



# **Inclusive Design Guidelines**

## **New York City**

City of New York  
Mayor's Office for People with Disabilities  
100 Gold Street, 2nd Floor  
New York, New York 10038

[www.nyc.gov/mopd](http://www.nyc.gov/mopd)

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## PREFACE

The *IDG* is voluntary, prescriptive, technical guidance that helps designers produce multisensory enhanced environments accommodating a wide range of physical and mental abilities for people of all ages.

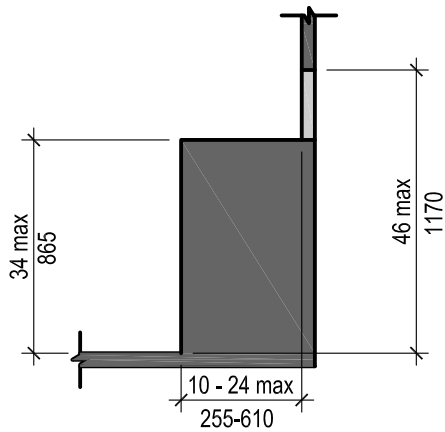
Although accessibility codes are written specifically for people with disabilities, some of the content is beneficial to society as a whole. One such code that exhibits this inclusiveness is *ICC/ANSI A117.1-2003*, the accessibility code approved by the American National Standards Institute (ANSI) and published by the International Code Council (ICC). It is for this reason, as well as its structure, numbering system, harmonization with relevant codes and the fact that it is a *2008 New York City Building Code* reference standard, we have chosen to utilize it throughout this book.

The *IDG* is a companion document to the *2008 New York City Building Code*, yet it also functions as a stand-alone publication. In harmonizing the *IDG* with both the city's building code and *ICC/ANSI A117.1-2003*, we have made it easy to find and compare corresponding legal requirements.

You will notice that chapters 3 through 10 contain an introduction and advisories. We suggest that you initially read the introductions to gain a quick overview of the book and a sense of the amount of detail that it contains. This will also help focus your searches later. Advisories supplement sections with interpretations, identify some concerns and include additional relevant information. Supplemental and alternate subsections expand the range and number of options associated with our recommendations. In total, the index comprises 1,400 listings to help navigate the book.

We understand that full application of our recommendations may not be feasible for some projects due to a number of reasons (i.e., existing conditions and budgetary constraints). However, even a partial application of the provisions set forth in the *IDG* will help to create a more usable environment.

Robert Piccolo, AIA  
Editor in Chief



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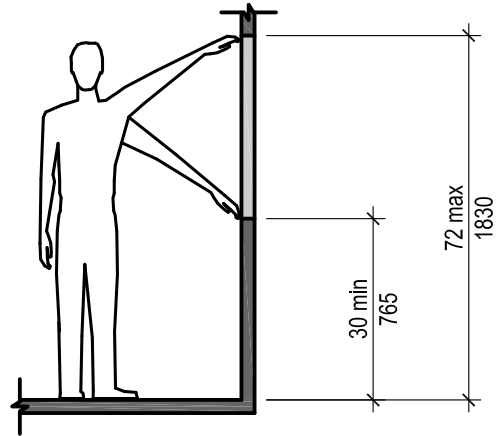
**Fig. 308.3.2**  
**Obstructed High Side Reach**

**308.4 Children’s Reach Ranges.** Projects designed for children’s use should follow the chart below, from *ADA Accessibility Guidelines for Building Elements Designed for Children’s Use* (1998). Percentage of the project dedicated to children and percentage of age group to be determined by designer.

**Table 308.4 Children’s Reach Ranges**

Forward or Side Reach	Ages 3 and 4	Ages 5 through 8	Ages 9 through 12
High (max)	36 inches (915mm)	40 inches (1015mm)	44 inches (1120mm)
Low (min)	20 inches (510mm)	18 inches (455mm)	16 inches (405mm)

**308.5 Supplemental Adult Standing Reach Range.** Supplemental adult standing reach ranges for both forward and side approach may be provided in addition to the other reach ranges in Section 308. The reach range should be 72 inches (1830 mm) maximum and the low reach range should be 30 inches (765 mm) minimum above the finished floor. Refer to Section 309.3.2 for supplemental standing reach range comfort zone for adults.



