

## State

- Air / Water quality (wetlands, dust...)
- HAZMAT (spills, dumping...)
  
- Antiquities (archeological)
- Labor / Workman's Comp.
- R.O.W.
- Fire performance standards
- Energy performance standards

## Supporting players

- ASTM
  - American Society for Testing and Materials - authors test and material quality standards.
- UL
  - Underwriters Laboratories - Testing agency for fire rated assemblies
- FM
  - Factory Mutual Testing Laboratories - Insurance based testing agency for fire and wind assemblies.
- ASHRAE
  - American Society of Heating Refrigeration and Air Conditioning Engineers.
  - Authors technical standards for performance of energy and related systems.

## Federal

- Civil Rights / ADA / Fair Housing Act
- Air / Water quality (HAZMAT)
- Endangered Species
- Labor
- OSHA - Workplace Safety
- Transportation

## Federal Enforcement

- OSHA
  - Occupational Health and Safety Administration - regulates workplace safety
- NIOSH
  - National Institute of Occupational Safety & Health - Sets workplace safety standards
- DOJ
  - Department of Justice - Enforces ADA rights / Fair Housing Act

- Since the early 1970's each model building code began to incorporate provisions which required certain buildings, certain percentages of parking, apartments and buildings constructed with federal or state monies to make access to and use of the buildings easier by people with physical disabilities.

## The Fair Housing act of 1988

- The Fair Housing Act, as amended in 1988, prohibits housing discrimination on the basis of race, color, religion, sex, disability, familial status, and national origin. Its coverage
- includes private housing, housing that receives Federal financial assistance, (including FHA / VA loans) and State and local government housing. It is unlawful to discriminate in any aspect of **selling or renting** housing or to deny a dwelling to a buyer or renter **because of the disability of that individual**, an individual associated with the buyer or renter, or an individual who intends to live in the residence.

## Fair Housing (cont'd)

- Other covered activities include, for example, financing, zoning practices, **new construction design**, and advertising.
- 
- The Act further requires that **new multifamily housing with four or more units be designed and built to allow access for persons with disabilities**. This includes accessible common use areas, doors that are wide enough for wheelchairs, kitchens and bathrooms that allow a person using a wheelchair to maneuver, and other adaptable features within the units.

- In the mid 1990's, the Congress of the United States passed into law the American with Disabilities Act (**ADA**). With passage of this law, the access to and use of the built environment by persons with physical disabilities became a **civil right**. This meant that no longer could the provisions for accessibility be waived by a local code official. It also meant that whether or not the project included state or federal funds, accessibility was required. The law went further to require that not just new construction was required to comply, but that existing construction, especially if it was part of a health care facility was required to make good faith progress to plan for and implement facility upgrades to enhance the accessibility of the facility.

# ADA

- Unlike most other regulations which can be appealed and exemptions / modifications written, the *American with Disabilities Act* is a **CIVIL RIGHT**
- This means a group or individual may file a complaint asserting discrimination...to the U.S. Dept. of Justice....so *the Attorney General* is the investigator / prosecutor...not many exemptions exist.

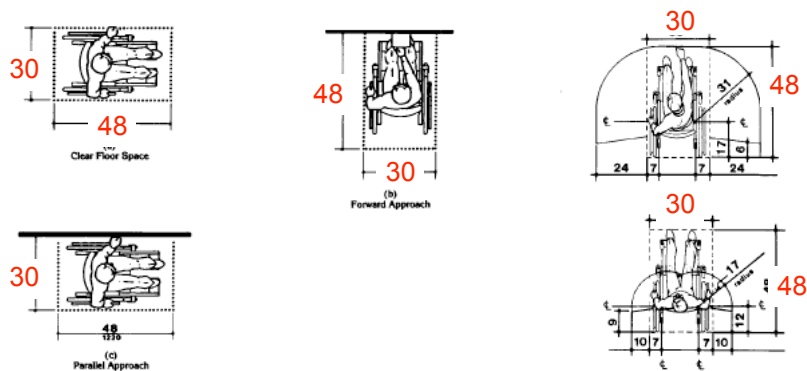
- Fundamentally designing for people of varying ages, and varying levels of physical ability is just good design (**Universal Design**).
- Anyone who has had to use a toilet at an airport appreciates toilet stalls large enough to bring your luggage into.
- Anyone who has approached a door with hands full appreciates the ease of use a lever handle brings. Those of use who use public lavatories appreciate that we can turn the lever handled faucets off with our elbows, keeping our just washed hands clean.
- As a parent, when I had a child in a stroller, I appreciated ramps at entrances and exits to buildings.
- As a read-while-you walk kind of pedestrian, the texture change at crosswalks have saved my life.

- When I was a younger student in architecture, I balked at ramps, elevators, lever handles, grab bars, and other devices meant to make the environment more accessible because it just wasn't as interesting as a good shadow on an elevation.
- But we are all just a twisted ankle, broken wrist, or soccer-induced twisted knee from **needing** this quality of design.
- Beyond the letter of the law (which is summarized in the Americans with Disabilities Act Accessibility Guidelines **ADAAG**) the ADA reminds us that accessibility must be accomplished without an expending effort greatly in excess of a non-disabled person. The point here is to facilitate the use of buildings and the environment *without a loss of dignity* by the disabled user.

- So when a project develops to a point where you have only left it possible to enter the building along the accessible path by going around to the side...or the back of the building
- START OVER because it is NOT ACCEPTABLE to make one group of people have to enter where the garbage is stored.
- The question I ask myself as a architect is "**Would I be comfortable having my mom use this?**" If the answer is no, we start over.

- Many of the specifics of the ADAAG were adapted from a previous standard.
- The ANSI A1117.1 standard was developed as a standard for veterans hospitals with a population in mind that had **good upper body strength** while having some lower extremity disability.
- This standard is being modified as time goes by, but you should know that **it does not address the needs of those without upper body strength** as often is the case with some elderly populations or some arthritic populations.
- Provisions for sight, vision, and upper body impairments have been incorporated in the ADAAG but continue to be updated.

