b. Pier foundations shall be placed below the frost line on level and undisturbed soil, or on controlled fill, which is free of grass and organic materials. (A small amount of sand may be of use to provide a level surface.) All pier foundations shall be set level and piers must be installed plumb. The pier foundation shall be at least a $16'' \times 16'' \times 4''$ solid concrete pad, precast or poured in place, or other approved material. Two nominal $4'' \times 8'' \times 16''$ solid concrete blocks may be used provided the joint between the blocks is parallel to the main frame longitudinal beam. Concrete used in foundations shall have a 28-day compressive strength of not less than 3,000 pounds per square inch (3000 P.S.I.).

EXCEPTION: Pier foundations may be exempt from extending below the frost line on manufactured home installations, only if the owner agrees to be responsible for the loosening of the anchor system on or about November 1 to prevent frost heave damage to the unit, and to retighten the anchors each spring. A statement to this effect is on the installation certificates and a space is provided for the owner's signature.

c. Unless otherwise directed by the owner of the site the soil bearing capacity of the site may be assumed to be 2,000 pounds per square toot. The acceptable construction under this subrule is based upon a soil bearing capacity of 2,000 pounds per square foot. Soils with less capacity will require increased size footings.

EXPLANATION: The permissible footing sizes and pier spacing given in this code are based upon a combined live and dead load of 65 pounds per square foot of unit. This assumes that the full snow and internal live load will not be present at the same time.

d. Piers may be constructed of concrete or undamaged nominal $8'' \times 8'' \times 16''$ concrete blocks, open celled or solid placed on the pier foundation. All open celled concrete block shall be installed with the cells of the block in a vertical position. Nominal $2'' \times 8'' \times 16''$ or nominal $4'' \times 8'' \times 16''$ solid concrete blocks may be utilized as needed, to achieve the necessary heights of the piers for a particular installation. A nominal $2'' \times 8'' \times 16''$ wood plate, or equivalent, shall be placed on top of each pier, unless there is at least 4″ of solid block, with shims fitted and driven between the wood plate or solid block and the main frame longitudinal beam. The wood blocking shall not occupy more than a nominal 2 inches of vertical space and shims shall not occupy more than 1 inch of vertical space. Shims which have a thickness of more than 3/8″ shall be hardwood.

1. Piers up to 40 inches in height, except corner piers over three blocks high (a nominal 24″), may be single block construction and shall be installed transverse (right angle) to the mainframe longitudinal beam. (see Figure 1)

2. Piers over 40 inches in height but not exceeding 80 inches in height and corner piers over three blocks high shall be double block construction with every other course either parallel or transverse (right angle) to the main frame longitudinal beam. These piers shall be capped with a nominal $16'' \times 16'' \times 4''$ solid concrete block or equivalent. (see Figure 2) Wood blocking and hardwood shims shall be installed accordingly.

3. Piers over 80 inches in height shall be reinforced concrete or double block construction following exactly the procedure given in paragraph number two above. Celled concrete blocks only shall be used (with open cells vertical) with 3/8″ diameter or larger steel reinforcing rods placed in the pier corners and all cells filled with 3,000 pounds per square inch concrete. (see Figure 3) Wood blocking and shims shall be installed accordingly.

16.626(2) *Requirements for anchorage systems*. When instructions are not provided by manufacturer, ties shall be attached vertically and diagonally to a system of ground anchors in a manner as illustrated in Figures 4 and 5. The minimum number of ties required are listed in Table 6-A. There shall be a diagonal tie between the ground anchors and the unit at each vertical tie. Additional diagonal ties may be required between vertical ties. The ties shall be as evenly spaced as practicable along the length of the unit with not over 8 feet open on each end.

a. Ties may be either steel cable, steel strapping, or other materials which meet the requirements of 16.626(2)"*f.*" Ties are to be fastened to ground anchors and drawn tight with galvanized turnbuckles or yoke-type fasteners and tensioning devices. Turnbuckles shall be ended with jaws of forged or welded eyes (hook ends are not approved).

b. When continuous straps (over-the-top tie-downs) are provided as vertical ties, they should be positioned at rafters and studs to prevent structural damage. Where a vertical tie and diagonal tie are located at the same place, both ties may be connected to a single doublehead ground anchor, provided that the anchor used is capable of carrying the combined loads and the anchor is included on a list of approved products maintained by the commissioner.

c. Cable used for ties may be either galvanized steel or stainless steel having a breaking strength of at least 4,725 pounds. Cable should be either 7/32″ diameter or greater (7 × 7) steel cable or ¼″ diameter or greater (7 × 19) aircraft cable. All cable ends should be secured with at least two I-bolt type cable clamps or other nationally approved fastening devices.

d. When flat steel straps are used as ties they shall be type 1, class B, grade 1, 1¼ inches wide and 0.035 inch thick, conforming with federal standard QQ-S-781-F, with a breaking strength of at least 4,725 pounds. Zinc coating (weather protection) shall be a minimum of 0.30 ounces per square foot of surface. Steel strap ties shall terminate with D-rings, bolts, or other nationally approved fastening devices which will not cause distortion or reduce breaking strength of ties.

e. The direction of pull of the diagonal ties should be at a right angle to the main frame longitudinal beam. Connection of the diagonal tie to the main frame longitudinal beam should be in accordance with anchor system instructions for those fastening devices. When steel strap ties are used, care should be exercised that the minimum bending radius is adhered to so the breaking strength is not reduced.

f. The anchorage materials shall be capable of resisting an allowable minimum working load of 3,150 pounds (pullout in a vertical direction) with no more than 2 percent elongation and shall withstand a 50 percent overload. All anchorage materials shall be resistant to weathering deterioration at least equivalent to that provided by a coating of zinc on steel strapping of not less than 0.30 ounces per square foot surface coated. Anchors to reinforced concrete slab or to rock shall be of comparable strength as provided within this paragraph.

Each ground anchor, when installed, shall be capable of resisting an allowable working load at least equal to 3,150 pounds in the direction of the ties plus a 50 percent overload (4,750 pounds total) without failure. Failure shall be considered to have occurred when the point of connection between the tie and anchor moves more than 2 inches at 4,750 pounds in the direction of the vertical tie when anchoring equipment is installed in accordance with the anchorage manufacturer's instructions. Those ground anchors which are designed to be installed so that the loads on the anchor are other than direct withdrawal shall be designed and installed to resist an applied design load of 3,150 pounds at 45° from horizontal without displacing the anchor more than 4 inches horizontally at the point when the tie attaches to the anchor.

Anchors designed for connection of multiple ties shall be capable of resisting the combined working load and overload consistent with the intent expressed in this section.

g. Ground anchors shall be installed so the load-carrying portion of the anchor in its final working position is below the frost depth 42 inches and the anchor head shall be at ground level. Total anchor length shall be more than 42 inches as necessary.

NOTE: Precaution shall be taken to ensure that no telephone, electrical, plumbing or water lines are contacted when installing ground anchors on private property. Utility line locations shall be verified with the property owner or owner's representative.

661—16.627(103A) Approval of existing manufactured home tie-down systems. This rule is to provide a method by which manufactured homes which have been installed prior to the effective date of these rules can be sold without requiring a new tie-down system to be installed and to allow existing manufactured homes which are properly supported and anchored to be sold without installing new support and anchorage systems.

16.627(1) *Sale of a certified unit.*

a. The commissioner shall be notified in writing by the seller of the change of ownership when any manufactured home sold after the effective date of these rules remains in the same location. The installation seal shall remain in place and a copy of the installation certificate shall be supplied to the new owner. Replacement seals and certificates may be obtained if necessary (see subrule 16.623(9)).

b. A certified manufactured home sold after the effective date of these rules which is moved to a new location must obtain a new certificate and seal. However, the existing support and anchorage system may be used if the installer verifies the conditions of use and the installation procedures of the existing systems are met at the new location.

16.627(2) *Sale or acceptance of installed existing units as an owner's option.* Application may be made to the commissioner for approval of an existing manufactured home support and anchor system on one of the following conditions:

a. If the support and anchorage systems were installed by an approved installer and are approved systems.

b. If the existing support and anchorage system has been inspected by an approved installer and the installer attests by signing the installation certificate that to the best of the installer's knowledge, the existing systems are equal to or better than the minimum requirements of this code.

c. If the existing support and anchorage systems are inspected and approved by a registered engineer or architect, and attested to in writing.

d. If the existing support and anchorage systems are inspected by a field inspector with the Iowa state building code (see subrule 16.625(1)) and the existing systems are found to be equal to or better than the minimum requirements of this code.

If compliance is met by one of the above procedures and payment of the required fee has been paid, an Iowa installation seal and certificate may then be issued.

661—16.628(103A) Procedure for governmental subdivisions for installation of factory-built structures. Any governmental subdivision which has adopted the state building code or any other building code is required to enforce the state building code requirements for the installation of factory-built structures (see Iowa Code section 103A.9(7)).

Governmental subdivisions who are issuing building permits and are inspecting construction for compliance with the local building regulations shall verify the installation of factory-built structures within their jurisdiction and shall sign the installation certificate and forward the appropriate copy to the commissioner.

1. The local official shall obtain the installation certificate and the installation seal from the person making application for a building permit which includes a factory-built structure.
2. Upon completion and review of the installation the local official shall attach the installation seal to the unit.
3. Governmental subdivisions are permitted to assess fees as may be required by local ordinances.
4. Nothing in this rule is intended to reduce the authority of the governmental subdivision from establishing zoning regulations as outlined in Iowa Code sections 414.28 and 335.30.

661—16.629(103A) Support and anchoring systems approval procedures.

16.629(1) *Approval of support and anchoring systems.* All support and anchoring systems shall be approved by the commissioner. Manufacturers shall obtain approval of such systems by submitting to the building code commissioner, all system drawings and all other related data, e.g., material specifications or standards, calculations of loads and stresses, soils and test data which will show compliance with the requirements of rule 16.626(103A). Support and anchoring systems designed and signed by a registered engineer competent in this field shall submit complete systems drawings only unless other technical data is requested by the commissioner.

EXCEPTION: Support or foundation systems for manufactured homes constructed to the requirements of Division VI, Part 1 of this code, or designed to meet local building regulations are exempt from approval by the commissioner. The installation certificate, 16.610(19), shall show that the support system has been approved by the local authority.

16.629(2) *Application for support and anchoring system approval.* Submissions for approval by the commissioner shall include drawings, data, and test results which show compliance with at least the minimum requirements of rule 16.626 (103A).

a. Support systems shall be one or more of the following:

(1) Engineered on grade support systems.

(2) Foundations installed in conformance with the state building code, e.g., piers, continuous footings, posts or isolated footings extending below the frost line. (see 16.626(1)*"b"* for exception)

(3) Use of concrete slabs or continuous footings. If such slabs or footings are used to transfer the anchoring loads to the ground, they shall be so constructed to provide the holding strength as required by 16.626(2)*"f."*

b. Materials specified shall meet the minimum requirements of the state building code including, but not limited to:

(1) Wood supports in contact with the ground shall be pressure-impregnated in accordance with uniform building code standard 25-12.

(2) Concrete, where used, shall have a minimum compressive strength of 2000 P.S.I. and be in conformance with uniform building code standard 26-11.

(3) Masonry units, where used, will be in accordance with uniform building code standards 24-4 and 24-5.

(4) Soils information shall reference the classifications of Table 29-B of the UBC and standard No. 29-1 of the UBC. Other classifications may be used to describe soil, however, it shall indicate the standard classification as well.

c. Ground anchoring systems shall include, but not be limited to:

(1) Submission for approval and registration for components which constitute portions or parts of support and anchoring systems by the manufacturer shall clearly indicate compliance with the requirements of the Iowa state building code "structural design." The requirements of 16.626 (103A) shall be considered minimum.

(2) Detailed procedures for field soil identification and anchor selection and test procedure for assuring proper installation.

(3) Restrictions on the use of each anchor and the specific soil types which apply.

(4) Each part identification mark and where it is located on the part.

The commissioner may require additional data or test results to determine compliance with the minimum requirements.

TABLE 6A
MINIMUM NUMBER OF TIEDOWNS
REQUIRED FOR SINGLEWIDE MOBILE HOMES

MOBILE HOME BOX LENGTH NOT EXCEEDING	MINIMUM NUMBER OF TIEDOWNS PER SIDE	
	DIAGONAL TIES	VERTICAL TIES*
40′-0″	3	2
54′-0″	3	2
73′-0″	4	2
84′-0″	5	2

*If more than minimum number of vertical or diagonal ties have been supplied, they shall all be used.

NOTES:

1. Doublewide mobile homes shall comply with Table 6A except that no vertical ties are required.
2. Wherever a vertical tie and a diagonal tie lie in a plane which is vertical and transverse to the main longitudinal beam, both ties may be connected to the same ground anchor, providing that particular anchor withstands both loadings.
3. This table shall be used only if there are no manufacturers approved installation requirements.

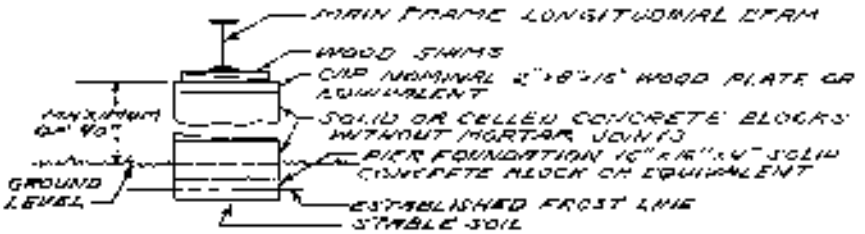


FIGURE 1. PIERS UP TO 40" IN HEIGHT (SINGLE BLOCK CONSTRUCTION)

NOTE: CORNER PIERS MORE THAN THREE (3) BLOCKS HIGH SHALL BE DOUBLE BLOCK CONSTRUCTION AS SHOWN IN FIGURES 2 & 3

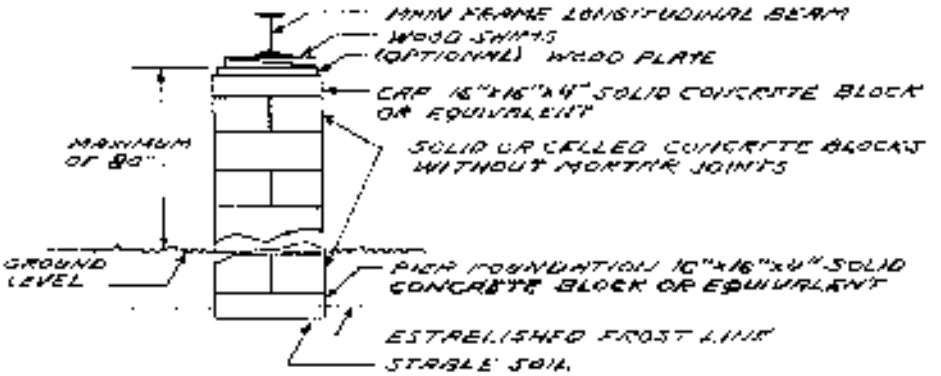


FIGURE 2 - PIERS OVER 40" IN HEIGHT AND NOT EXCEEDING 80" IN HEIGHT (DOUBLE BLOCK CONSTRUCTION)

