

Visual Guide to the Accessibility Checklists

Part I: Uniform Federal Accessibility Standard (UFAS)

UFAS contains the design requirements deemed to comply with Section 504 of the Rehabilitation Act of 1973. The implementation date for the Agency was June 10, 1982. For the full text of UFAS, see:

<http://www.access-board.gov/ufas/ufas-html/ufas.htm>

This guide is not intended to address all accessibility requirements of any Federal, State or local laws or regulations, nor should this information be relied on for that purpose. To ensure full compliance, borrowers, architects, agency officials, contractors and other interested persons should refer to the Uniform Federal Accessibility Standards and all other applicable Federal, State and local standards. The Owner(s) of the property are responsible for compliance with all applicable accessibility regulations.

Site: Parking #2

4.6.3* PARKING SPACES. Parking spaces for disabled people shall be at least 96 in (2440 mm) wide and shall have an adjacent access aisle 60 in (1525 mm) wide minimum (see [Fig. 9](#)). Parking access aisles shall be part of an accessible route to the building or facility entrance and shall comply with 4.3. Two accessible parking spaces may share a common access aisle. Parked vehicle overhangs shall not reduce the clear width of an accessible circulation route. Parking spaces and access aisles shall be level with surface slopes not exceeding 1:50 in all directions.

EXCEPTION: If accessible parking spaces for vans designed for handicapped persons are provided, each should have an adjacent access aisle at least 96 in (2440 mm) wide complying with 4.5, Ground and Floor Surfaces.

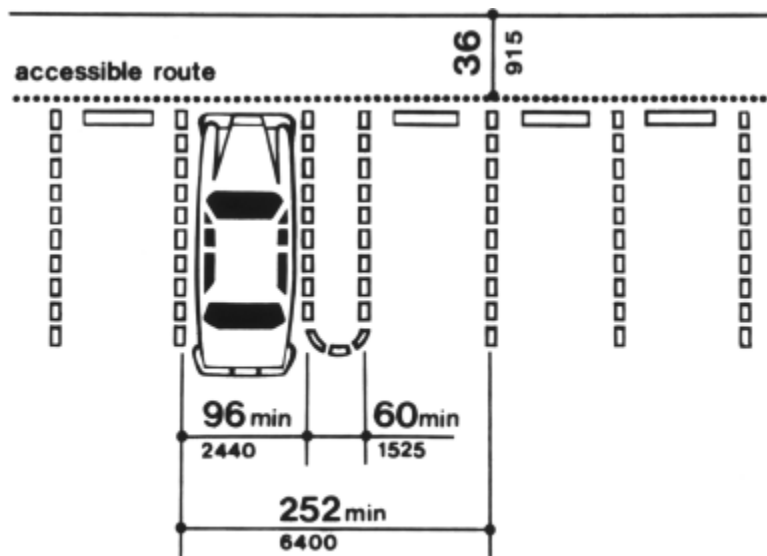


Figure 9
Dimensions of Parking Spaces

The access aisle shall be a minimum of 60 inches (1525 mm) wide. The accessible route connected to the access aisle at the front of the parking spaces shall be a minimum of 36 inches (915 mm).

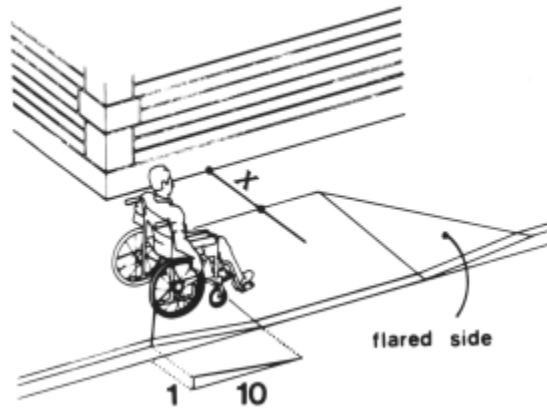
<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.6>

Site: Accessible Route #1

4.7 CURB RAMPS.

4.7.1 LOCATION. Curb ramps complying with 4.7 shall be provided wherever an accessible route crosses a curb.

4.7.5 SIDES OF CURB RAMPS. If a curb ramp is located where pedestrians must walk across the ramp, or where it is not protected by handrails or guardrails, then it shall have flared sides; the maximum slope of the flare shall be 1:10 (see [Fig. 12\(a\)](#)). Curb ramps with returned curbs may be used where pedestrians would not normally walk across the ramp (see [Fig. 12\(b\)](#)).



**Figure 12(a)
Sides of Curb Ramps
Flared Sides**

Note: If X is less than 48 inches, then the slope of the flared side shall not exceed 1:12.

If the landing depth at the top of a curb ramp is less than 48 inches, then the slope of the flared side shall not exceed 1:12.

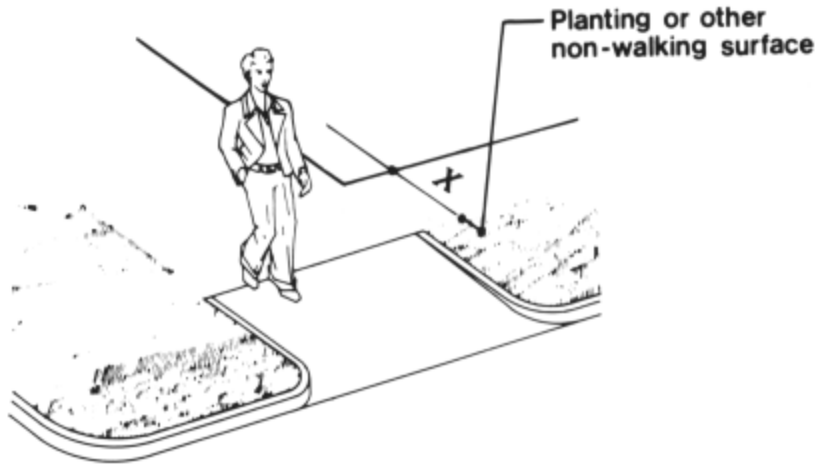


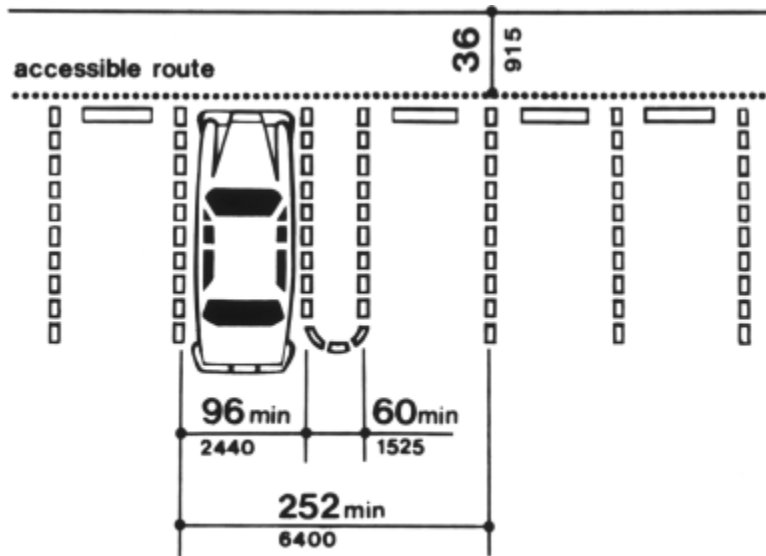
Figure 12(b)
Sides of Curb Ramps
Returned Curb

If X is less than 48 inches, then the slope of the flared side shall not exceed 1:12.

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.7>

Site: Accessible Route #2

4.3.3 WIDTH. The minimum clear width of an accessible route shall be 36 in (915 mm) except at doors (see 4.13.5).



**Figure 9
Dimensions of Parking Spaces**

The accessible route connected to the access aisle at the front of the parking spaces shall be a minimum of 36 inches (915 mm).

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.3>

Site: Accessible Route #3

4.3.2 LOCATION.

(1) At least one accessible route within the boundary of the site shall be provided from public transportation stops, accessible parking, and accessible passenger loading zones, and public streets or sidewalks to the accessible building entrance they serve.

(2) At least one accessible route shall connect accessible buildings, facilities, elements, and spaces that are on the same site.

(3) At least one accessible route shall connect accessible building or facility entrances with all accessible spaces and elements and with all accessible dwelling units within the building or facility.

(4) An accessible route shall connect at least one accessible entrance of each accessible dwelling unit with those exterior and interior spaces and facilities that serve the accessible dwelling unit.

4.3.3 WIDTH. The minimum clear width of an accessible route shall be 36 in (915 mm) except at doors (see 4.13.5). If a person in a wheelchair must make a turn around an obstruction, the minimum clear width of the accessible route shall be as shown in Fig. 7.

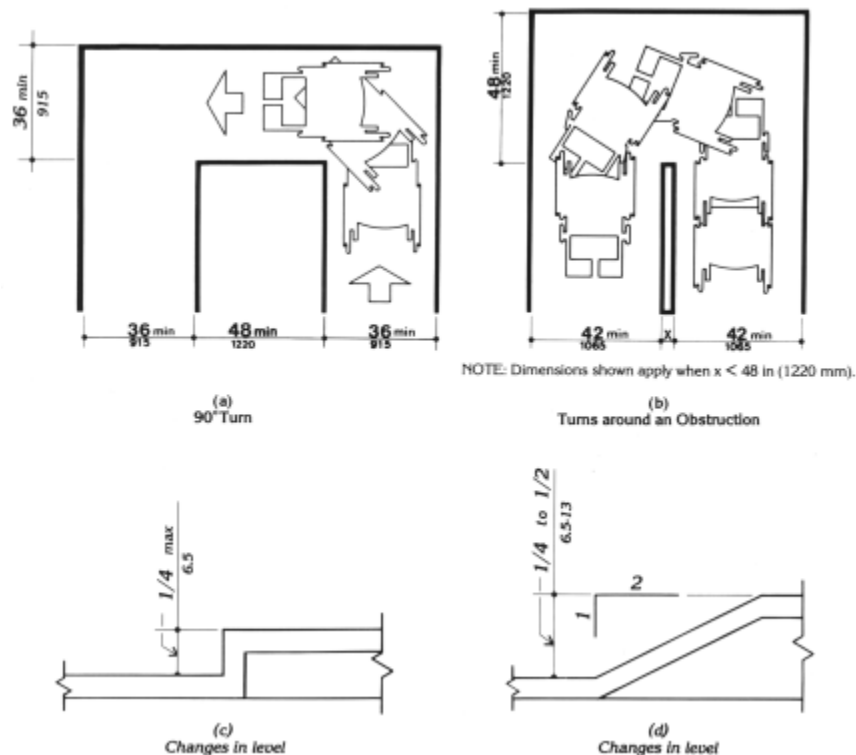


Figure 7: Width of Accessible Route

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.3>

Site: Accessible Route #5 through #9

4.8 RAMPS.

4.8.1* GENERAL. Any part of an accessible route with a slope greater than 1:20 shall be considered a ramp and shall comply with 4.8.

4.8.2* SLOPE AND RISE. The least possible slope shall be used for any ramp. The maximum slope of a ramp in new construction shall be 1:12. The maximum rise for any run shall be 30 in (760 mm) (see [Fig. 16](#)). Curb ramps and ramps to be constructed on existing sites or in existing buildings or facilities may have slopes and rises as shown in Table 2 if space limitations prohibit the use of a 1:12 slope or less (see 4.1.6).

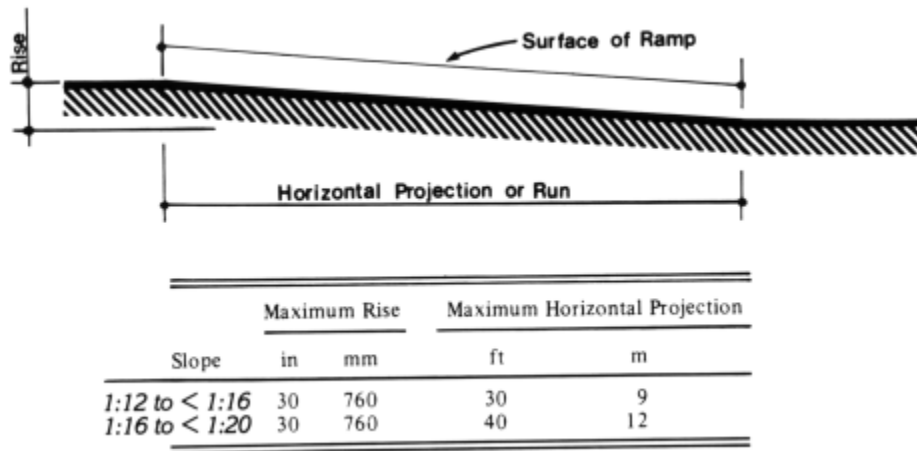


Figure 16
Components of a Single Ramp Run and Sample Ramp Dimensions

If the slope of a ramp is between 1:12 and 1:16, the maximum rise shall be 30 inches (760 mm) and the maximum horizontal run shall be 30 feet (9 m). If the slope of the ramp is between 1:16 and 1:20, the maximum rise shall be 30 inches (760 mm) and the maximum horizontal run shall be 40 feet (12 m).

4.8.3 CLEAR WIDTH. The minimum clear width of a ramp shall be 36 in (915 mm).

4.8.4 LANDINGS. Ramps shall have level landings at the bottom and top of each run. Landings shall have the following features:

- (1) The landing shall be at least as wide as the ramp run leading to it.
- (2) The landing length shall be a minimum of 60 in (1525 mm) clear.
- (3) If ramps change direction at landings, the minimum landing size shall be 60 in by 60 in (1525 mm by 1525 mm).

(4) If a doorway is located at a landing, then the area in front of the doorway shall comply with 4.13.6.

4.8.5* HANDRAILS. If a ramp run has a rise greater than 6 in (250 mm) or a horizontal projection greater than 72 in (1830 mm), then it shall have handrails on both sides. Handrails are not required on curb ramps. Handrails shall comply with 4.26 and shall have the following features:

(1) Handrails shall be provided along both sides of ramp segments. The inside handrail on switchback or dogleg ramps shall always be continuous.

(2) If handrails are not continuous, they shall extend at least 12 in (305 mm) beyond the top and bottom of the ramp segment and shall be parallel with the floor or ground surface.

(3) The clear space between the handrail and the wall shall be 1-1/2 in (38 mm).

(4) Gripping surfaces shall be continuous.

(5) Top of handrail gripping surfaces shall be mounted between 30 in and 34 in (760 mm and 865 mm) above ramp surfaces.

(6) Ends of handrails shall be either rounded or returned smoothly to floor, wall or post.

(7) Handrails shall not rotate within their fittings.

4.8.6 CROSS SLOPE AND SURFACES. The cross slope of ramp surfaces shall be no greater than 1:50. Ramp surfaces shall comply with 4.5.

4.8.7 EDGE PROTECTION. Ramps and landings with drop-offs shall have curbs, walls, railings, or projecting surfaces that prevent people from slipping off the ramp. Curbs shall be a minimum of 2 in (50 mm) high (see [Fig. 17](#)).

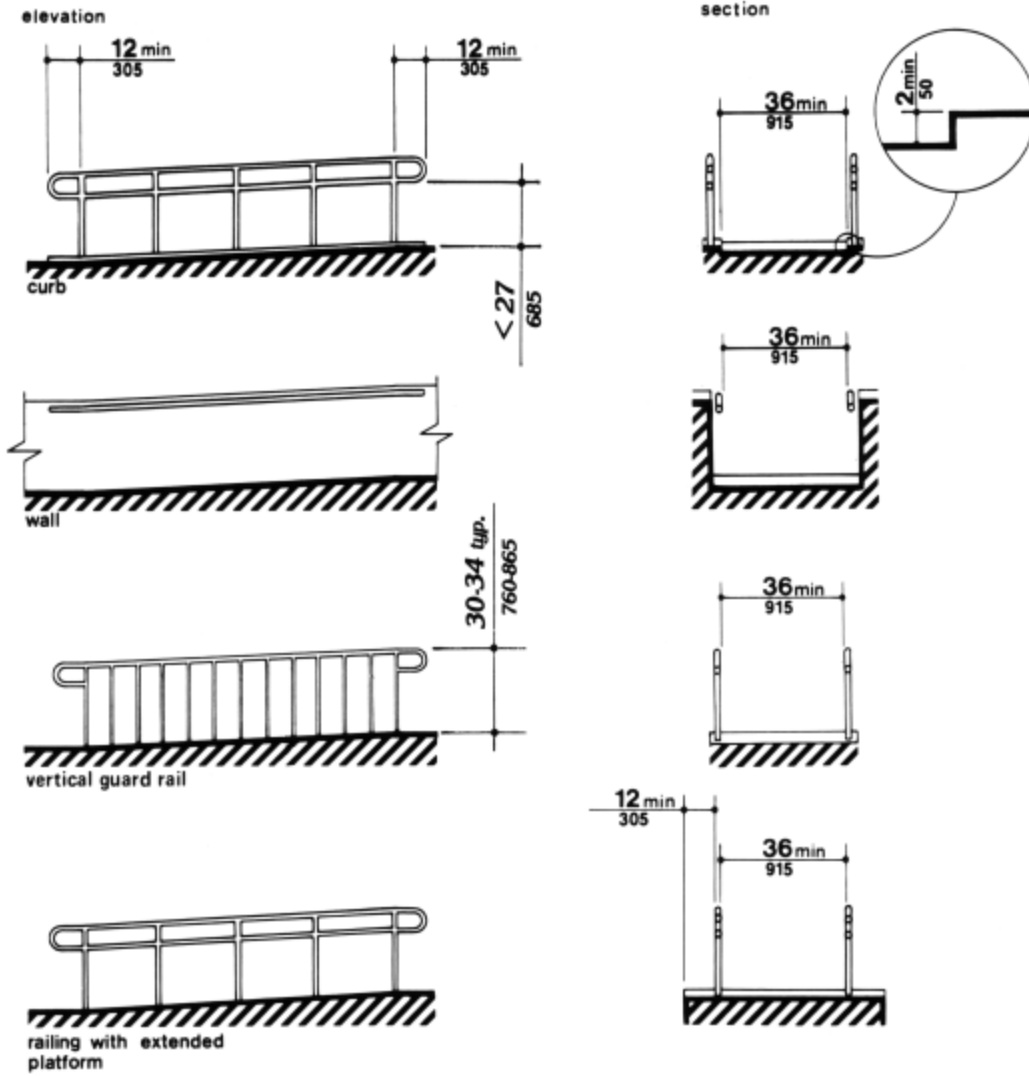
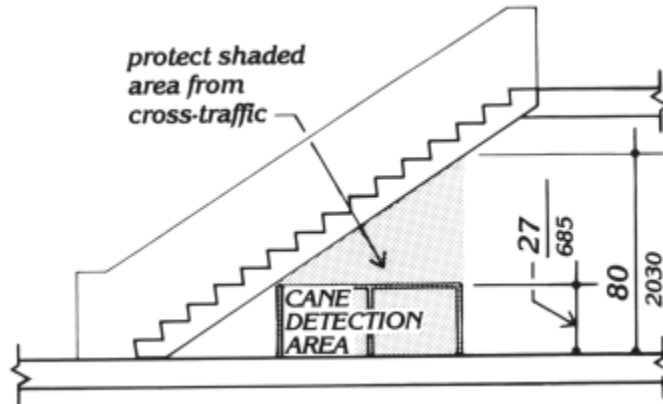


Figure 17
Examples of Edge Protection and Handrail Extensions

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.8>

Site: Accessible Route #10

4.4.2 HEAD ROOM. Walks, halls, corridors, passageways, aisles, or other circulation spaces shall have 80 in (2030 mm) minimum clear head room (see [Fig. 8\(a\)](#)). If vertical clearance of an area adjoining an accessible route is reduced to less than 80 in (nominal dimension), a barrier to warn blind or visually-impaired persons shall be provided (see [Fig. 8\(c\)](#)).



**Figure 8(c)
Protruding Objects
Overhead Hazards**

Overhead Hazards. As an example, the diagram illustrates a stair whose underside descends across a pathway. Where the headroom is less than 80 inches, protection is offered by a railing (2030 mm) which can be no higher than 27 inches (685 mm) to ensure detectability.

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.4>

Common Areas #1 through #5

4.13.5 CLEAR WIDTH. Doorways shall have a minimum clear opening of 32 in (815 mm) with the door open 90 degrees, measured between the face of the door and the stop (see [Fig. 24\(a\)](#), [\(b\)](#), [\(c\)](#), and [\(d\)](#)). Openings more than 24 in (610 mm) in depth shall comply with 4.2.1 and 4.3.3 (see [Fig. 24\(e\)](#)).

EXCEPTION: Doors not requiring full user passage, such as shallow closets, may have the clear opening reduced to 20 in (510 mm) minimum.

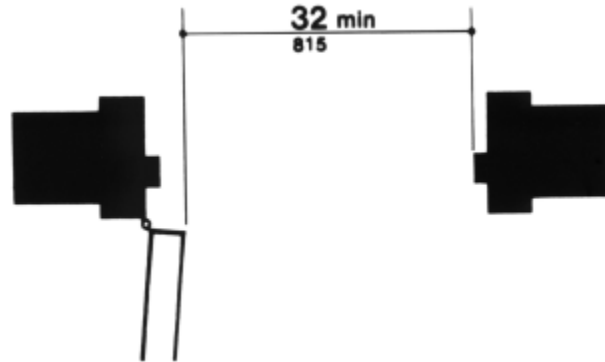


Figure 24(a)
Clear Doorway Width and Depth
Detail

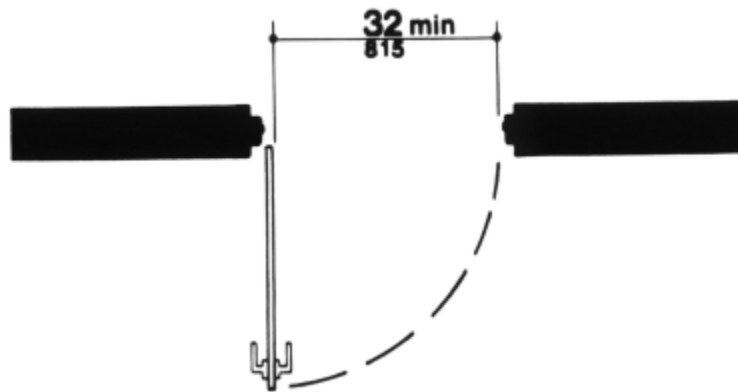


Figure 24(b)
Clear Doorway Width and Depth
Hinged Door

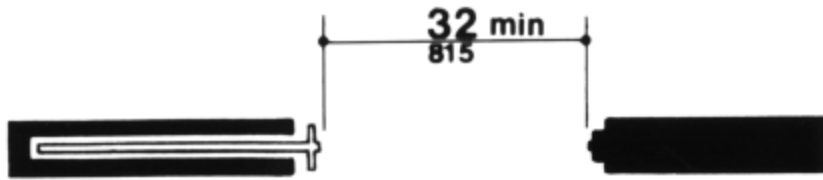


Figure 24(c)
Clear Doorway Width and Depth
Sliding Door

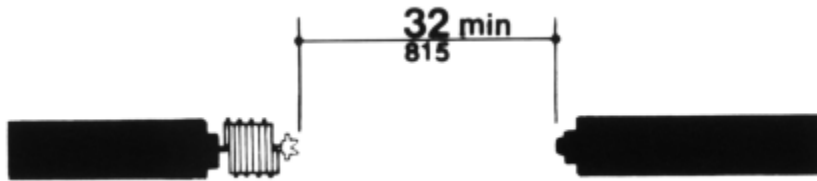


Figure 24(d)
Clear Doorway Width and Depth
Folding Door

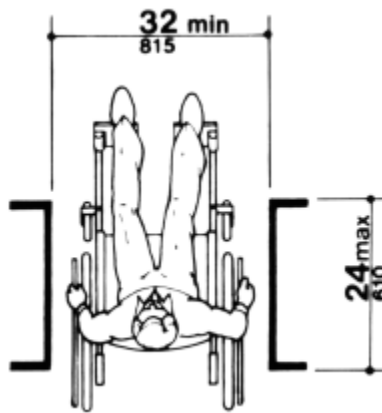
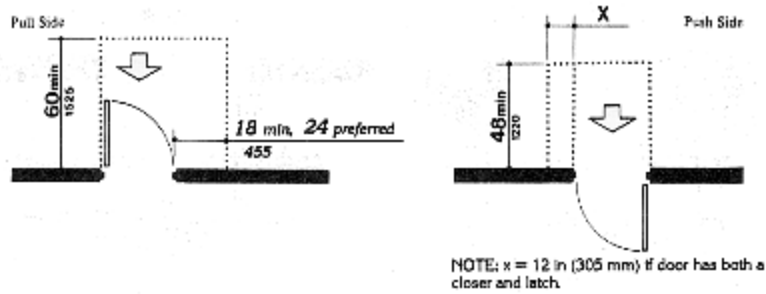
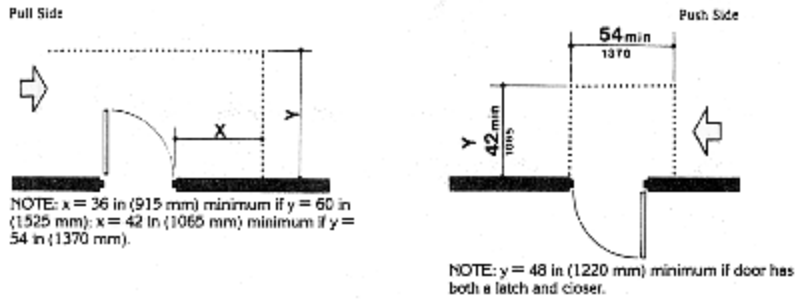


Figure 24(e)
Clear Doorway Width and Depth
Maximum Doorway Depth

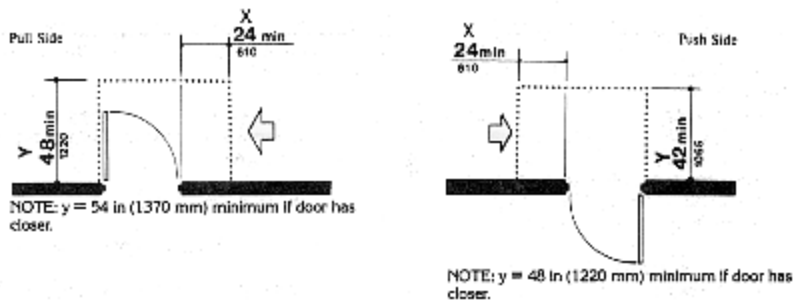
4.13.6 MANEUVERING CLEARANCES AT DOORS. Minimum maneuvering clearances at doors that are not automatic or power-assisted shall be as shown in [Fig. 25](#). The floor or ground area within the required clearances shall be level and clear. Entry doors to acute care hospital bedrooms for in-patients shall be exempted from the requirement for space at the latch side of the door (see dimension "x" in [Fig. 25](#)) if the door is at least 44 in (1120 mm) wide.



(a)
Front Approaches — Swinging Doors



(b)
Hinge Side Approaches — Swinging Doors



(c)
Latch Side Approaches — Swinging Doors

NOTE: All doors in alcoves shall comply with the clearances for front approaches.



(f)
Latch Side Approach — Sliding Doors and Folding Doors

Figure 25
Maneuvering Clearances at Doors

NOTE: All doors in alcoves shall comply with the clearances for front approaches.

Diagram (a) Front Approaches -- Swinging Doors. Front approaches to pull side of swinging doors shall have maneuvering space that extends 18 in (455 mm) minimum beyond the latch side of the door and 60 in (1525 mm) minimum perpendicular to the doorway.

Front approaches to push side of swinging doors, equipped with both closer and latch, shall have maneuvering space that extends 12 in (305 mm) minimum beyond the latch side of the door and 48 in (1220 mm) minimum perpendicular to the doorway.

Front approaches to push side of swinging doors, not equipped with latch and closer, shall have maneuvering space that is the same width as door opening and extends 48 in (1220 mm) minimum perpendicular to the doorway.

Diagram (b) Hinge Side Approaches -- Swing Doors. Hinge-side approaches to pull side of swinging doors shall have maneuvering space that extends 36 in (915 mm) minimum beyond the latch side of the door if 60 in (1525 mm) minimum is provided perpendicular to the doorway or maneuvering space that extends 42 in (1065 mm) minimum beyond the latch side of the door shall be provided if 54 in (1370 mm) minimum is provided perpendicular to the doorway.

Hinge-side approaches to push side of swinging doors, not equipped with both latch and closer, shall have a maneuvering space of 54 in (1370 mm) minimum, parallel to the doorway and 42 in (1065 mm) minimum, perpendicular to the doorway.

Hinge side approaches to push side of swinging doors, equipped with both latch and closer, shall have maneuvering space of 54 in (1370 mm) minimum, parallel to the doorway, 48 in (1220 mm) minimum perpendicular to the doorway.

Diagram (c) Latch Side Approaches -- Swinging Doors. Latch-side approaches to pull side of swinging doors, with closers, shall have maneuvering space that extends 24 in (610 mm) minimum beyond the latch side of the door and 54 in (1370 mm) minimum perpendicular to the doorway.

Latch-side approaches to pull side of swinging doors, not equipped with closers, shall have maneuvering space that extends 24 in (610 mm) minimum beyond the latch side of the door and 48 in (1220 mm) minimum perpendicular to the doorway.

Latch-side approaches to push side of swinging doors, with closers, shall have maneuvering space that extends 24 in (610 mm) minimum parallel to the doorway beyond the latch side of the door and 48 in (1220 mm) minimum perpendicular to the doorway.

Latch-side approaches to push side of swinging doors, not equipped with closers, shall have maneuvering space that extends 24 in (610 mm) minimum parallel to the doorway beyond the latch side of the door and 42 in (1065 mm) minimum perpendicular to the doorway.

Diagram (d) Front Approach -- Sliding Doors and Folding Doors. Front approaches to sliding doors and folding doors shall have maneuvering space that is the same width as the door opening and shall extend 48 in (1220 mm) minimum perpendicular to the doorway.

Diagram (e). Slide-Side Approach -- Sliding Doors and Folding Doors. Slide-side approaches to sliding doors and folding doors shall have a maneuvering space of 54 in (1370 mm) minimum, parallel to the doorway, and 42 in (1065 mm) minimum, perpendicular to the doorway.

Diagram (f) Latch Side Approach -- Sliding Doors and Folding Doors. Latch-side approaches to sliding doors and folding doors shall have a maneuvering space that extends 24 in (610 mm) minimum beyond the latch side of the door and extends 42 in (1065 mm) minimum perpendicular to the doorway.

Depending on the direction of approach, diagrams (a) through (f) illustrate minimum maneuvering space depths and latch side clearances for both push and pull sides of swinging, sliding and folding doors.

4.13.8* THRESHOLDS AT DOORWAYS. Thresholds at doorways shall not exceed 3/4 in (19 mm) in height for exterior sliding doors or 1/2 in (13 mm) for other types of doors. Raised thresholds and floor level changes at accessible doorways shall be beveled with a slope no greater than 1:2 (see 4.5.2).

4.13.9* DOOR HARDWARE. Handles, pulls, latches, locks, and other operating devices on accessible doors shall have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate. Lever-operated mechanisms, push-type mechanisms, and U-shaped handles are acceptable designs. When sliding doors are fully open, operating hardware shall be exposed and usable from both sides. In dwelling units, only doors at accessible entrances to the unit itself shall comply with the requirements of this paragraph. Doors to hazardous areas shall have hardware complying with 4.29.3. Mount no hardware required for accessible door passage higher than 48 in (1220 mm) above finished floor.

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.13>

Common Areas #6

4.5.3* CARPET. If carpet or carpet tile is used on a ground or floor surface, then it shall be securely attached; have a firm cushion, pad, or backing or no cushion or pad; and have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum pile height shall be 1/2 in (13 mm). Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim shall comply with 4.5.2. If carpet tile is used on an accessible ground or floor surface, it shall have a maximum combined thickness of pile, cushion, and backing height of 1/2 in (13 mm) (see [Fig. 8\(f\)](#)).

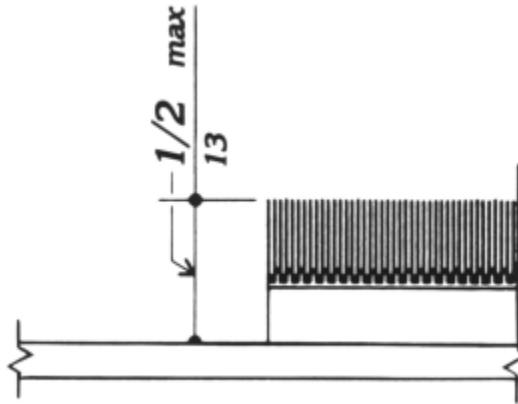


Figure 8(f)
Carpet Tile Thickness

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.5>

**Common Areas #7 AND
Accessible Dwelling Units
General: #6
Kitchen: #10**

4.27 CONTROLS AND OPERATING MECHANISMS.

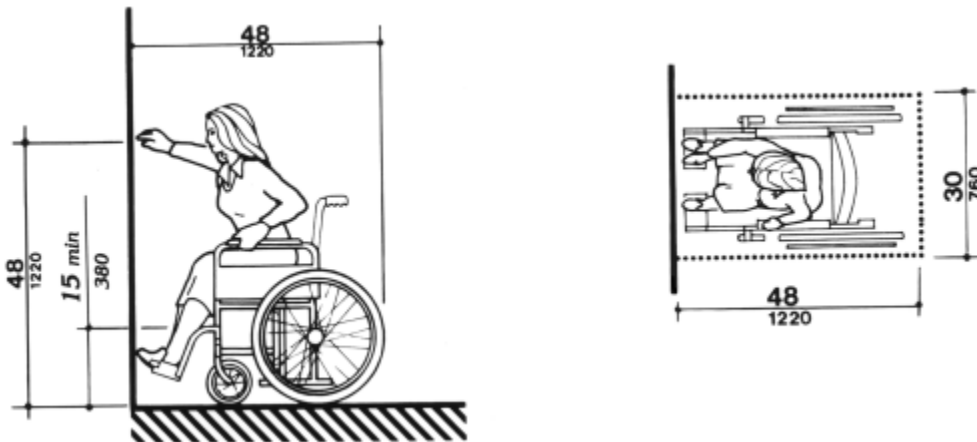
4.27.1 GENERAL. Controls and operating mechanisms required to be accessible by 4.1 shall comply with 4.27.

4.27.2 CLEAR FLOOR SPACE. Clear floor space complying with 4.2.4 that allows a forward or a parallel approach by a person using a wheelchair shall be provided at controls, dispensers, receptacles, and other operable equipment.

4.27.3* HEIGHT. The highest operable part of all controls, dispensers, receptacles, and other operable equipment shall be placed within at least one of the reach ranges specified in 4.2.5 and 4.2.6. Except where the use of special equipment dictates otherwise, electrical and communications system receptacles on walls shall be mounted no less than 15 in (380 mm) above the floor.

4.27.4 OPERATION. Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N).

4.2.5 FORWARD REACH. If the clear floor space only allows forward approach to an object, the maximum high forward reach allowed shall be 48 in (1220 mm) (see [Fig. 5\(a\)](#)). The minimum low forward reach is 15 in (380 mm). If the high forward reach is over an obstruction, reach and clearances shall be as shown in [Fig. 5\(b\)](#).



**Figure 5(a)
High Forward Reach Limit**

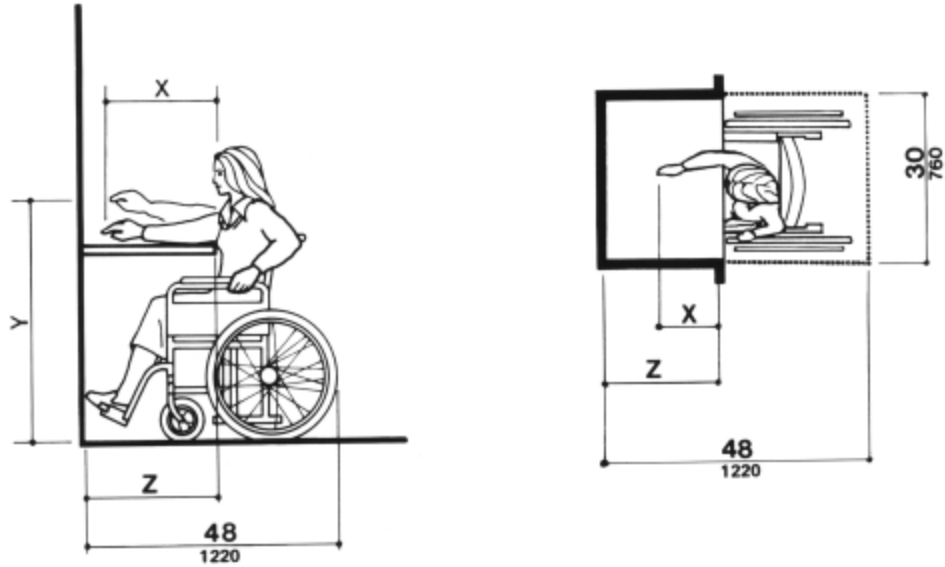


Figure 5(b)
Maximum Forward Reach over an Obstruction

The maximum level forward reach over an obstruction with knee space below is 25 inches (635 mm). When the obstruction is less than 20 inches (510 mm) deep, the maximum high forward reach is 48 inches (1220 mm). When the obstruction projects 20 to 25 inches (510 mm to 635 mm), the maximum high forward reach is 44 inches (1120 mm).

4.2.6* SIDE REACH. If the clear floor space allows parallel approach by a person in a wheelchair, the maximum high side reach allowed shall be 54 in (1370 mm) and the low side reach shall be no less than 9 in (230 mm) above the floor ([Fig. 6\(a\)](#) and [\(b\)](#)). If the side reach is over an obstruction, the reach and clearances shall be as shown in [Fig. 6\(c\)](#).

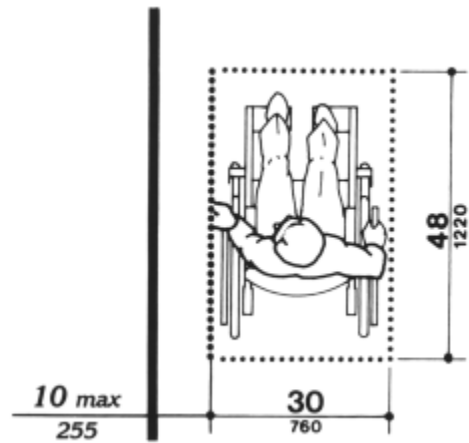
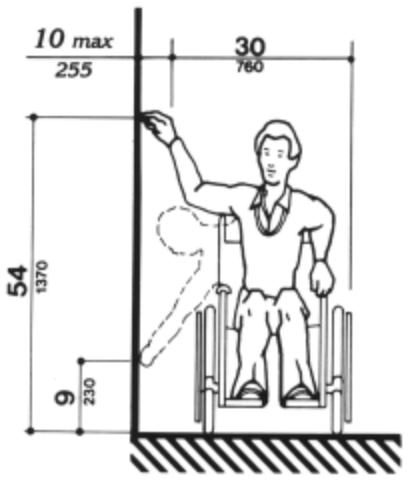
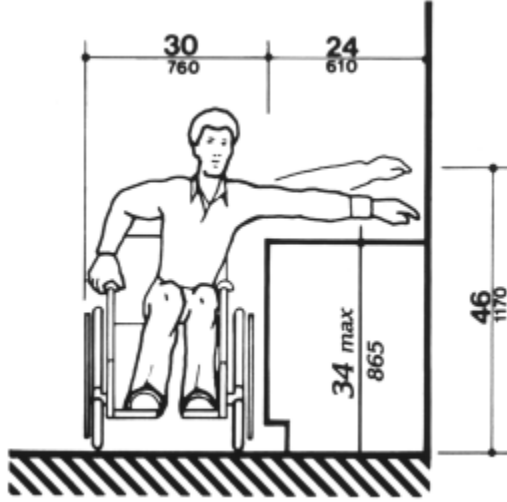


Figure 6(a)
Clear Floor Space - Parallel Approach



**Figure 6(b)
High and Low - Side Reach Limits**

The 30 by 48 inch wheelchair clear floor space is located a maximum 10 inches (255 mm) from the wall.