### From ADAAG: Wheelchair basics



## From ADAAG: Wheelchair basics: turns

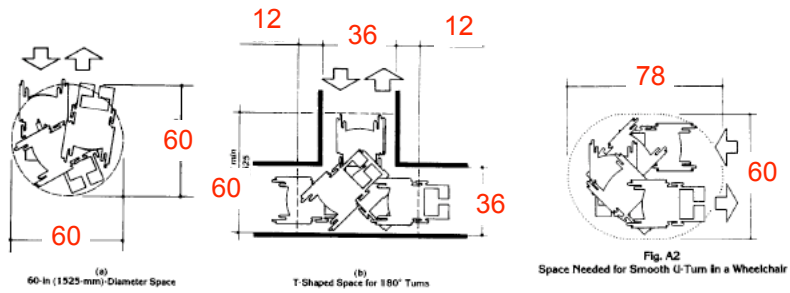


Fig. 3  
Wheelchair Turning Space

## Reach

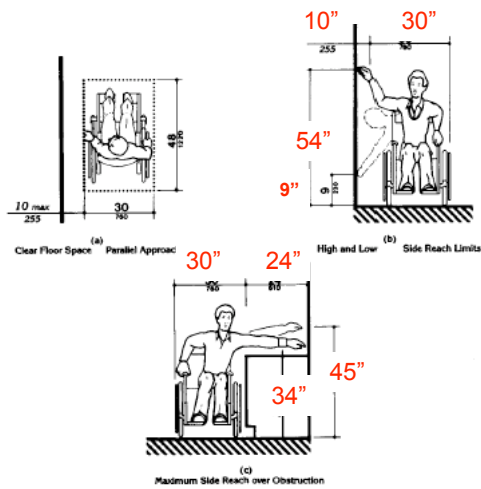
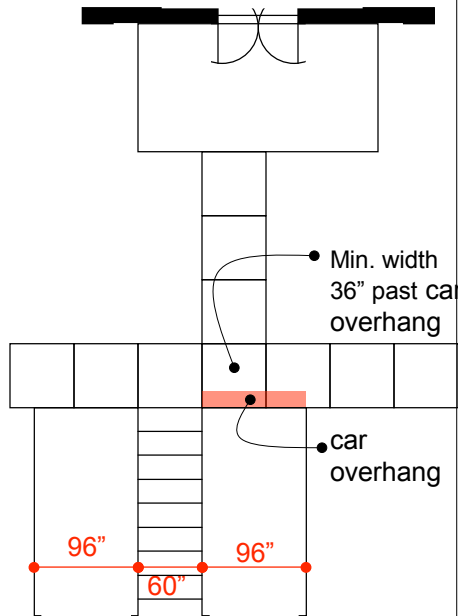


Fig. 6  
Side Reach



- Parking
  - Accessible spaces must be located on the shortest possible accessible route.
  - Minimum parking space width is 96" inches, with a 60" wide aisle adjacent.
  - Two parking spaces may share a common access aisle between them.
  - The maximum slope in any direction on an accessible parking space is 2 in 100 (2%).
  - Cars overhanging adjacent sidewalks must not reduce the width of the accessible route.



## From ADAAG: Parking

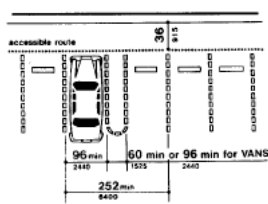
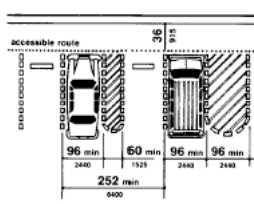
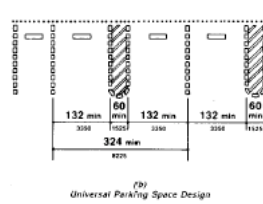


Fig. 9  
Dimensions of Parking Spaces

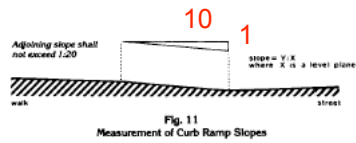


(b)  
Van Accessible Space at End Row



(c)  
Universal Parking Space Design  
Fig. A5  
Parking Space Alternatives

## From ADAAG: Curb Ramps



Slopes must not exceed 1 in 10

Returned Curb allowed only with **planting strip** not in a sidewalk

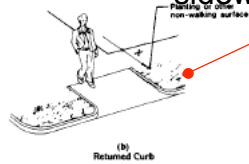
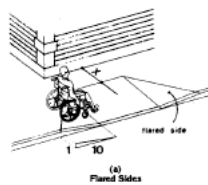
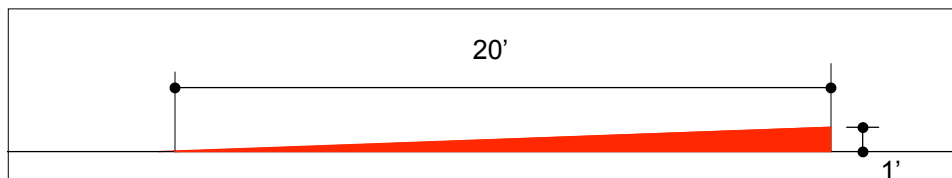
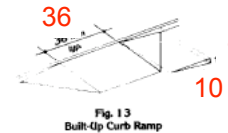


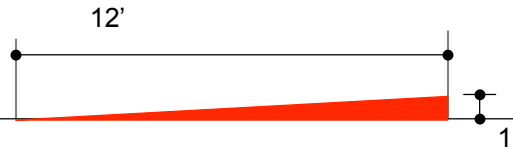
Fig. 12  
Sides of Curb Ramps



### – Sidewalks

- The maximum allowable slope for a sidewalk is 1 foot in 20 feet.
  - The minimum width for a sidewalk on an accessible route is 36"
  - A 60"x60" passing area must be provided every 200'
  - Sidewalks must be flush (one level within 1/2 inch of another)
  - The minimum width of a ramp from sidewalk to curb bottom is 36 inches between the flares.
  - The flare which transitions the sidewalk to the curb ramp cannot exceed a slope of 1 in 10.
- The surface of the curb ramp and flares must contrast in color and texture with surrounding walk and paving surfaces.