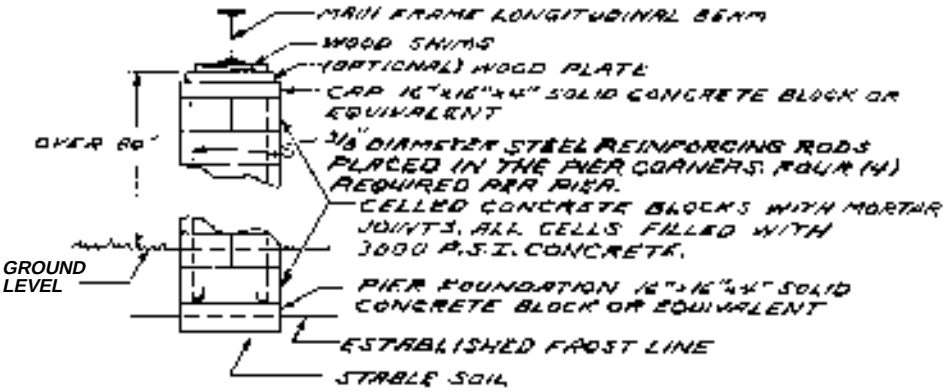
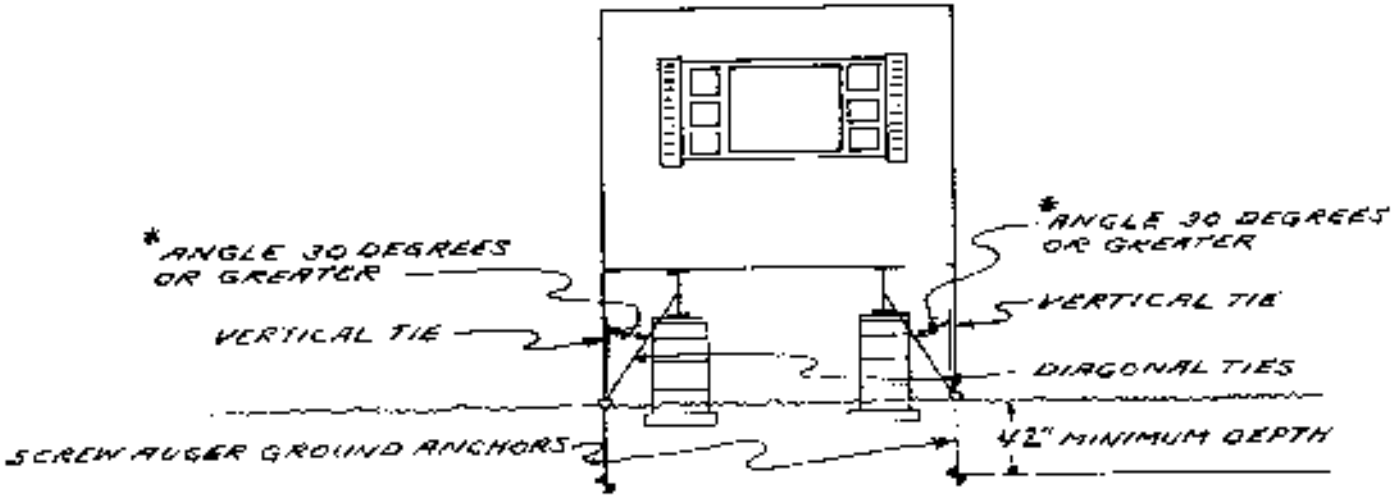


FIGURE 3 - PIERS OVER 80" IN HEIGHT (DOUBLE BLOCK CONSTRUCTION, STEEL REINFORCED)

FIGURE 4

MOBILE HOME TIEDOWN

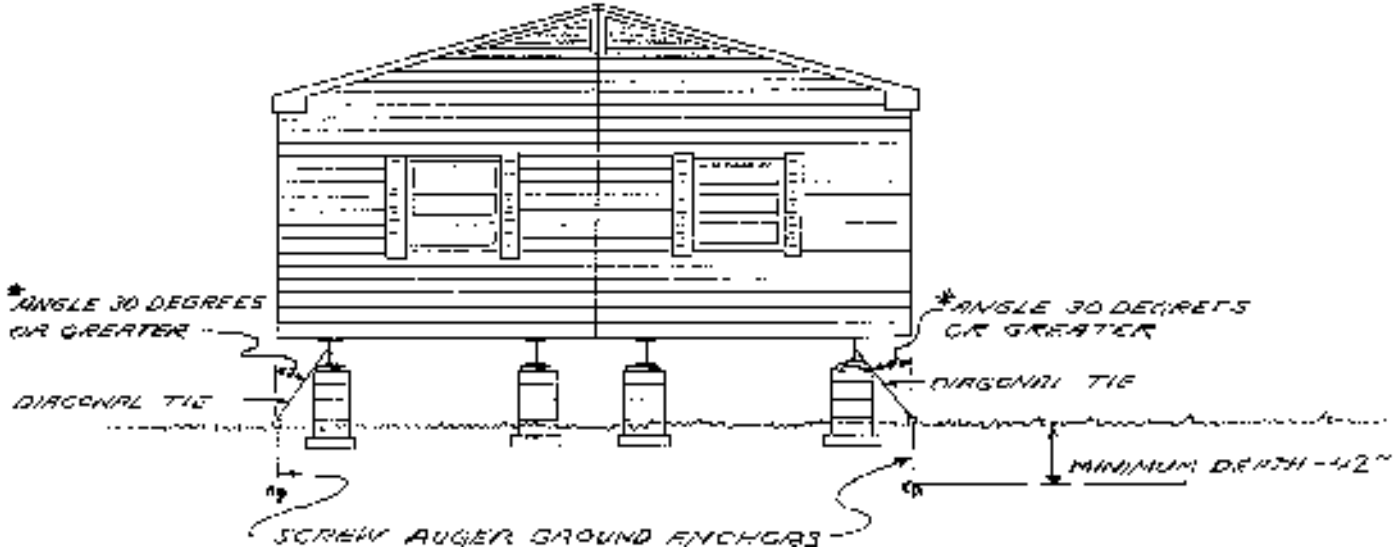


*DIAGONAL TIE SHALL DEVIATE FROM A VERTICAL DIRECTION 30 DEGREES OR MORE.

FIGURE 5

DOUBLE WIDE MOBILE HOME TIEDOWN

*DIAGONAL TIE SHALL DEVIATE FROM A VERTICAL DIRECTION 30 DEGREES OR MORE.



661—16.630 to **16.699** Reserved.

DIVISION VII

661—16.700(103A) Accessibility rules and regulations for the physically handicapped.

16.700(1) *Purpose*. These rules and regulations are intended to make all buildings and facilities used by the public accessible to, and functional for, the physically handicapped, to, through, and within their doors, without loss of function, space, or facility where the general public is concerned. These rules and regulations shall constitute obligatory provisions within any governmental subdivision in Iowa, as mandated by Iowa Code chapter 104A, and specifically section 103A.19 which prescribes the responsibility of governmental subdivisions for the enforcement of these accessibility standards.

16.700(2) *Scope.* These rules and regulations are applicable to all buildings and facilities, temporary or permanent, and their site facilities, including streets used by the general public. These provisions shall apply to multiple-dwelling unit buildings containing four or more individual dwelling units. Rehabilitation and renovation projects shall be made to comply with these rules whenever the projects are required by local building code or the state building code to meet requirements of new construction. All public and private buildings and facilities, temporary and permanent, used by the general public, whether new or existing, shall provide parking spaces for the handicapped as provided in subrule 16.704(5).

NOTE: See 661—16.706(103A) for specific requirements within the individual dwelling units and public and common use spaces of multiple-dwelling unit buildings.

661—16.701(103A) Definitions.

"Accessible route" means a continuous unobstructed path connecting all accessible elements and spaces in a building or facility that can be negotiated by a severely disabled person using a wheelchair and that is also safe for and usable by people with other disabilities. Interior accessible routes may include corridors, floors, ramps, elevators, lifts, and clear floor space at fixtures. Exterior accessible routes may include parking access aisles, curb ramps, walks, ramps, and lifts.

"Adaptability" means the ability of certain building elements, such as kitchen counters, sinks, and grab bars, to be added to, raised, lowered, or otherwise altered so as to accommodate the needs of either the disabled or able-bodied, or to accommodate the needs of persons with different types or degrees of disability.

"Appropriate number" means the number that would be necessary in a building, structure or facility to accommodate physically handicapped persons in proportion to the anticipated number of persons who would be using the building, structure or facility. In all cases the statement "appropriate number" shall be followed by the term "with a minimum of one."

"Children" means persons below the age of 12 (i.e., elementary school age and younger).

"Common grounds and elements" unless determined by contractual or tenants agreement shall be as follows:

1. The land and facilities on which the building has been constructed.
2. Common structural elements such as floors, exterior walls, roofs and ceiling.
3. Halls, corridors, lobbies, stairways, entrances/exits, elevators and other similar spaces or devices for general use.

4. Heating and cooling units, utilities and other similar equipment servicing more than one dwelling unit.

5. Swimming pools, hot tubs, saunas, laundry and recreation rooms and similar rooms and spaces.

"Condominiums residential" is a multiple-dwelling unit building or portion thereof, in which tenants hold full title to their dwelling units and joint ownership in the common grounds and elements.

"Curb ramp" is a short ramp cutting through a curb or built up to it from a lower level.

"Entrances" are openings giving access and egress to a building, structure or facility.

1. *"Primary entrance"* is any access to and from a building, structure or facility from a public way to the principal areas or spaces utilized by the general public.

2. *"Entrances at grade level"* means any access to a building, structure or facility at grade as defined in the state building code, used for entering or exiting those areas concerned with the use and life safety aspect of the building, structure or facility.

"Facility" means all or any portion of a building, structure, or area, including the site on which the building, structure, or area is located, wherein specific services are provided or activities are performed.

"Functional and usable spaces" means the rooms and spaces in a building or facility that house the major activities for which the building or facility is intended.

"Governmental facility" means a building or facility constructed by, on behalf of, or for the use of, a county, city, school district, school corporation or combination thereof or an executive board, commission, bureau, division, office or department of the state.

"Handicapped insignia" means an emblem displaying the international symbol of accessibility, indicating compliance with the requirements for accessibility functionality for the physically handicapped.

"Handicapped review certificate" means a form indicating, by authorized signature, that a building or facility is in compliance with these rules and regulations.

"Loft" means an intermediate level between the floor and ceiling of any story, located within a room of a dwelling.

"Physically handicapped person" means an individual who has a physical impairment, including impaired sensory, manual, or speaking abilities, that results in a functional limitation in gaining access to and using a building, facility or structure.

"Participating local authority" means the local building official or for factory-built structures the approved third-party agency for the proposed building or structure, provided the official or agency has applied for and been granted permission by the building code commissioner to complete handicapped review certificates.

"Public or general public" means, for the purposes of enforcing the handicapped rules and regulations in this code, the accommodation of a person or persons other than owners and employees given access to buildings, structures and facilities which by their nature, use or classification caters to or offers with or without fee or charge, services, facilities, goods or the conduct of business in the establishment.

"Tactile" means that which can be perceived by the sense of touch; used as a warning device for individuals with sight disabilities.

"Walking aid" means a device used by a person who has difficulty walking (for example, a cane, crutch, walker, or brace).

661—16.702(103A) Administration and enforcement.

16.702(1) *Application.* These standards and specifications shall apply to all new construction of buildings and facilities, and additions thereto, intended for use by the general public as required by Iowa Code chapter 104A, and to existing construction as such construction is required to meet new construction requirements.

NOTE: Illustrations which are herein included are pictorial examples of acceptable means of providing accessibility for the handicapped, and some dimensions shown exceed the code requirements. Other acceptable illustrations may be found in the "American National Standards Institute Standard Specifications" ANSI 117.1-1986 and in federal regulations 36 CFR Part 1190 "Minimum Guidelines and Regulations for Accessible Design" of the federal Architectural Transportation Barriers Compliance Board Uniform Federal Accessibility Standards as published in the Federal Register August 7, 1984 (49 FR 31528).

16.702(2) *Other standards or laws.* Other state and federal laws and regulations also address handicapped accessibility and may also apply to the construction stated above.

Iowa Code section 601D.9 requires curb cutouts and ramps in all new curbs constructed at any point along a public street which gives access to a crosswalk.

Iowa Code chapter 321L has requirements for handicapped identification devices which must be displayed by vehicles using handicapped parking spaces and provisions for on- and off-street parking in cities.

The Iowa labor services division has authority for enforcement of occupational safety and health standards which may include requirements for handicapped employees.

The Architectural Barriers Act of 1968 (Public Law 90-480), the Rehabilitation Act of 1973 (Public Law 93-112) and amendments to these Acts require all buildings used by federal agencies to provide accessibility for the handicapped. The Architectural and Transportation Barriers Compliance Board's minimum guidelines 36 CFR Part 1190 have been established as the minimum requirements for these buildings.

The requirements of the federal Fair Housing Act 1988 which apply to the construction of multifamily dwellings and are part of 24 CFR Part 100 Subpart D.

16.702(3) *Administration.* The building code commissioner is authorized by Iowa Code section 103A.5(5) to administer and enforce Iowa Code chapter 104A. The conforming standards of Iowa Code section 104A.6 also include the provisions of the Iowa state building code which apply to making facilities accessible to and functional for the physically handicapped.

16.702(4) *Certifying procedures.* It will be the duty of the commissioner's office, or a participating local authority, to certify that each building or facility within their jurisdiction meets the handicapped provisions in the following manner:

a. Before issuance of a permit to construct, or prior to the commencement of construction when no such permit is required, the handicapped review certificate must be completed by the participating local authority or the commissioner's office. Such certificates can be obtained from the commissioner on application by letter or other forms of communication.

b. The owner or the owner's agent shall apply directly to the commissioner, if there is no participating local authority, requesting a review of documents (plans, specifications, etc.) for compliance with these standards. The application shall include: a written request for review, payment of the fees required by Table 705B (end of 16.706(103A)) and one set of documents containing a minimum of the following: a dimensioned plot plan showing all pertinent site features; a floor plan showing each floor of the building; an indication of the size and direction of swing of the doors; sections for stairs and ramps with handrails indicated; the type, location and mounting heights for all water fountains, toilet fixtures and accessories. The location, type and mounting heights of public telephones, information showing the location dimensions of any elevators or passenger lifts including interior cab dimensions, height of controls and the type of tactile information provided; the location and height of all controls of frequent or essential use; the method used to identify rooms or offices including the height and location. The type, height and location of all general alarm stations and warning signals; a seating plan for all areas having fixed seating; and any other information necessary to ensure compliance. On satisfactory review of the documents the handicapped review certificate will then be completed by the commissioner or a member of the commissioner's staff, and copies B and C of the review certificate and the application for the handicapped insignia will be forwarded to the owner or the owner's agent.

c. On satisfactory review of the documents and completion of the handicapped review certificate by a participating local authority, copy A of the handicapped review certificate, the application for handicapped insignia, and payment of the handicapped insignia fee required by 16.702(4)*"e"* shall be forwarded to the commissioner.

d. On receipt of the application for handicapped insignia, the commissioner shall issue one or more insignias, as required, which shall be placed on all primary entrances to the building or facility when construction has been completed. The insignias will be issued to the local permit issuing authority or other responsible person to be held until completion of the building or facility.

e. There will be a schedule of fees (see Table 705B) for plan review and issuance of insignia of approval.

f. Local jurisdictions may set their own fees for plan review. These fees should include cost of insignias and placing of insignias.

