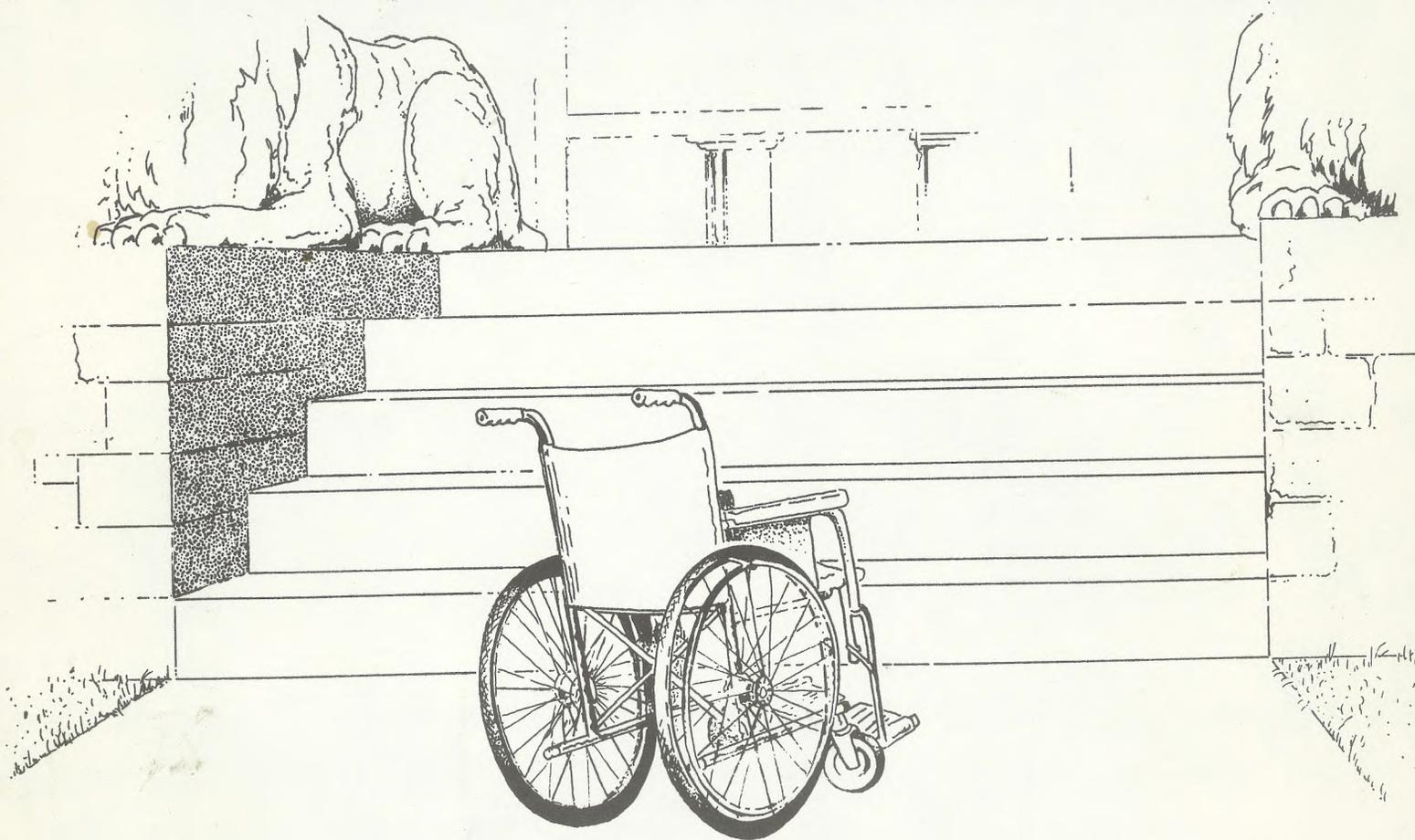


Toward a More Accessible Environment

(or: Un-handicapping the handicapped)



The Texas State Law, Graphically Illustrated:

FOR USE IN MAKING BUILDINGS AND OTHER FACILITIES ACCESSIBLE TO THE PHYSICALLY HANDICAPPED.

PREPARED BY:

THE UNIVERSITY OF TEXAS AT
ARLINGTON

EDUCATIONAL SUPPORT SERVICES OFFICE

FORWARD

One of the largest problems faced every day by the physically handicapped is architectural barriers. The problems accompanied with the prevention and removal of architectural barriers are not due to inadequate legislation or interest in the needs by those knowledgeable of the problems, the problem lies with the uninformed. Numerous volumes of testimony from handicapped citizens, rehabilitation officials, builders, architects, and legislators have been compiled by congressional committees and excellent guidelines have been developed as a result. The immediate problem involved with the prevention or removal of architectural barriers is educating the general public as to the needs of the physically handicapped.

The passage of Public Law 90-480 by the United States Congress in 1968 officially set in writing the need for a national awareness of the architectural needs of the physically handicapped. Subsequent amendments and addendums to physical barrier removal and prevention laws further support the concept of barrier free design and architecture to mobilize the handicapped. Public Law 90-480 was the national example and many states including Texas have followed the example.

The 61st Legislature of the State of Texas passed Senate Bill 111 which was to become Article 678-G of the Vernon's Annotated Civil Statutes. The Bill established minimum standards for making buildings and facilities accessible to and usable by the physically handicapped. Buildings and facilities which receive state monies for construction or substantial renovation must meet the standards set forth in Senate Bill 111. However, the majority of building structures in Texas do not utilize state or federal monies.

And while some architects have made sincere efforts to design accessible buildings for the physically handicapped, only 25% of all buildings constructed are designed by architects. Therefore, much work needs to be accomplished in the community.

The questions to be raised are: Who assumes the responsibility to educate the business community as to the architectural needs of the physically handicapped; Who assumes the leadership role to convince Mr. Businessman that the physically handicapped are consumers who would readily patronize accessible concerns; Who forwards the information and specifications for making businesses, libraries, city and county offices, recreation areas, and churches accessible to the physically handicapped?

You do. Whether you are a rehabilitation specialist, a high school or college staff member, or just a concerned citizen, you can have a tremendous effect upon the lives of all physically impaired citizens in your area. All you need to know are the problems faced by the physically handicapped and recommended solutions to the problems

In order to understand the nature of the problems let me recommend that you borrow or rent a wheelchair and use it for one day in the community. Then blindfold yourself for a day. Then refer to the state laws and graphic illustrations in this handout and make recommendations to every manager or proprietor that you come into contact with. Always keep in mind that these specifications are the minimum requirements.

The awareness and understanding of the needs of the physically handicapped is the first step. The freedom to function as an independent member of society is the end result. Be persistent and think ACCESSIBILITY -- it's the proper course to barrier-free design.

Jim Hayes, Coordinator
Educational Support Services Office
The University of Texas at Arlington

AN ACT

to require that those buildings and facilities constructed in the state by the use of federal, state, county, or municipal funds shall adhere to the principles prescribed by this Act in order to make these buildings and facilities accessible to, and useable by, the physically handicapped; and declaring an emergency.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF TEXAS:

Section 1. Policy. The provisions of this Act are enacted to further the policy of the State of Texas to encourage and promote the rehabilitation of handicapped or disabled citizens. It is the intent of this Act to eliminate, insofar as possible, unnecessary barriers encountered by aged, handicapped or disabled persons, whose ability to engage in gainful occupations or to achieve maximum personal independence is needlessly restricted when such persons cannot readily use public buildings.