## Slopes & Ramps



- Slopes:
- if a sidewalk slopes at a rate of more than 1 foot in 20 feet, it is considered too steep (a ramp).
- Ramps are used when walks would be too steep. The maximum slope of a ramp is 1 foot in 12 feet (1 in 16 is recommended).
- Ramps are required whenever the elevation change between levels is over 1/2 inch.
- Ramps must be a minimum of 36" clear (but it takes 60 to 72 inches to pass with dignity on a ramp).
- The maximum vertical rise of a ramp between landings is 30 inches.

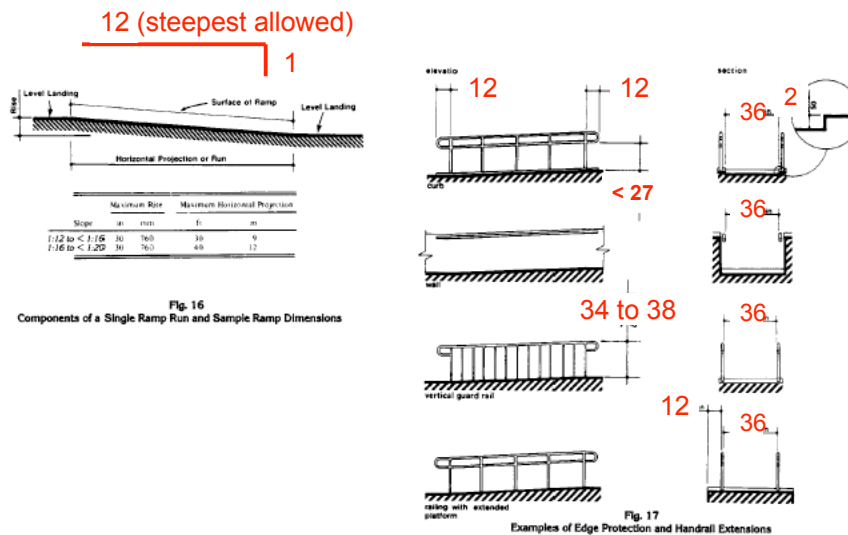
## Ramps...Landings

- Landings are required at the top and bottom of each ramp.
- Landings must be at least as deep as a ramp is wide, with a minimum depth of 60".
- If the ramp changes directions at the landing, it must be at least 60" x 60"
- If the ramp is more than 6" long, it must have handrails on each side. (not required at curb cuts or in auditoriums at seating).

## Ramps...Handrails

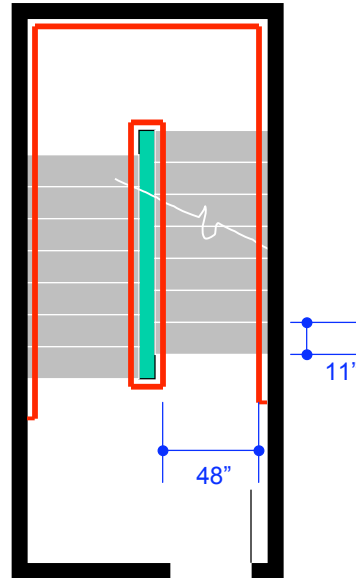
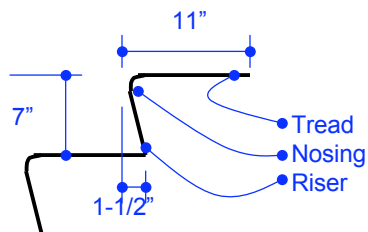
- Handrails must be shaped to be fully grasped around their diameter.
- Handrails must project 1-1/2" from wall surface to facilitate grasping.
- The inside handrail must be continuous around switchbacks.
- Handrails must be between 34" and 38" above the ramp surface.
- Nothing can project more than 4 inches into a ramp between the heights of 27" and 80".

## Ramp Handrail basics in inches



## Stairs

- Minimum width between handrails = 48" inches.
- Minimum stair tread = 11" inches.
- Maximum stair riser = 7". No open risers allowed.
- Stair nosing projection maximum = 1-1/2 inches, must transition with 60 degree slope.



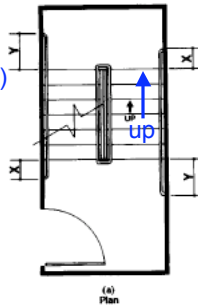
## Stairs... Railings

- Stair railings must be placed on both sides of the stairs, and be continuous on inside of switchbacks.
- Stair railings must extend 12" inches beyond the upper end of a stair run and extend 12" plus the dimension of one tread at the lower end of a stair run (min 23")
- Stair railings must be located 34" to 38" above stair nosings.

# Handrail extensions...and height

12" plus one tread at the bottom (min= 23")

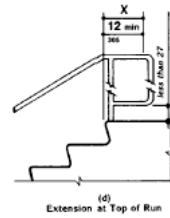
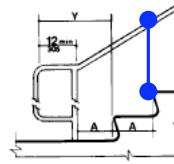
12" at top



12" at top

12" plus one tread at the bottom (min= 23")

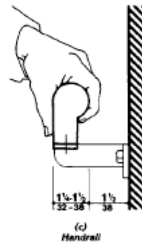
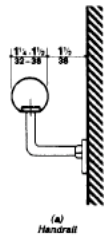
Railing height: 34" to 38" above nosing



# Grasp-able Handrails Required

Stair railings must project 1-1/2" from wall surface to facilitate grasping.