16.702(5) *Handicapped review certificate.* This certificate shall be in triplicate; copies A, B, and C. Each copy shall have a legible signature as required by the procedures in 16.702(4). Copy A shall be retained by or forwarded to the commissioner; copy B shall be forwarded to or shall remain with the local authority, and copy C will be given to the owner or the owner's agent.

16.702(6) *Handicapped insignia*. This insignia can only be obtained from the commissioner's office. It will be the easily recognized blue international insignia of accessibility. However, there will be a statement attesting to the fact that the building or facility meets the state building code requirements for the handicapped. Also, there will be a specific number on the insignia, correlating with the certificate. Replacement insignias can be obtained from the commissioner's office for which there will be an additional fee (see Table 705B).

661—16.703(103A) General principles and considerations.

16.703(1) *Dimensions of adult size wheelchair.*

a. Length: 42 inches plus 6 inches toe extension.

b. Width to outside of wheels: 26 inches.

c. Height of seat from floor: 19 inches.

d. Height of armrest from floor: 30 inches.

e. Height of pusher handles: 36 inches.

f. Width to outside of footrest: 18 inches.

16.703(2) *The functioning of a wheelchair.* These standards are required for the minimum comfortable maneuverability of a wheelchair.

a. The fixed turning radius of a standard wheelchair, wheel to wheel, is 18 inches. The fixed turning radius, front structure to rear structure, is 31½ inches.

b. The average turning space required (180 and 360 degrees) is 60 by 60 inches. However, a turning space longer than it is wide, e.g., 63 by 56 inches is more workable and desirable.

c. A minimum width of 60 inches is required for two individuals in wheelchairs to pass each other. (See Figure 1 for illustrations on specific turns.)

16.703(3) *The adult individual functioning in a wheelchair.* Typical dimensions of a large adult seated in a wheelchair.

a. The average unilateral vertical reach is 60 inches and ranges from 54 to 72 inches.

b. The average horizontal working reach is 30 inches and ranges from 28 to 32 inches.

c. The bilateral horizontal reach, both arms extended to each side, shoulder high, ranges from 54 to 71 inches and averages 64½ inches.

d. An individual reaching diagonally, e.g., as would be required for a wall-mounted dial telephone or towel dispenser, the average reach would be 48 inches from the floor.

e. Eye level ranges between 43 and 51 inches.

f. Lap height from floor is 27 inches.

g. Toe clearance from floor is 8 inches.

16.703(4) *The individual functioning on crutches.* Most individuals ambulating on crutches or braces, or both, and other aids, are able to maneuver within the specifications prescribed for wheelchairs.

16.703(5) *Average gait.* A person 5 feet 6 inches tall would require an average of 31 inches between crutch tips. A person 6 feet 0 inches tall would require an average of 32½ inches between crutch tips.

16.703(6) *Mobility of people with sight impairment.* Generally, tactile warning signals on walking surfaces are the most effective means to warn a blind or partially sighted person of a hazard. Tactile signals for hand reception are useful only if it is made certain that the signals will be touched. Only extreme hazards, such as a stairway leading down to a walk or corridor need to be marked by a tactile warning signal. (See Figure 2.)

Where floor or room information needs to be communicated, raised characters of the standard alphabet and numerals should be used and should be the minimum of 5/8 inch high and raised or indented at least 1/32 inch. (See ANSI A117.1-1980 for more detailed provisions.) An audible signal can be used as a signal to signify the need for action by individuals with sight impairment, e.g., fire warning.

16.703(7) *Emergency signals.* If such signals are required by the authority having jurisdiction, they shall provide a visual as well as an audible signal for those people who have either sight or hearing impairments.

661—16.704(103A) Site development.

16.704(1) *Development*. Proper attention to site development in the early stages in design is the most practical and economical way of making a site accessible and providing accessible entrances to buildings. The siting of facilities, grading, parking, and the routes of walks shall provide convenience, safety and unrestricted circulation of handicapped people and their vehicles.

16.704(2) *Grading.* The site shall be graded, even contrary to existing topography, so that it attains a level with all primary entrance/entrances as defined in 16.701(15), making the building or facility accessible to persons with physical disabilities.

16.704(3) *Exterior circulation routes.* At least one path of travel from each site access point to the principal entrances of buildings shall have no steps. This route should be the most direct route. If it is not the most direct route, this path should be no more than 100 feet of horizontal distance longer than the most direct route. Level routes or those with lower than the maximum allowable slope are preferable to more direct routes at maximum allowable slope or with ramps.

The most direct exterior path of travel between parking spaces planned for disabled drivers and the nearest accessible entrances to a building served by those spaces should be no longer than 200 feet of horizontal distance when walks have a slope less than 1:30 along their entire distance and no greater than 100 feet of horizontal distance when any part of the route has a slope greater than 1:30 or includes a ramp. Where applicable, protection against collection of snow and ice should be provided along such routes. The only accessible path of travel shall not lead to a service entry of a building or facility.

NOTE: Moving walkways in the path of travel shall not be counted in calculating length of travel.

16.704(4) *Walks.* Walks shall be designed to allow free passage to site facilities and adjacent streets, to allow passing of individuals using the walk and to eliminate hazards.

The minimum clear width of a walk shall be 48 inches 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 Figure 1. If a walk has two-way flow, there shall be places at least 60 inches by 60 inches to allow for two wheelchairs to pass at appropriate intervals. The interval used shall be based on the slope of the walk, overall length of the walk, visibility ahead, the nature of adjacent ground surfaces and the purpose for which the walk is used. All permanent street furniture serving walks shall be located along the sides of the walk, allowing a consistent edge and clear travel area for pedestrians.

Gratings should not be located in walks. If absolutely necessary, gratings in walks shall have spaces no greater than ½ inch wide. Surfaces shall be stable, firm and relatively slip resistant. The maximum height of surface changes shall be ¼ inch.

Walks shall have a maximum slope of 1:50 for at least 48 inches in front of accessible entrances. Walks outside of street rights-of-way which are part of an accessible route shall have a slope no greater than 1:20 along their entire distance. Any portion of a walk having a slope greater than 1:20 is a ramp and such portion shall be constructed as required by 661—subrule 5.705(1). Where they serve accessible building entrances, walks shall not be crowned. The cross slope of walks shall be no greater than 1:50.

Any sloped surface which is part of an accessible route shall have landings with no slope in the direction of travel at intervals no greater than 125 feet or when a rise of 30 inches has been attained whichever is first. (Surface may be crowned for water drainage.)

Wherever walks are intersected by other walks, driveways, parking lots or streets, at least some portion of the walk shall be at or blend to a common level. Methods used to accomplish this shall not restrict storm drainage along street edges nor interfere with snow removal.

16.704(5) *Parking and passenger loading zones.* Parking spaces, parking lots and passenger loading zones shall be in compliance with 661—Chapter 18.

661—16.705(103A) Building elements and spaces accessible to the physically handicapped.

16.705(1) *Ramps with gradients.* Any part of an accessible route with a slope greater than 1:20 shall be considered a ramp and shall conform to the following specifications:

a. Slope and rise. The least possible slope shall be used for any ramp. A ramp when necessary or required shall have a slope not greater than 1 foot rise in every 12 feet or 8.33 percent or 4 degrees 50 minutes. The maximum rise for any run shall be 30 inches. When space limitations prohibit the use of a 1:12 slope or less curb ramps, other than those located within street rights-of-way, having a slope greater than 1:10 but not greater than 1:8 shall have a maximum rise of 3 inches and a maximum run of 2 feet. Such curb ramps having a slope greater than 1:12 but not greater than 1:10 shall have a maximum rise of 6 inches and a maximum run of 5 feet. (See Fig. 2a for switchback and dogleg ramps.)

b. Handrails. A ramp shall have smooth handrails on both sides that are 32 inches in height measured from the surface of the ramp, and extend 1 foot beyond the top and bottom of the ramp. The inside handrail on switchback or dogleg ramps shall always be continuous. The diameter or width of the gripping surface of the handrail shall be 1¼ inches to 1½ inches. If the handrail is mounted adjacent to a wall, the space between the wall and the handrail shall be 1 ½ inches. Curb ramps having a rise greater than 6 inches shall have handrails which meet the requirements of this subrule.

c. Surface. Ramp and curb ramps shall have a nonslip surface.

d. Level platform.

(1) A ramp shall have a level platform at the top which is at least 5 feet deep by 5 feet wide if a door swings out onto the platform or toward the ramp. This platform shall extend at least 1 foot beyond each side of the doorway.

(2) A ramp shall have a level platform at least 5 feet deep and at least the width of the ramp if the door does not swing onto the platform or toward the ramp. The platform width shall be increased to provide operation clearance as required by 16.705(4).

e. Bottom clearance. Each ramp shall have at least 5 feet of straight clearance at the bottom.

f. Intermediate landings. Ramps shall have level intermediate landings for purposes of rest and safety wherever they turn, and at intervals not to exceed 30 inches of rise. The intermediate landing shall have a dimension of at least 5 feet measured in the direction of travel.

g. Ramp width. The minimum clear width of a ramp shall be 36 inches.

16.705(2) *Entrances.* The primary entrance as well as entrances at grade level as defined in rule 16.701(103A) shall be usable by physically handicapped persons. Such entrances shall be on a level that shall make the elevators, if any, accessible from that level. (See Figure 4 for door widths.)

Buildings or facilities which do not have an entrance at grade level (such as additions or additional floors) shall provide an entrance accessible to persons in wheelchairs at the level accessible to other persons which will provide accessibility to the building or facility.

16.705(3) *Accessibility within buildings and facilities.* Areas of buildings and facilities which are used by the general public shall be accessible to and functional for the physically handicapped throughout. For purposes of this rule, any skywalk or similar facility connecting two or more buildings or facilities and those routes used by the general public through the connected buildings and facilities shall be considered a single facility and shall be accessible throughout. However, building a skywalk connection to an existing building will not require modifications outside the skywalk corridor except to provide access to the skywalk system.

a. New construction. At least one accessible route shall connect accessible building or facility entrances with all accessible spaces and elements within the building or facility. One passenger elevator complying with subrule 16.705(7) shall serve each level, including mezzanines, in all multistory buildings and facilities unless exempted below. If more than one passenger elevator is provided, each elevator shall comply with subrule 16.705(7).

EXCEPTION 1: Elevators are not required in facilities that are less than three stories or that have less than 3,000 square feet per story unless the building is a governmental facility, a shopping center, a shopping mall or the professional office of a health care provider. The elevator exemption set forth in this paragraph does not obviate or limit in any way the obligation to comply with the other accessibility requirements. Floors above or below the accessible ground floor must meet the requirements of this subrule except for elevator service. If toilet or bathing facilities are provided on a level not served by an elevator, then toilet or bathing facilities must be provided on the accessible ground floor. If a building or facility is eligible for this exemption but a full passenger elevator is nonetheless planned, that elevator shall meet the requirements of subrule 16.705(7) and shall serve each level in the building. A full passenger elevator that provides service from a garage to only one level of a building or facility is not required to serve other levels.

EXCEPTION 2: Accessible ramps complying with subrule 16.705(1) may be used in lieu of an elevator.

EXCEPTION 3: Platform lifts (wheelchair lifts) complying with subrule 16.705(7) may be used in lieu of an elevator only under the following conditions:

1. To provide an accessible route to a performing area in an assembly occupancy.
2. To comply with the wheelchair viewing position line-of-sight and dispersion requirement of subrule 16.705(14).
3. To provide access where existing site constraints or other constraints make use of a ramp or an elevator infeasible.

EXCEPTION 4: Elevators are not required in apartment buildings of less than four stories.

b. Existing construction. For existing buildings or facilities or parts of existing buildings or facilities which are required to meet the accessibility provisions of this code and in which practical difficulties exist in carrying out all of the provisions of this code, the following minimum requirements shall apply:

(1) At least one accessible route complying with subrules 16.704(3) and 16.704(4) shall be provided to the building or facility.

(2) If it is established by a person having that authority that no entrance used by the general public can comply, then access at another entrance or entrances may be used provided directional signage is clearly located and displayed.

(3) When toilets are provided, at least one shall comply with subrule 16.705(8); the toilet facility may be unisex.

(4) Accessible routes shall be provided within a building or facility to those areas open to the general public on at least the level of access for the physically handicapped complying with this subrule. Whenever practical all levels of a building or facility shall be accessible.

NOTE: For the purposes of paragraph *"b,"* practical difficulties means: changes giving full access having little likelihood of being accomplished without incurring an increased cost of 50 percent of the replacement value of the building, structure or facility involved.

16.705(4) *Doors and doorways.* These requirements shall apply to interior and exterior doors which are located in areas which are accessible to the physically handicapped. (See Figure 4.)

a. Exterior doors. Doors at the primary entrance or entrances at grade level 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 1 foot beyond each side of the door. Sharp inclines and abrupt changes in level shall be avoided at door sills. Thresholds, as much as possible, should be flush with the floor.

b. Interior doors. Interior doors which are located in areas which are accessible to the physically handicapped shall meet the same requirements as for exterior doors in *"a"* except that the floor extension need be on the operating side only.

NOTE: Fig. 4 is included to indicate the current recommendations of ANSI A117.1-1986. Some dimensions shown exceed the requirements of this code.

c. General. All doors to accessible spaces or in accessible routes shall meet the following:

(1) Thresholds at doorways shall not exceed ¾ inch in height for exterior sliding doors or ½ inch for other types of doors.

(2) The maximum force for pushing or pulling open a door shall be 8.5 pounds for exterior hinged doors; 5.0 pounds for sliding, folding or interior hinged doors. Fire doors shall have the minimum force allowable by the local or state building code. These forces do not apply to the force required to retract latch sets.

(3) The minimum space between two hinged or pivoted doors in series shall be 48 inches plus the width of any door swinging into the space. Doors in series shall swing either in the same direction or away from the space between the doors.

(4) Handles, pulls, latches, locks and other operating devices on accessible doors should 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.

(5) If a door has a closer, then the sweep period of the closer should be adjusted so that from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

(6) Minimum maneuvering clearances for doors that are not automatic should be as shown in Fig. 4. The floor or ground area within the required clearances shall be level and clear. Entry doors to acute care hospital patient bedrooms shall be exempt from the requirement for space at the latch side of the door (see dimension "x" in Fig. 4) if the door is at least 44 inches wide.

(7) Doorways shall have a minimum clear opening of 32 inches with the door open 90 degrees and measured between the face of the door and the stop (Fig. 4). Openings more than 24 inches long shall comply with 16.705(4)*"a"* and 16.705(4)*"b"* (see Figure 4).

16.705(5) *Stairs.* Stairs that are required as a means of egress and stairs which are part of an accessible route shall conform to the construction for stairs in the Iowa state building code or other applicable codes with the following additional requirements:

a. Nosings. Steps in stairs that might require use by those with disabilities and by the aged shall not have abrupt lipped nosing.

b. Handrails. Stairs shall have handrails on both sides 34 to 38 inches high above the nosing of the treads. The inside handrail on switchback or dogleg stairs shall always be continuous. At least one handrail shall extend at least 12 inches beyond the top step and at least 12 inches plus the width of one tread beyond the bottom step and shall be returned or shall terminate in newel posts or safety terminals. (See Fig. 5.) At the bottom the handrail shall continue to slope for a distance of the width of one tread from the bottom riser; the remainder of the extension shall be horizontal. The diameter or width of the gripping surface of the handrail shall be 1¼ inches to 1½ inches. The clear space between wall and handrail shall be 1½ inches.

c. Treads and risers. On any given flight of stairs, all steps shall have uniform riser heights and tread depths. Risers shall be a maximum of 7 inches and treads shall be no less than 11 inches in depth measured from riser to riser.

