, in front and under bench is level with a maximum slope of	2%		1:48												yes		2%
6	A picnic bench/table shall have a level, firm ground surface immediately adjacent to an accessible route	yes														yes	yes	yes
7	The clear area around a picnic bench/table shall extend on all sides at least	2000														yes	2000	2000
8	The ground or floor surface of a seating area shall contrast in colour and texture with the surrounding surface	yes					yes										yes	yes
Back/Armrests																		
9	Bench or seating areas provide a mix of options (i.e. some with backrests, some with armrests, and some with both)	yes														yes		yes
10	Benches shall provide for back support or be affixed to a wall			yes			back support								yes		back support	yes
11	Minimum height of back support rising above seat			455												700 above floor		455

Continued on next page

BENCHES AND PICNIC AREAS (from page 35)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
12	Armrests are provided						yes, and gripable, at a height of 700 from the ground							yes	yes, at a height of 260 ± 40 from the seat			yes, at height a of 260 ± 40 from the seat
Seat																		
13	Height of the seat above grade shall be	450 - 500		430 - 485			450 - 500								400 - 450	450	450 - 500	450 - 500
14	Minimum depth of seat shall be			510 - 610											400 - 450			450
15	Where installed in wet locations, the surface of the seat shall be slip-resistant and shall not accumulate water			yes											yes			yes
Tables																		
16	The picnic bench/table top height shall be at a height above grade of	730 - 860			760		700 - 850									750 - 900	710 - 865	750 - 850
17	The clear kneespace height under a picnic bench/table shall be a minimum of	680					680 - 700									600	685	680 - 700
18	The clear kneespace width under a picnic bench/table shall be a minimum of	750					800										760	800
19	The clear kneespace depth under a picnic bench/table shall be a minimum of	480					600										480	600

BENCHES AND PICNIC AREAS COMMENTS

No.	Document	Comments
1	CSA	If the seating area is adjacent to a downward slope that is potentially hazardous, then a curb should be provided around the level area.
2	ADAAG	To assist in transferring to the bench, consider providing grab bars on a wall adjacent to the bench, but not on the seat back. If provided, grab bars cannot obstruct transfer to the bench.
3	Singapore	In large department stores, supermarkets, foyers of public places and public concourses (ie: mass rapid transit stations) seats shall be provided for persons with disabilities who are unable to stand for long periods.
4	Singapore	Seats or a bench shall be provided at a taxi stand for ambulant disabled and these shall not impede the movement of the wheelchair users. Armrests should be provided at the ends of the seats to assist ambulant disabled and older persons to get up.
5	Sweden	The clear space in front of a picnic table shall be 1500 x 1500 mm.
6	Australia	In pedestrian malls and similar places, all street furniture should be positioned on one side only of the accessible path of travel.
7	Australia	Where possible, a range of seat heights should be provided. Seats should generally be 450 mm high but where a high proportion of elderly users are anticipated, heights of up to 520 mm are preferred. Children and small people may prefer seats as low as 350 mm high.

CAFETERIAS AND RESTAURANTS

Cafeterias and restaurants should be accessible to everyone. However, at a minimum, one area of each bar and restaurant area should be accessible.

The minimum clear width ranges (2) from 820 - 1060 mm, with the Expert Panel selecting the wider requirement to allow for people to manoeuvre around someone seated in a wheelchair.

The top of the counter and table heights vary in height (4) from a 710 - 915 mm, often with the best practice being the mid range of 750 - 850 mm. It is important to consider both the **manoeuvring space as well as the seating space requirements** for wheelchair users. A space 800 x 1300 mm is considered a best practice.

Singapore addresses the question of what percentage of the restaurant or cafeteria must be accessible by stating that when fixed seating is provided at least one table in every 10 should be accessible to people with disabilities or at least two tables whichever is greater. Singapore further improves on this by stating that **a variety of table and chair arrangements or flexible arrangements should be provided.**

ICTA points out that **prices should be clearly displayed at the cash register** to be clearly visible to all customers. This is appreciated by people who are hard of hearing as well as all other customers.

A good design practice is the provision of a **continuous tray rail** in the cafeteria, and the provision of condiments and cutlery within reach of people who use wheelchairs and people of short stature.

Vending and dispensing machines should also be designed to be accessible.

CAFETERIAS AND RESTAURANTS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Aisle/Checkout Lanes																		
1	Is the cafeteria accessible	yes	yes	yes														yes
2	The food service lines have a minimum clear width of	920		915											820		1060	920
3	Minimum clear width at checkout lanes	920	yes	915										900	820		1060	1060
Counter/Table																		
4	The top of counter and table heights are between	730 - 860	865 max.	915 max.	760	800			850					800 max.	730 - 850	900	710 - 865	750 - 850
5	The tops of tray slides are at a height above the finished floor between			710 - 865												900	865	710 - 800
6	For information on kneespace and footprint requirements for tables and counters, see section on ANTHROPOMETRICS	yes	yes	yes	yes	yes			yes					yes	yes	yes	yes	yes
Seating																		
7	Seating spaces for persons in wheelchairs shall have adequate manoeuvring space to approach the seating area	yes												yes			yes	yes
8	At seating spaces for persons in wheelchairs there shall be adequate manoeuvring space to approach the table or counter	yes			yes									yes		yes	yes	yes
9	The equivalent choice of food in self-serve areas is located at a height from the floor a maximum of	1200		1220													50% of shelves at a max. of 1200	1200
10	Seating spaces for persons in wheelchairs shall have a clear floor area a minimum of (width x depth)	750 x 1200		760 x 1220	750 x 1200									750 x 1200			760 x 1370	800 x 1300

Continued on next page

CAFETERIAS AND RESTAURANTS (from page 39)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Controls																		
11	For cafeteria and vending machine operable controls requirements, see controls section in ANTHROPOMETRICS	yes	yes	yes	yes	yes	yes		yes	yes				yes	yes	yes	yes	yes
Other																		
12	Information on visual displays shall be supplemented by tactile and/or auditory information, colour contrasted, and located on a glare-free surface	yes				colour contrasted and glare-free			yes						yes		yes	yes
13	For circulation, line-up areas, and access route requirements, see the section on ACCESS ROUTES	yes	yes	yes	yes	yes			yes	yes		yes	yes	yes	yes	yes	yes	yes
14	For requirements at doors, see section on DOORS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
15	For signage requirements, see the section on SIGNAGE	yes	yes	yes	yes	yes	yes		yes	yes		yes		yes	yes	yes	yes	yes

CAFETERIAS AND RESTAURANTS COMMENTS

No.	Document	Comments
1	CSA	A forward approach for seating at tables and dining counters is preferred.
2	ADAAG	Locate the cash register so that a person using a wheelchair is visible to sales or service personnel and to minimize the reach for a person with a disability.
3	ADAAG	Where fixed tables or dining counters where food is consumed are provided, at least 5% but not less than one of the fixed tables, or a portion of the dining counter, shall be accessible.
4	Singapore	Where fixed seating is provided in eating outlets and establishments at least one table for every 10 tables or part thereof shall be provided for use by persons with disabilities or at least two tables whichever is the greater.
5	Singapore	Where fixed seating are provided it is advisable to provide empty spaces between the seats to accommodate wheelchair users.
6	Singapore	The International Symbol of Access shall be placed on the table intended for use by persons with disabilities.
7	Singapore	A circulation path of at least 900 mm wide shall be provided in front of the stalls.
8	Singapore	A variety of table and chair arrangements or flexible arrangements of tables and chairs should be provided in eating outlets or establishments.
9	Sweden	In cafeterias and restaurants good acoustics is important.
10	UN	Tables in cafeterias and restaurants should have cantilevered tops or straight legs at corners.
11	ICTA	The price should be displayed at the cash register, visible to the customer. This will be appreciated by people who are hard of hearing, Deaf or deafened, as well as to all other customers.

COMMUNICATIONS

A variety of different types of assistive listening system are available including a loop system, infrared, radio frequency, or direct wire. Assistive listening systems amplify sound for people who are hard of hearing as well as others.

The Canada AFG Guideline recommends that **assistive listening systems be provided wherever audio is integral to the use of a space** (1). It is important that the systems be accessible to those people that use hearing aids (4), as required in the U.S. and Canadian standards. The U.S. further requires **a noise ratio and sound pressure level to ensure access for people who are hard of hearing (5).**

Both South Africa and Canada require that a symbol indicate the existence of an assistive listening system and Sweden points out that the system should also be available for those speaking at the podium and on stage, both excellent recommendations. Sweden further recommends the use of **assistive listening systems at reception counters in transportation facilities.**

It is also important to reduce background noise into designing and acoustically advantageous facility to comply with universal design principles.

COMMUNICATIONS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
General																		
1	Is there an assistive listening device provided																where audio is integral to use of the space	yes
2	Where an assistive listening system is provided, an induction loop, infrared system, or radio frequency system shall be used	yes		yes													yes	yes
3	Receivers required for use with an assistive listening system shall include a 3.2 mm standard mono jack			yes														
4	Receivers required to be hearing aid compatible shall interface with telecoils in hearings aids through the provision of neck loops			yes													yes	yes
5	Assistive listening systems shall be capable of providing a sound pressure level of 110 dB min. and 118 dB max. with a dynamic range on the volume control of 50 dB			yes														yes
6	The signal to noise ratio for internally generated noise in assistive listening systems shall be 18 dB min.			yes														yes

COMMUNICATIONS COMMENTS

No.	Document	Comments
1	CSA	Receivers for systems such as inductive loops, infrared systems and FM radio frequency systems can be equipped to be compatible with hearing aids with T-switches or audio input capacity. Hard-wired systems can meet this requirement when provisions are made to accommodate persons with hearing aids.
2	CSA, South Africa	The symbol of accessibility for persons who are Deaf or hard of hearing should be used to indicate the existence of assistive listening systems in a facility.
3	ADAAG	An FM system may be better than an infrared system in some open air assemblies since infrared signals are less effective in sunlight. An infrared system is typically a better choice than an FM system where confidential transmission is important because it will be contained within a given space.
4	ADAAG	Neck loops and headsets that can be worn as neck loops are compatible with hearing aids. Receivers that are not compatible include ear buds, which may require removal of hearing aids, earphones, and headsets that must be worn over the ear, which can create disruptive interference in the transmission and can be uncomfortable for people wearing hearing aids.
5	Sweden	In assembly halls, assistive listening systems should also work at the podium and on the stage.
6	Sweden	The use of assistive listening systems at reception counters facilitates communication for people who have a hearing impairment.
7	South Africa	Hearing impaired people may need to report at the information counters of all airports, railway stations, hotels, etc to arrange for written messages or other information (or both). Such a counter and its location should be clearly identified by displaying the international loop system (Deaf) signal.
8	ICTA	Where assistive listening systems are provided, a sign announcing their availability should be posted.

COMPUTER ROOMS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Aisles																		
1	The clear width of aisles shall be a minimum of	920		915										900			1060	920
Counters/Tables																		
2	At seating spaces for persons in wheelchairs there shall be adequate manoeuvring space to approach the seating area	yes		yes									yes	yes		yes	yes	yes
3	For requirements for seating space, kneespace, counter and table surfaces, see section on ANTHROPOMETRICS	yes	yes	yes	yes	yes			yes					yes	yes	yes	yes	yes
Controls																		
4	For requirements for controls, see section on ANTHROPOMETRICS	yes	yes	yes	yes	yes	yes		yes	yes				yes	yes	yes	yes	yes
Other																		
5	Information on visual displays shall be supplemented by tactile and/or auditory information, colour contrasted, and located on a glare-free surface	yes				colour contrast in luminance and glare-free surface			yes									
6	For requirements at doors, see section on DOORS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
7	For circulation and access route requirements, see section on ACCESS ROUTES	yes	yes	yes	yes	yes			yes	yes		yes	yes	yes	yes	yes	yes	yes
8	For any signage requirements, see section on SIGNAGE	yes	yes	yes	yes	yes	yes		yes	yes		yes		yes	yes	yes	yes	yes

Note: Summary and technical comments for the section on Computer Rooms can be found in the section on Workstations.

CURB RAMPS, CROSSINGS AND ISLANDS

Curb ramps are required to be stable, firm, and slip-resistant (1) by most codes and standards. **Curb ramps are required to have a level transition (2) between the ramp and the adjacent surface. This is a change from previous codes and standards that used to require a small lip at curbs.** Appropriate drainage (4) is recommended with the maximum counter slope of 1:20, a requirement of Canada, the U.S., and the Philippines.

The maximum running slope of the curb varies from 1:8 to 1:16, with the best practice recommendation being 1:12 - 1:16. **The width of a curb ramp (11) varies from 900 mm to 1220 mm with the best practice being 1000 mm.** Canada requires curb ramps to be between 1200 to 1500 mm where they are exposed to snow (12). **A detectable warning surface (13) with colour and texture contrast is required by most codes and standards** with the Philippines recommending tactile blocks and Sweden requiring a different texture and luminance.

Curb ramps should be provided at both sides of the street and shall be aligned (20). A number of countries require that the curb ramps be wholly contained within the markings (23) of the crosswalk, an excellent idea. **Although the U.S., Mexico and Lebanon allow corner curb ramps, both Canada and South Africa recommend that these be avoided.**

A level area at a traffic island (29) should be provided at least 1300 mm long. Canada and Lebanon also require a detectable warning surface (31) on the level islands

The CSA comments that curb ramps that project into the roadway are not recommended as they are dangerous to users and obstruct vehicles. **The Philippines recommends that tactile blocks be provided in the immediate vicinity of crossings.** The U.N. Lebanon guidelines recommend that **guide strips be constructed to indicate the position of the pedestrian crossing for the benefit of people with visual impairments.**

CURB RAMPS, CROSSINGS AND ISLANDS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
General																		
1	Curb ramp surface to be stable, firm, and slip-resistant	yes		yes	yes	yes	yes			slip-resistant		yes		slip-resistant	yes	rough texture	yes	yes
2	Curb ramp to have a level transition from the ramp to the adjacent surfaces	yes		yes											yes	max. 15	yes	yes
3	Minimum level walking space back from the top of a curb ramp slope so pedestrian can avoid the curb ramp is	920		915	1200							1200		1200	1330	lower area, max. slope 1:12	1060	1200
4	Curb ramp design shall provide for appropriate drainage so that water will not accumulate on the path of travel	yes		yes								yes		yes		yes	yes	yes
5	Returned curbs and other edges parallel to pedestrian flow may be used where pedestrians would not be expected to walk across the ramp	yes		yes										yes			yes	yes
Slope																		
6	Maximum counter slope of gutters and road surfaces adjacent to curb ramp	1:20		1:20								1:20					1:20	1:20
7	Maximum running slope of the curb ramp shall be	1:15 - 1:10		1:12	1:16 - 1:12	1:8	1:12				1:8	1:12		1:10 (rise 150 - 200), 1:12 (rise +200)	1:8	1:12	1:8 - 1:10 (75 high), 1:10 - 1:12 (150 high)	1:12 - 1:16
8	Where there is no level space back from the top of a curb ramp slope, maximum slope ofthe flare is			1:12														1:12 - 1:16
Flared Sides																		
9	Curb ramp to have flared sides where pedestrians are likely to walk across them	yes		yes										yes	yes		yes	yes
10	Slope of flared side between	1:15 - 1:10		1:10										1:10 max.	45˚	1:12	1:10	1:12 - 1:15

Continued on next page

CURB RAMPS, CROSSINGS AND ISLANDS (from page 47)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Curb Width																		
11	Width of curb ramp (not including flare) shall be at least	920	920	915	1000	900	min. 900 - max. 1000					900		900	1000	900	1220	1000
12	Where exposed to snow width of curb ramp (not including flare) shall be	1200 - 1500																1200 - 1500
Detectable Warning Surfaces																		
13	Curb ramp to have detectable warning surface with colour and texture contrast with adjacent surfaces	yes			texture contrast	yes	different texture and luminance			yes		tactile blocks		yes	yes	yes	yes	yes
14	The detectable warning surface on the curb ramp to have a depth of	600 - 650								surface is a bubble ramp		300		600 min.		600		600 - 650
15	The detectable warning surface on the curb ramp to start back from the curb/gutter a distance of	150 - 200										immediate vicinity		300		yes		150 - 200
16	The detectable warning surface to extend the full width of the curb ramp	yes				no								yes		yes	yes	yes
17	As a detectable warning surface is required on a curb ramp, a level curb to gutter transition is permissible	yes																yes
18	See section on DETECTABLE WARNINGS for additional requirements	yes		yes		yes				yes		yes		yes			yes	yes
Location																		
19	Is a curb ramp provided at both sides of the street	yes		yes	yes		where crossing permitted			yes				yes		yes	yes	yes
20	Curb ramps provided at both sides of the street shall be aligned with the opposite curb cut	yes		yes						yes		as near perpendicular to street as possible		yes		yes	yes	yes
21	Curb ramps to be located at the side of the crosswalk farthest from the parallel vehicular roadway	yes														yes		yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
22	Curb ramps shall be located so that they do not project into vehicular traffic lanes parking spaces or parking access aisles			yes										yes		usual line of pedestrian flow		yes
23	Curb ramps at marked crossings shall be wholly contained within the markings			yes										yes	yes	yes	yes	yes
24	Curb ramps shall lead people directly into the crossing area designated for pedestrian use	yes		yes								locate at the nearest most convenient part		yes	yes	no	yes	yes
Diagonal Curb Cuts																		
25	Are corner curb ramp permitted	avoid		yes	yes					avoid						yes		no
26	The bottom of diagonal curb ramps shall have a clear space outside active traffic lanes of the roadway a minimum			1220												yes		yes
27	Diagonal curb ramps provided at marked crossings shall provide a minimum clear space within the markings of			1220												yes		diagonal crossings should not be used
28	Diagonal curb ramps with flared sides shall have a segment of curb, located on each side of the curb ramp, and within the marked crossing, a minimum length of			610											1220			diagonal crossings should not be used
Traffic Islands																		
29	Minimum length of level area between curb ramps on islands	1200		1220								1500		1200	yes, or have curb ramps	1500	1370	1300
30	Raised islands in a crossings to be cut through level with the street	yes		yes	yes									yes or have curb ramps with a level area 1200 x 1500			yes or have a curb ramp with a level area 1060 x 1370	yes
31	Islands level with the street more than 1200 in depth, shall have a detectable warning surface set back from the street a distance of	150 - 200														yes		150 - 200

Continued on next page

CURB RAMPS, CROSSINGS AND ISLANDS (from page 49)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
32	Islands level with the street more than 1200 in depth, shall have a detectable warning surface in depth that is	600 - 650														600		600 - 650
33	Islands level with the street shall have a detectable warning surface that contrasts with the surrounding walking surfaces	yes														yes	yes	yes

CURB RAMPS, CROSSINGS AND ISLANDS COMMENTS

No.	Document	Comments
1	CSA	The flared sides of curb ramps may be located outside the pedestrian crosswalk markings.
2	CSA	Curb ramps that project into the roadway are not recommended as they are dangerous to users and obstructive to vehicles.
3	ADAAG	Curb ramps and the flared sides shall be located so that they do not project into vehicular traffic lanes, parking spaces, or parking access aisles.
4	Sweden	Curbs between pedestrian area and traffic area should have a min. height of 400 mm.
5	South Africa	Visible, audible and tactile warning devices should be considered where these are required.
6	Singapore	Curb ramps do not require handrails.
7	Singapore	Curb ramps shall be located or protected to prevent obstruction by parked vehicles.
8	Singapore	Curb ramps shall be free from any obstruction such as signposts, traffic lights and similar items.
9	Singapore	A textured curb ramp surface will assist in giving a secure foothold to the ambulant disabled.
10	Philippines	Curb cut out should only be allowed when it will not obstruct a walkway or in any way lessen the width of a walkway.
11	Philippines	Provide tactile blocks in the immediate vicinity of crossings as an aid to people who are blind. The tactile surface has to be sufficiently high enough to be felt through the sole of the shoe, but low enough not to cause pedestrians to trip.
12	UN	Low-traffic crossings frequently used by people with disabilities can be controlled by a pedestrian push-button system.
13	UN	Constructing traffic islands to reduce the length of the crossing is recommended for the safety of all road users.
14	UN	Guide strips should be constructed to indicated the position of pedestrian crossings for the benefit of visually impaired pedestrians.
15	UN	The road surface at pedestrian crossings can be raised to the same level as the pathway so that wheelchair users do not have to overcome differences in height.
16	UN	To avoid confusing people with visual impairments, curb ramps should be positioned out of the usual line of pedestrian flow.
17	London AFG	While a smooth transition and minimal slope are ideal for someone in a wheelchair, they are a potential hazard to people with a visual impairment who may not notice the transition from sidewalk to street. Textured surfaces are an important safety feature in these circumstances.

DETECTABLE INDICATORS

Detectable indicators are increasingly being applied to the built environment to assist in wayfinding for persons of who have a vision impairment. This analysis includes detectable hazard indicators as well as detectable direction indicators, the difference between them being very important, **hazard indicators are intended to warn people of an upcoming hazard whereas direction indicators are to assist in wayfinding.**

Detectable hazard indicators are generally detectable markings including truncated domes that are required by Canada and the U.S. The Philippines says that hazard indicators (1) should be high enough to be detected but not create a trip hazard, whereas Singapore requires a diameter of 35 ± 1 with a top diameter of 25 ± 1. **Hazard indicators are required to be organized in a regular pattern, to be slip-resistant (4), colour contrasted (5) and to be installed at a regular distance back from the edge of the hazard.** Canada requires the edge of the hazard indicator to be located a distance of 600 to 650 mm back from the edge of the hazard (6), Uruguay 500 to 600 mm back, Singapore 300 mm back and the Philippines, that it be located before the hazard, the Expert Panel recommending that **the hazard indicator be 500 - 600 mm back from the hazard.** An important consideration is that the detectable hazard indicators not create a tripping hazard (9), something specified by Canada, the Philippines and Canadian AFG.

Detectable direction indicators are specified by Canada, Uruguay and Singapore with continuous ridges or patterns specified. The width of the detectable direction indicator from 600 - 800 mm for Canada, 200 to 600 mm in Uruguay, 300 mm in the Philippines and 600 minimum in Singapore.

The provision of both hazard indicators and direction indicators is clearly an area where international collaboration is required to ensure that a uniform surface is used to warn people. This is particularly important for people who are blind and have low vision.

Comments from CSA recommend that detectable direction indicators be located in large open floor areas and in shopping malls and transportation terminals to facilitate wayfinding. The Philippines requires tactile blocks in the vicinity of pedestrian crossings in the outdoor environment, while Singapore states that orientation and mobility of persons with visual impairments will be greatly enhanced through the use of tactile ground surface indicators. They further specify that they be colour and luminance contrasted against their surroundings, an excellent recommendation.

DETECTABLE INDICATORS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Detectable Hazard Indicators																		
1	Detectable hazard indicators shall be composed of	truncated domes								a bubble ramp		tactile blocks		truncated domes			change in texture	tactile markings
2	Detectable hazard indicators shall be composed of truncated domes with a height of 5 ± 0.5 mm and with a base diameter of 23 ± 2 mm	yes		yes								high enough to be detected but not a trip hazard		yes, and base diameter of 35 ± 1, top diameter of 25 ± 1				high enough to be detected but not a trip hazard
3	Detectable hazard indicators shall be organized in a regular pattern with spacing on centre of	60 ± 5		41 - 61										50 on centre and 15 between bases				organized in a regular pattern
4	Detectable hazard indicators shall be slip-resistant	yes		yes						yes		yes					yes	yes
5	Detectable hazard indicators shall have a colour that contrasts with the surrounding surface by at least 70%	yes		yes		colour contrast				texture and colour contrast							yes, texture and colour contrast	yes
6	Detectable hazard indicators shall be installed at a distance back from the edge of the hazard	600 - 650				500 - 600						before hazard		300			one step/ tread back	500 - 600
7	Detectable hazard indicators shall be installed along the full width of the hazard	yes				yes						yes					yes	yes
8	Detectable hazard indicators shall be installed so that the base surface is level with the surrounding surface or not above the surrounding surface more than	3										not a hazard		5 ± 1 max.				3
9	Detectable hazard indicators shall not create a tripping hazard	yes										yes					yes	yes
Detectable Direction Indicators																		
10	Detectable direction indicators shall facilitate wayfinding in open areas and signals a route to be taken	yes				yes								yes				yes

Continued on next page

DETECTABLE INDICATORS (from page 53)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
11	A detectable direction indicator shall be composed of	continuous ridges										tactile blocks		yes, on tiles 300 x 300 in size				continuous ridges
12	Detectable direction indicators shall be installed and have a width of between	600 - 800				200 - 600						300		600 min.				600 - 800
13	Detectable direction indicators shall be installed and have a clear width on each side of at least	320												800				320
14	A detectable direction indicator shall be installed with the ridges running in the direction of the route of travel	yes																yes
15	A detectable direction indicator shall be installed to not create a tripping hazard	yes										yes						yes
16	A detectable direction indicator shall be installed and have the base surface level with the surrounding surface or not above the surrounding surface more than	3												5 ± 1 (max. total height)				3

DETECTABLE INDICATORS COMMENTS

No.	Document	Comments
1	CSA	Detectable direction indicators should be located in large open floor areas (such as shopping malls or transportation terminals) to facilitate wayfinding by indicating the primary routes of travel.
2	Philippines	Tactile blocks should be provided in the immediate vicinity of crossings as an aid to people who are visually impaired. The tactile surface has to be sufficiently high enough to be felt through the sole of the shoe, but low enough not to cause pedestrians to trip.
3	Singapore	The orientation and mobility of persons with visual impairments will be greatly enhanced through the use of tactile ground surface indicators.
4	Singapore	Warning indicators warn of either a hazard or a destination.
5	Singapore	Warning indicators and directional indicators should be tiles 300 x 300 mm in size.
6	Singapore	Warning treatments may be required at hazardous locations such as steps, stairs, railway platforms, pedestrian crossings and wharves.
7	Singapore	Warning treatments may be required at destinations to provide information about the location of amenities such as ticketing machines, phone booths and the like.
8	Singapore	Tactile ground surface indicators act as landmarks, as such its application must be targeted.
9	Singapore	Tactile ground surface indicators should be colour and luminance contrasted against their surrounding surfaces.
10	Singapore	A warning treatment should be applied perpendicular to the hazard.
11	UN	A tactile guiding area preferably of rubber tiles, with minimum dimensions of 900 x 900 mm should be constructed in a guide strip at cross pathways, at pedestrian crossings and around obstructions.

DOORS

The main entrance should be served by an accessible route, (1) a requirement in most of the codes and standards. **Singapore and Lebanon require that there be a power door operator on at least one entrance door,** while Sweden requires one only if the door is heavy, South Africa states it as a preference and Australia requires a power operator if the depth of the recess of the entrance door is greater than 300 mm. As a best practice, **power doors should be provided at main entrance doors as some people are not able to open doors independently.** Many countries specify an illumination level of at least 200 lux at the entrance door, a feature that is appreciated by everyone.

The minimum clear width for doorways (3) varies from 750 mm in South Africa to 1000 mm in Bangladesh, although the majority recommend 800 mm. The Expert Panel selected a minimum clear width of 850 mm as the best practice. Revolving doors (2) are not permitted in Malaysia. An adjacent door, whenever a revolving door is provided, is called for in the majority of other codes. The height of door hardware (5) varies somewhat but was generally recommended to be a height of 800 - 1000 mm.

A small threshold (9) of up to 20 mm is permitted in Lebanon but **Singapore recommends that thresholds be level,** and the Philippines state a preference for no threshold. The best practice recommendation is a level interior threshold with a maximum 6 mm for exterior thresholds. This specification varies due to geographic and weather considerations but high thresholds can cause a tripping hazard and may be difficult for people to wheel over.

The provision of two doors in a series (14) with limited space between them causes a serious hazard as people who use wheelchairs may get caught between the doors. Canada, the U.S., Singapore and Lebanon call for a minimum of 1200 mm of clear floor space between the open door swing and the face of the next door, while South Africa, Ireland and the Philippines measure it from the face of one door to the face of the next at 1800 mm.

Canada provides details on the **location of the automatic door controls, specifying that they be located along the route of travel (20), clear of the door swing (22), that they be clearly visible (21), and mounted at a height between 800 - 1200 mm.** This useful information ensures that controls are accessible to everyone.

Adequate manoeuvring space beside doors is addressed by most countries but it is not required by Mexico, Uruguay, South Africa, Bangladesh or Malaysia. Generally, **an area of 1500 x 1500 mm is required in front of doors to provide sufficient room to reach the door handle, open the door and locate a mobility device such as a walker or wheelchair outside of the swing of the door.** Different requirements are provided for various types of doors. Where glazing is provided in doors (50), a number of countries specified that it be installed at a height that people who use wheelchairs or are of short stature are able to see through the glass.

The danger of people walking into glass doors has increasingly been recognized as seen by a number of comments from Sweden, Canada, South Africa and Singapore that require that there be markings at eye levels to assist people with visual impairments and others to detect the presence of the door. Other interesting comments recommend that door hardware contrast strongly with the background (Singapore), and that glass doors have a kickplate at the bottom edge (Uruguay). Australia suggests that canopies for weather protection may enable the elimination of thresholds.

For additional summary information on doors and entrances, see the section on ENTRANCES.