Stair railings must be shaped to be fully grasped around their diameter. (1-1/4" to 1-1/2")

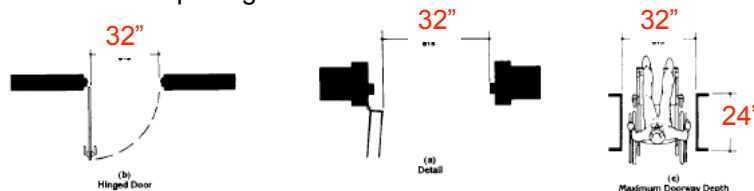


## Stairs...A.R.A.

- 2 Areas of rescue assistance must be provided in each smokeproof stair enclosure.
- 2 way communication, visual and audible must be provided between areas of rescue assistance and entry.
- Each area of rescue assistance must be at least 30" inches by 48" inches.
- Areas of rescue assistance must not encroach (reduce) required exit width.

## Doorways

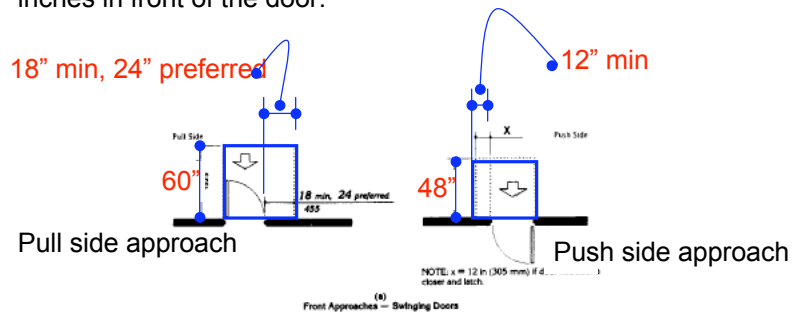
- Must have a minimum clear width when open of 32" inches (usually this takes a 36" wide door due to frame thickness and hinge intrusion)
- Must have the same floor elevation on each side of the door.
- Door closers must be adjusted to close the door from 70 degrees to a 3" inch opening in 3 seconds or more.



## Frontal door approach, pull and push side clearances

When approaching a pull door from the pull side, there must be 18 inches (24" preferred) clear wallspace adjacent to the pull for a distance of 60 inches back from the door.

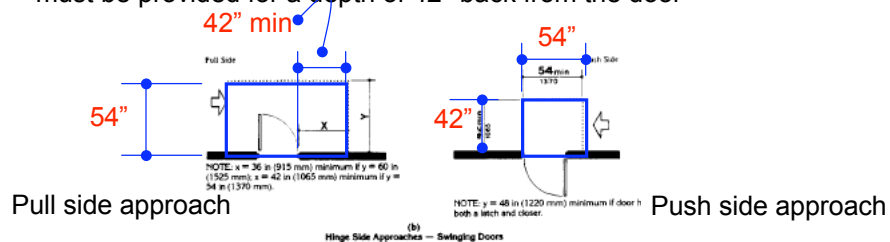
When approaching a push door from the push side, there must be 12 inches beside the door at the latch side for a depth of 48 inches in front of the door.



## Hinge Side door approach, pull and push side clearances

When approaching a hinged door from the pull hinge side, a clear area of 42 inches extending from the latch in the direction away from the hinge must be provided for a depth of 54 inches back from the door.

When approaching a hinged door from the push hinge side, a clear area of 54 inches extending from the latch in the direction of the hinge must be provided for a depth of 42 inches back from the door.

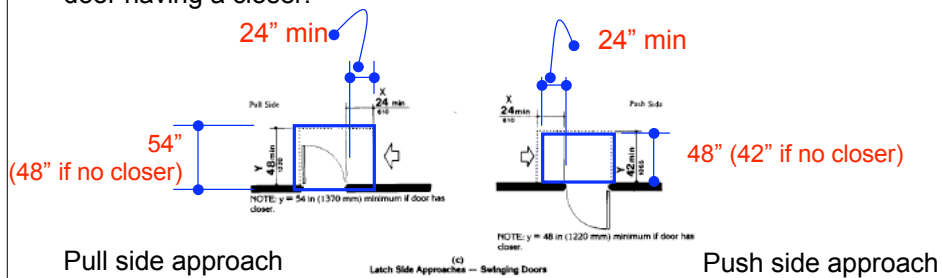




## Latch Side door approach, pull and push side clearances

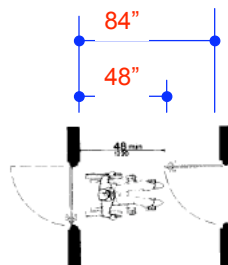
When approaching a hinged door from the pull latch side, a clear area of 24" extending from the latch in the direction of the hinge for a depth of 54" inches back from the door having a closer.

Approaching the push latch side, a clear area of 24" extending from the latch away from the hinges must be provided 48" deep from the door having a closer.



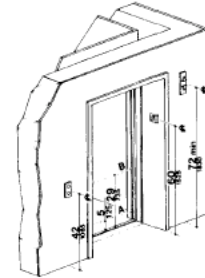
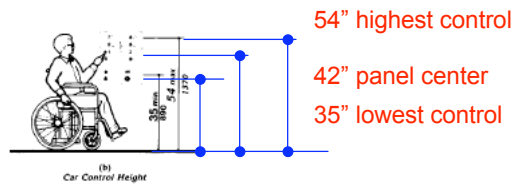
## Doors in Series, Vestibule

When installed in series (as in a vestibule) must have 48" between doorswings. (e.g. a 36" doorswing plus 48" clear space between doors equals a 84 inch dimension between doors).



## Elevators

- Hall and Car button panels must be located a maximum 42 inches above the floor, measured to the panel center.