EXCEPTION: Winding, circular and spiral stairways.

d. Open risers. Open risers are not permitted on any accessible route.

16.705(6) *Floors.* Floors shall conform to applicable codes with the following exceptions:

a. Surface. Floors shall wherever practicable have a nonslip surface.

b. Common level. Floors on the same story shall be of a common level throughout or be connected by a ramp in accordance with 16.705(1).

16.705(7) *Passenger elevators and platform lifts.* Accessible passenger elevators and platform lifts shall be on an accessible route and shall comply with the applicable requirements of 347—Chapter 72 or Chapter 73.

a. Passenger elevators. Elevator operation shall be automatic. Elevators shall have control buttons with identifying features for the benefit of the blind and shall allow for wheelchair traffic. (See Figure 6 for minimum dimensions.)

b. Platform lifts. Platform lifts may be used only when specifically allowed by subrule 16.705(3). Platform lifts shall facilitate unassisted entry, operation and exit from the lift.

16.705(8) *Toilet facilities.* At each floor level which is accessible to the physically handicapped and toilets or bathroom facilities are available, an appropriate number (at least one) of such facility shall be accessible to and usable by the physically handicapped. Where separate facilities are provided for each sex, accessibility to the physically handicapped shall likewise be provided for each sex. An appropriate number of water closets, urinals (when provided), showers or bathtubs (when provided), lavatories, mirrors, towel and disposal fixtures, and other dispensers, shall be provided in each facility, required by the remainder of this section. (See Figures 7 and 11.)

NOTE: Figs. 7 and 11 are included to indicate the current recommendations of ANSI A117.1-1986. Some dimensions shown exceed the requirements of this code.

a. Access. Toilet rooms, bathrooms, and water closets shall have a clear and unobstructed access of not less than 32 inches. The clear floor space for water closets not in stalls shall comply with Figure 7, and may be arranged to allow either left-handed or right-handed approach.

b. Grab bars. Grab bars shall be provided for water closets, bathtubs or showers, accessible to the physically handicapped and shall be capable of supporting a 250-pound load. Grab bars for water closets shall be within easy reach (within approximately 18 inches) of the water closet at the side and back, or on each side and shall be at a usable height (approximately 33 inches above the floor). (See Figures following Division VII.) Grab bars on the side of water closets shall be mounted so that there is a minimum of 54 inches from the front end of the grab bar and a maximum of 12 inches from the rear end of the grab bar and the wall behind the water closet. The grab bar for the back of the water closet shall have a minimum length of 24 inches. The diameter or width of the gripping surfaces of the grab bar shall be 1¼ inches to 1½ inches. If grab bars are mounted adjacent to a wall the space between the wall and the grab bar shall be 1½ inches.

c. Stalls. In toilet rooms, which have water closet stalls, those stalls which are required to be accessible to the physically handicapped shall:

(1) Have an unobstructed space of not less than 36 inches wide and 42 inches long in front of the water closet stool, entry to the stall shall have a clear width of 32 inches when located at the end and a clear width of 34 inches when located at the side. A door, if provided, shall not encroach into the required space in front of the water closet.

EXCEPTION: Grab bars may protrude into unobstructed space.

(2) Have grab bars or handrails as described in *"b"* above.

d. Water closets. Water closets which are accessible to the physically handicapped shall have the seat 17 to 19 inches above the floor.

e. Lavatories. Lavatories which are accessible to the physically handicapped shall, except for the projection of bowls and waste piping, have a clear unobstructed space at least 30 inches in width, 29 inches in height above the floor, and shall provide the toe clearance having a minimum height of 9 inches and a minimum depth of 17 inches. Hot water and drain pipes under lavatories shall be insulated or otherwise covered. There shall be no sharp or abrasive surfaces under lavatories. (See Fig. 7.)

f. Urinals. Urinals which are accessible to the physically handicapped shall be stall type or wall-hung with an elongated rim at a maximum of 17 inches above the floor.

g. Other fixtures. Where mirrors, towel and disposal fixtures and other dispensers are provided, at least one shall be installed so that the bottom of the mirror is within 40 inches of the floor, and the other fixtures are within 40 inches of the floor. Tilt mirrors may be used if the mirrors are installed so that the bottom of the mirror is within 44 inches of the floor and provides an equivalent field of view.

16.705(9) *Drinking fountain.* Where drinking fountains are provided, an appropriate number or at least one shall have a spout within 36 inches of the floor and shall have up-front hand-operated controls. When fountains are located in an alcove, the alcove shall be not less than 32 inches in width. (See Figure 8.)

16.705(10) *Public telephones.* Where public telephones are provided, an appropriate number shall be installed so that the headset dial and coin receiver are within 54 inches of the floor for side approach and within 48 inches of the floor for forward approach. Unobstructed access to the telephone within 12 inches of the telephone and not less than 32 inches in width and depth shall be provided. (See Fig. 9.)

a. Hearing disabilities. An appropriate number of the public telephones shall be equipped for those with hearing disabilities and so identified with instructions for use. These telephones can also be used by other persons.

b. Reserved.

16.705(11) *Signage.* All signage that provides emergency information or general circulation directions or identifies rooms and spaces shall comply with the following:

a. Identification. Raised or recessed letters or other types of identification shall be placed in a standard and convenient place.

b. Doors to hazardous areas. Doors not intended for normal use and which might prove dangerous if a blind person were to exit or enter shall be identifiable by a knurling of the door knob or handle.

c. Signs. All sign identification that provides emergency information, general circulation directions, or identifies rooms and spaces shall comply with the following:

(1) Letters and numbers on signs shall have a width-to-height ratio of between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10.

(2) Characters and symbols shall contrast with their background either light characters on a dark background or dark characters on a light background.

(3) Letters and numbers on signs shall be raised or incised 1/32 inch minimum and shall be sans serif characters. Raised characters or symbols shall be at least 5/8 inch high but no higher than 2 inches. Indented characters or symbols shall have a stroke width at least ¼ inch. Symbols or pictographs on signs shall be raised or indented 1/32 inch minimum.

(4) If accessible facilities are identified, then the international symbol of accessibility shall be used.

16.705(12) *Emergency warning systems*. If emergency warning systems are provided, they shall include both audible alarms and visual alarms. Emergency warning systems in medical care facilities may be modified to suit standard health care alarm design practice.

a. Audible alarms. Audible emergency alarms shall produce a sound that exceeds the prevailing equivalent sound level in the room or space by at least 15 decibels or exceeds any maximum sound level with a duration of 60 seconds by 5 decibels, whichever is louder. Sound levels for alarm signals shall not exceed 120 decibels.

b. Visual alarms. At a minimum, visual signal appliances shall be provided in buildings and facilities in each of the following areas: restrooms and any other general usage areas (e.g., meeting rooms), hallways, lobbies, and any other area for common use. Visual alarm signal appliances shall be integrated into the building or facility alarm system. If single station audible alarms are provided, then single station visual alarm signals shall be provided. Visual alarm signals shall have the following minimum photometric and location features:

(1) The lamp shall be a xenon strobe type or equivalent.

(2) The color shall be clear or nominal white (i.e., unfiltered or clear filtered white light).

(3) The maximum pulse duration shall be 2/10 of 1 second (0.2 second) with a maximum duty cycle of 40 percent. The pulse duration is defined as the time interval between initial and final points of 10 percent of maximum signal.

(4) The intensity shall be a minimum of 75 candela.

(5) The flash rate shall be a minimum of 1 Hz and a maximum of 3 Hz.

(6) The appliance shall be placed 80 inches above the highest floor level within the space or 6 inches below the ceiling, whichever is lower.

(7) In general, no place in any room or space required to have a visual signal appliance shall be more than 50 feet from the signal (in the horizontal plane). In large rooms and spaces exceeding 100 feet across, without obstructions 6 feet above the finish floor, such as auditoriums, devices may be placed around the perimeter, spaced a maximum of 100 feet apart, in lieu of suspending appliances from the ceiling.

(8) No place in common corridors or hallways in which visual alarm signaling appliances are required shall be more than 50 feet from the signal.

EXCEPTION: In governmental facilities the following requirements may be followed in lieu of the visual alarm requirements of 16.705(12)*"b"*:

If provided, electrically powered, internally illuminated, emergency exit signs shall flash as a visual emergency alarm in conjunction with audible emergency alarms. The flashing frequency of visual alarm devices shall be less than 5 Hz. If such alarms use electricity from the building as power source, then they shall be installed on the same system as the audible emergency alarms.

Visual alarm devices that are mounted adjacent to emergency exit signs may be used in lieu of flashing exit signs.

c. Auxiliary alarms. Sleeping accommodations provided for persons with hearing impairment shall have a visual alarm connected to the building alarm system or shall have a standard 110-volt electrical receptacle into which such an alarm can be connected and a means by which a signal from the building emergency alarm system can trigger such an auxiliary alarm. When visual alarms are in place, the signal shall be visible in all areas of the unit or room. Instructions for use of the auxiliary alarm or receptacle shall be provided.

16.705(13) *Controls and operating mechanisms.* Controls and operating mechanisms in accessible spaces, along accessible routes or part of accessible elements, e.g., thermostats, light switches, dispensed controls, shall comply with this section.

a. Clear floor space that allows a forward or parallel approach by a person using a wheelchair shall be provided at controls, dispensers, receptacles and other operable equipment.

b. The highest operable part of all controls, dispensers, receptacles and other operable equipment shall be placed within 48 inches of the floor for forward reach, between 9 and 54 inches from the floor for side reach and between 9 and 46 inches from the floor for a side reach over an obstruction.

c. Controls and operating mechanisms should be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist. The maximum force required to activate controls shall be no greater than 5 pounds.

16.705(14) *Assembly areas.*

a. In places of assembly with fixed seating, accessible wheelchair locations shall be provided consistent with the following table:

Capacity of Seating In Assembly Areas	Number of Required Wheelchair Locations
4 to 25	1
26 to 50	2
51 to 300	4
301 to 500	6
over 500	6, plus 1 additional space for each total seating capacity increase of 100

In addition, 1 percent, but not less than one, of all fixed seats shall be aisle seats with no armrests on the aisle side, or removable or folding armrests on the aisle side. Each such seat shall be identified by a sign or marker. Signage notifying patrons of the availability of such seats shall be posted at the ticket office. Aisle seats are not required to comply with 16.705(14)*"d."*

b. Size of wheelchair locations. Each wheelchair location shall provide minimum clear ground or floor spaces as shown in Figure 13.

c. Placement of wheelchair locations. Wheelchair areas shall be an integral part of any fixed seating plan and shall be provided so as to provide people with physical disabilities a choice of admission prices and lines of sight comparable to those for members of the general public. They shall adjoin an accessible route that also serves as a means of egress in case of emergency. At least one companion fixed seat shall be provided next to each wheelchair seating area. When the seating capacity exceeds 300, wheelchair spaces shall be provided in more than one location. Readily removable seats may be installed in wheelchair spaces when the spaces are not required to accommodate wheelchair users.

EXCEPTION: Accessible viewing positions may be clustered for bleachers, balconies, and other areas having sight lines that require slopes of greater than 5 percent. Equivalent accessible viewing positions may be located on levels having accessible egress.

d. Surfaces. The ground or floor at wheelchair locations shall be level and shall comply with subrule 16.705(6).

e. Access to performing areas. An accessible route shall connect wheelchair seating locations with performing areas, including stages, arena floors, dressing rooms, locker rooms, and other spaces used by performers.

16.705(15) *Accessible transient lodging.* Transient lodging includes hotels, motels, inns, boarding houses, dormitories, resorts and other similar places. It does not include establishments located within a building that contains not more than five rooms for rent or hire and that is actually occupied by the proprietor of such establishment as the residence of such proprietor. Accessible sleeping rooms or suites and additional sleeping rooms or suites with auxiliary alarms for persons with hearing impairments shall be provided in conformance with the following table:

Number of Rooms or Suites	Accessible Rooms or Suites	Auxiliary Alarm Rooms or Suites
1 to 25	1	1
26 to 50	2	2
51 to 75	3	3
76 to 100	4	4
101 to 150	5	5
151 to 200	6	6
201 to 300	7	7
301 to 400	8	8
401 to 500	9	9
501 to 1000	2 percent of total	2 percent of total
1001 and over	20 plus 1 for each 100 over 1000	20 plus 1 for each 100 over 1000

661—16.706(103A) Making apartments accessible and functional for the physically handicapped.

16.706(1) *Apartments within multiple-dwelling units*. The requirements of this rule shall apply to the individual dwelling units and the common use spaces which are accessible to the physically handicapped in covered multifamily dwellings. The term multifamily dwellings means any building consisting of four or more dwelling units if such buildings have one or more elevators, and ground floor units in other buildings consisting of four or more units.

Dwelling unit means a single unit of residence for a household of one or more persons. Examples of dwelling units covered by these rules include condominiums, an apartment unit within an apartment building, and other types of dwellings in which sleeping accommodations are provided but toilet or cooking facilities are shared by occupants of more than one room or portion of the dwelling. Examples of the latter include dormitory rooms and sleeping accommodations in shelters intended for occupancy as a residence for homeless persons.

Ground floor means a floor of a building with a building entrance on an accessible route. A building may have one or more ground floors. Where the first floor containing dwelling units in a building is above grade, all units on that floor must be served by a building entrance on an accessible route. This floor will be considered to be a ground floor.

a. The individual dwelling units shall contain an accessible route into and through the unit.

(1) All doors intended for use as passage through the dwelling unit shall have a clear opening of at least 32 inches nominal width with the door open 90 degrees, measured between the face of the door and the stop. Openings more than 24 inches in depth are not considered doorways (see Figure 4).

NOTE: A 34-inch door, hung in the standard manner, provides an acceptable 32-inch opening.

(2) Except at doorways the minimum clear width of the accessible route shall be at least 36 inches wide.

(3) In single-story units special features such as lofts or sunken or raised areas are not required to be on an accessible route provided the areas do not interrupt the accessible route through the remainder of the dwelling unit.

(4) In multistory dwelling units in buildings with elevators, the story of the unit that is served by the building elevator shall be the primary entry to the unit and such entry/accessible floor shall comply with the requirements of *"a"* (1), (2) and (3) above. The entry/accessible floor shall contain a bathroom or powder room which complies with paragraph *"c"* below.

(5) Exterior deck, patio, or balcony surfaces shall be no more than ½ inch below the floor level of the interior of the dwelling unit, unless they are constructed of impervious material such as concrete, brick or flagstone. In such case the surface shall be no more than 4 inches below the floor level of the interior or lower if required by local building code.

(6) Thresholds at exterior doors, including sliding tracks, shall be no higher than ¾ inch. Thresholds and changes in elevations as in (5) above shall be beveled with a slope no greater than 1:2.

b. Kitchens shall meet or be adaptable to meet the following:

(1) A clear floor space at least 30 inches by 48 inches that allows a parallel approach by a person in a wheelchair must be provided at the range or cooktop and the sink. Either a parallel or forward approach must be provided at the oven, dishwasher, refrigerator/freezer or trash compactor.