Section 2. Application of Act. (a) The standards and specifications set forth in this Act shall apply to all buildings and facilities used by the public which are constructed in whole or in part by the use of state, county, or municipal funds, or the funds of any political subdivision of the State. To such extent as is not contraindicated by federal law or beyond the State's power of regulation, these standards shall also apply to buildings and facilities constructed in this state through partial or total use of federal funds. All buildings and facilities constructed in this State, or substantially renovated, modified, or altered, after the effective date of this Act from any one of these funds or any combination thereof shall conform to each of the standards and specifications prescribed herein except where the governmental department, agency, or unit concerned shall determine, after taking all circumstances into consideration, that full compliance with any particular standard or specification is impracticable. Where it is determined that full compliance with any particular standard or specification is impractical, the reasons for such determination shall be set forth in written form by those making the determination and forwarded to the State Building Commission. If it is determined that full compliance is not practicable, there shall be substantial compliance with the standard or specification to the maximum extent practical, and the written record of the determination that it is impractical to comply with a particular standard or specification shall also set forth the extent to which an attempt will be made to comply substantially with the standard or specification.

(b) These standards and specifications shall be adhered to in those buildings and facilities under construction on the effective date of this Act, unless the authority responsible for the construction shall determine that the construction has reached a state where compliance is impractical. This Act shall apply to temporary or emergency construction as well as permanent buildings.

Section 3. Scope and Purpose. (a) This Act is concerned with non-ambulatory disabilities, semiambulatory disabilities, sight disabilities, hearing disabilities, disabilities of coordination and aging.

(b) It is intended to make all buildings and facilities covered by this Act accessible to, and functional for, the physically handicapped to, through, and within their doors, without loss of function, space, or facilities where the general public is concerned.

Section 4. Definitions. For the purpose of this Act the following terms have the meanings as herein set forth:

(1) "Nonambulatory disabilities" means impairments that, regardless of cause or manifestation, for all practical purposes, confine individuals to wheelchairs.

(2) "Semiambulatory disabilities" means impairments that cause individuals to walk with difficulty or insecurity. Individuals using braces or crutches, amputees, arthritics, spastics, and those with pulmonary and cardiac ills may be semiambulatory. The listing here made is illustrative and shall not be construed as being exhaustive.

(3) "Sight disabilities" means total blindness or impairments affecting sight to the extent that the individual functioning in public areas is insecure or exposed to danger.

(4) "Hearing disabilities" means deafness or hearing handicaps that might make an individual insecure in a public area because he is unable to communicate or hear warning signals.

(5) "Disabilities of coordination" means faulty coordination or palsy from brain, spinal, or peripheral nerve injury.

(6) "Aging" means those manifestations of the aging processes that significantly reduce mobility, flexibility, coordination, and perceptiveness but are not accounted for in the aforementioned categories.

(7) "Standard," when this term appears in small letters, is descriptive and means typical type.

(8) "Fixed turning radius wheel to wheel" means the tracking of the caster wheels and large wheels or a wheelchair when pivoting on a spot.

(9) "Fixed turning radius, front structure to rear structure" means the turning radius of a wheelchair, left front-foot platforms to right rear wheel, or right front-foot platform to left rear wheel when pivoting on a spot.

(10) "Involved (involvement)" means a portion or portions of the human anatomy or physiology, or both, that have a loss or impairment of normal function as a result of genesis, trauma, disease, inflammation, or degeneration.

(11) "Ramps, ramps with gradients" means ramps with gradients (or ramps with slopes) that deviate from what would otherwise be considered the normal level. An exterior ramp, as distinguished from a "walk," shall be considered an appendage to a building leading to a level above or below existing ground level. As such, a ramp shall meet certain requirements similar to those imposed upon stairs.

(12) "Walk, walks" means a predetermined, prepared-surface, exterior pathway leading to or from a building or a facility, or from one exterior area to another, places on the existing ground level and not deviating from the level of the existing ground immediately adjacent.

(13) "Appropriate number" means the number of a specific item that would be reasonably necessary, in accord with the purpose and function of a building or a facility, to accommodate individuals with specific disabilities in proportion to the anticipated number of individuals with disabilities who would use a particular building or facility.

Section 5. Design Criteria. The following design criteria shall be applicable:

(1) The collapsible-model wheelchair of tubular metal construction with plastic upholstery for back and seat is most commonly used. The standard model of all manufacturers falls within the following limits, which are used as the basis of consideration:

- (A) Length: 42 inches
- (B) Width, when open: 25 inches
- (C) Height of seat from floor: $19\frac{1}{2}$ inches
- (D) Height of armrest from floor: 29 inches
- (E) Height of pusher handles (rear) from floor: 36 inches
- (F) Width, when collapsed: 11 inches

(2) The fixed turning radius of a standard wheelchair, wheel to wheel, is 18 inches. The fixed turning radius, front structure to rear structure, is 31.5 inches.

(3) The average turning space required by a person in a wheelchair (180 to 360 degrees) is 60 x 60 inches. A turning space of 63 x 56 inches may at times prove more workable and desirable.

(4) A minimum width of 60 inches is required for two individuals in wheelchairs to pass each other.

(5) In a wheelchair the average unilateral vertical reach is 60 inches and ranges from 56 inches to 78 inches.

(6) The average horizontal working (table) reach of a person in a wheelchair is 30.8 inches and ranges from 28.5 inches to 33.2 inches.

(7) The bilateral horizontal reach, both arms extended to each side, shoulder high, of a person in a wheelchair, ranges from 54 inches to 71 inches and averages 64.5.

(8) An individual reaching diagonally (from a wheelchair) as would be required in using wall-mounted dial telephones or towel dispenser, would make the average reach (on the wall) 48 inches from the floor.

(9) Most individuals ambulating on braces or crutches, or both, or on canes are able to manipulate within the specifications prescribed for wheelchairs, although doors present quite a problem at times. However, a crutch tip extending laterally from an individual is not as obvious to others in heavily trafficked areas, and not as obvious or protective as a wheelchair and is, therefore, a source of vulnerability.

(10) On the average, individuals 5 feet 6 inches tall require an average of 31 inches between crutch tips in the normally accepted gait.

(11) On the average, individuals 6 feet 0 inches tall require an average of 32.5 inches between crutch tips in the normally accepted gait.

Section 6. Site Development. (a) The ground shall be graded, even contrary to existing topography, so that it attains a level with a normal entrance and will make a facility accessible to individuals with physical disabilities.

(b) Public walks shall be at least 48 inches wide and shall have a gradient not greater than 5 percent. These walks shall be of continuing common surface, not interrupted by steps or abrupt changes in level. Wherever walks cross other walks, driveways, or parking lots they shall blend to a common level. A walk shall have a level platform at the top which is at least 5 feet by 5 feet if a door swings out onto the platform or toward the walk. This platform shall extend at least one foot beyond each side of the doorway. A walk shall have a level platform at least 3 feet deep and 5 feet wide, if the door does not swing onto the platform or toward the walk. This platform shall extend at least one foot beyond each side of the doorway.