**Figure 6(c)
Maximum Side Reach over Obstruction**

If the depth of the obstruction is 24 inches (610 mm) and the maximum height of the obstruction is 34 inches (865 mm), the maximum high side reach over the obstruction is 46 inches (1170).

Common Areas #8

4.22 TOILET ROOMS.

4.22.1 MINIMUM NUMBER. Toilet facilities required to be accessible by 4.1 shall comply with 4.22. Accessible toilet rooms shall be on an accessible route.

4.22.2 DOORS. All doors to accessible toilet rooms shall comply with 4.13. Doors shall not swing into the clear floor space required for any fixture.

4.22.3 CLEAR FLOOR SPACE. The accessible fixtures and controls required in 4.22.4, 4.22.5, 4.22.6, and 4.22.7 shall be on an accessible route. An unobstructed turning space complying with 4.2.3 shall be provided within an accessible toilet room. The clear floor space at fixtures and controls, the accessible route, and the turning space may overlap.

4.2.3* WHEELCHAIR TURNING SPACE. The space required for a wheelchair to make a 180-degree turn is a clear space of 60 in (1525 mm) diameter (see [Fig. 3\(a\)](#)) or a T-shaped space (see [Fig. 3\(b\)](#)).



Figure 3(a)
Wheelchair Turning Space
60-in (1525 mm) Diameter Space

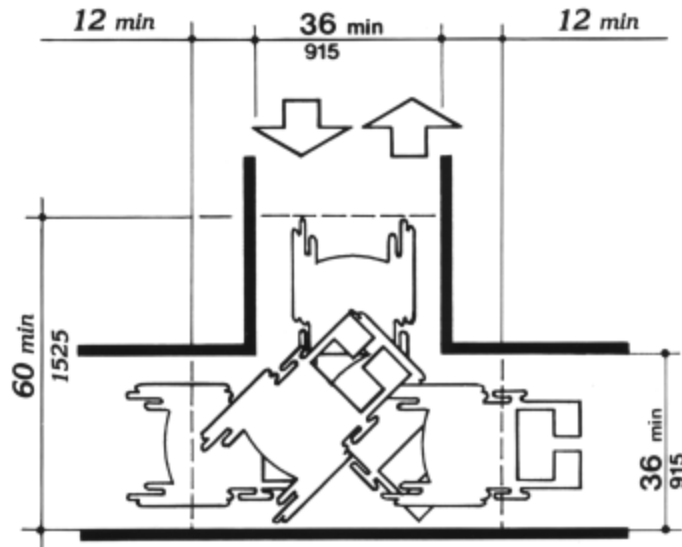


Figure 3(b)
Wheelchair Turning Space
T-Shaped Space for 180 Degree Turns

The T-shape space is 36 inches (915 mm) wide at the top and stem within a 60 inch by 60 inch (1525 mm by 1525 mm) square.

EXCEPTION: In toilet rooms with only one water closet and one lavatory, a clear floor space of 30 in by 60 in (815 mm by 1525 mm) may be used in lieu of the unobstructed turning space.

4.22.4 WATER CLOSETS. If toilet stalls are provided, then at least one shall comply with 4.17; its water closet shall comply with 4.16. If water closets are not in stalls, then at least one shall comply with 4.16.

4.16 WATER CLOSETS.

4.16.1 GENERAL. Accessible water closets shall comply with 4.16. For water closets in accessible dwelling units, see 4.34.5.2.

4.16.2 CLEAR FLOOR SPACE. Clear floor space for water closets not in stalls shall comply with [Fig. 28](#). Clear floor space may be arranged to allow either a left-handed or right-handed approach.

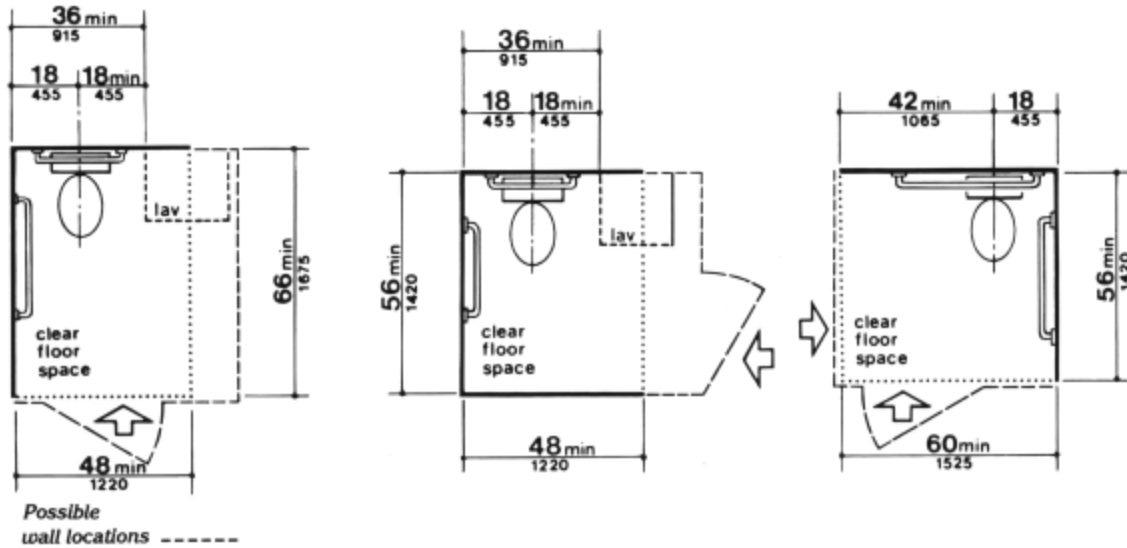


Figure 28
Clear Floor Space at Water Closets

For a front transfer to the water closet, the minimum clear floor space at the water closet is a minimum 48 inches (1220 mm) in width by a minimum of 66 inches (1675 mm) in length. For a diagonal transfer to the water closet, the minimum clear floor space is a minimum of 48 inches (1220 mm) in width by a minimum of 56 inches (1420 mm) in length. For a side transfer to the water closet, the minimum clear floor space is a minimum of 60 inches (1525 mm) in width by a minimum of 56 inches (1420 mm) in length.

4.16.3* HEIGHT. The height of water closets shall be 17 in to 19 in (430 mm to 485 mm), measured to the top of the toilet seat (see [Fig. 29\(b\)](#)). Seats shall not be sprung to return to a lifted position.

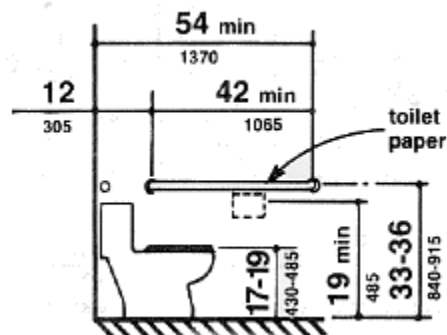


Figure 29(b)
Grab Bars at Water Closets
Side Wall

A 42 inch (1065 mm) minimum length grab bar is required to the side of the water closet spaced 12 inches (305 mm) maximum from the back wall and extending a minimum of 54 inches (1370 mm) from the back wall at a height between 33 and 36 inches (840-915 mm). The toilet paper dispenser shall be mounted at a minimum height of 19 inches (485 mm).

4.16.4* GRAB BARS. Grab bars for water closets not located in stalls shall comply with [Fig. 29](#) and 4.26.

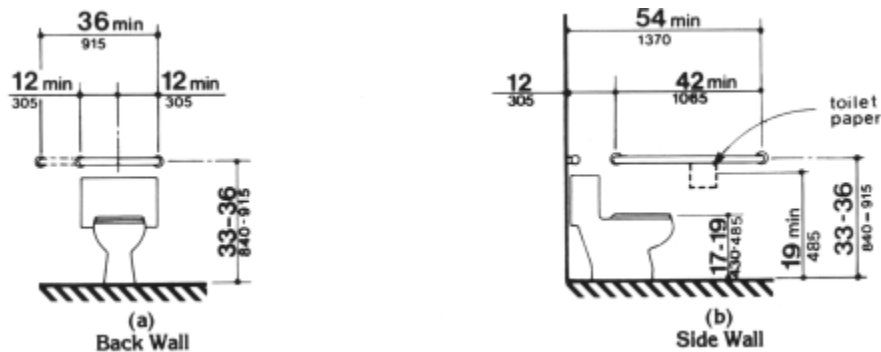


Figure 29
Grab Bars at Water Closets

Fig. 29(a) Back Wall. A 36 inch (915 mm) minimum length grab bar is required behind the water closet mounted at a height between 33 and 36 inches (840-915 mm). The grab bar must extend a minimum of 12 inches (305) beyond the center of the water closet toward the side wall and a minimum of 24 inches (610 mm) toward the open side for either a left or right side approach.

Fig 29(b) Side Wall. A 42 inch (1065 mm) minimum length grab bar is required to the side of the water closet spaced 12 inches (305 mm) maximum from the back wall and extending a minimum of 54 inches (1370 mm) from the back wall at a height between 33 and 36 inches (840-915 mm). The toilet paper dispenser shall be mounted at a minimum height of 19 inches (485 mm).

4.16.5* FLUSH CONTROLS. Flush controls shall be hand operated or automatic and shall comply with 4.27.4. Controls for flush valves shall be mounted on the wide side of toilet areas no more than 44 in (1120 mm) above the floor.

4.16.6 DISPENSERS. Toilet paper dispensers shall be installed within reach, as shown in [Fig. 29\(b\)](#). Dispensers that control delivery, or that do not permit continuous paper flow, shall not be used.

4.22.5 URINALS. If urinals are provided, then at least one shall comply with 4.18.

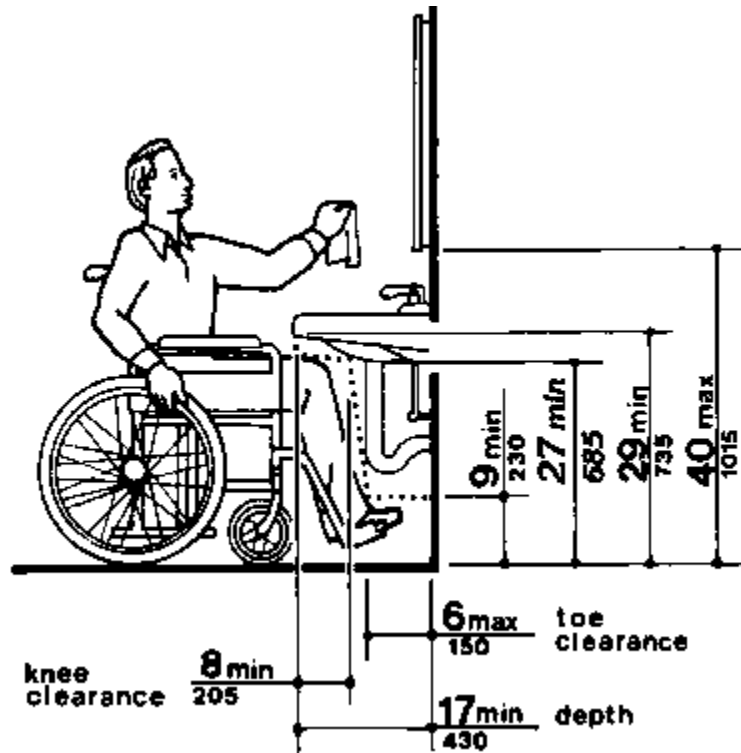
4.22.6 LAVATORIES AND MIRRORS. If lavatories and mirrors are provided, then at least one of each shall comply with 4.19.

4.22.7 CONTROLS AND DISPENSERS. If controls, dispensers, receptacles, or other equipment is provided, then at least one of each shall be on an accessible route and shall comply with 4.27.

4.19 LAVATORIES AND MIRRORS.

4.19.1 GENERAL. The requirements of 4.19 shall apply to lavatory fixtures, vanities, and built-in lavatories.

4.19.2 HEIGHT AND CLEARANCES. Lavatories shall be mounted with the rim or counter surface no higher than 34 in (865 mm) above the finished floor. Provide a clearance of at least 29 in (735 mm) from the floor to the bottom of the apron. Knee and toe clearance shall comply with [Fig. 31](#).



**Figure 31
Lavatory Clearances**

In addition to clearances discussed in the text, the following knee clearance is required underneath the lavatory: 27 inches (685 mm) minimum from the floor to the underside of the lavatory which extends 8 inches (205 mm) minimum measured from the front edge underneath the lavatory back towards the wall; if a minimum 9 inches (230 mm) of toe

clearance is provided, a maximum of 6 inches (150 mm) of the 48 inches (1220 mm) of clear floor space required at the fixture may extend into the toe space.

4.19.3 CLEAR FLOOR SPACE. A clear floor space 30 in by 48 in (760 mm by 1220 mm) complying with 4.2.4 shall be provided in front of a lavatory to allow forward approach. Such clear floor space shall adjoin or overlap an accessible route and shall extend a maximum of 19 in (485 mm) underneath the lavatory (see [Fig. 32](#)).

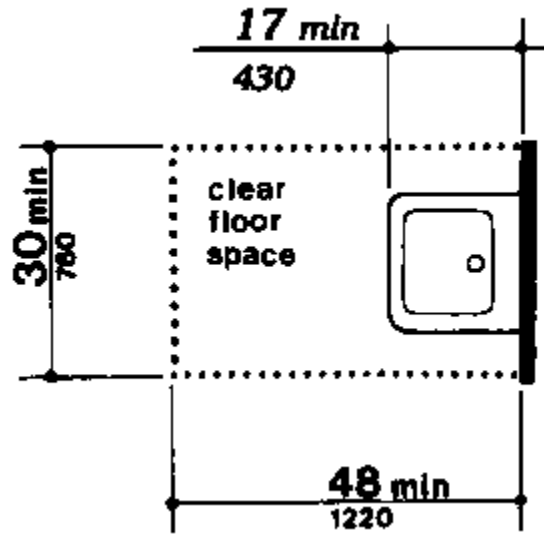


Figure 32
Clear Floor Space at Lavatories

The minimum depth of the lavatory is 17 inches (430 mm).

4.19.4 EXPOSED PIPES AND SURFACES. Hot water and drain pipes under lavatories shall be insulated or otherwise covered. There shall be no sharp or abrasive surfaces under lavatories.

4.19.5 FAUCETS. Faucets shall comply with 4.27.4. Lever-operated, push-type, and electronically controlled mechanisms are examples of acceptable designs. Self-closing valves are allowed if the faucet remains open for at least 10 seconds.

4.19.6* MIRRORS. Mirrors shall be mounted with the bottom edge of the reflecting surface no higher than 40 in (1015 mm) from the floor (see [Fig. 31](#)).

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.22>

Common Areas #9

4.24 SINKS.

4.24.1 GENERAL. Sinks required to be accessible by 4.1 shall comply with 4.24. Sinks in kitchens of accessible dwelling units shall comply with 4.34.6.5.

4.24.2 HEIGHT. Sinks shall be mounted with the counter or rim no higher than 34 in (865 mm) from the floor.

4.24.3 KNEE CLEARANCE. Knee clearance that is at least 27 in (685 mm) high, 30 in (760 mm) wide, and 19 in (485 mm) deep shall be provided underneath sinks.

4.24.4 DEPTH. Each sink shall be a maximum of 6-1/2 in (165 mm) deep.

4.24.5 CLEAR FLOOR SPACE. A clear floor space at least 30 in by 48 in (760 mm by 1220 mm) complying with 4.2.4 shall be provided in front of a sink to allow forward approach. The clear floor space shall be on an accessible route and shall extend a maximum of 19 in (485 mm) underneath the sink (see [Fig. 32](#)).

4.24.6 EXPOSED PIPES AND SURFACES. Hot water and drain pipes exposed under sinks shall be insulated or otherwise covered. There shall be no sharp or abrasive surfaces under sinks.

4.24.7 FAUCETS. Faucets shall comply with 4.27.4. Lever-operated, push-type, touch-type, or electronically controlled mechanisms are acceptable designs.

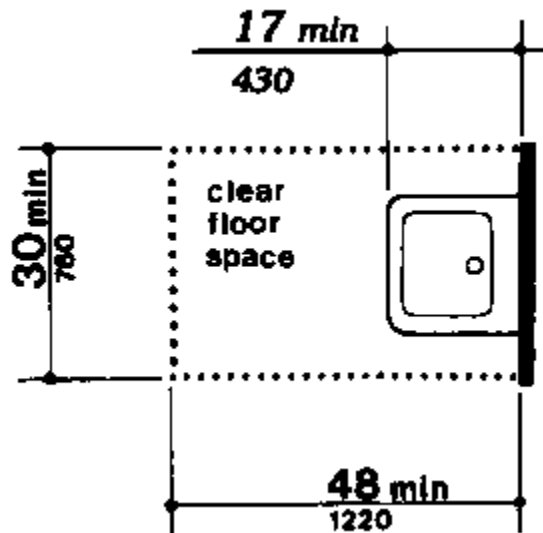


Figure 32
Clear Floor Space at Lavatories
The minimum depth of the lavatory is 17 inches (430 mm).

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.24>

Public Areas #2 through 5

4.6.3* Parking Spaces. Accessible parking spaces shall be at least 96 in (2440 mm) wide. Parking access aisles shall be part of an accessible route to the building or facility entrance and shall comply with [4.3](#). Two accessible parking spaces may share a common access aisle (see [Fig. 9](#)). Parked vehicle overhangs shall not reduce the clear width of an accessible route. Parking spaces and access aisles shall be level with surface slopes not exceeding 1:50 (2%) in all directions. [Appendix Note](#)

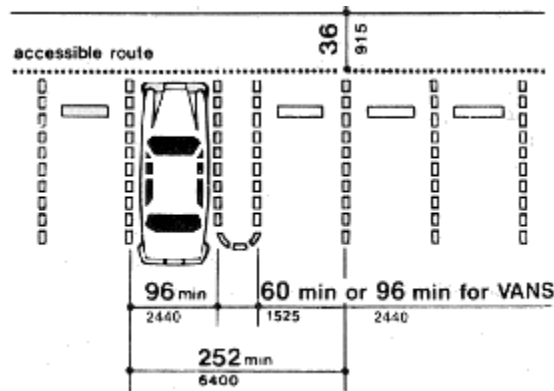


Figure 9
Dimensions of Parking Spaces

The access aisle shall be a minimum of 60 inches (1525 mm) wide for cars or a minimum of 96 inches (2440 mm) wide for vans. The accessible route connected to the access aisle at the front of the parking spaces shall be a minimum of 36 inches (915 mm).

4.6.4* Signage. Accessible parking spaces shall be designated as reserved by a sign showing the symbol of accessibility (see 4.30.7). Spaces complying with [4.1.2\(5\)\(b\)](#) shall have an additional sign "Van-Accessible" mounted below the symbol of accessibility. Such signs shall be located so they cannot be obscured by a vehicle parked in the space.

4.1.2 (5) (b) One in every eight accessible spaces, but not less than one, shall be served by an access aisle 96 in (2440 mm) wide minimum and shall be designated "van accessible" as required by [4.6.4](#). The vertical clearance at such spaces shall comply with [4.6.5](#). All such spaces may be grouped on one level of a parking structure.

EXCEPTION: Provision of all required parking spaces in conformance with "Universal Parking Design" (see appendix [A4.6.3](#)) is permitted.

Appendix Note

A4.6.3 Parking Spaces. The increasing use of vans with side-mounted lifts or ramps by persons with disabilities has necessitated some revisions in specifications for parking spaces and adjacent access aisles. The typical accessible parking space is 96 in (2440 mm) wide with an adjacent 60 in (1525 mm) access aisle. However, this aisle does not permit lifts or ramps to be deployed and still leave room for a person using a wheelchair or other mobility aid to exit the lift platform or ramp. In tests conducted with actual lift/van/wheelchair combinations, (under a Board-sponsored Accessible Parking and Loading Zones Project)

researchers found that a space and aisle totaling almost 204 in (5180 mm) wide was needed to deploy a lift and exit conveniently. The "van accessible" parking space required by these guidelines provides a 96 in (2440 mm) wide space with a 96 in (2440 mm) adjacent access aisle which is just wide enough to maneuver and exit from a side mounted lift. If a 96 in (2440 mm) access aisle is placed between two spaces, two "van accessible" spaces are created. Alternatively, if the wide access aisle is provided at the end of a row (an area often unused), it may be possible to provide the wide access aisle without additional space (see [Fig. A5\(a\)](#)).

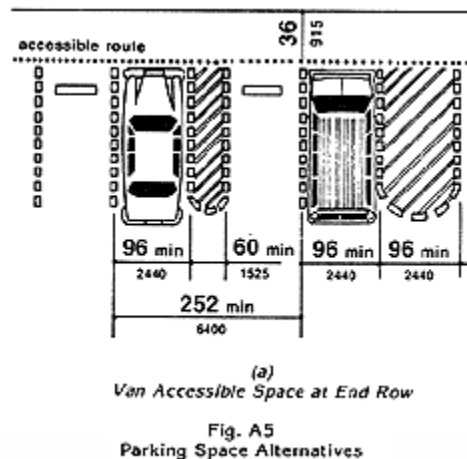
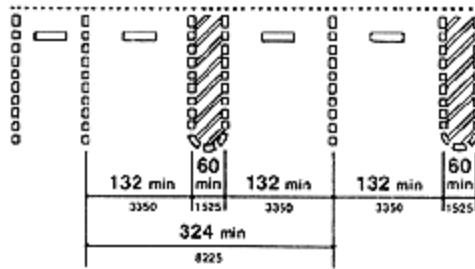


Figure A5a
Parking Space Alternatives
Van Accessible Space at End Row

A sign is needed to alert van users to the presence of the wider aisle, but the space is not intended to be restricted only to vans.

"Universal" Parking Space Design. An alternative to the provision of a percentage of spaces with a wide aisle, and the associated need to include additional signage, is the use of what has been called the "universal" parking space design. Under this design, *all* accessible spaces are 132 in (3350 mm) wide with a 60 in (1525 mm) access aisle (see [Fig. A5\(b\)](#)). One advantage to this design is that no additional signage is needed because all spaces can accommodate a van with a side-mounted lift or ramp. Also, there is no competition between cars and vans for spaces since all spaces can accommodate either. Furthermore, the wider space permits vehicles to park to one side or the other within the 132 in (3350 mm) space to allow persons to exit and enter the vehicle on either the driver or passenger side, although, in some cases, this would require exiting or entering without a marked access aisle.



(b)
Universal Parking Space Design

Fig. A5
Parking Space Alternatives

**Figure A5b
Parking Space Alternatives
Universal Parking Space Design**

An essential consideration for any design is having the access aisle level with the parking space. Since a person with a disability, using a lift or ramp, must maneuver within the access aisle, the aisle cannot include a ramp or sloped area. The access aisle must be connected to an accessible route to the appropriate accessible entrance of a building or facility. The parking access aisle must either blend with the accessible route or have a curb ramp complying with 4.7. Such a curb ramp opening must be located within the access aisle boundaries, not within the parking space boundaries. Unfortunately, many facilities are designed with a ramp that is blocked when any vehicle parks in the accessible space. Also, the required dimensions of the access aisle cannot be restricted by planters, curbs or wheel stops.

<http://www.access-board.gov/adaag/html/adaag.htm#4.6>

**Common Areas #7 AND
Accessible Dwelling Units
General: #6
Kitchen: #10**

4.27 CONTROLS AND OPERATING MECHANISMS.

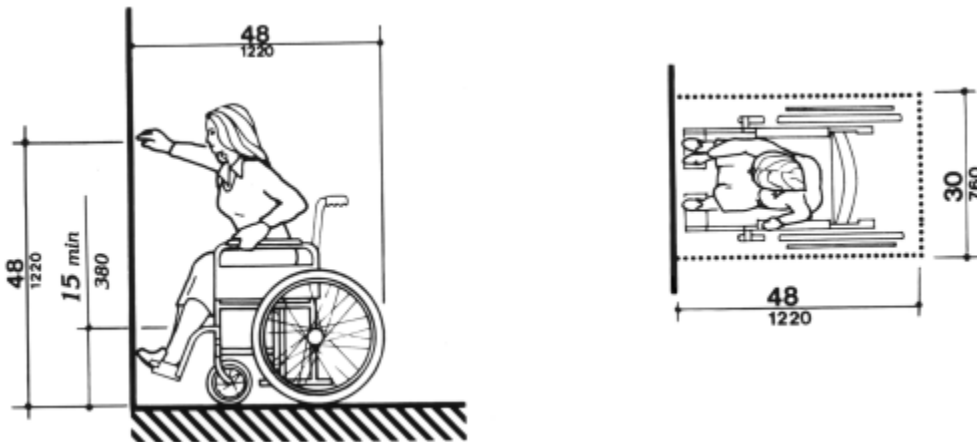
4.27.1 GENERAL. Controls and operating mechanisms required to be accessible by 4.1 shall comply with 4.27.

4.27.2 CLEAR FLOOR SPACE. Clear floor space complying with 4.2.4 that allows a forward or a parallel approach by a person using a wheelchair shall be provided at controls, dispensers, receptacles, and other operable equipment.

4.27.3* HEIGHT. The highest operable part of all controls, dispensers, receptacles, and other operable equipment shall be placed within at least one of the reach ranges specified in 4.2.5 and 4.2.6. Except where the use of special equipment dictates otherwise, electrical and communications system receptacles on walls shall be mounted no less than 15 in (380 mm) above the floor.

4.27.4 OPERATION. Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N).

4.2.5 FORWARD REACH. If the clear floor space only allows forward approach to an object, the maximum high forward reach allowed shall be 48 in (1220 mm) (see [Fig. 5\(a\)](#)). The minimum low forward reach is 15 in (380 mm). If the high forward reach is over an obstruction, reach and clearances shall be as shown in [Fig. 5\(b\)](#).



**Figure 5(a)
High Forward Reach Limit**

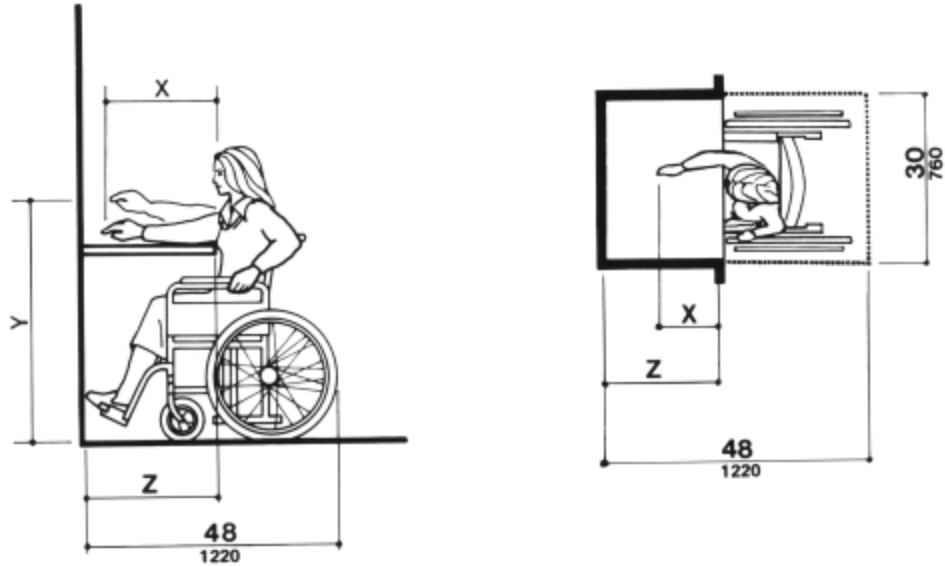


Figure 5(b)
Maximum Forward Reach over an Obstruction

The maximum level forward reach over an obstruction with knee space below is 25 inches (635 mm). When the obstruction is less than 20 inches (510 mm) deep, the maximum high forward reach is 48 inches (1220 mm). When the obstruction projects 20 to 25 inches (510 mm to 635 mm), the maximum high forward reach is 44 inches (1120 mm).

4.2.6* SIDE REACH. If the clear floor space allows parallel approach by a person in a wheelchair, the maximum high side reach allowed shall be 54 in (1370 mm) and the low side reach shall be no less than 9 in (230 mm) above the floor (Fig. 6(a) and (b)). If the side reach is over an obstruction, the reach and clearances shall be as shown in Fig. 6(c).

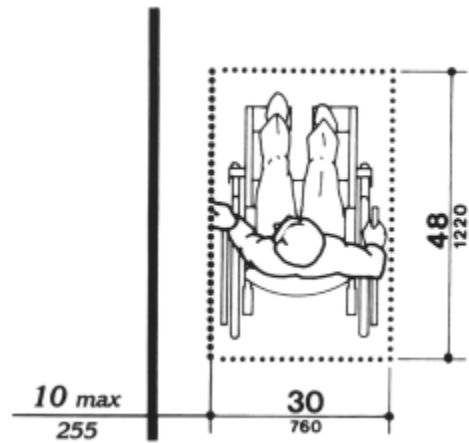
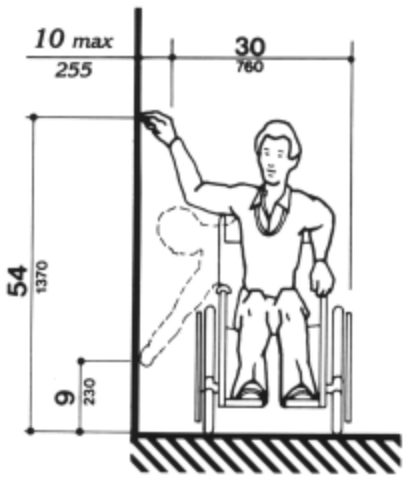
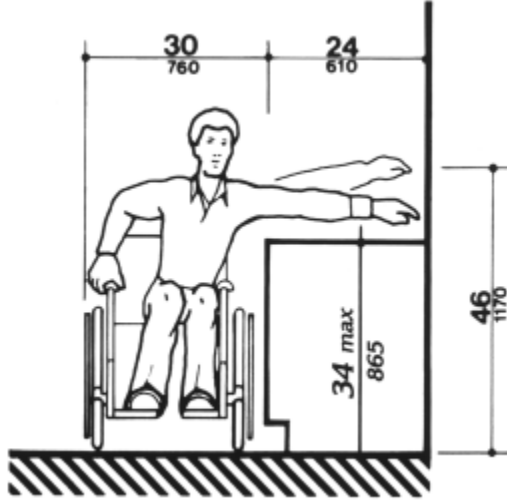


Figure 6(a)
Clear Floor Space - Parallel Approach



**Figure 6(b)
High and Low - Side Reach Limits**

The 30 by 48 inch wheelchair clear floor space is located a maximum 10 inches (255 mm) from the wall.



**Figure 6(c)
Maximum Side Reach over Obstruction**

If the depth of the obstruction is 24 inches (610 mm) and the maximum height of the obstruction is 34 inches (865 mm), the maximum high side reach over the obstruction is 46 inches (1170).

Accessible Dwelling Units
General: #7 and #8

4.25 STORAGE.

4.25.1 GENERAL. Fixed storage facilities such as cabinets, shelves, closets, and drawers required to be accessible by 4.1 shall comply with 4.25.

4.25.2 CLEAR FLOOR SPACE. A clear floor space at least 30 in by 48 in (760 mm by 1220 mm) complying with 4.2.4 that allows either a forward or parallel approach by a person using a wheelchair shall be provided at accessible storage facilities.

4.25.3 HEIGHT. Accessible storage spaces shall be within at least one of the reach ranges specified in 4.2.5 and 4.2.6. Clothes rods shall be a maximum of 54 in (1370 mm) from the floor (see [Fig. 38](#)).

4.25.4 HARDWARE. Hardware for accessible storage facilities shall comply with 4.27.4. Touch latches and U-shaped pulls are acceptable.

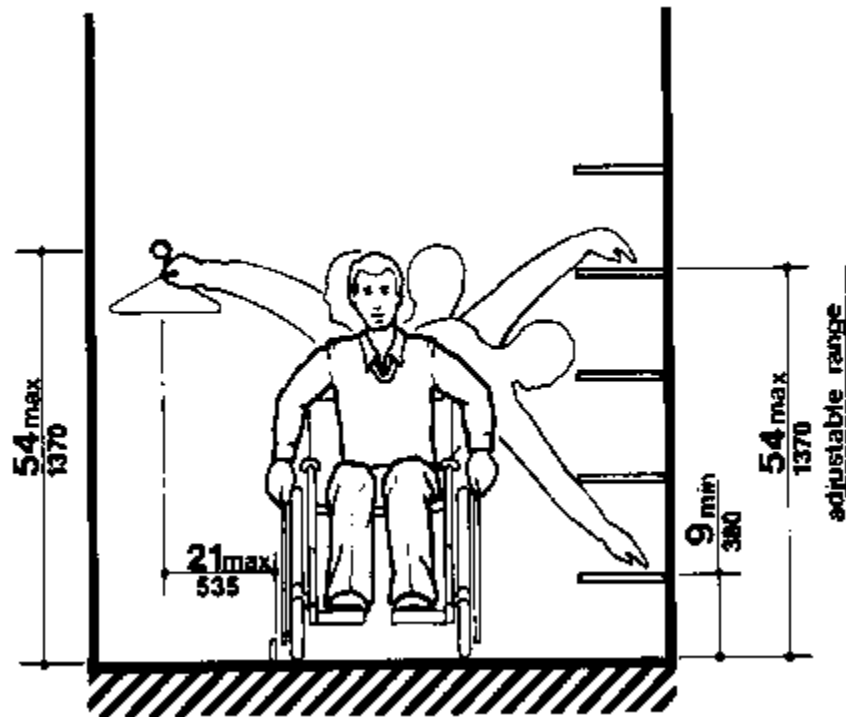


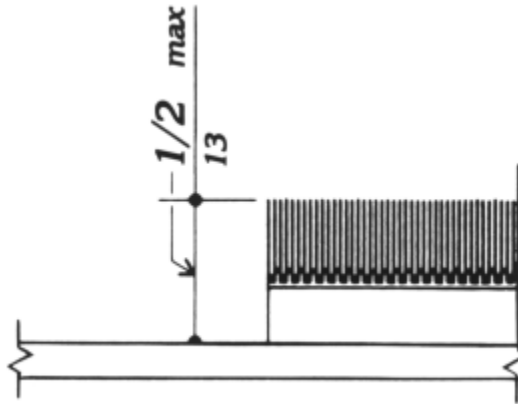
Figure 38
Storage Shelves and Closets

If the clear floor space allows a parallel approach by a person in a wheelchair and the distance between the wheelchair and the shelf exceeds 10 inches, the maximum high side reach shall be 48 inches (1220 mm) above the floor and the low side reach shall be a minimum of 9 inches (230 mm) above the floor. The shelves can be adjustable. The maximum distance from the user to the shelf shall be 21 inches (535 mm).

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.25>

**Accessible Dwelling Unit
General: #9**

4.5.3* CARPET. If carpet or carpet tile is used on a ground or floor surface, then it shall be securely attached; have a firm cushion, pad, or backing or no cushion or pad; and have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum pile height shall be 1/2 in (13 mm). Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge. Carpet edge trim shall comply with 4.5.2. If carpet tile is used on an accessible ground or floor surface, it shall have a maximum combined thickness of pile, cushion, and backing height of 1/2 in (13 mm) (see [Fig. 8\(f\)](#)).



**Figure 8(f)
Carpet Tile Thickness**

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.5>

**Accessible Dwelling Units
Kitchen: #3 and #4**

4.34.6.4 WORK SURFACES. At least one 30 in (760 mm) section of counter shall provide a work surface that complies with the following requirements (see [Fig. 50](#)):

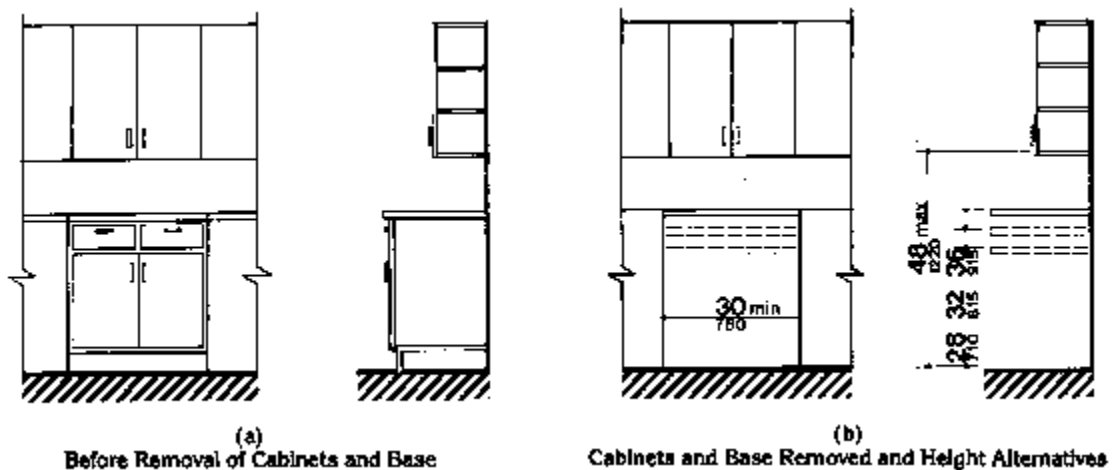
(1) The counter shall be mounted at a maximum height of 34 in (865 mm) above the floor, measured from the floor to the top of the counter surface, or shall be adjustable or replaceable as a unit to provide alternative heights of 28 in, 32 in, and 36 in (710 mm, 815 mm, and 915 mm), measured from the top of the counter surface.

(2) Base cabinets, if provided, shall be removable under the full 30 in (760 mm) minimum frontage of the counter. The finished floor shall extend under the counter to the wall.

(3) Counter thickness and supporting structure shall be 2 in (50 mm) maximum over the required clear area.

(4) A clear floor space 30 in by 48 in (760 mm by 1220 mm) shall allow a forward approach to the counter. Nineteen inches (485 mm) maximum of the clear floor space may extend underneath the counter. The knee space shall have a minimum clear width of 30 in (760 mm) and a minimum clear depth of 19 in (485 mm).

(5) There shall be no sharp or abrasive surfaces under such counters.



**Figure 50
Counter Work Surface**

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.34>

Accessible Dwelling Units
Kitchen: #5

4.34.6.5* SINK. The sink and surrounding counter shall comply with the following requirements (see [Fig. 51](#)):

(1) The sink and surrounding counter shall be mounted at a maximum height of 34 in (865 mm) above the floor, measured from the floor to the top of the counter surface, or shall be adjustable or replaceable as a unit to provide alternative heights of 28 in, 32 in, and 36 in (710 mm, 815 mm, and 915 mm), measured from the floor to the top of the counter surface or sink rim. The total width of sink and counter area shall be 30 in (760 mm).

(2) Rough-in plumbing shall be located to accept connections of supply and drain pipes for sinks mounted at the height of 28 in (710 mm).

(3) The depth of a sink bowl shall be no greater than 6-1/2 in (165 mm). Only one bowl of double- or triple-bowl sinks needs to meet this requirement.

(4) Faucets shall comply with 4.27.4. Lever-operated or push-type mechanisms are two acceptable designs.

(5) Base cabinets, if provided, shall be removable under the full 30 in (760 mm) minimum frontage of the sink and surrounding counter. The finished flooring shall extend under the counter to the wall.

(6) Counter thickness and supporting structure shall be 2 in (50 mm) maximum over the required clear space.

(7) A clear floor space 30 in by 48 in (760 mm by 1220 mm) shall allow forward approach to the sink. Nineteen inches (485 mm) maximum of the clear floor space may extend underneath the sink. The knee space shall have a clear width of 30 in (760 mm) and a clear depth of 19 in (485 mm).

(8) There shall be no sharp or abrasive surfaces under sinks. Hot water and drain pipes under sinks shall be insulated or otherwise covered.