(2) Clearance between counters and all opposing base cabinets, countertops, appliances or walls must be at least 40 inches. In U-shaped kitchens with sink or cooktop at the base of the "U," the base cabinets must be removable at that location or a 60-inch turning radius must be provided.

c. All bathrooms of covered multifamily dwelling units shall comply with provisions of subparagraph (1) of this paragraph or at least one bathroom in the dwelling unit shall comply with provisions of subparagraph (2) of this paragraph and all other bathrooms and powder rooms within the dwelling unit must be on an accessible route with usable entry doors in accordance with paragraph *"a"* above.

However, in multistory dwelling units, only those bathrooms on the accessible level are subject to these requirements. Where the powder room is the only facility provided on the accessible level of a multistory dwelling unit, the powder room must comply with the provisions of subparagraph (1) or (2) of this paragraph.

(1) Sufficient maneuvering space shall be provided within the bathroom for a person using a wheelchair or other mobility aid to enter and close the door, use the fixtures, reopen the door and exit. Doors may swing into the clear floor space provided at any fixture if the maneuvering space is provided. Maneuvering space may include any kneespace or toespace available below the bathroom fixtures.

Such clear floor space is illustrated in Figures 10(a), (b), (c) and (d). Clear floor space at fixtures may overlap.

If the shower stall is the only bathing facility provided in the covered dwelling unit, the shower stall shall measure at least 36 inches by 36 inches.

NOTE: Cabinets under lavatories are acceptable provided the bathroom has space to allow a parallel approach by a person in a wheelchair; if parallel approach is not possible within the space, any cabinets provided would have to be removable to afford the necessary knee clearance for forward approach.

(2) Where the door swings into the bathroom there shall be a clear space (2′6″ × 4′0″) within the room to position a wheelchair or other mobility aid clear of the path of the door as it is closed and to permit the use of the fixtures. This clear space can include any kneespace and toespace available below the bathroom fixtures.

Where the door swings out, a clear space shall be provided within the bathroom for a person using a wheelchair or other mobility aid to position the wheelchair such that the person is allowed use of the fixtures. There also shall be a clear space to allow persons using wheelchairs to reopen the door to exit.

When both tub and shower fixtures are provided in the bathroom, at least one shall be made accessible. When two or more lavatories are provided in a bathroom, at least one shall be made accessible.

Toilets shall be located within bathrooms in a manner that permits a grab bar to be installed on one side of the fixture. In locations where toilets are adjacent to walls or bathtubs, the centerline of the fixture shall be a minimum of 1′6″ from the obstacle. The other (nongrab bar) side of the toilet fixture shall be a minimum of 1′3″ from the finished surface of the adjoining walls, vanities, or from the edge of a lavatory. (See Figure 10(a).)

Vanities and lavatories shall be installed with the centerline of the fixture a minimum of 1′3″ horizontally from an adjoining wall or fixture. The top of the fixture rim is a maximum height of 2′10″ above the finished floor. If kneespace is provided below the vanity, the bottom of the apron is at least 2′3″ above the floor. If provided, full kneespace (for front approach) is at least 1′5″ deep. (See Figure 10(c).)

Bathtubs and tub/showers located in the bathroom shall provide a clear access aisle adjacent to the lavatory that is at least 2′6″ wide and extends for a length of 4′0″ (measured from the head of the bathtub). (See Figure 10 Alt. Spec. Clear Floor Space at Bathtub.)

Stall showers in the bathroom may be of any size or configuration. A minimum clear floor space 2′6″ wide by 4′0″ should be available outside the stall. (See Figure 10(d).) If the shower stall is the only bathing facility provided in the covered dwelling unit, or on the accessible level of a covered multistory unit, and measures a nominal 36″ × 36″, the shower stall must have reinforcing to allow for installation of an optional wall-hung bench seat.

d. Walls in bathrooms which are to be adaptable shall be reinforced to allow later installation of grab bars around toilet, tub, shower stall and shower seat where such facilities are provided.

Illustration of minimum areas of reinforcement are shown in Figure 11. Where the toilet is not placed adjacent to a side wall, provision shall be made for floor-mounted foldaway or similar alternative grab bars. Where the powder room (a room with a toilet and sink) is the only toilet facility located on an accessible level of a multistory dwelling unit, it must comply with this requirement for reinforced walls for grab bars.

NOTE: Installation of bathtubs is not limited by the illustrative figures; a tub may have shelves or benches at either end; or a tub may be installed without surrounding walls, if there is provision for alternative mounting of grab bars. For example, a sunken tub placed away from walls could have reinforced areas for installation of floor-mounted grab bars. The same principle applies to shower stalls—e.g., glass-walled stalls could be planned to allow floor-mounted grab bars to be installed later.

Reinforcement for grab bars may be provided in a variety of ways (for example, by plywood or wood blocking) so long as the necessary reinforcement is placed so as to permit later installation of appropriate grab bars.

e. Accessible and usable public and common use areas shall be readily accessible to and usable by handicapped persons.

The following chart identifies the public and common use areas that shall be made accessible, cites the appropriate section of the American National Standards Institute, and describes the appropriate application of the specification, including modifications to the standard:

Basic Components for Accessible and Usable
Public and Common Use Area or Facilities

Accessible element or space	ANSI A117.1	Application
1. Accessible Route(s) ...	4.3	Within the boundary of the site: (a) From public transportation stops, accessible parking spaces, accessible passenger loading zones, and public streets or sidewalks to accessible building entrances. (b) Connecting accessible buildings, facilities, elements and spaces that are on the same site. On grade walks or paths between separate buildings with covered multifamily dwellings, while not required, should be accessible unless the slope of finish grade exceeds 8.33% at any point along the route. Handrails are not required on these accessible walks. (c) Connecting accessible building or facility entrances with accessible spaces and elements within the building or facility, including adaptable dwelling units.

		(d) Where site or legal constraints prevent a route accessible to wheelchair users between covered multifamily dwellings and public or common-use facilities elsewhere on the site, an acceptable alternative is the provision of access via a vehicular route so long as there is accessible parking on an accessible route, and necessary site provisions such as parking and curb cuts are available at the public or common use facility.
2. Protruding objects	4.4	Accessible routes or maneuvering space including, but not limited to, halls, corridors, passageways or aisles.
3. Ground and floor and surface treatments	4.5	Accessible routes, rooms, and spaces, including floors, walks, ramps, stairs, and curb ramps.
4. Parking and passenger-loading zones	4.6	If provided at the site, designated accessible parking at the dwelling unit on requests of residents with handicaps, on the same terms and with the full range of choices (e.g., surface parking or garage) that are provided for other residents of the project. See Iowa Administrative Code Chapter 18 of Public Safety [661] for minimum parking requirements.
5. Curb ramps	4.7	Accessible routes crossing curbs.
6. Ramps	4.8	Accessible routes with slopes greater than 1:20.
7. Stairs	4.9	Stairs on accessible routes connecting levels not connected by an elevator.
8. Elevator	4.10	If provided.
9. Platform lift	4.11	May be used in lieu of an elevator or ramp under certain conditions.
10. Drinking fountains and water coolers		Fifty percent of fountains and coolers on each floor, or at least one, if provided in the facility or at the site.
11. Toilet rooms and bathing facilities .... (including water closets, toilet rooms and stalls, urinals, lavatories and mirrors, bathtubs, shower stalls, and sinks.)	4.22	Where provided in public use and common-use facilities, at least one of each fixture provided per room.

12. Seating, tables, or work surfaces	4.30	If provided in accessible spaces, at least one of each type provided.
13. Places of assembly....	4.31	If provided in the facility or at the site.
14. Common-use spaces and facilities ....(including swimming pools, playgrounds,entrances, rental offices, lobbies, elevators, mailbox areas, lounges, halls and corridors, and the like.)	4.1 through 4.30	If provided in the facility or at the site: (a) Where multiple recreational facilities (e.g., tennis courts) are provided sufficient accessible facilities of a type to ensure equitable opportunity for use by persons with handicaps. (b) Where practical, access to all or a portion of nature trails and jogging paths.
15. Laundry rooms	4.32.6	If provided in the facility or at the site, at least one of each type of appliances provided in each laundry area, except that laundry room serving covered multifamily dwellings would not be required to have front-loading washers in order to meet the requirements. (Where front-loading washers are not provided, management will be expected to provide assistive devices on request if necessary to permit a resident to use a top-loading washer.)

f. Light switches, electrical outlets, thermostats and other environmental controls shall be located no higher than 48 inches, and no lower than 15 inches, above the floor. If the reach is over an obstruction (for example, an overhanging shelf) between 20 and 25 inches in depth, the maximum height is reduced to 44 inches for forward approach; or 46 inches for side approach, provided the obstruction (for example, a kitchen base cabinet) is no more than 24 inches in depth. Obstructions should not extend more than 25 inches from the wall beneath a control. (See Figure 12.)

NOTE: Controls or outlets that do not satisfy these specifications are acceptable provided that comparable controls or outlets (i.e., that perform the same functions) are provided within the same area and are accessible.

Table 705A. Rescinded IAB 3/3/93, effective 5/1/93.

TABLE 705B
SCHEDULE OF FEE FOR HANDICAPPED REVIEW AND COMPLIANCE

Handicapped Review Certificate and Insignia	$15.00
Replacement Insignia	15.00
Plan Review Fee*	30.00
Hourly Rate (additional for over 3 hours, including revised submissions of the same building)	15.00

*Plan Review Fee applies only to buildings reviewed by the commissioner's office.

NOTES: Plans submitted to the state for review and certification shall include a minimum $45.00 payment. If more than the minimum three hours are used in handicapped review, the additional hourly fee will be billed and must be paid before the review certificate is issued.

The plan review fees for state-owned buildings in 661—16.131(103A) include the handicapped review fee.

Rules 16.1(103A) through 16.99(103A) are intended to implement Iowa Code sections 103A.10, 103A.11, 103A.13, 103A.14, 103A.15, 103A.16 and 103A.17.

Rules 16.100(103A) through 16.705(103A) are intended to implement Iowa Code sections 103A.7 and 103A.9.

Rule 16.706(103A) is intended to implement Iowa Code sections 103A.7(5), 104A.2 and 104A.3.

661—16.707 to **16.799** Reserved.

NOTE: Figures 1 to 11 are included herein to illustrate acceptable methods of compliance with this code. Some dimensions exceed code requirements but are the preferred dimensions. Other acceptable illustrations can be found in ANSI 117.1-1980 and the minimum guidelines of the federal Architectural and Transportation Barriers Compliance Board rules 36 CFR Part 1190. (Federal Register Wed., Aug. 4, 1982.)

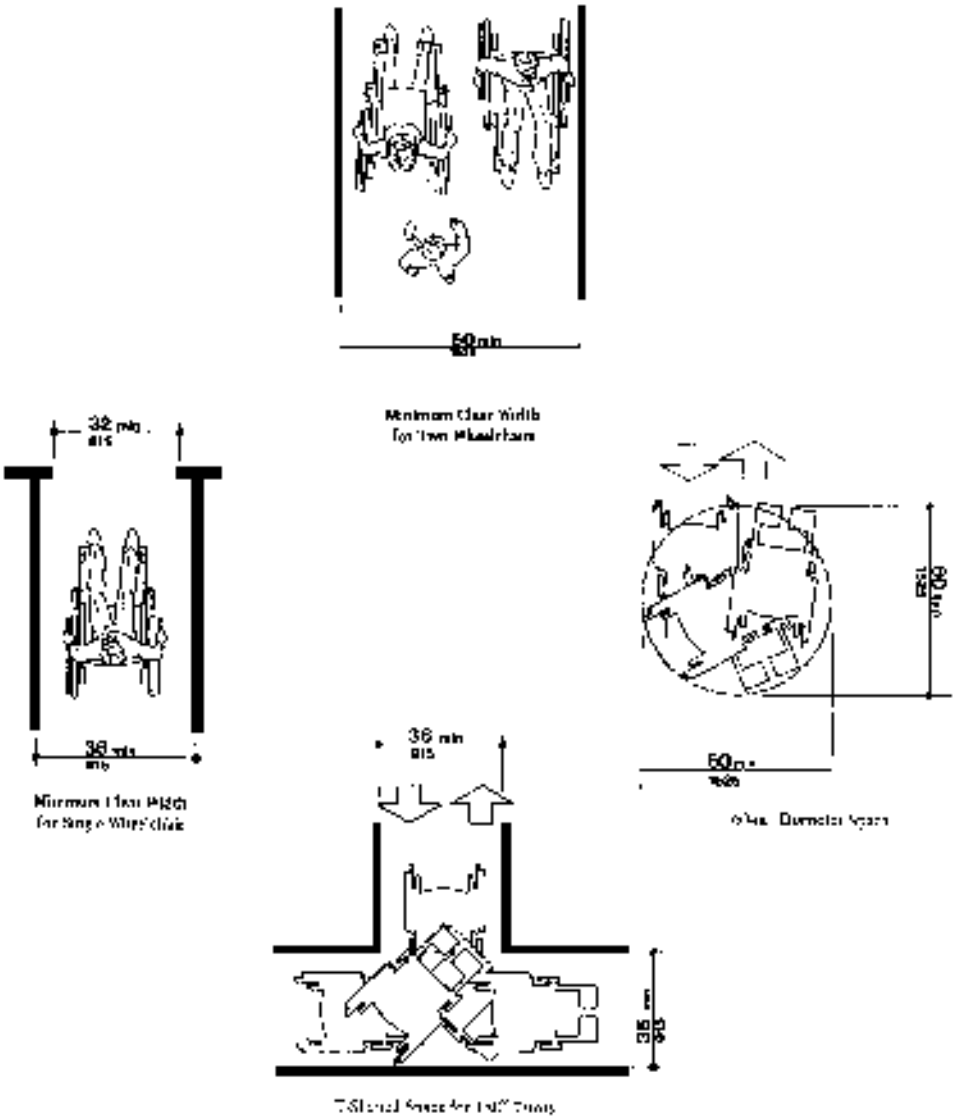
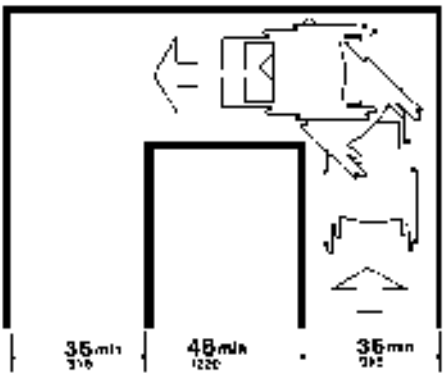
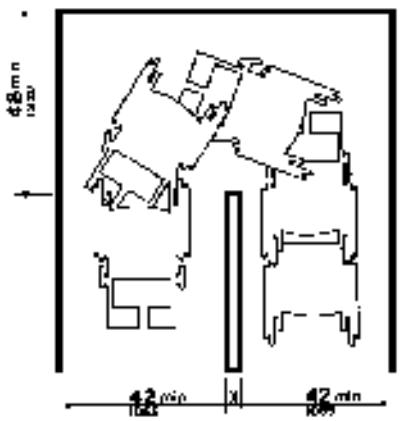


FIG 1
Wheelchair Turning Space



90° Turn

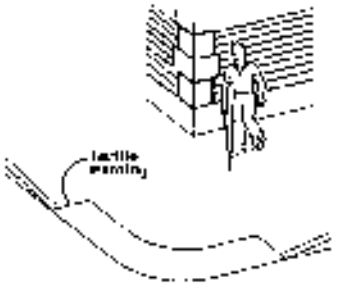


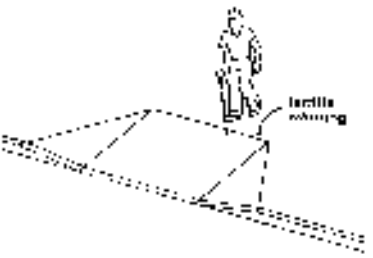
NOTE: Dimensions above apply when ≥ 48 in (1220 mm).