**Fig. 308.5**

**Supplemental Adult Standing Reach Range**

**308.5 Advisory.** These reach ranges were determined using anthropometric data from *Architectural Graphic Standards*. Male and female high forward reach heights at a 40 degree angle where averaged. The reach range is supplemental to provide additional preferences that exceed the code requirements. This may require dual controls or other elements since the code requirements must be maintained.

**309 Operable Parts**

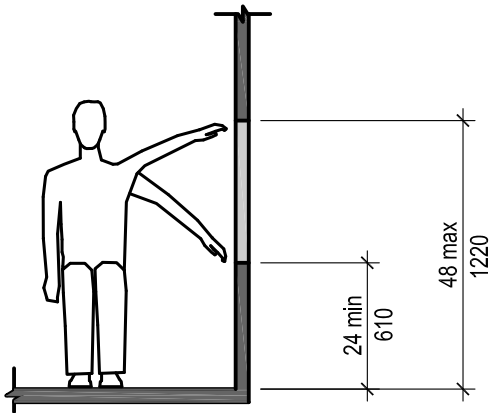
**309.1 General.** Operable parts should comply with Section 309.

**309.1 Advisory.** Operable parts is a very important section since it applies systemically to the guidelines. It affects doors, elevators, windows, drinking fountains, toilet and bathing rooms, appliances, alarms, signage, telephones, two-way communications, and many dwelling unit components including entrances, controls, kitchen cabinetry, landscape elements, communication elements, etc. Visual, tactile and audible characteristics are basic design considerations that should be well thought out. Visual characteristics include contrast, color and illumination. Tactile characteristics include, shape, surface texture and vibration. Auditory characteristics include sounds and pre-recorded messages. There are many people with reduced vision, dexterity, hearing and mental abilities that need to be considered in the design of operable parts, especially for safety reasons.

**309.2 Clear Floor Space.** A clear floor space complying with Section 305 should be provided.

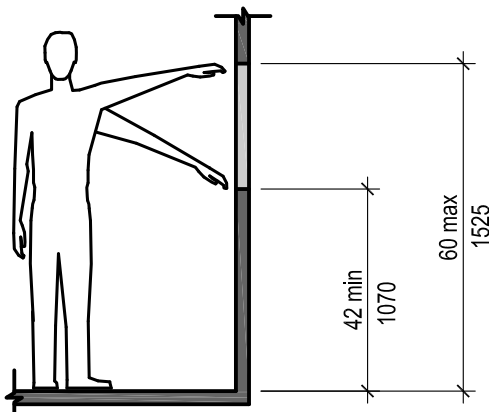
**309.3 Height.** Operable parts should be placed within one or more of the reach ranges specified in Section 308.

**309.3.1 Comfort Seated Reach Zone.** It is recommended to locate operable parts, especially controls within the most generally comfortable obstructed/unobstructed reach zone between 24 inches (610 mm) and 44-48 inches (1118-1220 mm) above the finished floor.

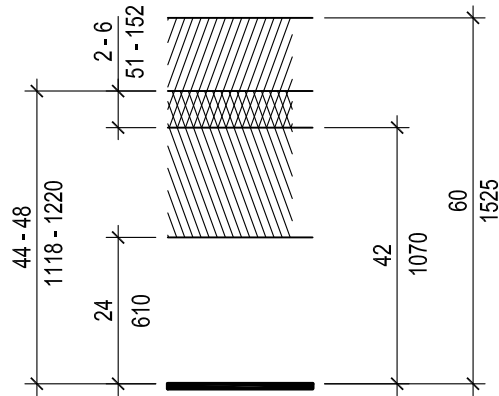


**Fig. 309.3.1**  
Comfort Seated Reach Zone

**309.3.2 Standing Comfort Reach Zone.** A standing comfort reach zone may be provided to locate operable parts, especially controls within the most generally comfortable standing reach zone between 42 inches (1070 mm) and 60 inches (1525 mm) above the finished floor.



**Fig. 309.3.2**  
Standing Comfort Reach Zone



**Fig. 309.3.3**  
Standing/Seated  
Comfort Zones Overlap.

**309.3.2 Advisory.** These reach ranges were determined using anthropometric data from *Architectural Graphic Standards*. Male and female high forward for optimal control reach heights where averaged. The reach range is supplemental to provide additional preferences that exceed the code requirements. This may require dual controls or other elements since the code requirements must be maintained.

**309.3.3 Comfort Zones Overlap.** The overlap of zones complying with Section 309.3.1 and Section 309.3.2 results in a zone that provides comfortable reach for both seated and standing positions ranging from 42 inches (1066 mm) to 44-48 inches (1118-1220 mm) aff. The overlap band is 2-6 inches (51-152 mm) wide. Eye levels complying with Section 310 should be considered for visual operation.