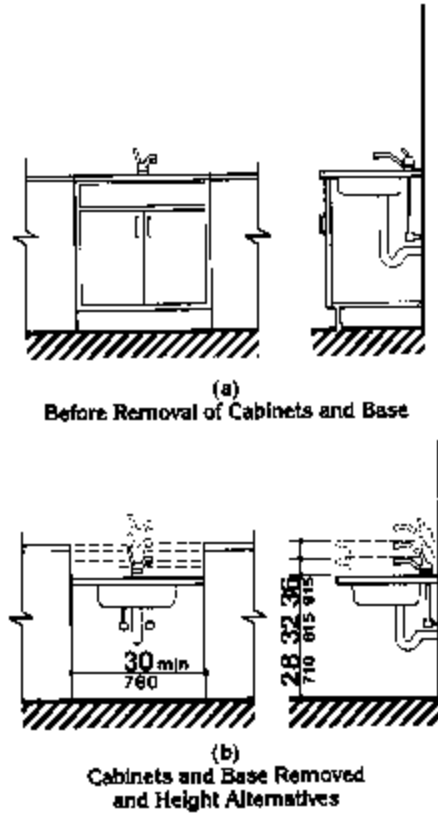


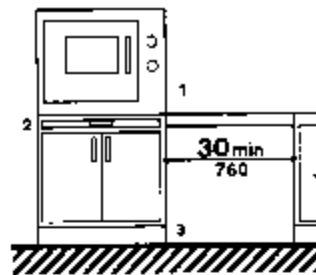
Figure 51
Kitchen Sink

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.34>

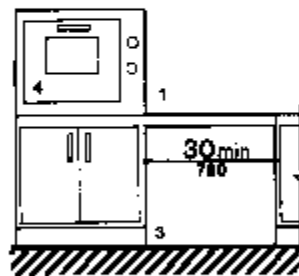
**Accessible Dwelling Units
Kitchen: #9**

4.34.6.6* RANGES AND COOKTOPS. Ranges and cooktops shall comply with 4.34.6.2 and 4.34.6.3. If ovens or cooktops have knee spaces underneath, then they shall be insulated or otherwise protected on the exposed contact surfaces to prevent burns, abrasions, or electrical shock. The clear floor space may overlap the knee space, if provided, by 19 in (485 mm) maximum. The location of controls for ranges and cook-tops shall not require reaching across burners.

4.34.6.7* OVENS. Ovens shall comply with 4.34.6.2 and 4.34.6.3. Ovens shall be of the self-cleaning type or be located adjacent to an adjustable height counter with knee space below (see [Fig. 52](#)). For side-opening ovens, the door latch side shall be next to the open counter space, and there shall be a pull-out shelf under the oven extending the full width of the oven and pulling out not less than 10 in (255 mm) when fully extended. Ovens shall have controls on front panels; they may be located on either side of the door.



(a)
Side-Hinged Door



(b)
Bottom-Hinged Door

SYMBOL KEY:

1. Countertop or wall-mounted oven.
2. Pull-out board preferred with side-opening door.
3. Clear open space.
4. Bottom-hinged door.

**Figure 52
Ovens without Self-Cleaning Feature**

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.34>

**Accessible Dwelling Units
Bathroom: #2 through #4**

4.34.5.3 LAVATORY, MIRRORS, AND MEDICINE CABINETS.

- (1) The lavatory and mirrors shall comply with 4.22.6.
- (2) If a cabinet is provided under the lavatory in adaptable bathrooms, then it shall be removable to provide the clearances specified in 4.22.6.
- (3) If a medicine cabinet is provided above the lavatory, then the bottom of the medicine cabinet shall be located with a usable shelf no higher than 44 in (1120 mm) above the floor.

4.22.6 LAVATORIES AND MIRRORS. If lavatories and mirrors are provided, then at least one of each shall comply with 4.19.

4.19 LAVATORIES AND MIRRORS.

4.19.1 GENERAL. The requirements of 4.19 shall apply to lavatory fixtures, vanities, and built-in lavatories.

4.19.2 HEIGHT AND CLEARANCES. Lavatories shall be mounted with the rim or counter surface no higher than 34 in (865 mm) above the finished floor. Provide a clearance of at least 29 in (735 mm) from the floor to the bottom of the apron. Knee and toe clearance shall comply with [Fig. 31](#).

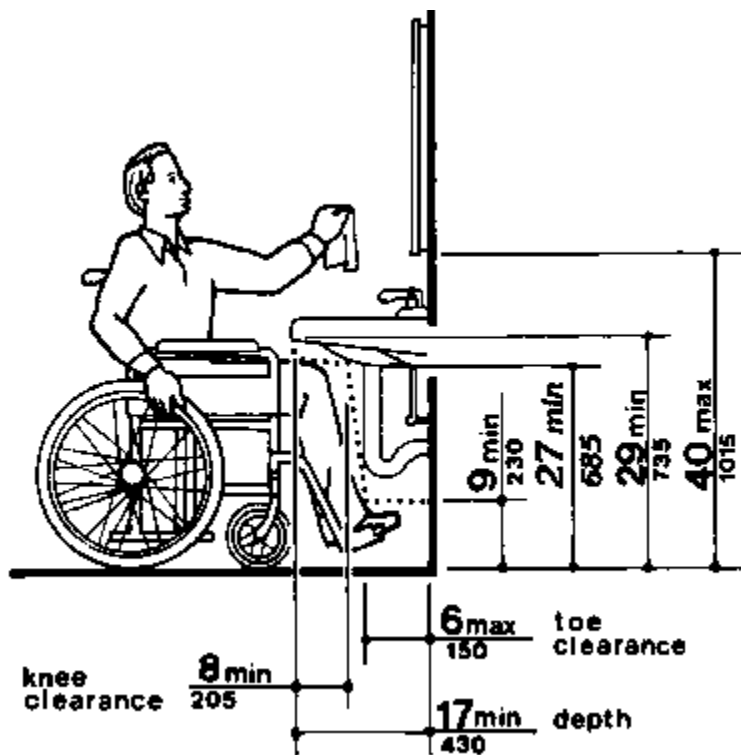


Figure 31
Lavatory Clearances

In addition to clearances discussed in the text, the following knee clearance is required underneath the lavatory: 27 inches (685 mm) minimum from the floor to the underside of the lavatory which extends 8 inches (205 mm) minimum measured from the front edge underneath the lavatory back towards the wall; if a minimum 9 inches (230 mm) of toe clearance is provided, a maximum of 6 inches (150 mm) of the 48 inches (1220 mm) of clear floor space required at the fixture may extend into the toe space.

4.19.3 CLEAR FLOOR SPACE. A clear floor space 30 in by 48 in (760 mm by 1220 mm) complying with 4.2.4 shall be provided in front of a lavatory to allow forward approach. Such clear floor space shall adjoin or overlap an accessible route and shall extend a maximum of 19 in (485 mm) underneath the lavatory (see [Fig. 32](#)).

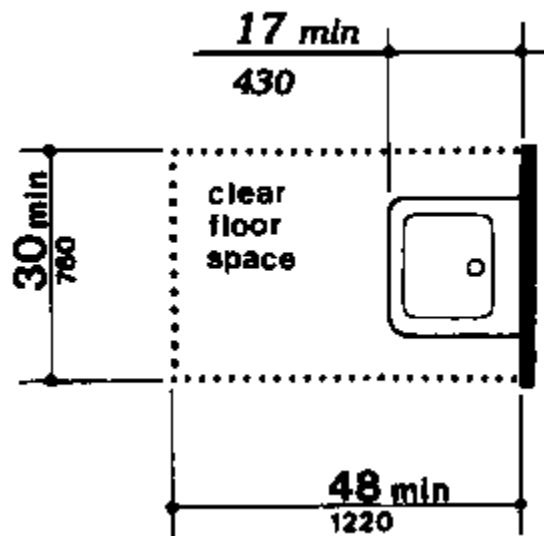


Figure 32
Clear Floor Space at Lavatories

The minimum depth of the lavatory is 17 inches (430 mm).

4.19.4 EXPOSED PIPES AND SURFACES. Hot water and drain pipes under lavatories shall be insulated or otherwise covered. There shall be no sharp or abrasive surfaces under lavatories.

4.19.5 FAUCETS. Faucets shall comply with 4.27.4. Lever-operated, push-type, and electronically controlled mechanisms are examples of acceptable designs. Self-closing valves are allowed if the faucet remains open for at least 10 seconds.

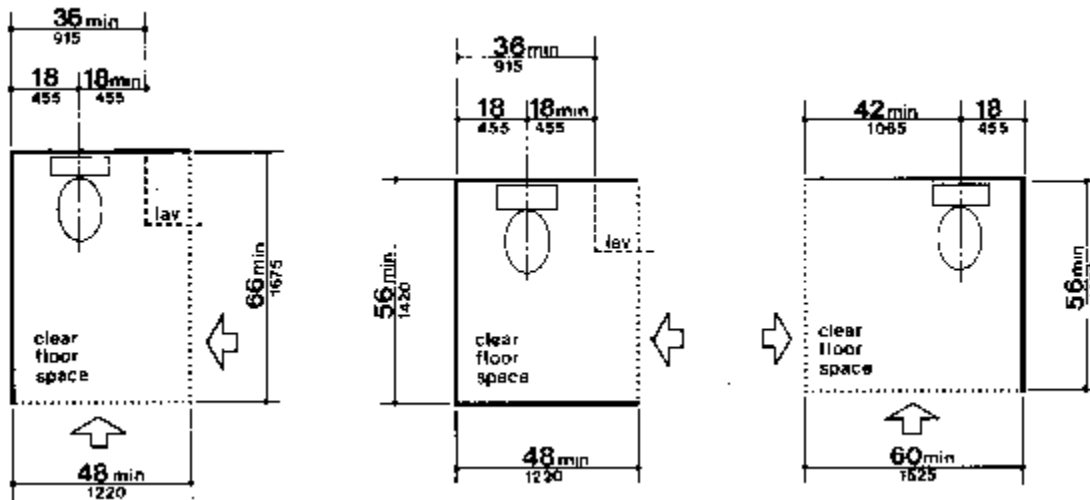
4.19.6* MIRRORS. Mirrors shall be mounted with the bottom edge of the reflecting surface no higher than 40 in (1015 mm) from the floor (see [Fig. 31](#)).

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.34>

**Accessible Dwelling Units
Bathroom: #5 through #7**

4.34.5.2 WATER CLOSETS.

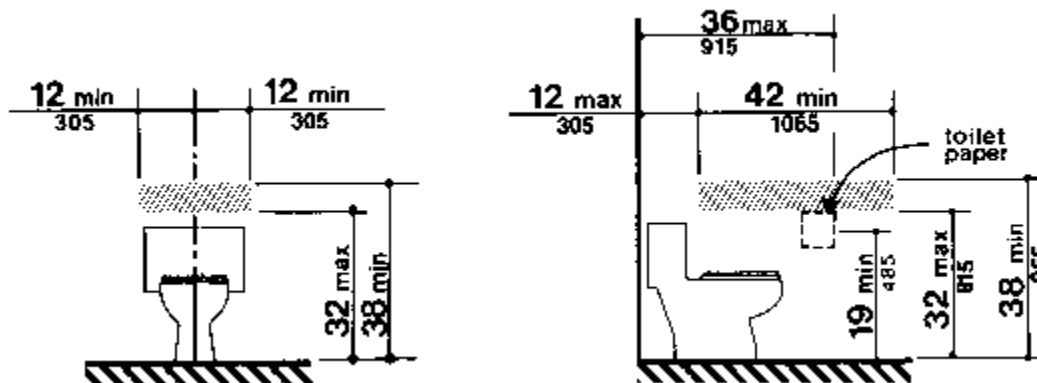
(1) Clear floor space at the water closet shall be as shown in [Fig. 47\(a\)](#). The water closet may be located with the clear area at either the right or left side of the toilet.



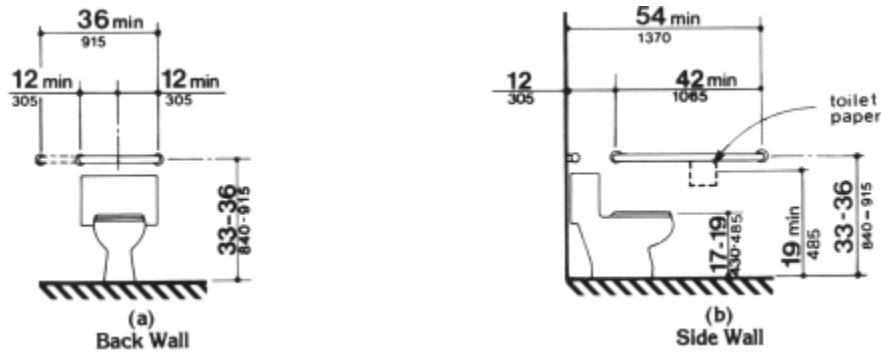
**Figure 47(a)
Clear Floor Space for Adaptable Bathrooms**

(2) The height of the water closet shall be at least 15 in (380 mm), and no more than 19 in (485 mm), measured to the top of the toilet seat.

(3) Structural reinforcement or other provisions that will allow installation of grab bars shall be provided in the locations shown in [Fig. 47\(b\)](#). If provided, grab bars shall be installed as shown in [Fig. 29](#) and shall comply with 4.26.



**Figure 47(b)
Reinforced Areas for Installation of Grab Bars**



**Figure 29
Grab Bars at Water Closets**

Fig. 29(a) Back Wall. A 36 inch (915 mm) minimum length grab bar is required behind the water closet mounted at a height between 33 and 36 inches (840-915 mm). The grab bar must extend a minimum of 12 inches (305) beyond the center of the water closet toward the side wall and a minimum of 24 inches (610 mm) toward the open side for either a left or right side approach.

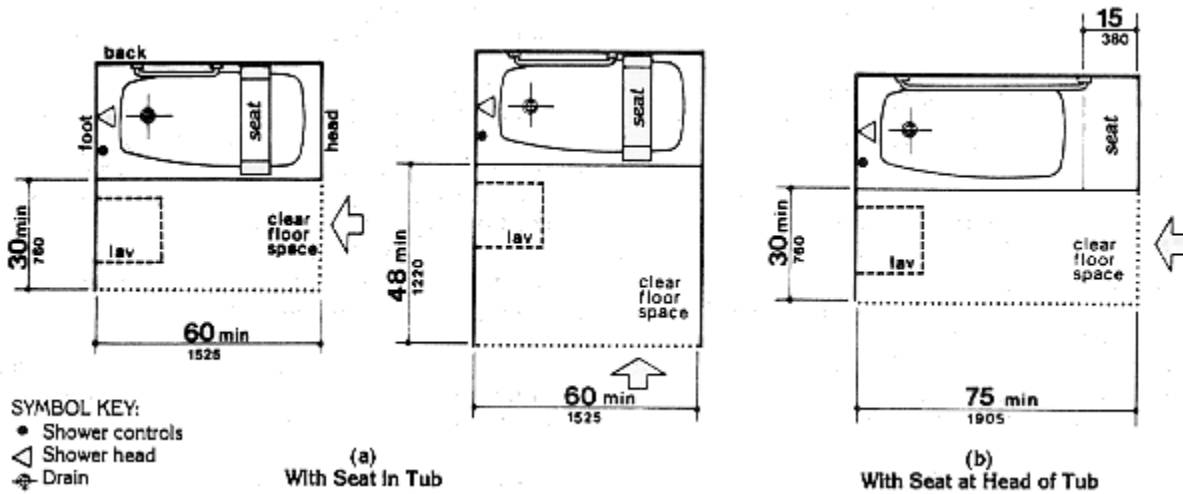
Fig 29(b) Side Wall. A 42 inch (1065 mm) minimum length grab bar is required to the side of the water closet spaced 12 inches (305 mm) maximum from the back wall and extending a minimum of 54 inches (1370 mm) from the back wall at a height between 33 and 36 inches (840-915 mm). The toilet paper dispenser shall be mounted at a minimum height of 19 inches (485 mm).

<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.34>

**Accessible Dwelling Units
Bathroom: #8 through #11**

4.34.5.4 BATHTUBS. If a bathtub is provided, then it shall have the following features:

(1) Floor space. Clear floor space at bathtubs shall be as shown in [Fig. 33](#).



**Figure 33
Clear Floor Space at Bathtubs**

Fig. 33(a)

With Seat in Tub. If the approach is parallel to the bathtub, a 30 inch (760 mm) minimum width by 60 inch (1525 mm) minimum length clear space is required alongside the bathtub. If the approach is perpendicular to the bathtub, a 48 inch (1220 mm) minimum width by 60 inch (1525 mm) minimum length clear space is required.

Fig. 33(b)

With Seat at Head of Tub. If the approach is parallel to the bathtub, a 30 inch (760 mm) minimum width by 75 inch (1905 mm) minimum length clear space is required alongside the bathtub. The seat width must be 15 inches (380 mm) and must extend the full width of the bathtub.

(2) Seat. An in-tub seat or a seat at the head end of the tub shall be provided as shown in [Fig. 33](#) and [34](#). The structural strength of seats and their attachments shall comply with 4.26.3. Seats shall be mounted securely and shall not slip during use.

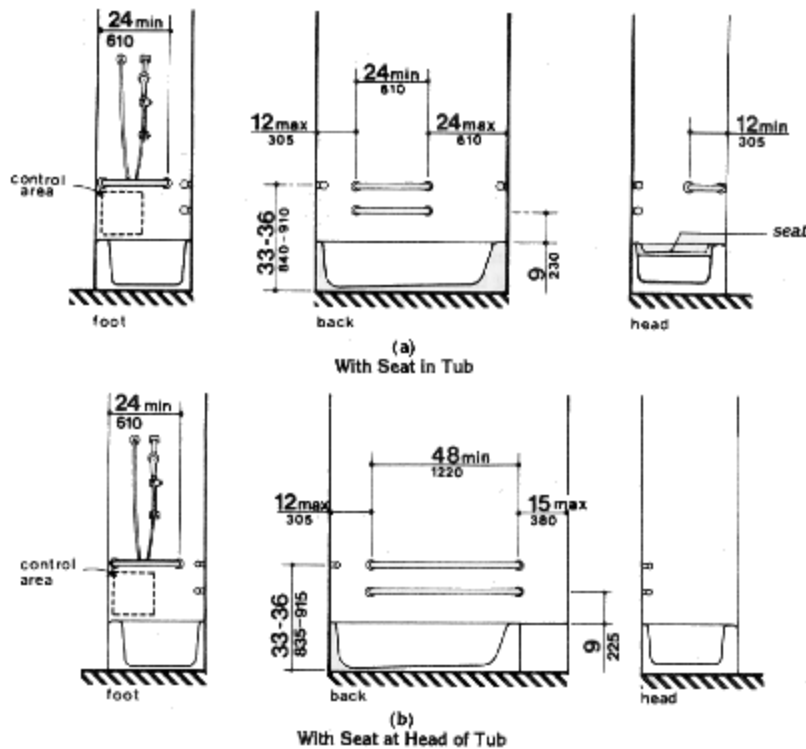


Figure 34
Grab Bars at Bathtubs

Fig. 34(a)

With Seat in Tub. At the foot of the tub, the grab bar shall be 24 inches (610 mm) minimum in length measured from the outer edge of the tub. On the back wall, two grab bars are required. The grab bars mounted on the back (long) wall shall be a minimum 24 inches (610 mm) in length located 12 inches (305 mm) maximum from the foot of the tub and 24 inches (610 mm) maximum from the head of the tub. One grab bar shall be located 9 inches (230 mm) above the rim of the tub. The others shall be 33 to 36 inches (840 mm to 910 mm) above the bathroom floor. At the head of the tub, the grab bar shall be a minimum of 12 inches (305 mm) in length measured from the outer edge of the tub.

Fig. 34(b)

With Seat at Head of Tub. At the foot of the tub, the grab bar shall be a minimum of 24 inches (610 mm) in length measured from the outer edge of the tub. On the back wall, two grab bars are required. The grab bars mounted on the back wall shall be a minimum of 48 inches (1220 mm) in length located a maximum of 12 inches (305 mm) from the foot of the tub and a maximum of 15 inches (380 mm) from the head of the tub. Heights of grab bars are as described above.

(3) Grab bars. Structural reinforcement or other provisions that will allow installation of grab bars shall be provided in the locations shown in [Fig. 48](#). If provided, grab bars shall be installed as shown in [Fig. 34](#) and shall comply with 4.26.

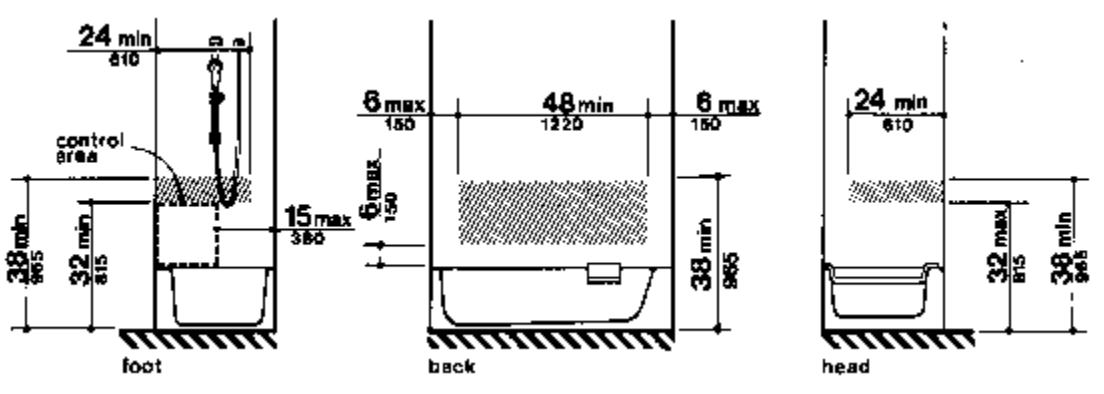


Figure 48(a)
Location of Grab Bars and Controls
of Adaptable Bathrooms - With Seat in Tub

Note: The hatched areas are reinforced to receive grab bars.

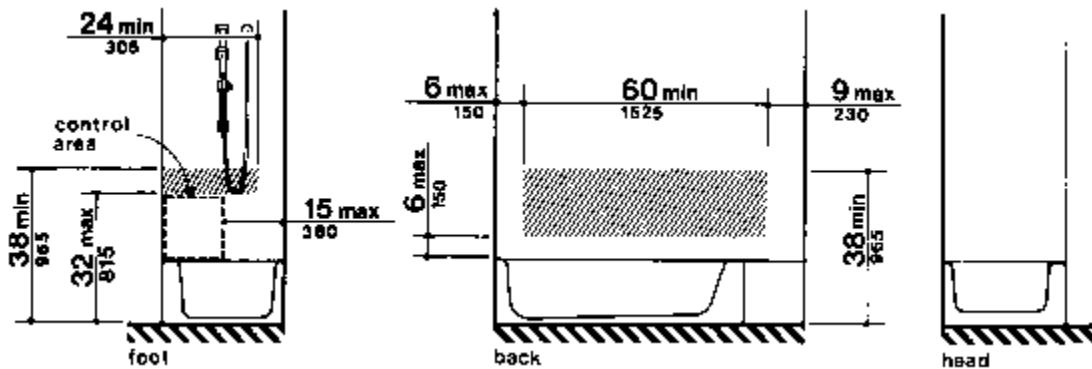


Figure 48(b)
Location of Grab Bars and Controls
of Adaptable Bathrooms - With Seat at Head of Tub

Note: The hatched areas are reinforced to receive grab bars.

(4) Controls. Faucets and other controls shall be located as shown in [Fig. 34](#) and shall comply with 4.27.4.

(5) Shower unit. A shower spray unit with a hose at least 60 in (1525 mm) long that can be used as a fixed shower head or as a hand-held shower shall be provided.

4.34.5.5 SHOWERS. If a shower is provided, it shall have the following features:

(1) Size and clearances. Shower stall size and clear floor space shall comply with either [Fig. 35\(a\)](#) or [\(b\)](#). The shower stall in [Fig. 35\(a\)](#) shall be 36 in by 36 in (915 mm by 915 mm). The shower stall in [Fig. 35\(b\)](#) will fit into the same space as a standard 60 in (1525 mm) long bathtub.

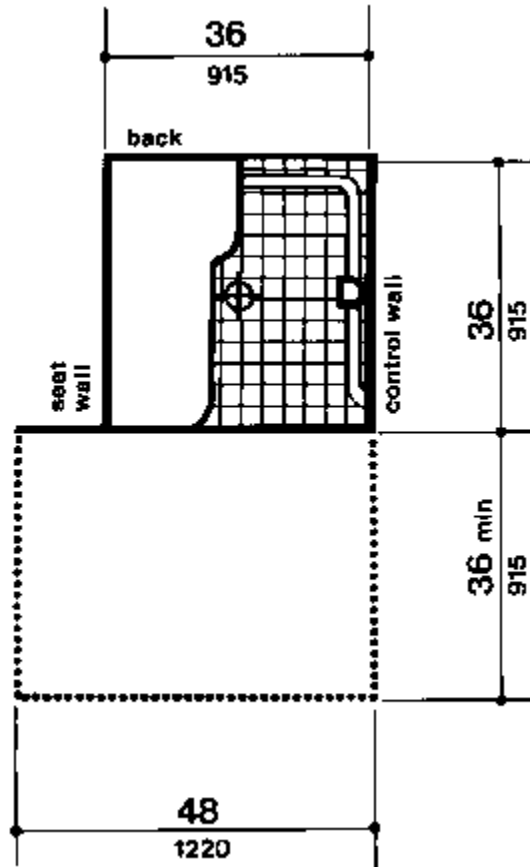


Figure 35(a)
Shower Size and Clearances
36-in by 36-in (915-mm by 915-mm) Stall

The clear floor space shall be a minimum of 48 inches (1220 mm) in length by a minimum of 36 inches (915 mm) in width and allow for a parallel approach. The clear floor space shall extend 1 foot beyond the shower wall on which the seat is mounted.

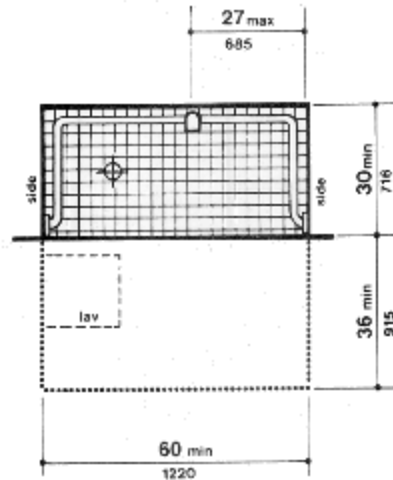


Figure 35(b)
Shower Size and Clearances
30-in by 60-in (760-mm by 1525-mm) Stall

The clear floor space alongside the shower shall be a minimum of 60 inches (1220 mm) in length by a minimum of 36 inches (915 mm) in width.

(2) Seat. A seat shall be provided in the shower stall in [Fig. 35\(a\)](#) as shown in [Fig. 36](#). The seat shall be 17 in to 19 in (430 mm to 485 mm) high measured from the bathroom floor and shall extend the full depth of the stall. The seat shall be on the wall opposite the controls. The structural strength of seats and their attachments shall comply with 4.26.3. Seats shall be mounted securely and shall not slip during use.

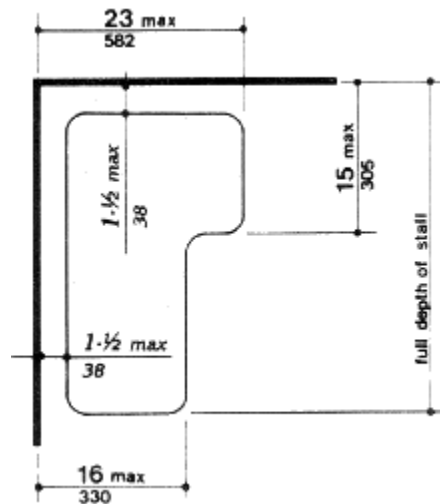


Figure 36
Shower Seat Design

The diagram illustrates an L-shaped shower seat extending the full depth of the stall. The seat shall be located 1-1/2 inches (38 mm) maximum from the wall. The front of the seat (nearest to the opening) shall extend a maximum 16 inches (330 mm) from the wall. The back of the seat (against the back wall) shall extend a maximum of 23 inches (582 mm) from the side wall and shall be a maximum of 15 inches (305 mm) deep.

(3) Grab bars. Structural reinforcement or other provisions that will allow installation of grab bars shall be provided in the locations shown in [Fig. 49](#). If provided, grab bars shall be installed as shown in [Fig. 37](#) and shall comply with 4.26.

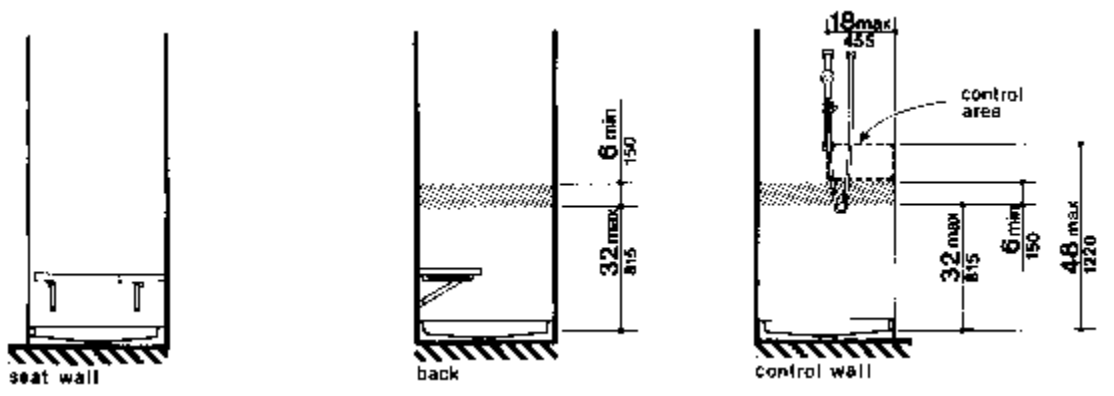


Figure 49(a)
Location of Grab Bars and Controls
of Adaptable Showers - 36-in by 36-in Stall

Note: The hatched areas are reinforced to receive grab bars.

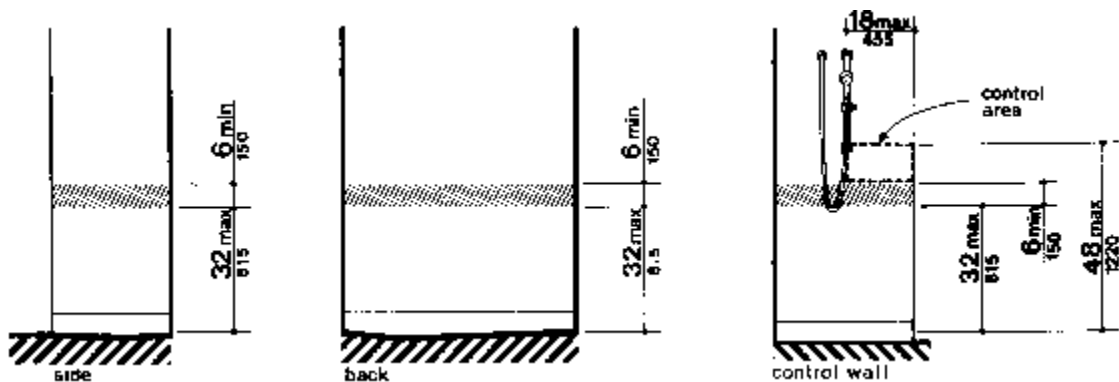


Figure 49(b)
Location of Grab Bars and Controls
of Adaptable Showers - 30-in by 60-in Stall

Note: The hatched areas are reinforced to receive grab bars.

(4) Controls. Faucets and other controls shall be located as shown in [Fig. 37](#) and shall comply with 4.27.4. In the shower stall in [Fig. 35\(a\)](#), all controls, faucets, and the shower unit shall be mounted on the side wall opposite the seat.

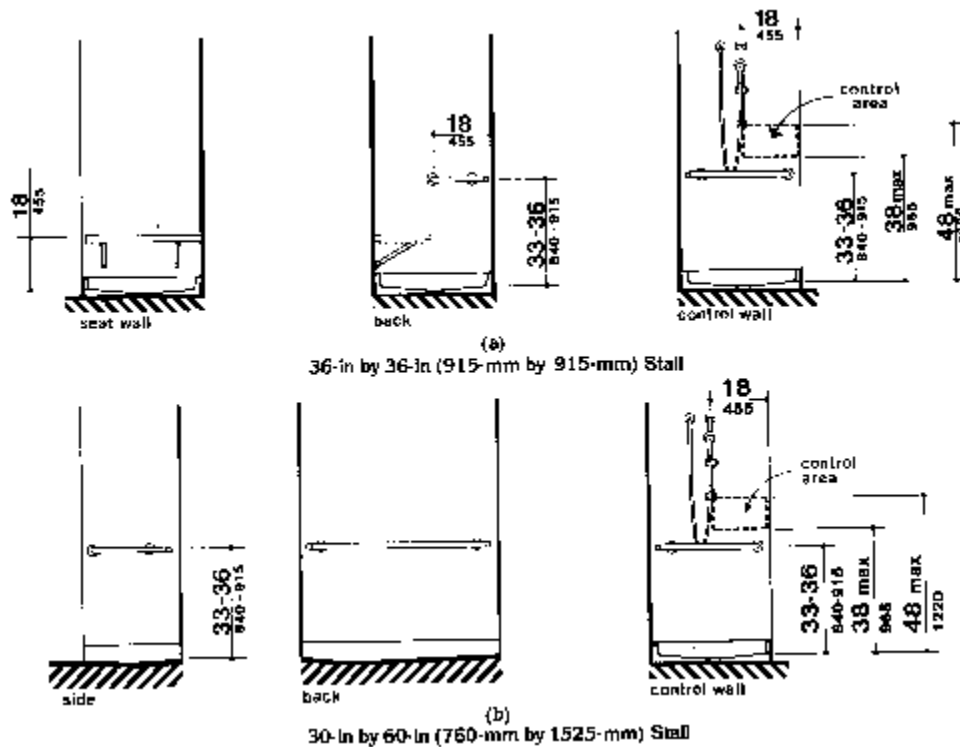


Figure 37
Grab Bars at Shower Stalls

Fig. 37(a)

36 inches by 36 inches (915 mm by 915 mm) Stall. The diagram illustrates an L-shaped grab bar that is located along the full depth of the control wall (opposite the seat) and halfway along the back wall. The grab bar shall be mounted between 33 to 36 inches (840-915 mm) above the shower floor. The bottom of the control area shall be a maximum of 38 inches (965 mm) high and the top of the control area shall be a maximum of 48 inches (1220 mm) high. The controls and spray unit shall be within 18 inches (455 mm) of the front of the shower.

Fig. 37(b)

Fig. 37(b) 30 inches by 60 inches (760 mm by 1525 mm) Stall. The diagram illustrates a U-shaped grab bar that wraps around the stall. The grab bar shall be between 33 to 36 inches (840-915 mm) high. The controls are placed on a side wall in an area between 38 inches and 48 inches (965 mm and 1220 mm) above the floor. The controls and spray unit shall be within 18 inches (455 mm) of the front of the shower.

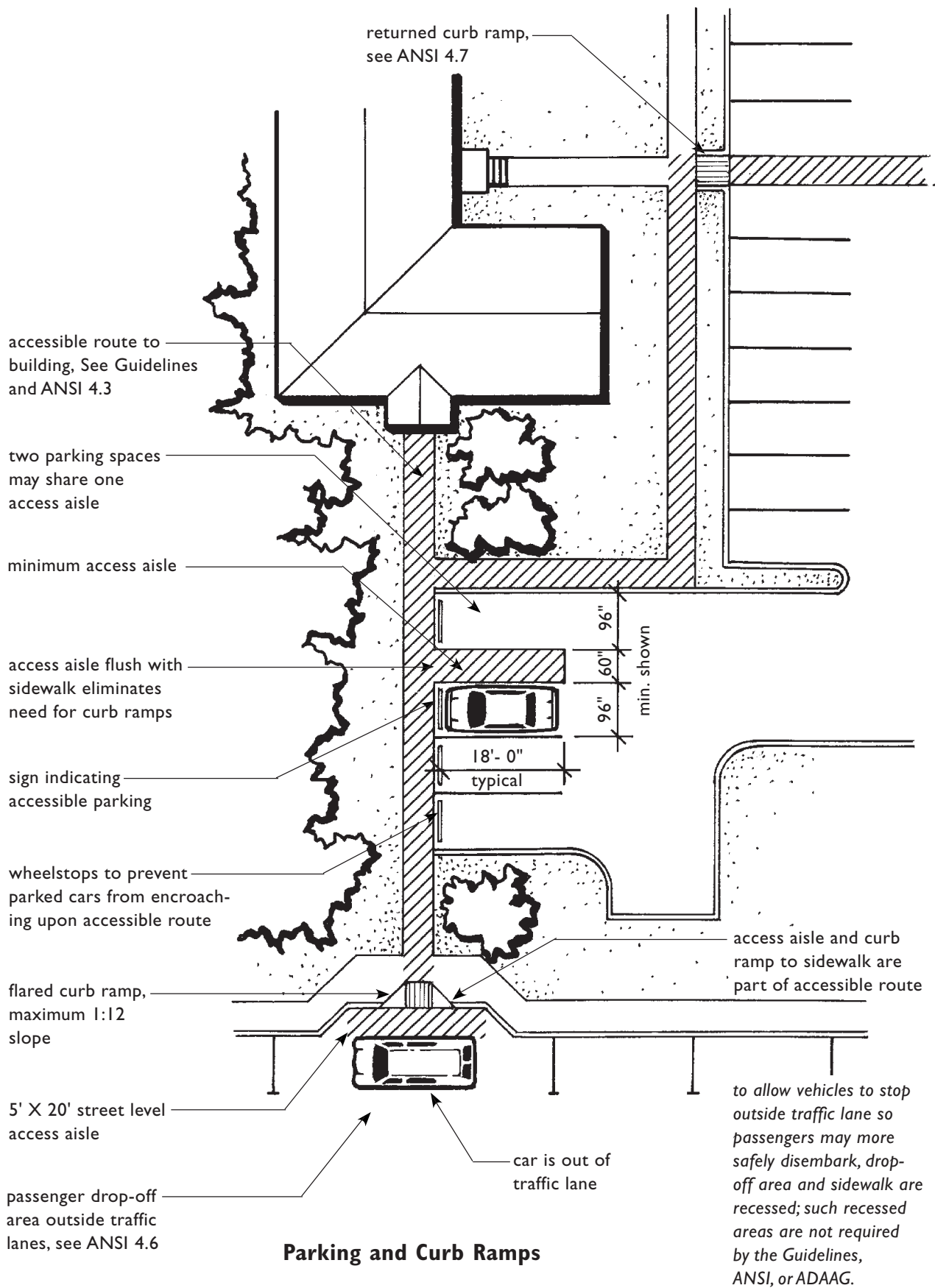
(5) Shower unit. A shower spray unit with a hose at least 60 in (1525 mm) long that can be used as a fixed shower head at various heights or as a hand-held shower shall be provided.
<http://www.access-board.gov/ufas/ufas-html/ufas.htm#4.34>

Visual Guide to the Accessibility Checklists

Part II: Fair Housing Act Design Manual (DM)

The Fair Housing Act Design Manual is published by HUD and implements the Fair Housing Act Accessibility Guidelines. The implementation date was March 13, 1991. Projects funded after this date must comply with the Fair Housing Act Accessibility Guidelines. For the full text of the Design Manual, see: <http://www.huduser.org/publications/pdf/fairhousing/fairintro.pdf>

This guide is not intended to address all accessibility requirements of any Federal, State or local laws or regulations, nor should this information be relied on for that purpose. To ensure full compliance, borrowers, architects, agency officials, contractors and other interested persons should refer to the Uniform Federal Accessibility Standards and all other applicable Federal, State and local standards. The Owner(s) of the property are responsible for compliance with all applicable accessibility regulations.