(c) Spaces in parking lots that are accessible to the building or facility shall be set aside and identified for use by individuals with physical disabilities. An adequate parking space is one that is open on one side and which allows room for individuals in wheelchairs or individuals with braces and crutches to get in and out of an automobile onto a level surface, suitable for wheeling and walking. Parking spaces for individuals with physical disabilities when placed between two conventional diagonal or head-on parking spaces shall be 12 feet wide. Care in planning shall be exercised so that individuals in wheelchairs and individuals using braces and crutches are not compelled to wheel or walk behind parked cars. Consideration shall be given to the distribution of spaces for use by the disabled, in accordance with the frequency and regularity of their parking needs. Walks shall be in conformity with Section 6 (b) of this Act.

Section 7. Ramps. (a) Where ramps with gradients are necessary or desired, they shall conform to the following specifications:

(1) A ramp shall not have a slope greater than one foot rise in 12 feet, or 8.33 percent, or 4 degrees 50 minutes.

(2) A ramp shall have handrails on at least one side, and preferably tow sides, that are 32 inches in height, measured from the surface

of the ramp, that are smooth, that extend one foot beyond the top and bottom of the ramp, and that as far as practicable conform with American Standard Safety Code for Floor and Wall Openings, and Toe Boards as promulgated by the American Standards Association, Inc.

(b) Ramps shall have a surface that is nonslip. A ramp shall have a level platform at the top which is at least 5 feet by 5 feet, if a door swings out onto the platform or toward the ramp. This platform shall extend at least one foot beyond each side of the doorway. A ramp shall have a level platform at least 3 feet deep and 5 feet wide, if the door does not swing onto the platform or toward the ramp. This platform shall extend at least one foot beyond each side of the doorway. Each ramp shall have at least 6 feet of straight clearance at the bottom. Ramps shall have level platforms at 30 foot intervals for purposes of rest and safety and shall have level platforms wherever they turn.

Section 8. Entrances. At least one primary entrance to each building shall be useable by individuals in wheelchairs. At least one entrance useable by individuals in wheelchairs shall be on a level that would make the elevators accessible.

Section 9. Doors. Doors shall have a clear opening of no less than 32 inches when open and shall be operable by a single effort. The floor on the inside and outside of each doorway shall be level for a distance of 5 feet from the door in the direction the door swings and shall extend one foot beyond each side of the door. Sharp inclines and abrupt changes in level shall be avoided at doorsills. As much as practicable, thresholds shall be flush with the floor.

Section 10. Stairs. Stairs shall conform to standards of the American Standards Association, Inc., with the following additional considerations: Steps in stairs shall be designed wherever practicable so as not to have abrupt (square) nosing. Stairs shall have handrails 32 inches high as measured from the tread at the face of the riser. Stairs shall have at least one handrail that extends at least 18 inches beyond the top step and beyond the bottom step. Steps should, wherever possible, and in conformation with existing step formulas, have risers that do not exceed 7 inches.

Section 11. Floors. Floors shall wherever practicable have a surface that is nonslip. Floors on the same story shall be of a common level throughout or be connected by a ramp in accord with Section 7 (a) through the first paragraph of Section 7 (b), inclusive.

Section 12. Toilet Rooms. (a) An appropriate number of toilet rooms, in accordance with the nature and use of a specific building or facility, shall be accessible to, and useable by, the physically handicapped.

(b) Toilet rooms shall have space to allow traffic of individuals in wheelchairs, in accordance with Section 5.

- (c) Toilet rooms shall have at least one toilet stall that
 - (1) is 3 feet wide
 - (2) is at least 4 feet 8 inches, preferably 5 feet deep
 - (3) has a door (where doors are used) that is 32 inches wide and swings out
 - (4) has handrails on each side, 33 inches high and parallel to the floor, 1½ inches in outside diameter, with 1½ inches clearance between rail and wall, and fastened securely at ends and center.
 - (5) has a water closet with seat 20 inches from the floor.

(d) Toilet rooms shall have lavatories with narrow aprons, which when mounted at standard height are useable by individuals in wheelchairs, or shall have lavatories mounted higher, when particular designs demand, so that they are useable by individuals in wheelchairs.

(e) Mirrors and shelves shall be provided above lavatories at a height as low as practicable and no higher than 40 inches above the floor, measured from the top of the shelf and the bottom of the mirror.

(f) Toilet rooms for men shall have an appropriate number of wall mounted urinals with the opening of the basin 19 inches from the floor, or shall have floor mounted urinals that are on level with the main floor of the toilet room.

(g) Toilet rooms shall have an appropriate number of towel racks, towel dispensers, and other dispensers and disposal units mounted no higher than 40 inches from the floor.

Section 13. Water Fountains. (a) An appropriate number of water fountains or other water dispensing means shall be accessible to, and useable by, the physically disabled.

(b) Water fountains or coolers shall have up-front spouts and controls. Water fountains or coolers shall be hand-operated or hand and foot operated.

Section 14. Public Telephones. (a) An appropriate number of public telephones shall be made accessible to, and useable by, the physically disabled.

(b) Such telephones shall be placed so that the dial and the handset can be reached by individuals in wheelchairs.

(c) An appropriate number of public telephones shall be equipped for those with hearing disabilities and so identified with instructions for use.

Section 15. Elevators. Elevators shall be provided and shall be accessible to, and useable by, the physically disabled at all levels normally used by the general public. Elevator control buttons shall have identifying features for the benefit of the blind. Elevators shall allow for traffic by wheelchairs.

Section 16. Switches and Controls. Switches and controls for light, heat, ventilation, windows, draperies, fire alarms, and all similar controls of frequent or essential use, shall be placed within the reach of individuals in wheelchairs.

Section 17. Identification for the Blind. Appropriate identification of specific facilities within a building used by the public is essential for the blind. Raised letters or numbers shall be used to identify rooms and offices. Identification shall be placed on the wall, to the right or left of the door, at a height between 4 feet 6 inches and 5 feet 6 inches measured from the floor, and preferably at 5 feet. Doors that are not intended for normal use, and that are dangerous if a blind person were to exit or enter by them, shall be made quickly identifiable to the touch by knurling the door handle or knob.

Section 18. Warning Signals. (a) Audible warning signals shall be accompanied by simultaneous visual signals for the benefit of those with hearing disabilities.

(b) Visual signals shall be accompanied by simultaneous audible signals for the benefit of the blind.

Section 19. Hazards. (a) Every effort shall be exercised to obviate hazards to individuals with physical disabilities.

(b) Access panels or manholes in floors, walks, and walls can be extremely hazardous, particularly when in use, and shall be avoided where possible.

(c) When manholes or access panels are open and in use, or when an open excavation exists on a site, particularly when it is approximate to normal pedestrian traffic, barricades shall be placed on all open sides, at least 8 feet from the hazard, the warning devices shall be installed in accord with the provisions of Subsection (b) of this section.

(d) Low-hanging door closers that are within the opening of a doorway when the door is open, or that protrude hazardously into regular corridors, or traffic ways when the door is closed, shall be avoided.