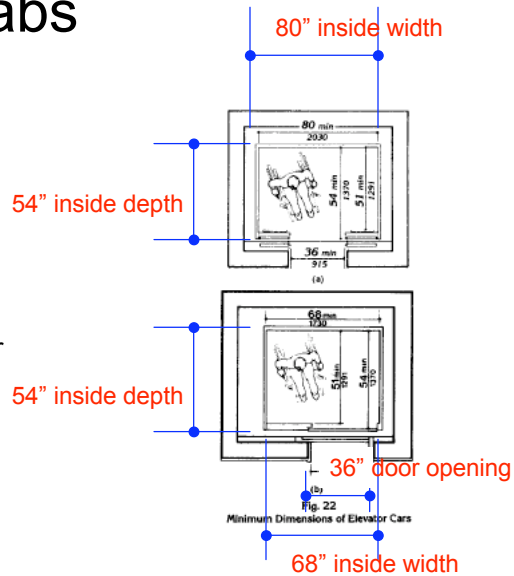
NOTE: The automatic door reopening device is actuated if an object passes through either line A or line B. Line A and line B represents the vertical locations of the door reopening device not requiring contact.

Fig. 20  
Holstway and Elevator Entrances

## Elevator Cabs

Elevator cars with center door openings must be a minimum of 80" wide and 54" deep with a 36" wide clear door opening

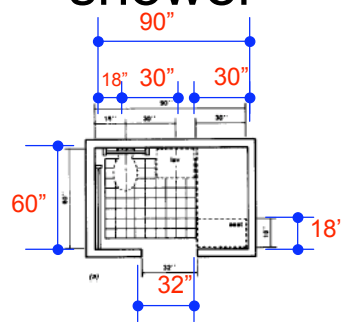
Elevator cars with side door opening must be a minimum of 68" wide and 54" deep with a 36" wide clear door opening.

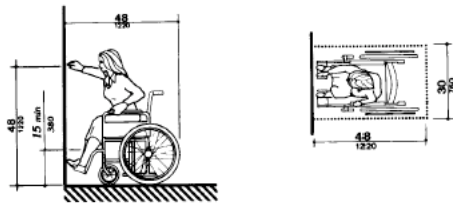
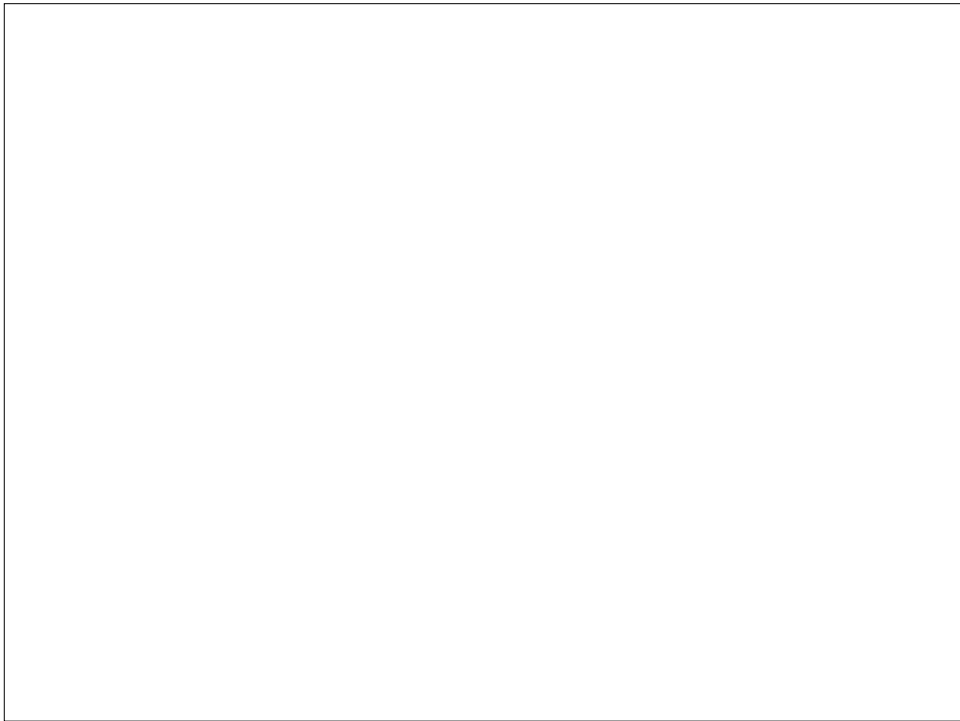


## Toilet Stalls and lav's

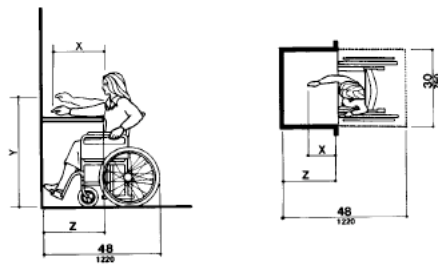
- 60 inches wide, 56 inches deep with floor mounted w.c. with 32 inch clear door opening
- 60 inches wide, 59 inches deep with wall mounted w.c. with 32 inch clear door opening
- toilet mounted 18 inches from the right side with a 36 inch grab bar mounted at the right side