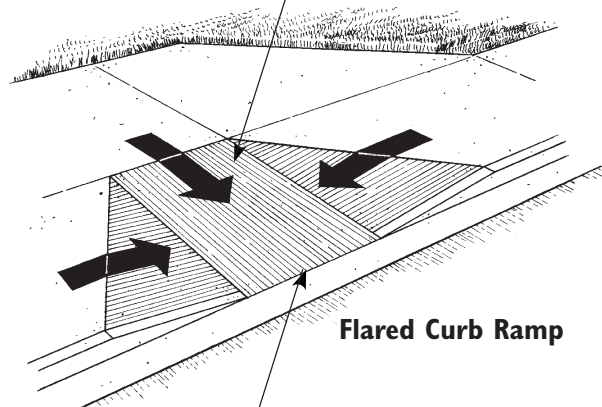


Parking and Curb Ramps

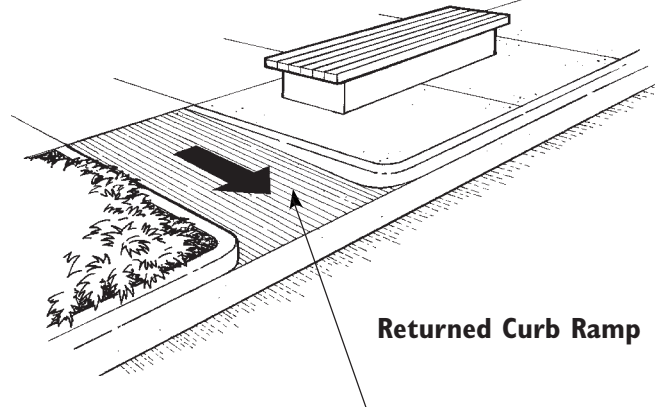
required textures on curb ramps, see ANSI 4.7.7

flared curb ramp allows people to walk safely across it

returned curb ramp needs protection so people will not trip on it



Flared Curb Ramp



Returned Curb Ramp

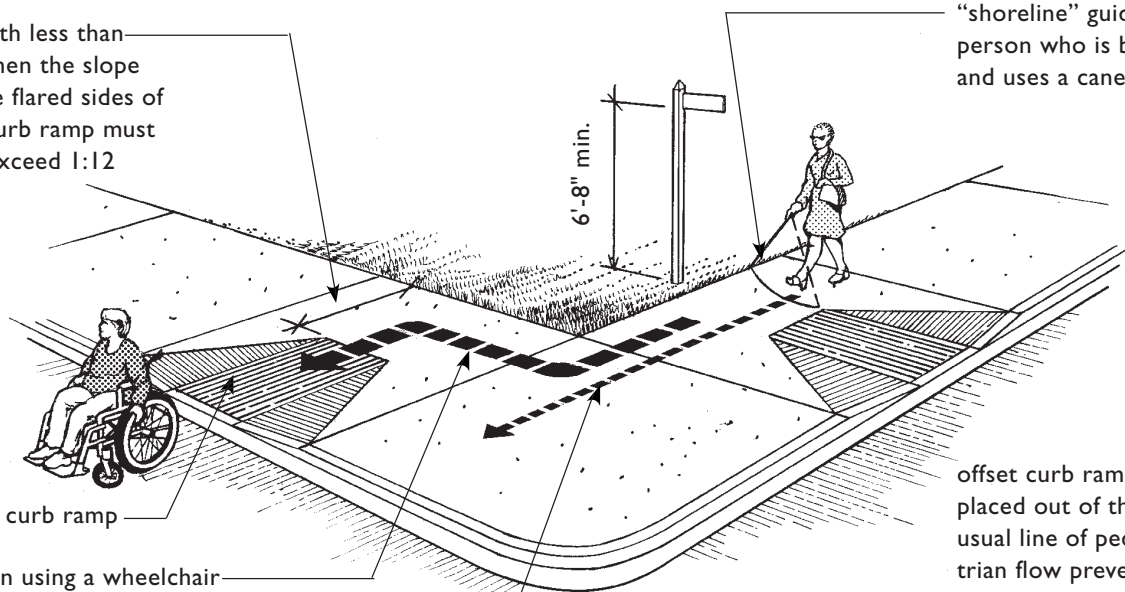
smooth transition with no lip or drop-off here

The "flared curb" ramp is safest and allows people to enter the ramp directly or from a side angle. This design is best used where pedestrians are likely to walk across the ramp.

The "returned curb" ramp has the curb "turned back" the full depth of the ramp. This design can be a tripping hazard to pedestrians and should be used only where adjacent plant beds or other features will prevent approach from the sides.

required textures on curb ramps, see ANSI 4.7.7

if width less than 48" then the slope of the flared sides of the curb ramp must not exceed 1:12



6'-8" min.

"shoreline" guides person who is blind and uses a cane

flared curb ramp

person using a wheelchair must take short detour

path of a person with visual disability to the curb

Offset Curb Ramps

offset curb ramp placed out of the usual line of pedestrian flow prevents person with visual disability from walking out into road before realizing it

Types of Curb Ramps

WHAT IS AN ACCESSIBLE ROUTE ?

An accessible route is a continuous, unobstructed path through sites and buildings that connects all accessible features, elements, and spaces. It is the critical element that allows the successful use of any site or building by a person with a disability. Such a route is safe for someone using a wheelchair or scooter and also is usable by others.

Accessible routes on a site may include parking spaces, parking access aisles, curb ramps, walks, ramps, and lifts. Accessible routes within buildings may include corridors, doorways, floors, ramps, elevators, and lifts. Specifications for accessible routes are found in ANSI 4.3. Certain elements of accessible routes which must be given careful attention are:

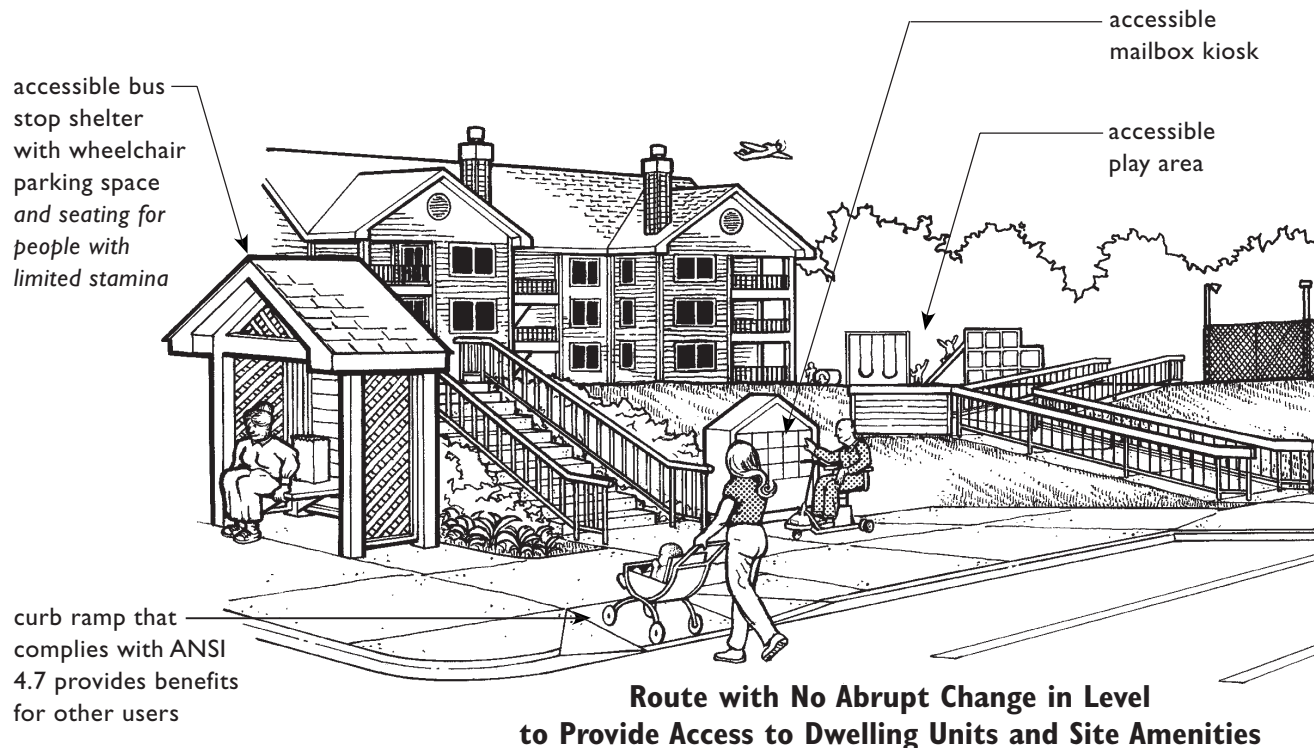
- width of route
- slope of route
- ground and floor surfaces
- cross slope
- headroom
- curb ramps
- protruding objects
- lift/elevator design

These elements are discussed in detail in Part Two, Chapter 2.

Stairs and Accessible Routes

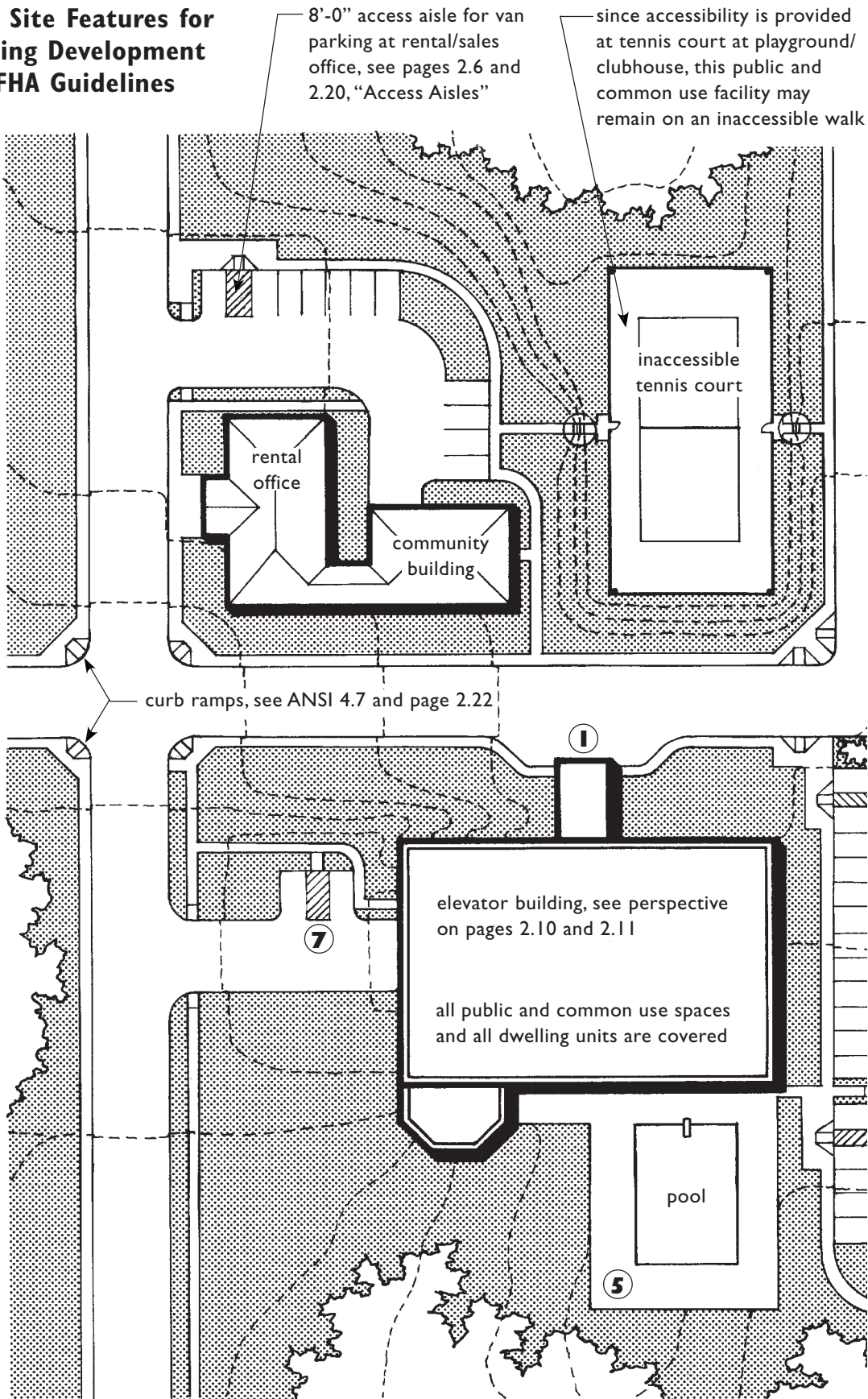
Stairs are not an acceptable component of an accessible route because they prevent use by people using wheelchairs and others who cannot climb steps. ANSI specifications for accessible stairs (4.9) make stairs safer and more usable by mobility impaired people who can climb stairs.

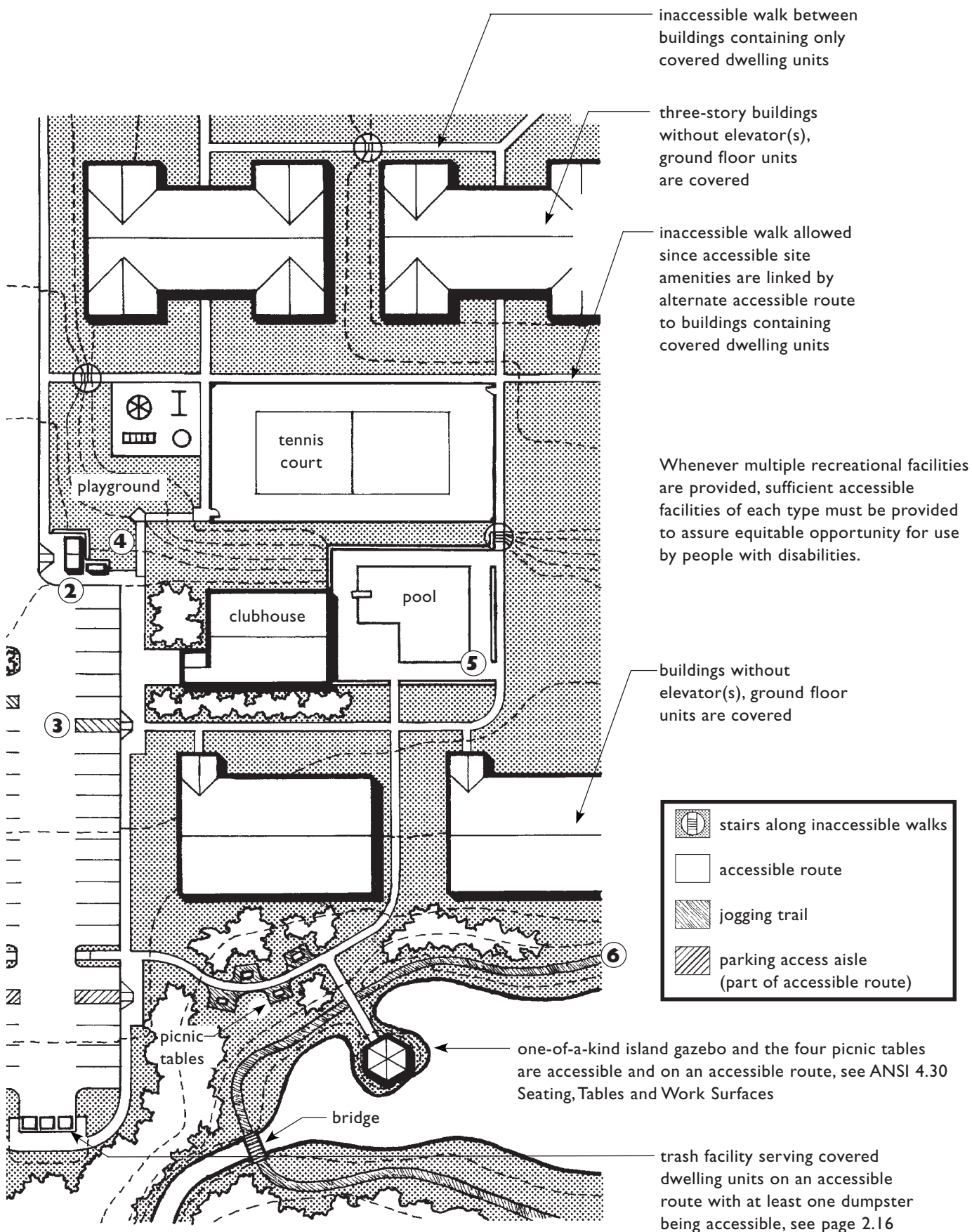
accessible routes must connect covered dwelling units with accessible site facilities (and at least one of each type of recreational facility when more than one of each is provided at any location)

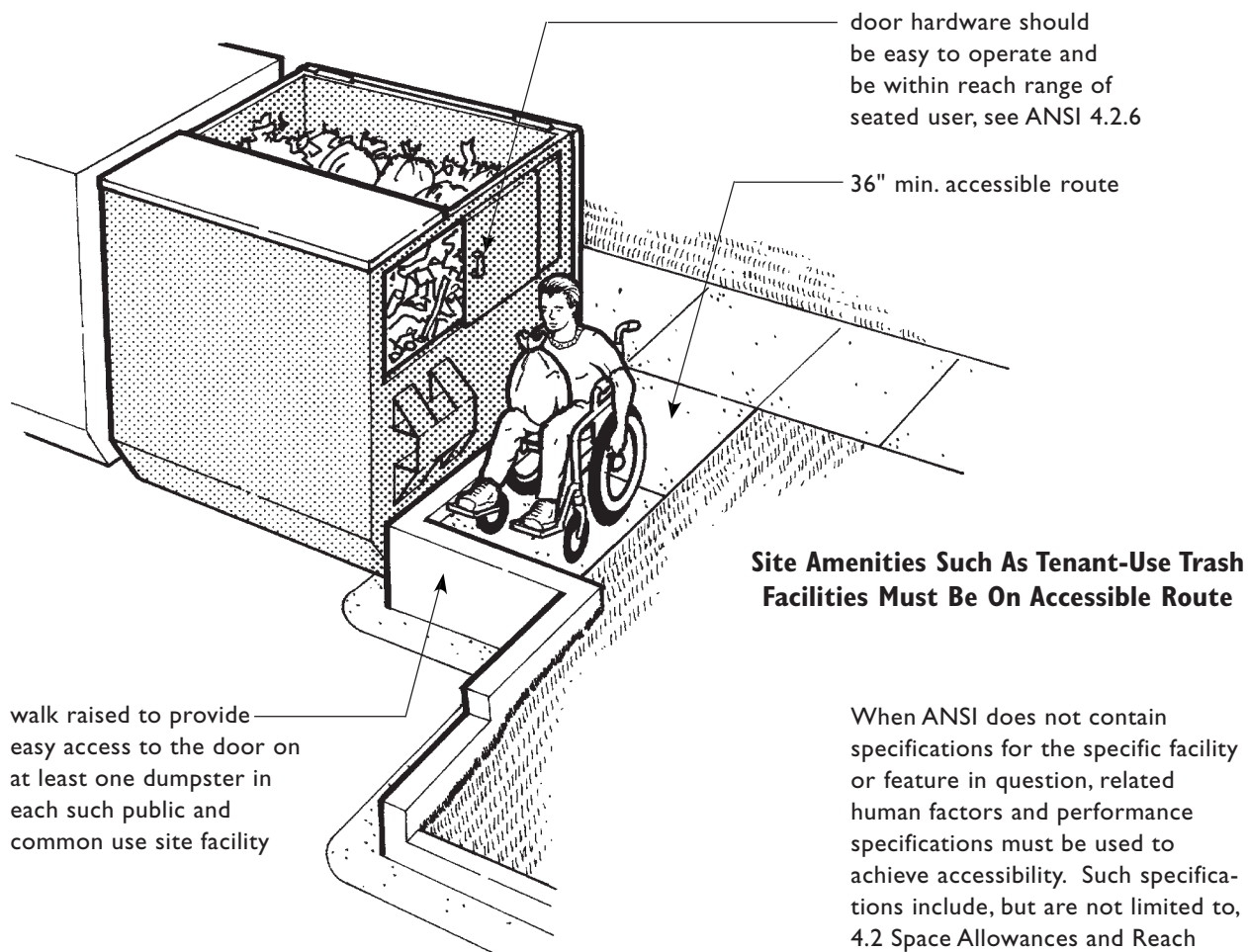


Example: Accessible Site Features for a Multifamily Housing Development Covered by the FHA Guidelines

- ① accessible passenger loading zone, see ANSI 4.6
- ② accessible bus shelter (pedestrian arrival point) on an accessible route, see drawing on page 1.6
- ③ accessible resident and visitor parking, see page 2.23
- ④ ramp from upper level of site with tennis court to lower level with clubhouse is part of a required accessible route and must meet ANSI 4.8 Ramps
- ⑤ both pools must be on an accessible route that continues around the apron (access into water not required) since they serve separate buildings containing covered dwelling units
- ⑥ all or a portion of jogging trails must be accessible where practical; this trail is accessible from this point to bridge (smooth, level, paved surface with no abrupt change in level); beyond bridge, trail is inaccessible
- ⑦ van accessible space, see page 2.13, note 16







WALKS EXEMPT FROM ACCESSIBLE ROUTE REQUIREMENTS

On-grade walks between separate buildings containing only covered dwelling units are not required to be accessible. However, if the grade of walks between buildings containing only dwelling units does not exceed 8.33%, it is recommended that these walks meet the requirement for accessible routes and not be interrupted by steps. If these walks are made accessible, handrails will not be required on any part of the walk where the slope is between 5% and 8.33%.

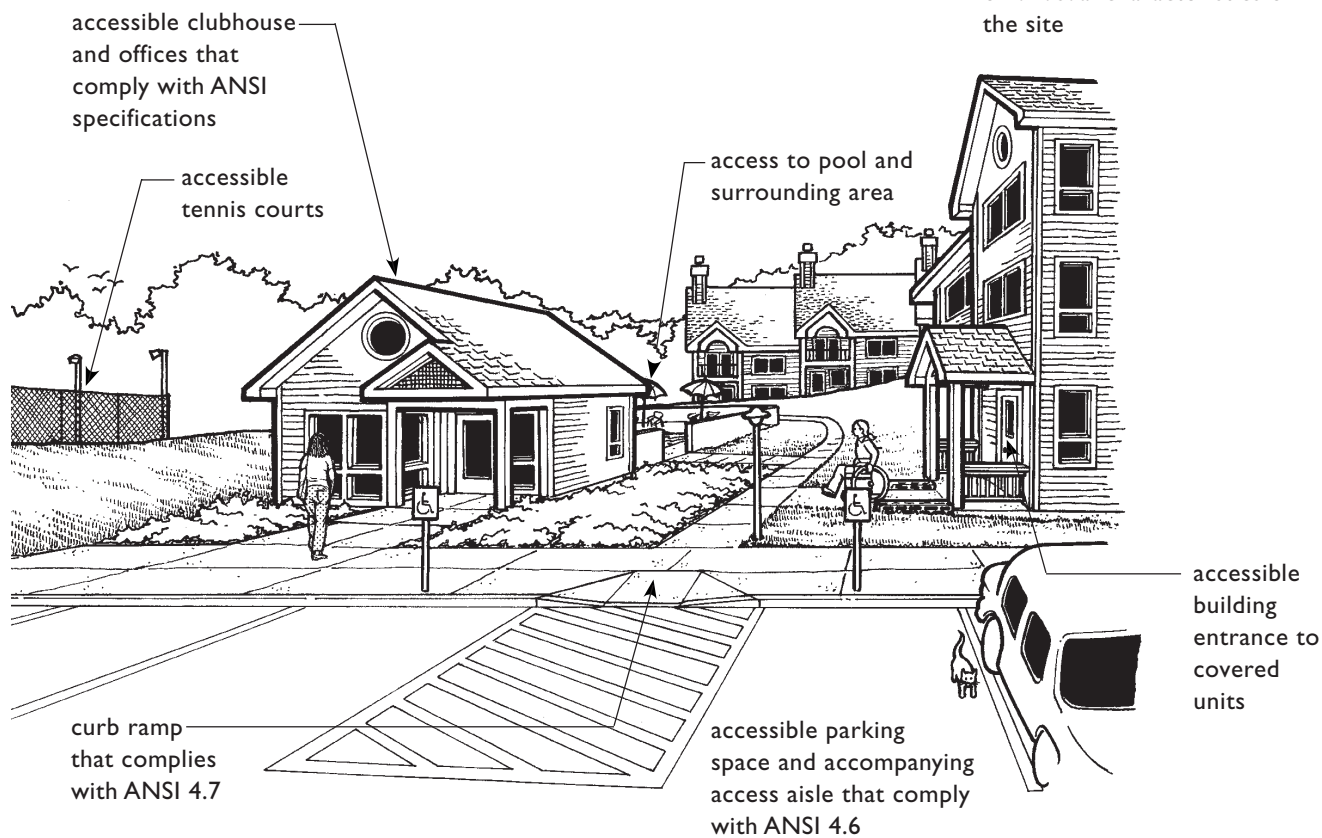
It is important to note, however, that if walks between buildings containing only covered dwelling units are also part of a required accessible route—for example, if the walk serves as the route to a common use facility located nearby—then the route would be required to be accessible. (See page 1.8, “Accessible Routes and Walks Between Accessible Buildings and Site Facilities.”)

When stairs are installed along routes that are required to be accessible, there must be an alternative way to get between levels. If the alternative way is an elevator or lift, the stairs do not need to comply with ANSI 4.9. If the alternative way is a ramp, the stairs must comply with ANSI 4.9. When an accessible route consists of both a ramp and stairs, it is best if they are located in close proximity so people who can use only one of the two (such as the ramp), need not travel an unreasonable additional distance.

Walks on Accessible Routes

Walks that are part of accessible routes become ramps when their slope exceeds 5% (1 in 20). Handrails are not required on walks with slopes between 0% and 5%, but they are required on those steeper than 5% and up to 8.33% (1 in 12). Slopes steeper than 8.33% are not usable by most people with disabilities and cannot be considered part of an accessible route. Handrail requirements for walks differ, depending upon which buildings the walks connect. This is addressed in the following sections.

each building on site must have at least one building entrance on an accessible route unless prohibited by extreme terrain or unusual characteristics of the site



WHERE ARE ACCESSIBLE ROUTES REQUIRED ON SITES?

Accessible Route from Site Arrival Points to Accessible Building Entrances

The Guidelines require that an accessible route be provided from public transportation stops, accessible parking spaces, accessible passenger loading zones, and public streets or sidewalks to accessible building entrances unless it is impractical to do so as determined by application of the site tests specified in Requirement 1 (site impracticality due to terrain or unusual site characteristics, see page 1.38). Because these walkways are required to be accessible, handrails, as per ANSI, must be provided when the slope of the walk is between 5% (1 in 20) and 8.33% (1 in 12).

Accessible Routes and Walks Between Accessible Buildings and Site Facilities

The Guidelines require accessible routes to connect buildings containing covered dwelling units (those with one or more elevators and ground floors of other buildings, except two-story townhouses) and accessible facilities, elements, and spaces on the same site. The Guidelines do not require accessible routes, walks, or paths between buildings containing only covered dwelling units unless the route is also part of a required accessible route. For example, if a building also contains a facility such as a laundry that is shared by two buildings, then an accessible route must be provided between the two buildings.

If no portion of the finished grade of a route between two buildings that contain only dwelling units exceeds 8.33% (1 in 12), it is

recommended that the route be made accessible. Such voluntary accessible walks must meet the same specifications as an accessible route except that handrails, commonly required on accessible routes when their slope exceeds 5% (1 in 20), are not required.

Accessible Site Facilities on Accessible Routes

The Guidelines require accessible and usable public and common use areas. All facilities, elements, and spaces that are part of public and common use areas must meet ANSI 4.1 through 4.30 and must be on an accessible route from covered dwelling units. Such facilities might include outside mailboxes, site furnishings, outside storage areas, refuse disposal areas, playing fields, amphitheaters, picnic sites, swimming pools and sun decks, tennis courts, clubhouses, playgrounds, gazebos, parking areas, sidewalks, and all or part of nature trails and jogging paths.

Where multiple recreational facilities of the same type are provided at the same location on the site (e.g., tennis courts), not all but a “sufficient” number of the facilities must be accessible to ensure an equitable opportunity for use by people with disabilities. Whenever only one of a type of recreational facility is provided at a particular location on the site, it must be accessible and connected by an accessible route to the covered dwelling units. (See Chapter 2: “Accessible Public and Common Use Spaces.”)

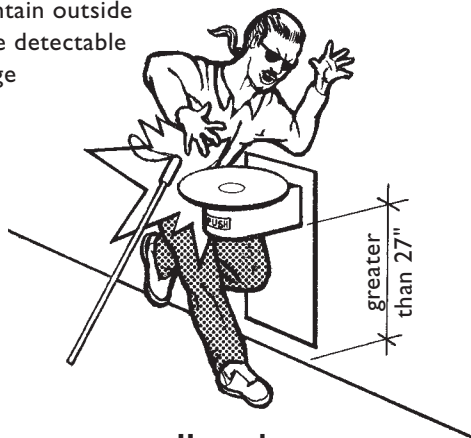
PROTRUDING OBJECTS

Many people with visual impairments use a long cane for guidance. The cane is used to follow a “shoreline” such as the edge of a sidewalk or a curb or, indoors, the baseboard of a wall. The cane, when swept ahead of the user, also detects obstacles in the path. Objects which protrude from walls or hang from overhead are not detectable and are, therefore, hazardous because a person with a visual disability can not avoid running into them.

Detectable items are obstacles that can be maneuvered around.

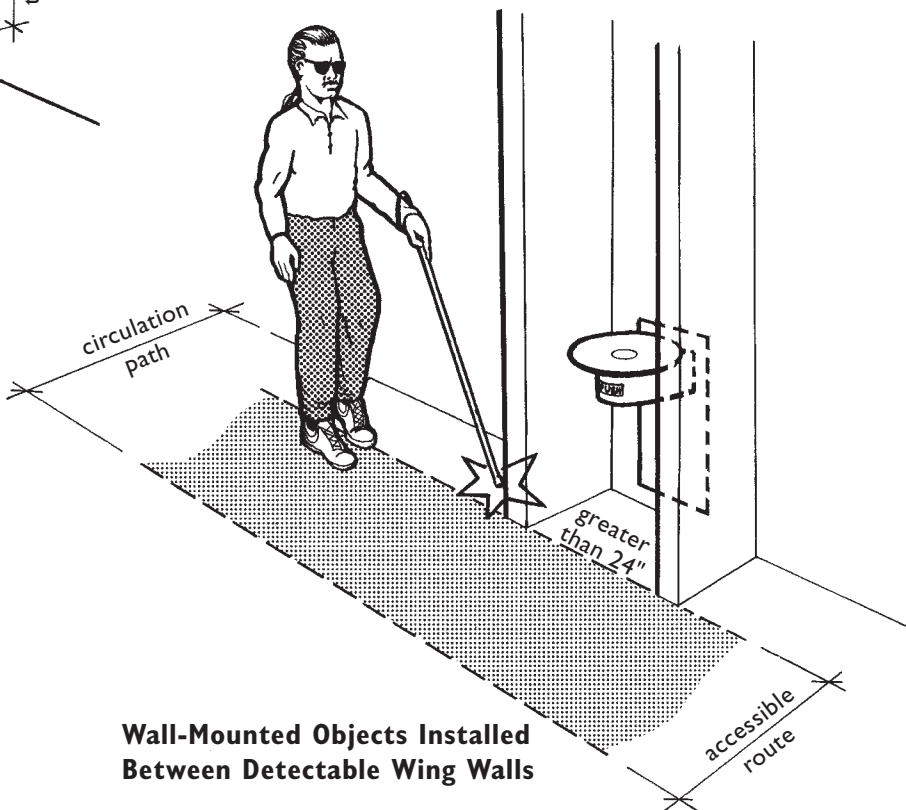
There must always be a 36-inch wide accessible route around any obstacle. Large wall-mounted items such as fire extinguishers and telephone enclosures must be recessed, set in alcoves, or designed so they have structures extending close to the floor, no higher than 27 inches, and within the long cane detectable area.

bottom edge of fountain outside cane detectable range



Hazardous Protruding Objects

wing walls or other detectable warning barrier must not reduce accessible route



Wall-Mounted Objects Installed Between Detectable Wing Walls

good general illumination

weather protection

high intensity lighting focused at locks for people with low vision

color contrast between door and frame

clear, readable, high contrast signage

door closer with safe sweep period (ANSI 4.13.10)

view window (or wide angle peep hole in door)

lever or other easy-to-use door hardware (ANSI 4.13.9)

maneuvering space next to latch side of door (ANSI 4.13.6)

clear width of open doorway min. 32" (ANSI 4.13.5)

low force to open door (ANSI 4.13.11)

adequate slope to prevent ice build-up

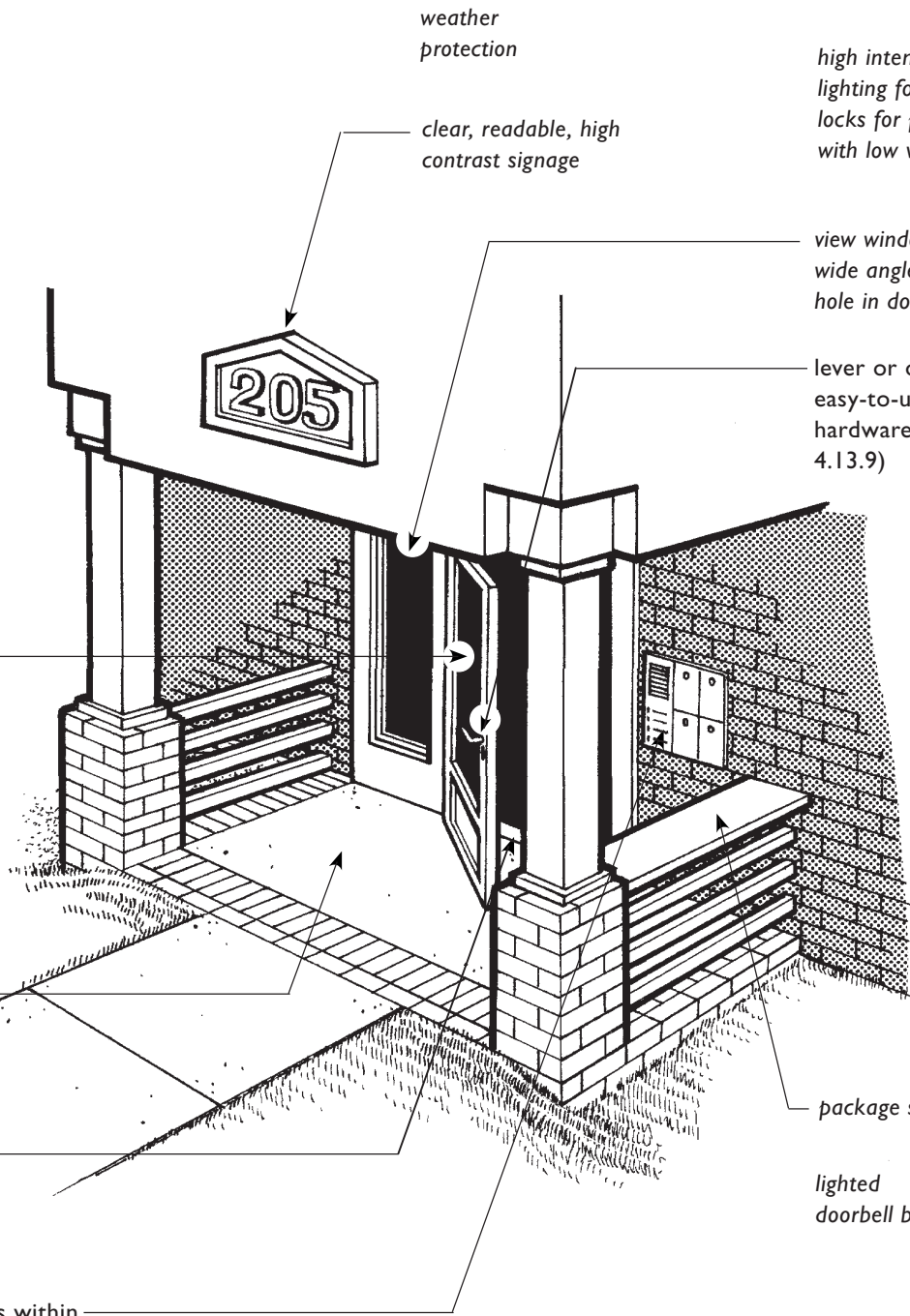
package shelf

low or no threshold (ANSI 4.13.8)

lighted doorbell buttons

Call and mail boxes within reach of a seated person.

Call boxes should be equipped with both visual and audible signals so as to be usable by both hearing and non-hearing people.



Design of Accessible Building Entrances

Notes in italic type are recommendations only and are not required by ANSI or the Guidelines. All recommended features are helpful to people with and without disabilities.

INTRODUCTION

The ANSI specifications for accessible controls and operating mechanisms require a clear floor space to allow an approach by a person using a wheelchair, specify the height of the operable portion of the control, and require little or no force be exerted to operate the control. The Fair Housing Accessibility Guidelines (the Guidelines) do not require controls to be fully accessible but specify that light switches, electrical outlets, thermostats and other environmental controls, which are operated on a regular or frequent basis in the daily use of a dwelling unit, be in accessible locations.

The Guidelines' specifications for accessible locations, based on the ANSI (A117.1 - 1986) Standard, address where to position controls and outlets to be within the reach range of a seated user. Force and type of motion required to operate controls are not covered by the Guidelines.

CONTROLS AND OUTLETS SUBJECT TO THE REQUIREMENTS OF THE GUIDELINES

Environmental controls such as thermostats and other heating, air-conditioning, and ventilation mechanisms including ceiling fans and electrically operated skylights must be positioned in accessible locations, as must **light switches** and **electrical outlets** for each room. All these covered controls and outlets must be in accessible locations, with a few exceptions.

The Guidelines allow, for example, controls or outlets that do not satisfy the requirements, if comparable controls or outlets in accessible locations are provided within the same area. Comparable controls or outlets are those that perform the same function. For example, floor outlets (which are inaccessible) or outlets mounted in the corner of kitchen counters are permitted under the Guidelines, provided other outlets are available to serve the same space or area.

Controls and outlets not covered by the Guidelines include circuit breakers or electrical outlets dedicated to individual appliances such as refrigerators, built-in microwave ovens, washing machines, and dryers because neither circuit breakers nor these outlets are accessed frequently by residents. Appliance controls are not required to be in accessible locations because the Fair Housing Act is not intended to regulate the design of appliances.

Thus, when appliance controls are built into or are located on the appliance itself, they are not considered to be covered controls. Range or washing machine controls need not be within the reach range of seated users, although certainly it is preferred that such controls be within reach. Range

hood fan and light controls, when mounted on the hood, are part of an appliance and are, therefore, not covered. However, if the range hood fan and light are wired to a separate switch on a wall or any location other than on the hood, range, or cooktop, then the control must be in an accessible location.

Garbage disposals do not fall under any of the categories of covered controls. The operating switch for a garbage disposal is not mounted on the appliance itself but is wired to another location. Although not a covered control, since garbage disposals are used frequently and since it is relatively simple to place operating switches for

garbage disposals in accessible locations, it is recommended that it be done.

Emergency interrupt switches to mechanical systems such as furnaces or hot water heaters also are not covered by the Guidelines. However, it is recommended that such switches be in locations that can be reached from a seated position. Even when the mechanical system is located behind a narrow door in a small closet dedicated specifically to that purpose, it is recommended that the interrupt switch be positioned so it can be reached from outside the closet by a person using a wheelchair.