DOORS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
General																		
1	Where a turnstile is used it shall have an adjacent gate with a minimum clear width of	810	800	815					yes	750		800	turnstiles not allowed	900	800	yes	950	900
2	Where revolving doors are used an adjacent door shall be provided that complies with the requirements for clear width	yes	yes				yes		yes	yes			revolving doors not allowed	yes	yes	yes	yes	yes
Clear Width																		
3	The minimum clear width of a doorway shall be	810	800	815	900	800	800	800 exterior, 750 interior	850	750	1000	800	800, 760 washroom	900	800	900 exterior, 800 interior, 750 washroom	950	850
Door Hardware, Closing Time and Forces																		
4	Door hardware to be operable by one hand without tight grasping, pinching, or twisting of the wrist	yes	yes	yes	yes	yes	yes			operable with one hand, and avoid round door knobs		yes	yes	yes	preferred	yes	yes	yes
5	Door hardware to be mounted above floor at a height of	800 - 1200		865 - 1220	950		800 - 1000		850 - 1100	1000 max.		820 - 1060		900 - 1100	900 - 1100	900 - 1000	400 - 1200	800 - 1000
6	Minimum time for door equipped with a closer to close from 90° to 12° shall be	3 s	3 s	5 s					3 s					3 s			3 s	5 s
7	Maximum force required to push or pull open an exterior swinging door	38 N	38 N				doors with closers should have automatic openers	38 N	30 N			4 kg		38 N		minimal effort	38 N	30 N
8	Maximum force required to push or pull open an interior swinging door	22 N	22 N	22.2 N			doors with closers should have automatic openers	22 N	30 N			4 kg		22 N	19.5 N	minimal effort	22 N	19.5 N

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DOORS (from page 57)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Thresholds																		
9	The maximum threshold height at doors to be no more than	13	13	13	13					15 max.		none preferred, max. 25	minimal	be level	56 (with a 1:8 ramp with max. length of 450)	20	13	level interior, 6 exterior
10	Maximum threshold height at exterior sliding doors	19		19								25				20		19
11	Thresholds over a height of 6 mm to be bevelled to a maximum slope of	1:2		1:2			1:12			if over 15 bevelled at 1:10		1:12			1:8	yes	1:2	1:8
Double Leaf Doors																		
12	At double-leaf doors, at least one leaf complies with requirements for clear width and manoeuvring space at doors	yes	yes	yes			yes	yes	yes	yes				yes		yes	yes	yes
13	If doors have more than one independently operated leaf and where only one door is accessible in a bank of doors, it shall be identified by the International Symbol of Access	yes														yes		yes
Doors in Series																		
14	For doors in series, the distance between two swinging doors plus the width of the door swing into the space, shall be at least	1200	1200	1220				1700 from closed face to face		1800 from closed face to face		1800 from closed face to face		1200	1350	1200	1370	1350
Sliding Door																		
15	Sliding door hardware to be exposed and usable from both sides	yes		yes						at least 60 mm of clear finger space				yes	yes		yes	yes
16	Maximum force to open a sliding or folding door	22 N		22.2 N					25 N	finger tip pressure				22 N	19.5 N			finger tip pressure

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Power-Assisted Doors																		
17	A power-assisted swinging door shall remain open for a minimum of	5 s													time for safe passage by a person with a mobility impairment	adequate interval		5 s
18	Power-assisted doors to swing fully open from closed shall take at least	3 s	3 s											3 s			3 s	3 s
19	At power-assisted swing doors opening into the route of travel, there shall be a cane detectable guardrail or barrier	yes												yes (cane detectable at 580)		yes	yes	yes
20	For doors that are not automatically activated, controls to open power-assisted doors shall be located along the route of travel	yes															yes	yes
21	For doors that are not automatically activated, controls to open power-assisted doors shall be clearly visible before reaching the door	yes					min. 40% luminance contrast										yes	yes
22	For doors that are not automatically activated, controls to open power-assisted doors shall be clear of the door swing or any other fixture	yes					yes								not closer than 1000 to the arc of the door swing		yes	yes
23	For doors that are not automatically activated, controls to open power-assisted doors shall be located at a height above the floor between	800 - 1200					800					700 - 1200			900 - 1200 push button, 900 - 1250 touch pad	900 - 1200		800 - 900
24	The controls for power-assisted doors shall consist of activation pads that are operable by touching any part of the surface with a fist, arm, or one hand, without tight grasping, pinching, or twisting of the wrist	yes					power controls be of suitable design	yes										yes

Continued on next page

DOORS (from page 59)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
25	The controls for power-assisted doors shall have dimensions of at least	25 x 75															diameter of 150	25 x 75
26	The controls for power-assisted doors shall be marked with the International Symbol of Access	yes																yes
27	A power-assisted door requires a force to stop its movement of not more than	66 N												66 N			66 N	66 N
Manoeuvring Space																		
28	Doorways shall have a level manoeuvring area on the push and pull sides of a door	yes	yes		yes	yes	yes					yes			yes	yes	yes	yes
29	Doorways shall have a clear floor area beside the latch edge that extends the full height of the door	yes																yes
30	A clear floor area on the interior of a closet is not required	yes										yes					yes	yes
31	Minimum manoeuvring floor space – front approach – pull side	1500 x 1500		1525 x 1270				1500 x 1500	1800 x 1350			1500 x 1500		1500 x 1500	1350 x 1380		1525 x 1600	1525 x 1600
32	Minimum manoeuvring floor space – front approach – push side	1200 x 1200		1220 x 1120	1500 x 900							1500 x 1500		1200 x 1200	1350 x 1270		1370 x 1250	1500 x 1500
33	Minimum manoeuvring floor space – latch side approach – pull side	1200 x 1500		1220 x 1425								1500 x 1500		1500 x 1500	1510 x 1750	1200 x 1600	1370 x 1600	1500 x 1750
34	Minimum manoeuvring floor space – latch side approach – push side	1050 x 1500		1065 x 1425				1500 x 1500	1200 x 2000			1500 x 1500			1200 x 1610	1200 x 1400	1370 x 1525	1500 x 1500
35	Minimum manoeuvring floor space – hinge side approach – pull side	1500 x 1500		1525 x 1730 or 1370 x 1880			1500 x 1500					1500 x 1500		1500 x 1500	1510 x 2250	1400 x 1700	2440 x 2440	1500 x 1750
36	Minimum manoeuvring floor space – hinge side approach – push side	1050 x 1350		1065 x 1375			1500 x 1500					1500 x 1500			1160 x 1630	1200 x 1600	1370 x 1830	1500 x 1500

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
37	Minimum manoeuvring space beside door – front approach – pull side	600	600	455			700							600	470	300	600	600
38	Minimum manoeuvring space beside door – front approach – push side	300	300	305			700	600						300	470	300	300	470
39	Minimum manoeuvring space beside door – latch side approach – pull side	600		610				300		450				600	840	1300	600	600
40	Minimum manoeuvring space beside door – latch side approach – push side	600		610				600		450					610	700	600	600
41	Minimum manoeuvring space beside door – hinge side approach – pull side	600		915											840	500	600	600
42	Minimum manoeuvring space beside door – hinge side approach – push side	450		560											220	300	450	450
43	Minimum manoeuvring space at sliding door – front approach	1200 x 900		1220 x 815					1200 x 1400						1350 x 1270		1370 x 1060	1350 x 1270
44	Minimum manoeuvring space at sliding door – side approach	1050 x 1350		1065 x 1370											1160 x 1570		1370 x 1550	1370 x 1550
45	Minimum manoeuvring space at sliding door beside latch – front approach	50												300	470		50	300
46	Minimum manoeuvring space at sliding door beside latch – side approach	540		610										300	610		540	610
Signage and Visual Displays																		
47	For additional signage specifications, including information relating to text, pictograms and Braille, see section on SIGNAGE	yes	yes	yes		yes	yes		yes	yes		yes		yes	yes	yes	yes	yes

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DOORS (from page 61)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Controls																		
48	For requirements for controls, see ANTHROPOMETRICS	yes	yes	yes	yes		yes		yes	yes		yes		yes	yes	yes	yes	yes
Kick Plates																		
49	Height of door kick plates on the push side of the door	250				400			300	300		300 - 400		250		300 - 400	200 - 400	200 - 400
Glazing																		
50	On doors with transparent glazing, the lower edge of the transparent glazing to be located above the floor no higher than	900						900					800 - 1500	800 - 1500	1000	1400 - 1600	765	800
Illumination																		
51	Illumination levels at operating controls or devices shall be at least	100 lx													150 lx		100 lx	150 lx
52	Illumination levels at operating controls or devices where reading is required shall be at least	200 lx													200 lx		200 lx	200 lx
Other																		
53	For other door requirements at stairwell entrances, see the section on STAIRS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
54	For other door requirements at ramp landings, see the section on RAMPS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
55	For other door requirements at entrances or exits, see section on ENTRANCES	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes	yes
56	For other door requirements at washrooms, see sections on WASHROOMS or INDIVIDUAL WASHROOMS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

DOORS COMMENTS

No.	Document	Comments
1	CSA	In existing buildings, swing clear hinges can often be used to increase the clear opening of a door without enlarging the frame.
2	CSA	In a typical installation, a door with a width of 900 mm is required to achieve a clearance opening of 810 mm.
3	CSA	Doors and door frames that contrast in colour with their background enable people to more easily locate the door.
4	CSA	In double doors the use of a centre post should be avoided.
5	CSA, Singapore	U-shaped door handle levers reduce the risk of catching clothing, or of causing injury from an exposed lever end.
6	CSA, ADAAG	Knob handles and thumb latch handles are not appropriate because they require tight grasping and fine finger control. Push/pull mechanisms are preferred.
7	CSA	Panic hardware that does not interfere with passage through a doorway is available and should be used.
8	CSA, Sweden	Doors that are entirely made of glass are difficult to detect. They should have a colour contrasting strip around the perimeter of the surrounding opening at least 50 mm wide. A contrasting horizontal strip of a similar width and at a height of 1350 mm from the floor may also be used.
9	CSA	The length of time the door should remain open is affected by the distance between the manual power assist control and the door itself. Placement of the door controls should consider the distance a person must travel from the control to reach the door.
10	CSA	Card readers or other types of security access systems should be located close to the power assist control.
11	CSA	As a supplement to the upper activation pad for a power assist control, another activation pad should be located with its centreline 200 mm from the floor, so that the door opener may be activated by a person using a foot or wheelchair footrest.
12	CSA	Larger areas may be required for larger mobility devices, such as scooters and powerchairs at the entrance area to doors.
13	CSA	The additional floor area at the latch edge of the door is required so that a person in a wheelchair or with a guide-dog can approach the door, activate the door handle, swing the door open and pass through it without having to back up while opening the door.
14	Uruguay	Any glass doors should have a kick plate of 400 mm high at the bottom edge.
15	South Africa	Where a person could accidentally walk into a glass surface, the glass shall be adequately marked in such a way as to be easily visible at a height between 800 - 1000 mm above the floor.
16	South Africa	Windows and doors shall not open across a walkway, corridor, stair or ramp or so that they obstruct circulation.
17	South Africa	The knurling of door handles or raised letters immediately adjacent to door handles is advocated as an aid in building design for use of blind people.
18	South Africa, Singapore	Door closures are a hindrance and their use should be avoided. Where such closures cannot be avoided, the delayed-action type shall be used.
19	Singapore, UN, Australia, CSA	The colour of the door shall contrast with the door frame or the wall.
20	Singapore	Wherever possible and practical, automatic doors (swing or sliding type) should be provided instead of doors that are manually opened.
21	Singapore	U-framed full height glass doors shall, if provided, be prominently marked or highlighted with motifs to make them visible. The markings or motifs shall consist of two horizontal bands each at least 100 mm high and of contrasting colours to assist visibility. The upper band shall be affixed at a height between 1400 - 1600 mm and the lower band affixed at a height between 850 - 1000 mm above floor level.
22	Singapore	Door handles should contrast strongly with their background.
23	Australia	Canopies for weather protection at entry doors may enable thresholds to be eliminated.

DRINKING FOUNTAINS

Requirements for drinking fountains focus on the height of the spout (4), ranging from 675 - 700 mm (Australia) to a 915 mm maximum, specified by the U.S. **The height of the water flow (7) is recommended to be 100 mm, and controls should be easy to operate** (8) and located on both sides, not more than 180 mm from the front as specified by Australia.

The clear floor area in front of the drinking fountain ranges from 750 x 1200 mm (Canada and Singapore) to 800 x 1300 mm (Australia) and 1350 x 1200 mm (Mexico). The Expert Panel selected the 800 x 1300 mm clear floor area, which is compatible with other floor area requirements.

Recessing drinking fountains in alcoves, outside of the pedestrian route is an excellent idea as it eliminates the possibility of creating a hazard for people with visual impairments. Likewise, **a colour contrasted wall behind the drinking fountain assists in making them easier to locate.**

Mexico suggests that the floor area in front of the fountain have **a textural change** to assist people who are blind to locate the fountain. Bangladesh recommends that accessible drinking fountains be well located so that people who use wheelchairs do not have to travel greater distances than others.

Automatic infrared activators will allow the maximum number of users to use a drinking fountain.

DRINKING FOUNTAINS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Floor Area/Spatial																		
1	Minimum clear floor area in front of a drinking fountain	1200 x 750		1220 x 760	1350 x 1200									1200 x 750	800 x 1300		760 x 1370	800 x 1300
2	Minimum space from wall to front of fountain	430	485	430	500									430	490 - 500			430
3	The fountain is recessed or located out of the path of travel	yes			yes									yes	preferred		yes	yes
Spout																		
4	The spout height located above the floor a height of	750 - 900	915 max.	915 max.	730 - 780									750 - 800	675 - 700	850 - 950	760 - 915	760 - 800
5	The spout located at front of the unit	yes	yes	yes, max. depth from front is 125										yes	yes		yes	yes
Water Flow																		
6	The water flow trajectory parallel or nearly parallel to the front of unit	yes		yes										yes	yes		yes	yes
7	Minimum height of water flow	100		100										100	80 - 100		100	100
Controls																		
8	If hand operated, controls are located at or near the front of fountain	yes												yes	yes, or on both sides, not more than 180 mm from the front		easily operated from a wheelchair	yes, or on both sides, not more than 180 mm from the front
9	Hand controls to be operable by one hand and do not require tight grasping, pinching, or twisting of the wrist	yes	yes	yes										yes	operable by one hand		yes	yes
10	Controls shall not be solely operated by foot	yes													yes			yes
11	Maximum force of activation	22 N	22 N	22.2 N										22 N	19.5 N		22 N	19.5 N

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DRINKING FOUNTAINS (from page 65)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
12	Controls allow the user to control the timing and water delivery height	yes												not self closing				yes
13	Maximum height above the floor of a cup from a dispenser	1200																1200
Knee Toe Space																		
14	For information on kneespace requirements, see ANTHROPOMETRICS section	yes		yes	yes	yes			yes					yes			yes	yes
Colour Contrast																		
15	Drinking fountains are colour contrasted with their background	yes																yes

DRINKING FOUNTAINS COMMENTS

No.	Document	Comments
1	CSA	The provision of two drinking fountains at different heights meets the needs of most people.
2	ADAAG	The purpose of requiring water flow a minimum of 100 mm high is so that a cup can be inserted under the flow of water.
3	Mexico	The area in front of the drinking fountain shall be signalled with a texture change.
4	ADAAG, Bangladesh	Accessible fountains should be located so that wheelchair users do not have to travel a greater distance than other people to use a drinking fountain.
5	Singapore	A wall-mounted drinking fountain in an alcove is preferred because it does not create a hazard for persons with visual impairments.
6	ICTA	The walls in a drinking fountain area alcove should be colour contrasted with the surrounding walls adjacent to the alcove.

ELEVATORS

Accessibility criteria for elevators is included in all codes and standards analyzed in this report. **The minimum clear width of the elevator door varies greatly** from a minimum of 800 mm in several of the countries (U.S., Sweden, Ireland and South Africa), to 915 mm and 950 mm in the Canadian CSA and AFG Guidelines respectively, to the very large dimensions of 1050 mm and 1065 mm in Bangladesh and the U.S. respectively. The Expert Panel decided on 950 as it would accommodate larger mobility aids such as scooters.

The interior dimensions of an elevator should, at a minimum, accommodate a person in a wheelchair and an attendant. The interior dimensions of the elevators ranges from a minimum width of 800 mm in Malaysia, to 900 mm in Singapore, and 1500 mm in Mexico. The back wall to front dimensions are larger ranging from 1000 mm in Spain and 1300 mm in Lebanon, to 1700 mm in Mexico (5).

Most countries specify that elevators be **self-leveling,** a feature with a tolerance ranging from 13 to 20 mm. In addition, an automatic reopening device for the elevator door is required to prevent the door from closing on people, a requirement in most standards. Canada, the U.S. and Sweden all require a **device sensor at two heights (11,12)** to ensure that the doors do not close on children as well as adults and people who are blind and use guide dogs.

Ireland specifies that the elevator doors should remain open for eight seconds while Canada and the U.S. specify five seconds (14).

Handrails are required along one access wall (31) in most standards, at a height ranging from 800 - 1150 mm (32), with the best practice at 800 - 900 mm with adequate space between the wall and the rail to allow room for a hand.

It is important to provide adequate illumination inside an elevator as many people find it difficult to see the controls clearly. Illumination levels in elevators (34) ranges from 54 lux in the U.S. to 150 lux in South Africa.

It is also important to have **a minimum of clear floorspace in front of controls (35)** so that people who use wheelchairs are able to use the elevator, a requirement in most codes. **The maximum height of buttons is generally at 1200 mm (36)**, although Malaysia allows the buttons to be at a height of 1400 mm.

The minimum size of floor registration buttons (40) is consistent with Canada, the U.S., Sweden and Bangladesh, all requiring that the floor registration buttons be raised (41). Only the U.S., Canada and Sweden require that the buttons be **arranged in ascending order.** This is an approach that should be adopted universally.

A common approach is taken by most countries as they require **Braille and tactile characters to be placed immediately on the left of the control panel buttons.** A telephone for communication in an emergency is required by only a few countries although some form of communication device (an intercom) is required by others. It is always important to remember to provide communications systems for people who have a communication impairment.

Canada, the U.S., Sweden, South Africa, Malaysia and Lebanon all require both audio and visible means for identification of elevators. Sweden, the U.S. and Canada require a specified decibel level (70) and **signals that sound once for up and twice for down** are required in Canada, the U.S., Sweden, Malaysia and Lebanon (73).

To assist people who are blind to know what floor level they are on, **raised characters and tactile floor designations are required on the door jambs of the elevator hoists to indicate the floor level** (79). Audible individual car floor location indicators are also required in Canada, the U.S., Mexico, Sweden, and Malaysia. **Automatic verbal announcements** (71) that announce floor levels are required in Canada, the U.S. and Ireland. This is a feature appreciated by people with visual impairments.

The hall buttons in elevator lobbies are required to be low enough to be reached by people who use wheelchairs and people of short stature with most countries specifying a maximum height of 1200 mm (90), though Malaysia recommends 1400 mm. A very important consideration is the provision of **adequate manoeuvring space in front of the hall call buttons so that people are able to reach them.** This is a requirement of Singapore, Philippines, Sweden, the U.S. and Canada.

Canada suggests that a **mirror be provided on the rear wall,** especially if the size of the elevator does not allow a person who uses a wheelchair to turn around. Sweden suggests that tactile and visual information be provided at a 45 degree angle from the wall so that standing people and people with visual impairments can read the characters. Singapore points out that **control should require only light positive pressure to activate them.**

ELEVATORS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
General																		
1	Elevator operation shall be automatic	yes		yes						yes	yes		yes					yes
Elevator Doors																		
2	The elevator door opening shall be a minimum clear width of	915		915 side, 1065 centre	900	800	800	800	850	800	1050			900		800	950	950
3	For any car door with a minimum clear width of 915 mm, the minimum inside car back wall to front return, and back wall to inside face of door shall be a minimum of	1525		1525	1700		door 800 on wall with length 1100 with car 1100 x 1400						1800				door 950, car 1525 x 1725	1700
4	If the minimum clear width of a car door located at any location is 815, the minimum inside car side to side width shall be	1065			1500	1100	door 800 on wall with length 1100		1000				800	900		1000		1065
5	If the minimum clear width of a car door located at any location is 815, the minimum inside car back wall to front return shall be	1370			1700	1400	door 800 on wall with length 1100		1000				1800			1300		1700
Sliding Doors																		
6	Automatic opening and closing, power operated car and landing doors, which slide horizontally, shall be provided	yes		yes			yes				yes		yes				yes	yes
7	Maximum space (width) between the hall floor and the elevator floor shall not be greater than			32					20				10					10
Self Levelling Device																		
8	There is a self-levelling feature that will automatically bring and maintain the car at floor landings (under zero – rated loading conditions) within a tolerance of	13		± 13			± 20				± 13					20	13	13

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ELEVATORS (from page 69)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Door Reopening Device																		
9	Elevator doors shall be provided with a reopening device that shall stop and automatically reopen a car door and hoist way door if the door becomes obstructed by an object or person	yes		yes			yes				yes		yes	yes		yes	yes	yes
10	The door reopening device will open door fully to a minimum of	910		915														910
11	The lower reopening device sensor is located above the floor at a height of	125 (± 25)		125			25										125 (± 25)	125 (± 25)
12	The upper reopening device sensor is located above the floor at a height of	735 (± 25)		735			1800										735 (± 25)	735 (± 25)
13	The reopening device effective time to be a minimum of	20 s		20 s	15 s						20 s					5 s	20 s	20 s
14	Minimum time door will remain open before starting to close if a hall call	5 s		5 s				8 s									4 s	8 s
15	Minimum time door will remain open before starting to close if a car call	3 s		3 s				8 s									3 s	8 s
16	A reduction of the time that the door remains open shall be permitted after operation of the door close button	yes					yes										yes	yes
Flooring																		
17	The elevator floor has a firm, stable, and slip-resistant surface	yes		yes	yes				yes		yes	yes				yes	yes	yes
18	Elevator carpet pile height shall be a maximum of	13		13							low profile					low pile	13	13
Floor Area/Interior Space																		
19	The minimum clear width of a car door centered on the car shall be	1065		1065	900		800, 1100 for outdoor lifts		850	1100	1050	800		900		800	950	1100

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
20	The minimum inside car width side to side if car door centered on the car shall be	2030		2030	1500		1100		1000		1275	1400		1200		1000	1725 (2030 in heavy-use areas)	2030
21	The minimum inside car depth from inside car back wall to front return if car door is centered on the car shall be	1295		1295	1700		1400		1200		2000	1400		1400		1300	1525	1700
22	The minimum inside car depth from inside car back wall to inside face of door if car door is centered on the car shall be	1370		1370			1400					1100						1400
23	The minimum clear width of a car door located at the side (off centre) shall be	915		915			800, 1100 for outdoor lifts		850	800		800					950	915
24	The minimum inside car width side to side if car door is located at the side (off centre) shall be	1725		1725			1400		1400								1725	1725
25	The minimum inside car depth from inside car back wall to front return if car door is located at the side (off centre) shall be	1295		1295					1400			1100					1525	1400
26	The minimum inside car depth from inside car back wall to inside face of door if car door is located at the side (off centre) shall be	1370		1370														1370
27	The minimum clear width of a car door located at any other location than centered on the car or at the side (off centre) shall be	915		915			800, 1100 for outdoor lifts											915
28	The minimum inside car width side to side for car door located at any other location than centered on the car or at the side (off centre) shall be	1370		1370			1100											1370
29	The minimum inside car depth from inside car back wall to front return for car door located at any other location than centered on the car or at the side (off centre) shall be	2030		2030			1400											2030

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ELEVATORS (from page 71)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
30	The minimum inside car depth from inside car back wall to inside face of door for car door located at any other location than centered on the door or at the side (off centered) shall be	2030		2030			1400											2030
Handrails																		
31	Handrails are provided on all non-access elevator walls	yes			yes	yes	at least 1 wall			on two sides	at least 1 wall, rear preferred		yes	yes		yes	yes	yes
32	In car elevator top of handrail height above the floor between	800 - 920			920	650 - 1150	900 (± 25)		950 - 1050	850 - 1000	800			900		800 - 850	800 - 920	800 - 900
33	In car elevator handrail space between wall and rail	35 - 45				35 - 45	35		45 - 55		38 min.			40 - 50			40 - 45	35 - 45
Illumination																		
34	Illumination at car controls, platform, car threshold, and landing sill shall be a minimum of	100 lx		54 lx						150 lx (50 lx at control panel)						yes	100 lx	100 lx
Controls/Floor Designation Buttons																		
35	The minimum clear floor space at controls shall be	760 x 1220		760 x 1220			1500 x 1500	50 from any wall or projection			1500 width	750 x 1300		900 x 1200			760 x 1370	800 x 1300
36	Maximum height of buttons with floor designations that serve 16 or less elevator landings	1220		1220			900 - 1200	900 - 1200		1200	1370	1200	1400	900 - 1200		1200	1200	1200
37	Maximum height of buttons with floor designations that serve more than 16 landings and with a parallel approach provided shall be	1370		1370			1200			1200	1370	1200		900 - 1200		900 - 1200		1370
Emergency Control Buttons																		
38	Emergency control buttons shall have their centrelines above the floor a minimum of	890		890			900			1200 max.	890	900					890	890
39	The emergency controls, including the emergency alarm shall be grouped at the bottom of the control panel	yes		yes			yes				yes						yes	yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Floor Registration Buttons																		
40	Minimum size of floor registration buttons in their smallest dimension	19		19			20				18	20				20	19	20
41	Floor registration buttons or the surrounding button collar shall be raised a minimum of	1.5		yes			exit floor button to be green and protrude 5 mm beyond other buttons				raised, flush or recessed					embossed		1.5 embossed
42	Except where provided in a standard telephone keypad arrangement, buttons shall be arranged with numbers in ascending order	yes		yes			yes											yes
43	When two or more columns of buttons are provided, they shall read from left to right	yes		yes			yes											yes
44	Except where provided in a standard keypad arrangement, control buttons shall be identified by tactile and visual characters	yes		yes			yes						yes					yes
45	Tactile characters and Braille shall be placed immediately to the left of the button to which they apply	yes		yes				next to or on button		yes	yes	provide Braille		yes			yes	yes
46	The control button for the main entry floor and the control buttons for other functions (other than for floor designations) shall be identified with tactile and visual symbols	yes		yes			yes						yes					yes
47	Buttons for floor designations shall be provided with visible indicators to show that a call has been registered	yes		yes			yes				yes		yes				yes	yes
48	The visible floor indicator shall extinguish when the car arrives at the designated floor	yes		yes			yes						yes				yes	yes

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ELEVATORS (from page 73)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Telephone																		
49	Telephone style keypads shall be in a telephone keypad arrangement	yes		yes			yes											yes
50	Telephone style keypads shall have call buttons with their minimum smallest dimension of	19		19			20											20
51	Telephone style keypad buttons shall be raised a minimum of	1.5		1.5														1.5
52	For telephone style keypads Braille shall not be required	yes																yes
53	For telephone style keypad characters shall have a minimum height of	13		13			15											15
54	For telephone style keypad characters the number five shall have a single raised dot	yes		yes			yes											yes
55	For telephone style keypad characters, the single dot on the number five shall have a base diameter of between	3 - 3.05		3 - 3.05														3 - 3.05
56	Telephone style keypad characters shall be centred on the corresponding keypad button	yes		yes			on the active part of the button											yes
57	A telephone style keypad display shall be provided in the car with visible indicators to show registered car destinations	yes		yes														yes
58	A telephone style keypad display shall be provided in the car with visible indicators to show registered car destinations that shall extinguish when the call has been answered	yes		yes														yes
59	A telephone style keypad display shall be provided in the car and a five point star shall be used to indicate the main entry floor	yes		yes														yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
60	Telephones where provided shall be equipped with a receiver that generates a magnetic field in the area of the receiver cap	yes															yes	yes
61	Telephones where provided shall have a volume control	yes		yes													yes	yes
62	Telephone handset cord shall have a minimum length of	900		735													735	900
63	The international symbol for telephone shall be displayed on the communication device	yes		yes							yes							yes
Emergency Communications																		
64	The car emergency signalling device shall not be limited to voice communication	yes			visible and audible signal		visible and audible signal						yes			yes	yes	yes
65	If instructions for the car emergency signalling device are provided, essential information shall be provided in both tactile and visual form	yes																yes
66	The highest operable part of an emergency two-way communication system shall be located a maximum height from the floor of	1220		1220			1200	1200		1200							1200	1200
67	If the emergency two-way communication device is located in a closed compartment, the compartment door hardware shall be operable with one hand and not require tight grasping, pinching, or twisting of the wrist	yes															yes	yes
68	If the emergency two-way communication device is located in a closed compartment, force to activate operable parts of the compartment door hardware shall be no more than	22.2 N																22.2 N

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ELEVATORS (from page 75)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Car Audible Signals																		
69	Each elevator in a bank of elevators shall have audible and visible means for identification	yes		yes			yes			yes			yes			yes		yes
70	Measured at the annunciator, the car position audible signal shall have a level above the ambient noise level between	10 - 80 dBA		10 - 80 dBA			35 - 65 dBA adjustable to suit location											35 - 65 dBA adjustable to suit location
71	The car position audible signal shall be an automatic verbal announcement identifying the floor at which the car has stopped	yes		yes				yes									yes	yes
72	As the car passes or stops at a floor an audible signal shall sound inside the elevator at a maximum frequency of	1500 Hz		1500 Hz	an audible signal will sound													1500 Hz
73	Audible signals shall sound once for the UP direction and twice for the DOWN direction and shall have verbal annunciators that state the word UP or DOWN	yes		yes			once for up, twice for down						yes			yes		once for up, twice for down
74	Measured from the hall call button, the audible signal or verbal annunciator shall be above the ambient noise level between	10 - 80 dBA		10 - 80 dBA			35 - 65 dBA adjustable to suit location											35 - 65 dBA adjustable to suit location
75	Verbal annunciators shall have a frequency of			300 - 3000 Hz														adjustable to area
Car Visual Signals																		
76	A visible and audible signal shall be provided at each hoist way entrance to indicate which car is answering a call and its direction	yes		yes			yes				yes		yes			yes	yes	yes
77	The visible signal in the smallest dimension shall be a minimum of	60		13			30 - 60				62						60	60
78	Signals shall be visible from the floor area adjacent to the hall button	yes		yes							yes							yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Characters/Braille on Door Jambs																		
79	Raised character and Braille floor designations shall be provided on both jambs of the elevator hoist way entrances	yes		yes		at least one jamb		at least one jamb			raised yes, Braille not required	yes				yes	yes	yes
80	Raised character and Braille floor designations shall have the baseline of the characters centred above the floor at a height of	1525	1500	1525		1400		900 - 1200			1500	1400 - 1600				1500	1500 (± 25)	1500 - 1525
81	A raised star placed immediately to the left of the floor designation shall also be provided on both jambs at the main entry level	yes		yes														yes
82	A raised star placed immediately to the left of the floor designation shall also be provided on both jambs at the main entry level and have a height of	50		51													50	50
Location Indicators																		
83	In elevator cars, both the audible and visible car floor location indicators shall be provided to identify the floor location of the car	yes		yes	yes		yes						yes				visible	yes
84	Indicators shall be located above the car control panel or above the door	yes		yes			yes										yes	yes
85	Indicator numbers shall be a minimum height of at least	16		13			30 - 60										16	16
86	As the car passes or stops at a floor served by the elevator, the corresponding character shall illuminate	yes		yes													yes	yes
87	The visible indicator shall extinguish when the car arrives at the designated floor	yes		yes							yes						yes	yes