Parts allowed on Obstruction

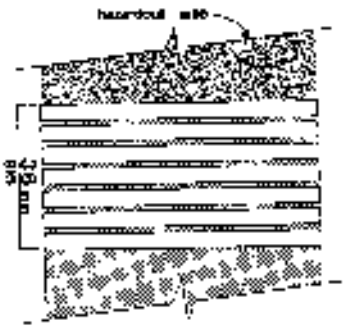
Width of Accessible Route

FIG I (Continued)
Wheelchair Turning Space

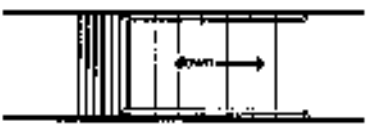




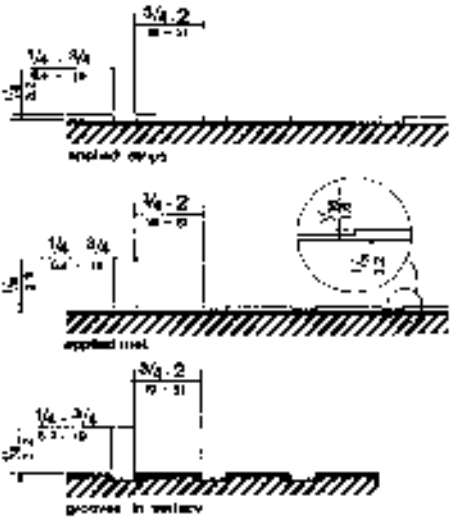
Warning Signals at Curb Ramps



Plan of Tactile Warning Surface



Tactile Warning at Stairs



Sections of Tactile Warning Surfaces

Strips and Grooves used as Tactile Warnings on Walking Surfaces

FIG 2
Tactile Warning of Hazardous Areas

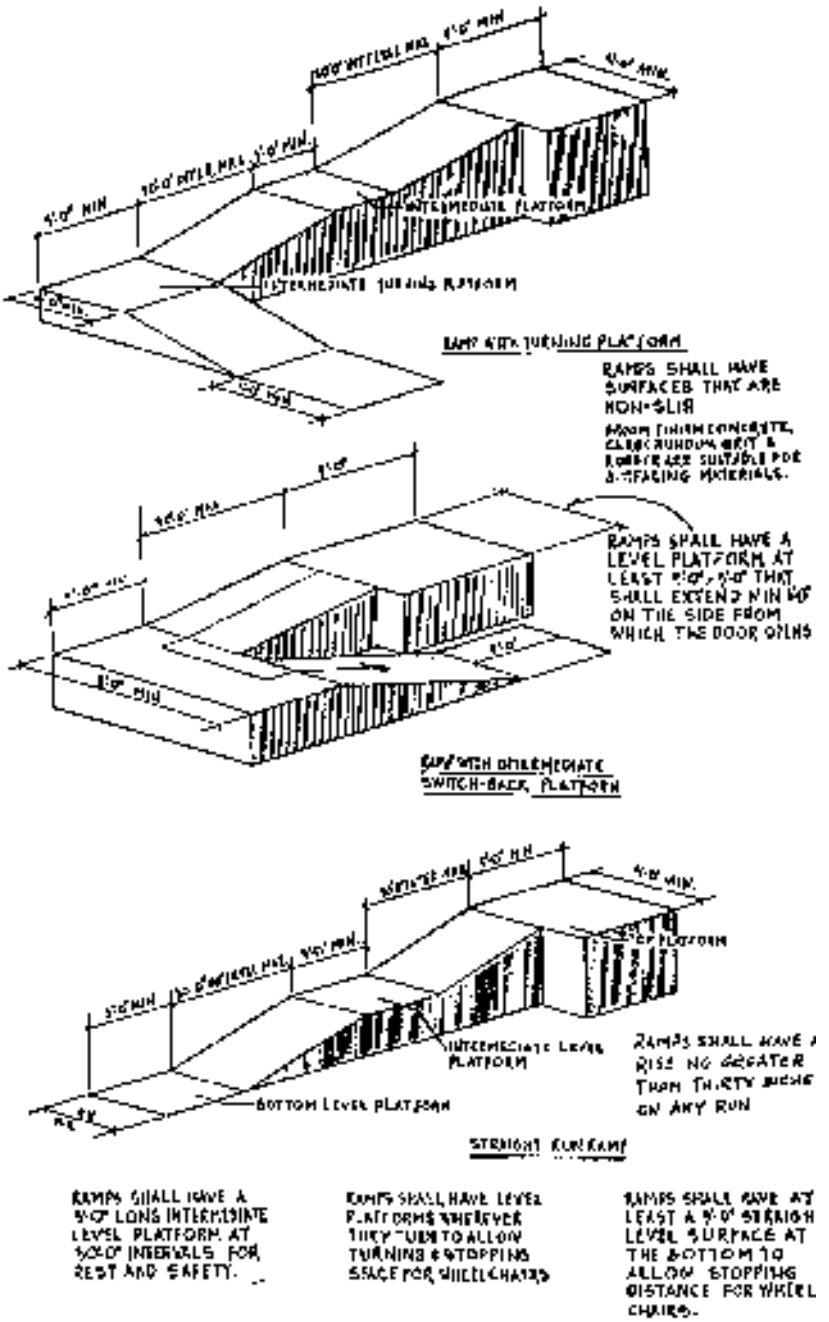

RAMP WITH TURNING PLATFORM
RAMPS SHALL HAVE SURFACES THAT ARE NON-SLIP
RAMPS SHALL HAVE A LEVEL PLATFORM AT LEAST 5'-0" x 5'-0" THAT SHALL EXTEND 1'-0" MIN BEYOND THE SIDE FROM WHICH THE DOOR OPENS
RAMP WITH INTERMEDIATE SWITCH-BACK PLATFORM
STRAIGHT RUN RAMP
RAMPS SHALL HAVE A 5'-0" LONG INTERMEDIATE LEVEL PLATFORM AT 30'-0" INTERVALS FOR REST AND SAFETY.
RAMPS SHALL HAVE LEVEL PLATFORMS WHEREVER THEY TURN TO ALLOW TURNING & STOPPING SPACE FOR WHEELCHAIRS
RAMPS SHALL HAVE AT LEAST A 5'-0" STRAIGH LEVEL SURFACE AT THE BOTTOM TO ALLOW STOPPING DISTANCE FOR WHEEL CHAIRS.

Figure 2a

FIG: 3
Handicapped Parking Spaces
Rescinded IAB 4/17/91, effective 6/1/91

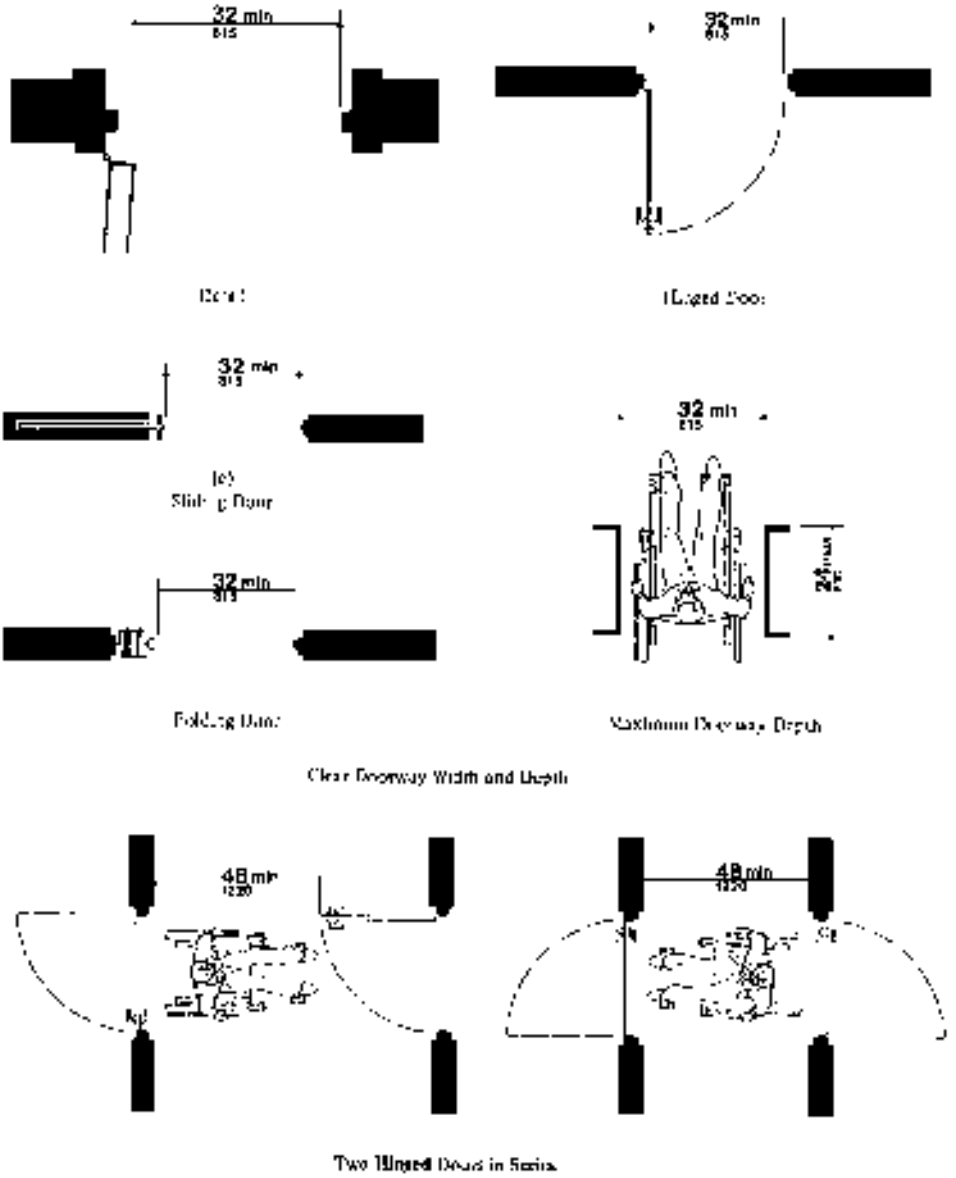
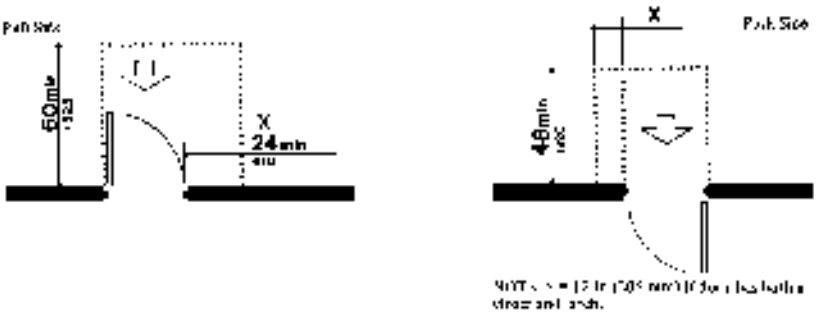
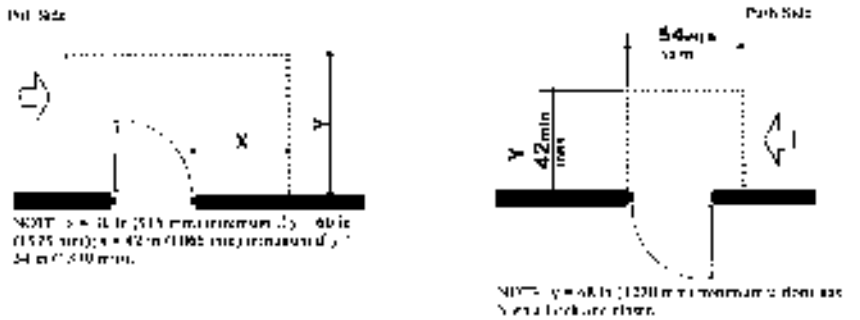


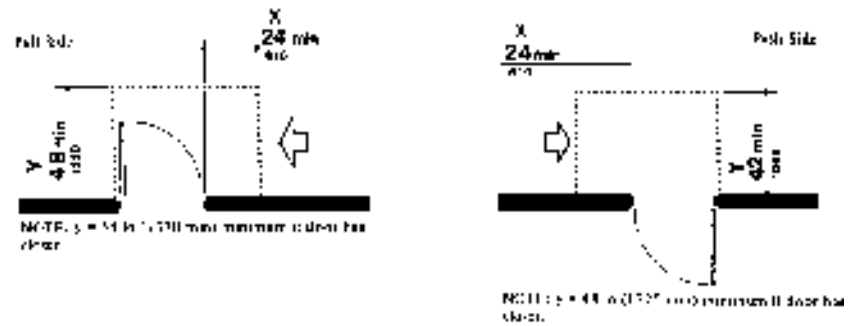
FIG 4
Doorway Widths and Maneuvering Clearances



Front Approaches — Swinging Doors



Hinge Side Approaches — Swinging Doors

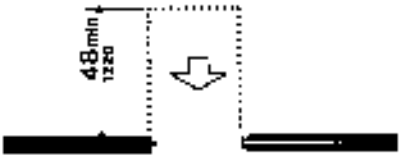


Latch Side Approaches — Swinging Doors

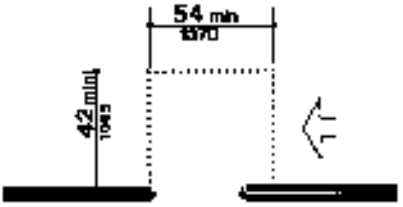
NOTE: All doors in throughways shall comply with the clear space requirements.