## A small toilet with roll-in shower





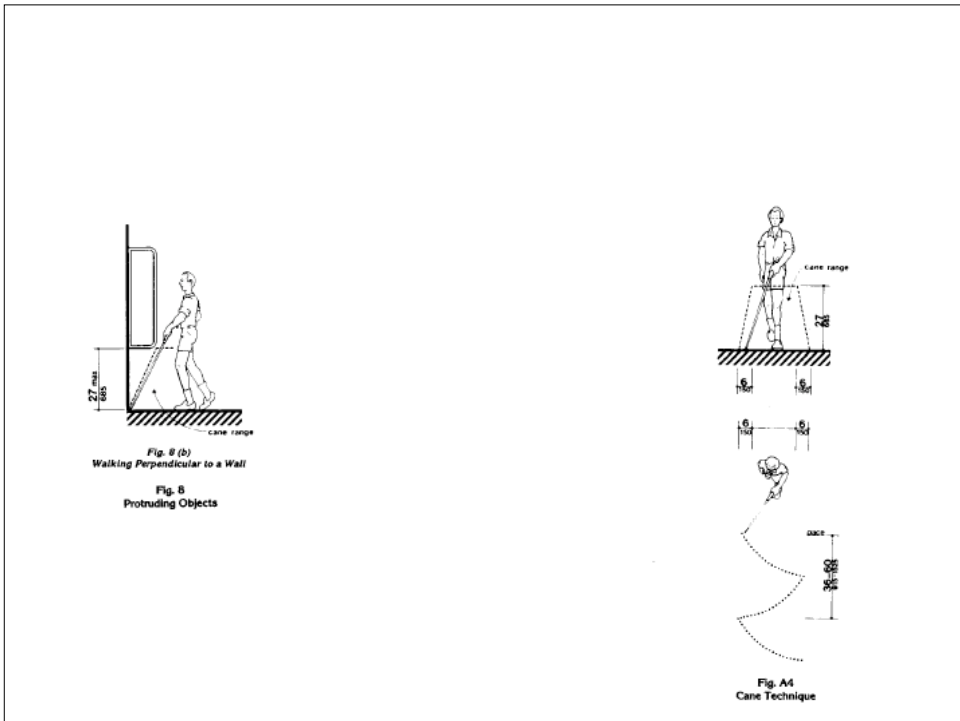
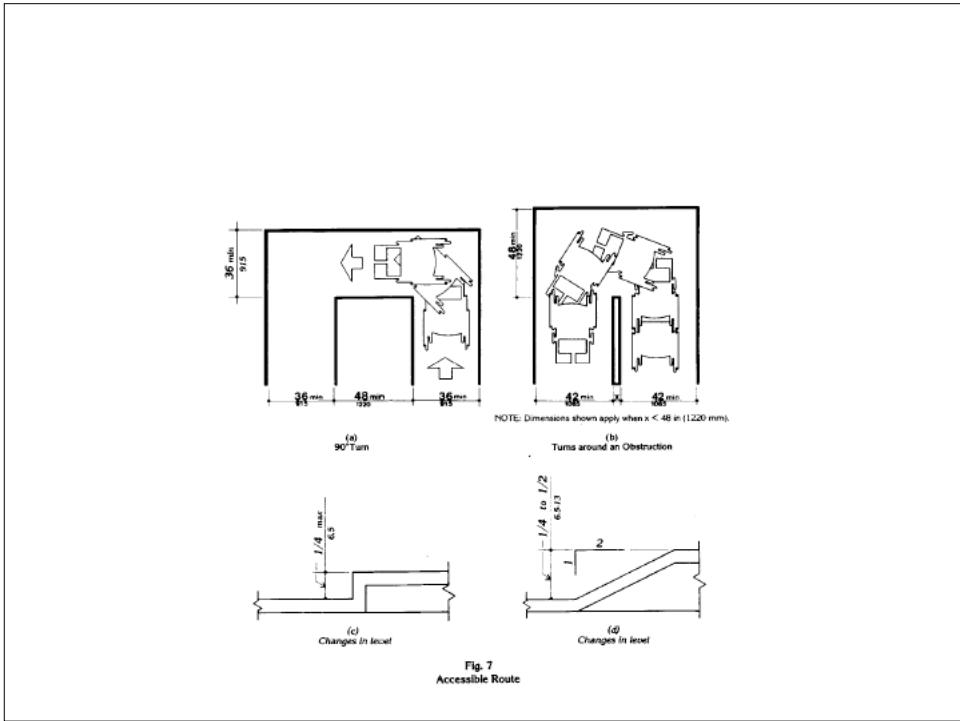
(a)  
High Forward Reach Limit



NOTE: x shall be  $\leq 25$  in (635 mm); z shall be  $\geq x$ . When  $x < 20$  in (510 mm), then y shall be 48 in (1220 mm) maximum. When x is 20 to 25 in (510 to 635 mm), then y shall be 44 in (1120 mm) maximum.