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ELEVATORS (from page 77)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
88	An automatic verbal announcement that announces the floor at which the car has stopped shall be provided	yes		yes			yes	yes									yes	yes
89	At the annunciator, the announcement shall be above ambient noise levels between	10 - 80 dBA		10 - 80 dBA			35 - 65 dBA adjustable to suit location											35 - 65 dBA adjustable to suit location
Hall Buttons																		
90	Hall buttons in elevator lobbies and halls shall be located vertically above the floor measured to the centreline of the respective buttons between	890 - 1220		380 - 1220	1200	900 - 1100	900 - 1100		900 - 1200		1000		1400 max.	900 - 1200		900 - 1200	920 (± 25)	900 - 1100
91	The clear floor space in front of hall buttons shall be a minimum of	760 x 1220		760 x 1220			1500 x 1500					750 x 1300		no obstructions near the call button			760 x 1370	1500 x 1500
92	Minimum size of hall call buttons in their smallest dimension	19		19			20				18	20					20	20
93	Hall buttons shall have visual signals to indicate when each call is registered and when it is answered	yes		yes			yes				yes						yes	yes
94	The hall or in-car lantern shall have a minimum centreline height above the floor of	1830		1830							1800						1830	1830
95	The hall button that designates the UP direction shall be located above the button that designates the DOWN direction	yes															yes	yes
96	The hall button or the surrounding button collar shall be raised a minimum of	1.5									raised, flush or recessed							1.5
97	Objects located beneath the hall buttons shall protrude a maximum of	25																25

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Signage, Pictograms, Visual Characters, Tactile, Braille																		
98	For more information on text, pictograms, symbols, visual characters and Braille, see section on SIGNAGE	yes	yes	yes		yes	yes		yes	yes	yes	yes		yes	yes	yes	yes	yes
Tactile Characters																		
99	In addition to the required tactile signs, a tactile elevator car identification shall be placed immediately below the hoist way entrance floor designation	yes		yes														yes
100	The tactile elevator car identification shall have a height of	50		51							50							50

ELEVATORS COMMENTS

No.	Document	Comments
1	CSA	Where the interior size of an elevator makes it difficult for a person using a wheelchair to turn around, a mirror should be provided on the rear wall to allow the user to see the car position indicators and the door opening.
2	ADAAG	The clear floor or ground space required at elevator call buttons must remain free of obstructions including ashtrays, plants, garbage cans and other decorative elements that prevent wheelchair users and others from reaching the call buttons.
3	ADAAG	Braille provided on elevator car controls shall be located either directly below or adjacent to the corresponding raised characters or symbols.
4	Bangladesh	In installations with more than two lifts in a bank, a telephone or other device for two-way communication between each lift car and a convenient point outside the lift shall preferably be provided.
5	Sweden	Where the area inside an elevator makes it difficult for a person using a wheelchair to turn around, there should be space for turning around just outside the doors to the elevator a minimum 1500 x 1500 mm.
6	Sweden	Controls/floor buttons should be positioned at least 10 mm from each other, projecting from the base and not lying in a recessed position below the panel surface. Buttons should give a response so that it is possible to feel or hear that the button has been activated. The necessary power to depress buttons should be 2.5 to 5 N.
7	Sweden	Distances from control devices to a corner has to be considered. The car control should be placed in the middle of the long side of the elevator and at least 400 mm from the corner. The hall control should be placed at least 500 mm from an interior corner.
8	Sweden	Information (tactile and visual) should be placed at a 45° angle from the wall. This will facilitate reading for a standing person and for a person with a visual impairment to read the tactile characters or Braille.
9	Sweden	The button for the exit floor should protrude beyond the other buttons and is preferably green in colour. It should be possible to identify the button visually and tactilely.
10	Ireland	A 1/2 length mirror should be installed to provide a wheelchair user with a rear view to safely reverse out of the lift.
11	Singapore	Where lifts are provided in a building at least one lift shall be made accessible from the entrance level for vertical circulation and shall serve all levels intended for access by persons with disabilities.
12	Singapore	The emergency bell in the lift must be connected to a blinking light in the lift car to signal to persons with hearing impairment that the emergency bell has been activated.
13	Singapore	An audible signal shall be provided to signal the closing of doors to alert the lift passengers.
14	Singapore	If there are two control panels inside the lift car, that is one for the wheelchair user and the other which is mounted at eye level the control buttons at eye level shall be provided with Braille and tactile markings.
15	Singapore	Lift call and control buttons shall not be touch sensitive but shall require a light positive pressure to activate them.
16	Singapore	The symbol identifying the location of an accessible lift shall be provided and shall be in accordance with signage requirements in the section on signage.

ENTRANCES

Sweden encourages the use of good design practices at the main entrance by recommending that it be easy to find for people with cognitive limitations and for people with visual impairments. **They recommend that the entrance not be hidden but be designed to look like a main entrance.**

An excellent universal design practice is recommended by Singapore with the statement that **walls and ceilings be finished in a plain matte colour of lights tones to help diffuse light and increase visibility.**

For additional summary information on doors and entrances, see the section on DOORS.

ENTRANCES

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Accessible Route																		
1	Is the entrance served by an accessible route	yes	yes	yes			yes	yes		yes		yes		yes	yes	yes	yes	yes
2	There shall not be a step that obstructs the passage for a wheelchair at the main entrance	yes					yes					yes						yes
3	For access route requirements to the entrance area, see section on ACCESS ROUTES	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes	yes
4	For circulation route requirements from parking lots to building entrances, see section on PARKING and PASSENGER DROP-OFF	yes		yes			yes					yes		yes		yes	yes	yes
5	For requirements of an entrance door served by a set of stairs, see section on STAIRS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
6	For requirements of an entrance door served by a ramp, see the section on RAMPS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Signage/Symbols																		
7	Does signage exist if accessible entrance is not obvious	yes					yes			yes		yes	yes	yes	yes	yes		yes
8	The International Symbol of Accessibility is displayed at entrances	yes			yes				yes	yes		yes	yes	yes		yes		yes
9	For signage requirements, see section on SIGNAGE	yes		yes		yes	yes		yes	yes		yes		yes	yes	yes	yes	yes
Doors																		
10	Is at least one door equipped with a power door operator?						if the door is heavy or has a heavy closer			preferred				yes	if recess depth to door face is greater than 300	yes		yes
11	If the primary entrance is locked during certain hours, is there a signalling device available to allow notification that someone wishes to enter?			yes														yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
12	For further requirements for doors, see section on DOORS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Front Entrance Reception Counter																		
13	The front entrance reception counter or desk shall have an accessible section with a height of	730 - 860	counter to be barrier free	915 max.	730 - 780	800			850						750 (± 20)		710 - 865	730 - 860
14	For floor and kneespace requirements at reception counters, see section in ANTHROPOMETRICS	yes		yes	yes				yes			yes		yes	yes	yes	yes	yes
Illumination Levels																		
15	Minimum illumination level at front entrances where reading is necessary, to be at least	200 lx							200 lx	150 lx					200 - 300 lx		200 lx	200 lx

ENTRANCES COMMENTS

No.	Document	Comments
1	CSA	Detectable directional indicators should be located in large open areas with the indicated routes leading from the entrance to major destinations such as the information desk/kiosk, stairway, or elevator.
2	Sweden	The main entrance should be easy to find for people with cognitive limitations and for people with vision impairments. The entrance should not be “hidden”, it should be designed to look like a main entrance. Clear signs will also facilitate finding the building. Contrast in luminance in doors and walkways to the entrance, and tactile paving may facilitate wayfinding for people with vision impairments.
3	Sweden	The lighting at the reception desk should facilitate lip-reading.
4	Sweden	Daylight and illumination should not cause any glare. It should be possible to screen off large windows by the use of thick curtains, awnings or blinds.
5	Sweden	Fixtures should be placed so that there are no reflections and so that the light does not create distracting reflections on glass surfaces or floor areas. Take into consideration that people using wheelchairs will have a different angle of vision from that of standing adults.
6	Sweden	When you move from a dark area into a light area there is a risk of being dazzled. Therefore the contrast in tone between adjacent spaces and between outdoors and indoors should not be too great.
7	Sweden	Any door telephone, doorbell, door code panel, etc. should be positioned and designed so that they can also be used by people with disabilities. The controls should be placed at least 700 mm from interior corners, with a height 800 - 1000 mm from the floor.
8	Sweden	If the tactile and visual information is placed at a 45° angle from the wall, it will facilitate reading by a standing person and enable a person with a visual impairment to read the tactile characters or Braille.
9	South Africa	The information counter and its location (such as at airports, railway stations, etc.), where people who are hearing impaired can arrange for written messages or other information, should be clearly identified by displaying the International Symbol of Access for Deaf people.
10	Singapore	Walls and ceilings should be finished in plain colours of light tones (to help diffuse light around the room or area) and a matte finish (to avoid unwanted glare or reflection).
11	Malaysia	Entrances and exits should be identified by a change of floor texture, or by a sound signal.

FIRE SAFETY

The Regulations Respecting Occupational Safety and Health under part to off the Canada Labor Code has numerous requirements that address fire safety requirements for all building occupants, including the requirement **for fire procedures in alternate formats, the need for practicing evacuation procedures with all building occupants and the need for the development of fire safety plans in conjunction with building occupants who have a disability or require some assistance.**

Accessibility codes and standards address fire safety issues such as visual alarms, exits and areas of rescue assistance to facilitate fire and emergency planning for people with disabilities. See also stair, ramp and signage requirements for additional safety related requirements.

Visual alarms are specified by the Philippines, Malaysia, Australia, Sweden, the U.S. and Canada, with Canada and the U.S. specifying the frequency range of 1 to 3 Hz (2). The AFG Guidelines recommend that visual alarms **be mounted at a height of 2030 mm or 1520 mm below the ceiling which ever is lower (5),** a recommendation from the AFG standard. **These technical specifications must be accompanied by operational procedures and fire safety plans that address the needs of everyone, including people with disabilities.**

The clear width of the exit corridor is specified at 1200 mm by Spain, Bangladesh, Philippines and the AFG Guidelines. The same countries also require directional signage (8), illumination (9), and emergency lights (11). Bangladesh specifies requirements for an accessible egress route allowing a slope of 1:8 for the egress route.

Areas of rescue assistance are mentioned by Canada, Mexico, and Uruguay as a safe holding area for people unable to evacuate independently. Specifications include that there be a minimum space for wheelchairs (19) at least 800 x 1300 mm, a minimum floor space, and directional signage (22). A most important consideration is that the area of rescue assistance (23) also be designated in **the evacuation procedure documents.**

Signage for emergency situations is required to be colour contrasted by Uruguay, Sweden, Spain, Bangladesh and Philippines. Additional information is provided in the signage section.

An important comment from Canada is that **the visual alarm should be placed so that the signal from at least one alarm is visible throughout the enclosed space.** Visual alarms **should also be installed in washrooms** where someone who is hard of hearing or Deaf may be alone. South Africa suggests that indicators be applied to the underside of handrails to indicate floor levels. **Australia notes that it is essential that audible emergency signals have the appropriate intensity and frequency** to ensure that they are audible to people who have a hearing loss. The Lebanon U.N. Guidelines **recommend all public announcements be audible as well as visual,** an excellent recommendation.

FIRE SAFETY

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Visual Alarms																		
1	Visual alarms shall be lights that flash in conjunction with the audible emergency alarms	yes	yes	yes			yes	yes		alarm to have red flashing light behind to light up the bell sign		yes	yes		yes		yes	yes
2	Visual alarms shall be lights that have a flash rate within the frequency range of	1 - 3 Hz		1 - 3 Hz											1 Hz		1 - 3 Hz	1 - 3 Hz
3	Visual alarms shall be synchronized to flash in unison	yes																yes
4	Visual alarms shall be spaced a maximum distance apart of			15 m													15 m	15 m and depending on building type
5	Visual alarms shall be mounted at a height from the floor of			2030													2030 or 1520 below the ceiling, whichever is lower	2030 or 1520 below the ceiling, whichever is lower
Exits																		
6	All exits shall be clearly visible						yes	yes			yes	yes						yes
7	The width of exit corridors shall be not less than								1200		1000	1200					1060	1200
8	Exit access and passages leading to exit shall be marked to guide traffic						yes				yes	yes						yes
9	Exits shall be illuminated in darkness						yes	yes			yes	yes						yes
10	Hotel and lodging exits shall be linked with a common lobby or open area so occupants can choose from 2 paths of travel						yes				yes							yes
11	Staircases and corridors shall be provided with emergency lights						yes	yes			yes						yes	yes
12	All exits shall be easily discernable and accessible from the areas served by them						yes	yes			yes	yes						yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
13	Exits shall be located so they provide continuous means of escape to the exterior or to designated areas of refuge							yes			yes	yes					yes	yes
14	Exit access aisles may be level or ramped with a slope not exceeding							1 to 20			1:8							1:12
Areas of Rescue/Refuge																		
15	There shall be an area of rescue assistance identified with signage	yes			yes	yes		yes									yes	yes
16	An area of refuge shall be separated from the building floor area by a fire separation having a fire-resistance rating at least equal to that required for an exit	yes	yes		yes			yes									yes	yes
17	Refuge area served by an exit or firefighter's elevator	yes	yes					yes									yes	yes
18	Minimum spaces for wheelchair areas of refuge	2	2		yes												2	2
19	Minimum area of refuge floor space for each wheelchair	850 x 1200			750 x 1200	1200 x 1200											850 x 1370	800 x 1300
20	Refuge area is smoke protected in buildings of more than three stories		yes		at any storey			smoke protect									above or below ground level	at any storey above or below ground level
21	An area of refuge shall be equipped with a telephone or communication system connected to an emergency response system	yes						yes										yes
22	An area of refuge shall have its location indicated by directional signs	yes			yes	yes		yes										yes
23	An area of refuge shall be identified on all publicly displayed floor evacuation plans	yes						yes										yes

Continued on next page

FIRE SAFETY (from page 87)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
24	An area of refuge shall be identified on floor evacuation plans that are available in alternative formats	yes																yes
25	An area of refuge shall be designated in evacuation procedure documents	yes	yes					yes										yes
Elevators																		
26	Core walls of individual lifts have a fire-resistance rating				be fire resistant			yes			min. 2 h							min. 2 h
27	Elevator car doors to have a resistance rating of at least							30 min			1 h							1 h
Signage																		
28	Colour and design of letters, arrows and symbols on exit signs shall be in high contrast with their background					yes	yes	yes	yes		yes	colour on grey						yes
29	Words on exit signs shall be a height of at least					15			140		150							150
30	Floor level signs in all interior exit corridors serving guest rooms in hotels shall have their bottom edge										between 150 - 200 above the floor							between 150 - 200 above the floor
31	For exit doors, the floor level sign shall be on the door or adjacent to the door with the closest edge within 100 mm of the door frame										yes							yes
32	For additional requirements of signage located in, identifying, or directing persons to areas of refuge, see the section on SIGNAGE	yes	yes	yes	yes	yes	yes		yes	yes	yes	yes		yes	yes	yes	yes	yes

FIRE SAFETY COMMENTS

No.	Document	Comments
1	CSA	Visual alarms require strategic placement so that the signal from at least one alarm is visible throughout any enclosed space.
2	CSA	Visual alarms shall be significantly brighter than the ambient light.
3	CSA	Visual alarms with overlapping signals are to be synchronized so that the observed combined flash pattern does not exceed the allowable frequency range.
4	CSA, Ireland	People waiting in areas of refuge should not obstruct the egress/evacuation route.
5	CSA, Ireland	The door swing should not encroach on the waiting space.
6	CSA, Ireland	An area of refuge could be an enlarged landing in an exit stairway.
7	CSA, Ireland	Since areas of refuge provide temporary safety, it is important for building management to have operating procedures in place that complement the building design features.
8	South Africa, Ireland	Emergency warning signals shall be both audio and visible.
9	South Africa	The fire alarm sign shall be square with a pictogram of a bell and a bell gong on it. See the section on SIGNAGE for the appropriate size of such a sign and the anticipated viewing distance to sign size requirements.
10	South Africa	Attaching indicators to the underside of handrails to indicate the position of landings, knurling of door handles or raised letters immediately adjacent to door handles is encouraged as building design cues for use by people who are visually impaired.
11	Bangladesh	Warning signs against use of the lifts during a fire shall be displayed near every call button for a passenger lift.
12	Australia	For audible alarms, levels shall exceed by 15 dBA the noisiest background sound pressure level averaged over a period of 60 seconds and the level shall not be less than 75 dBA.
13	Australia	It is essential that audible emergency signals have an intensity and frequency that can attract the attention of the individuals who have partial hearing loss. People over 60 years of age generally have difficulty in perceiving frequencies higher than 6000 Hz.
14	Malaysia	All systems for public announcements and emergency warning must be audible as well as visual.
15	UN	All public announcements are to be audible and visual.
16	ICTA	Ramps shall be used in exits or exit access corridors where changes in elevation exceed 13 mm.
17	ICTA	“Area of Rescue Assistance” should be the preferred term in practice for “refuge”, “area of refuge” or “refuge area” in order to clearly indicate the function of the building space and to avoid any confusion in translation from English.
18	Ireland	Trip hazards must be avoided in evacuation route design. If a ramp has to be used, the slope should be 1:20.
19	Ireland	All internal doors in a building, including fire-resisting doors, should be easy to open. The maximum force necessary to open an internal door should be 8 NM. If this is not possible in the case of fire-resisting doors, the door leaf(s) should be maintained in an open position and an automatic self-closing device (linked to the building’s Fire Detection and Warning System) should be fitted.

HANDRAILS

Technical specifications for handrails are provided by all countries included in this study. **Handrails are required on both sides of stairs** (2) a requirement by all countries except for the National Building Code of Canada. The height of handrails varies from the low of 700 mm to a high of 1050 mm (3). The best practice is judged to be **two handrails – one at a height of 650 – 750 mm and the second at a height of 860 - 920 mm.**

The minimum clear width of a ramp between handrails (4) ranges from 870 mm (NBC) to 1200 mm in many countries. **Handrails are required to have horizontal extensions (7) extending beyond the bottom and the top of the ramp or stairs by all countries with the exception of Bangladesh.**

The diameter of handrails (13) is consistent at 35 - 45 mm with the exception of South Africa where they allow a maximum diameter of 60 mm. Handrails are required to have a **continuous gripping surface** (11) without interruption by most codes and standards except Bangladesh, the Philippines and Malaysia. It is important to provide handrails that are **easy to grasp and comfortable to use.** Increasingly handrails are required to be **colour contrasted** (24) with their surrounding surface. This is considered a good universal design practice.

Mexico recommends that ramps and stairs wider than 4 m have a handrail in the middle. The Lebanon UN Guidelines highlight the **dangers for children by calling our attention to the spacing between vertical and horizontal bars.** They further recommend a **contrasting tactile strip the applied to the top and bottom edges of the handrail for emergency exits stairs or ramps.** This is an excellent safety feature.

HANDRAILS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
At ramps																		
1	Handrails are required on both sides if the rise on the ramp run is greater than	150	no limit	150	no limit	no limit	500 interior		no limit	no limit		no limit		150	no limit		no limit	no limit
2	Handrails are required on both sides of the ramp	yes		yes	yes	yes	yes	yes	yes	yes	if steeper than 1:15	yes	yes	yes	yes		yes	yes
3	The handrail height above the ramp shall be	860 - 920	865 - 965	865 - 965	900	700 - 900	900, and another at 700 outdoor		650 - 750 and 950 - 1050	850 - 1000		700 and 900		800 - 900	665 - 700 and 865 - 1000		865 - 920	650 - 750 and 860 - 920
4	Minimum clear width of ramp – between handrails – shall be	920	870	915	900	900	1500 outdoor	1000	1200	1100		1200	1200	1200	1000	900	950 - 1000	1000
5	The distance between at least one set of handrails on a wider ramp shall be	920 - 1000										1200	1200		1000	1500	1000	1000
6	The maximum distance between the side wall and the ramp side of the handrail not to exceed	100						95							100			100
7	Handrails extend horizontally beyond the top and bottom of the ramp or stairs at least	300	300	305	300	300	300	300	300	300		300	yes	300	300	300	300	300
At stairs																		
8	There shall be handrails on both sides of the stairs	yes		yes	yes	yes	yes	yes	yes	yes	only if part of the escape route	yes	yes	yes	yes	yes	yes	yes
9	Top height of handrail above stair nosing shall be	860 - 920	865 - 965	865 - 965	900	700 - 900	900	840 - 900	650 - 750 and 950 - 1050	900 - 1000	min. 900	700 and 900	840 - 875	800 - 900	865 - 1000	700 - 750 and 850 - 950	865 - 920	650 - 750 and 860 - 920
10	Top of the handrail above stair nosing and the top of the handrail on the landing above the floor shall be uniform in height	yes		yes		yes		840 - 900 stairs, 840 - 1000 landings							yes		yes	yes
11	Handrails shall be continuous around landings less than 2100 mm in length except where it is intersected by an alternative path of travel or has an entry door leading into it	yes					handrail should be continuous if possible											yes

Continued on next page

HANDRAILS (from page 91)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
12	Minimum distance between handrails on stairs shall be	920		915						900		1200	900		1000	1500		920
General																		
13	Handrails shall have a diameter (or equivalent gripping shape) of	30 - 40	30 - 43	32 - 51	32 - 38	35 - 50	30 - 50	45 - 50	40 - 50	max. 60		30 - 50		35 - 45	30 - 40		30 - 40	30 - 40
14	Handrails shall resist a force applied in any direction of at least	1.3 kN							50 daN/m	rigid and securely fixed			yes	1.3 kN	1.1 kN	withstand heavy loads	0.9 kN	1.3 kN
15	Handrails are free of abrasive elements	yes		yes	yes		yes	yes	yes	finished off not to present a hazard				yes	yes	yes	yes	yes
16	Handrails to have a continuous gripping surface, without interruption by newel posts or any other construction elements or obstructions that can interrupt a hand hold	yes	yes	yes	yes	yes	yes	yes and have a continuous gripping surface	yes	yes				yes, easy grasp with a firm comfortable grip without obstruction	not less than 270° around uppermost surface Fully circular preferred	yes	yes	yes, easy grasp with firm comfortable grip without obstruction
17	The minimum clear space between a smooth wall surface and the handrail	35 - 45	40	38	40	50			45 - 55	40		50		40	50	40	40 - 45	40
18	The minimum clear space underneath the handrail shall be	35 - 45		38					300			40			15			40
19	The clear space between a rough wall surface and the handrail shall be	45 - 60	60							min. 40				min. 60		60	60	60
20	A recess containing a handrail shall have a minimum height above the top of the rail of	450		455					300					450	600	450	450	450
21	Handrail shall be continuous on the inside of ramps, stairs and around landings	yes	yes	yes			yes								yes where possible		yes	yes
22	Handrails shall extend horizontally beyond the top and bottom of the ramp or stairs at least	300	300	305	300	300	300		300	300		300		300	300		300	300

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
23	Handrails shall have horizontal extensions that return to wall, floor or post	yes	yes	yes									yes	or turn down at an angle of 180°			yes	yes
24	Handrails shall be colour contrasted from the surrounding surfaces	yes					luminance 40% contrast		yes	yes				yes		yes	yes	yes
25	When handrail extensions are not continuous do they shall return to the wall, floor or post	yes	yes	yes				yes		finished to not create a hazard		yes		yes	or turn down at an angle of 180°	yes	yes	yes
26	When handrails are not continuous and return to the post they shall be a maximum off the floor of	680																680

HANDRAILS COMMENTS

No.	Document	Comments
1	Mexico	Ramps and stairs that are more than 4 m wide should have a handrail in the middle.
2	South Africa	Affixing indicators to the underside of handrails to indicate the position of landings is extremely useful for wayfinding by people who are visually impaired.
3	Singapore	A handrail should be easy to grasp, providing a firm and comfortable grip so that the hand can slide along the rail without obstruction.
4	Singapore	Wide handrails or grab bars which allow only a pinching grip are undesirable, and a proper hand-sized grasping area should be provided.
5	Singapore	Handrails shall be slip-resistant.
6	Australia	Where a handrail is not continued, a tactile indicator in the form of a domed button shall be provided on the top of the handrail, 150 ± 10 from the end of the handrail.
7	Australia	Where affixed to a wall, handrails should be in a contrasting colour, and have a luminance contrast with the wall of not less than 30%.
8	Australia	On stairs and ramps, a second handrail at a lower height may be provided, at a height of between 665 - 700 mm.
9	UN	Spacing between vertical and horizontal bars of railings should be narrow for the safety of children.
10	UN	For emergency exit stairs or ramps, a contrasting tactile strip at least 900 mm long should be applied to the top and bottom edges of the handrail to alert the partially sighted.

KITCHENS

Adequate manoeuvring space in a kitchen or kitchenette is important so that people are able to use all appliances and counter space. A minimum clear width between counters of 1500 mm is recommended (1). It is important to provide **floor space in front of all appliances (2), as specified by Canada and the U.S.**

An accessible work surface with adequate kneespace (4,5,6) as well as reach heights (9) for kitchen cabinets and drawers are specified. Another important consideration is that an electrical receptacle be provided at the side or front of the work space (8).

An accessible sink with kneespace and a lever-type (19) handle are recommended by Spain. Controls should be located at the front of appliances (22) with the work surface height at a range between 750 - 800 mm (23), as specified by Spain. **An adjacent work surface beside all appliances is an excellent design element.** Adequate illumination levels (33) in the kitchen are specified by Canada, Spain and South Africa where 200 lux is recommended.

There are a great number of practical comments and recommendations to make the kitchen space accessible including side-by-side refrigerators, designing storage space so that it is easily reached and ergonomically sound, an important consideration for everyone. Full-height storage cabinets which provide a good range of accessible storage are also appreciated by everyone.

KITCHENS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Clear Floor Area and Clearances																		
1	The minimum clearance between counters and all opposing base cabinets, countertops, appliances or walls in a kitchen shall be	1500		1015 (walk thru), 1525 (closed on 3 sides)							1500							1500
2	The minimum clear floor space for approach to all appliances or operable parts of controls shall be	750 X 1200		760 x 1220													760 x 1370	800 x 1300
Controls																		
3	For requirements for operable parts of controls (thermostats, electrical switches, circuit breakers, locks, intercom buttons, electrical wall outlets), see section on ANTHROPOMETRICS	yes		yes	yes	yes	yes		yes	yes				yes	yes		yes	yes
Work Surfaces																		
4	At least one work surface shall have a width of at least	750		760													760	760
5	At least one work surface shall have a depth of at least	600																600
6	At least one work surface shall have a height of	730 - 860		865 max.													710 - 865	730 - 860
7	See section in ANTHROPOMETRICS for requirements for work surfaces, kneespace	yes	yes	yes	yes	yes			yes					yes	yes	yes	yes	yes
Receptacles																		
8	There shall be electrical receptacles at the side or in front of the work space	yes																yes
Cabinets																		
9	Kitchen cabinets, drawers and shelves shall have at least one shelf located from the floor not more than	1100		1170													1200	1100

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
10	Upper kitchen cabinets and drawers shall have D-type door pulls mounted close to the bottom of the cabinet doors	yes																yes
11	Lower kitchen cabinets and drawers shall have D-type door pulls mounted close to the top of base cabinet doors	yes																yes
12	Minimum toe space depth for base cabinets	150		150														150
13	Minimum toe space height for base cabinets	230		230													230	230
14	A sink shall be located with its centreline from the side wall at least	460															460	460
Sink																		
15	A sink shall have no sharp or abrasive surfaces under it	yes		yes													yes	yes
16	Kitchen sink rim height above the floor to be between	810 - 860		865 max.					750 - 800								710 - 865	750 - 800
17	See section in ANTHROPOMETRICS for requirements for work surfaces, kneespace, toe space	yes	yes	yes	yes	yes			yes					yes	yes	yes	yes	yes
Sink Faucets and Pipes																		
18	A sink shall have hot water and drain pipes offset to the rear and not abut the clear space	yes		yes														yes
19	Faucets shall have lever-type handle operable with a closed fist or automatically activated	yes		yes					handle type								yes	yes
20	Faucets controls if not automatically activated shall be operable with one hand and without tight grasping, pinching, or twisting of the wrist	yes		yes					yes								yes	yes

Continued on next page

KITCHENS (from page 97)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
21	See section in ANTHROPOMETRICS for requirements for operating controls	yes		yes	yes		yes		yes	yes				yes	yes		yes	yes
Ranges, Ovens and Cook Tops																		
22	Ranges, ovens, and cook tops should have controls located which do not require reaching across the burners to operate	yes		located at front					located at front									located at front
23	A cook top or range shall have a surface height located above the floor between	810 - 860		865 max.					750 - 800									750 - 800
24	A cook top or range shall have an adjacent work surface at the same height as the cook top with a width of at least	400																400
25	For cook top floor space and knee clearance requirements, see work space in ANTHROPOMETRICS	yes	yes	yes	yes	yes			yes					yes	yes	yes	yes	yes
26	Ovens should have controls located on the front panel	yes		yes														yes
27	If an oven is equipped with a side opening door, a horizontal surface shall be provided either on the latch side of the door or as a pull-out shelf under the oven	yes		yes														yes
28	If an oven is equipped with a side opening door, and a horizontal pull-out shelf under the oven is provided, it shall extend the width of the oven	yes																yes
29	If an oven is equipped with a side opening door, and a horizontal pull-out shelf under the oven is provided, it shall be possible to pull out the shelf a minimum depth of	250																250

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Fridge																		
30	A refrigerator and freezer shall be self-defrosting	yes																yes
31	If a refrigerator and freezer are of an over and under type, the freezer shelf space shall be located above the floor no more than	1100		no more than 50% of freezer above 1370														individual preference
32	Refrigerator and freezer controls shall be located above the floor no more than	1100		1220														individual preference
Illumination																		
33	Illumination levels in the kitchen and at operating controls where reading is necessary shall be illuminated to a level of at least	200 lx							200 lx	200 lx at counter tops								200 lx
Other																		
34	For any signage requirements, see section on SIGNAGE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
35	For any room door requirements, see section on DOORS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

KITCHENS COMMENTS

No.	Document	Comments
1	CSA	An additional pull-out work board below the standard countertop level is desirable.
2	CSA	The work surface linking the kitchen appliances should be continuous.
3	CSA	If hot water and drain pipes abut the clearances under the sink, they should be insulated.
4	CSA	Natural lighting, task lighting, and dimmer switches improve and add to conventional lighting.
5	CSA	Cook tops with flat ceramic surfaces are not desirable for people with low vision.
6	CSA	To avoid burns, side opening wall ovens are preferred.
7	CSA	It is recommended that ovens be self-cleaning.
8	CSA	Microwave ovens should be mounted at counter height.
9	CSA	Some people find side-by-side refrigerators more accessible. However, these models may be wider and may be taller.
10	CSA	Where an over and under refrigerator/freezer model is chosen, some people find it preferable to have the freezer at the bottom.
11	CSA	In all types of refrigerators, controls for both the refrigerator and freezer should be within a horizontal reach of 500 mm for a seated user.
12	CSA	Full-height storage cabinets provide a good range of accessible storage.
13	CSA	Full-extension drawers and shelves provide storage space that is easy to reach and use.
14	CSA	Lazy Susan trays can provide accessible storage.
15	Spain	Work surfaces should be at two heights: to work from a stand up position: 850 - 950 mm, to work from a seated position: 750 - 850 mm.
16	Spain	Kitchen spaces must be of at least 5 m^2.
17	Singapore	Non-slip flooring should be used.
18	Singapore	Cupboards at high or low level may be hazardous for older persons to reach with safety. Any shelf at a height that would require a person to stand on a stool or chair must be avoided.