Maneuvering Clearances at Doors

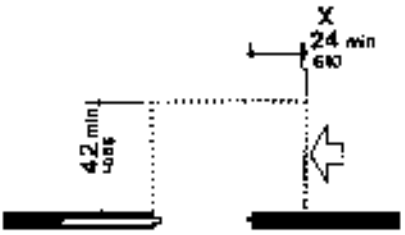
FIG 4 (Continued)
Doorway Widths and Maneuvering Clearances



Front Approach – Sliding Doors



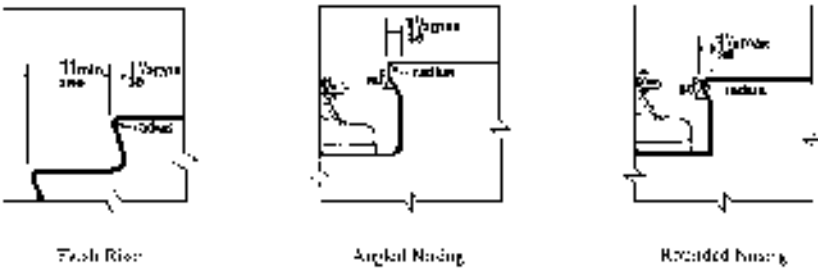
Side Approach – Sliding Doors



Latch Side Approach – Sliding Doors

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

FIG 4 (Continued)
Doorway Widths and Maneuvering Clearances



Usable Tread Width and Examples of Acceptable Nosings

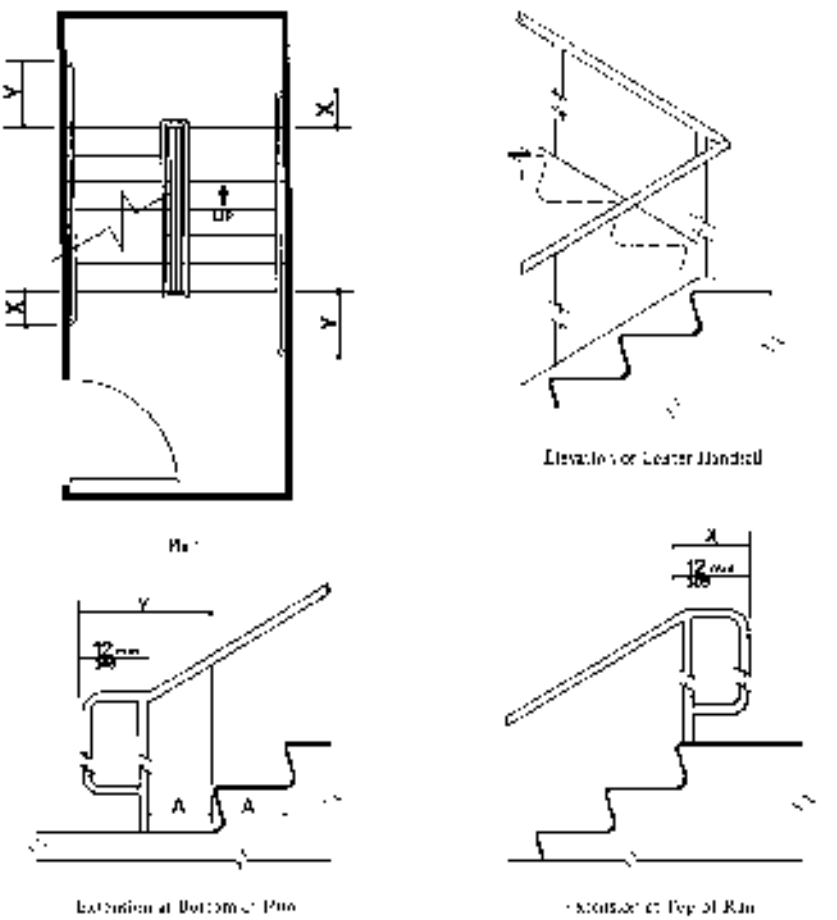
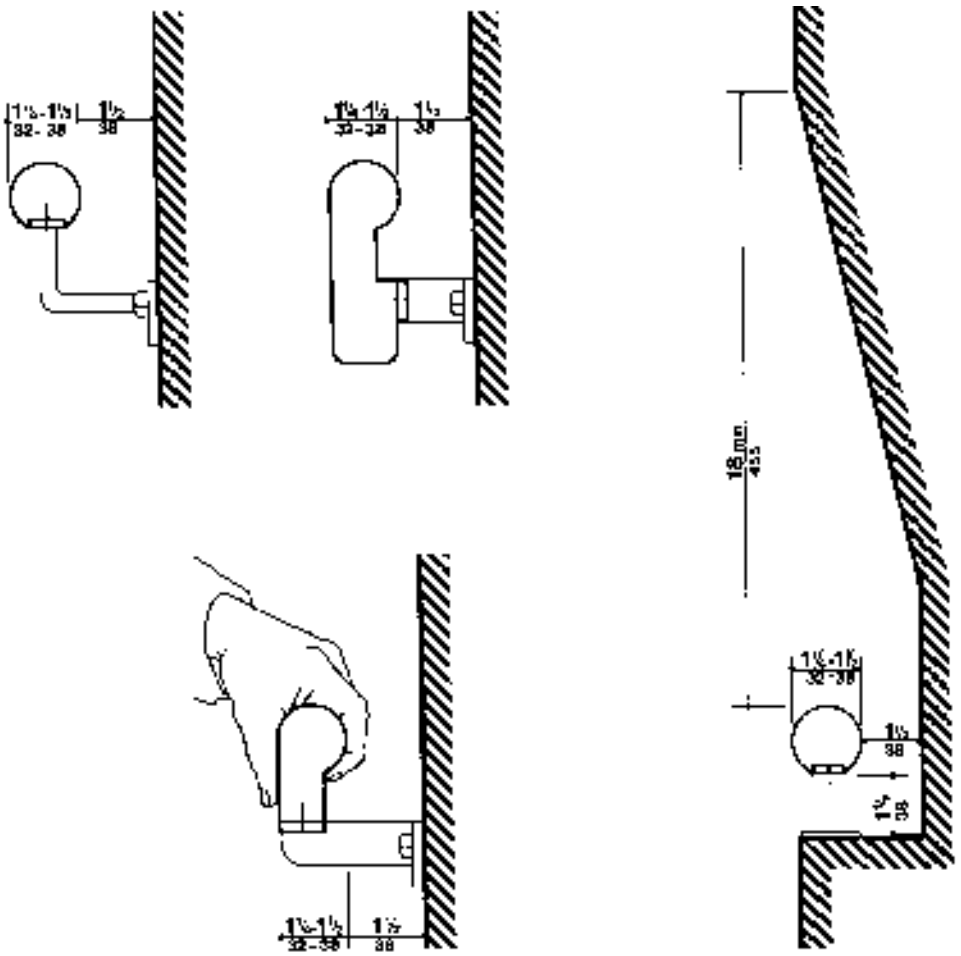
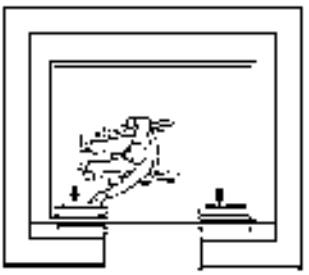


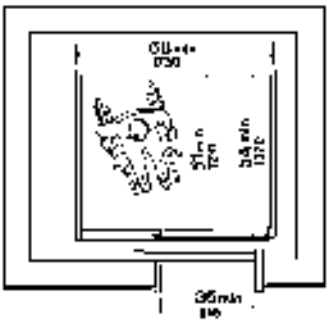
FIG. 5
Stair Handrails

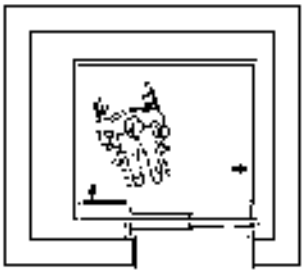


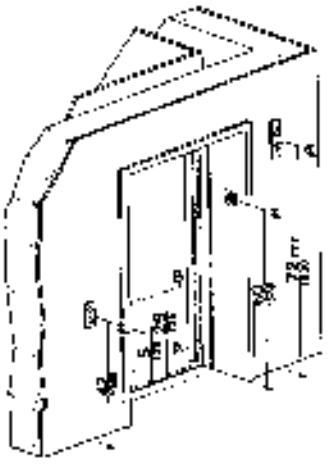
Size and Spacing of Handrails and Grab Bars