SWITCHES, OUTLETS, AND CONTROLS COVERED BY THE GUIDELINES

Covered

- light switches for controlling all room lights
- electrical outlets
- environmental controls
thermostats and controls for other heating, air-conditioning, and ventilation systems

Not Covered

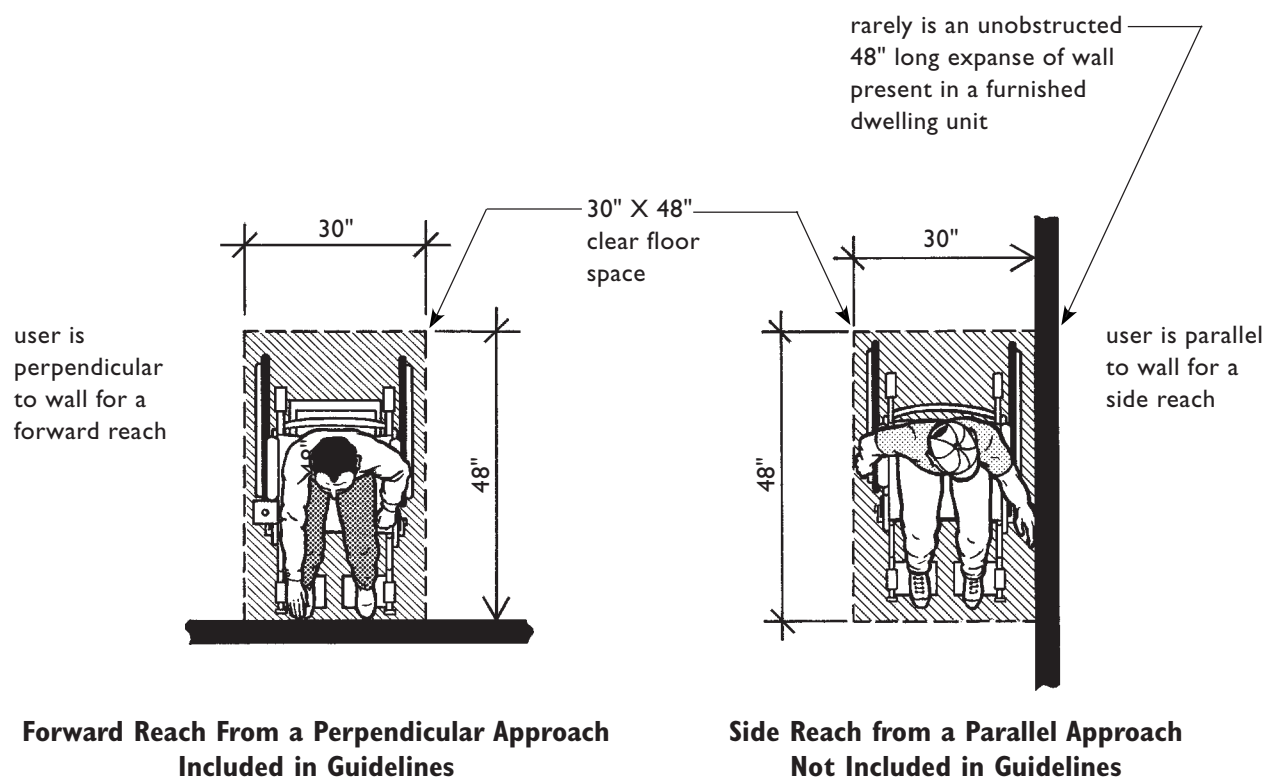
- circuit breakers
- appliance controls
- outlets dedicated for specific appliances

ACCESSIBLE LOCATIONS

The Guidelines contain height specifications for wall-mounted controls and outlets based upon the reach ranges of seated people given in the ANSI Standard. Typically ANSI and other accessibility standards present reach ranges for both forward and side reaches: **1.** where the user must reach over an obstruction, and **2.** where the user's approach is not restricted by an obstruction. One of these positions, a side reach from a parallel position without an obstruction, requires a 48-inch long clear floor space parallel and close to the wall so a user can get close enough to reach controls and

switches. Once a dwelling unit is furnished, sufficient room to execute such a parallel approach usually is not available; thus this specification was omitted from the Guidelines.

To accommodate all users in situations where there may or may not be a built-in counter, base cabinet, or other obstruction to interfere with reach, the Guidelines include specific requirements for mounting controls and switches so a person using a wheelchair can execute: **1.** a forward reach with no obstruction, **2.** a forward reach over an obstruction, and **3.** a side reach over an obstruction.



FORWARD REACH WITH NO OBSTRUCTION

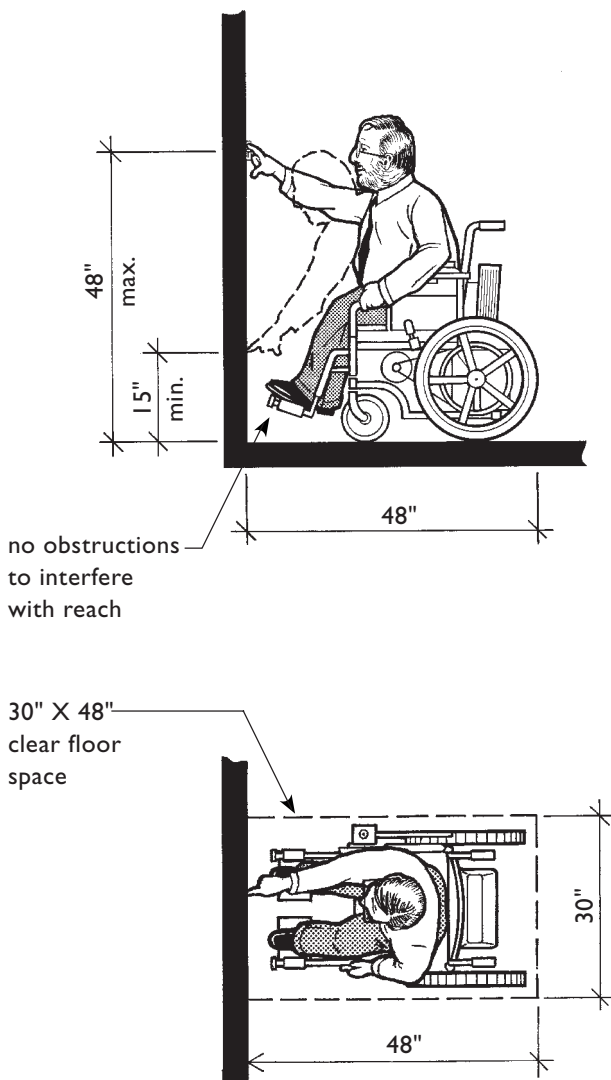
Where there are no obstructions to interfere with the reach of a person using a wheelchair, controls and outlets may be mounted in a range from 15 to 48 inches above the floor. There must be a clear floor space of 30 inches x 48 inches perpendicular to the wall, adjoining a 36-inch wide accessible route, to allow a person using a wheelchair to approach and get into position to execute a forward reach to the control or outlet. See Chapter 4: “Accessible Route into and Through the Covered Dwelling Unit.”

Thermostats and other controls that must be read pose additional considerations. Even though people using wheelchairs may be able to execute a forward reach of 48 inches at a clear wall, they may have difficulty seeing the small numerals and indicators generally found on thermostats. A person using a wheelchair, when positioned perpendicular to a wall, must lean forward over his or her feet and knees making it difficult to get close enough to read small type. Therefore, it is critical that thermostats and similar controls that must be read are mounted at or lower than 48 inches above the floor.

FORWARD REACH OVER AN OBSTRUCTION

Controls and outlets may be positioned above obstructions (e.g. built-in shelves and countertops) and still be mounted in locations that are accessible. A minimum 30-inch wide clear knee space as deep as the reach distance, adjoining a 36-inch wide accessible route, must be available below

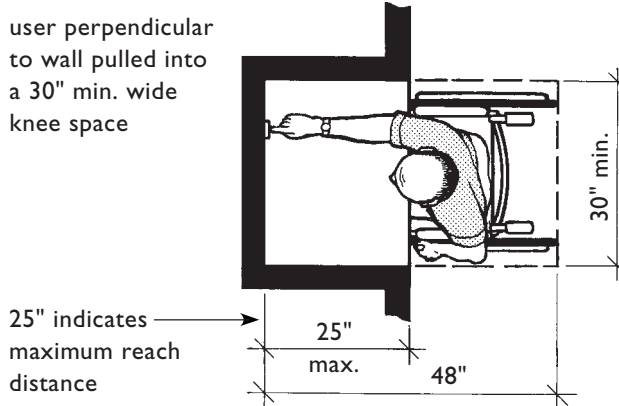
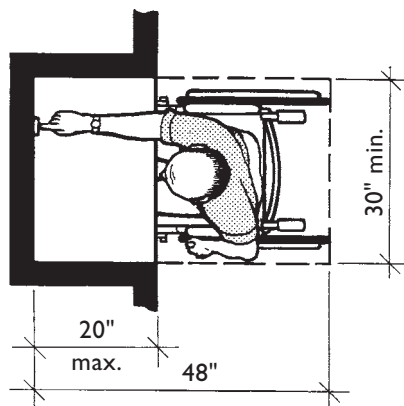
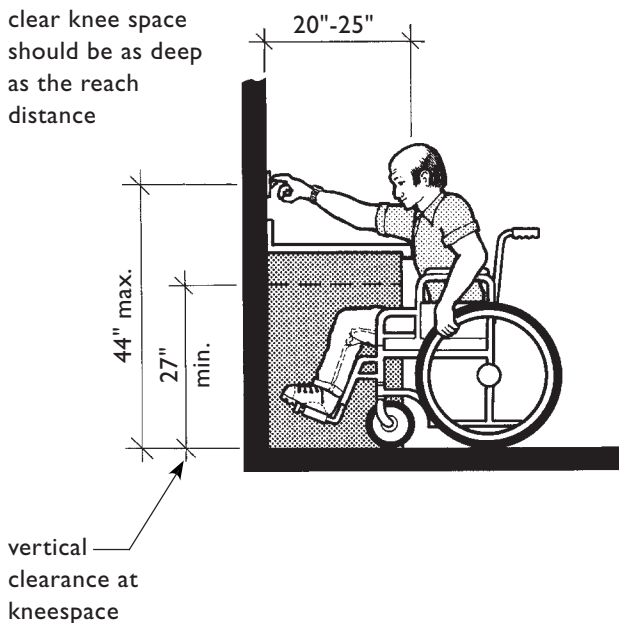
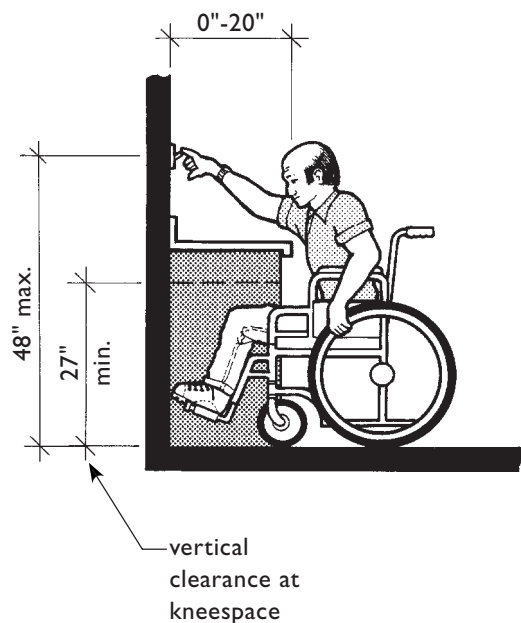
the counter/obstruction to allow a person using a wheelchair to pull up and execute a forward reach over the obstruction.



**High and Low Forward Reach Limits
 From a Perpendicular Approach**

For obstructions extending from 0 to 20 inches from the wall the maximum height for a control or outlet over the obstruction is 48 inches above the floor. Deeper shelves, extending 20 to 25 inches from the wall, reduce the maximum mounting height of controls and outlets to 44 inches. Controls and outlets mounted over obstructions

extending further than 25 inches are outside the reach range of people using wheelchairs and are not considered to be in accessible locations. However, HUD allows an industry tolerance of 1/2 inch to permit the installation of standard countertops that may project from the back wall for a maximum dimension of 25-1/2 inches.

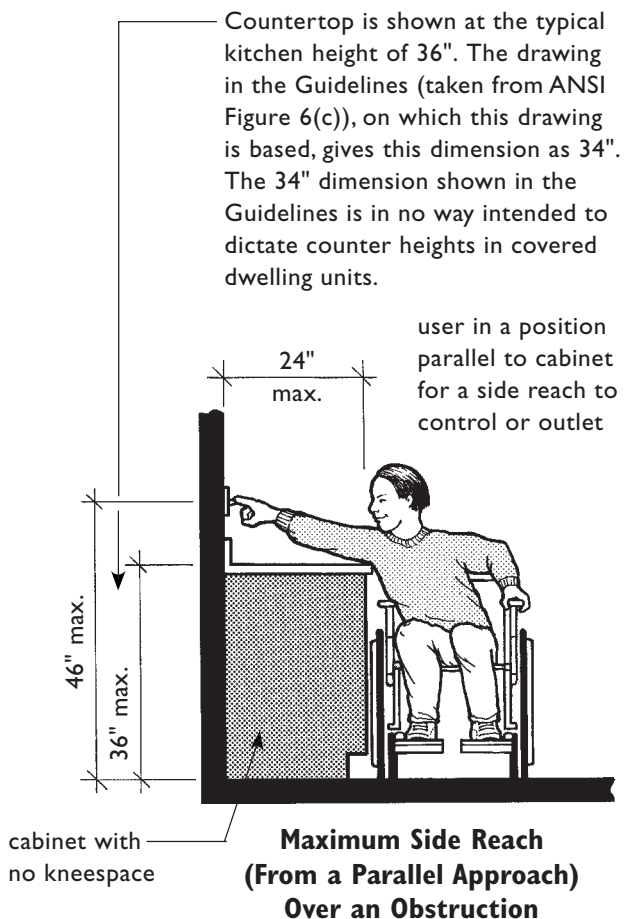


**Maximum Forward Reach
(From a Perpendicular Approach) over an Obstruction**

SIDE REACH OVER AN OBSTRUCTION

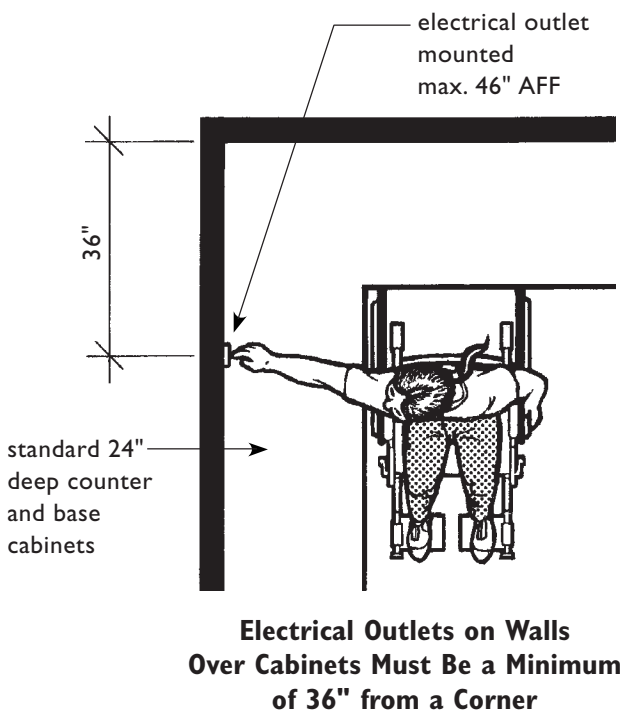
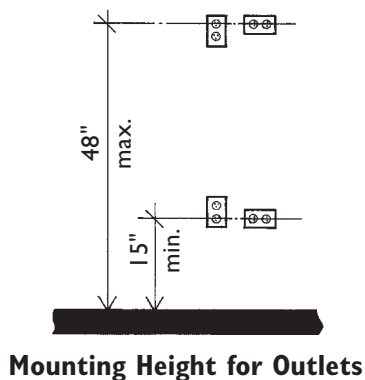
To reach controls and outlets mounted over base cabinets which lack knee space, a person using a wheelchair must be able to approach the cabinet from a position parallel to the cabinet and execute a side reach. This parallel position is made up of a 30-inch x 48-inch clear floor space adjoining a 36-inch wide minimum accessible route. When executing a side reach over a cabinet, the upper limit of the range is reduced to 46 inches.

Cabinet depth is limited to 24 inches. HUD permits use of a standard 24-inch deep cabinet with an additional extension of 1 to 1-1/2 inches for countertops for a maximum depth of 25-1/2 inches. If a built-in shelf, cabinet, or other obstruction must be deeper than 25-1/2 inches, then any switches, outlets, and controls that must be in accessible locations are not permitted to be installed over such deep surfaces.



MOUNTING LOCATIONS FOR OUTLETS

For accessible controls and outlets, all operable parts must be within the ranges specified above. When electrical outlets are installed horizontally or vertically, duplex outlets must have both receptacles within the reach range. Measurements are made as illustrated below.

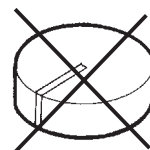


RECOMMENDATIONS FOR INCREASED ACCESSIBILITY

The Guidelines do not specify that controls and switches installed in dwelling units be accessible in terms of ease of operation, but that they be in accessible locations. For anyone specifying building products and appliances and wishing to enhance the accessibility of dwelling units, the following is a brief discussion of the types of switches and controls that increase usability for people with disabilities, as well as other persons who may experience hand limitations.

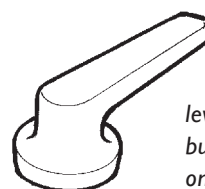
The most universally usable switches are rocker switches, toggle switches, and touch type electronic switches because they can be operated by a single touch, require little force, and do not require gripping, twisting, or fine finger dexterity.

Lever controls are generally usable by people with disabilities because they do not require grasping or significant force, and in some instances, their shape may double as an integral pointer to indicate the control's position. For people with limited strength or hand dexterity, smooth round knobs are especially difficult, as are controls that must be pushed down and turned at the same time.



smooth round knobs are difficult for people with hand limitations as well as for people with visual impairments

Poor Choice



levers are ideal but rarely found on appliances

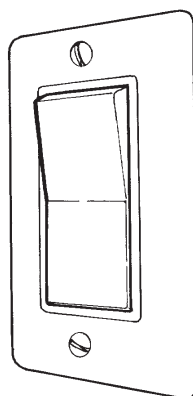


blades help indicate position and make turning somewhat easier

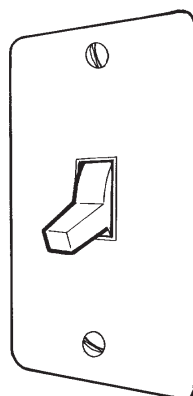


small lever or extended blade provides position pointer and leverage for easy turning without gripping

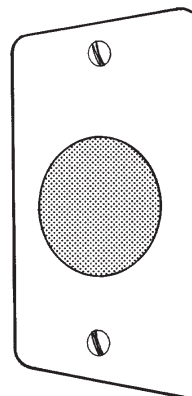
Better Control Choices



rocker



toggle



touch sensitive

Switches Most People Can Operate

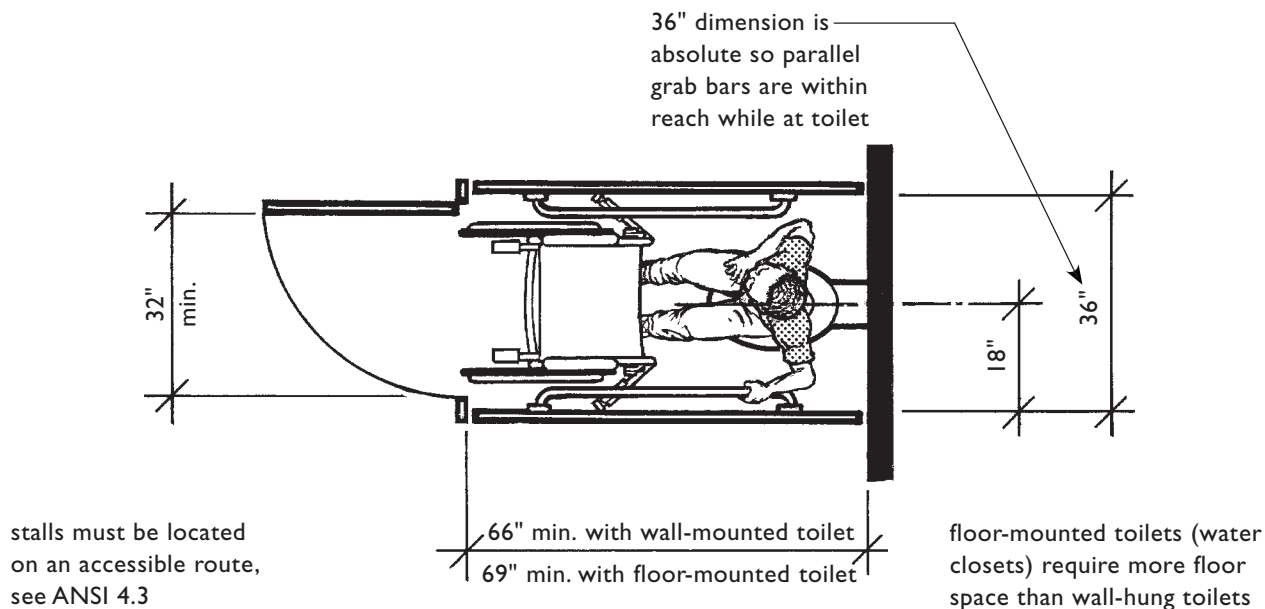
TOILET ROOMS, BATHROOMS, BATHING FACILITIES, AND SHOWER ROOMS

The Guidelines require that all toilet rooms and bathing facilities in all public and common use facilities must be on an accessible route and at least one of each fixture type in each room or space must be accessible. The ANSI Standard addresses the types of fixtures and their mounting heights, the types of controls, and the amount of clear floor space required at accessible fixtures. These specifications, combined with clearances for doors and turning spaces for wheelchairs, determine the minimum toilet room requirements. See ANSI 4.22 Toilet Rooms, Bathrooms, Bathing Facilities, and Shower Rooms.

Toilet and bathing facilities that are required to be accessible include shower/dressing rooms located on the site for use of residents and their guests in addition to such spaces as common use public toilet rooms. Although neither the Guidelines nor the ANSI contain specifications for

shower/dressing rooms, such as those which may serve a swimming pool, the applicable sections of ANSI for similar components apply in these spaces and must be provided.

Three Types of Toilet Stalls. The ANSI Standard allows considerable flexibility in the size and layout of toilet rooms. There are three types of accessible toilet stalls for use by people with different disabilities. The narrow stall is 36 inches wide and varies in length, depending on whether it has a floor-mounted or wall-hung toilet fixture. This stall was originally intended for people who walk with difficulty, many of whom use crutches and braces and who need grab bars to steady themselves when sitting down and standing up. Such people generally have good upper body strength, a characteristic not always true of people who use wheelchairs. This 36-inch wide stall, although space efficient, does not work well for many people who use wheelchairs.

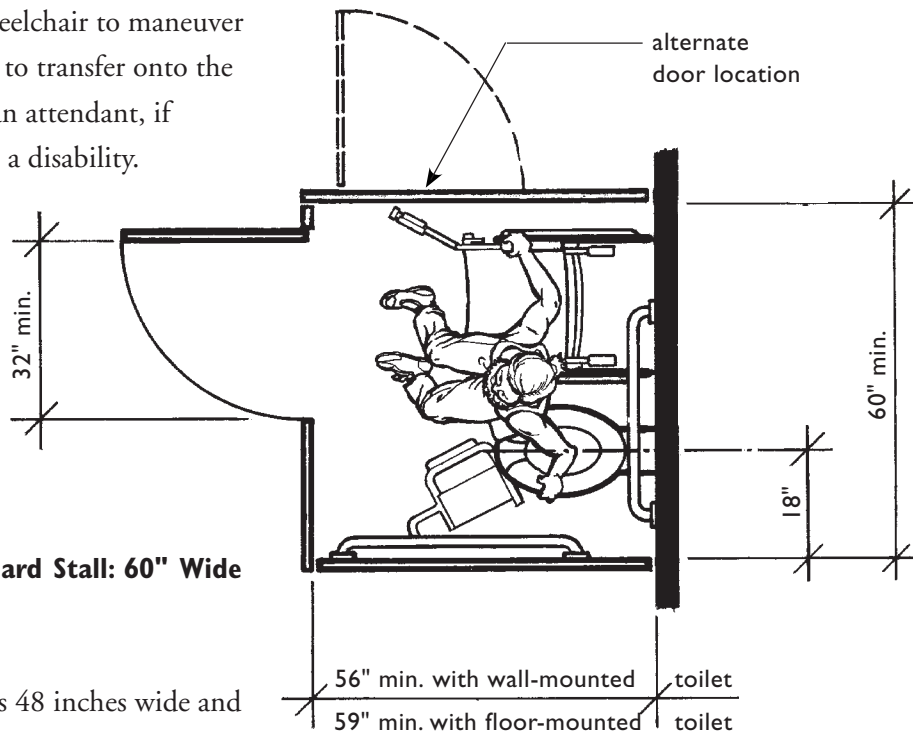


Alternate Stall I: 36" Wide

The 60-inch wide stall is a significant improvement over the narrow one because it accommodates most users. The extra floor space allows a person who uses a wheelchair to maneuver into his/her own best position to transfer onto the toilet. It also allows space for an attendant, if needed, to assist a person with a disability.

stalls must be located on an accessible route, see ANSI 4.3

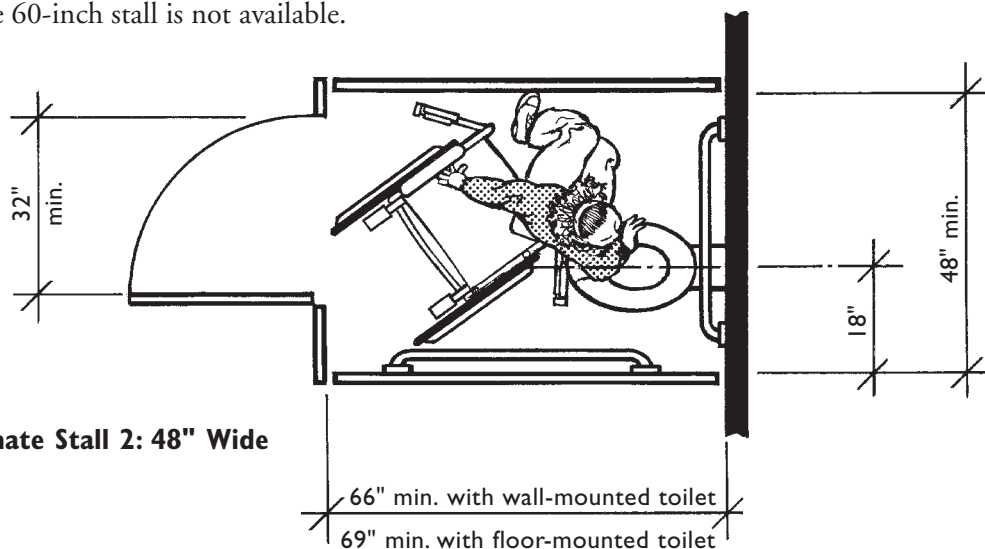
Standard Stall: 60" Wide



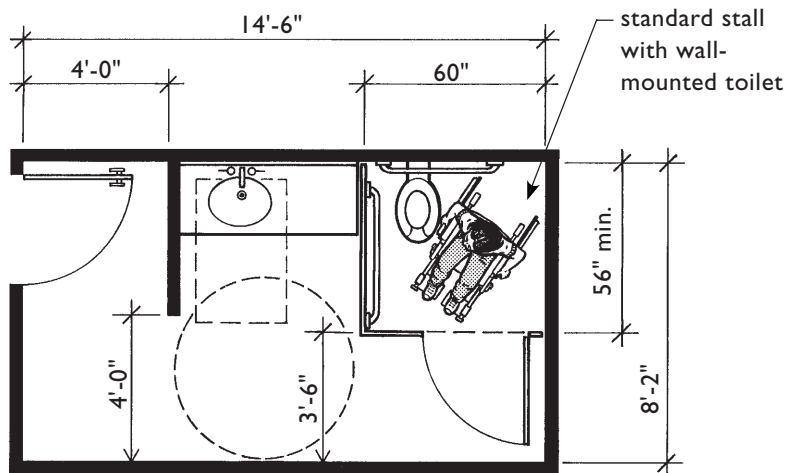
The third ANSI stall is 48 inches wide and is a compromise between the first two. This stall offers slightly more flexibility in the manner it is used by people with disabilities than the 36-inch wide stall. Since it cannot be used the same way as either of the others, it is limited in its usefulness. Often it is designed into renovation projects where sufficient space for the 60-inch stall is not available.

stalls must be located on an accessible route, see ANSI 4.3

Alternate Stall 2: 48" Wide

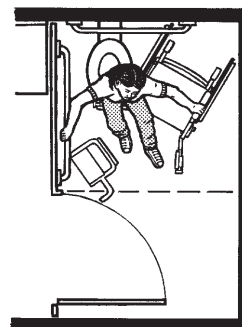


Sample plans of toilet rooms and shower/dressing rooms are presented to offer examples of how fixtures and elements can be combined into modest efficient spaces that comply with the ANSI.

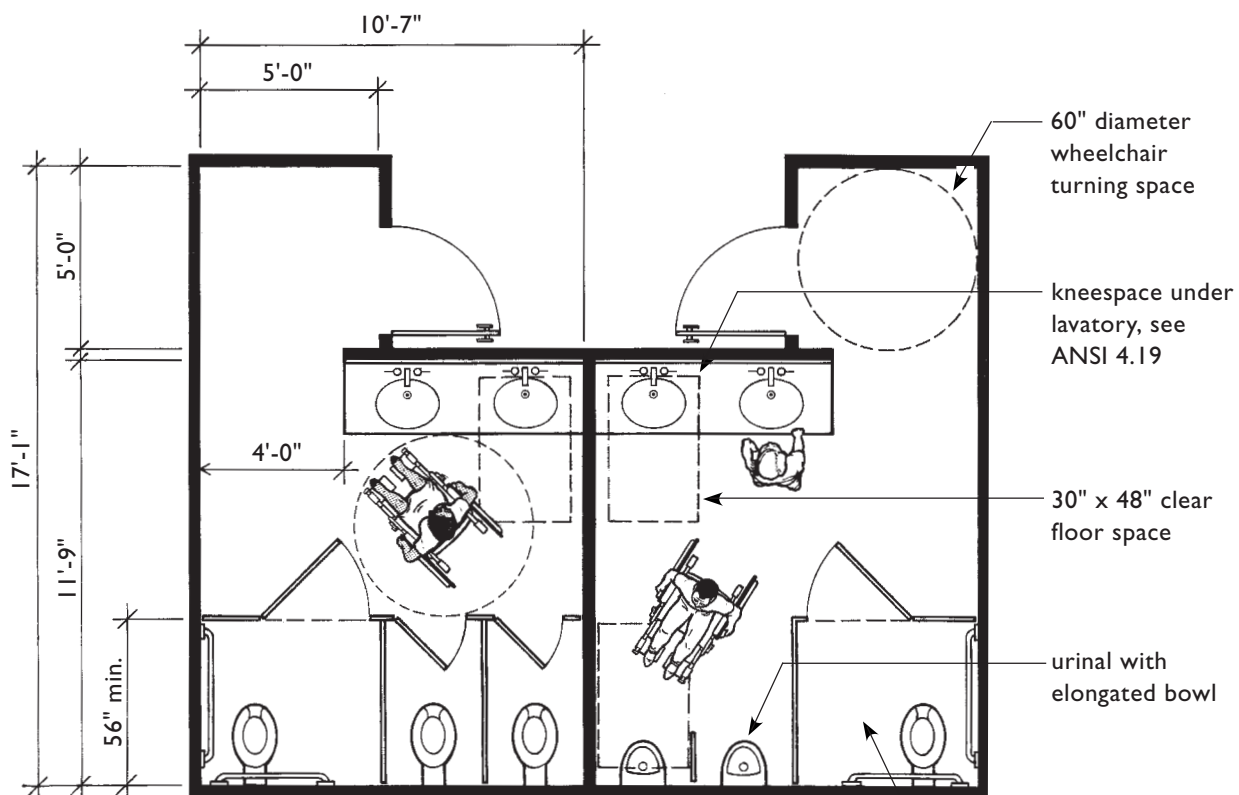


Small Toilet Room with Single Standard Stall
 Scale 3/16"=1'-0"

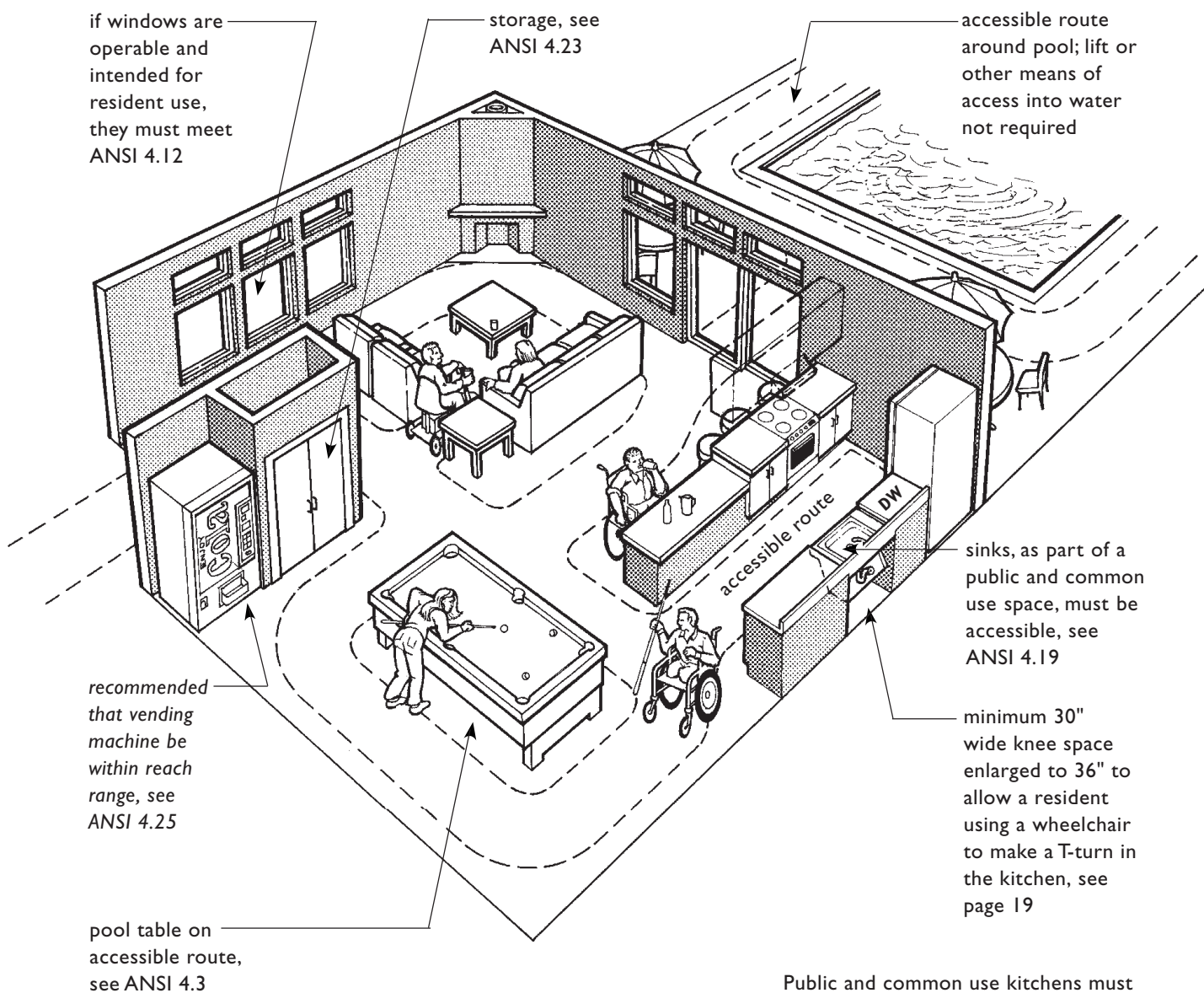
By repositioning the partition layout, additional space can be added to the toilet compartment to provide more maneuvering space without adding additional square footage to the room.



Standard Alcove or "End of Row" Stall
 Scale 3/16"=1'-0"



Larger Public and Common Use Toilet Room
 Scale 3/16"=1'-0"



Accessible Elements and Features of a Public and Common Use Clubhouse

Public and common use kitchens must be usable and at least meet the requirements in the Guidelines for kitchens. If preferred, the requirements for kitchens in ANSI 4.32 could be followed.

Notes in italic type are recommendations only and are not required by ANSI or the Guidelines. All recommended features are helpful to people with and without disabilities.

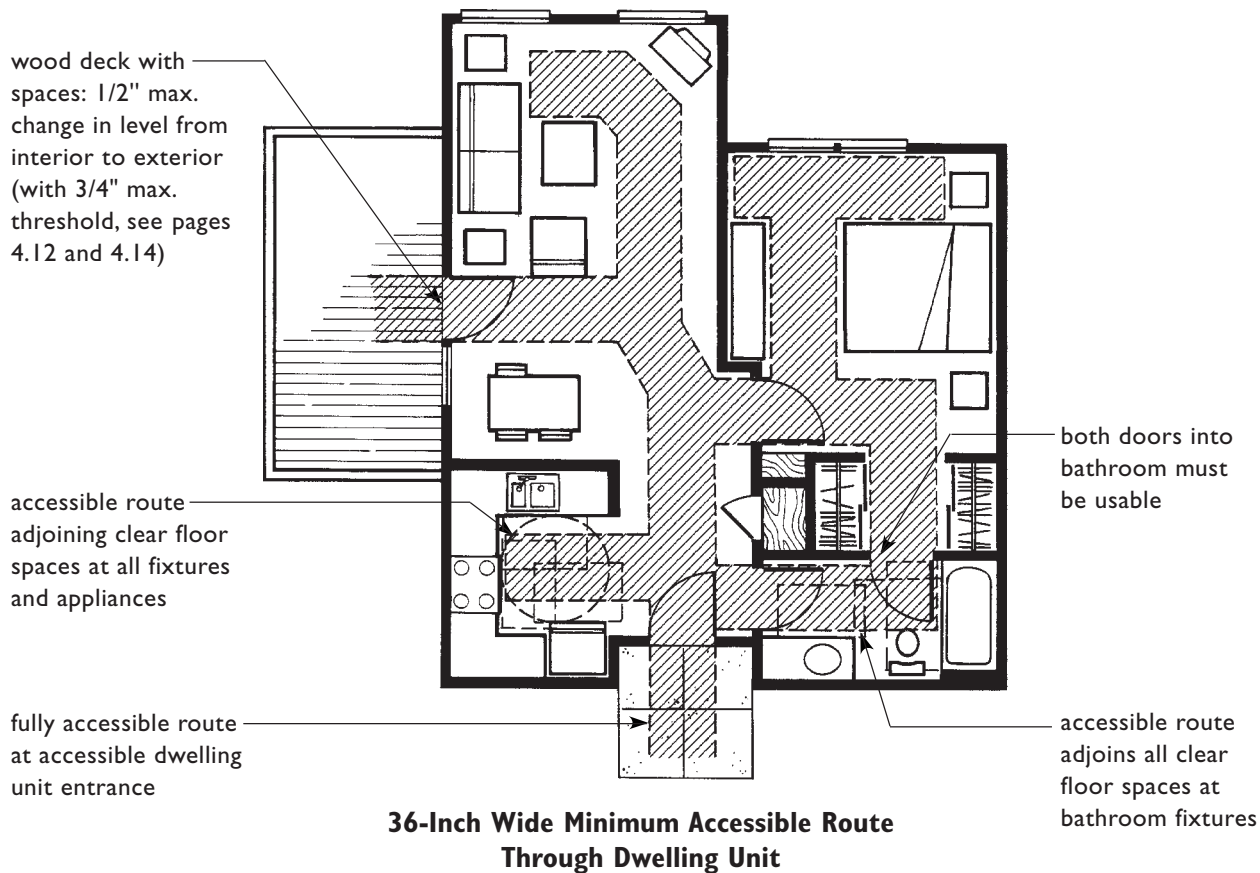
INTRODUCTION

The Fair Housing Accessibility Guidelines (the Guidelines) specify that an accessible route be provided into and throughout the entire covered dwelling unit. The accessible route must pass through the main entry door, continue through all rooms in the unit, adjoin required clear floor spaces at all kitchen appliances and all bathroom fixtures, and connect with all secondary exterior doors.