LIBRARIES

The most important consideration in libraries is that aisles are wide and that sufficient space is provided to allow someone who uses a wheelchair to turn around.

All interior spaces in the library should be accessible to people using wheelchairs (1). The recommended **width for** a library aisle should be 920 mm. **The width of the checkout** (2) should be wider at 1060 mm to allow for people to manoeuvre around someone seated in a wheelchair.

Uruguay and Canada point out that it is important to consider **information on visual displays** (7) to ensure that it is well contrasted and located on a glare-free surface. Other areas of the library should comply with general requirements such as the access route, doors and signage recommendations.

LIBRARIES

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Aisles/Seating																		
1	The aisles shall be a minimum width of	920	920	915										900			1060	920
2	The minimum clear width at the checkout lane shall be	920		915										900			1060	1060
3	Seating spaces for persons in wheelchairs shall have a minimum clear floor area of (width x depth)	750 x 1200		760 x 1220	750 x 1200									900 x 1200			760 x 1370	800 x 1300
4	Seating spaces for persons in wheelchairs shall have adequate manoeuvring space to approach the seating area	yes		yes										yes			yes	yes
Counter/Table																		
5	For requirements for counters, table heights and kneespace requirements, see section in ANTHROPOMETRICS	yes	yes	yes	yes	yes			yes					yes	yes	yes	yes	yes
Controls																		
6	For requirements for operable controls, see section in ANTHROPOMETRICS	yes	yes	yes	yes	yes	yes		yes	yes				yes	yes	yes	yes	yes
7	Information on visual displays shall be supplemented by tactile and/or auditory information, colour contrasted, and located on a glare-free surface	yes				colour contrast and glare-free			yes								yes	yes
Other																		
8	For door requirements, see section on DOORS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
9	For circulation, line-up areas, and access route requirements, see section on ACCESS ROUTE	yes	yes	yes	yes	yes			yes	yes		yes	yes	yes	yes	yes	yes	yes
10	For any signage requirements, see the section on SIGNAGE	yes	yes	yes	yes	yes	yes		yes	yes		yes		yes	yes	yes	yes	yes

Note: For additional comments, see section on Workstations.

LODGING AND TRANSIENT ACCOMMODATIONS

Transient accommodation includes hotels, motels, hostels, university residences, and all types of short-term accommodation.

The U.S. requires that guestrooms with mobility features be **disbursed throughout all types of classes of guestrooms.** Some of the technical specifications include access to the entrance door, **a second door viewer at a low height,** (4) a doorbell or intercom (5) and adequate lighting (3). Lighting is addressed by Canada, South Africa and Australia, with the best practice at 200 lux.

Windows sills should be at a maximum height of 750 mm (8) **with locking mechanisms that are reachable, as specified by the CSA Standard.** The U.S. requires that exterior spaces including patios and terraces also be accessible (10). Sweden and the U.S. specify that the living and dining areas be accessible (11) and comply with reach requirements to access all switches (12) such as thermostat, fans etc., something that is addressed by most countries. Australia and the U.S. require a clear floor space beside the bed (13).

The **number of accessible rooms** (15 - 26) is specified by the U.S. (5%), Ireland (1 of 20), the Philippines (1 of 50) and Singapore (1 of 200). A mix of rooms with roll-in showers and regular showers is recommended. The U.S. provides specific numbers for the number of rooms with a roll-in showers vs. those without. For example, for facilities with 200 - 300 guestrooms available, seven accessible rooms with a regular shower would be required and 3 with roll-in showers.

Emergency alarm systems (31) are required to have both audible and visual signals in Sweden, Australia, in Canada and, an important safety issue. Only the U.S. specifies a requirement for **volume control** (34) telephones and both Canada and the U.S. mention space for TTY's so that Deaf people (35) are able to use a telephone for communication.

An accessible storage space is specified by Canada and Australia with clear floor space in front of clothes closets with shelves at a variety of heights. Technical specifications for the location of **the medicine cabinet** (60) is also addressed by Canada, with Bangladesh and Canada requiring a minimum of illumination at the medicine cabinet.

LODGING AND TRANSIENT ACCOMMODATIONS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
General																		
1	Transient accommodation in accessible bedrooms or suites shall include hotels, motels, hostels, or university residences	yes		yes				yes			yes	yes						yes
2	Guest rooms required to provide mobility features shall be dispersed among the various types and classes of guest rooms			yes														yes
Entrance Door																		
3	The entrance landing or area shall be capable of being illuminated to a level of at least	200 lx								150 lx					150 lx		200 lx	200 lx
4	A door shall have a second door viewer located at a height from the floor between	1100 - 1200																1100 - 1200
5	A door bell or intercom system shall be located at a height above the floor of	400 - 1200					controls suitably located											800 - 1000 and 700 from corner
6	A door bell or intercom system if connected to a security release door opener, shall have a visual and audible signal at the entrance to indicate “go ahead”	yes																yes
7	A door bell or intercom system shall be connected to a communication system within the unit	yes																yes
Windows																		
8	Windows in rooms shall have sills a maximum height from the floor of	750															765	750
9	Windows in rooms shall have opening and locking mechanisms located a height from the floor of	400 - 1200															400 - 1200	400 - 1200
10	Exterior spaces, including patios, terraces and balconies that serve the guest room shall be accessible			yes													yes	yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Other Areas																		
11	Living and dining areas shall be accessible			yes			yes											yes
Controls																		
12	The height for operating control requirements for such items as electrical switches, outlets, thermostats, communication systems, breaker boxes, exhaust fans and main water shut-off valves shall be between (for additional info, see control section in ANTHROPOMETRICS)	400 - 1200		380 - 1220			800 - 1000			500 - 1200		700 - 1200		600 - 1200	380 - 1060		400 - 1200	400 - 1200
Sleeping Area/Bed																		
13	At least one sleeping area shall provide a clear floor space a minimum of			760 x 1220											1000 wide		760 x 1370	800 x 1300
14	The clear floor space shall be positioned for parallel approach to the side of the bed			yes														yes
Number of Accessible Rooms																		
15	In guest room accommodations having more than 25 beds, minimum number of beds meeting clear floor width requirement			5%				1 out of 20 or part thereof		none		1 per 50 + 1/100 part thereof. At least 1 at entry level		1 per 200 hotel rooms or part thereof. 1 per 100 or part thereof hostels, residences, dorms				1 out of 20 or part thereof
16	Min. # of rooms without roll-in showers/(with roll-in showers) of total rooms 1 - 25			1/(0)														1/(0)
17	Min. # of rooms without roll-in showers/(with roll-in showers) of total rooms 26 - 50			2/(0)				1/(0) out of 20										2/(0)
18	Min. # of rooms without roll-in showers/(with roll-in showers) of total rooms 51 - 75			3/(1)														3/(1)

Continued on next page

LODGING AND TRANSIENT ACCOMMODATIONS (from page 106)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
19	Min. # of rooms without roll-in showers/(with roll-in showers) of total rooms 76 - 100			4/(1)														4/(1)
20	Min. # of rooms without roll-in showers/(with roll-in showers) of total rooms 101 - 150			5/(2)														5/(2)
21	Min. # of rooms without roll-in showers/(with roll-in showers) of total rooms 151 - 200			6/(2)														6/(2)
22	Min. # of rooms without roll-in showers/(with roll-in showers) of total rooms 201 - 300			7/(3)														7/(3)
23	Min. # of rooms without roll-in showers/(with roll-in showers) of total rooms 301 - 400			8/(4)														8/(4)
24	Min. # of rooms without roll-in showers/(with roll-in showers) of total rooms 401 - 500			9/(4)														9/(4)
25	Min. # of rooms without roll-in showers/(with roll-in showers) of total rooms 501 - 1000			2% of total														2% of total
26	Min. # of rooms without roll-in showers/(with roll-in showers) of total rooms 1001 +			20 + 1 for each 100 over 1000														20 + 1 for each 100 over 1000
Toilet/Bathing Facilities																		
27	Number of toilet and bathing facilities to be accessible			no fewer than 1			accessible rooms to have accessible bathtub or shower stall			min. 1 room per 100 or part of, to have a wash basin and bath or shower				accessible rooms to have accessible bathtub or shower stall				no fewer than 1
28	At least one water closet, one lavatory, and one bathtub or shower shall be accessible			yes													yes	yes
29	For all bathtub requirements, see section on BATHTUBS	yes		yes					yes	yes				yes	yes	yes	yes	yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
30	For grab bar requirements, see section in WASHROOMS	yes	yes	yes	yes				yes	yes	yes		yes	yes	yes	yes	yes	yes
Alarms/Visual Notification Devices																		
31	An emergency alarm shall include both audible and visual signals	yes					yes								yes			yes
32	Visible notification devices shall be provided to alert room occupants of incoming telephone calls, a doorknock or bell			yes						by flasher lamp								yes
33	Notification devices shall not be connected to emergency visible alarm signal appliances			yes						yes								yes
Telephone/Communication Devices																		
34	Telephones in rooms shall have volume controls			yes													yes	yes
35	To facilitate the use of a TTY, telephones shall be served by an electrical outlet located a maximum distance from the telephone of	1200		1220														1200
36	Guest rooms required to provide communication features shall be dispersed among the various types and classes of guest rooms			yes														yes
37	Minimum number of guest rooms which provide mobility and communication features		1														1	
38	Maximum number of guest rooms which provide mobility and communication features			10%														10%
39	Minimum number of required guest rooms with communication features where there are between 2 - 25 rooms			2														2
40	Minimum number of required guest rooms with communication features where there are between 26 - 50 rooms			4														4

Continued on next page

LODGING AND TRANSIENT ACCOMMODATIONS (from page 107)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
41	Minimum number of required guest rooms with communication features where there are between 51 - 75 rooms			7														7
42	Minimum number of required guest rooms with communication features where there are between 76 - 100 rooms			9														9
43	Minimum number of required guest rooms with communication features where there are between 101 - 150 rooms			12														12
44	Minimum number of required guest rooms with communication features where there are between 151 - 200 rooms			14														15 + 5% of rooms over 150
45	Minimum number of required guest rooms with communication features where there are between 201 - 300 rooms			17														15 + 5% of rooms over 150
46	Minimum number of required guest rooms with communication features where there are between 301 - 400 rooms			20														15 + 5% of rooms over 150
47	Minimum number of required guest rooms with communication features where there are between 401 - 500 rooms			22														15 + 5% of rooms over 150
48	Minimum number of required guest rooms with communication features where there are between 500 - 1000 rooms			5% of total														15 + 5% of rooms over 150
49	Minimum number of required guest rooms with communication features where there are between 1001 + rooms			50 + 3 for each 100 over 1000														15 + 5% of rooms over 150
Storage Areas																		
50	At least one of each type of storage must be accessible (including closets, cabinets, clothes rails, drawers, shelves)	yes		yes													yes	yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
51	A clothes and storage closet shall have a clear floor area in front of it of at least	750 x 1200													800 x 1300		760 x 1370	800 x 1300
52	A clothes and storage closet shall have a clothes rail a maximum height from the floor of	1200 - 1400													1350		1350	1200
53	A clothes closet where shelves are provided shall have at least three shelves located at a height from the floor of	400 - 1200													230 - 1350		230 - 1200	400 - 1200
54	General storage space shall have a door that swings outward	yes															yes	yes
55	General storage space shall be capable of being illuminated to a level of at least	100 lx									100 lx						30 lx	100 lx
Towel Rack																		
56	A bathroom towel bar shall be installed above the floor at a maximum height of	1100															1100	1100
57	A bathroom towel bar shall have a clear floor area in front of a minimum of	750 x 1200															760 x 1370	800 x 1300
58	A bathroom towel bar shall be located within a horizontal reach of not more than	500															500	500
Medicine Cabinet																		
59	A medicine cabinet shall have a clear floor area in front of it (which may include the knee clearance at the lavatory) a minimum of	750 x 1200															760 x 1370	800 x 1300
60	A medicine cabinet shall be located within a horizontal reach of not more than	500															500	500
61	A medicine cabinet shall have a bottom shelf located at a maximum above the floor of	1000															1000	1000

Continued on next page

LODGING AND TRANSIENT ACCOMMODATION (from page 109)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
62	A medicine cabinet shall be illuminated to a level of at least	200 lx									300 lx						200 lx	200 lx
63	A medicine cabinet shall have the centreline of doors and hardware a maximum height above the floor of	400 - 1200															400 - 1200	400 - 1200
Other																		
64	For any signage requirements, see section on SIGNAGE	yes	yes	yes	yes	yes	yes		yes	yes	yes	yes		yes	yes	yes	yes	yes
65	For any parking requirements, see section on PARKING	yes	yes	yes	yes	yes	yes			yes	yes	yes	yes	yes	yes	yes	yes	yes
66	For any stair requirements, see section on STAIRS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
67	For any ramp requirements, see section on RAMPS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
68	For any access route requirements, see section on ACCESS ROUTE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
69	For any door requirements, see section on DOORS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
70	For any kitchen requirements, see section on KITCHENS	yes		yes							yes			yes			yes	yes
71	For any shower requirements, see section on SHOWERS	yes	yes	yes	yes	yes	yes							yes	yes	yes	yes	yes
72	For any washroom requirements, see section on INDIVIDUAL WASHROOMS	yes	yes	yes	yes			yes		yes	yes	yes		yes	yes	yes	yes	yes
73	For any passenger pickup drop-off requirements, see section on PASSENGER PICKUP DROP-OFF	yes		yes			yes			yes		yes		yes		yes	yes	yes
74	For any elevator requirements, see section on ELEVATORS	yes		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes	yes	yes
75	For any fire regulations, see section on FIRE REGULATIONS	yes	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes	yes		yes	yes

LODGING AND TRANSIENT ACCOMMODATIONS COMMENTS

No.	Document	Comments
1	CSA	Sufficient storage space should be provided for devices such as wheelchairs, shower chairs, walkers, transfer benches and commode chairs.
2	CSA	Flip down grab bars may be used in washrooms.
3	CSA	If occupants require a higher toilet seat, seat height adaptors should be available.
4	CSA	Shelving should not pose a protrusion hazard.
5	Sweden	If there is a restaurant associated with the hotel, lodging which has washrooms, at least one washroom must be accessible.
6	Sweden	Some rooms should be suitable for people with allergies and environmental sensitivities.
7	Ireland	Each room to provide a turning circle with a diameter of 1500 mm.
8	South Africa	Night lights shall be provided in circulation areas and in bathrooms.
9	South Africa	Any building which is or contains a registered clinic or health care centre shall be accessible.
10	Singapore	For hotels or boarding houses that are expecting to cater to a large number of persons with disabilities, owners are encouraged to provide more than the required number of accessible guestrooms.
11	Singapore	Provide an emergency alarm system in the bathroom and by the bedside, operated by a floor length pull chord and connected to a bell or other signal to the reception counter so that a guest can summon help in an emergency.
12	Singapore	Providing light switches near the bed is recommended.
13	Singapore	Two-way switches are recommended so that a guest does not have to cross the room in the dark to turn the light on or off.
14	Singapore	Controls should have contrasting colours.
15	Australia	In sleeping accommodations and in all rooms where people with hearing impairment may reside, care should be taken to locate auxiliary emergency alarms to ensure that they will be effective when warning of emergencies. To be effective, visual auxiliary alarms should be located and oriented so that they will spread signals and reflections throughout a space or raise the overall light level sharply.
16	Australia	Deaf people may not need accessibility features other than the emergency alarm connections and communications devices. Therefore, some rooms should be equipped with emergency visual alarms or connections.

MEETING, BOARD AND TRAINING ROOMS

Seating should be movable and the table should not have obstructions under it to prevent someone using a wheelchair from wheeling under the table.

An accessible access aisle is required in all meetings rooms and training facilities, as specified by Singapore, the U.S. and Canada. Clothes closets are required to be accessible with shelves (4) and coat rails at a maximum height of 1200 mm (3).

Illumination is addressed by Canada with 100 lux required (6) in the storage areas and a minimum of 200 lux for the meeting room space (8). Singapore, Bangladesh, South Africa and Canada all address illumination levels for meeting rooms and training rooms.

Information on visual displays is required to be both tactile and auditory to ensure that everybody receives information, as specified by South Africa and Canada (10).

It is also important to consider the accessibility of AV and communication equipment to ensure it is inclusive.

A well illuminated area at the front of the room should be provided where a sign language interpreter will stand. Separate lighting should be provided for this area so that it can remain illuminated when the room lighting is dimmed for an AV presentation.

Australia draws attention to the requirement for even illumination and focused lighting without shadows to facilitate lip-reading and sign language interpretation. This is an important consideration for people who are Deaf or hard of hearing.

MEETING, BOARD AND TRAINING ROOMS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Aisle																		
1	The access aisle widths are a minimum of	920		915										900			1060	920
Closets/Storage																		
2	Closets shall have a clear floor area in front of them a minimum of	750 x 1200		760 x 1220										900 x 1200			760 x 1370	800 x 1300
3	Closets shall have a clothes rail at a maximum height from the floor of	1200 - 1400		1220 max.													1350	1200 max.
4	Closets where shelves are provided shall have at least three shelves at a height from the floor of	400 - 1200		1015 - 1220													400 - 1200	400 - 1200
5	A general storage space shall have a door that swings outward	yes															yes	yes
6	A general storage space shall be capable of being illuminated to a minimum level of	100 lx															30 lx	100 lx
Counter/Table																		
7	For requirements for workstations and tables, kneespace, etc., see section in ANTHROPOMETRICS	yes	yes	yes	yes	yes			yes					yes	yes	yes	yes	yes
8	The illumination level at work spaces shall be at least	200 lx								200 lx	150 lx			100 lx			100 lx	200 lx
Controls																		
9	For requirements for operable controls, see section in ANTHROPOMETRICS	yes	yes	yes	yes	yes	yes		yes	yes				yes	yes	yes	yes	yes
Other																		
10	Information on visual displays shall be supplemented by tactile and/or auditory information, colour contrasted, and located on a glare-free surface	yes				colour contrast and glare-free			yes								yes	yes

Continued on next page

MEETING, BOARD AND TRAINING ROOMS (from page 113)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
11	For information on kitchens or kitchenettes, see section on KITCHENS	yes		yes							yes			yes			yes	yes
12	For circulation, line-up areas, and access route requirements, see section on ACCESS ROUTES	yes	yes	yes	yes	yes			yes	yes		yes	yes	yes	yes	yes	yes	yes
13	For requirements at doors, see section on DOORS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
14	For any signage requirements, see section on SIGNAGE	yes	yes	yes	yes	yes	yes		yes	yes		yes		yes	yes	yes	yes	yes
15	For auditorium or theatre style seating requirements, see section on AUDITORIUMS	yes		yes	yes	yes		yes	yes	yes		yes		yes	yes	yes	yes	yes
16	For any communication requirements, see section on COMMUNICATION	yes		yes													yes	yes

MEETING, BOARD AND TRAINING ROOMS COMMENTS

No.	Document	Comments
1	Australia	To facilitate lip-reading and/or interpreting clear, even illumination is required for the faces of both the speaker and the interpreter.
2	Australia	Do not use accessible multipurpose rooms as storage areas.
3	Australia	Adequate focused lighting without excess shadows shall be provided both on the face of the presenter for lip-reading and on the interpreter for sign language interpretation.
4	ICTA	All meeting rooms should have induction loop or FM systems.

PARKING

Most countries specify **that accessible parking should be located near to the building entrance,** Sweden requires it to be within 25 meters of the entrance (2) and Lebanon within 50 meters. A best practice is that the accessible route to the building be marked but only if the main entrance is not accessible (3). **It is important that the accessible route be safe and outside of the vehicular route.**

The number of accessible parking spaces is well specified by most standards (5 - 16) with one space in every 25 spaces and 2% for parking spaces of 500 spaces or more.

The minimum width of parking stalls (17) varies considerably from 2300 mm in Bangladesh to 3800 mm in Mexico. The Expert Panel recommends 2600 mm as a best practice. Adjacent accessible aisle widths (18) vary from 1200 - 2440 mm, with the best practice being 1500 mm. A stable, firm, slip-resistant surface (21) and a curb ramp where there is a level change are all required. **Both a vertical sign and a symbol on the pavement are required to mark all accessible parking spaces.**

Some countries including Sweden, Canada and the U.S. specify that there be designated parking for vans (27).

South Africa, Singapore and Canada all advise that **designated accessible parking spaces be identified for drivers while entering a parking lot.** Singapore recommends that parking be sheltered wherever possible and that the **telephone number of the building management be posted on the sign** so that parking violations can be reported. This last recommendation is appreciated by many people with disabilities.

PARKING

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
General																		
1	Is there accessible parking near the building entrance	yes	yes	yes	yes	yes				yes		yes	yes			yes	yes	yes
2	Circulation routes adjacent to accessible parking spaces shall be part of the shortest accessible route to the building entrance	yes					within 25 m of entrance			yes		yes	yes			within 50 m of entrance	yes	yes
3	Is there a marked accessible route to building	yes	yes	yes						yes		yes	yes					yes if main route is not accessible
4	For requirements for ground surfaces including level changes, gratings, protrusion hazards, headroom, and overhead hazards, see section on ACCESS ROUTES	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes	yes
Number																		
5	Number of accessible parking stalls required for 1 - 25 spaces		0	1	1 per 25 or part thereof	1 per 100 or part thereof							2			1	1	1
6	Number of accessible parking stalls required for 26 - 50 spaces		0	2	2	1							2			1	2	2
7	Number of accessible parking stalls required for 51 - 75 spaces		1	3	3	1				adequate where 50 + stalls provided			2			2	3	3
8	Number of accessible parking stalls required for 76 - 100 spaces		1	4	4	1							2			2	4	4
9	Number of accessible parking stalls required for 101 - 150 spaces		2	5	1 per 25 or part thereof	2							2			2	5	5
10	Number of accessible parking stalls required for 151 - 200 spaces		2	6	1 per 25 or part thereof	2				min. 1 per 200 or part thereof			2			3	6	6
11	Number of accessible parking stalls required for 201 - 300 spaces		3	7	1 per 25 or part thereof	3				min. 1 per 200 or part thereof			2			4	7	7
12	Number of accessible parking stalls required for 301 - 400 spaces		4	8	1 per 25 or part thereof	4							3			6	8	8

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PARKING (from page 117)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
13	Number of accessible parking stalls required for 401 - 500 spaces		5	9	1 per 25 or part thereof	5							4			12	9	9
14	Number of accessible parking stalls required for over 500 spaces		1 per 100	2%	1 per 25 or part thereof	1 per 100 or part thereof										5%	2%	2%
15	Number of accessible parking stalls required for over 1000 spaces		20 + 1 for each 100 or part of, over 1000													50% +1 for each 100	20 + 1 for each 100 or part of, over 1000	20 + 1 for each 100 or part of, over 1000
16	Number of accessible parking stalls required for over 2000 spaces		30 + 1 for each 100 or part of, over 2000													50% +1 for each 100		30 + 1 for each 100 or part of, over 2000
Cars – Accessible Parking Stalls/Access Aisles																		
17	Minimum accessible stall width for cars (requires additional access aisle)	2600	2400	2440	3800	3500	3600 including access aisle			3500	2300	3700	3000			2500	2440	2600
18	Minimum adjacent access aisle width for cars shall be	1500	1500	1525	1200											1200	2440	1500
19	Minimum accessible parallel parking car stall width including access aisle shall be	3900			5000							3700				3600	4880	3900
20	Minimum accessible parallel parking car stall length including access aisle	7000			stall length 5000					appropriate length							7840	7000
21	Parking and adjacent access aisle has a firm, stable, slip-resistant and level surface	yes	yes	yes	yes		yes			level/flat surface		yes	yes			yes	yes	yes
22	Access aisle indicated by diagonal markings where paved	yes		marked	yes												yes	yes
23	There shall be a curb cut and curb ramp if there is a level change leading from the access aisle to the sidewalk	yes		yes	yes		yes			to the rear of the bay		yes				yes	yes	yes
24	Bollards (used to stop cars from infringing on access aisles) or curbs, shall not impede access to the aisle or vehicle	yes																yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
25	Vehicles when parked shall not impede access to the aisle			yes								yes					yes	yes
26	Two accessible parking spaces may share a common access aisle	yes		yes	yes											yes where aisle is 1200 min.	yes	yes
Van – Accessible Parking Stalls/Access Aisles																		
27	There shall be designated van accessible parking spaces and access aisles						yes										yes	yes
28	The minimum width of van parking stall shall be	2600		3350			5000 incl. access aisle										2440	3350
29	Minimum width of van parking stall, where next to access aisle with a minimum width of 2440			2440													2440	2440
30	Minimum length of a van parking stall	5500																5500
31	Minimum width of adjacent parking access aisle for van parking	2000		2440														2000
32	The minimum depth of rear access aisle for van parking shall be	2000																2000
33	The minimum width of rear parking access aisle for van parking shall be	2600																2600
34	The minimum clearance height of van parking stall and along the vehicle access/egress route shall be	2750		2490											2500	2400	3350	2750
35	The minimum clear space on a sidewalk beside a parallel van parking stall shall be	2000 x 2000															2440 wide	2440 wide
Signage/Symbols																		
36	Each accessible parking space shall be designated for use by persons with physical disabilities	yes	yes	yes	yes					yes		yes					yes	yes
37	Minimum sign width and height	300 x 450															300 x 450	300 x 450

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PARKING (from page 119)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
38	Vertical parking sign shall incorporate the International Symbol of Access	yes		yes	yes					yes		yes	yes				yes	yes
39	A vertical sign shall be mounted on a wall or post in front of the parking stall, at a height from ground to the centreline of	1500 - 2500	1500 min.	1525													1500 - 2500	1500 - 2500
40	In pedestrian areas, signs that are on free standing supports between 680 - 2030 mm in height, measured from the floor, shall not protrude into the path of travel more than	100																not at all
41	An International Symbol of Access shall be painted on the ground, in the centre of the designated accessible parking stalls	yes			yes					yes		yes					yes	yes
42	Minimum length of International Symbol of Access on the pavement	1000															1000	1000
43	Symbol to be colour contrasted with background pavement	yes															white logo on blue	yes
44	For ticketing and paying machines information on visual displays shall be supplemented by tactile and/or auditory information, colour contrasted and located on a glare-free surface	yes																yes
45	For other signage requirements, see section on SIGNAGE	yes	yes	yes		yes	yes		yes	yes	yes	yes		yes	yes	yes	yes	yes
Controls																		
46	For requirements of operating controls on ticketing and paying machines, see controls section in ANTHROPOMETRICS	yes		yes	yes		yes		yes			yes		yes	yes	yes	yes	yes
Detectable Hazard Indicators																		
47	A detectable hazard indicator shall be located at an unprotected drop-off edge where the change in elevation is greater than	250								a bubble ramp								250

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
48	For further requirements, see section on DETECTABLE WARNINGS	yes		yes		yes				yes		yes		yes			yes	yes
49	A detectable hazard indicator shall be located where the slope is steeper than 1:3	yes	yes	yes								yes						yes
50	For additional curb ramp requirements, see section on CURB RAMPS	yes	yes	yes	yes	yes	yes			yes	yes	yes		yes	yes	yes	yes	yes
51	A detectable hazard indicator shall be located at an entry into a vehicular route or area where no curbs or other elements separate it from the pedestrian route of travel	yes	yes	yes								yes						yes

PARKING COMMENTS

No.	Document	Comments
1	CSA, South Africa, Singapore	The location of designated parking spaces should be identified for drivers entering a parking lot or structure. Where the location of the designated parking spaces is not obvious or is distant from the approach viewpoint, directional signs should be placed along the route leading to them.
2	CSA, Singapore	The accessible route should not require people to pass behind vehicles.
3	CSA	Colour contrasting bollards or curbs should be used to prevent parked vehicles from protruding into the accessible circulation route.
4	CSA	The distance between the bollards or curbs should allow the passage of a wheelchair.
5	CSA	The vertical sign should be located so that it is visible to a driver of a vehicle approaching the space, but does not create a protrusion hazard.
6	CSA	A clear floor area of at least 1200 x 1200 mm in front of the opertating controls of ticketing and paying machines provides for both a side and front approach.
7	CSA	Controls with different shapes can help identify different functions.
8	ADAAG	A sign at a designated van parking space should be used to alert van users to the presence of a wider parking and aisle space. (It is informative, not restrictive).
9	ADAAG	Universal parking spaces should be considered as an alternative to the provision of providing a percentage of spaces with wide aisles and the need to supply additional signage. All accessible spaces are 3350 mm wide with a 1525 mm access aisle.
10	ADAAG	Access aisles by parking spaces should be level with the parking space. The aisle cannot include a ramp or sloped area.
11	ADAAG	The access aisle must be connected to an accessible route to the nearest accessible entrance of a building or facility.
12	Singapore	Vehicle park auto-pay machines shall be located on the same level as the accessible vehicle parking lots.
13	Singapore	It is recommended that a telephone be installed at the vicinity of the accessible parking lot to enable persons with disabilities to call the building management for assistance.
14	Singapore	Accessible vehicle parking lot shall be sheltered whenever possible.
15	Singapore	Parallel parking for persons with disabilities is discouraged.
16	Singapore	Vehicle parking entrance shall have a height clearance of at least 2000 mm.
17	Singapore	A vehicle parked in the designated accessible stall shall not obscure the designated signage for the parking space.
18	Singapore	The telephone number of the building management, town council or the relevant authority should be clearly printed on the vertical signage for the purpose of reporting unauthorized parking.
19	Singapore	Where bollards are erected at entrances to walkways or pathways they shall have a minimum clear width of 900 mm between bollards, not be linked with a chain or rope, have a maximum height of 1000 mm, have a colour which contrasts with the background or be provided with a coloured band around the neck of the bollard to further aid visibility, not have ornamental features protruding horizontally, be well lit with fittings positioned in such a manner that will not cause glare.
20	Singapore	Open jointed pavers or aeration concrete blocks should be avoided at external open spaces or vehicle parks where pedestrians are expected to walk. The voids in aeration concrete blocks can catch the foot or walking aids and cause injury or a fall especially when an older person who is ambulant may already be unstable.