(e) Low-hanging signs, ceiling lights, and similar objects or signs and fixtures that protrude into regular corridors or traffic ways shall be avoided. A minimum height of 7 feet, measured from the floor, shall be had.

(f) Lighting on ramps shall be at least equal to that prescribed by the specifications of American Standards Association, Inc. Exit signs shall be in accordance with specifications of American Standards Association, Inc., except as modified by Section 8 of this Act.

Section 20. Responsibilities for Enforcement. (a) The responsibility for administration and enforcement of this Act shall reside primarily in the State Building Commission, but the State Building

Commission shall have the assistance of appropriate state rehabilitation agencies in carrying out its responsibilities under this Act. State agencies involved in extending direct services to disabled or handicapped persons are authorized to enter into interagency contracts with the State Building Commission to provide such additional fundings as might be required to insure that service objectives and responsibilities of such agencies are achieved through the administration of this Act. In enforcing this Act the State Building Commission shall also receive the assistance of all appropriate elective or appointive public officials. The State Building Commission shall from time to time inform professional organizations and others of this law and its application.

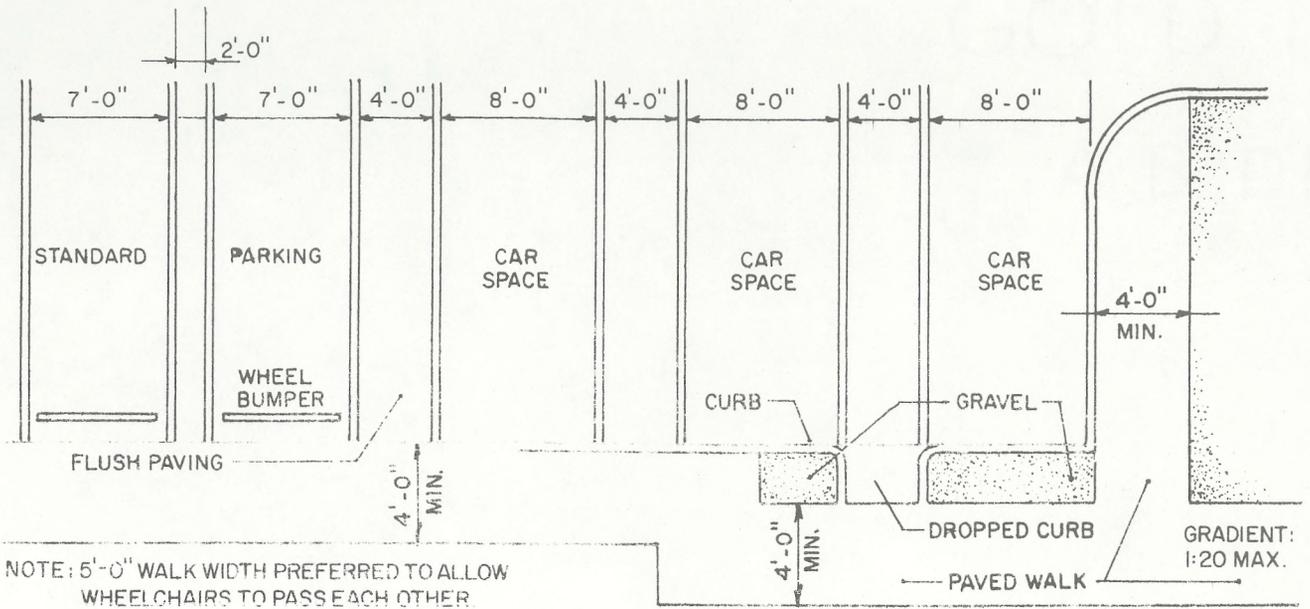
(b) The State Building Commission shall have all necessary powers to require compliance with its rules and regulations and modifications thereof and substitutions therefore, including powers to institute and prosecute proceedings in the District Court to compel such compliance, and shall not be required to pay any entry or filing fee in connection with the institution of such proceeding.

(c) The State Building Commission is authorized to promulgate such rules and regulations as might reasonably be required to implement and enforce this Act. The State Building Commission, after consultation with state rehabilitation agencies, is also authorized to waive any of the standards and specifications presently set forth in this Act and to substitute in lieu thereof standards or specifications consistent in effect to such standards or specifications as might be adopted by the American Standards Association, Inc. (or its federally-recognized successor in function) subsequent to the effective date of this Act.

(d) The respective governing boards of state-supported institutions of higher education are responsible for enforcement of this Act on all properties under their jurisdiction. In all other instances, the responsibility for enforcement of this Act shall be in the State Building Commission.

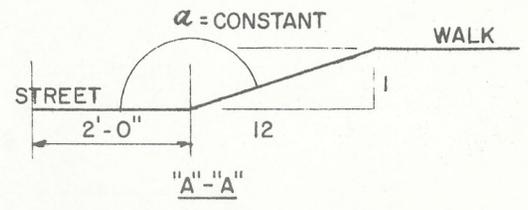
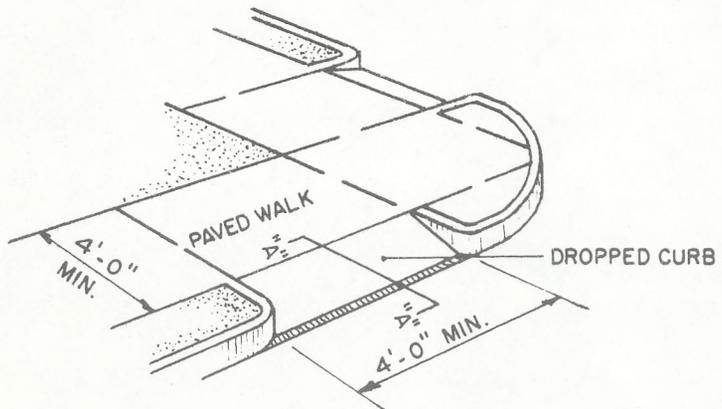
Section 21. This Act takes effect on January 1, 1970.

Section 22. Severability Clause. If any provision of this Act or the application thereof to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications of the Act which can be given effect without the invalid provision or application, and to this end the provisions of this Act are declared to be severable.

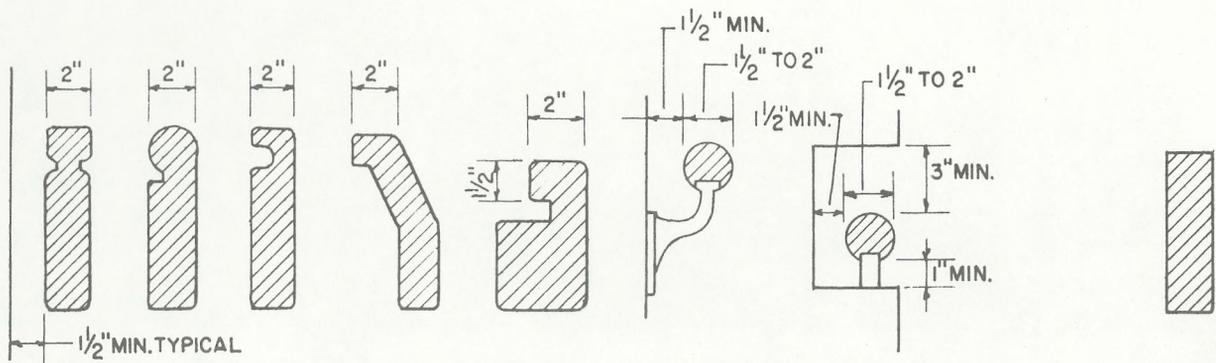


NOTE: 5'-0" WALK WIDTH PREFERRED TO ALLOW WHEELCHAIRS TO PASS EACH OTHER.