Unlike public and common use areas, where a fully accessible route that complies with ANSI A117.1 - 1986, or an equal or more strict accessibility standard is required, the Guidelines designate specific elements of an accessible route that must be provided. The accessible route must be **1.** sufficiently wide and **2.** lacking in abrupt changes in level so residents with disabilities (and/

or their guests with disabilities) can safely use all rooms and spaces, including storage areas and, under most circumstances, exterior balconies and patios that may be part of their dwelling unit. See page 4.11 for exception at balconies and patios constructed of impervious materials.

An accessible route is not required into a basement or garage. However, doors from the interior of the dwelling unit to an unfinished basement or a garage attached to a single-story dwelling unit must be “usable”; see Chapter 3: “Usable Doors.” Providing an accessible route and a usable door in these circumstances will allow a resident to make later modifications, such as installing a ramp from the dwelling unit into the garage, thereby increasing usability of the unit.



INTRODUCTION

The ANSI specifications for accessible controls and operating mechanisms require a clear floor space to allow an approach by a person using a wheelchair, specify the height of the operable portion of the control, and require little or no force be exerted to operate the control. The Fair Housing Accessibility Guidelines (the Guidelines) do not require controls to be fully accessible but specify that light switches, electrical outlets, thermostats and other environmental controls, which are operated on a regular or frequent basis in the daily use of a dwelling unit, be in accessible locations.

The Guidelines' specifications for accessible locations, based on the ANSI (A117.1 - 1986) Standard, address where to position controls and outlets to be within the reach range of a seated user. Force and type of motion required to operate controls are not covered by the Guidelines.

CONTROLS AND OUTLETS SUBJECT TO THE REQUIREMENTS OF THE GUIDELINES

Environmental controls such as thermostats and other heating, air-conditioning, and ventilation mechanisms including ceiling fans and electrically operated skylights must be positioned in accessible locations, as must **light switches** and **electrical outlets** for each room. All these covered controls and outlets must be in accessible locations, with a few exceptions.

The Guidelines allow, for example, controls or outlets that do not satisfy the requirements, if comparable controls or outlets in accessible locations are provided within the same area. Comparable controls or outlets are those that perform the same function. For example, floor outlets (which are inaccessible) or outlets mounted in the corner of kitchen counters are permitted under the Guidelines, provided other outlets are available to serve the same space or area.

Controls and outlets not covered by the Guidelines include circuit breakers or electrical outlets dedicated to individual appliances such as refrigerators, built-in microwave ovens, washing machines, and dryers because neither circuit breakers nor these outlets are accessed frequently by residents. Appliance controls are not required to be in accessible locations because the Fair Housing Act is not intended to regulate the design of appliances.

Thus, when appliance controls are built into or are located on the appliance itself, they are not considered to be covered controls. Range or washing machine controls need not be within the reach range of seated users, although certainly it is preferred that such controls be within reach. Range

hood fan and light controls, when mounted on the hood, are part of an appliance and are, therefore, not covered. However, if the range hood fan and light are wired to a separate switch on a wall or any location other than on the hood, range, or cooktop, then the control must be in an accessible location.

Garbage disposals do not fall under any of the categories of covered controls. The operating switch for a garbage disposal is not mounted on the appliance itself but is wired to another location. Although not a covered control, since garbage disposals are used frequently and since it is relatively simple to place operating switches for

garbage disposals in accessible locations, it is recommended that it be done.

Emergency interrupt switches to mechanical systems such as furnaces or hot water heaters also are not covered by the Guidelines. However, it is recommended that such switches be in locations that can be reached from a seated position. Even when the mechanical system is located behind a narrow door in a small closet dedicated specifically to that purpose, it is recommended that the interrupt switch be positioned so it can be reached from outside the closet by a person using a wheelchair.

SWITCHES, OUTLETS, AND CONTROLS COVERED BY THE GUIDELINES

Covered

- light switches for controlling all room lights
- electrical outlets
- environmental controls
thermostats and controls for other heating, air-conditioning, and ventilation systems

Not Covered

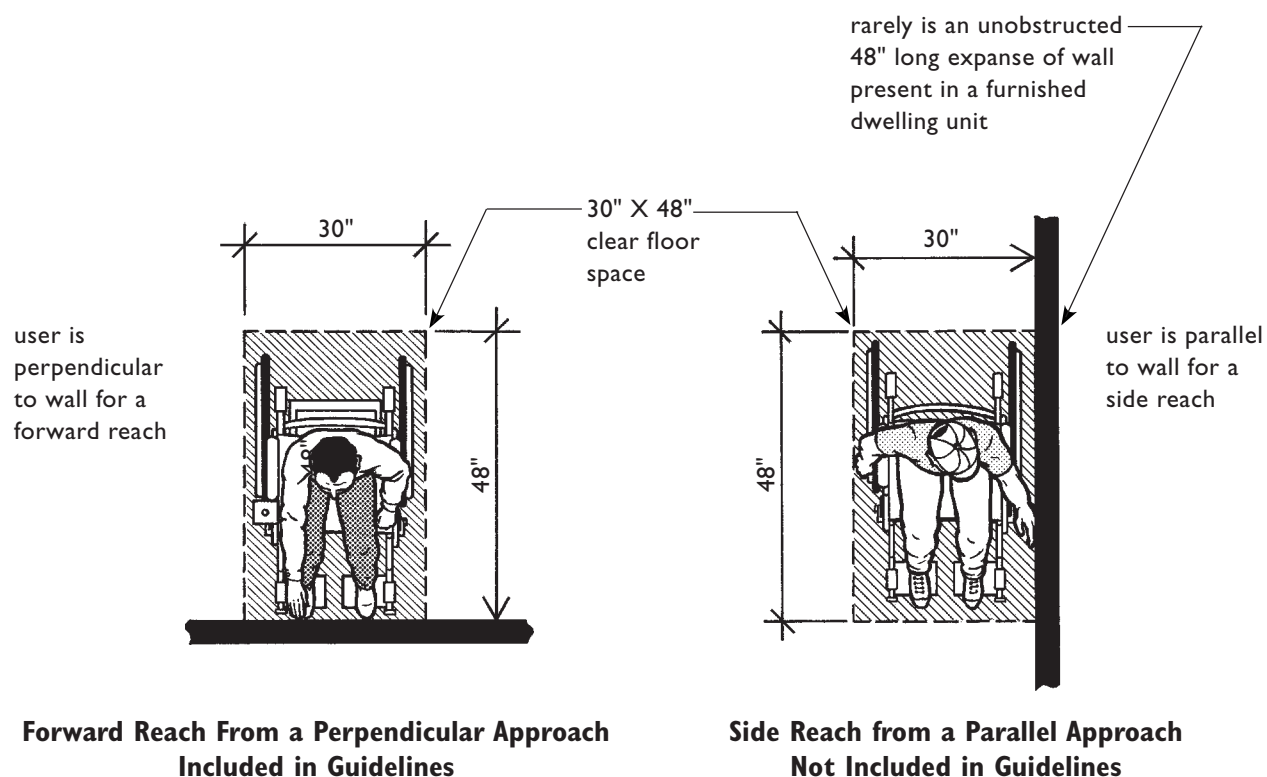
- circuit breakers
- appliance controls
- outlets dedicated for specific appliances

ACCESSIBLE LOCATIONS

The Guidelines contain height specifications for wall-mounted controls and outlets based upon the reach ranges of seated people given in the ANSI Standard. Typically ANSI and other accessibility standards present reach ranges for both forward and side reaches: **1.** where the user must reach over an obstruction, and **2.** where the user's approach is not restricted by an obstruction. One of these positions, a side reach from a parallel position without an obstruction, requires a 48-inch long clear floor space parallel and close to the wall so a user can get close enough to reach controls and

switches. Once a dwelling unit is furnished, sufficient room to execute such a parallel approach usually is not available; thus this specification was omitted from the Guidelines.

To accommodate all users in situations where there may or may not be a built-in counter, base cabinet, or other obstruction to interfere with reach, the Guidelines include specific requirements for mounting controls and switches so a person using a wheelchair can execute: **1.** a forward reach with no obstruction, **2.** a forward reach over an obstruction, and **3.** a side reach over an obstruction.

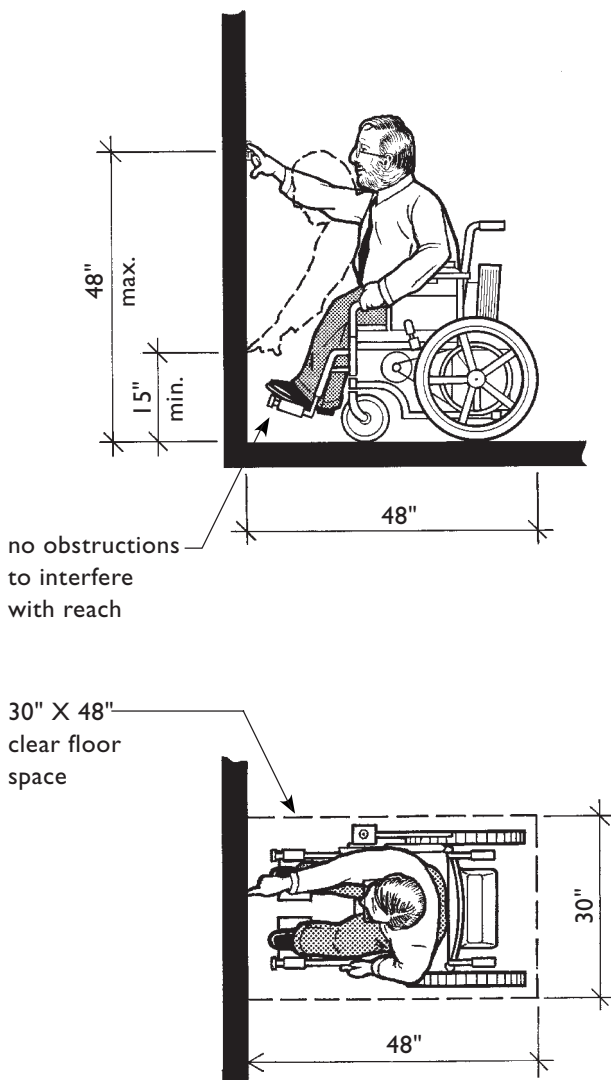


FORWARD REACH WITH NO OBSTRUCTION

Where there are no obstructions to interfere with the reach of a person using a wheelchair, controls and outlets may be mounted in a range from 15 to 48 inches above the floor. There must be a clear floor space of 30 inches x 48 inches perpendicular to the wall, adjoining a 36-inch wide accessible route, to allow a person using a wheelchair to approach and get into position to execute a forward reach to the control or outlet. See Chapter 4: “Accessible Route into and Through the Covered Dwelling Unit.”

Thermostats and other controls that must be read pose additional considerations. Even though people using wheelchairs may be able to execute a forward reach of 48 inches at a clear wall, they may have difficulty seeing the small numerals and indicators generally found on thermostats. A person using a wheelchair, when positioned perpendicular to a wall, must lean forward over his or her feet and knees making it difficult to get close enough to read small type. Therefore, it is critical that thermostats and similar controls that must be read are mounted at or lower than 48 inches above the floor.

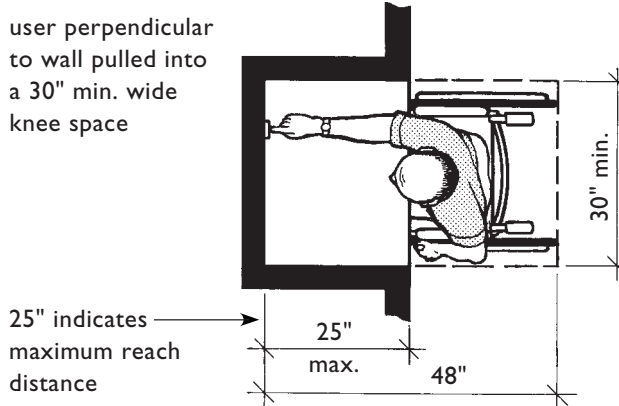
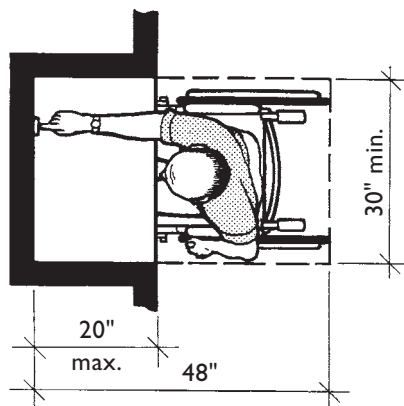
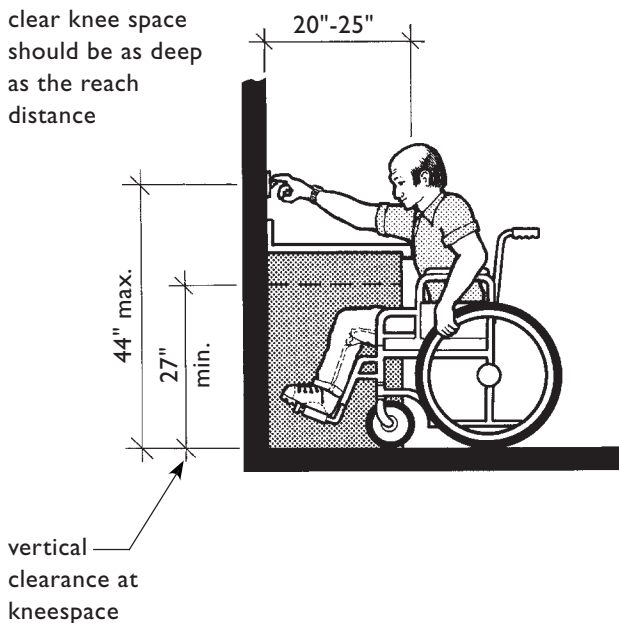
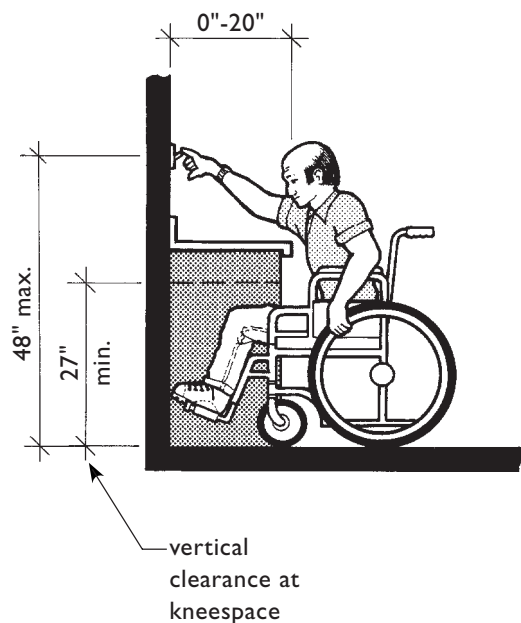
the counter/obstruction to allow a person using a wheelchair to pull up and execute a forward reach over the obstruction.



**High and Low Forward Reach Limits
 From a Perpendicular Approach**

For obstructions extending from 0 to 20 inches from the wall the maximum height for a control or outlet over the obstruction is 48 inches above the floor. Deeper shelves, extending 20 to 25 inches from the wall, reduce the maximum mounting height of controls and outlets to 44 inches. Controls and outlets mounted over obstructions

extending further than 25 inches are outside the reach range of people using wheelchairs and are not considered to be in accessible locations. However, HUD allows an industry tolerance of 1/2 inch to permit the installation of standard countertops that may project from the back wall for a maximum dimension of 25-1/2 inches.

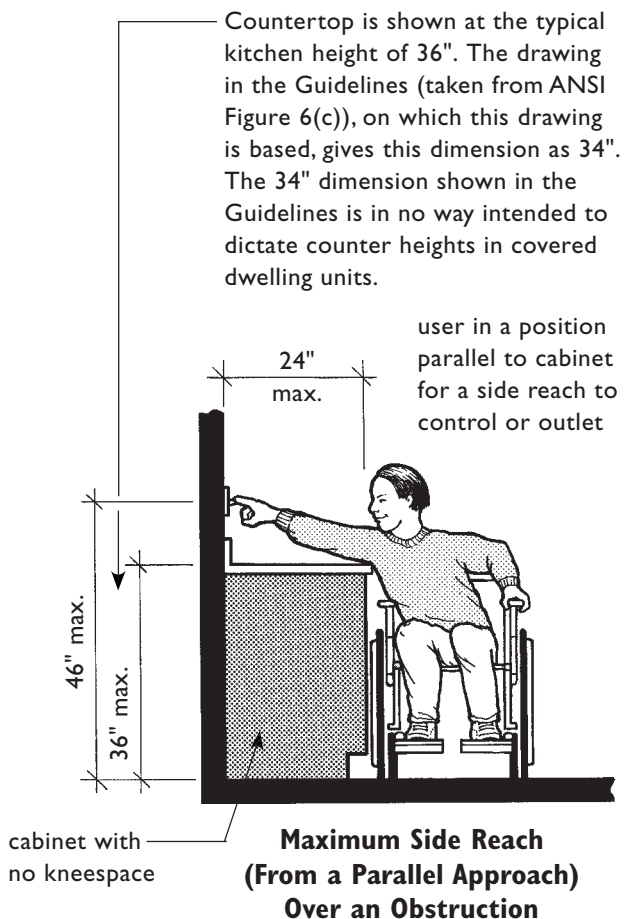


**Maximum Forward Reach
(From a Perpendicular Approach) over an Obstruction**

SIDE REACH OVER AN OBSTRUCTION

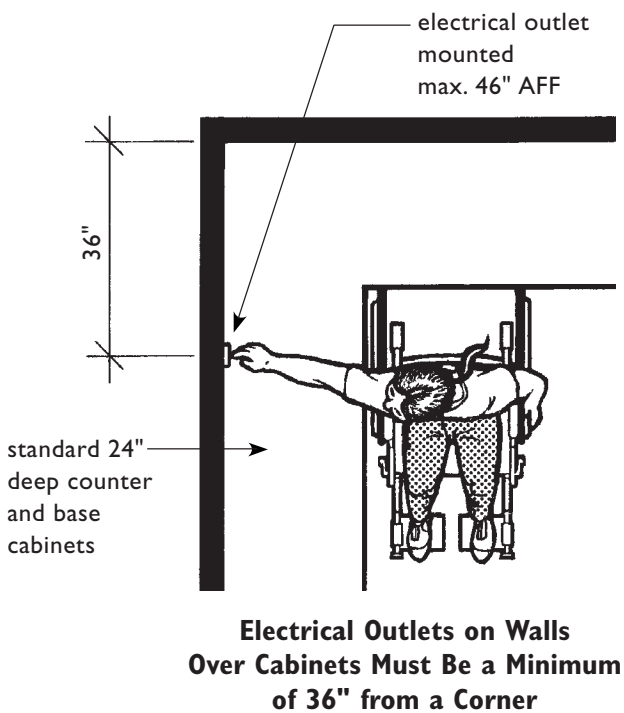
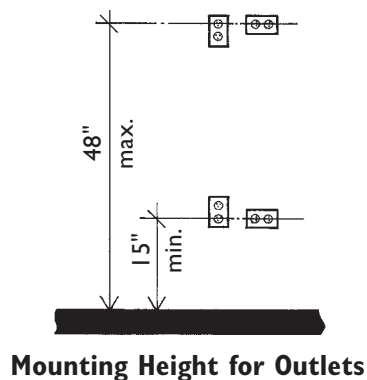
To reach controls and outlets mounted over base cabinets which lack knee space, a person using a wheelchair must be able to approach the cabinet from a position parallel to the cabinet and execute a side reach. This parallel position is made up of a 30-inch x 48-inch clear floor space adjoining a 36-inch wide minimum accessible route. When executing a side reach over a cabinet, the upper limit of the range is reduced to 46 inches.

Cabinet depth is limited to 24 inches. HUD permits use of a standard 24-inch deep cabinet with an additional extension of 1 to 1-1/2 inches for countertops for a maximum depth of 25-1/2 inches. If a built-in shelf, cabinet, or other obstruction must be deeper than 25-1/2 inches, then any switches, outlets, and controls that must be in accessible locations are not permitted to be installed over such deep surfaces.



MOUNTING LOCATIONS FOR OUTLETS

For accessible controls and outlets, all operable parts must be within the ranges specified above. When electrical outlets are installed horizontally or vertically, duplex outlets must have both receptacles within the reach range. Measurements are made as illustrated below.

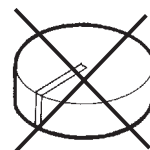


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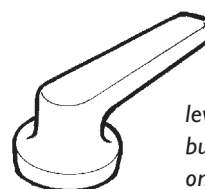
The most universally usable switches are rocker switches, toggle switches, and touch type electronic switches because they can be operated by a single touch, require little force, and do not require gripping, twisting, or fine finger dexterity.

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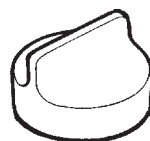


smooth round knobs are difficult for people with hand limitations as well as for people with visual impairments

Poor Choice



levers are ideal but rarely found on appliances

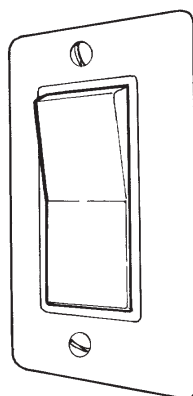


blades help indicate position and make turning somewhat easier

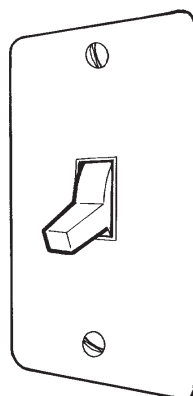


small lever or extended blade provides position pointer and leverage for easy turning without gripping

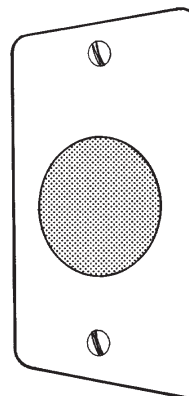
Better Control Choices



rocker

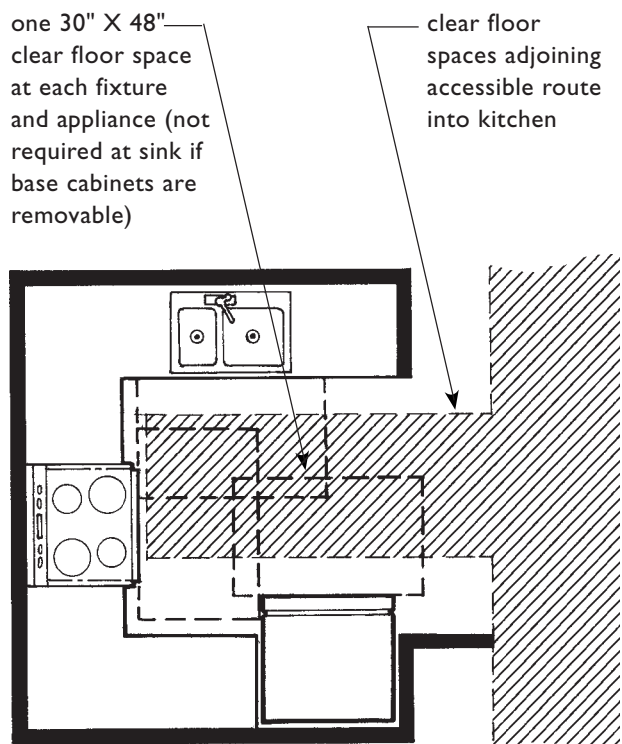


toggle



touch sensitive

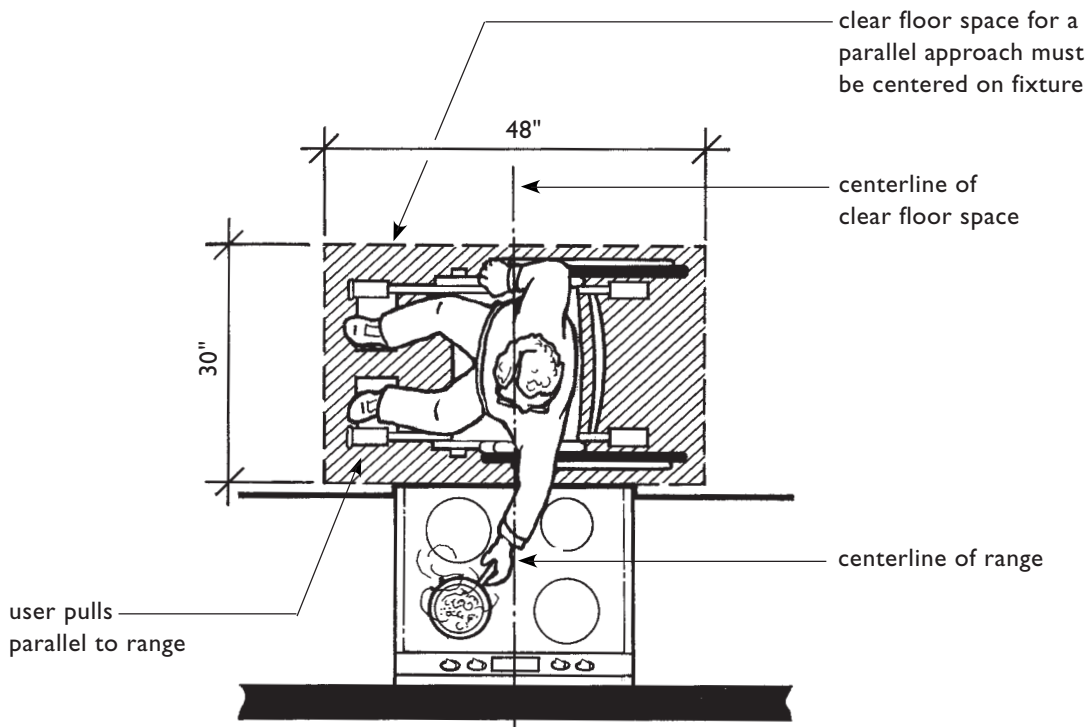
Switches Most People Can Operate



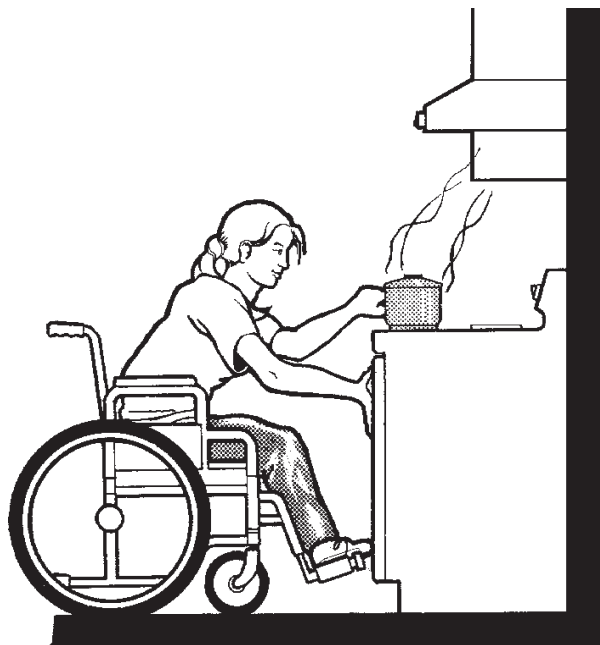
Overlapping Clear Floor Spaces and Accessible Route Provide Maneuvering Space

CLEAR FLOOR SPACE AT RANGES, COOKTOPS, AND SINKS

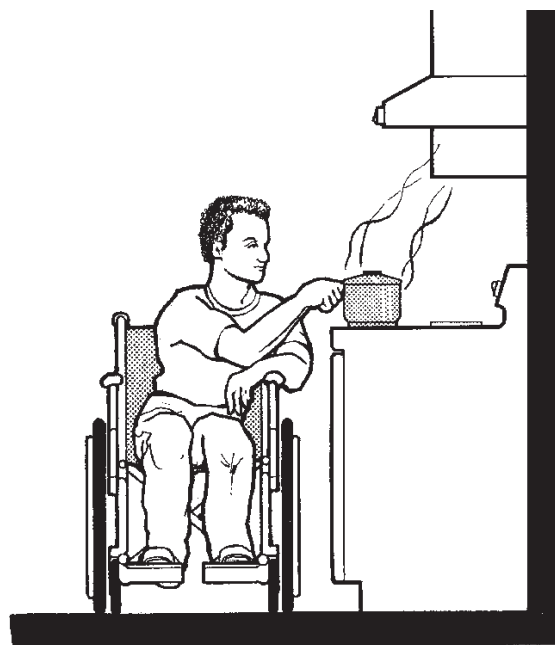
Unless knee space is provided, space to execute a parallel approach must be provided at ranges, cooktops, and sinks. The clear floor space in this parallel orientation allows the wheelchair user to make a close side approach permitting safer and easier reach to controls and cooking surfaces. A forward approach, on the other hand, is difficult and unsafe, especially when controls are located at the back, because it requires seated users to lean forward over their feet and knees to reach not only hot pots and pans but the controls as well. See pages 7.11 through 7.16 for required clear floor space at cooktop or sink when knee space is provided.



Space for Parallel Approach Required at Range and Cooktop



Forward Approach at Range is Difficult and Unsafe

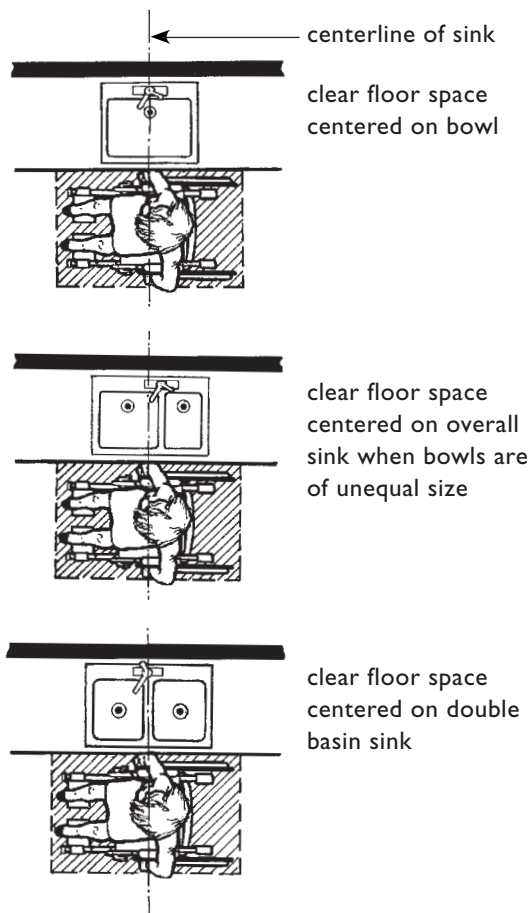


Parallel Approach to Range Specified in Guidelines

A **parallel** approach also must be provided at sinks so a seated user can reach down into the bowl. A forward approach with kneespace below the sink may be required in some very small U-shaped kitchens. See page 7.11.

The parallel clear floor space at sinks, as at ranges and cooktops, must be centered on the bowl or appliance. At single bowl sinks the centerline of the clear floor space must align with the centerline of that bowl. Where there are multiple bowl sinks the clear floor space must be centered on the overall sink itself.

Faucets usually are placed at the center of or within six inches of the center of the sink, regardless of the number of basins. Since the clear floor space is centered on the sink, users are still afforded access to faucet controls.



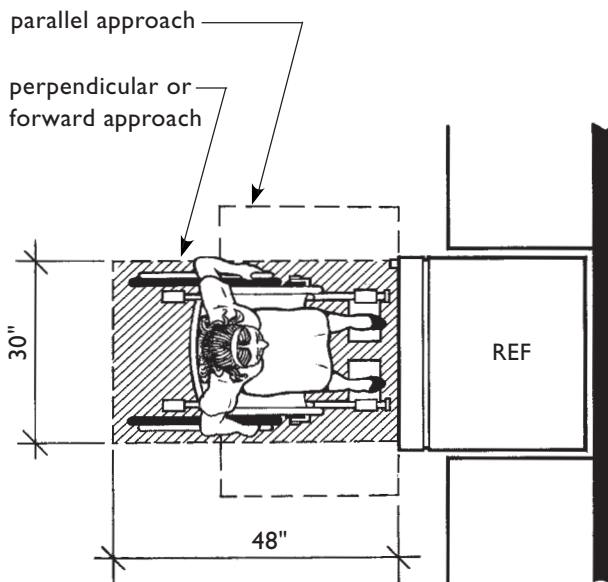
Space for Parallel Approach Required at Sinks

**CLEAR FLOOR SPACE AT OVENS,
 DISHWASHERS, REFRIGERATORS,
 FREEZERS, AND TRASH COMPACTORS**

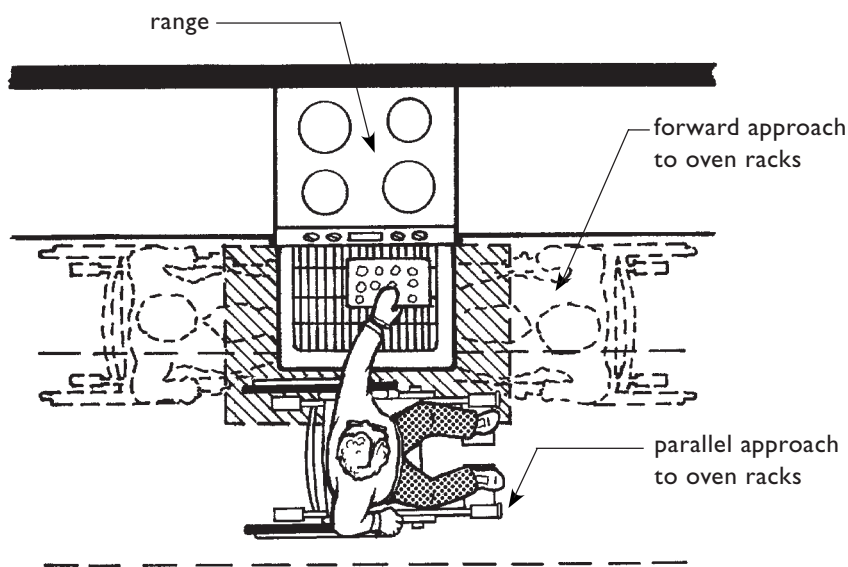
The 30-inch x 48-inch clear floor space oriented in either one of two positions—parallel or perpendicular—is required at the oven, dishwasher, refrigerator, freezer, and trash compactor. Wall-mounted and microwave ovens, like ovens in ranges, also must have either a parallel or perpendicular clear floor space adjacent to the appliance.

Even though this group of appliances has operable doors that require the user to be able to get out of the way of the door swing, for purposes of design and room layout the clear floor space must be centered on the appliance itself. However, the clear floor space for the specific appliance and the clear floor space for adjacent appliances and fixtures, combined with the 36-inch wide accessible route into the room, provide the functional space necessary to open a door and maneuver close to the appliance to be able to reach into it.

clear floor space for at least one type of approach (forward or parallel) must be centered on the refrigerator; this applies to side-by-side as well as over/under models



Space for Either a Forward or Parallel Approach Must be Provided



**Functional Use of Oven
 Could Be From Any One of These Positions**

DOORWAY WIDTH AND DEPTH

DOORWAY CLEAR OPENING

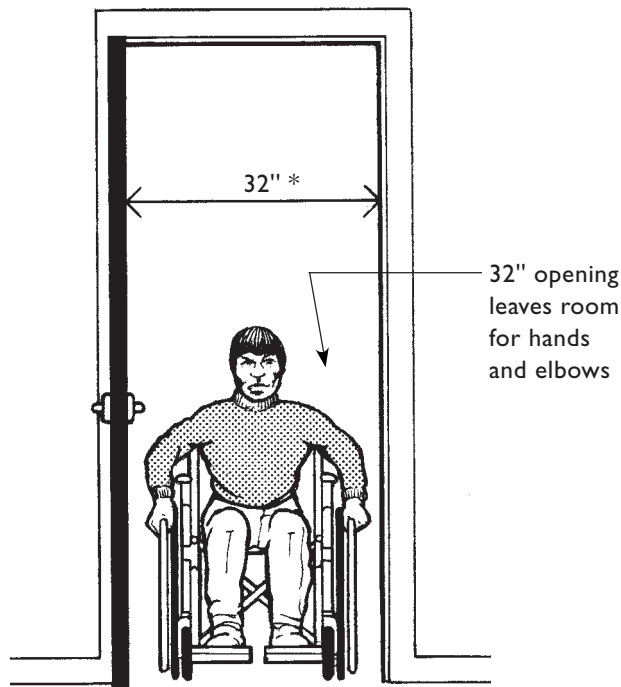
The commonly used hinged, folding, or sliding doors installed in the standard manner provide a passage width that is reduced by both the door standing in the doorway and door stops, if present. Thus, the available passage width is less than the size of the door.

Accessible doors in public and common use spaces and primary entry doors of dwelling units must provide a clear opening of **32 inches minimum**. This means the clear opening must not be less than 32 inches, but it may be more. The Guidelines allow **usable doors** (secondary exterior doors and doors that allow passage within the dwelling unit) to be a **nominal 32 inches** clear width. Usable doors are intended to provide 32 inches of clear width. But because of normal installation practices, adjacent conditions, variation in products such as hinges, and thicknesses of available materials, the doorway may vary from the 32-inch clear width by a nominal or small amount. Tolerances of 1/4 inch to 3/8 inch are considered an acceptable range for usable doors. This tolerance does not apply to accessible doors.

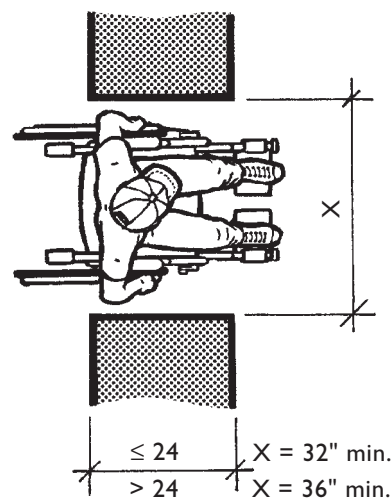
DOORWAY DEPTH

In both public and common use spaces and within dwelling units, the wall thickness of all cased openings must be no greater than 24 inches if the width of the doorway or passage is the minimum 32 inches. Doorways with a depth greater than 24 inches must be widened to provide the 36-inch minimum clear width for an accessible route.

- * 32" clear minimum for accessible doors
- 32" nominal clear width for usable doors



Doorway Clear Opening

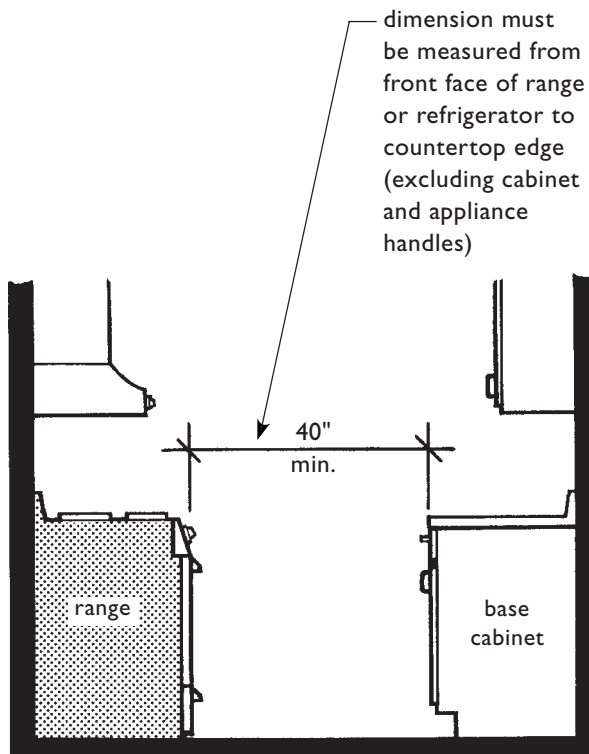


Doorway Depth

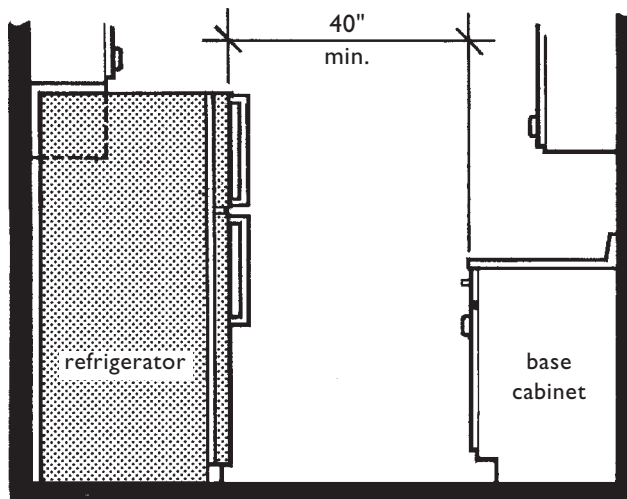
CLEARANCE BETWEEN COUNTERS AND ALL OPPOSING ELEMENTS

The Guidelines require a clearance of at least 40 inches between all opposing base cabinets, countertops, appliances, and walls. The 40-inch clearance is measured from any countertop or the face of any appliance (excluding handles and controls) that projects into the kitchen to the opposing cabinet, countertop, appliance, or wall.