PASSENGER DROP-OFF AND PICKUP AREAS

A passenger drop-off area should be provided at the main entrance of facilities and should accommodate all vehicles, including buses, taxis and vans. There are a great variety of different accessible vehicles therefore **the best practice would be to provide a passenger drop-off zone (1) with a space of 1500 x 6000 mm. An access aisle (2) should also be provided** on the roadway parallel and adjacent to the pedestrian walkway. **A curb ramp should always be provided.** If there is no curb ramp (7), there should be some **hazard indicator** to warn of the drop-off and change in level. South Africa specifies a bubble ramp, the Philippines specifies tactile blocks and Lebanon recommends that a textured surface at least 600 mm wide is required. The best practice requires that a hazard indicator such as bollards be used.

The minimum vertical clearance required at accessible loading zones (11) varies from 2000 mm specified by Singapore to 3350 mm. The best practice selected by the Expert Panel is 2750 mm, which is believed to accommodate most vehicles.

Signage (15) should be provided to indicate the designated drop-off area, and having the area sheltered is recommended by Singapore and Lebanon.

Sweden recommends that the pickup and drop-off area be clearly visible from the entrance. Singapore recommends that where bollards are provided a minimum clear width of 900 mm be provided and that the bollards contrasting in colour with their background. Singapore further recommends that **taxi stands be located next to the accessible entrance.**

PASSENGER DROP-OFF AND PICKUP AREAS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Access Aisle																		
1	Loading zone access aisle shall be a minimum of (width x length)	1500 x 6000		1525 x 6100										1500 x 4500			7000 x 2440	1500 x 6000
2	Access aisles shall be at the same level as the vehicle pull-up space they serve			yes										yes				yes
3	Access aisles shall be marked so as to discourage parking in them			yes												yes	yes	yes
4	An access aisle shall be provided on the roadway that is parallel and adjacent to the pedestrian walkway	yes		yes													yes	yes
Curb Ramp																		
5	Is a curb ramp located between the access aisle and the vehicle pull-up space	yes					yes							yes		yes	yes	yes
6	For further curb ramp requirements, see the section on CURB RAMPS	yes		yes			yes					yes		yes		yes	yes	yes
Hazard Indicators																		
7	If there is no curb between the vehicular area and the passenger pickup area, the area shall be separated by a hazard indicator	yes								a bubble ramp		tactile blocks		900 wide 300 back from road		yes, textured surface min. 600		yes, and use bollards
8	For additional access route requirements, see the section on ACCESS ROUTES	yes	yes	yes								yes		yes			yes	yes
9	For requirements on detectable warnings, see DETECTABLE WARNING section	yes	yes	yes								yes		yes			yes	yes
10	Detectable hazard indicators shall be located at an entry into a vehicular route or parking area where no curbs or other elements separate it from the pedestrian route of travel	yes												yes				yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Vertical Clearance																		
11	Minimum vertical clearance height required at accessible passenger loading zones and along vehicle access routes	2750		2895										2000			3350	2750
Sidewalk																		
12	Sidewalk space for side lift area shall be a minimum of (width x length)	2000 x 2000															2440 wide	2000 x 2000
13	Bollards are required if vehicle route is at the same grade as the adjacent sidewalk															yes		yes
Slope																		
14	Maximum cross slope of loading zone	2%		1:48			1:50							level			1:50	1:50
Signage																		
15	Signage shall indicate the designated use and time limits																	yes
16	For signage requirements at the passenger drop-off and pickup area, see section on PARKING	yes	yes	yes										yes			yes	yes
Other																		
17	Passenger loading zone shall be sheltered with a canopy													where possible		yes		yes
18	Passenger loading area shall be well lighted																	yes

PASSENGER DROP-OFF AND PICKUP AREAS COMMENTS

No.	Document	Comments
1	CSA	Covered passenger pickup areas are recommended.
2	CSA	Passengers using a wheelchair require a transfer space level with the roadway.
3	Sweden	Passenger pickup and drop-off area should be close to the entrance (maximum 25 m).
4	Sweden	It is an advantage if the pickup and drop-off area is clearly visible from the entrance, and that you are able to sit and wait to be picked up.
5	South Africa	Curb cuts should be provided where required in conjunction with pedestrian crossings, taxi and bus ramps, and parking garages.
6	Singapore	A passenger alighting and boarding point should be provided at the level of approach for persons with disabilities to alight from and board a vehicle.
7	Singapore	Where transfer has to be made from a vehicular surface to a pedestrian surface, the driveway and the pavement or footway surfaces shall be blended to a common level or ramped.
8	Singapore	Differences in level between the driveway and the pavement or pathway shall be avoided.
9	Singapore	At least one accessible route leading to an accessible entrance of the building shall be provided from the alighting and boarding point of taxi stands.
10	Singapore	Where bollards are erected at entrances to walkways or pathways, they shall have a minimum clear width of 900 mm between bollards, not be linked with a chain or rope, have a maximum height of 1000 mm, have a colour which contrasts with the background or be provided with a coloured band around the neck of the bollard to further aid visibility, not have ornamental features protruding horizontally, be well lit and the light fitting should be positioned in such a manner that will not cause glare.
11	Singapore	The International Symbol of Access shall be installed at or near taxi stands to direct persons with disabilities to an accessible entrance.
12	Singapore	Taxi stands should be located nearest to an accessible entrance.
13	Singapore	The taxi pickup area should, where possible, be provided at the level of approach for persons with disabilities to access the vehicle.
14	Singapore	Where a taxi stand is not on the same level with the walkway or pathway, it shall have two separate ramps for boarding and alighting.
15	Singapore	A shelter shall be provided at taxi stand for protection against the elements.
16	Singapore	Open jointed pavers or aeration concrete blocks should be avoided at external open spaces or vehicle parks where pedestrians are expected to walk. The voids in aeration concrete blocks can catch the foot or walking aids and cause injury or a fall especially when an older person who is ambulant may already be unstable.

RAMPS

The running slope of ramps is addressed by all codes and standards, with the minimum acceptable slope of 1:12 (5). Some exceptions exist in Bangladesh where a slope of 1:8 is allowed along the route from the parking and in Malaysia where 1:8 is allowed if the ramp is used by the walking disabled. The Expert Panel selected a slope of 1:16 to 1:20 as the best practice. **The width of a ramp varies widely,** from 870 mm in National Building Code of Canada, measurements from 900 to 1000 mm in Lebanon, Uruguay, Canada CSA, the U.S. and Australia, 1200 mm in Mexico, Philippines, Malaysia and Singapore and 1300 mm in Sweden.

The maximum horizontal distance between landings (6) varies considerably from 3000 mm with the National Building Code of Canada to 12 000 mm in South Africa, with the Expert Panel selecting 6000 mm as a best practice. There is general agreement that the cross slope should not exceed a ratio of 1:50 (4), except in the Philippines who specify a ratio of 1:100.

A level landing at the top and bottom of the ramp (11) is required by most countries, as well as a level landing where the ramp changes direction. The length of the landing (14) varies from 1200 mm to 2000 mm, with 2000 mm being judged to accommodate the widest range of users. If the **landing** has a door opening onto it (15), it is important to provide adequate manoeuvring space with most countries specifying 1500 x 1500 mm. However, the AFG Guideline recommends **2440 x 2440 mm, to accommodate power wheelchairs and scooters.**

A colour contrasted strip (17) at the top and bottom of a ramp and wherever there is a change in slope is specified by Canada, Uruguay, Sweden and Lebanon, a requirement that increases the safety for all users. Most countries specify that the ramp be stable, firm and slip-resistance (18), an important consideration.

Edge protection (22) is required on ramps or landings that are not at grade by most codes and standards, with the edge ranging in height from 75 - 100 mm with 40 - 75 mm preferred. The bottom edge of a rail above a ramp should have a maximum height of 75 mm (25).

Ramps should be well illuminated, mentioned by South Africa, Australia and Canada (26).

A good universal design approach recommended by Singapore, Sweden and the CSA is to allow for a choice of both stairs and ramps. The CSA discourages designers from using **curved ramps as they are more difficult for wheelchair manoeuvring.** South Africa's comment of adding indicators to the underside of handrails to assist in wayfinding for blind people is innovative.

RAMPS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Slope																		
1	A slope steeper than 1:20 on a accessible route is considered to be a ramp	yes															steeper than 1:25	yes
2	Minimum clear width of a ramp	920 - 1000	870	915	1200	900	1300 indoor, 1500 outdoor	1000	1200 low traffic, 1500 high traffic	1100		1200	1200	1200	1000	900	950 - 1000	1000
3	Minimum clear width of a ramp – between handrails	920	870	915			1500 outdoor	1000		1100					1000		950 - 1000	1000
4	The distance between at least one set of handrails on a wider ramp shall be	920 - 1000										1200	1200		1000	1500	1000	1000
5	The running slope between landings on a ramp shall be	1:12 - 1:20	1:12	1:12	1:12 - 1:16	1:10 - 1:16	1:12 interior, 1:20 outdoor	1:12 if ramp less than 4500, 1:20 if greater than 4500	1:10 - 1:16	1:12 if rise greater than 400, 1:10 if rise less than 400	1:8 (if from parking area)	1:12	1:12 (1:8 if used by walking disabled)	1:10 for rise 50 - 200, 1:12 for rise 200 +	1:14 - 1:20	1:12 - 1:20	1:20	1:16 - 1:20
6	The maximum horizontal distance between landings on a ramp shall be	9000	3000	9000	6000	15 000	600 if 1:12, 10 000 if 1:20	9000	9000	12 000		6000	6000	9000	9000 if 1:14, 15 000 if 1:20	10 000	9000	6000
7	Maximum cross slope of a ramp to be	1:50		1:48	1:50	1:50	1:50	1:50		1:40		1:100			1:40		1:50	1:50
8	Level landings on a ramp shall be designed to drain water from their surface	yes		yes			yes	yes						yes	with 1:40 cross slope	sloped to enable drainage	yes, if steeper than 1:25	yes
Handrails																		
9	For requirements for handrails, see section on HANDRAILS	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes	yes
Guardrails																		
10	Where guardrails are installed and where the top is higher than 920 mm, handrails at the required height shall also be provided	yes														yes	yes	yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Landings																		
11	There is a level landing at top and bottom of each run of a ramp	yes	yes	yes			yes	yes		level landing every 1500 of vertical rise		yes		yes	yes	yes	yes	yes
12	A level landing is required where a ramp changes direction	yes	yes	yes						yes				yes	yes	yes	yes	yes
13	Minimum landing width shall be as wide as the ramp run leading to it	yes	yes	yes				1000 min.	yes	yes		yes		yes	yes	yes	yes	1500
14	The minimum required landing length	1500	1500	1525			2000	1300 clear of door swing	1500	1200 min.		1800 top/ bottom, 1500 midway		1500	1200	1200	1525	2000
15	Minimum landing size if served by door serving an accessible route (length x width)	1500 x 1500	1500 x 1500	1525 x 1525				1500 x 1500		2000 x 1500 pull side OR 1500 x 1500 push side		1500 x 1500		1500 x 1500	1510 x 1750	1200 x 1500	2440 x 2440	2000 x 1500 pull side OR 1500 x 1500 push side
16	Where an intermediate landing meets a slope change there shall be a colour contrasted strip as wide as the ramp with a depth of	50 ± 10																50 ± 10
17	At the top and bottom of a ramp where a slope change occurs, there shall be a colour contrasted strip as wide as the ramp, with a depth of	50 ± 10			600 - 900	safe for the visually impaired									60		50 ± 10	
18	Ramp and landing surfaces shall be stable, firm, and slip-resistant	yes		yes			yes	yes	yes	slip-resistant	if steeper than 1:10	yes		slip-resistant	yes	yes, and avoid carpet	yes	yes
19	Ramp and landing surfaces shall produce minimal glare	yes															yes	yes
20	Ramp and landing surfaces shall not be heavily patterned	yes															yes	yes
Door Latch Space																		
21	Where a door leads onto a ramp landing, there shall be space beside the latch side of the door of at least	600		610			700 - 1000			380				600 pull side, 300 push side	840		600 pull side, 300 push side	600 pull side, 300 push side
Edge Protection																		
22	Edge protection is required at ramps or landings not at grade	yes		yes			yes	yes		yes		yes	yes	yes	yes	yes	yes	yes

Continued on next page

RAMPS (from page 129)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
23	The minimum height of the edge protection shall be	75	no edge protection	100	50	50	40	75	100	75		100	100	75	65	400	50	75
24	The lower edge of a raised barrier above the ramp or landing surface shall have a maximum height of	75	no raised barrier	100				75		75				75	75		50	75
25	The bottom edge of a rail above the ramp or landing surface shall have a maximum height of	75		100						75				75	150		50	75
Illumination																		
26	Ramps shall be well illuminated	yes					safe for the visually impaired			yes							yes	yes
27	Exterior ramps shall be illuminated at ground level to at least	100 lx								150 lx (all ramps)					150 lx (all ramps)		30 - 100 lx	150 lx
Signage																		
28	For requirements on signage, see section on SIGNAGE	yes	yes	yes													yes	yes

RAMPS COMMENTS

No.	Document	Comments
1	CSA	The more gradual the slope of a ramp, the more easily people can use it without assistance. Slopes with a grade of 1:20 - 1:15 are preferred.
2	CSA, Singapore, Sweden	Many people find using steps easier and safer than using a ramp, therefore both stairs and a ramp should be provided in any one location.
3	CSA	Using curved ramps as a design solution is discouraged.
4	CSA, Singapore	Where ramps are required to overcome a major change in level, they have to be very long, and require multiple ramps and landings, other design solutions should be considered.
5	CSA	Adverse weather conditions can cause slippery conditions on exterior ramps. To avoid this situation several options are possible: a porous material may be used to lessen the build-up of snow or ice; the ramp surface may be heated; or the ramp may be covered.
6	CSA	An edge protection that is open at the surface level facilitates snow removal and lessens water accumulation.
7	CSA	Lighting should be used to emphasize important features such as exterior ramps.
8	ADAAG	Ramps that do not have level landings at changes in direction can create a multi-sloped surface which will not meet the requirements to be part of an accessible route.
9	ADAAG	A level landing is needed at doors to permit manoeuvring and simultaneous door operation.
10	ADAAG	Landings subject to wet conditions shall be designed to prevent the accumulation of water.
11	South Africa	Windows and doors shall not open across a walkway, corridor, stair or ramp so that they obstruct circulation.
12	South Africa	The fixing of indicators to the underside of handrails to indicate the position of landings is advocated as an aid in building design for use of blind people.
13	Singapore	Where the horizontal run of an approach ramp exceeds 9000 mm in length, an alternative stepped approach in addition to the ramp may be provided for the ambulant disabled and shall not exceed 1200 mm in a horizontal run.

SECURITY

Security controls can impose a barrier to the participation of people with disabilities. Careful design should eliminate these obstacles.

Canada requires that **security access systems be located along accessible routes (1) and provide equitable alternative means** (2) to allow people with disabilities through security systems. Sweden, the U.S. and Canada all provide **a minimum clear width (4) for security gates, whereas the Expert Panel recommends 950 mm.**

Card access systems should be designed and installed so they are at an appropriate height (6), are contrasted (8) with tactile graphic symbols. The combination of **both audible and visual signals** (11) will facilitate use by everyone.

Keypads should also comply with accessibility criteria and not be located above a maximum height of 1060 mm, should be colour contrasted and should have a raised dot on the No. 5, which helps orient people, especially people with visual impairments. These comments and requirements have been detailed by the Canadian CSA Standard.

Sweden draws attention to the fact that **security access systems** should be coordinated with the door opener and that keypads are more legible if the keys are at 45˚ angle.

SECURITY

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
General																		
1	Security access systems shall be located along the accessible route	yes															yes	yes
2	Security access systems shall provide equitable alternative means to allow persons with disabilities through the security system	yes															yes	yes
3	Security gates or screens where queue systems are used shall have both audible (beep) and visual (light) signals to indicate "proceed" and "stop" instructions	yes																yes
4	Security gates or screens where turnstiles are used shall have an adjacent gate with a clear width a minimum of	810		815			800 interior, 900 exterior										950	950
Controls																		
5	Security access systems shall have the centreline of the operating controls located at a height above the floor of	400 - 1200		380 - 1220			within reach for standing and sitting users										400 - 1200	800 - 1200
Card Access																		
6	Card access shall have an access slot located at a height above the floor of	800 - 900															1060 max.	800 - 900
7	Card access shall have an access slot with its edges bevelled	yes																yes
8	Card access shall have an access slot that is colour contrasted with its surrounding surface	yes																yes
9	Card access shall have an access slot that includes tactile graphic symbols on the surrounding surface	yes															yes	yes

Continued on next page

SECURITY (from page 133)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
10	Card access shall have an access slot that includes tactile graphic symbols on the surrounding surface that represent the card and identify the orientation of the card insertion	yes															yes	yes
11	Card access shall have both audible (beep) and visual (light) signals to indicate that access has been granted	yes																yes
Keypads																		
12	Keypads shall be located at a with height from the floor of	800 - 1200															1060 max.	800 - 1060
13	Keypads shall be colour contrasted with the background	yes					luminance contrast										yes	yes
14	Keypads shall have characters that are colour contrasted with the keys	yes															yes	yes
15	Keypads shall, if numeric, be telephone type and have a raised dot on the number 5	yes					yes											yes
16	The keypads shall have a raised dot on the number 5 with a height of	0.7 (± 0.1)																0.7 (± 0.1)
17	The keypads shall have a raised dot on the number 5 with a base in diameter of	1.5																1.5
18	Keypads shall have both audible (beep) and visual (light) signals to identify that access has been granted	yes																yes

SECURITY COMMENTS

No.	Document	Comments
1	CSA	Security access systems should be useable by everyone. Proximity or contactless scanners may facilitate this. Biometric systems (e.g. retinal or palm scanners) cannot accommodate all users.
2	CSA	The keys on a keypad should be readable both from a standing and a seated position.
3	Sweden	Security access system should be placed so that the control devices are not too close to an interior corner or other barriers. Recommended distance from a corner or barrier is 700 mm.
4	Sweden	If the security access system is connected to a door opener, the control device should not be too close to the swing arc of the opening door. Recommended distance from the arc is 700 - 1000 mm.
5	Sweden	The keys on a keypad are more readable if the keys are at a 45˚ angle out from the wall.
6	Sweden	Controls should be placed with consideration to wheelchair users with impaired arm function. Recommended height for controls is 800 - 1000 mm.

SHOWERS

A universal design approach is the provision of roll-in showers that accommodate both people who use a shower seat and those who prefer to use a shower chair. The minimum clear floor space (3) varies from 760 x 1525 mm in the U.S. to 1400 x 1600 mm in Australia and to 1500 x 1500 mm in Lebanon. The size of the shower depends on whether it is designed to accommodate a single person or someone who will have an attendant.

A minimal curb or rise (4) is recommended by Sweden for the roll-in shower and if there is a curb provided in a regular shower, it should not exceed more than 10 mm (8) and it should be beveled at a slope of 1:2. **Positive drainage should be considered to facilitate drainage.**

There seems to be some difference in opinion regarding the location of the shower seat; Canada, the U.S. and Lebanon specify it on the wall opposite the controls, while Singapore and Australia specify the adjacent wall (15). **The Expert Panel** agreed with the later recommendation, and **recommends it be within reach of the seat, on the adjacent wall as it ensures that the controls are within reach for someone sitting on the shower seat regardless of the size of the shower stall.** Singapore specifies (19) a non-slip seat that is self-draining.

The number of grab bars (28) varies from 4 for the CSA to 1 or 2 in Mexico, Uruguay and Australia. **A vertical grab bar** mounted on the side wall (32) provides support to those entering and exiting the shower, specified by Singapore and Canada. A uniform height for the grab bars is within the 750 - 850 mm range.

Hand-held shower heads are recommended (47), with a minimum length of 1500 mm.

A comment from the Lebanon UN Manual recommends that drain openings be placed in a corner of the stall so that slip-resistant rubber mats can be used. Singapore recommends a **colour contrasting curb** and, as in other areas of a facility, the use of **plain colours with a matte finish to reduce glare and to diffuse light around the room.**

Care should be taken to provide a slip-resistant surface, even when wet. A heat lamp is a good design feature and preset temperature controls will prevent water becoming too hot and causing an injury to people who are unable to feel the temperature of the water.

SHOWERS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Shower Entrance																		
1	In each shower room the number of accessible shower stalls shall be at least		1											yes	yes			at least 1 per shower area
2	Doors or curtains for showers shall not obstruct the controls or the transfer space	yes												yes	yes			yes
3	Minimum clear floor space in front of a roll-in shower with long side parallel to the entrance shall be	900 x 1200	900 x 1500	760 x 1525										900 x 1400	1400 x 1600	1500 x 1500	920 x 1525	920 x 1525
4	Curb height or threshold for roll-in shower stall shall not exceed	13	13	13			none if possible							10		13		10
5	Curb height or threshold for roll-in shower stall shall be bevelled to a slope no steeper than the ratio of 1:2 (50%) for heights between	7 - 13		6.5 - 13										up to 10			0 - 13	6.5 - 10
6	A shower stall with a curb shall have a clear floor area in front of the shower entrance (depth X width) of at least	900 x 1200		1220 x 915										1400 x 900		1500 x 1500	920 x 1525	920 x 1525
7	A shower stall with a curb shall have a clear floor area in front of the shower entrance with the long dimension parallel to the shower entrance	yes		yes										yes			yes	yes
8	A curb in a shower stall shall not be higher than	100												10 bevelled at a slope of 1:2	no curb	20		10 bevelled at a slope of 1:2
9	A curb in a shower stall shall have a width of less than	100													no curb			50
Shower Interior																		
10	A roll-in shower shall have minimum interior clear area dimensions of at least	750 x 1500	900 x 1500	760 x 1525	900 x 900	800 x 1200	2200 x 2200							1500 x 1500	1100 x 1160	900 x 1500	920 x 1525	1500 x 1500
11	Shower floor shall be slip-resistant when wet	yes	yes	yes	yes	yes								yes		yes	yes	yes

Continued on next page

SHOWERS (from page 137)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
12	The shower floor shall have a minimal slope to provide positive drainage	yes		yes	yes										1:70 - 1:80			yes
13	A shower stall with a curb shall have an interior clear area (width x length) of at least	900 x 900		915 x 915	900 x 900	800 x 1200									at least 1000 in front of seat	900 x 900		at least 1000 in front of seat x 915
Shower Seat																		
14	A shower stall shall be provided with a seat	yes	yes	yes	seat with or without a curb					yes				yes	yes	yes		yes
15	A shower stall shall have a seat on the wall opposite the controls	yes		yes	seat with or without a curb									on wall nearest controls across from opening	adjacent wall	yes		no, on adjacent wall
16	A shower stall with a curb shall have a seat extending the full width of the stall, less the space allowed for the shower curtain	yes		within 75 of shower stall entry										900 min. roll-in shower and 600 in individual washroom with a shower	within 100 of stall entry	yes		yes
17	A shower stall shall have a seat with a depth of at least	400	450	380 - 405	400 with or without a curb									400	390 - 400	450		450
18	A shower stall shall have a seat with a height off the floor of between	430 - 480	450	430 - 485										450 - 480	470 - 480	450 - 500		450 - 480
19	A shower stall shall have a seat with a smooth non-slip surface without rough edges	yes	yes	yes										yes and be self-draining				yes and be self-draining
Controls																		
20	The roll-in shower controls shall be mounted on long (back) wall above the grab bar	yes		yes											yes	yes	yes	yes
21	Maximum mounting height above the floor for shower controls shall be	1200		965 -1220	900 - 1200									1200	900 - 1100	1200	1200	1200

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
22	Controls shall not be spring loaded	yes												yes			yes	yes
23	Controls shall have lever handles with a length from the centre of rotation to the handle tip of at least	75				yes								yes				75
24	The controls in a shower stall shall be mounted within reach of the seat	yes													yes	yes		yes
25	The controls, faucets and shower spray unit shall be installed on the side wall	yes, opposite the seat		yes, opposite the seat and 965 - 1220 from the floor											on rear wall	yes	on adjacent wall	within reach of the seat, on the adjacent wall
26	The controls in a shower stall with a curb shall be accessible from outside the stall	yes		yes												yes		yes
Grab Bars																		
27	For grab bar requirements, see section in WASHROOM	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
28	The number of grab bars in a shower shall be	4		2 (3 where there is no seat)	1	2								"L" shaped or 2 bars in an "L" (750 vertical x 900 horizontal)	1 - 2	1	2	4
29	In a roll-in shower there shall be one horizontal grab bar mounted on a side wall	yes		yes												yes		yes
30	The side horizontal grab bar shall have a length of at least	600												900	600			900
31	The side wall horizontal grab bar mounted above the floor at a height of	750 - 850	850	840 - 915										700 - 800	800 - 810	850 - 950		750 - 850
32	The vertical grab bar mounted on a side wall (beside the shower entrance) shall have a minimum length of	1000	900											750			750	1000

Continued on next page

SHOWERS (from page 139)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
33	The side wall vertical grab bar (mounted beside the shower entrance) shall have its lower end above the floor a height of	600 - 650												700 - 800			700 - 800	700 - 800
34	The vertical grab bar mounted on a side wall located back from the outside edge of the shower between	50 - 80															80 - 120	50 - 80
35	In a roll-in shower one horizontal grab bar shall be mounted on the back wall and have a minimum length of	1000		1225											yes	continuous	920	continuous
36	In a roll-in shower the horizontal grab bar mounted on the back wall shall be mounted above the floor at a height of	750 - 850		840 - 915	800	700 - 800								700 - 800	800 - 810	850 - 950	850	750 - 850
37	In a roll-in shower one vertical grab bar shall be mounted on the back wall and shall have a minimum length of	750													600			750
38	The distance between the bottom of the vertical grab bar and the top of the horizontal grab bar shall be between	50 - 60													50 - 60			50 - 60
39	The vertical grab bar on the back wall shall be mounted away from the side wall between	400 - 500																400 - 500
40	A shower stall with a curb shall have one horizontal grab bar on the back wall	yes		yes	yes										yes	yes		yes
41	The horizontal grab bar on the back wall of a shower shall be located above the shower floor at a height of	750 - 850		840 - 915	800	700 - 750								700 - 800	800 - 810	850 - 950	850	750 - 850
42	The horizontal grab bar on the back wall of a shower shall have a minimum length of	750		615											600	continuous		continuous

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
43	A shower stall with a curb shall have one vertical grab bar on the same wall as the controls, at a distance from the outside wall of	80 - 120																80 - 120
44	The vertical grab bar on the same wall as the controls shall have its lower end located above the floor at a height of	600 - 650																600 - 650
45	The vertical grab bar on the same wall as the controls shall have a minimum length of	1000																1000
Shower Head																		
46	Shower head to be of hand-held type	yes		hand-held or fixed										yes	yes	yes	yes	yes
47	Length of shower head hose to be a minimum of	1500	1500	1500										1500		1500	1525	1500
48	Shower head allowed to be used in a fixed position	yes	yes	yes										yes	yes	yes	yes	yes
49	Mount shower heads to be adjustable upwards from a height above the floor of	1200												1000	1000	yes		1000
50	The vertical bar on which the shower head is mounted shall be installed so as not to obstruct the use of grab bars	yes		yes										yes	yes		yes	yes
Water Temperature																		
51	For requirements, see information on Water Temperature in section on WASHROOMS	yes	yes	yes					yes					yes	yes		yes	yes

SHOWERS COMMENTS

No.	Document	Comments
1	CSA	The shower drain should be located below the seat, or off to one side.
2	CSA	A lever handle in the off position should be angled to the front. Hot and cold faucets for lavatories, bathtubs, and showers should be consistently oriented.
3	CSA	Avoid shower doors that may create obstacles to entering the shower, such as those affixed with a floor track or those that may limit the clear opening.
4	CSA	To expand the usability of a shower stall, a folding seat should be located on the side wall. A seat that folds to a vertical position when not in use will allow persons to use the shower in a seated or standing position.
5	Mexico	For transfer showers, access must be level, with no curbs or ramps. The seat shall be 400 mm in depth, and across the full stall width. Controls should be on the opposite wall. The grab bars shall be located on the back wall and on the control wall. One fixed and one hand-held shower head are required.
6	Uruguay	Minimum shower stall dimensions shall be 800 x 1200 mm.
7	Sweden	A shower stall in a workplace should be easily adaptable to meeting the needs of people with disabilities, for example, constructing reinforced walls which will permit the installation of grab bars at a later date if needed. Shower seats should be chosen with consideration given to the needs of the person.
8	Sweden	Where adaptation to individual needs is not possible or feasible, such as in hotels and public places, grab bars should be installed from the beginning.
9	ICTA	If shower curtains are used, the shower rod should be reinforced and securely attached to the walls similar to a grab bar to prevent someone from grabbing them and having them give way under the pressure.
10	Singapore	Hot and cold water supplies should have clearly visible colour contrasted and embossed signs.
11	Singapore, CSA	The curb at the shower entrance shall have a colour that contrasts with the surrounding flooring colour to reduce the possibility of tripping.
12	Singapore	In sports complexes and public swimming pools, at least one individual shower stall shall be accessible in both male and female areas.
13	Singapore	Where grab bars are not located in a washroom, provision should be made to mount them in the future.
14	Singapore	Light switches, coat hooks and other accessories should contrast strongly with their backgrounds.
15	Singapore	Walls and ceilings should be finished in plain colours (not complex patterns, which can be confusing) of light tones (to help diffuse light around the room or area) and with a matte finish (to avoid unwanted glare or reflection).
16	Singapore	Where an individual washroom is designed to include a shower facility, the minimum internal dimensions shall be 2000 x 1750 mm.
17	Lebanon UN	Drain openings should be placed in a corner of the stall so that slip-resistant rubber mats can be used.