FOR GRATINGS, SECTION II SITE DEVELOPMENT



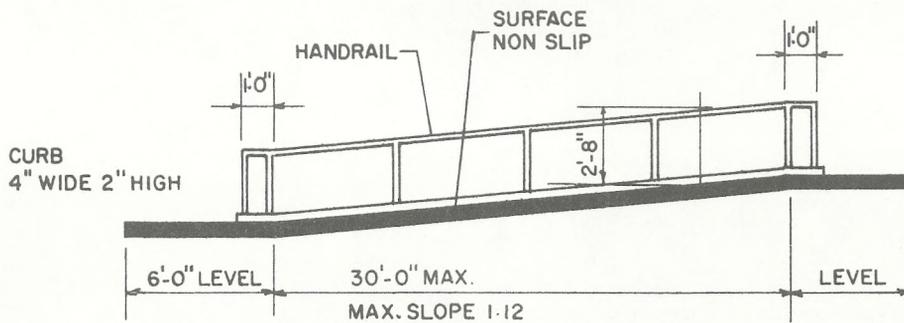
Drawings Courtesy of John C. Worsley



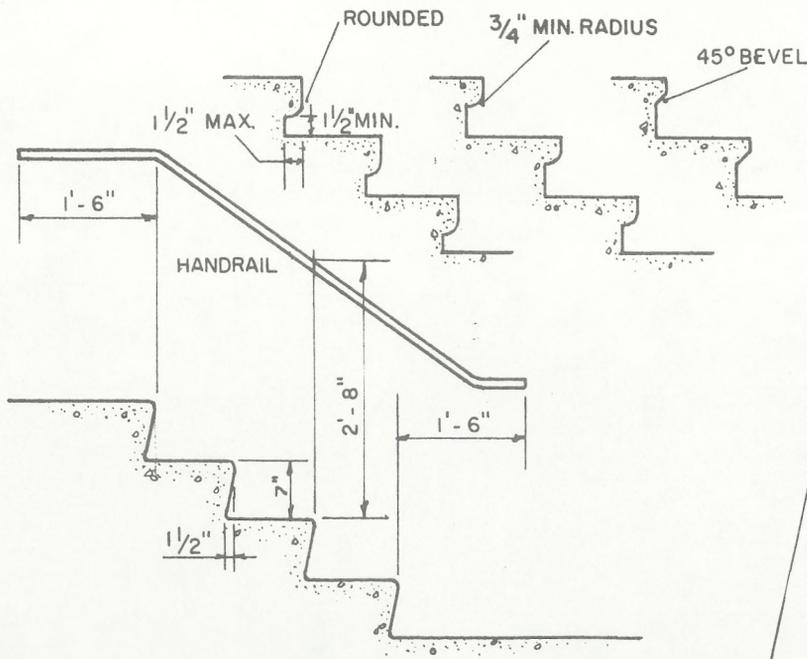
ACCEPTABLE TYPES OF HANDRAILS - OTHER EASY TO GRIP TYPES ACCEPTABLE

UNACCEPTABLE
DIFFICULT TO GRIP

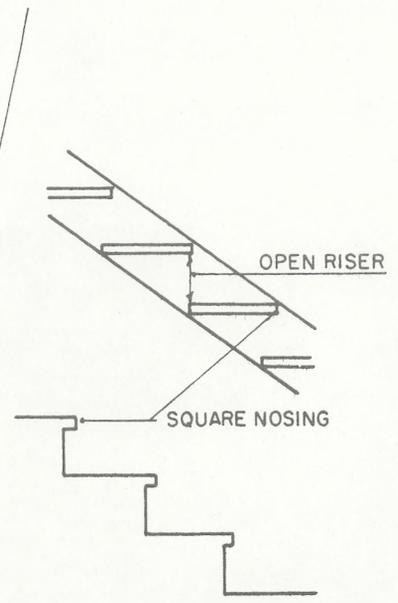
RAMP AND STAIR HANDRAILS



RAMPS WITH GRADIENT