Refrigerators vary greatly in depth and may extend up to eight inches beyond cabinet faces. Standard free-standing and drop-in ranges may project up to three inches. Appliance depths (excluding door handles) must be included when calculating the 40-inch clearances.

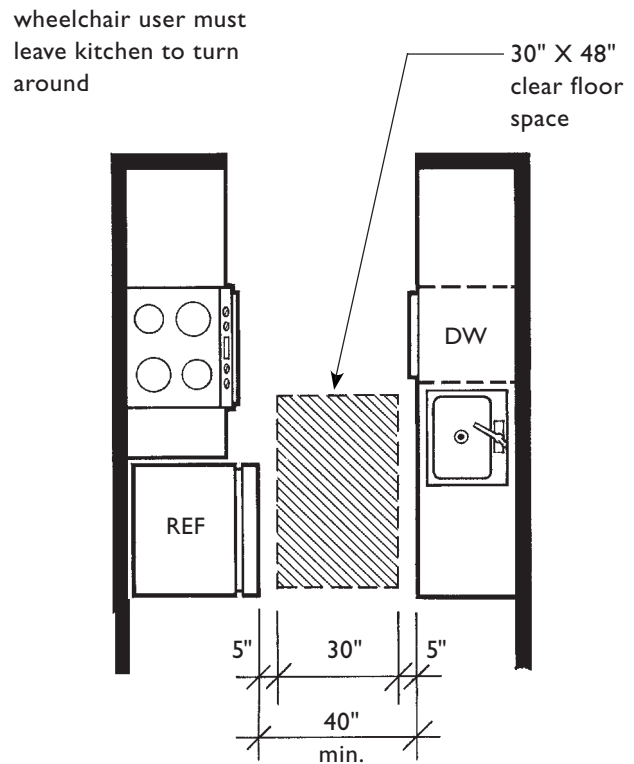


Minimum Clearance between Range and Opposing Base Cabinet



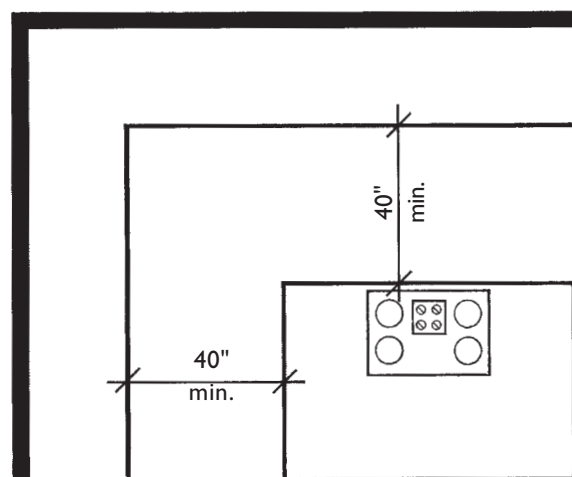
Minimum Clearance between Refrigerator and Opposing Base Cabinet

In a narrow kitchen the 40-inch minimum clearance provides an additional five inches on either side of the required clear floor space of 30 inches x 48 inches at each fixture or appliance, so a user in a wheelchair can maneuver as close as possible to appliances or fixtures. A narrow kitchen such as the one shown to the right meets the Guidelines and is usable, but may be difficult for many people using wheelchairs. Its narrow corridor design requires a user in a wheelchair to exit the kitchen to turn around.



40" Minimum Clearance Between all Counters, Base Cabinets, Appliances, and Walls

In more elaborate kitchens where an island is planned, the 40-inch clearance must be maintained between the face of the island and all opposing features. Even though an accessible route for a 90-degree turn around an obstruction is 36 inches, to ensure sufficient space for maneuvering within the kitchen, the Guidelines require that the minimum clearance of 40 inches be maintained.



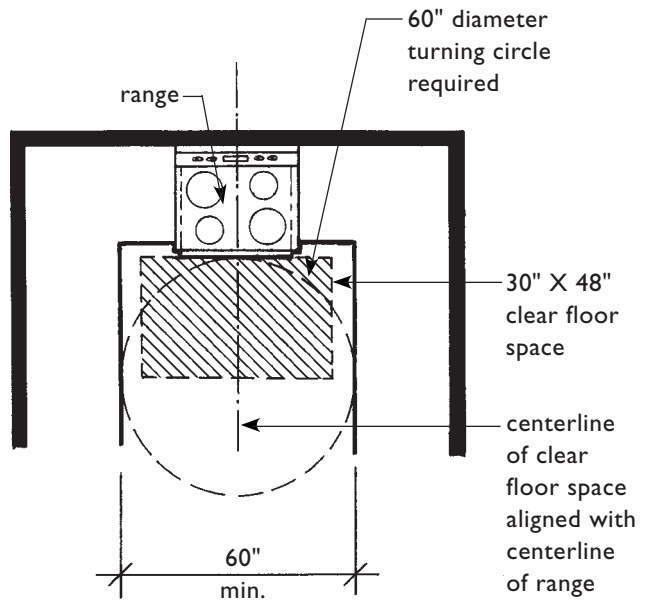
40" Must Be Maintained Between Island and all Opposing Features

U-SHAPED KITCHENS

A 60-inch diameter turning circle is required in a U-shaped kitchen that has a sink, range, or cooktop at its base. This turning diameter is necessary to provide adequate maneuvering space for a person using a wheelchair to approach and position themselves parallel to the appliance or fixture at the base of the U. Any appliances, such as refrigerators and ranges (excluding door handles), that project beyond countertops and cabinets must not encroach upon this 60-inch diameter turning space.

In addition to the turning space, the kitchen must be arranged so there is a 30-inch x 48-inch clear floor space for a parallel approach centered on the sink, range, or cooktop. The centerline of the fixture or appliance must be aligned with the centerline of the clear floor space.

When a sink, even a standard single basin sink, is at the bottom of the U and a dishwashing machine is planned to be included adjacent to the sink, the distance between the legs of the U must be greater than 60 inches to allow for a full centered approach at the sink. See the lower plan in the right column.

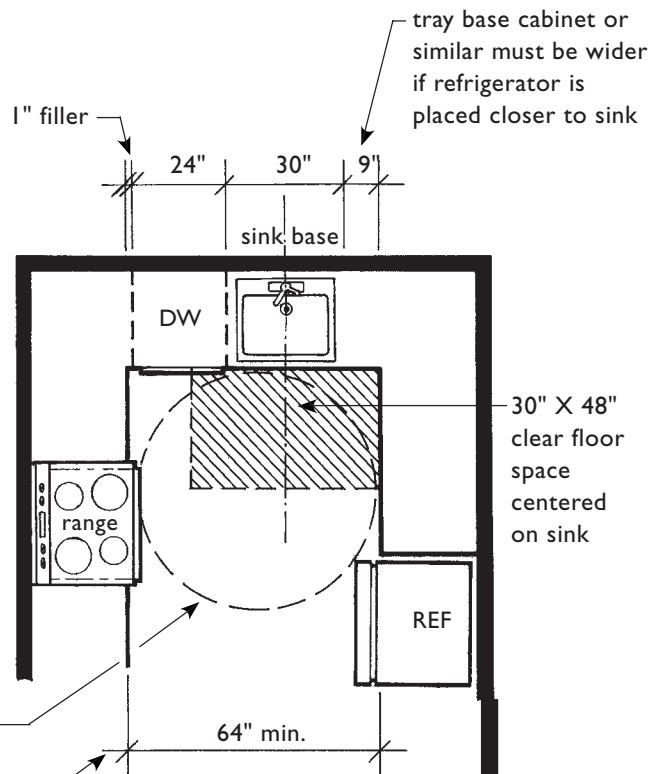


60" Diameter Turning Circle when Sink (Only), Cooktop, or Range is at Bottom of U-Shaped Kitchen

refrigerator must be selected and positioned so it does not encroach upon the 60" diameter turning circle or the clear floor space at the sink

60" diameter turning circle

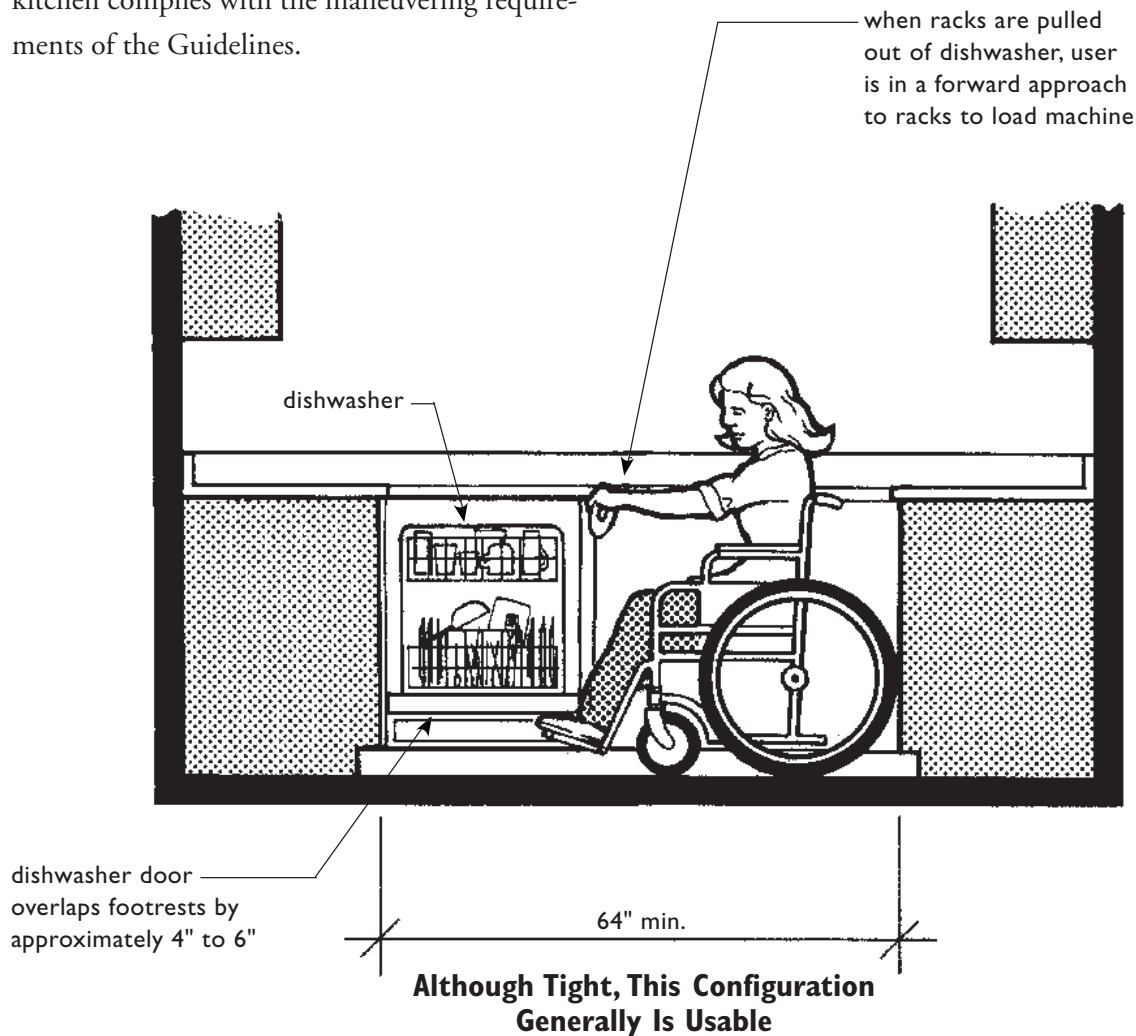
this dimension may need to be increased slightly for a double basin sink if wider than 30"



Sink and Dishwasher at Bottom of U-Shaped Kitchen Increases Room Width

In the lower plan on page 7.9, the refrigerator is pulled away from the sink and beyond the turning circle. Since a refrigerator may not overlap the five-foot turning space, if the refrigerator must be located closer to the sink, the distance between the legs of the U must be increased.

To reduce the need for additional floor space, and because clear floor space at appliances and fixtures may overlap, the clear floor space at the sink can serve as the clear floor space for a forward approach to dishwasher racks when they are pulled out of the dishwasher. Even though the dishwasher door would rest on the feet of the user, the required clear floor spaces are provided and the kitchen complies with the maneuvering requirements of the Guidelines.

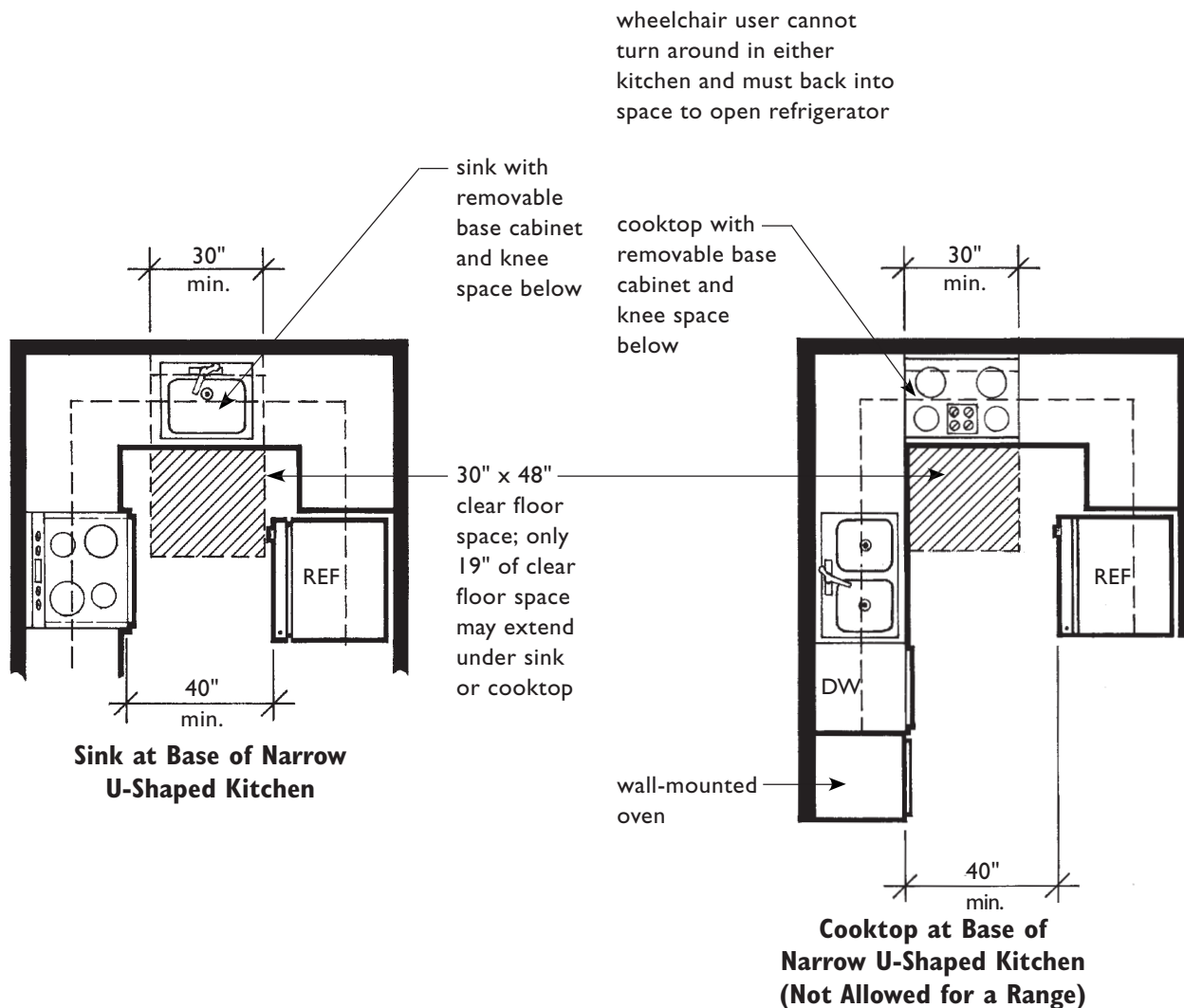


AN EXCEPTION

The Guidelines permit U-shaped kitchens with a sink or cooktop at the base of the U to have less than 60 inches between the legs of the U only when removable base cabinets are provided under the cooktop or sink. A clearance of at least 40 inches is required. Since knee space cannot be provided below a range, kitchens with a range at the base of the U must have the 60-inch minimum turning diameter.

Once the base cabinet is removed, the resulting knee space allows a person using a wheel-

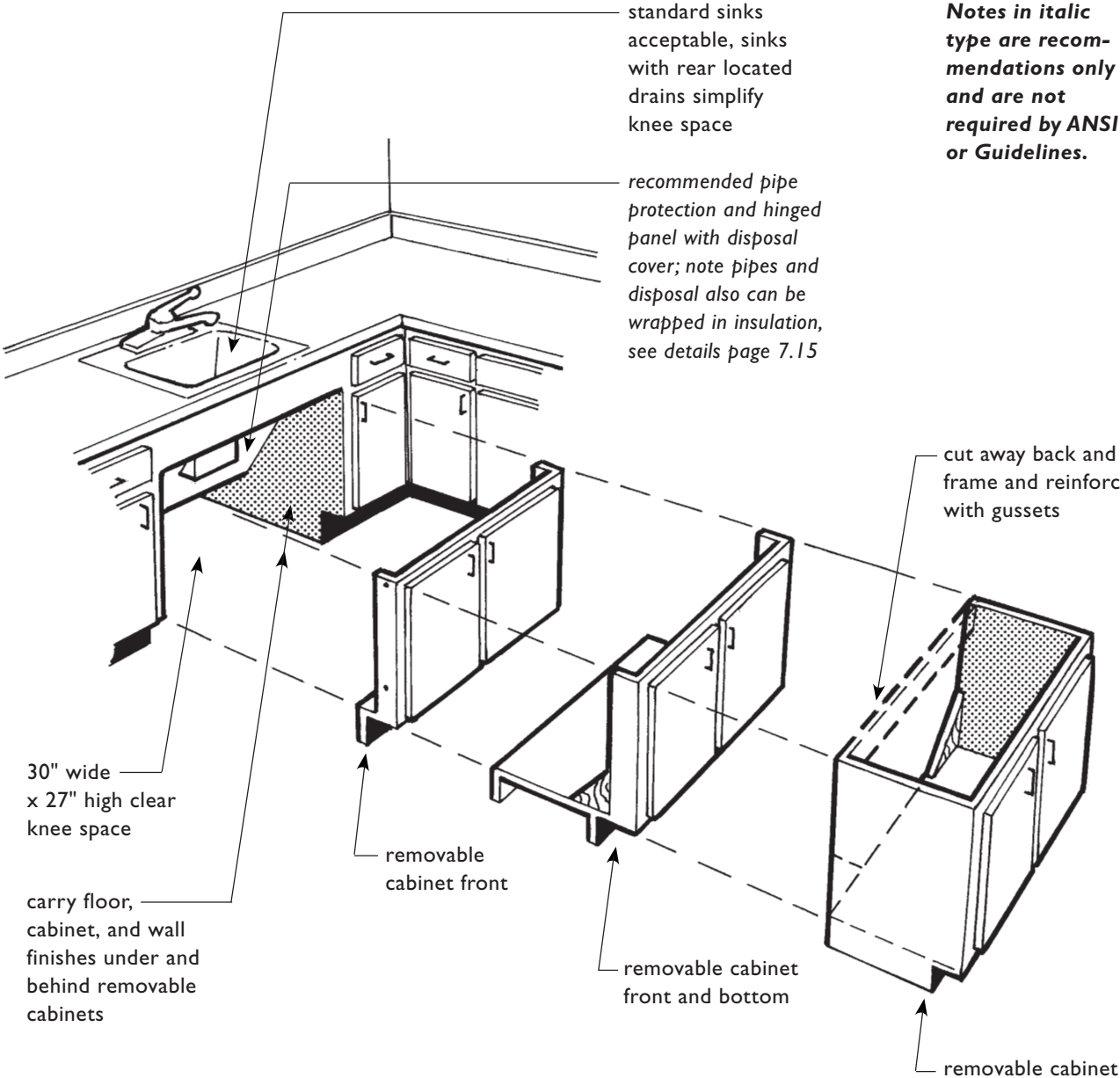
chair to pull up under the feature to reach controls and perform cooking/cleaning functions. A note of caution: knee space beneath cooktops provides essential maneuvering space for seated people, but it also creates a greater risk from hot food spilled in the lap. If cooktops are to be provided with knee space below, although not required, it is suggested that they be placed in lowered or adjustable height counter segments so they can be used more easily and safely by people using wheelchairs. Knee space configurations are shown on pages 7.14 and 7.15.



REMOVABLE BASE CABINETS

Narrow U-shaped kitchens, where knee space must be provided below sinks or cooktops, can appear identical to those kitchens which lack this additional feature since knee space can be concealed by a removable base cabinet. When a potential resi-

dent or owner needs the knee space it can be provided quickly and easily. Specifications for knee space are based on the Guidelines' requirements for bathrooms and ANSI 4.19 and 4.32. See also pages 7.14 - 7.15 and 7.52.

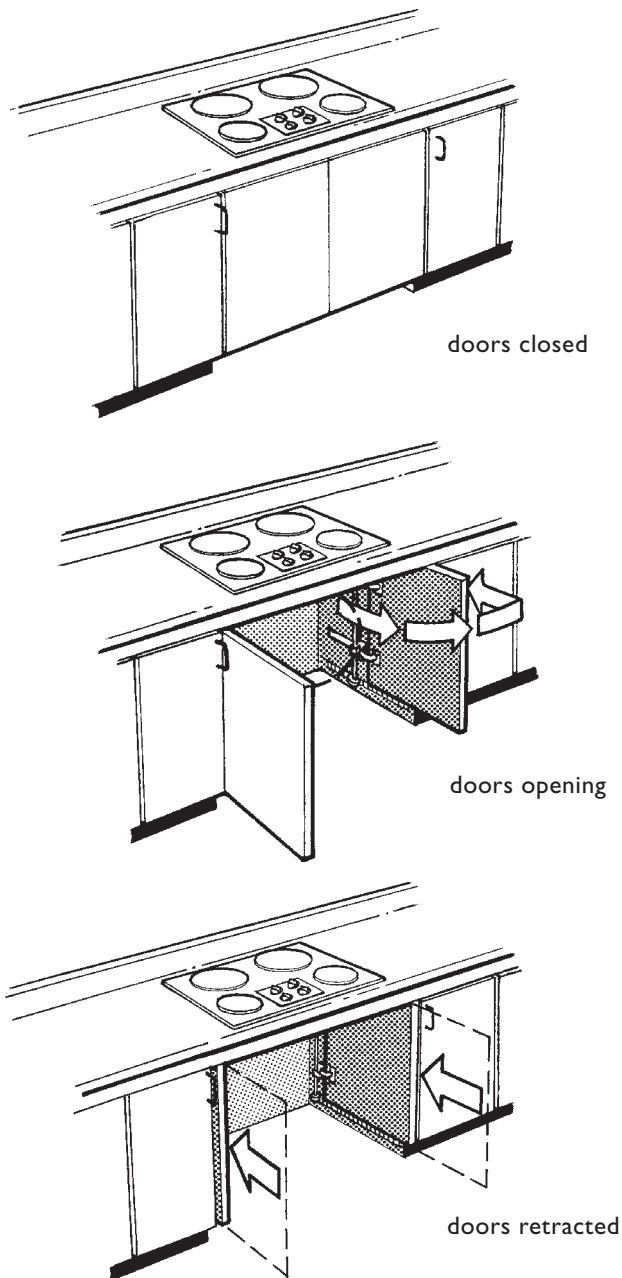


Possible Removable Cabinet Options for Required Knee Spaces at Sinks or Cooktops in Narrow (Less Than 60" Wide) U-Shaped Kitchens

The Guidelines require that the floor, walls, and cabinet faces of knee space be finished during initial construction so no other work is necessary when the base cabinet is removed. When sinks or cooktops are installed at the bottom of a narrow U-shaped kitchen, regardless of whether the knee space is exposed or concealed by a removable cabinet, hot pipes or exposed sharp edges should be insulated or enclosed at the time of initial construction. Protection methods are addressed on page 7.14 “Knee Space and Pipe Protection.”

There are no kitchen cabinet manufacturers that currently offer “removable base cabinets” in their standard lines. The methods for providing removable cabinets presented here are some of the possible solutions. Of those shown, the removable cabinet front is likely to be the easiest to accomplish based upon current manufacturing processes. However, the resident may need to reinstall the cabinet at a later date, therefore, storage needs to be considered. It is recommended that instructions regarding proper storage be taped to the inside of the cabinet, as well as reinstallation instructions, if applicable. Other similar design options include removable cabinet floor and bottom, or, with some modification of rear supports, removal of the entire cabinet. This last option requires the counter to be installed independent of the base cabinet, with storage of the removable portion of the cabinet again a consideration.

Use of swinging retractable cabinet door hardware provides another excellent method to conceal knee space because the doors are self-storing and no part of the cabinet has to be removed or stored at another location. A special combination hinge allows the doors to swing open in a traditional manner and, when desired, allows the doors to be pushed back into the cabinet.



Use of Self-Storing Door Hardware to Expose Knee Space

KNEE SPACE AND PIPE PROTECTION

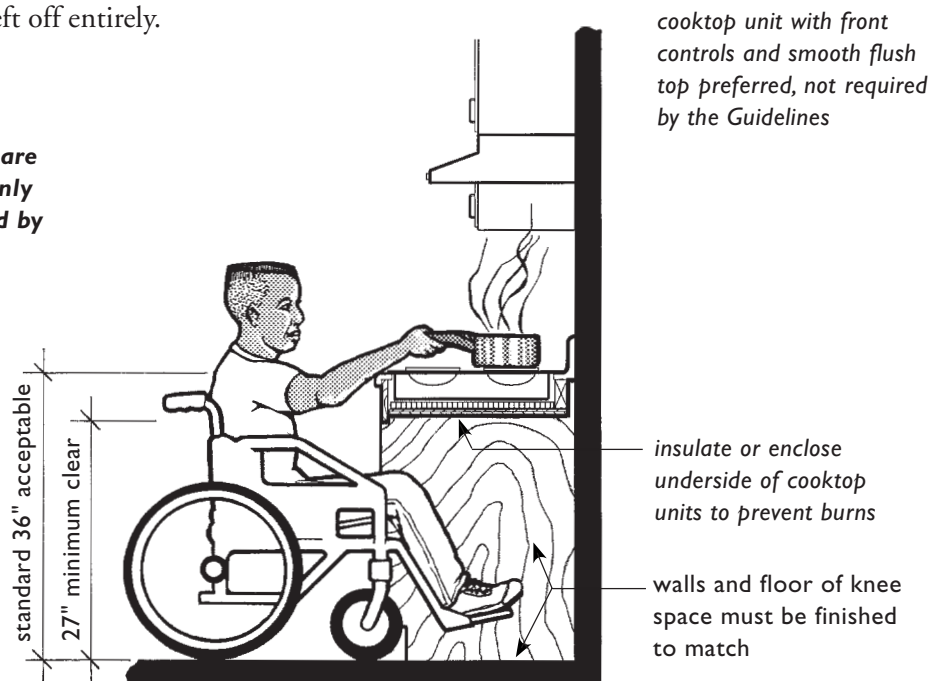
Where knee spaces are provided below sinks and cooktops, protecting seated users from burns and abrasions is strongly recommended. While the Guidelines do not specify such protection, the two most common design standards on accessibility (ANSI A117.1, 1986 and UFAS) require that the bottom of cooktops and sink supply lines and drain pipes be insulated or enclosed. Many people who use wheelchairs or scooters have limited sensation in their legs and cannot feel that they are touching a hot pipe or sharp edge and may be unaware that a serious injury has occurred. In addition, the need for protection from burns is an important safety consideration for all persons.

Pipes at sinks may be wrapped with insulation, but each time the plumbing is serviced the insulation must be removed and reinstalled. If the pipes are rewrapped using the original insulation (which may have lost much of its adhesion) the resulting application often is ineffective or the insulation may be left off entirely.

A more aesthetic and practical method for pipe protection is the installation of a removable panel over the plumbing. This panel shields the seated user and hides the plumbing from view. If such a panel is installed it should not inhibit access by encroaching upon the knee space. The panel should be hinged or otherwise removable so the pipes can be serviced easily.

The dimensions for the knee space itself must be 30 inches wide (minimum) and should be 27 inches high (minimum). Since there is no specific ANSI figure delineating the requirements for knee space clearance beneath sinks or cooktops in dwelling units, the accompanying illustrations may be used as guidance when providing knee space beneath removable base cabinets. The pipe protection panel is patterned after the ANSI Figure 31 for Lavatory Clearances. See also ANSI 4.32.5.5 Sinks and 4.32.5.6 Ranges and Cooktops.

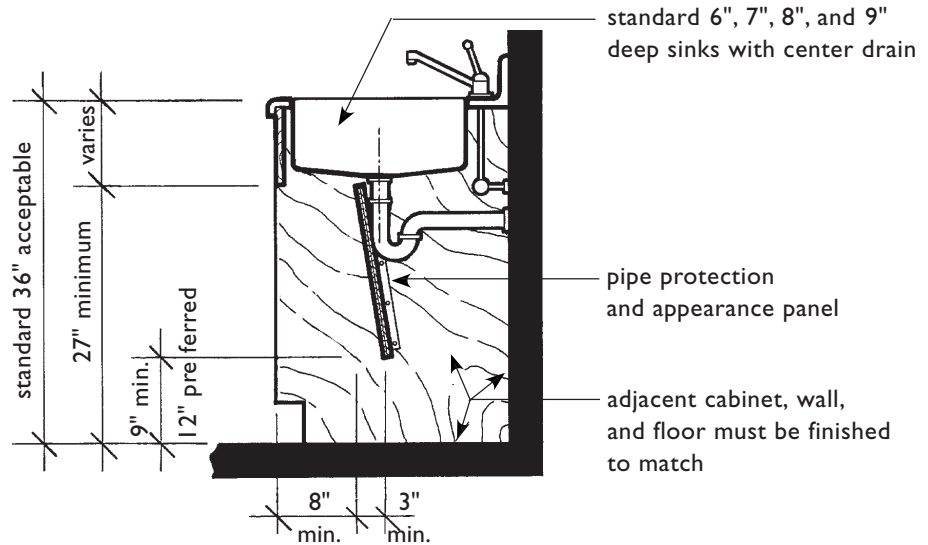
Notes in italic type are recommendations only and are not required by ANSI or Guidelines.



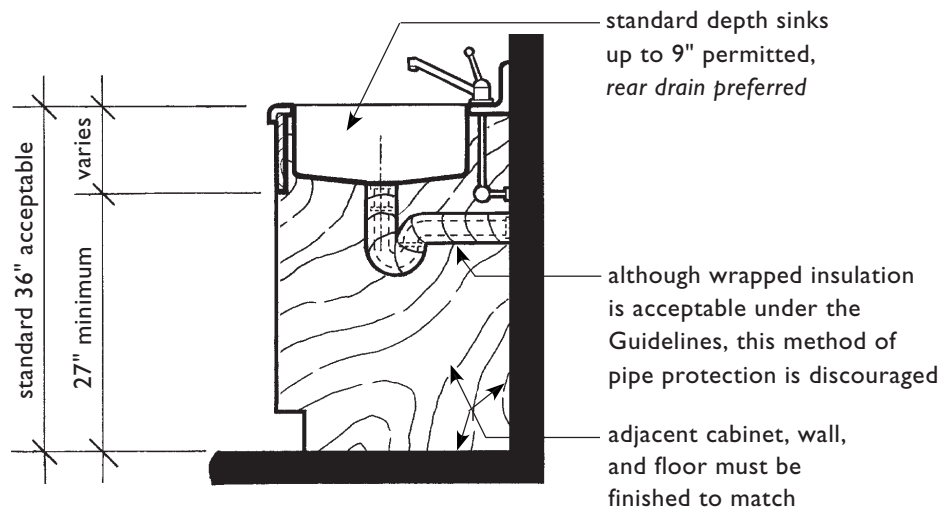
Cooktop with Knee Space Below

Knee Space at Sink with Pipe Protection Panel

sinks with rear located drain are not required but are a significant advantage when creating usable knee space



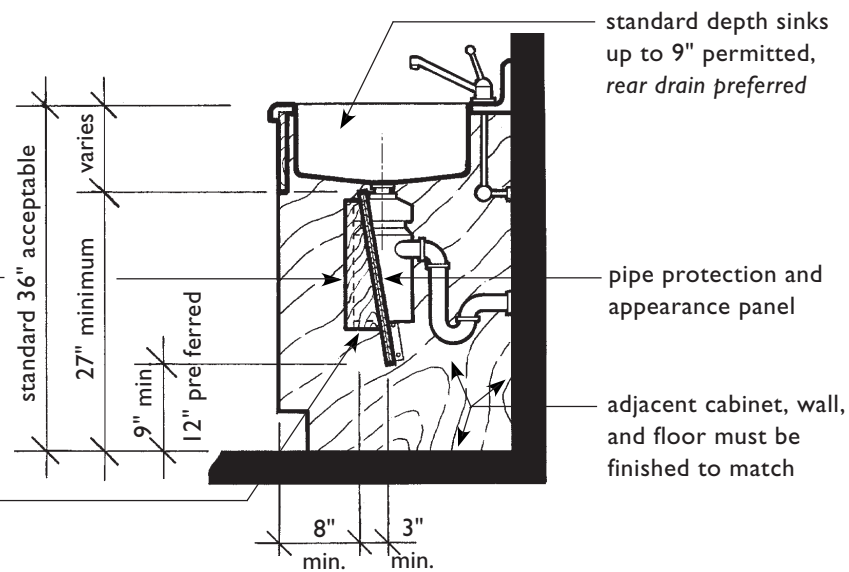
Knee Space at Sink with Wrapped Pipes



Knee Space at Sink with Garbage Disposal and Pipe Protection Panel

disposal cover
12" wide ±

open bottom for
ventilation and access
to reset buttons

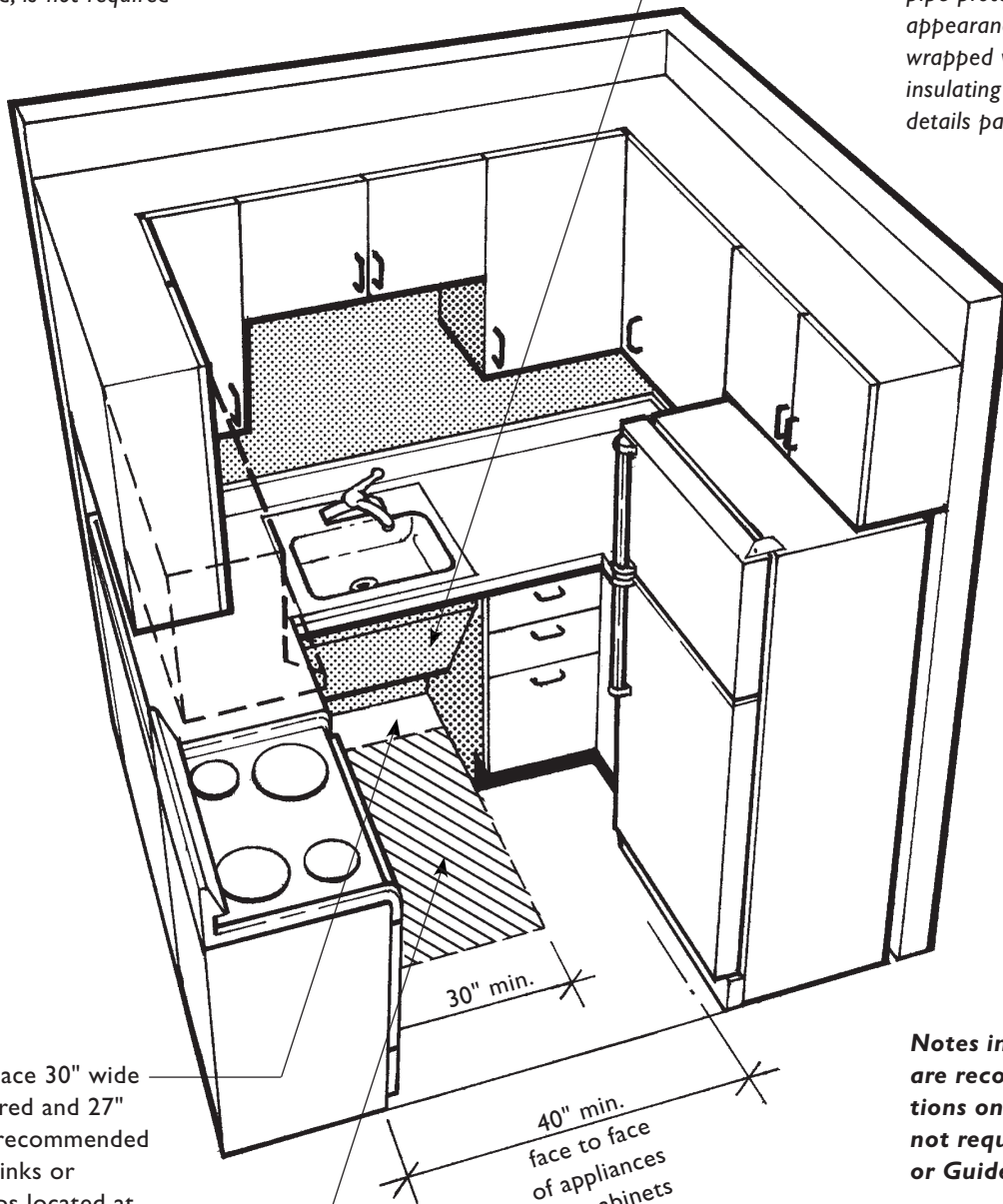


shallow basin sink and rear drain, although not required by the Guidelines, greatly improve access by wheelchair user

lever hardware, although preferred, is not required

knee spaces must have walls and floor surfaces finished

plumbing and other elements should be covered by a removable pipe protection and appearance panel, or be wrapped with padded insulating material, see details page 7.15



knee space 30" wide is required and 27" high is recommended under sinks or cooktops located at bottom of U-shaped kitchens when the U is less than 60" wide

30" X 48" min. clear floor space; must not extend more than 19" into knee space

40" min. face to face of appliances and cabinets

Notes in italic type are recommendations only and are not required by ANSI or Guidelines.

Knee Space at Narrow U-Shaped Kitchens

INTRODUCTION

The Fair Housing Accessibility Guidelines (the Guidelines) do not require that grab bars be installed in bathrooms. However, the Guidelines do require that bathroom walls be sufficiently strong to allow for later installation of grab bars for resident use. This requirement applies to all bathrooms, and also to powder rooms when the powder room is the only toilet facility on the entry level of a multistory dwelling unit in an elevator building (see page 4.9). Reinforcing methods are discussed later in this chapter.