SIGNAGE

Accessible signage, including the design, configuration and installation of accessible signage is addressed by all countries included in this study, with the exception of Mexico, Ireland, and Malaysia. The provision of accessible signage **with well contrasted, tactile information** ensures that all people are able to make their way through a facility.

The International Symbol of Access is required by most countries (1) to designate accessible facilities. **Most countries require signage to be at a uniform height (2) at a range between 1400 mm to 1600 mm.** Interior signage is required to be located on the latch side of doors (3) in Canada, the U.S., Singapore and Lebanon, a good design practice as people who are blind can only use signage if it is consistently located.

Many countries specify that signage be consistently located, including electronic signage (6) and that it be on **a glare-free surface with a uniform design.** Signage must be colour contrasted (11), a requirement by most countries **with Sweden also requiring luminance contrast,** Australia and Spain requiring light on dark, and dark on light which is considered the best practice. The level of illumination on signs when emergency lighting is used (12) is recommended by Bangladesh, Singapore, Australia, Lebanon and Canada with the best practice at 200 lux. **Letters and numbers on signs are required to be sans serif** (14), with Australia recommending Helvetica medium. Decorative or italic script is discouraged.

Pictograph symbols and tactile characters are specified with Braille placed directly below the pictograph. Pictograph symbols are required at height of 16 - 51 mm (42).

Canada and the U.S. provide further technical specifications on the size and style of characters. Where double leaf door or no door is provided, signage should be mounted on the nearest adjacent wall (49), as required by Singapore, the U.S. and Canada. Both Singapore and Canada state that **overhead signs are not required to be tactile as they cannot be reached for touching (53).**

Technical specifications for Braille are provided by the U.S., Canada and Singapore with a recommendation for **Grade 2 Braille,** provided below the text. **Minimum viewing distances** are specified by South Africa; for example, a minimum character height of 10 for maximum viewing distance of 4500 mm (86).

The Canadian CSA Standard warns that red letters should not be used on a black background and that vertical wording and electronic scrolling signage should also be avoided. Sweden correctly points out that signage should be simple, short and easy to understand, which are good universal design practices. Singapore includes a series of recommendations for colour and tone contrasting combinations.

SIGNAGE

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Location and General																		
1	Where facilities or their elements are required to be identified as accessible, the International Symbol of Access shall be used	yes		yes						yes		yes		yes	yes	yes		yes
2	The centerline of interior signage shall be at a height above the floor of	1500 (± 10)		1525		1400 - 1700	1400 - 1600			1400 - 1600		1400 - 1600		1500 (± 25)	1200 - 1600	1400 - 1600	1475 - 1525	1500 (± 25)
3	Interior signage to be located on the latch side of the doors.	yes		yes			near exit doors and escape routes							yes		yes	yes	yes
4	Where there is no wall space on the latch side of a door, signs shall be located on the nearest adjacent wall	yes										located to be easily seen		yes			yes	yes
5	Door mounted signs shall be permitted on the push side of doors equipped with closers and without hold open devices	yes																no
6	Signage shall be consistently located	yes, including electronic signage				yes	yes		yes			yes		yes			yes	yes
7	Signage shall be positioned to avoid shadow areas and glare	yes, including electronic signage				yes	yes		yes					yes		yes		yes
8	Where signage is provided, it shall have a glare-free surface	yes, including electronic signage		yes		yes	yes		yes					yes		yes	yes	yes
9	Signage shall be of uniform design	yes, including electronic signage																yes
10	Signage used to give the same type of information within the same facility, shall be consistently shaped, coloured, and positioned	yes, including electronic signage				yes	easy to find, contrasted luminance, easy to understand							yes		yes		yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
11	Signage shall be colour contrasted with its background	yes, including electronic signage				yes	contrasted luminance		yes	yes	yes	yes		yes		yes	yes	yes
12	The level of illumination on signs that depend on emergency lighting shall be at least	200 lx					well illuminated				65 lx			200 lx	200 - 300 lx	yes	200 lx	200 lx
13	For additional specific requirements, see sections on PARKING, WASHROOMS and PUBLIC TELEPHONES	yes		yes								yes		yes			yes	yes
Letters, Characters and Numbers																		
14	Letters and numbers on signs shall be sans serif	yes	yes	yes			easy to read		yes					yes	Helvetica medium		yes	yes
15	Visual characters shall be upper case and/or lower case	yes		yes										in title case			yes	yes
16	Visual characters shall be conventional in form and shall not be italic, oblique, script, highly decorative, or have other unusual form	yes				yes	easy to read		yes								yes	yes
17	Signs shall have Arabic numbers	yes	yes						yes					yes			yes	yes
18	Letters and numbers on signs shall have a width to height ratio between	3:5 to 1:1		3:5 to 1:1							75 x 75					3:5 to 1:1	3:5 to 1:1	3:5 to 1:1
19	Letters and numbers on signs shall have a stroke width to height ratio of between	1:5 to 1:10		1:5 to 1:10					1:3 - 1:7							1:5 to 1:10	1:5 to 1:10	1:5 to 1:10
20	Signs, letters, numbers and pictographs shall be colour contrasted with its background by at least	70%		light on dark/ dark on light			luminance contrast		light on dark/ dark on light	yes	light on dark/ dark on light	colour on grey		contrasting colour and tone	light on dark/ dark on light	yes	light on dark/ dark on light	light on dark/ dark on light
21	Visual characters and their backgrounds shall have a non-glare finish	yes		yes			yes		yes					yes		yes		yes

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SIGNAGE (from page 145)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
22	Visual character width shall be 55% minimum and 110% maximum of the height of the character with the width based on upper case letter "O" and the height based on the upper case letter "L"	yes		yes, based on the upper case letters "O" and "I"														yes
23	Visual characters shall have a stroke thickness that is 10% minimum and 30% maximum of the height of the character based on the upper case letter "L"	yes		15% of the upper case letter "I"														yes
24	Signs, letters, and numbers shall use an upper case "X" for character measurement	yes		upper case letter "I"					upper case letter "H"									yes
25	Pictograph symbols on tactile signs should be raised above the surface between	0.8 - 1.5	0.7	0.8					0.4 - 0.6	raised letters and symbols		1		0.8		1	0.8	0.8 - 1.5
26	Pictograph symbols on tactile signs should be accompanied by the equivalent description in Braille placed directly below the pictograph or symbol	yes, Grade 1		yes, contracted Grade 2 Braille								yes		wherever embossed characters are used	yes		yes, Grade 2 Braille	yes, Grade 2 Braille
27	Where both visual and tactile characters are required, either one sign with both visual and tactile are provided, OR two separate signs, one visual and one tactile shall be provided			yes								yes						one with both visual and tactile characters
28	Pictograph symbols on tactile signs should be colour contrasted with their background by at least 70%	yes		contrast light/dark or dark/light			luminance contrast					colour on grey		have colour and tone contrast	have contrast	yes	light/ or dark/ light	contrast light/dark or dark/light
29	Pictograph symbols on tactile signs should have a height between	16 - 50		16 - 51								easily seen		16 - 50			16 - 50	16 - 50
Tactile																		
30	Tactile characters shall be raised a minimum height above their background by at least	0.8	0.75	0.8					0.4 - 0.6	raised letters and symbols		1		0.8	raised	1	0.8	0.8 - 1.5

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
31	Tactile characters shall be sans serif and shall not be italic, oblique, script, highly decorative, or have other unusual form	yes		yes										be sans serif font				yes
32	Tactile character width shall be 55% minimum and 110% maximum of the height of the character with the width based on the uppercase letter "O" and height based on the upper case letter "L"	yes		yes, based on the upper case letters "O" and "I"														yes
33	Tactile characters shall have a stroke thickness that is 15% maximum of the height of the character based on the upper case letter "L"	yes		based on the upper case letter "I"														yes
34	Spacing between individual tactile characters shall be between	3 - 6		3.2 - 4 x the character stroke width												normal spacing		3 - 6
35	Spacing between individual tactile characters shall be calculated by measuring the two closest points between each adjacent character within a message excluding spaces between words	yes		yes														yes
36	Spacing for individual tactile characters shall be 135% minimum and 170% maximum of the character height between the baseline of separate lines of characters within a message	yes		yes														yes
37	Individual tactile character height measured vertically from the baseline of the character, based on the upper case letter "L" shall be between	13 - 19		13 - 51, based on the upper case letter "I"										16 - 50				13 - 19
38	The baseline of individual tactile characters shall be located above the floor or ground surface at a height between	1220 - 1525		1220 - 1525								1400 - 1600		1500 (± 25)		1400 - 1600	1475 - 1525	1500 (± 25)

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SIGNAGE (from page 147)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
39	Where characters have rectangular cross section spacing, the spacing between individual characters shall be between	3 - 10		3.2 - 4 x the character stroke width														3 - 10
40	Where characters have other cross section spacing between individual characters, the spacing shall be between 2 - 10 mm at the base of the cross section and 3 - 10 mm at the top of the cross sections	yes		yes														yes
41	Spacing shall be measured between the baselines of separate lines of characters and shall be 135% to 170% of the character height	yes		yes														yes
42	Character height measured vertically from the baseline of the character based on the upper case letter “L” shall be between	16 - 51		16 - 51 based on the upper case letter “I”														16 - 51
43	Tactile characters with a rectangular cross section shall have a stroke thickness that is 10% minimum and 15% maximum of the height of the character based on the upper case letter “L”	yes		15% of the upper case letter “I”														yes
44	Tactile characters with other than rectangular cross sections shall have a stroke thickness that is 10% minimum and 30% maximum of the height of the character and a stroke thickness at the top of the cross section that is 15% maximum of the height of the character based on the upper case letter “L”	yes																yes
45	Tactile signage shall be mounted with its horizontal centreline above the floor at a height of	1500 (± 10)		1525	1200							1400 - 1600		1500 (± 25)			1475 - 1525	1500 (± 25)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
46	A tactile sign used to identify a door, shall be mounted on the wall beside the latch side of the door	yes		yes	yes							consistently located		yes				yes
47	A tactile sign shall have the leading vertical edge a distance away from the door jamb of	150 (± 10)																150 (± 10)
48	A tactile sign where double-leaf doors are used, or where no wall space adjoins the door's latch edge, shall be mounted on the nearest adjacent wall	yes		yes										yes			yes	yes
49	A tactile sign shall allow a person to approach the sign to within 100 mm without encountering protruding objects or standing within a door swing	yes																protrusions not permitted
50	Signs containing tactile characters shall have the centreline of the tactile characters located beyond the arc of any door swing so that there is a clear floor space of			clear floor area of 455 x 455 beyond arc of door swing														800 x 1300
51	Tactile signage should have a clear wall area around the sign of at least	75																75
52	Tactile markings shall supplement the text of regulatory signs, (ie:prohibition and mandatory signs, caution and danger warning signs), and identification signs for rooms, titles, names, or numbers	yes																yes
53	Overhead signs do not have to be tactile since they cannot be reached for touching	yes												yes				yes
54	Pictographs/symbols shall have minimum colour contrast with the background of	70%		light/dark or dark/light			luminance contrast		contrast	yes		colour on grey		contrast in colour and tone	have contrast	have contrast	light/dark or dark/light	light/dark or dark/light

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SIGNAGE (from page 149)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
55	Spacing between individual characters shall be 10% minimum and 35% maximum of character height. Spacing shall be calculated by measuring the two closest points between each adjacent character within a message, excluding spaces between words	yes		yes														yes
56	Spacing between the baseline of separate lines of characters within a message shall be 135% minimum and 170% maximum of the character height	yes		yes														yes
Pictographs																		
57	Characters and/or Braille shall not be located in the pictograph field	yes		yes										text description placed directly below the pictograph			yes	yes
58	Character symbols for pictograph on tactile signs should have a character height of at least	150		150						100 x 100				152			150	150
59	Pictographs and their fields shall have a non-reflective finish	yes		yes			yes							yes			yes	yes
60	Pictographs shall contrast with their background fields: either a light pictograph/dark field or a dark pictograph/light field	yes		yes			yes			yes, and the symbol of a person in a wheelchair shall be yellow on black		yes		yes			yes	yes
61	Where text descriptors for pictographs are required, they shall be located directly below or adjacent to the pictograph	yes		yes										easy to touch and read				yes
Symbols																		
62	Symbols of accessibility and their backgrounds shall have a non-glare finish	yes		yes		yes	yes		yes					yes		yes	yes	yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
63	Symbols of accessibility shall contrast with their backgrounds. Either a light symbol/dark background or a dark symbol/ light background	yes		yes			luminance contrast		yes	strong contrast				colour and tone that contrast		yes	yes	yes
Braille																		
64	Tactile characters shall be accompanied by Grade 2 Braille	yes		yes										wherever embossed characters are used		yes	yes	yes
65	Braille dots shall have a domed or rounded shape	yes		yes										yes				yes
66	The measurement range for standard sign Braille shall have a dot base diameter of	1.5		1.5 - 1.6														1.5
67	The measurement range for standard sign Braille shall have a dot height of between	0.6 - 0.8		0.6 - 0.9														0.6 - 0.8
68	The measurement range for standard sign Braille shall have a distance between any two dots in the same cell centre to centre of between	2.3 - 2.5		2.3 - 2.5														2.3 - 2.5
69	The measurement range for standard sign Braille shall have a distance between corresponding dots in adjacent cells centre to centre between	6.1 - 7.6		6.1 - 7.6														6.1 - 7.6
70	The measurement range for standard sign Braille shall have a distance between corresponding dots from one cell to the cell directly below centre to centre of between	10.0 - 10.1		10.0 - 10.2														10.0 - 10.2
71	Braille shall be located below the corresponding text	yes		yes										yes and left aligned				yes
72	If text is multi lined, Braille shall be placed below the entire text	yes		yes														yes

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SIGNAGE (from page 151)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
73	Braille shall be separated from any other tactile characters by at least	10		9.5														10
74	Braille as measured from the base line of the Braille cells, shall be located above the finished floor at a height between	1015 - 1525		1220 - 1525								1400 - 1600		1500 (± 25)				1500 (± 25)
75	Braille shall be in accordance with literary Braille. The indication of an upper case letter shall only be used for the first word of a sentence, proper nouns and names, individual letters of the alphabet, initials, or acronyms	yes		yes														yes
Viewing Distance																		
76	Minimum character height to maximum viewing distance of 50 000						height depends on viewing distance			160						size proportionate to the viewing distance		size proportionate to the viewing distance
77	Minimum character height to maximum viewing distance of 40 000									140								300
78	Minimum character height to maximum viewing distance of 35 000									100, (30 000 - 40 000)								300
79	Minimum character height to maximum viewing distance of 25 000									80								300
80	Minimum character height to maximum viewing distance of 15 000									50								300
81	Minimum character height to maximum viewing distance of 12 000									40 (10 000 - 15 000)								300
82	Minimum character height to maximum viewing distance of 9000	300								20 (5000 - 10 000)								250

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
83	Minimum character height to maximum viewing distance of 8000	250 (at 7500)												250				250
84	Minimum character height to maximum viewing distance of 6000	200		66 (+3.2 per 305 above 6000)						20 (5000 - 10 000)				200			200	200
85	Minimum character height to maximum viewing distance of 4570			51 (+3.2 per 305 above 4750)					140 (5000)	10 (2000 - 5000)					150 (5000)			150
86	Minimum character height to maximum viewing distance of 4500	150								10 (2000 - 5000)				150			150	150
87	Minimum character height to maximum viewing distance of 4000								112	10 (2000 - 5000)					130			130
88	Minimum character height to maximum viewing distance of 3000	100					70 - 100, distance of 1000 - 3000		84	10 (2000 - 5000)				120	100 (3500)			120
89	Minimum character height to maximum viewing distance of 2500						70 - 100, distance of 1000 - 3000			10 (2000 - 5000)				100	80		100	100
90	Minimum character height to maximum viewing distance of 2300	75 (at 2250)					70 - 100, distance of 1000 - 3000			10 (2000 - 5000)							75	70 - 100
91	Minimum character height to maximum viewing distance of 2000						70 - 100, (1000 - 3000)		56	10 (2000 - 5000)				60				70 - 100
92	Minimum character height to maximum viewing distance of 1830			16 (+3.2 per 308 above 1830)						10 (0 - 2000)								50
93	Minimum character height to maximum viewing distance of 1500	50					15 min. if possible to get close to sign			10 (0 - 2000)				50	50		50	50
94	Minimum character height to maximum viewing distance of 750	25					15 min. if possible to get close to sign		28 (1000)	10 (0 - 2000)					25 (800)		25	25

SIGNAGE COMMENTS

No.	Document	Comments
1	CSA	Where the background colour of a sign does not contrast significantly with the surrounding surface, a contrasting border around the sign is recommended.
2	CSA	Illuminated red letters should not be used on a black background.
3	CSA	Examples of colours that contrast more than 70% are navy blue with matte white (95%), apple green with white (72%) and silver with saddle brown (70%).
4	CSA	Colour combinations that should be avoided include yellow/grey, yellow/white, blue/green, red/green, black/violet, and red/black.
5	CSA	Signage, including electronic display monitors, should be placed at decision making points along routes of travel, including exits and entrances.
6	CSA	Signs facing the direction of travel are easiest to notice and read.
7	CSA	Vertical wording and electronic scrolling signage should be avoided.
8	CSA	Where scrolling signage has to be used, characters and symbols should move slowly across the screen.
9	CSA	A mixture of upper and lower case letters (e.g. “Canada”) can be read more easily and recognized more quickly than capitals only.
10	CSA	Signage should be consistently located including height considerations for overhead or wall mounted signs, as well as uniform placement of identification signs for facilities and services.
11	Sweden	An uppercase letter shall only be used for the first word of a sentence, proper nouns and names, individual letters of the alphabet, initials and acronyms.
12	ADAAG	Braille shall be contracted (Grade 2 Braille).
13	Bangladesh	Exit signs shall have words 150 mm high with a stoke of not less than 20 mm.
14	Bangladesh	Minimum exit sign illumination (internally or externally), shall be 5 foot candles.
15	Sweden	The sign should be illuminated so that the viewer doesn’t get dazzled or shadow the sign.
16	Sweden	Sometimes verbal information is needed as a compliment.
17	Sweden, Singapore	Signs should be easy to understand, including for persons with cognitive limitations and people who cannot read or understand the language. Pictograms that are well known and easy to understand should be used if possible. The content of signs shall be simple, short and easy to understand.
18	Sweden	Character heights depend on viewing distance.
19	South Africa	Where induction loops or other electronic aids are installed, the international loop system (Deaf) sign shall be displayed.
20	South Africa	Hearing impaired people may need to report at the information counters at airports, railway stations, hotels, etc to arrange for written messages or other information. Such a counter and its location should be clearly identified by the symbol for the hearing impaired.
21	Singapore	Recommended signage colour and tone contrasts are – Background (red brick or dark stone) Sign (white) Characters (black, dark green or dark blue); Background (light brick or light stone) Sign (black or dark) Characters (white or yellow); Background (white-washed walls) Sign (black or dark) Characters (white or yellow); Background (green vegetation) Sign (white) Characters (black, dark green or dark blue).
22	Singapore	Persons with disabilities may have limitations in the movement of their head or a reduction in peripheral vision. Signs positioned perpendicular to the path of travel are easiest for them to notice.
23	Singapore	Persons can generally distinguish signs within an angle of 30˚ to either side of the centreline of their faces without moving their heads.
24	Singapore	The symbol of access shall consist of a symbolized figure in a wheelchair on a plain square background. The symbolized figure shall face to the right and the colour of the symbolized figure shall be white on a blue background.
25	Singapore	All text shall be in title case arranged with left alignment.
26	Singapore	Directional signs incorporating the symbol of access shall be displayed at main lobbies or passageways if the accessible route is not the main route.
27	Singapore	Where the location of the designated facility is not obvious or is distant from the approach viewpoints, directional signs incorporating the symbol of access should be placed along the route and at decision making points to direct person with disabilities to facilities such as lifts, entrances, telephone booths, toilets, vehicle parks and the like.
28	Singapore	Tactile signs incorporating pictograms shall indicate whether the toilet is for male or female.
29	Singapore	Arrows shall be located on the side of the sign to which they are pointing, that is arrows pointing left shall be on the left and arrows pointing right shall be on the right.
30	Singapore	The sign shall not have any sharp edges and if fitted to a frame, the frame shall not have any sharp edges.
31	Singapore	Illuminated clear glass or acrylic signs with coloured etched legend are not acceptable for legibility reasons.
32	Singapore	To enable a sign to be located on both light and dark backgrounds, or for corporate signage where the colour cannot be changed, a contrasting border shall be placed around the sign.
33	Singapore	The content of signs, shall be simple, short and easy to understand.

STAIRS

Surprisingly, the design of stairs varies considerably from country to country. The Expert Panel recommends the maximum riser height of stairs (1) of 150 - 180 mm with a tread depth (2) between 275 - 300 mm. **No open risers (4) are permitted** by most codes and standards as they are hazardous to people who use canes or wear braces. Bangladesh has an interesting approach to **the width of staircases as they specify 1250 mm for lodging, 1500 mm for schools, offices and small shops and a wider width of 2000 mm for health-care and assembly areas (5).**

To increased visibility, horizontal strips (15) are required at the edge of stair treads by many countries and **detectable warning indicators are increasingly becoming a requirement** (Canada, Uruguay, Sweden, the Philippines, Singapore and Lebanon). The extent of the design challenge in ensuring that the person approaching the stairs is able to detect the warning surface is reflected in the interval of the warning surface from 300 mm - 920 mm. This is a very important design element; they must be applied consistently to ensure they are effective.

The CSA Standard in Canada requires **tactile signage (29), which is particularly important at emergency egress stairs.** Another important safety concern is the illumination level (33) on stairs, something addressed by Canada, Spain, South Africa, Singapore and Lebanon, with the Expert Panel recommending 150 lux and that lighting be positioned without causing shadows.

Sweden recommends that stairs have a minimum width of 1200 mm if the stairs are part of the escape route and that stair widths be sufficient to allow stretchers to be safely carried.

Some interesting comments include the recommendation that strongly patterned carpets not be used on stairs, a design practice commonly used by many hotels. **Many people find patterned carpets on stairs disorienting,** especially older people and people with vision limitations.

South Africa points out that headroom should be at least 2100 mm vertically to prevent people from hitting their head on the underside of stairs. South Africa further recommends that windows and doors not open across a walkway, corridors or stair ramps. These are extremely important recommended design practices that increase safety for people using stairs. All these features increase safety for people while using the stairs.

STAIRS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Treads and Risers																		
1	The maximum riser height shall be	180	125 - 180	100 - 180		180		150	180	175 ± 6	215	200		150	150 - 165	120 - 180	125 - 180	150 - 180
2	The minimum tread depth shall be	280	280	280		280	250 interior, 300 outdoor	280	280	250	215	280		300	275 - 300	280 - 350	280 - 355	275 - 300
3	Flights of stairs shall have uniform riser heights and tread depths	yes		yes		yes	yes	yes			± 5	± 5		yes	yes	yes	yes	yes
4	There shall be no open risers	yes		yes			100 max. opening	yes		yes		avoid	yes	yes	yes	yes	yes	yes
5	The minimum width of staircase shall be				1200	1200	900	1000	1200	900	1250 (lodging), 1500 (schools, offices, small shops), 2000 (health care, assembly bldgs, large shops)	1200				900 one-way traffic, 1500 for two-way traffic, 1500 for exit routes		1250 (lodging), 1500 (schools, offices, small shops), 2000 (health care, assembly bldgs, large shops)
6	The maximum rise of a flight of stairs between landings shall be					18 steps max.		max. 1800 interior or no elevator, max. 1500 exterior or with elevator	13 steps max.	3000 max.	15 steps/ flight max.	3650	2000			2500 max.		2500 max.
Nosing																		
7	Maximum nosing projections shall be	38		38				15 - 25				slanted	not allowed	25	25	40	25	15 - 25
8	Abrupt underside of nosings shall be avoided	yes		yes				yes				yes	yes	yes		yes	yes	yes
9	The maximum radius of the leading edge of the tread shall be	13	13	13													13	13
10	Where nosings project, they slope to the riser at an angle greater than	60˚		30˚ max. from vertical												40˚ max. projection	not less than 60˚	40˚ max. projection
11	Stair nosings shall be slip-resistant	yes	yes		yes							yes		yes		yes	yes	yes
12	All step nosings shall have colour contrast with the stair treads	yes	yes	preferred	yes					yes		yes		yes		yes	yes	yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
13	Where nosings project, there shall not be sharp or abrupt angles that prevent the foot from sliding up the riser	yes						yes				yes		yes		yes	yes	yes
14	The minimum light level on a flight of stairs shall be	100 lx				10 lx								120 lx	150 lx		100 lx	150 lx
Horizontal Strips																		
15	There shall be a horizontal strip at the edge of the tread	yes						yes				yes		yes	yes	yes	yes	yes
16	There shall be a horizontal strip at the edge of the tread extending the full width of the tread	yes						yes				yes		yes	yes	yes	yes	yes
17	There shall be a horizontal strip at the edge of the tread with a depth of	50 ± 10						50 - 75						50 - 65	50 - 75	60		50 ± 10
18	There shall be a horizontal strip at the edge of the tread that is colour contrasted with the tread and riser	yes					first/last step to be clearly marked with min. 40% contrast	yes				yes	yes	yes	yes	yes	yes	yes
19	There shall be a horizontal strip at the edge of the tread that is slip-resistant	yes										yes		yes		yes		yes
Handrails																		
20	For requirements for handrails at stairs, see section on HANDRAILS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Detectable Warning Indicators																		
21	Detectable warning indicators shall be provided where the stairs are not enclosed	yes											yes	near the edge of landing		yes	yes	yes
22	Detectable warning indicators shall be provided at each landing incorporating an entrance into a stair system	yes				yes	min. 40% contrast on indicator at top, bottom and each landing		yes			yes		near the edge at top, bottom, intermediate landings		yes	yes	yes

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STAIRS (from page 157)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
23	Detectable warning indicators shall be provided where the regular pattern of a stairway is broken	yes						yes				yes				yes	yes	yes
24	Detectable warning indicators shall be provided where the run of a landing not having a continuous handrail is greater than 2100 mm	yes																yes
25	Detectable warning surface shall extend the full width of the stair	yes						yes	yes					yes		yes	yes	yes
26	The detectable warning surface depth at the top of stairs shall be	900 - 920	900					800 (400 where not head-on)	800			300		600 min. at top, bottom, intermediate landings		600	920	800
27	The detectable warning surface shall begin one tread width back from the stair nosing	yes						400 back from first step						300 back at top, bottom, intermediate landings			yes	yes
28	See section on DETECTABLE WARNINGS for additional requirements	yes	yes	yes		yes	yes	yes	yes			yes		yes			yes	yes
Signage																		
29	If the stair is located in a separate stairwell, it shall be identified with tactile signage	yes																yes
30	If the stair is located in a separate stairwell, floors shall be identified with tactile signage	yes																yes
31	Emergency egress stairs shall be identified with tactile signage	yes																yes
32	For additional signage requirements, see section on SIGNAGE	yes	yes	yes		yes	yes		yes	yes	yes	yes		yes	yes	yes	yes	yes

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Illumination																		
33	Stairs shall be well illuminated so that they can be easily seen	yes					yes		yes	yes, with a min. 150 lx				min. 120 lx, and position without causing shadow	yes	yes		yes, 150 lx, and positioned without causing shadows
Areas of Refuge																		
34	For requirements regarding areas of refuge in or adjacent to a set of stairs, see section on FIRE SAFETY REGULATIONS	yes	yes	yes			yes			yes	yes	yes	yes		yes		yes	yes
Water Accumulation																		
35	Exterior stairs shall be designed to avoid water accumulation	yes		yes												yes	yes	yes

STAIRS COMMENTS

No.	Document	Comments
1	CSA	In exterior situations and on wide stairs, a handrail should be provided near the centre so that it can be easily accessible to users.
2	CSA, Singapore	Strongly patterned carpets should not be used on stairs.
3	ADAAG	Consider providing visual contrast on tread nosings, or at the leading edges of treads without nosings, so that stair treads are more visible for people with low vision.
4	Bangladesh	The number denoting the floor shall be at least 72 mm^2, contrasting black on white.
5	Sweden	Stairs should be have a minimum width of 1200 mm if they are part of an escape route from an area intended for more than 150 people. Stairs width should be sufficient to allow stretchers to be safely carried.
6	South Africa	No door shall open onto a stairway unless the door opens onto a landing.
7	South Africa	The width of the landing where a door opens onto it shall be at least that of the door.
8	South Africa	Any landing that serves two flights of stairs in the same straight line shall have a length of at least 1100 mm and be at least as wide as the stairs.
9	South Africa	The headroom at any point on any stairway shall be at least 2100 mm measured vertically from the pitch line.
10	South Africa	To accommodate walking-impaired people, low risers and wide treads are preferable.
11	South Africa	Windows and doors shall not open across a walkway, corridor, stair or ramp so that they obstruct circulation.
12	Malaysia	Warning should be given of any obstacle or hazard on the floor or walls by use of contrasting colours. In particular contrasting colours as well as changes of floor texture should be used at the beginning and end of a flight of stairs.
13	Singapore	The treads and walls of the staircase should have contrasting colours to alert persons with visual impairments of the presence of steps.
14	Singapore	Detectable warning surfaces shall consist of flooring material that is contrasting in colour with the surrounding flooring material.
15	Singapore	Stairs should be illuminated to a minimum level of 120 lux and be positioned to provide lighting in both directions of travel without causing shadows and offering adequate contrast between treads and risers.
16	Singapore	Bright stainless steel or polished brass should not be used for nosing strips.