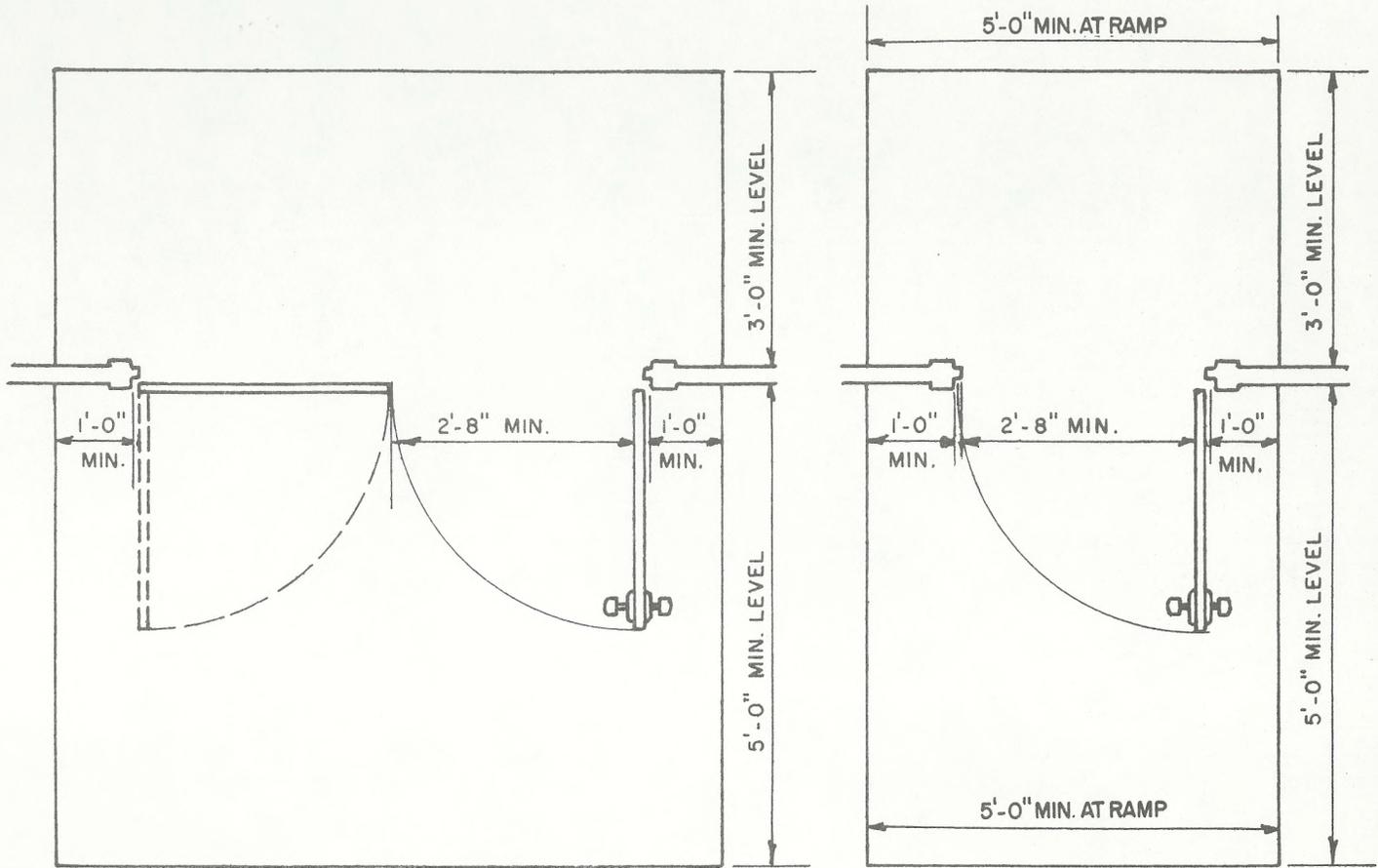


ACCEPTABLE



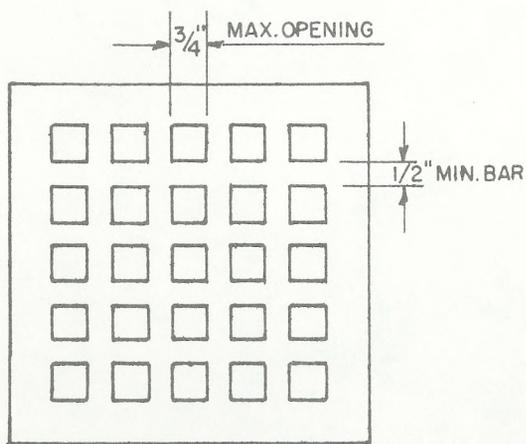
UNACCEPTABLE

STAIRS

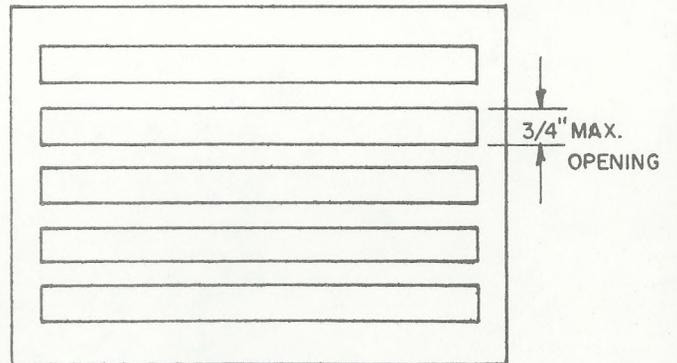


DOUBLE DOOR

SINGLE DOOR

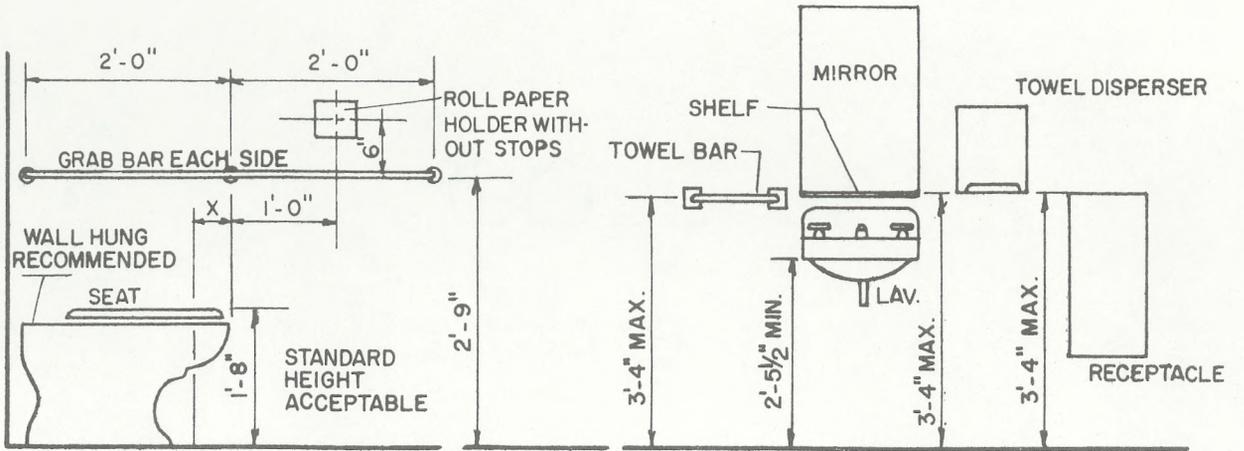


CAST TYPE



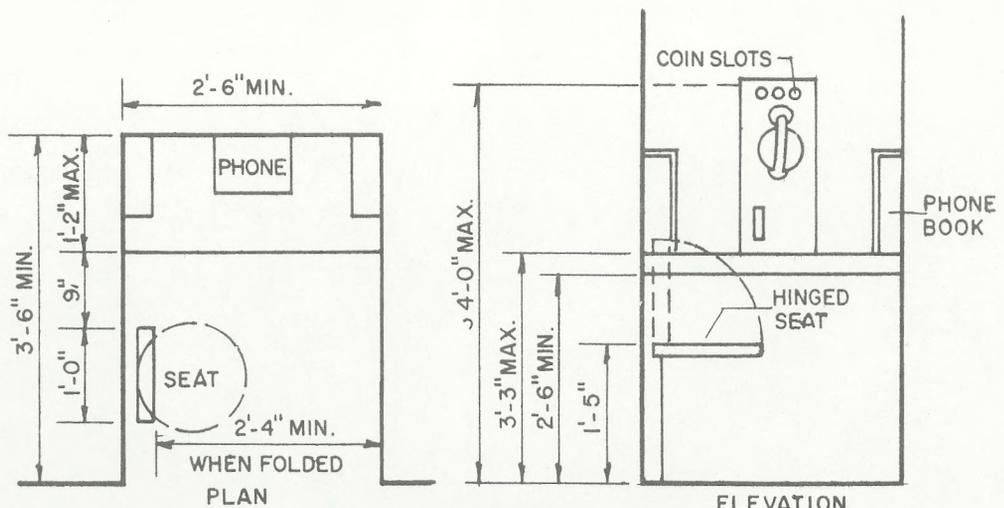
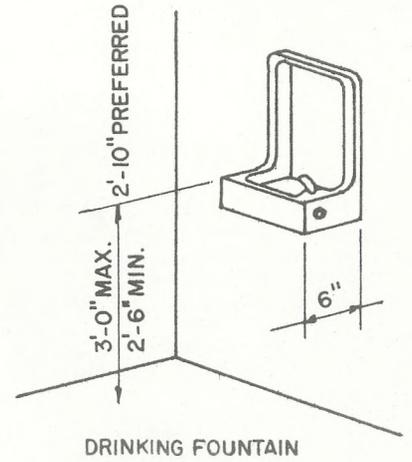
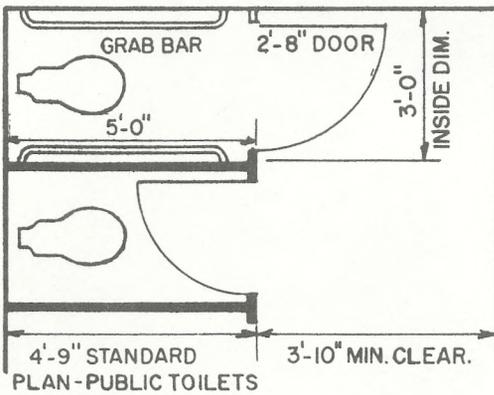
PARALLEL BARS