(b)  
Maximum Forward Reach over an Obstruction

Fig. 5  
Forward Reach



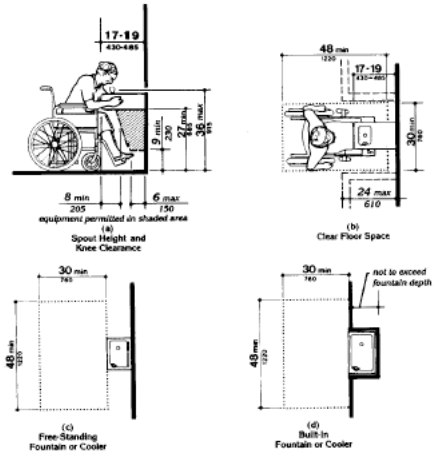
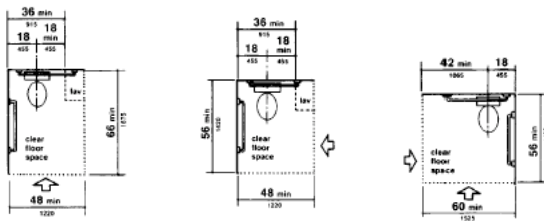
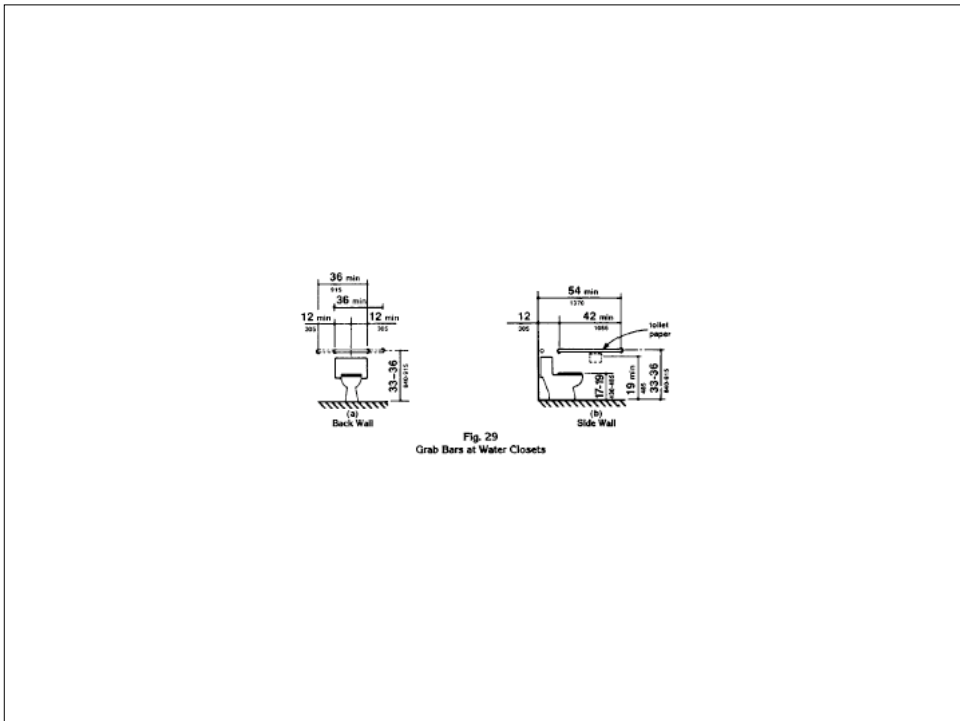
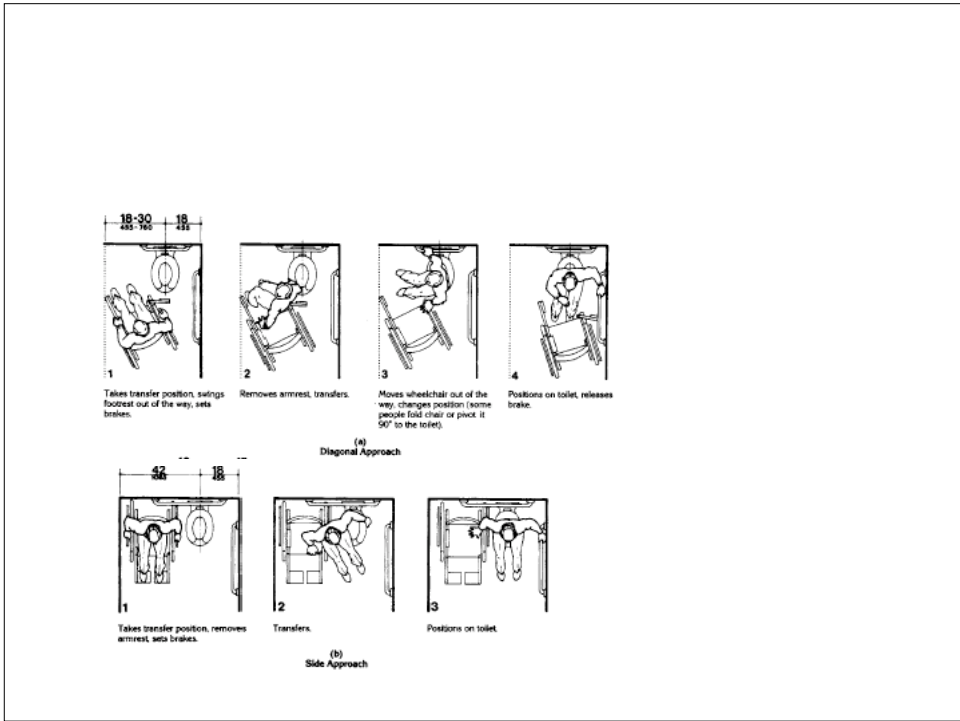
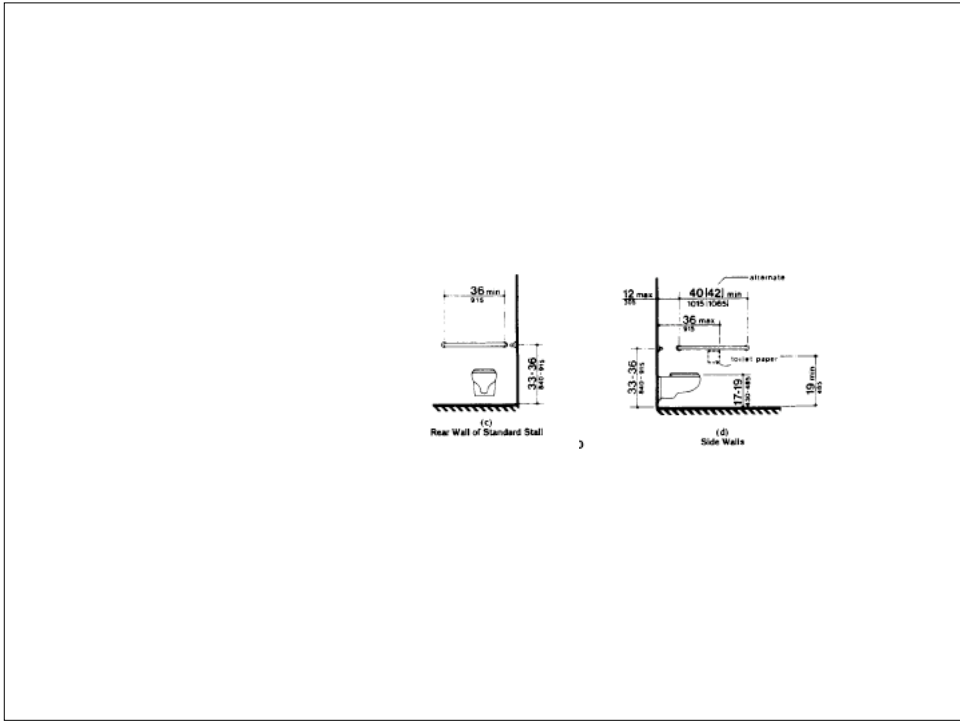
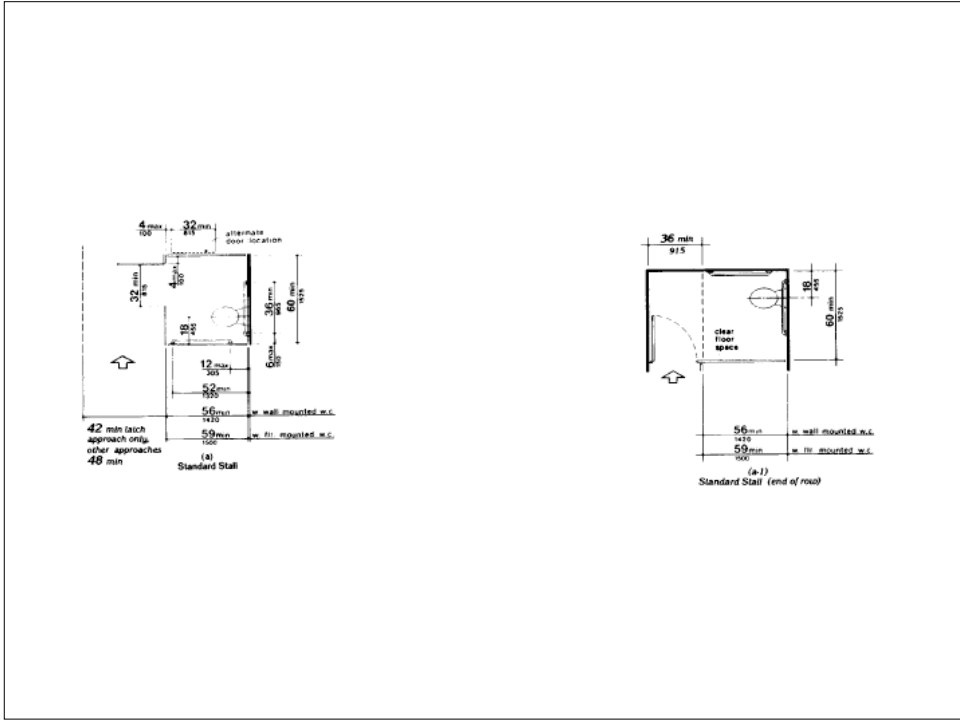