TELEPHONES

At least one telephone in every bank of telephones should be accessible to someone who uses a wheelchair, and one telephone accessible to someone who is Deaf or hard of hearing.

Public telephones should be equipped with **volume control device** (8) to ensure that they are accessible to people who are hard of hearing, although this feature is generally appreciated by everybody, especially in a noisy environment. Australia and Canada require **illumination (10) at a minimum of 200 lux beside the telephone.** The maximum height for all operable parts of the telephone (12) varies from a minimum of 800 mm to a maximum of 1370 mm, with the height range of 750 - 900 mm for telephones designed to be used by people who are seated.

The minimum clear floor space in front of a telephone (1) varies from 750 x 1200 mm to 1500 x 1000 mm, recommended by Sweden, with the best practice being 800 x 1300 mm. It is important that public telephones be located along the accessible route and that they do not protrude from the wall (2). The length of the telephone handset cord (7) should be 1000 mm, as specified by Canada.

In some places, public telephones are now available with TTY's incorporated into the payphone. Requirements of Canada, the U.S., Singapore address the need for a shelf for a TTY (teletypewriter) (16) so that people who are Deaf or hard of hearing are able to use the telephone. It is important to remember that sufficient room be provided for the shelf as well as above the shelf (22) to facilitate typing and reading. Telephones equipped with either a TTY or volume control should display the access symbol for people who are Deaf or hard of hearing (24).

The U.S. points out that pay telephones equipped with a text telephone space (underneath the telephone) cannot also be accessible to people who use wheelchairs as there is a conflict in the area for kneespace. Therefore a separate telephone for people who use a text telephone is recommended. Uruguay recommends both visual, tactile and sound signaling for public telephones.

TELEPHONES

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Clear Floor Space																		
1	The minimum clear floor space in front of the telephone for the kneespace for a seated person (which may extend 480 mm underneath the telephone) shall be	750 x 1200		760 x 1220			1500 x 1000 (plus 1500 x 1500 outside booth)							900 x 1200 (booth opening 900 min., and not restricted by fixed seats)	800 x 1300	1200 x 850	760 x 1370	800 x 1300
Enclosure																		
2	Telephones and enclosures shall protrude from the wall a maximum distance of	100		100											shall not protrude		100	shall not protrude
3	Telephone and enclosures may protrude more than 100 mm from wall if the enclosure is cane detectable	yes															yes	yes
4	The leading edge of telephones and enclosures are a maximum height from the floor of	680	685	685													680	350
5	The distance from the edge of the telephone enclosure to the face of the telephone unit is (side approach)			255											260 to operable parts		255	255
6	The distance from the edge of the telephone enclosure to the face of the telephone unit is (front approach)			510													510	510
Handset Cord																		
7	Minimum length of telephone handset cord shall be	1000		735										900	735	750	1000	1000
Controls																		
8	Telephones with a volume control shall have a graduated volume control	yes		yes														yes
9	Is there a volume control on the telephone	yes	yes	yes			yes								yes	yes	yes	yes
10	Minimum light level at operating controls, directory and the shelf shall be	200 lx													200 lx		200 lx	200 lx

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
11	The maximum height of operable parts (including coin slot) above the floor for a standing person shall be	1370	1200	1220										800 - 1200		900 - 1200	1370	1370
12	The maximum height of operable parts (including coin slot) above the floor if telephone is designed for seated persons	1200	1200	1220	1200	1400	1000 - 1100							800 - 1200	1100		1200	1000 - 1100
13	For requirements for floor space, see section in ANTHROPOMETRICS	yes		yes	yes				yes			yes		yes	yes	yes	yes	yes
Kneespace																		
14	Minimum width of clear kneespace under a telephone for a seated person	750		760	680		800							900	800		760	800
15	Telephones for seated persons shall have a knee clearance height of at least	680		685	680		700							800	640 - 650		720	700
Shelf																		
16	A shelf for a TTY (teletypewriter) shall be required		yes	yes													yes	yes
17	Maximum shelf height above the floor	680 - 730	865											700 - 800				700 - 800
18	The knee clearance height under telephone shelf shall be	680 - 730		685										680 min.	640 - 650			700
19	A level public telephone shelf shall have a minimum depth of	300	350	large enough for a TTY										480			350	350
20	A level public telephone shelf shall have a minimum width of	450	250	large enough for a TTY													250	450
21	At a public telephone where no teletypewriter (TTY) or text telephone (TT) is provided, a level shelf shall be provided with a minimum clear width of	225	250	large enough for a TTY													250	250
22	There shall be a clear space above the level shelf of at least	250	250	150													250	250

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TELEPHONES (from page 163)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Signage/Symbols																		
23	Where directional signage to telephones are provided they shall include appropriate symbols of accessibility	yes	yes	yes										yes		yes	yes	yes
24	Telephones with a volume control shall be identified by the symbol of accessibility for persons who are hard of hearing or Deaf	yes														yes	yes	yes
25	Where a teletypewriter (TTY) or text telephone (TT) is provided at a public telephone, it shall be identified by the symbol for a TTY	yes		yes												yes	yes	yes

TELEPHONES COMMENTS

No.	Document	Comments
1	CSA, ADAAG	Telephones with volume control are useful for everyone in locations with high noise levels. Volume controls should be installed at any public telephone.
2	CSA	If only one telephone is provided, it should allow for operation by a seated person and by a person who is hard of hearing or Deaf.
3	CSA	If more than one telephone is provided, at least one should be for operation by a seated person, and at least one by a person who is hard of hearing, deafened, or Deaf. If more than one type of telephone is provided (e.g. card, coin, internal, taxi) at least one of each type should be provided for use by both a seated person and a hard of hearing or Deaf person.
4	CSA	At least one public telephone equipped with a TTY (teletypewriter) or TT (text telephone) should be provided in public areas.
5	CSA	If only one TTY or TT is provided it should be located at the telephone for a standing position.
6	CSA, Singapore, ICTA	If a seat is provided, the seat should be moveable so that a person using a wheelchair can approach and use the telephone.
7	ADAAG	A telephone with a TTY installed underneath cannot also be a wheelchair accessible telephone because the required 865 mm minimum keypad height can cause the highest operable part of the telephone (usually the coin slot) to exceed the maximum permitted reach range.
8	ADAAG	While seats are not required at TTY's, reading and typing at a TTY is more suited to sitting than standing.
9	ADAAG	Pay telephones designated to accommodate a portable text telephone (TT) or teletypewriter (TTY) shall be equipped with a shelf and an electrical outlet within or adjacent to the telephone enclosure.
10	Uruguay	In a group of public telephones, at least one should have the operable controls at a maximum height of 1400 mm with visual, tactile and sound signalling. In case of a telephone inside a phone booth, the minimum booth area should be 800 x 1200 mm, with a forward approach space of 800 x 2050 mm.
11	Singapore	Telephone books if provided shall be located within reach of a wheelchair user.
12	Singapore	Where payphones are provided at least one payphone shall be made accessible.
13	South Africa	Where induction loops or other electronic aids are installed, the international loop system (Deaf) sign shall be displayed.
14	ICTA	Telephone headsets should be available for those who need them while talking on a telephone at workstations.
15	ICTA	Phone booths should be recessed out of the pedestrian route.

WASHROOMS

Accessible signage on washroom doors is particularly important so that people with visual impairments and others can identify the appropriate washroom.

All codes and standards require adequate manoeuvring space at washroom doors with an internal clear area at the door (7), generally 1500 x 1500 mm. **Two doors in a series is a common design practice that should be avoided at washroom doors.** The Philippines, Singapore, South Africa and Canada specifically mention that if the washroom is not accessible, signage (3) shall indicate the location of the nearest accessible washroom, with South Africa specifying that it not be more than 200 m away.

The **minimal size of the toilet stall** (8) varies from 1500 x 1500 mm in Bangladesh and the National Building Code of Canada to 2200 x 2200 mm in Sweden, and 1600 x 2000 mm in Australia. The best practice is considered by the Expert Panel to be 1700 x 1800 mm. An important requirement in the U.S., Canada and Lebanon standards is the requirement that the **toilet stall door align** (10) **with the transfer space** adjacent to the toilet. **The minimal stall door opening** varies (13) from 750 mm in Lebanon to 900 mm, specified by Mexico, Singapore with the Canadian AFG at 950 mm. Many, but not all countries specify that the door open outward (15) and that there be a door pull (16).

The height of the toilet (23) varies considerably from country to country with the lowest range in Canada at 400 - 460 mm and the highest range in Australia from 460 - 480 mm. Generally, people who use wheelchairs prefer to transfer at the same height as the seat of their wheelchair whereas older people prefer a higher toilet seat height. **It is important to locate the toilet at a distance that will facilitate use of the grab bars** (27). The best practice suggests that the center line of the toilet should be between 460 - 480 mm from the side wall. **Clear space on the transfer side of the toilet** (28) varies from 1200 x 800 mm in Uruguay to 750 x 800 mm in Spain whereas Sweden requires 900 mm on both sides.

Grab bars size is fairly uniform, mounted at a height (39) of 700 mm in Ireland and Bangladesh and as high as 915 mm in the U.S. and 950 mm in Lebanon. The length of the grab bar behind the toilet (49) ranges in length from 300 mm in Australia to 915 mm in the U.S., with the longer length preferred by the Expert Panel.

The height of the urinal (50) is specified by the U.S., Canada, Spain, the Philippines, Malaysia, Singapore and Australia, ranging from 430 - 510 mm. Most also require clear floor space (51) in front of the urinal, and Canada, Mexico, Spain, Singapore and Australia also specifying **grab bars (57) mounted vertically beside the urinal, a recent addition to accessibility guidelines.**

The **height of the lavatory** (68) varies from a low of 760 mm in Mexico to a high of 865 mm in the U.S. with the best practice at 800 - 840 mm in Singapore, with a minimum kneespace under the lavatory (74) ranging from 640 mm in Australia to 700 mm in Spain. Offset pipes under the lavatory (77) and lever handles (80) are recommended. The **location of the toilet paper dispenser** (96) ranges from a height of 355 mm in the U.S. to a high of 1200 mm in Lebanon with the Expert Panel recommending a height of 600 - 700 mm and **below the grab bar, so that it does not interfere with the use of the grab bar.**

A minimal level of illumination (98) was specified at 200 lux by Australia, South Africa, Canada and Sweden says the washroom should be well lighted.

Some valuable comments from Australia draw attention to the fact that people with disabilities making transfers onto toilets place greater than average shear force on seats and fittings and Singapore recommends that light switch coats hooks and similar items contrast in colour with their backgrounds.

ICTA pointed out that the **water temperature should be maintained above 50˚C to prevent bacterial growth.** In addition, they recommend that a visual alarm be located in washrooms to alert people who are Deaf or hard of hearing in the event of an emergency. Important to note is **that partition walls do not provide adequate support for grab bars.**

Deodorizers that emit perfume should be avoided as they can cause reactions in people with environmental sensitivities.

WASHROOMS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Main Entrance Door																		
1	For main entrance door requirements, see section on DOORS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Signage																		
2	If there is no door at a washroom entrance, the signage shall be mounted on the outside walls on both sides of the entrance opening	yes										easily found						yes
3	If the washroom is not accessible, the signage shall indicate the location of the nearest accessible washroom	yes								yes, which should not be more than 200 m away		yes		yes				yes
4	For further signage requirements at washroom entrances, or in washrooms, see SIGNAGE section	yes	yes	yes		yes	yes		yes	yes	yes	yes		yes	yes	yes	yes	yes
Floor Area																		
5	A clear floor area shall be provided at the entrance door	yes		yes			yes					yes		yes				yes
6	For manoeuvring space requirements at doors, see DOOR section	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes
7	Minimum internal clear area at the washroom entrance door	1500 x 1200				diameter of 1200						1500 x 1500		1500 x 1500		1500 x 1500	1525 x 1600	1500 x 1500
8	Minimum internal stall length x width	1500 x 1600	1500 x 1500	1420 x 1525 (wall mounted toilet) 1525 x 1500 (floor mount)	1700 x 1700		2200 x 2200			1600 x 1600	1500 x 1500	1700 x 1800	enough space to turn and use the facilities	1500 x 1750	1600 x 2000	1500 x 1500	1800 x 1830	1700 x 1800
Toilet Stall Door																		
9	Is the stall door lock capable of being latched on the inside by devices operable with one hand and without tight grasping, pinching, or twisting of the wrist	yes		yes			yes					yes		yes	preferred		yes	yes

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WASHROOMS (from page 167)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
10	The toilet stall door shall be aligned with the transfer space adjacent to the toilet	yes		yes												yes	yes	yes
11	The toilet stall door shall be self-closing so that when at rest, the door will be ajar to an extent beyond the jamb by not more than	50		yes													yes	yes
12	The stall door lock (sliding bolt or lever) requires a force to open of no more than	22 N	22 N	22.2 N										22 N	19.5 N		22 N	19.5 N
13	Minimum stall door clear opening	810	800	815	900		800				800	800		900	800	750	950	900
14	Minimum clear space in front of the toilet stall door (see DOOR section for more information on entrance and manoeuvring space requirements)	1500 x 1500	1400 x 1700	1525 x 1065					1500 x 1500			1500 x 1500	yes	1200 x 1200	1510 x 1750		1600 x 1370	1500 x 1500
15	Does the door swing outward unless additional space is provided within the room for the door to swing	yes	yes	yes	swing outward									swing outward	yes	yes	yes	yes
16	Does the inside toilet door have a horizontal D-type door pull	yes	yes	yes										yes	yes	yes		yes
17	The inside toilet door D-type door pull length is at least	140	140											600				140
18	The centreline of the D-type door pull on the inside of the stall door is located from the hinge	200 - 300	200 - 300	near the latch										130	50 min. from latch side opening		200 - 300 from hinge	50 min. from latch side opening
19	Does the outside of the toilet door have a horizontal D-type door pull	yes	yes	yes										yes		yes	yes	yes
20	On the outside of the stall door near the latch side, there is a D-type door pull with a minimum length of	140	140											140			140	140
21	The centreline of the D-type door pull on the outside of the stall door is located a distance from the hinge of	120 - 220		near the latch										near the latch side of the door			near the latch side of the door	near the latch side of the door

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
22	Have D-type pull handles located above the floor at a height of	800 - 1000		865 - 1220										900 - 1100	900 - 1000			800 - 1000
Toilet Seat and Flush Controls																		
23	Top of toilet seat located above the floor at a height of	400 - 460	400 - 460	430 - 485	450 - 500		480	450 - 460	450 - 500	460 - 480	450	450		450 - 480	460 - 480	450 - 500	400 - 460	460 - 480
24	The toilet seat shall not be spring activated	yes	yes	yes						yes				yes			yes	yes
25	If no seat lid or tank the toilet shall have a back support	yes	yes	yes					yes	yes				yes			yes	yes
26	The toilet tank top shall be securely attached	yes												wall mounted toilet is preferred			yes	yes
27	Toilet located from centreline to adjacent wall a distance of	460 - 480	285 - 305	405 - 455					950 - 1050	450 - 500	300 - toilet seat outside edge			460 - 480	450 - 460	450 - 500	460 - 480	460 - 480
28	There shall be a clear transfer space along the clear side of the toilet measured from the back wall and the edge of the toilet seat of at least (depth x width)	1500 x 900	1500			1200 x 800	900 wide on both sides, for transfer from either side		750 x 800		1500 x 650		yes	1200 x 900	800 (± 10) deep	900 x 1500	950 x 1830	900 x 1500
29	The flush controls shall be mounted on the transfer side of the toilet	yes	yes	yes						easily accessible to a wheelchair user				yes	yes	yes	yes	yes
30	The flush controls shall be hand operated or electronically controlled	yes	yes	yes	by hand				yes	by hand				yes	yes	by hand	yes	yes
31	The flush controls if hand operated shall be of a lever-type	yes	yes		yes				or by large button	flush control button to be extended				not require tight grasping, pinching, or twisting of the wrist			yes	yes
32	The flush controls to be mounted above the floor at a height of	400 - 1200		380 - 1220		400-1400				600		1200 max.		600 - 1200	600 - 1100	500 - 1200	400 - 1200	600 - 1100
Grab Bars General																		
33	Grab bars shall be slip-resistant	yes	yes										grab bars are required	yes		yes	yes	yes

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WASHROOMS (from page 169)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
34	Grab bar diameter to be	30 - 40	30 - 40	32 - 51	38				30 - 40	32	32			35 - 45	30 - 40	30 - 40	30 - 40	30 - 40
35	Space between a wall mounted grab bar and the wall to be	35 - 45	35 - 45	38					45 - 55	48	32			40 - 50	50 - 60	35 - 45	30 - 40	35 - 45
36	The grab bars shall be installed to resist a force from any direction of at least	1.3 kN	1.3 kN	1.112 kN										1.3 kN	1.1 kN	firmly fixed	1.3 kN	1.3 kN
37	Grab bars and the adjacent surfaces shall be free of any sharp or abrasive elements	yes	yes	yes										yes	yes		yes	yes
38	Grab bars shall not rotate within their fittings	yes		yes											yes			yes
39	Horizontal grab bar to be mounted above the floor at a height of	750 - 850	840 - 920	840 - 915	800			700	700 - 750	800	700			740 - 780	800 - 810	850 - 950	840 - 920 (230 above toilet seat)	750 - 850
40	Minimum number of horizontal grab bars to serve a toilet	2	1	2		1	2, a fold down on each side of toilet	2	2		2	3		3 (4 in individual washroom)	2 (3 in individual washroom)	1	2 (one is "L" shaped)	2 (one on side and one behind)
41	The grab bar on the side wall is located a maximum distance from the rear wall of	300		305				350		380	400			extending at least 450 in front of the toilet seat	50 - 60		extend 150 in front of toilet seat	350
42	The grab bar shall be located on the side wall closest to the toilet	yes	yes	yes	yes	yes				yes	yes	yes	yes	yes	yes	yes	yes	yes
43	The grab bar on the side wall extends in front of toilet at least	450	450	extends from the rear wall at least 1370				200	300	200 (if "L" shaped, 300 long 45° bend to vertical and 300 long)	300			450	100 - 150		150	450
44	An additional vertical grab bar shall be located on the side wall	yes - optional						yes						yes	yes		required	yes
45	An additional vertical grab bar located on the side wall shall have a minimum length of	600						600							400 - 500		700	600

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
46	A vertical grab bar located on the side wall is optional and should be located a maximum distance in front of the toilet of	250						200						450 (vertical bar required)	200 - 250		150 (vertical bar required)	250
47	Vertical grab bar located on the side wall should be located at a height above the floor of	900 - 1500						bottom at 800						850 - 1300	900 - 1000		bottom 230 above toilet seat	bottom at 800
48	A grab bar shall be located on the wall behind the toilet	yes	yes	yes	yes				yes	yes		yes		yes	next to toilet, transfer side	yes	yes	yes
49	The length of the grab bar located on the wall behind and centred on the toilet is at least	600	450	915				600		750				750	300		600	915
Urinal and Flush Controls																		
50	The wall hung urinal lower rim height above the floor is not more than	430	488 - 512	430					300 - 400			480	400	400		450	488 - 510	400
51	Minimum clear floor space in front of and centred on the urinal is	750 x 1200		760 x 1220					750 x 1200			750 x 1300		750 x 1200	800 x 1300		760 x 1370	800 x 1300
52	The approach to the urinal is unobstructed by changes in floor level or by privacy screens	yes											yes	no changes in floor level		yes	yes	yes
53	The urinal shall be adjacent to an accessible route	yes										yes				yes	yes	yes
54	The urinal flush controls shall be operated by one hand without tight grasping, pinching, or twisting of the wrist or be automatic	yes		yes		yes			yes					yes			yes	yes
55	The urinal flush controls shall be located above the floor no more than	1200		1220		1400						1200		1200			1120	1120
56	The urinal flush controls shall be operated by a force less than	22 N		22.2 N										22 N			22 N	22 N
Urinal Grab Bars																		
57	There are grab bars mounted vertically on the back wall on either side of the urinal	yes			yes				yes					yes	yes		yes	yes

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WASHROOMS (from page 171)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
58	Each grab bar mounted vertically on the back wall on either side of the urinal has a length of least	600							yes					500			300	600
59	Each grab bar mounted vertically on the back wall on either side of the urinal is from the centreline of the urinal no more than	380							350								380	380
60	The lower end of the vertical grab bars on either side of the urinal are mounted at a height above the floor of	600 - 650							750				1200	1000			1000 to centreline of grab bar	600 - 650
Urinal Vertical Markers																		
61	Urinals shall have vertical markers centred on and above the urinal	yes																no
62	Urinal vertical markers shall be no wider than	50																n/a
63	Urinal vertical markers shall be raised above the surrounding wall surface at least	3																n/a
64	Urinal vertical markers shall be colour contrasted from the surrounding wall surface by no less than	70%																n/a
65	Urinal vertical markers shall extend above the top of the urinal not less than	150																n/a
66	Urinal vertical markers where applicable shall extend above the top of the urinal to a point above the finished floor of at least	1300																n/a
Lavatory																		
67	Minimum distance between the centreline of the lavatory and the side wall is	460	460	460										460 - 480		450	460	460
68	The lavatory top shall be located at a height above the floor of	810 - 860	865	865	760 - 800	900	suitably located	800	800 - 850	830 max.		800		800 - 840	770 - 800	800 - 850	820 - 840	800 - 850

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
69	Minimum clear space in front of a lavatory is (of which a maximum of 480 mm in depth may be under the lavatory)	750 x 1200		760 x 1220	1350 x 1350				800 x 1200			750 x 1300		750 x 1200	800 x 1000	750 x 1200	760 x 1370	760 x 1370
70	Minimum front apron of lavatory vanity clearance width	750	760	760		800			800					750	600	700	760	760
71	Minimum front apron of lavatory vanity has a knee clearance height of	720	735	735					700	680				720		650 - 700	685	700
72	Minimum width of kneespace	750	760	760					800					750	600	700	760	800
73	Minimum depth of kneespace	200	205	205					250			500		200	300		205	250
74	Minimum kneespace height under lavatory shall be	680	685	685					700	650		700		680	640 - 650	650	685	685
75	Minimum additional lavatory toe space with knee height at 680 mm under lavatory with depth of	230	150	150										230	190 - 200		225	230
76	Minimum additional lavatory toe space height	230	230	230										230	290		230	290
77	The lavatory has the hot water and drain pipes offset to the rear	yes	yes	or set up to protect against contact										yes	yes	yes		yes
78	If hot water and drain pipes about the clearances under a lavatory they shall be insulated	yes	yes	yes					yes					yes	yes	yes	yes	yes
79	The water temperature of the water supplied to the lavatory shall be thermostatically controlled	yes													yes			yes
80	Lavatory faucets and other controls shall be lever-type, operable with a closed fist or are they electronically controlled	yes	yes	yes	yes	yes	yes		yes	yes				yes	yes	yes	yes	yes
81	Lavatory faucets shall be lever type with a minimum distance between the centre of rotation to the handle tip of at least	75								150								75

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WASHROOMS (from page 173)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
82	Lavatory faucets shall not be spring loaded	yes		if spring loaded remain open 10 s min.					yes					yes			yes	yes
83	Hand operated metering faucets shall remain open for a minimum time of			10 s														10 s
Water Temperature																		
84	The water temperature supplied shall not exceed	55˚C		49˚C			40˚C										43˚C	55˚C
85	The water temperature supplied shall be thermostatically controlled or controlled by a pressure equalizing valve	yes	yes											yes	yes		yes	yes
Accessories																		
86	At least one of each type of washroom accessory shall be provided with its operable parts and controls located above the floor a maximum height of	1200	1200		1200		1000			1200		easy to reach		1200	900 - 1100	1200	900 - 1200	1200
Coat Hook																		
87	Maximum coat hook height above the floor	1200	1200	1220			suitably located					easy to reach		1300	1200 - 1350		1200	1200
88	Maximum coat hook projection from wall	40	50											40			50	40
89	Coat hook to be mounted on a side wall of the toilet stall	yes	yes											yes			yes	yes
Mirror																		
90	At least one mirror is mounted with its bottom edge above the floor no more than	1000	1000	1015		900	suitably located			820 (at top of sink)		easy to reach		1000	900	1000	1000	900
Soap Dispenser																		
91	Where a soap dispenser is provided at an accessible lavatory it shall be located no higher off the floor than	1100	1200	1220 (no counter) 1120 (over counter)	1200		suitably located					easy to reach		1000 - 1200	900 - 1100	1200	900 - 1200	900 - 1100

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
92	Where a soap dispenser is provided at an accessible lavatory it shall be operable with one hand to dispense soap on the palm of that hand	yes					suitable design											yes
93	Where a soap dispenser is provided at an accessible lavatory it shall be located within the maximum reach of a person seated at a lavatory (from the front of the lavatory) of	500					yes					easy to reach		placed in close proximity to the basin			accessible to wheelchair user	placed in close proximity to the basin
Shelf																		
94	Minimum shelf or counter length and width	200 x 400												200 x 400		not allowed		200 x 400
95	A shelf shall be located above the floor no higher than	1200		1015 - 1220						820, and fitted to the basin				900 - 1100	900 - 1100			900 - 1100
Toilet Paper Dispenser																		
96	The toilet paper dispenser shall be located so that the dispensing of the paper is at a height above the floor of	600 - 700		355 - 485			suitably located			easy access		easy to reach	within reach	50 - 250 above the top of toilet seat	700 top of toilet seat	with height 50 - 1200 from floor		600 - 700 and below grab bar
97	The toilet paper dispenser shall be located so that the dispensing of the paper is in line with the front of the toilet seat	yes		180 - 230 in front of toilet										300 max. from the front toilet edge and below grab bar	yes			180 - 230 in front of toilet and below grab bar
Illumination																		
98	The minimum illumination level in washrooms at operating controls where reading is necessary	200 lx					well lighted		100 lx	200 lx					200 lx		100 lx	200 lx
99	The minimum illumination level in washrooms at operating controls	100 lx							200 lx	200 lx				100 lx	200 lx		200 lx	200 lx

Continued on next page

WASHROOMS (from page 175)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Signage/Visual Displays																		
100	Information on visual displays shall be located on a glare-free surface	yes												be clearly visible				yes
101	Information on visual displays shall be supplemented by tactile and/or auditory information	yes												have tactile finishes and the International Symbol of Access				yes
102	Information on visual displays shall be colour contrasted	yes												yes				yes

WASHROOMS COMMENTS

No.	Document	Comments
1	CSA	A full length mirror should not be installed where it would reflect into the path of travel. The use of tilted mirrors should also be avoided.
2	CSA	Entrances without doors are easier for everyone to use. If a washroom has doors, a single door is preferable to two doors in series.
3	CSA	Accessories such as towel dispensers and waste receptacles should be placed close to the lavatory and not protrude into the path of travel.
4	ADAAG	Convenience fixtures such as baby changing tables must be accessible to people with disabilities as well as to other users. However, the manoeuvring space at the toilet cannot be obstructed by the baby changing tables or other fixtures or conveniences.
5	Australia	People with disabilities making transfers from wheelchairs to toilet seats will place greater than average shear forces on seats and fittings.
6	Australia	A unisex washroom is recommended in areas used by the general public, e.g. shopping centres, hotels and the like where a person with a disability may be accompanied by a member of the opposite sex. Access to the facility should not necessitate traversing an area reserved for one sex only. (See section on INDIVIDUAL WASHROOMS for more information on unisex washrooms.)
7	Singapore	Grab bars should contrast with the colour of the background to aid visibility.
8	Singapore	Privacy shields extending beyond the front edge of the urinal rim require a minimum clear width of 750 mm.
9	Singapore	A child protection seat should be provided in one of the water closet compartments in both male and female washrooms to allow parents to seat their baby safely in the restroom with them.
10	Singapore	Where a Family Room is not provided, a diaper changing station should be provided in both the male and female washrooms or in individual washrooms for persons with disabilities, so that both fathers and mothers can use the facility.
11	Singapore	If the diaper changing stations are to be located in stalls, a fold down type station is recommended to save space and to avoid causing an obstruction to wheelchair users.
12	Singapore	Light switches, coat hooks and similar items should contrast strongly with their backgrounds.
13	Singapore, CSA	Stalls should be equipped with a waterproof emergency call button or pull cord for activating the bell. It should be conveniently accessible (near the toilet and the sink), located 400 - 600 mm above the floor, and have a colour that is contrasting with the background. There should be a notice stating “Emergency Call”, prominently affixed next to the push button or pull cord. Someone should be available at all times to respond to the emergency call.
14	South Africa	It is desirable to have lavatories set in a counter, lavatories on pedestals are not recommended.
15	Sweden	The ability for people with hearing impairments to be made aware of emergency alarms should be considered.
16	ICTA	Toilets with automatic flushers should provide sufficient time and flexibility of movement, to prevent premature activation while the toilet is still in use.
17	ICTA	The water temperature should be maintained above 50˚C to prevent bacterial growth in the water system.
18	ICTA	An additional coat hook can be installed at 1400 mm above the floor.
19	ICTA	Visual alarms should be provided in the washroom to alert Deaf and hard of hearing people, in the event of an emergency.
20	ICTA	Grab bars should not be installed on partition walls, as they do not provide adequate load bearing support.
21	Lebanon UN	The space between the two taps/faucets should not be less than 200 mm.
22	Lebanon UN, South Africa	The left tap/faucet should be connected to the hot water supply.