**309.4 Standard Operation.** Operable parts should be multisensory and as simple and intuitive as possible to use. This is not only to avoid a learning curve, but to prevent incorrect operation, unintentional actuation through lockout devices or simple multiple step actuation, where appropriate to avoid fire, electrical and other potential hazards. Both right and left hand users and a range of hand sizes should be accommodated. Children's components should be properly scaled. Controls should be ergonomically designed to increase usability, safety, comfort and usable duration while reducing fatigue. Automatic operation should be provided with manual back-up. Operable parts should be operable with one hand and should not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts should be 5.0 pounds (22.2 N) maximum.

**309.4 Advisory.** If possible, simplify an operation by breaking down the sequence into distinct non-overlapping steps to avoid concurrent multiple tasks. This requires less dexterity and avoids a learning curve which is important for many people especially the elderly and people with reduced dexterity and learning disabilities.

**309.4.1 Alternate Operation.** Actuation and operation can be accomplished for some with the use of their hands but for others this is not viable or preferred. Consider alternate means: elbow, arm, shoulder, thigh, knee, foot, voice/sound, motion, or even body temperature and weight. Actuator/controls may be a button, pad, foot pedal, designated wall or floor surface area, motion detector, weight trigger, remote control/actuator (see Section 708.7), automatic remote (continuous signal transmitter), card readers, PDA's and other means. Intuitive automatic operation resolves many operational concerns (e.g., sizing for both adult and children, sanitation and improper usage). Automatic operation should be provided with manual back-up. Standard and alternate operations should be redundant to provide a variety of options, preferences and address changing needs.

**309.4.1 Advisory.** A variety of choices should be provided for the user depending on their needs and preferences that may change, even on a day to day basis. Sanitary, safety and even security concerns may be different for each user. A person may not want to risk contaminating their hands and prefer to activate a device with their elbow or other means. Buttons should be sized accordingly for the way they are activated. (e.g., 3-inch or larger, round, square or rectangular button, for elbow or knee activation). In some instances, physical activation may be accomplished by walking on a surface, sitting on a device, closing a door, links to other controls, etc. Motion detectors are not viable for all applications and may not provide the level of control needed (e.g. faucet controls may turn water on and off but may not allow flow and temperature adjustment). In many situations computers can be used in very sophisticated ways, programmed for general usage or modified for individual use. They may be linked electronically to pre-programmed transmitters that activate personalized programming. This can be accomplished with a personalized coded tagging device. A version of this type of device is commonly available in the automotive industry for unlocking and activating preset preferences.

**309.4.2 Children's Operation.** Operation and parts intended for children should be scaled appropriately and simplified further to accommodate the age group. Reach ranges should comply with Table 308.4.

**309.5 Childproofing.** "Any safety device should be strong enough to prevent injury to young children, yet easy for adults to use," according to the U.S. Consumer Product Safety Commission. They identify twelve safety devices that can prevent injuries and save the lives of young children: safety latches and locks; safety gates; door knob covers and door locks; anti-scald devices; smoke detectors; window guards and safety netting; corner and edge bumpers; outlet covers and outlet plates; carbon monoxide (CO<sup>2</sup>) alarms; tassel on each separate window blind cord and inner cord stops on blinds (consider cordless blinds); anchors to avoid furniture and appliance tip-overs; and layers of protection for pools and spas.

**309.5 Advisory.** Refer to the U.S. Consumer Product Safety Commission's *Childproofing Your Home, 12 Safety Devices to Protect Your Children*. Additional important safety information is contained in this booklet. Other publications can be obtained from: <http://www.cpsc.gov/>

**309.6 Visual Characteristics.** Consider visual characteristics that addresses contrast, color and illumination. High visual contrast should be provided to distinguish the operable parts from the background (e.g. switches, handles, cooking controls). Eye levels are important and should comply with Section 302.10. Consider large type for both printed and digital readouts. Color should also be carefully considered to avoid confusion with the background and distinguish sub-components. Illumination includes task lighting or increased light levels at controls. Consider complying with Section 302.11. Operable parts may be internally lit or backlit (e.g. lighted control knob on an electronic device). Visual characteristics are important for people with vision and hearing disabilities to locate components and to determine actuation and operation.