GRATINGS (AVOID GRATINGS IN PEDESTRIAN AREAS WHERE POSSIBLE)

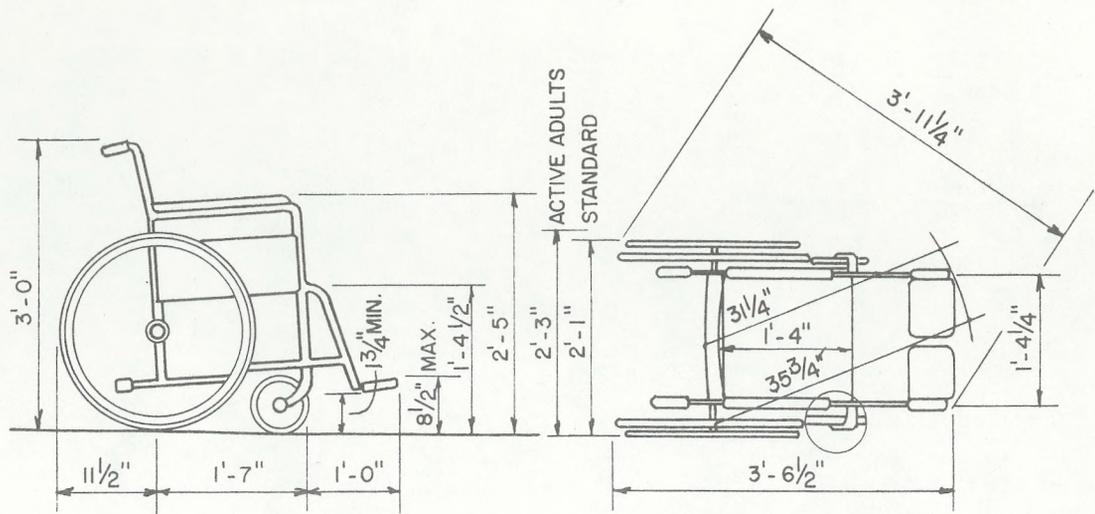


ELEVATION (X AS GREAT AS POSSIBLE)

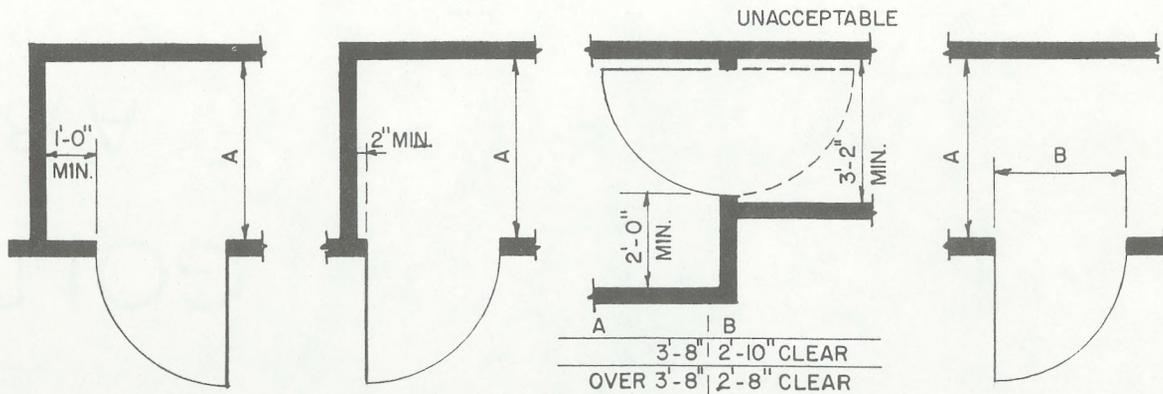
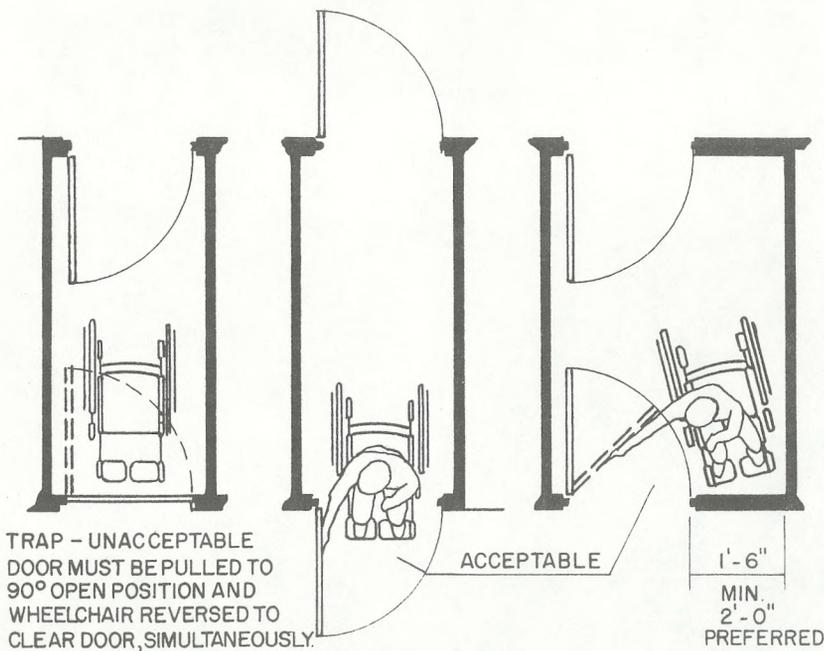
ELEVATION
NOTE: URINAL MOUNTING
HEIGHT OPTIONAL