Fig. 27  
Drinking Fountains and Water Coolers









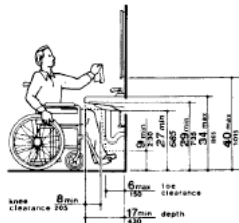


Fig. 31  
Lavatory Clearances

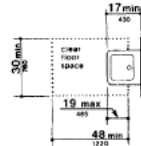


Fig. 32  
Clear Floor Space at Lavatories

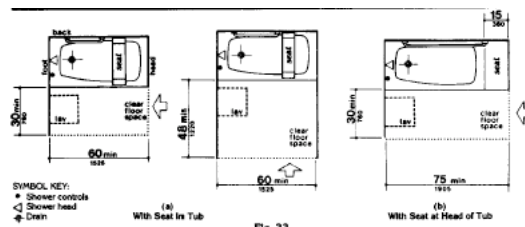
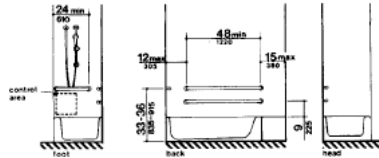
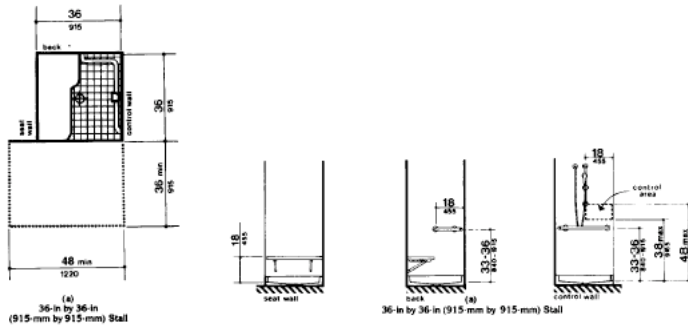


Fig. 33  
Clear Floor Space at Bathtubs



(b)  
With Seat at Head of Tub  
Fig. 34  
Grab Bars at Bathtubs



(a)  
36-in by 36-in  
(915 mm by 915 mm) Stall

(b)  
36-in by 36-in (915 mm by 915 mm) Stall

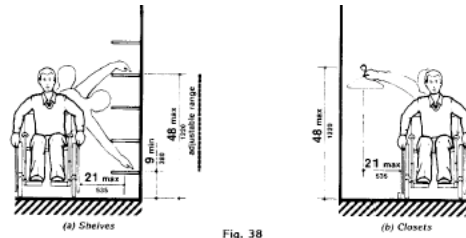


Fig. 38  
Storage Shelves and Closets

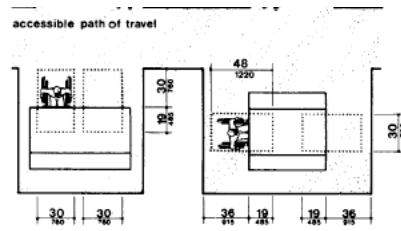


Fig. 45  
Minimum Clearances for Seating and Tables