**309.7 Tactile Characteristics.** Consider tactile characteristics including symmetrical/asymmetrical shapes, compressible/non-compressible material, texture and vibration. Shape enhances operation with one hand, increasing ease & comfort. Texture contrast helps distinguish components and texture enhances grasping. Vibration is extremely useful for people with visual or hearing disabilities to locate components & determine actuation and operation.

**309.8 Auditory Characteristics.** Consider operable parts with auditory characteristics that include sounds and pre-recorded messages. Sounds are important for people with visual disabilities to help locate, actuation and operate components. Pre-recorded messages can identify components and provide operational instructions for function, actuation, shut-off and warnings. Consider utilizing T-coil to receive auditory information for people who use hearing aids.

**309.9 Multisensory Alarms.** Alarms recommended throughout the book, should be visual, auditory and tactile, complying with Section 309.6, Section 309.7 and Section 309.8. Where appropriate, connect to a central system or automated system (local or web based) to notify user and relevant responder. Alarms are important, even critical, for a wide range of applications: fire, smoke, carbon monoxide, gas, power outage, appliance overheating, water leakage, water temperature, personal emergency, entrapment, motion detection, security, appliance timers, open appliance, continuous water flow, HVAC equipment failure, protrusion, obstacle, drop-off, door swing, etc. Alarms are especially important in dwelling units: kitchens (e.g. appliance malfunction, open appliance, cooking accidents, water and gas leakage); bathrooms (e.g., water leakage, high water temperature, continuous wc water flow, and accidents caused by slippage); laundry rooms and utility equipment rooms. Where safety is critical, provide stepped up alarms and automatic shutoffs.

**310 Eye Levels.** Eye levels should comply with Section 310.

**310 Advisory.** Eye levels are based on the *Architectural Graphic Standards* anthropometric data (see Section 105.3). Eye levels are critical for some applications (e.g. instructions, warning labels, emergency signage, and controls). Dimensions range from the lowest female dimension to the maximum male dimensions for standing and sitting positions. A number of factors may affect the sitting position eye levels, especially seat height, body size and posture. This is true of people who use mobility devices. Other sight factors are not addressed here such as range of viewing angles and lines of sight (see Section 802.9). Many sections in the *IDG* are effected by eye levels: 506, 703, 709, 714, 802, 902 and 905.3. Care should be taken regarding visual obstructions, viewing positions and the field of view. A sitting position is a requirement that is not limited to people with a disability, but a necessity for many with diminished mobility and stamina.

**310.1 Adult Standing.** Eye levels for an adult standing should be 56.6 inches (1440 mm) minimum and 70.3 inches (1785 mm) maximum above the finished floor.

**310.2 Adult Sitting.** Eye levels for an adult sitting should be 41.5 inches (minimum) and 52.1 maximum above the finished floor.

**310.3 Child Standing, Ages 5 to 12.** Eye levels for a child standing, ages 5 to 12 should be 35 inches (890 mm) minimum and 60 inches (1525 mm) maximum.

**310.4 Child Sitting, Ages 5 to 12.** Eye levels for a child sitting, ages 5 to 12 should be 28.4 inches (720 mm) minimum and 43.3 inches (1100 mm) maximum.

**310.5 Sitting Mobility Devices for Adults.** Eye levels for a person that uses a sitting mobility devices should be 43 inches (1090 mm) minimum and 51 inches (1295 mm) maximum above the finished floor.

**310.5.1 Horizontal Eye Position.** Eye position for a parallel approach is the centerline of the clear floor space complying with Section 305.3 or 18 inches (460 mm) from the side of the space. Eye position for a perpendicular approach is 36 inches (915 mm) from the front edge of the clear floor space complying with Section 305.3.

**311 Lighting.**

**311 Advisory.** Lighting is included in many sections of the *IDG*, but detailed lighting guidelines are beyond the technical scope of this book. It is recommended to visit the Illuminating Engineering Society of North America's website: <http://www.ies.org/> The site contains extensive material including: lighting handbooks; educational material; recommended practices and ANSI standards; lighting energy management; design guidelines; measurement testing and calculation guides; technical memoranda, lighting publication packages, other IESNA publications, *LD+A* the magazine of the Illuminating Engineering Society of North America and other lighting books. One of their strategic goals directly affects inclusive design by promoting the dynamic development of innovative lighting research and the rapid translation of discoveries to improve the lighted environment. See also Section 1027 Lighting for dwelling units.