INDIVIDUAL WASHROOMS

Individual accessible washrooms can be used by both men, women and children and provide adequate room for an attendant or family members.

An individual washroom is recommended in areas of a facility where a person with a disability may be accompanied by a member of the opposite sex. Responding to the need for more universally designed facilities, **individual accessible washrooms are increasingly being incorporated into public buildings.**

The clear opening of the washroom door (4) varies from 750 mm in South Africa to 950 mm in the London AFG Guidelines. As the individual washroom is designed to accommodate someone who may be accompanied by a caregiver, the Expert Panel recommends a best practice of 900 mm for the clear width of the door.

The size of the room (9) varies from country to country, with 1500 x 2000 mm in Ireland, 1600 x 2000 mm in Australia and 2280 x 2290 mm in AFG Guidelines. The AFG Guideline has been prepared to accommodate people who use large power wheelchairs and scooters. **The selected best practice is 1800 x 1700 mm,** as specified by South Africa. Many individual washrooms incorporate two or more fixtures to make it easier for everyone to use them.

Technical specifications for the sink, toilet, lavatory and accessories are outlined in the Washroom section.

Singapore specifies that there be at least one individual washroom at every level of a building where toilets are required. The Canadian Standard recommends that, where several individual washroom are provided in different locations, the toilet should be located with the **transfer space on alternate sides** to accommodate the greatest number of people.

INDIVIDUAL WASHROOMS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
General																		
1	The washroom shall provide one toilet and one lavatory	yes	yes	lavatory and either 2 toilets or 1 toilet + 1 urinal				yes		a water closet pan or bath or shower				yes		yes	yes	yes
Main Door Hardware																		
2	The washroom door lock shall be operable with one hand, without tight grasping, pinching, or twisting of the wrist	yes		yes										yes	preferred		yes	yes
3	The washroom door lock requires an opening force of no more than	22 N		22.2 N										22 N	19.5 N		22 N	19.5 N
4	The minimum clear opening for main washroom door shall be	810	800	815						750		800		900	800	750	950	900
5	The door shall be equipped with a lever-type knob	yes	yes							yes, 150 mm long				yes	preferred		yes	yes
6	The washroom door shall be operable from the outside under emergency conditions	yes								yes				yes	yes	yes	yes	yes
7	For entrance door requirements for the individual washroom, see section on WASHROOMS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Floor Area																		
8	The minimum floor area shall not be less than	3.5 m^2									3 m^2	2.25 m^2						3 m^2
9	Minimum length x depth of washroom between walls shall be	1700 x 1700	1700 x 1700					1500 x 2000		1800 x 1700	1500 x 1500	1700 x 1700		1750 x 1750	1600 x 2000	1500 x 1500	2280 x 2290	1800 x 1700
Grab Bars																		
10	For requirements for grab bars, see WASHROOM section	yes	yes	yes	yes			yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Lavatory																		
11	For lavatory requirements, see WASHROOM section	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes		yes	yes	yes	yes	yes

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INDIVIDUAL WASHROOMS (from page 179)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Toilets and Flush Controls																		
12	For requirements for toilet seat and flush controls, see WASHROOM section	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes
Accessories																		
13	For requirements for accessories (soap dispenser, coat hook, mirror, shelf, toilet paper dispenser), see those areas in the WASHROOM section	yes	yes	yes	yes	yes	yes			yes		yes		yes	yes	yes	yes	yes
Signage/Visual Displays																		
14	For information on visual displays/signage, see WASHROOM section	yes		yes										yes	yes		yes	yes
Illumination																		
15	For information on washroom illumination, see WASHROOM section	yes								yes				yes			yes	yes

INDIVIDUAL WASHROOMS COMMENTS

No.	Document	Comments
1	CSA, Singapore	Wall-hung toilets are preferred because they provide additional space at toe level.
2	CSA	Recessed toilet paper dispensers are preferred when using bulk dispensers, since dispensers that interfere with the effective use of the grab bars are not recommended.
3	CSA, South Africa	It is desirable to have lavatories set in a counter; lavatories on pedestals are not recommended.
4	CSA	Lavatories that are shallow, with a goose-neck faucet are not recommended.
5	CSA	The faucet lever in the off position should be angled to the front.
6	CSA	A full-length mirror should not be installed where it would reflect into the path of travel. The use of tilted mirrors should also be avoided.
7	CSA	Individual washrooms should be identified by a sign denoting a man, a woman, and the International Symbol of Accessibility.
8	CSA	In individual washrooms, ensure that there is a clear area around the toilet, adequate for the transferring needs of a person and their personal care assistant.
9	CSA	Where several individual washrooms are provided in different locations, it is desirable to locate the toilet with the transfer space on alternate sides in order to accommodate the preferred transfer side.
10	Ireland	If there are only 2 unisex water closets, ensure at least one is accessible.
11	Sweden	The ability for people with hearing impairments to be made aware of emergency alarms should be considered.
12	South Africa	The exterior door shall be fitted with a suitable means of indicating whether the compartment is occupied.
13	Singapore	The towel and soap dispensers, hand dryer, waste bin, sanitary bin, light switches, coat hooks and other accessories shall contrast in colour and tone with their background.
14	Singapore	Accessories should be placed in close proximity to the accessible basin.
15	Singapore	The lighting should be fixed in such a position that it does not shine directly onto the mirror.
16	Singapore, CSA	Individual washrooms should be equipped with a waterproof emergency call button or pull cord for activating the bell. It should be conveniently accessible (near the toilet and the sink), located 400 - 600 mm above the floor, and have a colour that is contrasting with the background. There should be a notice stating “Emergency Call”, prominently affixed next to the push button or pull cord. Someone should be available at all times to respond to the emergency call.
17	Singapore	Tactile signs incorporating pictograms shall indicate whether the toilet is for male or female.
18	Singapore	At every level of a building where toilets are required, there shall be provided at least one individual washroom for wheelchair users and it shall be provided for both male and female users, or there should be one stall compartment for wheelchair users in both the male and female washrooms.
19	Singapore	A child protection seat should be provided in individual washrooms for persons with disabilities, and installed in a manner to avoid causing an obstruction to wheelchair users.
20	Singapore	Where a family room is not provided, a fold-down diaper changing station should be provided in both the male and female washrooms or in the individual washrooms for persons with disabilities, so that both fathers and mothers can use the facility.
21	Australia	People with disabilities making transfers from wheelchairs to toilet seats will place greater than average shear forces on seats and fittings.
22	Australia	A unisex washroom is recommended in areas used by the general public, (ie: shopping centres, sports centres and hotels), where a person with a disability may be accompanied by a member of the opposite sex. Access to the facility should not necessitate traversing an area reserved for one sex only.

WORKSTATIONS (INCLUDING COMPUTER ROOMS)

Manoeuvring through computer rooms and workstations requires adequate space. The clear width requirement throughout workstations and computer rooms (1) varies from 900 mm (Singapore) to 1060 mm (Lebanon), with the best practice being 920 mm.

Singapore, the U.S. and Canada all require that workstations **have appropriate approach (2), manoeuvring space (3), and have an accessible counter space** (4) to accommodate someone who uses a wheelchair. Lighting levels are addressed by Canada, the U.S., South Africa, Singapore and Australia (6) with the best practice being **200 lux,** an important consideration for everyone.

Information on visual displays should be accessible to all people including those with low vision. The U.S., Canada, Spain and Singapore also require that tactile and auditory information (8) be provided, that signage be colour contrasted and be on a glare-free surface. These are excellent recommendations that increase legibility are also outlined in the Signage section.

Some excellent comments on workstations from Sweden include that the **table or workstation be adjustable,** that electronic and magnetic fields from illumination installations be limited as they may interfere with hearing aids and finally that **additional illumination be self-controlled to regulate the light distribution and illumination level to meet individual needs.**

ICTA comments that **lateral access to the filing cabinets** should be provided and that tables should not have cross rail construction underneath or other obstacles that would limit someone using a wheelchair. They further suggest **rotating storage units, window shades and louvers which provide individual customization.** Chairs with casters that are lockable are recommended to allow a person to transfer safely from a wheelchair. They also suggest some interesting accommodations for persons with disabilities such as office equipment equipped with **wireless remote control** or with front touch controls.

WORKSTATIONS

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Aisle																		
1	The access aisle widths are a minimum of	920		915										900		1060		920
Counter/Table/Workstation																		
2	There shall be adequate manoeuvring space for persons in wheelchairs to approach the seating area	yes		yes										yes		yes		yes
3	At seating spaces for persons in wheelchairs, there shall be adequate manoeuvring space to approach the table, workspace, or counter	yes	yes	yes										yes		yes		yes
4	There shall be a low barrier-free section of the workspace counter	yes	yes	yes										yes		yes		yes
5	For requirements for workstation/ table heights and kneespace, see section in ANTHROPOMETRICS	yes	yes	yes	yes	yes			yes					yes	yes	yes		yes
6	Lighting level at work surfaces shall be at least	200 lx							100 lx	200 lx				100 lx	250 lx			200 lx
Controls																		
7	For requirements for operable controls, see section in ANTHROPOMETRICS	yes	yes	yes	yes	yes	yes		yes	yes				yes	yes	yes		yes
Visual Displays																		
8	Information on visual displays shall be supplemented by tactile and/or auditory information, colour contrasted, and located on a glare-free surface	yes				colour contrast and glare-free			yes					yes				yes
9	For any signage requirements, see section on SIGNAGE	yes	yes	yes	yes	yes	yes		yes	yes		yes		yes	yes	yes		yes

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WORKSTATIONS (from page 183)

No.	Question	Canada CSA	Canada NBC	U.S. ADAAG	Mexico	Uruguay	Sweden	Ireland	Spain	South Africa	Bangladesh	Philippines	Malaysia	Singapore	Australia	Lebanon UN	Canada AFG	Best Practice
Other																		
10	For requirements at doors, see section on DOORS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes		yes
11	For circulation, line-up areas, and access route requirements, see section on ACCESS ROUTES	yes	yes	yes	yes	yes			yes	yes		yes	yes	yes	yes	yes		yes

WORKSTATIONS (INCLUDING COMPUTER ROOMS) COMMENTS

No.	Document	Comments
1	Australia	Where a sound amplification system is provided, a listening system to aid hearing-impaired people shall be installed or made available.
2	Australia	A sign indicating that an assistive hearing device is installed or is available shall be provided at the main door or doors to the enclosed space. Where the listening system does not cover the total area of the enclosed space, the boundaries of the area served shall be designated by such signs.
3	Sweden	Tables/workstations should be adjustable if possible to suit individual needs.
4	Sweden	It is important to be able to see well at workstations and places where work is done. Have targeted, additional illumination, with the ability to regulate the light distribution, illumination level and luminance distribution, taking into consideration the need for visual effort and activity.
5	Sweden	The illumination installations and fittings should have good colour reproduction and not emit disturbing heat waves, visible or invisible flickering, sound or UV radiation.
6	Sweden	The electric and magnetic fields from the illumination installation should be limited.
7	ICTA	Lateral access file drawers should be provided for better access.
8	ICTA	Excessive cross rail construction, sharp corners, and knob type poles should be avoided.
9	ICTA	Fully adjustable workstations should be provided, including desk surfaces, chairs, foot rests, and work surfaces.
10	ICTA	Wall drapery should be considered to absorb sound.
11	ICTA	A round or oval top on a pedestal allows an approach from all directions.
12	ICTA	Individual office workstations should be designed in a circular fashion.
13	ICTA	Adjustable lighting should be available and a range from 100 to 400 lux.
14	ICTA	Consider using rotating storage units at workstations and in storage areas that could be on casters.
15	ICTA	Install silencers on forced air heating systems to reduce noise levels at workstations.
16	ICTA	Provide window shades/louvers to reduce direct sunlight and glare.
17	ICTA	Chair casters should be lockable to allow a person to transfer from a wheelchair.
18	ICTA	Office equipment should have wireless remote control and/or front touch controls.

Note: The comments in this section also apply to the sections on Libraries and Computer Rooms.

3] BEST PRACTICES: EXAMPLES AND APPLICATIONS

Access Routes – Clear Width

The pedestrian route is clear and wide, and outlined by pavers that are contrasting in colour and texture from the pavers used for the main route. There is a wide clear route between the street elements and the stores, and the trees are aligned with the street furniture. In addition, there are no grates or surface hazards within the pedestrian route.

This photo of a streetscape demonstrates a best practice design. It illustrates the sidewalk with benches, light posts, garbage cans, trees and store fronts.

All of the storefronts are aligned on the right, and all of the signage is overhead. There are no obstacles or merchandise in front of the stores in the pedestrian route.

Photo submitted by Eduardo Álvarez

The street furniture including the benches, light posts, garbage cans are aligned on the left of the sidewalk. This design eliminates hazards or protrusion hazards that might not be detected by someone who is blind. This design also provides good wayfinding cues.

Accessible Ticketing Machine

This accessible ticketing and fare dispensing machine is a good example of a best practice as it is usable by everyone.

Photo submitted by Betty Dion

The buttons and instructions are colour contrasted with the background, and the text and font characters are large and easy to read for everyone. The buttons are also large and easy to press.

The operable controls are at an appropriate height above the floor allowing them to be reached by people who are sitting or standing. The machine is located along the pedestrian route with adequate manoeuvring space in front.

The location of the audio output is clearly marked tactically and with Braille allows the dispensing machine to be used by people who are blind or visually impaired, or by those who prefer an audio format.

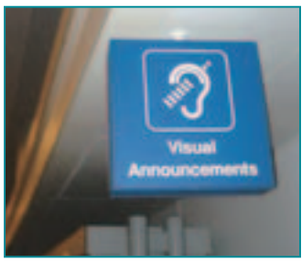

Photo submitted by Betty Dion

Communication – Visual Announcements

Displaying text announcements in a transportation terminal ensures that everyone receives important information.

This well contrasted signage with the appropriate symbol of access for people with hearing impairments alerts everyone to the location of the visual announcements.

Text announcements are provided in conjunction with all audio announcements, indicating flight delays, cancellations and emergency messages. This provides a good example of a communication best practice.

Communication – Video and Electronic Signage

This example of a best practice illustrates a video display using a variety of different media.

The video and electronic signage display is located in a transportation terminal. It combines audio and text information as well as a pictorial explanation providing details of security information and procedures for passenger screening.

The text at the bottom of the screen is well contrasted, and the audio output is automatically adjusted to the surrounding ambient noise level to ensure maximum audibility.

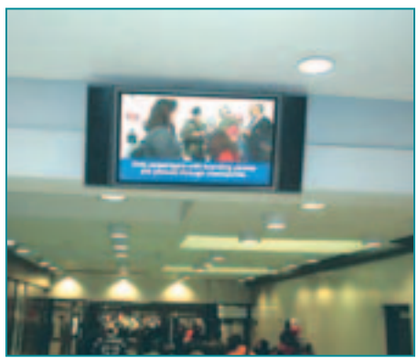

Photo submitted by Betty Dion

Photo submitted by Andrés Balcázar de la Cruz

Directional Indicators and Detectable Warnings

This photo illustrates a crosswalk with detectable directional indicators leading to the curb edge which has a detectable warning surface along the edge where the curb meets the street.

The detectable warning indicators are truncated domes, and run parallel to the roadway, immediately adjacent to the roadway to indicate both visually and tactically that you are approaching the street.

Detectable directional indicators with raised lines indicate the direction of travel. The directional indicators run perpendicular to the roadway, and act as a guide to direct people to the crosswalk.

The pedestrian sidewalk and curb are nearly level, reducing the trip hazard for pedestrians. The crosswalk is also clearly marked with painted strips which have contrasting colour and luminance with the roadway.

Elevators

Photo submitted by Betty Dion

This photo illustrates two very large elevators. The automatic elevator doors are centered on the elevator cab and open nearly the full width of the elevators, a best practice which enables everyone, including people who use scooters and wheelchairs, to easily enter and exit the elevator.

Directly in front of the doors to the elevators are two large colour contrasted and tactile dots. The dots are consistently used throughout this facility to indicate the presence of the elevators, a best practice feature appreciated by sighted people, as well as people with visual impairments.

The hall call button is located between the two elevators and there is a large clear area enabling all users to easily approach and access the button. The large button is colour contrasted with the background wall and is equipped with a visual feature which illuminates the surrounding area of the button. In addition to the visual feature, there is an audible feature which sounds a tone when the button is pressed.

Photo submitted by Andrés Balcázar de la Cruz

Elevator – Hall Call Buttons

This photo of elevator call buttons located in the hall adjacent to the elevator opening illustrates a best practice which accommodates all users, regardless of ability.

The vertical panel containing the call buttons is stainless steel, and is set in a panel of stone which itself has a colour and texture contrast with the surrounding wall.

There are two sets of call buttons, a higher set for people who are standing, and a lower set for people who are seated or of short stature. There are Up/Down arrows located on the buttons, which are in a contrasting colour and are tactile. A large illuminated floor indicator is located on a pad above the hall call buttons, which indicates the location of the elevator.

Photo submitted by Andrés Balcázar de la Cruz

Entrance – Tactile Wayfinding System

This example of a best practice illustrates a wayfinding system that will assist people in locating information about the facility and also lead them to the main entrance doors.

Detectable directional indicators which contrast with the floor surface lead from the sidewalk to a building directory, and then to the entrance with the automatic doors. The location and pattern of the directional indicators are uniformly applied to provide orientation information.

The doors are of a colour which contrasts with their surroundings, and the glass doors have colour contrasting surrounding edges. To prevent people, particularly people with visual impairments, from walking into the glass panels, the glass doors and side panels have etched stickers/markers at eye level to provide a reference point indicating the presence of a glass panel.

Photo submitted by Eduardo Álvarez

Fire Safety – Area of Refuge/Area of Rescue Assistance

This photo shows an area of rescue assistance in a stairwell where people unable to evacuate in an emergency are able to wait safely until help arrives.

There is a level landing large enough to accommodate a person who uses a wheelchair which is also out of the path of travel of people using the stairs. The location of the area of rescue assistance is clearly marked and visible to everyone and its location is illustrated on the fire safety plan.

This area of rescue assistance is located off a stairwell in an area that is equipped with doors that are fire rated for greater protection.

Fire Safety and Evacuation Planning

A best practice in ensuring the safety of all visitors to a building requires that evacuation and emergency plans include strategies that meet the needs of persons with disabilities.

In the facility in this photograph, measures were taken to ensure one elevator would remain in service for at least 30 minutes after a fire alarm. This includes a system to create positive pressure in the elevator shaft to ensure the shaft, elevator cab and the waiting space/air lock outside the elevator on each floor, remain smoke-free. In addition, the elevator doors and walls have been fire rated to halt the progress of a fire for up to 30 minutes.

Photo submitted by Elisabet Svensson

Within the building, each floor has been divided in two major fire compartments. In the compartment where the lift cannot be used during a fire, there is a safe area of refuge/rescue assistance provided with an emergency button connected to a constantly monitored response centre. Each fire compartment is also equipped with an evacuation chair in order to assist with the evacuation of people with mobility impairments. The inner doors on evacuation routes have been fitted with automatic opening devices and panic release evacuation handles.

The building is equipped with integrated low frequency alarms and audio loudspeakers for communicating instructions to everyone in the building. All evacuation plans are positioned for reading from both sitting and standing positions and have pictographs and instructions for the safe evacuation of persons with disabilities.

Photos submitted by Elisabet Svensson

Heritage Buildings: Improving Accessibility and Safe Evacuation

The Wrangel Palace was built around 1660 and has been the home of the Svea Court of Appeal since 1750.

An improvement project undertaken to increase the accessibility and evacuation arrangements for persons with disabilities illustrates how the principles of universal design can be used to improve access and result in best practices for saving cultural heritage buildings.

The historic building already had an accessible side entrance, however, it was considered equally as important to make the main entrance accessible. Originally there was a step at the main entrance, which was eliminated by raising the level of the ground. Creating a level main entrance rather than building a ramp in addition to the stairs illustrates an example of inclusive and universal design, a best practice which makes the facility more accessible to everyone.

A stair lift was installed to enable people with disabilities to access the foreyard area immediately in front of the building at the main entrance, creating an inclusive environment. The heavy entrance door was provided with automatic door opener permitting easier access for everyone.

Kitchen – Front Mounted Stove Controls

This photo illustrates the control panel of a stove and oven which is easy to use for everyone.

The stove and oven controls are located at the front, which make them easy and safe to use for everyone, including people who use a wheelchair or persons of short stature. This best practice in product design eliminates the need for users to reach over hot elements to reach the controls.

Photo submitted by Betty Dion

The controls are well contrasted which makes them easy to see, including for people with visual impairments. The knobs are easy to grasp, and provide audible, visual and tactile feedback that the knob has been turned. The raised button area also provide audible and tactile feedback during activation.

In addition, the stove top surface provides visual feedback that the element has been turned on to prevent people from touching an area that may be hot.

Lockers and Storage

The photo illustrates a group of lockers which are available at various heights, a best practice which makes them accessible to the greatest number of users.

The locker doors are colour contrasted with both the surrounding walls, and the locker dividers. Each locker is numbered and identified with a label. The label, as well as the numbers on the label, contrast with their background and the numbers are tactile. This best practice allows everyone to easily identify their locker, including people with visual impairments.

There is a bench near the lockers which can accommodate people who wish to sit down while accessing the locker, or to provide a place to sit while changing. This best practice feature is appreciated by everyone, especially people with mobility and agility impairments.

Photo submitted by Betty Dion

Photo submitted by Betty Dion

Parking – Pedestrian Warning Signal

The audible and visual signal alerts pedestrians when a car is exiting from the parking garage. Care is still needed by both pedestrian and drivers but this example of a best practice demonstrates a multi-format warning system that is inclusive of both sighted and non-sighted persons.

Ramps

This photo illustrates a ramp constructed of a non-slip material leading to a building entrance.

The ramp has a slope which is 1:15, a best practice which enables the greatest range of people to use the ramp safely and independently.

There is a dual height handrail provided on both sides of the ramp, a best practice which enables users to chose the handrail most appropriate for them. The handrail extends beyond the top and bottom of the ramp ensuring people are able to steady themselves before ascending or descending the ramp.

Photo submitted by Betty Dion

The ramp is framed with contrasting pavers and has been formed in a colour which contrasts with the surrounding courtyard area, a best practice which provides a visual cue to the presence of the ramp.

Shower Stall

This photo illustrates a fully accessible shower for both ambulatory persons and people who use a wheelchair, a best practice for all public facilities.

There is no curb at the shower entrance, only a slightly raised ridge in the floor, a best practice for everyone as it eliminates the trip hazard created by curbs. The slight slope of the ridge also ensures there is positive drainage in the shower stall.

There is sufficient manoeuvring space in the shower to permit easy transfer from a wheelchair to the fold-up, self-draining shower bench. There is a non-slip grab bar positioned adjacent to the shower bench to assist with the transfer. When the bench is folded up, there is sufficient manoeuvring space created to permit the use of a roll-in shower chair if required.

The shower head has a long hose for hand-held use, or it can be placed in a sliding vertical bar and fixed at the desired height for hands-free use, a convenience for all users. The sliding bar is positioned so that it does not interfere with use of the grab bar. The faucet has a lever handle and provides for temperature control to prevent scalding, a good safety feature for everyone.

Photo submitted by Betty Dion

Photo submitted by Betty Dion

Stairs and Handrails

This photo illustrates a staircase at a transportation facility which is a good example of a best practice.

The stairs have a tactile and colour contrasted detectable warning at the bottom of the stairs, one tread width back from the bottom stair. There is a colour contrasting and textured strip at the edge of every step. The riser is closed and colour contrasted to the tread. There is a level landing half way up the staircase to enable users to rest if necessary.

There are handrails on both sides of the stairs which are round and easy to grip. The handrails are continuous for the entire flight of stairs and extend a full stair width beyond the bottom of the last step. The handrail extension enables users to maintain their grip until they are safely on the ground level if descending, or to steady themselves prior to ascending.

Swimming Pools

This swimming pool equipped with built-in stairs rather than a ladder illustrates the universal design principle of ease of use.

Each step descending into the pool has a contrasting colour strip at the edge which assists in clearly defining each step.

The handrail is positioned to enable users to step onto a ledge in the pool in order to grasp the handrail before proceeding down the steps into the water. The handrail has 2 heights, a best practice which enables people to grasp the handrails in the most comfortable position for the entire length of the stairs.

Photo submitted by Betty Dion

There is a wide colour contrasting band of tile near the edge of the pool, which slightly slopes upwards to indicate to people they are nearing the edge of the pool, a great safety feature for everyone, but especially for people with visual impairments.

Tactile Display

This photo illustrates a tactile display of an historic building located within a park. The interpretive model is provided to afford people who are blind the opportunity to obtain similar information available to sighted people. The building is a scale model bronze display enabling people who are blind or visually impaired to obtain a tactile impression of the building layout. The tactile model is on a table-like platform with knee clearance space which would enable people who use wheelchairs to also approach the tactile model.

Photo submitted by Enrique Rovira Beleta Cuyas

Adjacent to the tactile model, are three Braille panels describing the historical significance of the building. The Braille panels are angled for ease of reading by people who are both seated and standing.

This is an excellent example of a best practice for providing people who are blind with the opportunity to experience the layout and significance of an historic building.

Individual Washroom

This photo illustrates an individual unisex accessible washroom. The washroom is independent of either the men's or women's washroom, a best practice feature that enables people with disabilities who require assistance within the washroom to be accompanied by a member of either sex.

There is a large clear area on the transfer side of the toilet and there are non-slip grab bars located behind and beside the toilet. The toilet paper dispenser has been installed in line with the front of the toilet in a position which is easy to reach from a seated position. In addition, the dispenser has been installed so it will not obstruct use of the grab bars, a best practice appreciated by people who rely on the grab bars for assistance. The toilet flusher is controlled by a hands-free infrared sensor ensuring ease of use for everyone.

Photo submitted by Betty Dion

There is sufficient kneespace at the lavatory, and the pipes have been recessed and offset to the rear to prevent scalding, a best practice for safety and convenience. The mirror is located at a height which is usable by people who are ambulatory or wheelchair users. In addition, the accessories such as the soap dispenser, paper towel dispenser and garbage receptacle are easy to reach from the lavatory, a best practice feature appreciated by both seated and standing persons.

Washrooms – Toilets and Grab Bars

This photo illustrates an accessible toilet appropriately located next to load-bearing walls. There is sufficient clear width on the transfer side and in front of the toilet to allow a person to position their wheelchair to facilitate a transfer. The flush mechanism is controlled by an infrared automatic sensor.

There are horizontal, slip-resistant grab bars mounted beside and behind the toilet on the load-bearing walls. There is no seat back for the toilet, but there is a backrest to support people while seated. The toilet paper dispenser is located below the grab bar, within reach of a person seated on the toilet. Its location does not create an obstruction to the use of the grab bar.

Photo submitted by Andrés Balcázar de la Cruz

Photo submitted by Andrés Balcázar de la Cruz

Washrooms – Urinals

This photo illustrates an accessible urinal, which extends nearly to the floor. The urinal is equipped with non-slip grab bars on both sides, in addition to a horizontal grab bar above the urinal. The grab bars are colour contrasted from the surrounding area.

The urinal is equipped with an infrared automatic flusher. There is a counter ledge above the urinal for people to place their belongings, something that is appreciated by many people. There is also a large clear space in front of the urinal to allow for easy manoeuvring for everyone, including people who use wheelchairs.

Wayfinding – Orientation Signage

This photo illustrates a tactile floor plan used to facilitate wayfinding at a railway station by people who are blind or visually impaired.

The map is designed to be clearly visible and the symbols and text have good colour and luminance contrast with their background.

The map has tactile characters and symbols with the text in relief and Braille. There is a legend which explains the pictographs found throughout the tactile map. There is consistent use of colour to denote key design elements and entrance points.

To facilitate safety for people as they move about the railway station, areas where there are detectable indicators and detectable warnings are indicated with tactile replicas on the wayfinding map.

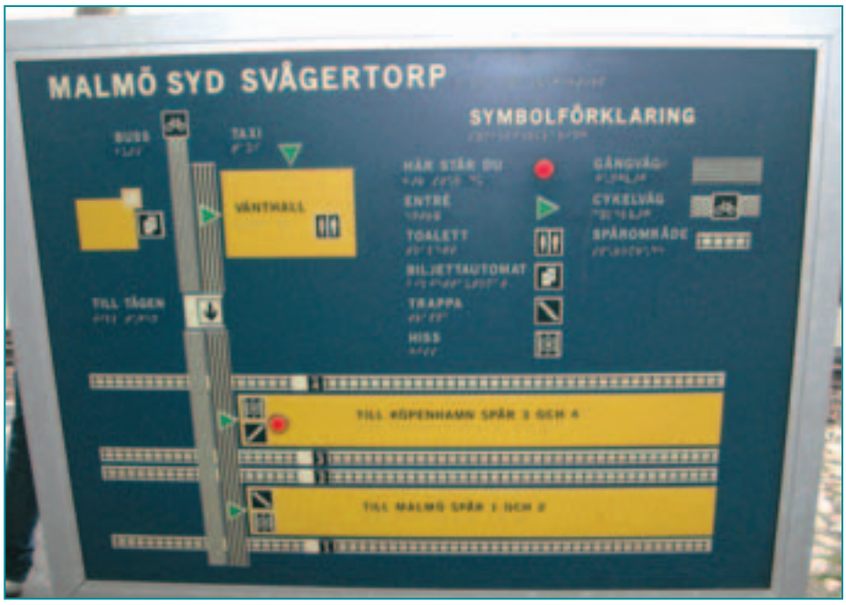

Photo submitted by Elisabet Svensson

4] APPENDIX

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