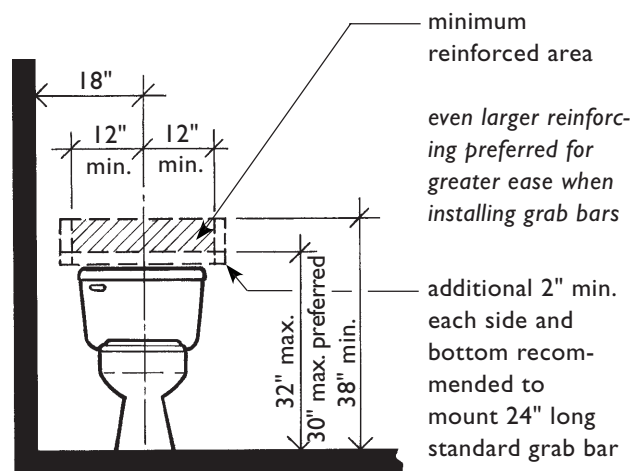
Grab bars are critical for many people with mobility impairments to be able to safely transfer on and off the toilet. Safety for everyone is greatly increased by the addition of grab bars at bathtubs and showers. The Guidelines do not prescribe the type or size of grab bars, nor the structural strength they must exhibit. The Guidelines state only that the necessary reinforcement must be placed “to permit the later installation of appropriate grab bars.” HUD encourages builders to look at the 1986 ANSI A117.1 Standard, or an equivalent or stricter standard, or their state or local building code in planning for or selecting appropriate grab bars.

It is recommended that building owners and managers permanently mount directions for installation of grab bars in every dwelling unit where applicable. The type of construction should be described, where reinforcing is located, and suggestions made for the most effective method for installing grab bars. These notices could be laminated to the inside of a linen closet door or to the inside of a utility or water heater/furnace door.

REINFORCING FOR GRAB BARS AT TOILETS

The Guidelines specify that reinforcing at least 6 inches wide by 24 inches long, capable of supporting grab bars, be provided behind and beside toilets. These minimal areas to be reinforced are adapted from the 1986 ANSI A117.1 Standard. However, the reinforcing should be both longer and wider so sufficient solid material is available to mount grab bars of differing lengths, mounting configurations, and designs. In fact, the Guidelines encourage longer reinforcing, as shown in the Guidelines Figure 3, “Water Closets in Adaptable Bathrooms,” where the preferred length of 42 inches for side wall reinforcing is given.

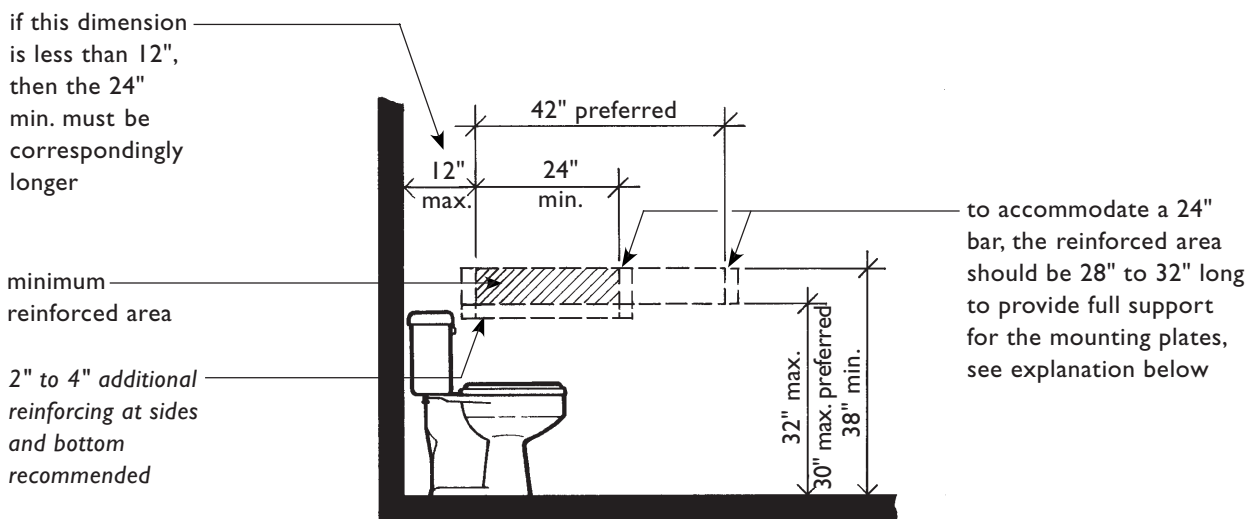
Grab bars, to be within the ranges presented in most accessibility standards, are mounted so their centerline is 33 inches to 36 inches above the floor. If the bottom of the reinforced area is at 32 inches, and a resident chooses to mount a bar at 33 inches, the mounting plates will extend below the reinforced area by 1/2 inch or more. To avoid a weak and unsafe connection, it is critical that reinforcing be enlarged.



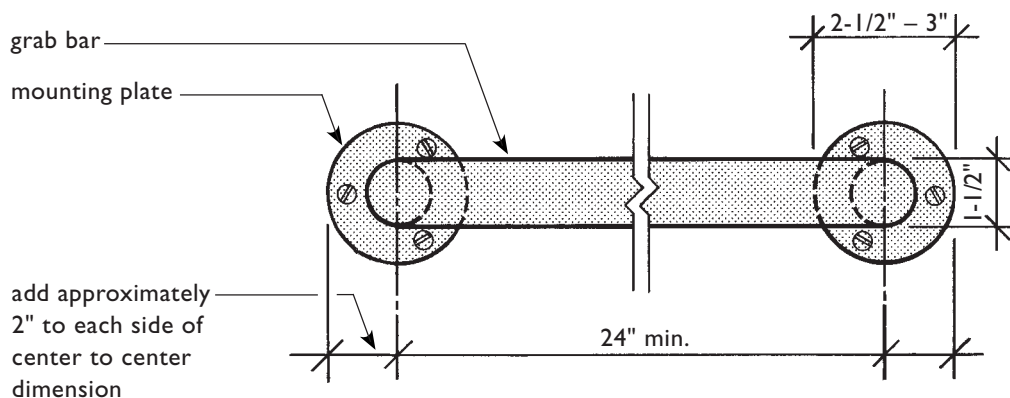
Minimum Reinforcing Behind Toilets Located Beside a Wall

The leading edge of the reinforcing beside the toilet should be positioned at least 36 inches from the back wall to accommodate a bar that is a minimum of 24 inches long. If the reinforcing starts 6 inches from the back wall then the 24

inches of reinforcing should be increased to 30 inches minimum. Whenever a toilet is next to a wall that allows for a longer area of reinforcing (42" is preferred), the longer area should be reinforced.



Minimum Reinforcing to the Side of Toilets

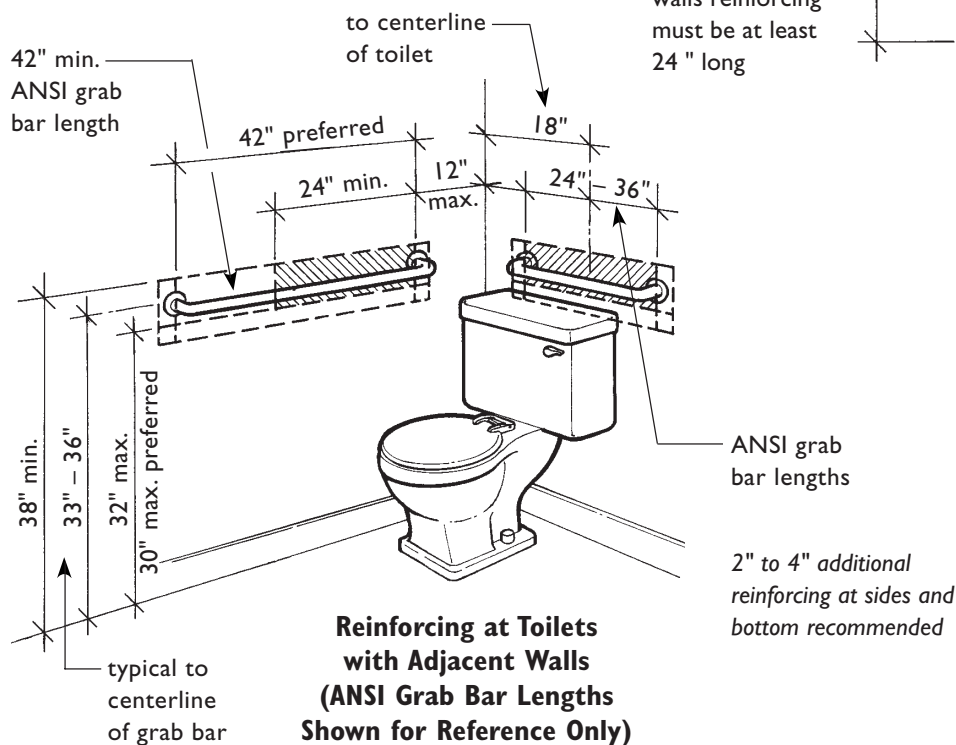
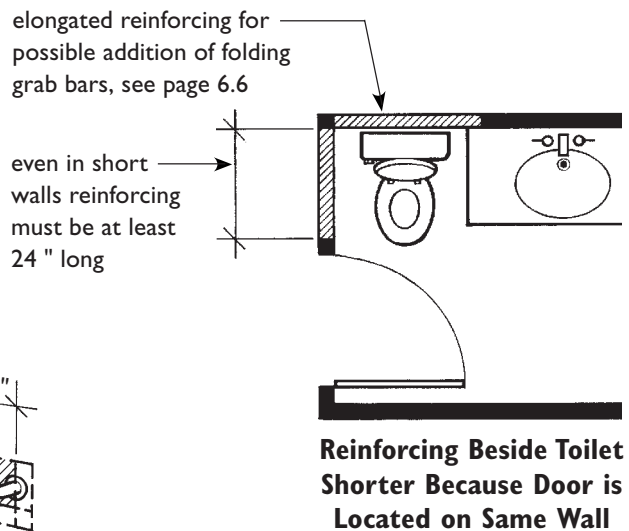
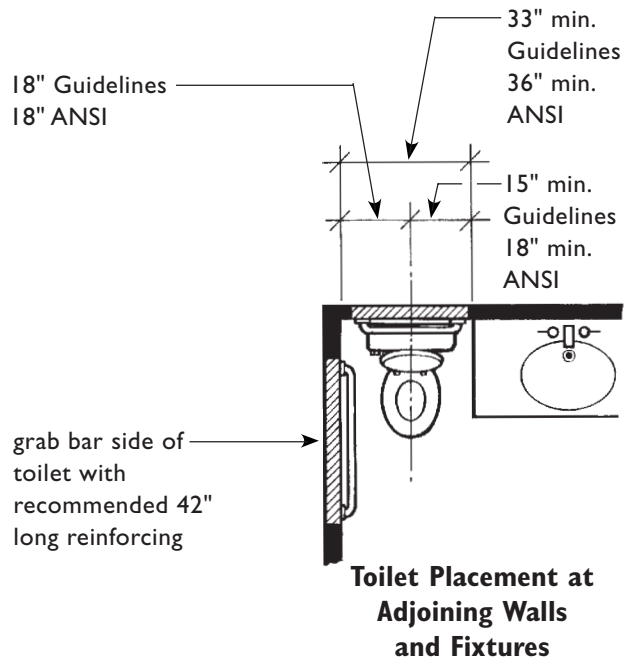


**Escutcheon Plates
 Extend Beyond the Given Grab Bar Length**

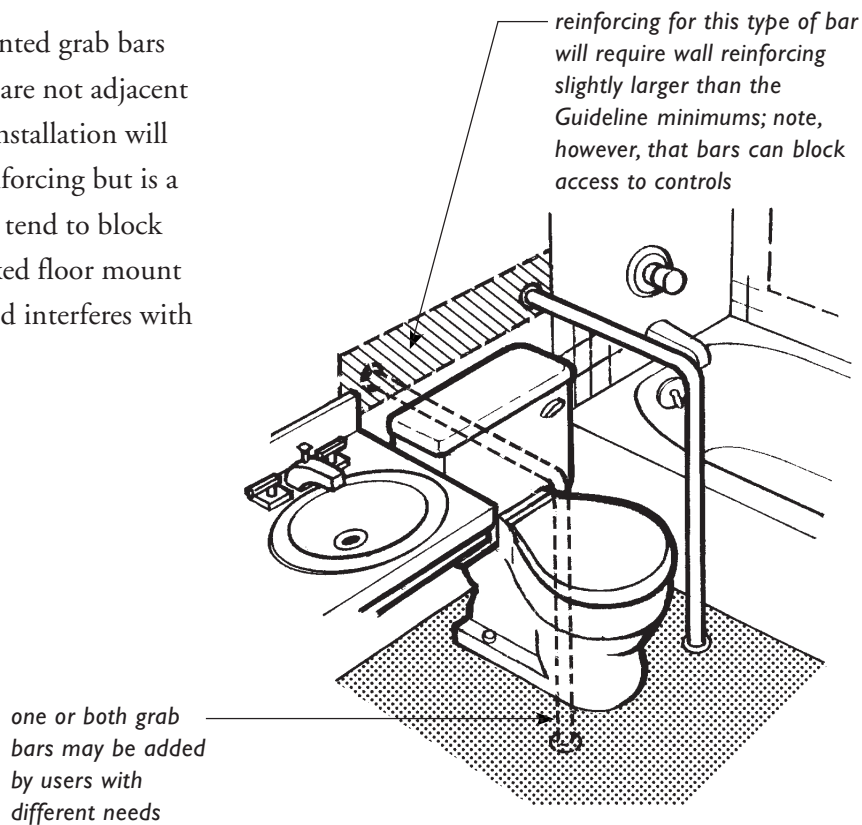
REINFORCED WALLS FOR GRAB BARS

Toilets positioned beside a wall offer the highest degree of safe use since a grab bar can be mounted to the side of the toilet. The dimensions describing the distance from the center of the toilet to a side wall and to the nearest fixture or obstruction on the opposite side have been adapted from the ANSI Standard. The 18 inches from the centerline of the toilet to the wall is an absolute measurement and will accommodate a grab bar and the shoulders of a person seated on the toilet. The Guidelines provide for a 15-inch minimum dimension on the nongrab bar side, which is more lenient than ANSI (which requires 18 inches minimum).

In small bathrooms where the door is located in the side wall immediately adjacent to the toilet, full length reinforcing as specified in the Guidelines may not be possible without enlarging the room. While a short grab bar is not preferred, it does work for some people.



Fixed floor and wall-mounted grab bars also can be installed where toilets are not adjacent to full length walls. This type of installation will require little if any additional reinforcing but is a poor choice because the grab bars tend to block access to adjacent fixtures. The fixed floor mount encroaches on clear floor space and interferes with wheelchair maneuvering.

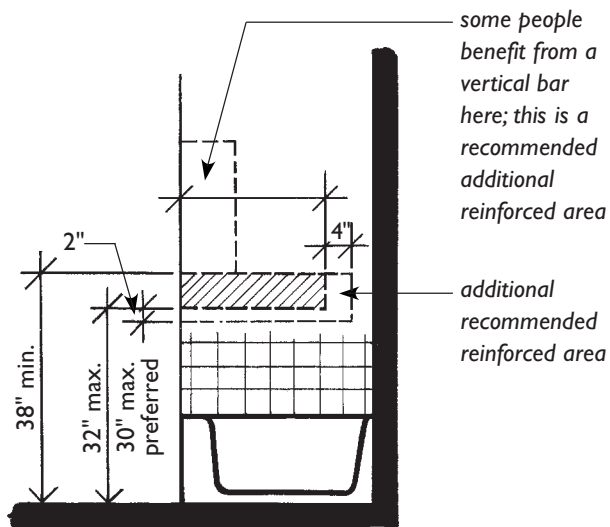


**Fixed Floor and Wall-Mounted Bars
 Not a Good Choice for Many People**

**REINFORCING FOR GRAB BARS
 AT CONVENTIONAL BATHTUBS**

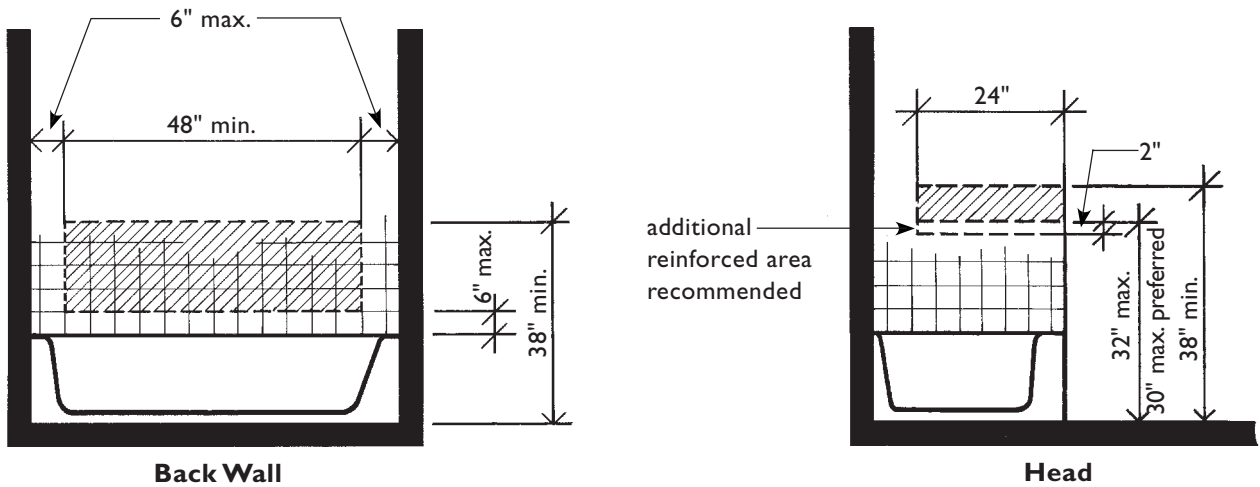
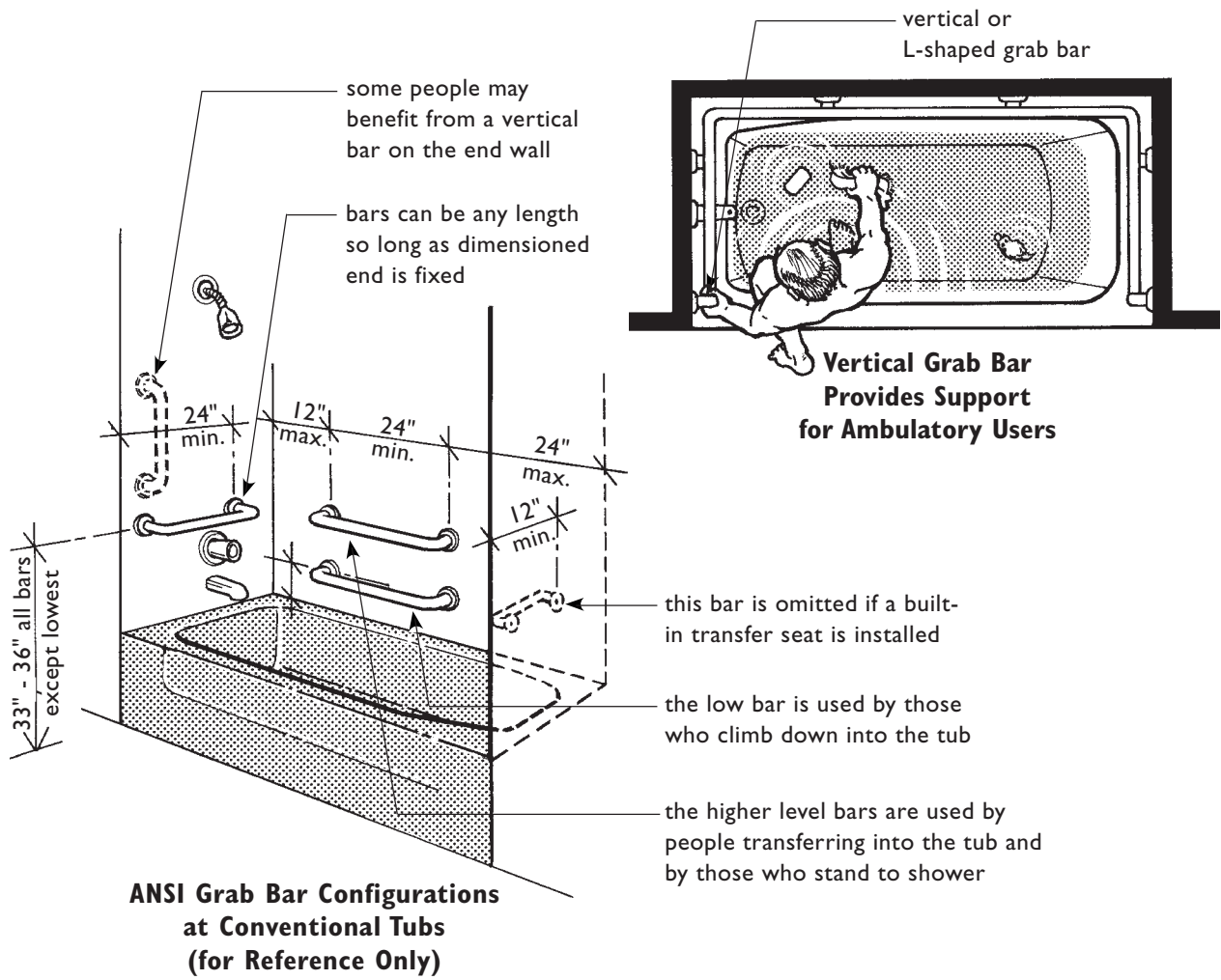
At conventional bathtubs the Guidelines specify wall reinforcing for grab bars as shown in the accompanying illustrations. The intent is to make it easy for a resident to install grab bars similar to those specified in ANSI A117.1 or other equal accessibility standard or code.

For the same reasons as discussed at toilets, the reinforced areas specified at the head and foot of tubs should be enlarged to provide full support for mounting plates and horizontal bars at the lowest position of 33" above the room floor. The enlarged reinforced areas are shown here as recommended additional reinforcing.



Foot (Control Wall)

**Reinforced Areas Required by the Guidelines
 at Conventional Bathtubs**



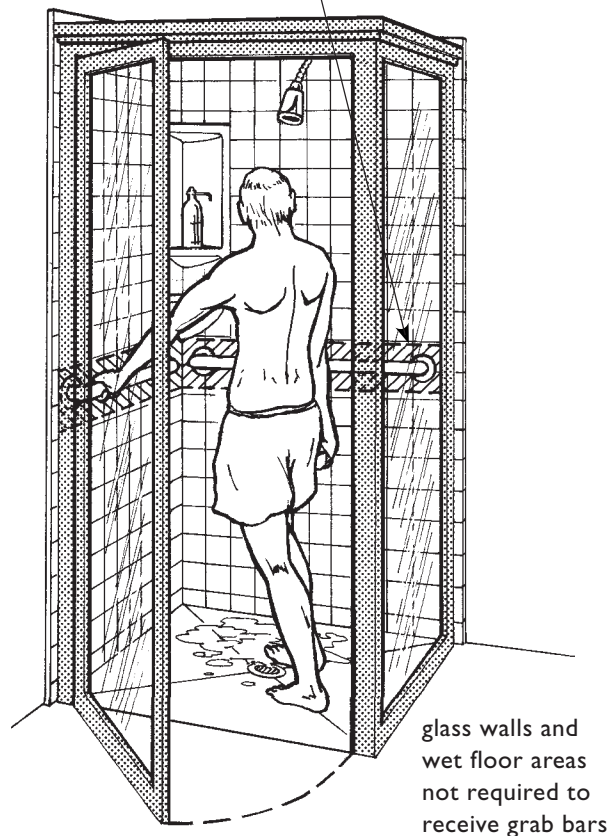
Reinforced Areas Required by the Guidelines at Conventional Bathtubs

REINFORCING FOR GRAB BARS AND SEATS AT SHOWERS

In glass shower stalls, only those walls that are solid construction, i.e., wood or metal studs with gypsum wallboard and/or tile or solid masonry, must have reinforced areas. Glass walls are not required to be reinforced, nor are shower stalls required to have the waterproof pan or floor seal pierced to receive screws/bolts for floor-mounted grab bars.

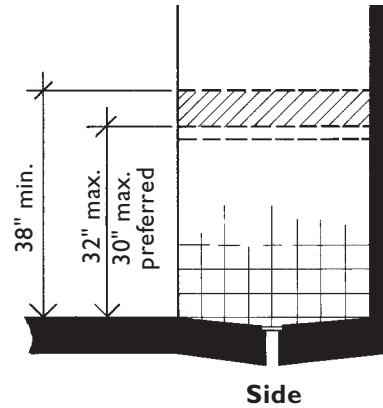
grab bars are helpful for standing users also

reinforcing in conventional walls for grab bars

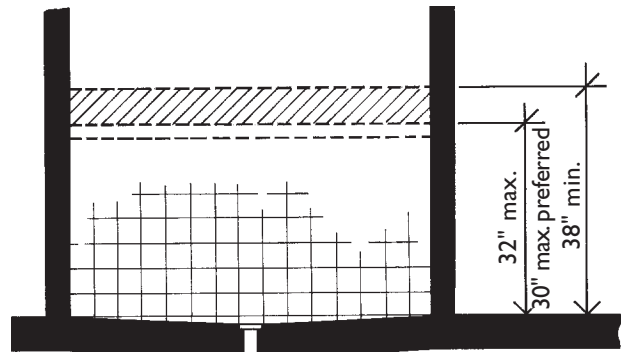


Reinforcing in Glass-Walled Shower Stalls

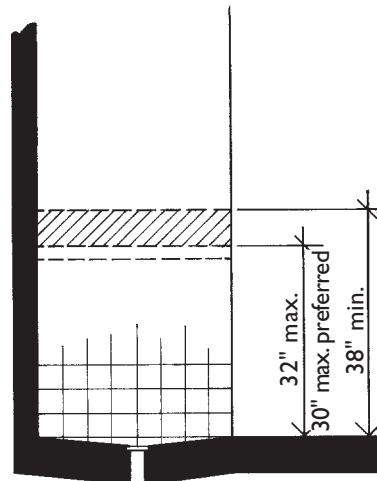
glass walls and wet floor areas not required to receive grab bars



Side



Back



Side

Minimum Reinforcing for Grab Bars in Showers

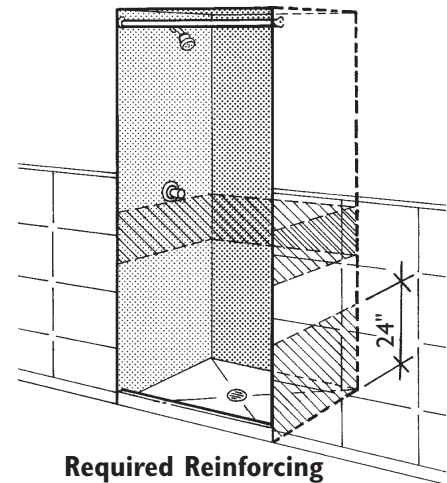
REINFORCED WALLS FOR GRAB BARS

Shower stalls in covered dwellings may be any size or configuration unless they are the only bathing fixture provided in the dwelling unit or on the entry level of a multistory dwelling in a building with one or more elevators. (See clear floor space at shower stalls in Chapter 7, Part B: "Usable Bathrooms.") Reinforcing for grab bars must be at the height shown in the illustrations on the preceding page and extend the full width of both side walls and the back wall. If shower walls curve, reinforcing must still be provided.

Because of the commonly accepted need to install horizontal grab bars between 33 and 36 inches above the floor, it is recommended that this reinforcing be enlarged so the bottom edge is 30 inches above the floor as explained previously at toilets and tubs.

There are certain situations where the shower stall is required to have reinforcing for later installation of a wall-hung bench seat. When this is required is addressed in Part B of Chapter 7, "Usable Bathrooms." Reinforcing is required in a shower stall that measures a nominal 36 inches x 36 inches. The reinforcing is located on the wall opposite the controls and must run the full width of the stall, starting at the floor, to a minimum height of 24 inches.

HUD encourages builders to refer to the ANSI Standard or local codes for specifications on grab bars and wall-hung shower benches. The ANSI specified shower seat is an excellent design for safe use by people with disabilities. The builder should attempt to locate several manufacturers and size the reinforced area for the seat to accommodate more than one model. See Product Resource List in Appendix A. Information detailing reinforced areas and location, as well as product choices, should be included in the permanently affixed resident information recommended at the beginning of this chapter.

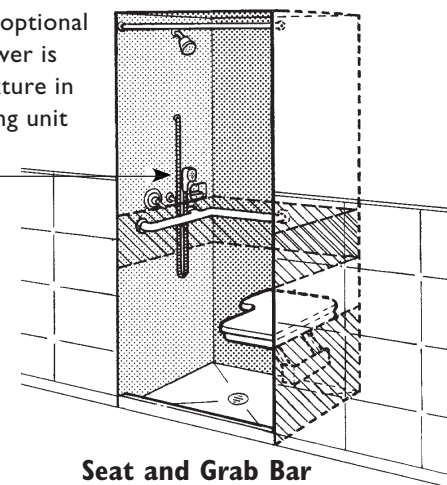


**Required Reinforcing
When Shower is Only
Bathing Fixture**

reinforcing for optional
seat when shower is
only bathing fixture in
covered dwelling unit

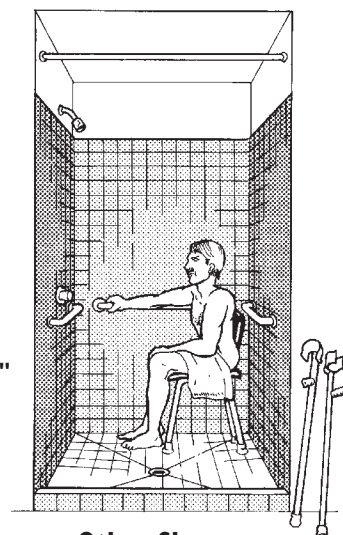
optional
hand-held
shower

17"-19", typical
seat height as
specified in
ANSI



**Seat and Grab Bar
in 36" X 36" Shower**

32" X 48"
shower



**Other Shower
Configurations Permitted**

**RECOMMENDED
REINFORCING METHODS**

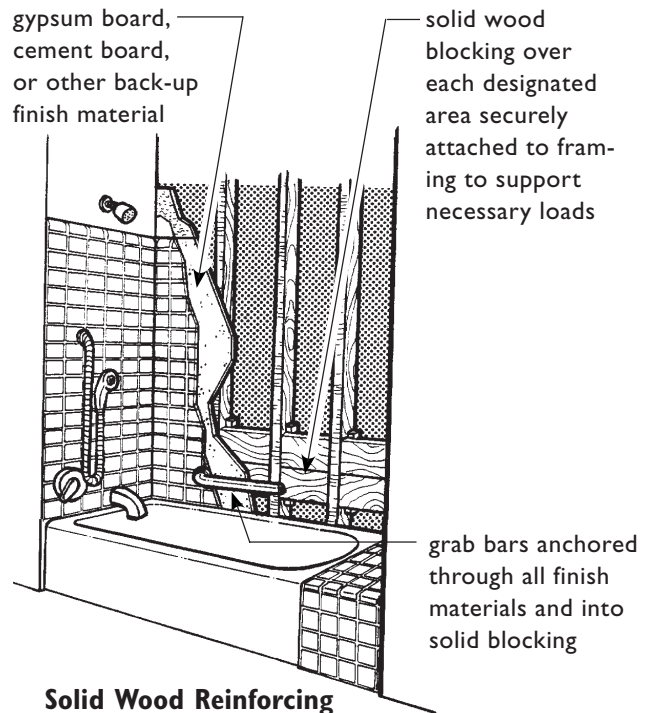
The Guidelines do not prescribe the type of material to use or methods for providing reinforcement at bathroom walls. Grab bar reinforcing may be accomplished in a variety of ways, some of which are suggested below.

**LIMITED AREA REINFORCING
WITH SOLID WOOD BLOCKING**

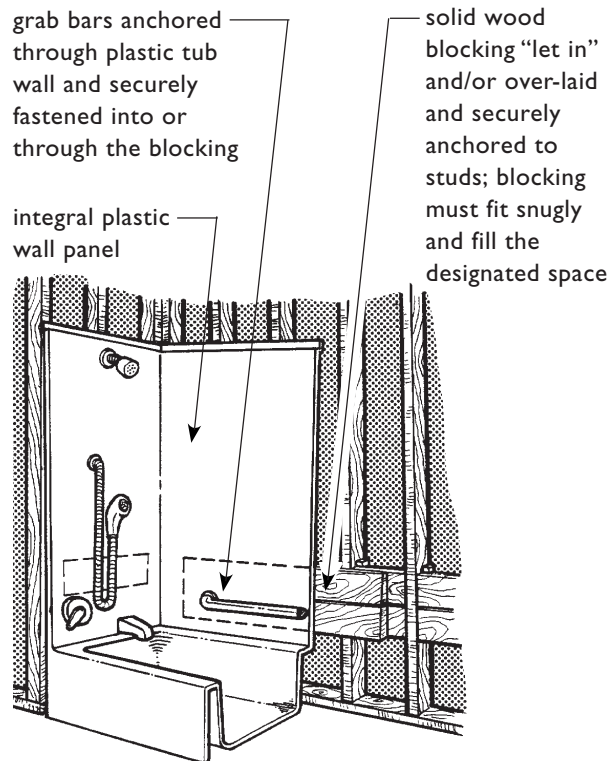
Stud Wall. In wood frame construction, the mounting area for grab bars can be reinforced by installing solid wood blocking either between or “let into” the studs and fastening the blocking securely to the studs. In either way, the solid wood reinforcing is installed flush with the face of the stud so finish materials can be applied to the studs and blocking in the normal manner.

Molded Fixtures. Fiberglass and acrylic bathtubs and showers with integral wall panels are common in both new construction and remodeling. The panels alone are too thin to support grab bars, and because they do not touch the stud wall except at the top, there is a space between the panel and the stud wall. To attach grab bars to these surfaces, an area of solid wood blocking or other solid substance must be installed in the cavity between the fiberglass or acrylic wall and the wall.

Since the space between the panels and the stud wall gets narrower as it approaches the top of the panels where they are fastened to the studs, this blocking must be cut to fit snugly in the space between the studs and the panel. The blocking must contact the plastic panel over the entire reinforced area.



**Solid Wood Reinforcing
on Wood Stud Walls**



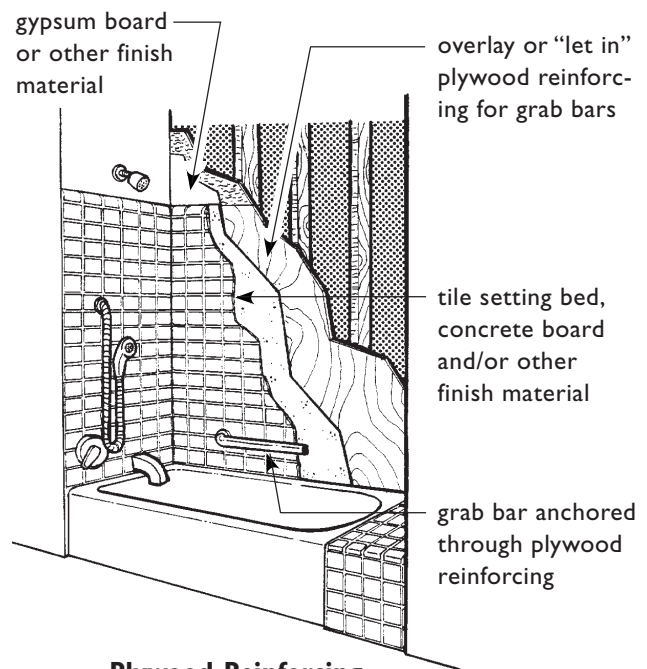
**Reinforcing for Grab Bars
Behind Fiberglass or Acrylic Tub
and Shower Surrounds**

Some fiberglass and acrylic tubs, showers, and wall sections are now made with reinforcing already in the walls to stiffen the fixture. If the reinforced fiberglass or acrylic wall is not specifically labeled as built for grab bars and meeting the ANSI load requirements, then additional reinforcing may need to be installed.

WHOLE WALL OR LARGE AREA REINFORCING WITH PLYWOOD

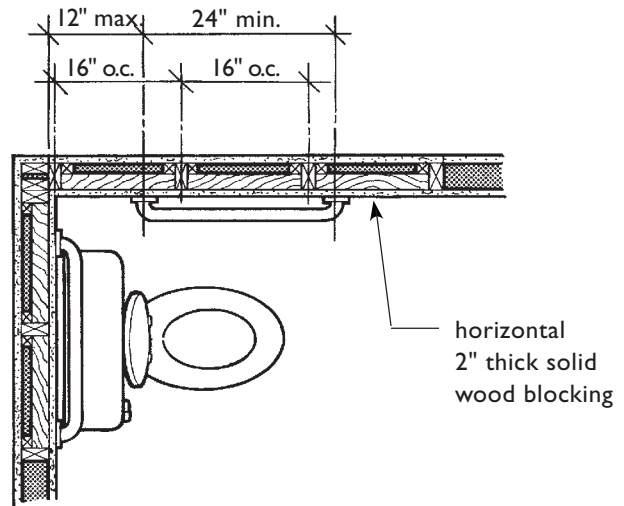
Although the location and the limited size of the wall areas that must be reinforced are specified by the Guidelines, it may be necessary or desirable to extend the reinforcing over a larger area or throughout the entire wall. Some people may want to locate grab bars in areas other than those specified in the Guidelines and other accessibility standards. Other people may have difficulty finding the minimum reinforced wall areas concealed inside a finished wall and install the grab bars in an unreinforced area. A larger reinforced area provides greater flexibility in placement and easier installation of grab bars.

Heavy plywood applied to the studs over a larger area can support grab bars and provide a base for the installation of finish materials such as ceramic tile or plastic wall panels. Plywood can be applied to the face of studs or “let in.” In either case the plywood must be of sufficient thickness and should be securely attached to withstand the forces specified in ANSI 4.24, or an equivalent or stricter standard. Anchors for securing the grab bars to the reinforced walls should be through-the-wall type or another type capable of meeting the ANSI force requirements.



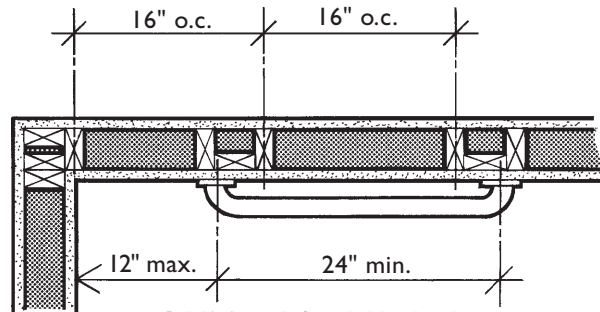
**Plywood Reinforcing
on a Wood or Metal Stud Wall**

Because of standard stud spacing, reinforced areas often will have to be longer than specified to support necessary blocking.



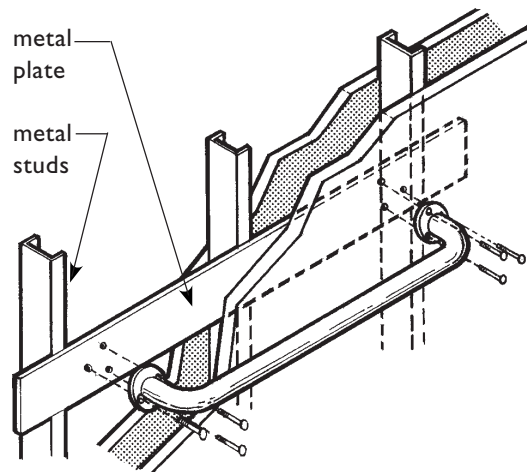
Plan View of Extended Horizontal Blocking Between Conventional Wood Studs

Additional vertical studs can be placed at ends of each specified reinforced area. This method is more expensive, difficult to install accurately, and more difficult to find after construction. It provides less flexibility in bar placement and is more likely to result in a weak connection.



Additional Stud Method of Reinforcing for Grab Bars

A manufactured, formed metal reinforcing plate can be spot welded or screwed to studs.



Reinforcing at Metal Studs