PUBLIC TELEPHONES



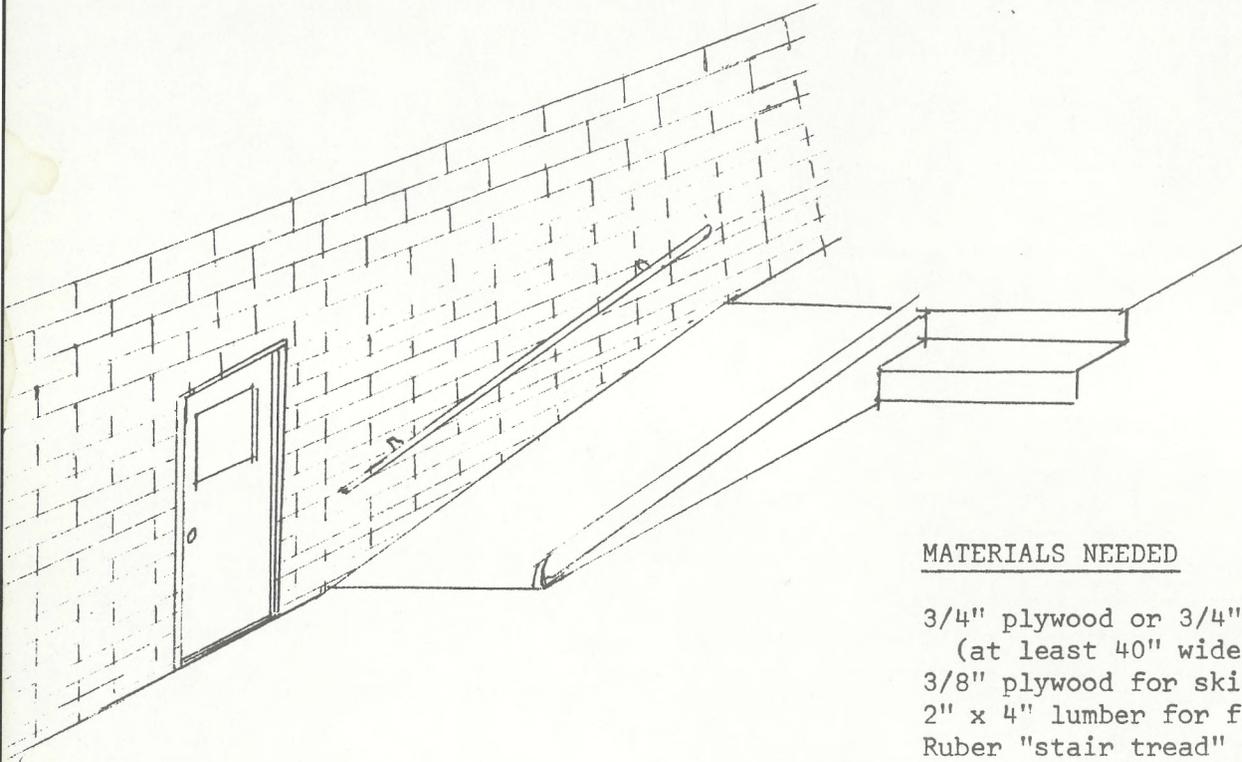
STANDARD WHEELCHAIR DIMENSIONS



PLANNING RESTRICTED SPACES

SIDEWALK & CURB RAMPS

THAT YOU CAN BUILD.



MATERIALS NEEDED

3/4" plywood or 3/4" lumber for surface
(at least 40" wide)
3/8" plywood for skirting
2" x 4" lumber for framework
Ruber "stair tread" for surface
Glue, wood screws and nails

Wooden interior ramps need not be expensive. All they do require is sturdy construction, non-skid surface, correct slope, ample width, and a safety rail at the side(s). Most such ramps can be constructed for well under \$50.00 and are portable so they can be stored when not needed. The "when not needed" is a bit tricky because if you will watch, you'll see that most of the use is by able bodied people who find ramps easier to use than steps.

GOLD LABEL
A B DICK

MATERIALS NEEDED

ASPHALT - This can usually be obtained from your city, county, or state street or highway department. Approximately $\frac{1}{4}$ to $\frac{1}{2}$ of a yard will be needed for the average ramp.

Some materials may be kept in storage for use as needed. Check with supplier to see how long it may be kept until used.

3" to 4" STEEL PIPE

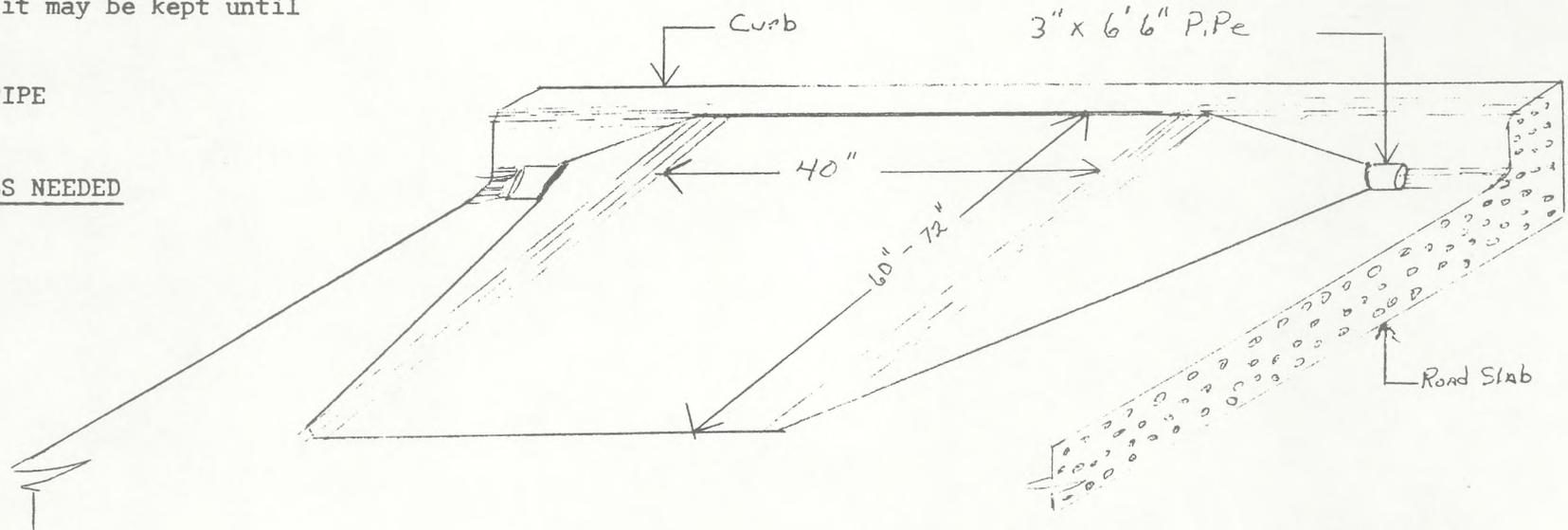
TOOLS NEEDED

Shovel
Rake
Tamping Device
Broom
Chalk
Yard Stick

MEASURING THE SITE

The ramp should be about 40 inches wide at the top of the curb. The distance straight out from the curb should be about one foot for each inch of curb height. A five to six foot ramp length is sufficient for most sidewalk curbs.

The ramp should flair out from the pathway so that it will not have sharp sides which drop off.



Drawings courtesy of East Central State College

PREPARING THE SITE

The ramp area should be swept thoroughly. Site should be dry when asphalt is dumped.

Mark the boundaries on the wall of the curbing and the flaired area of the street. Chalk is an excellent marker.

If gutter between wall of curb and street needs to be unblocked to serve as water run off, place 3" or 4" steel pipe in gutter before fitting with asphalt. Make sure that pipe sticks out to the edge of ramp.

INSTALLATION

1. Place pipe in position if it is needed.
2. Shovel asphalt onto street area. Rake it into shape as you unload.
3. Tamp mixture with tamper to settle mixture and to remove air pockets.
4. Form shape with tamper.
5. Add mixture as tamping settles.
6. Let set for about one week.