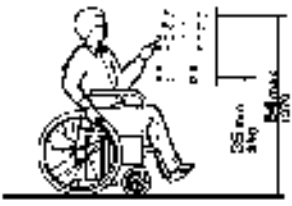
FIG 5 (Continued)
Stair Handrails

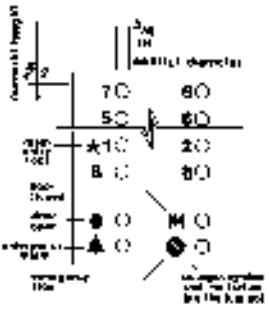










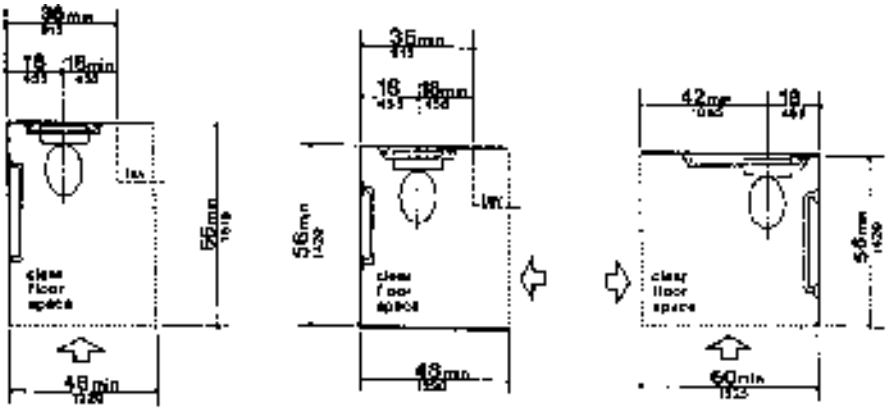


Control Heights

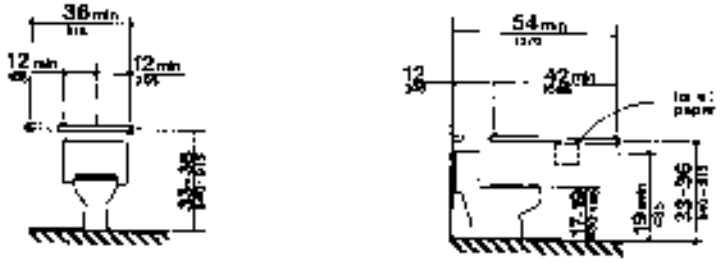
Panel Detail

Hallway and Elevator Entrances

FIG. 6
Car Controls



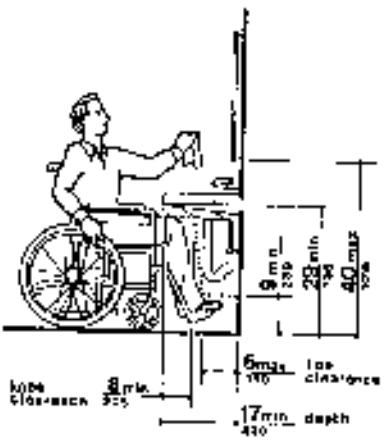
Clear Floor Space at Water Closets



Back Wall

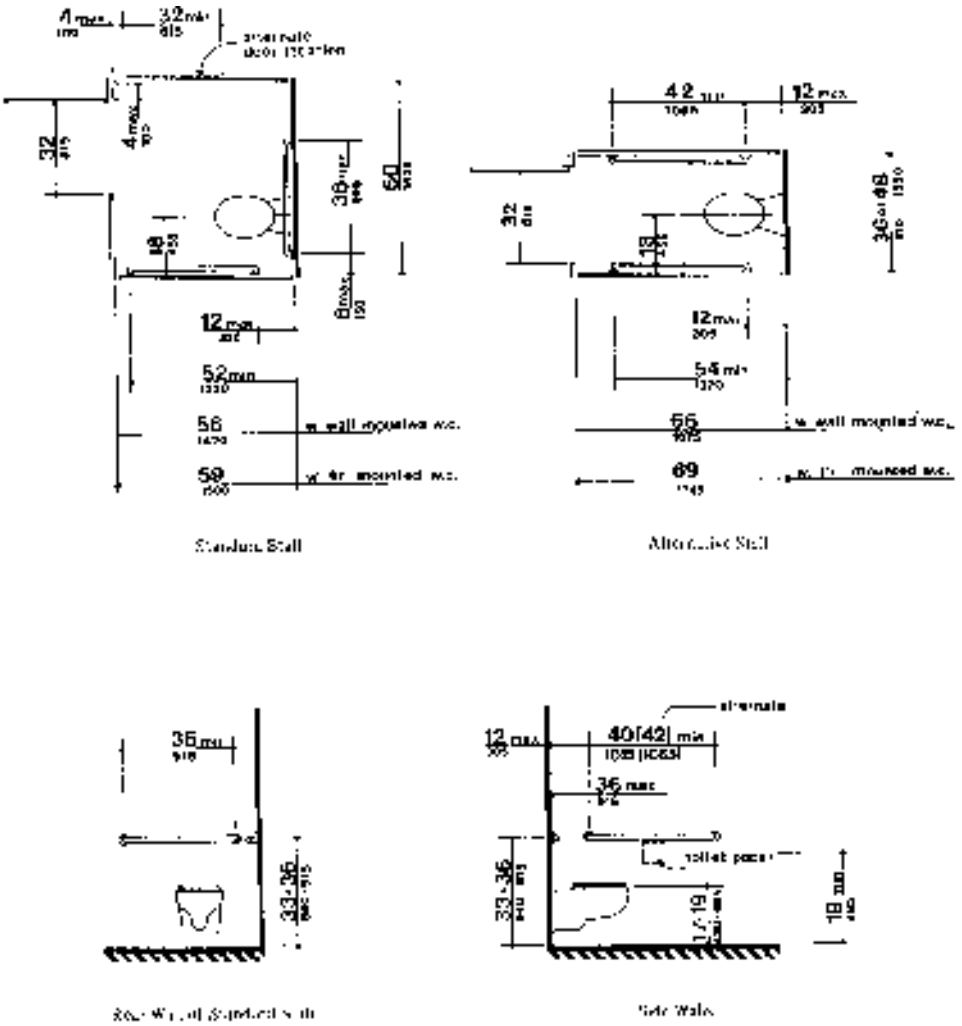
Side Wall

Grab Bars at Water Closets



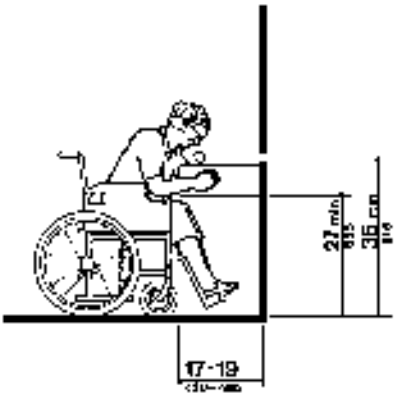
Lavatory Clearance

FIG 7
Toilet Facilities

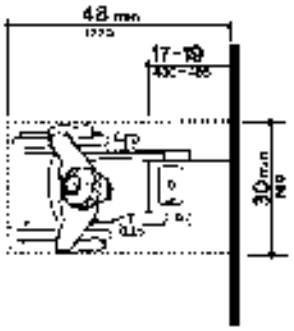


Toilet Stalls

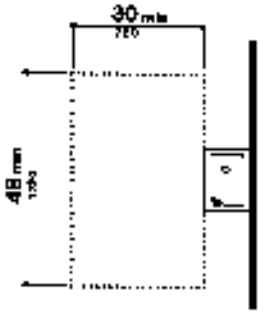
FIG 7 (Continued)
Toilet Facilities



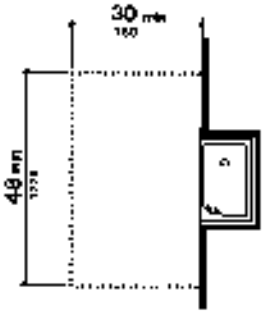
Sport Height and
Knee Clearance



Clear Floor Space

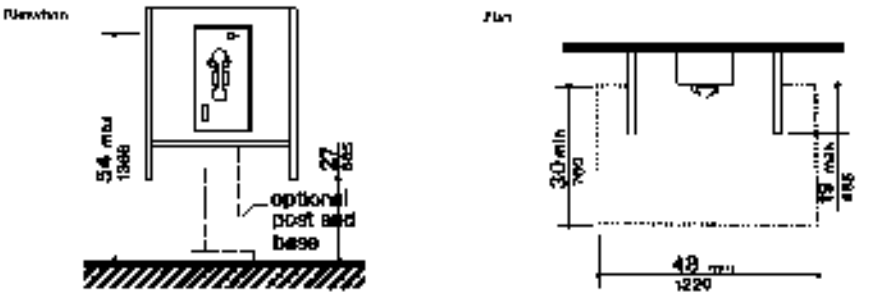


Free Standing
Fountain or Cooler

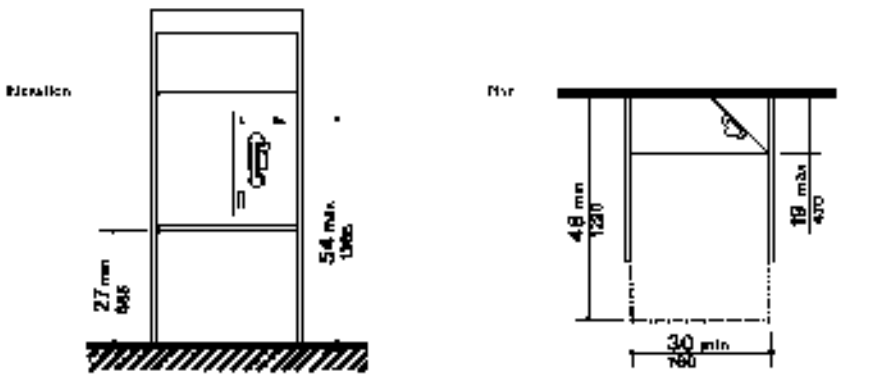


Built-in
Fountain or Cooler

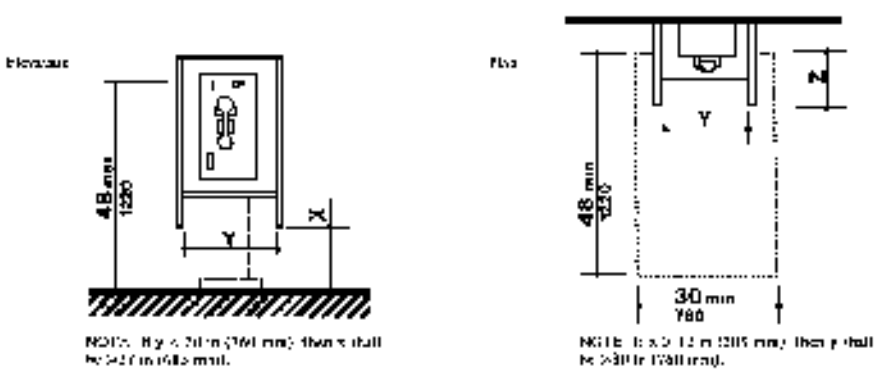
FIG 8
Drinking Fountains and Water Coolers



Side Reach Possible



Full Height Enclosure

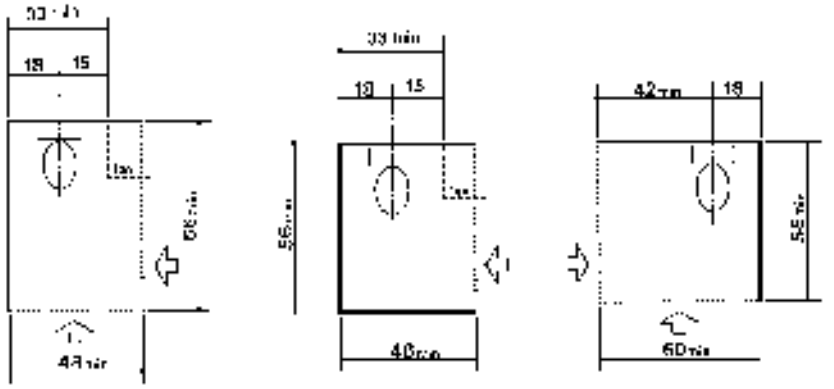


NOTE: If X ≥ 24 in (610 mm), then Y shall be ≥ 24 in (610 mm).

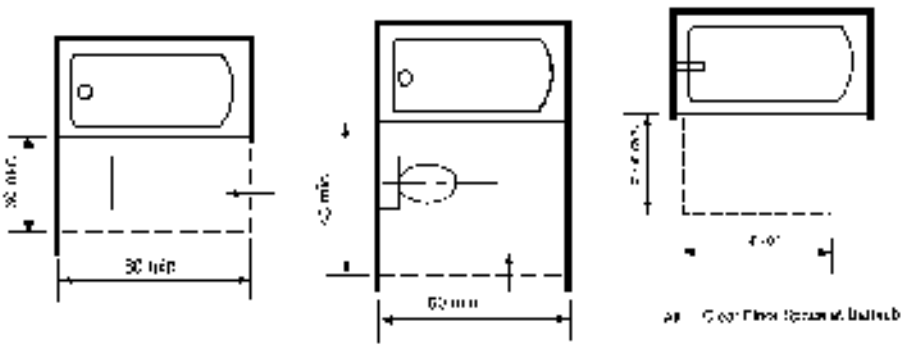
NOTE: If X ≥ 12 in (305 mm), then Y shall be ≥ 30 in (760 mm).

Forward Reach Required

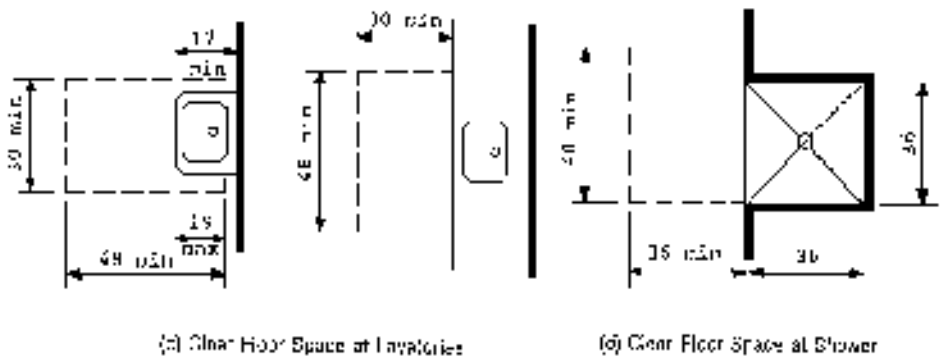
FIG 9
Mounting Heights and Clearances for Telephones



(a) Clear Floor Space for Water Closets

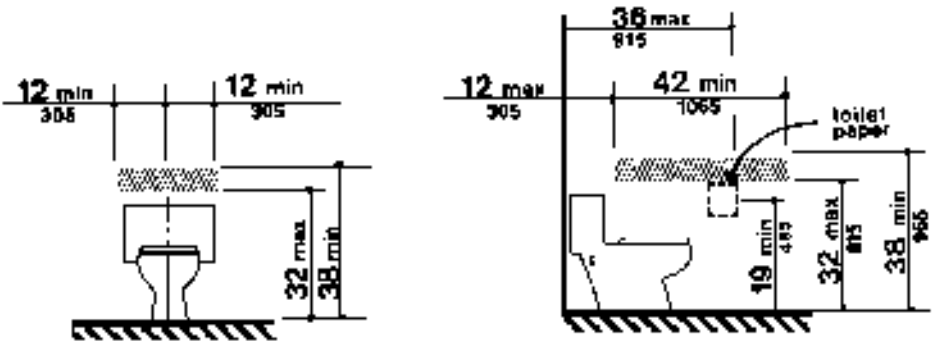


(b) Clear Floor Space at Bathtubs



(c) Clear Floor Space at Lavatories (d) Clear Floor Space at Shower

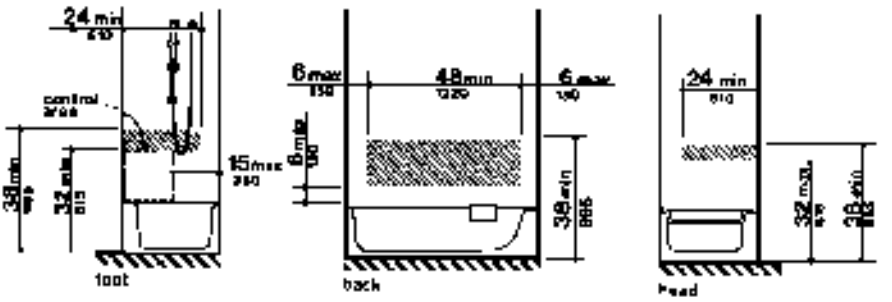
Fig. 10 Clear Floor Space for Adaptable Bathrooms



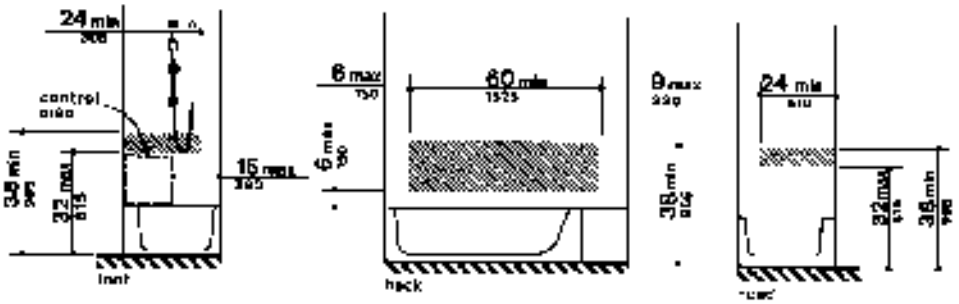
Note: The hatched areas are reinforced to receive grab bars.

Reinforced Areas for Installation of Grab Bars

FIG 11
Water Closets, Bathtubs and Showers in Adaptable Bathrooms



With Seat in Tub

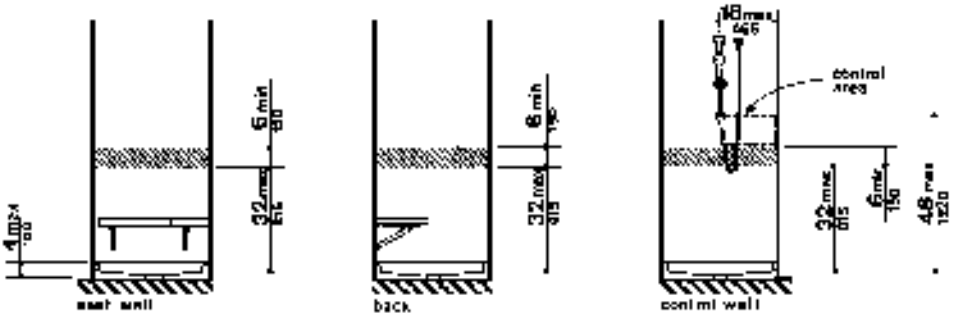


With Seat at Head of Tub

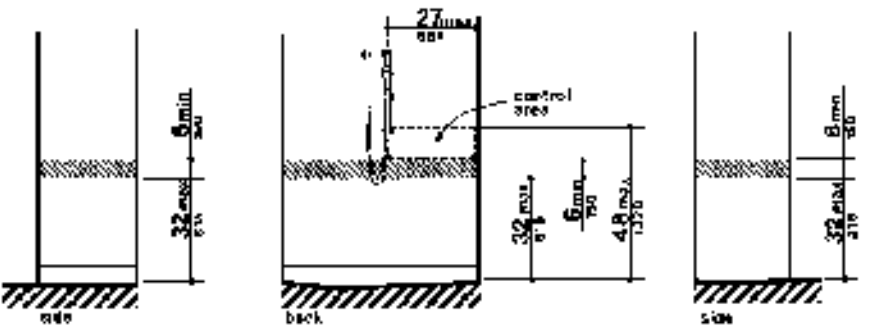
NOTE: The hatched areas are reinforced to receive grab bars.

Location of Grab Bars and Controls of Adaptable Bathtubs

FIG 11 (Continued)
Water Closets, Bathtubs and Showers in Adaptable Bathrooms



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



30-in by 60-in (750-mm by 1525-mm) Stall

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

Location of Grab Bars and Controls of Adaptable Showers

FIG 11 (Continued)
Water Closets, Bathtubs and Showers in Adaptable Bathrooms

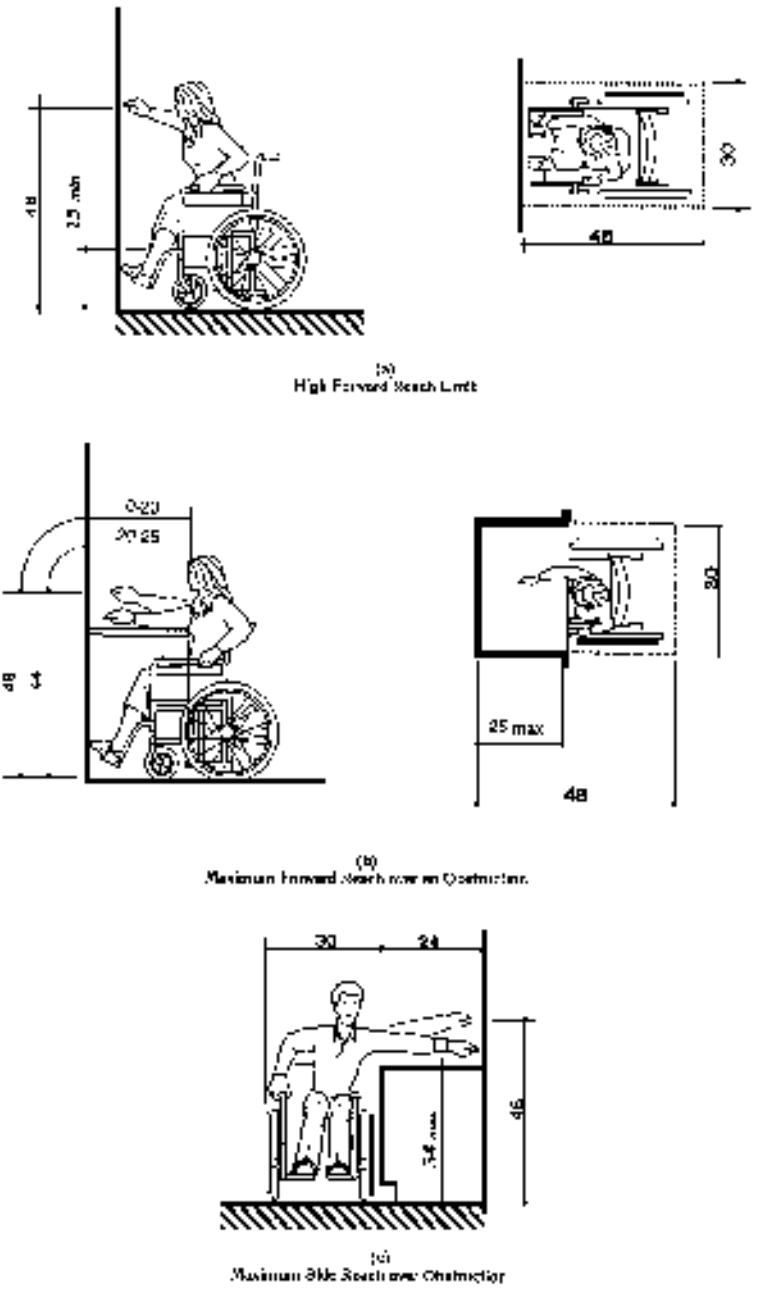
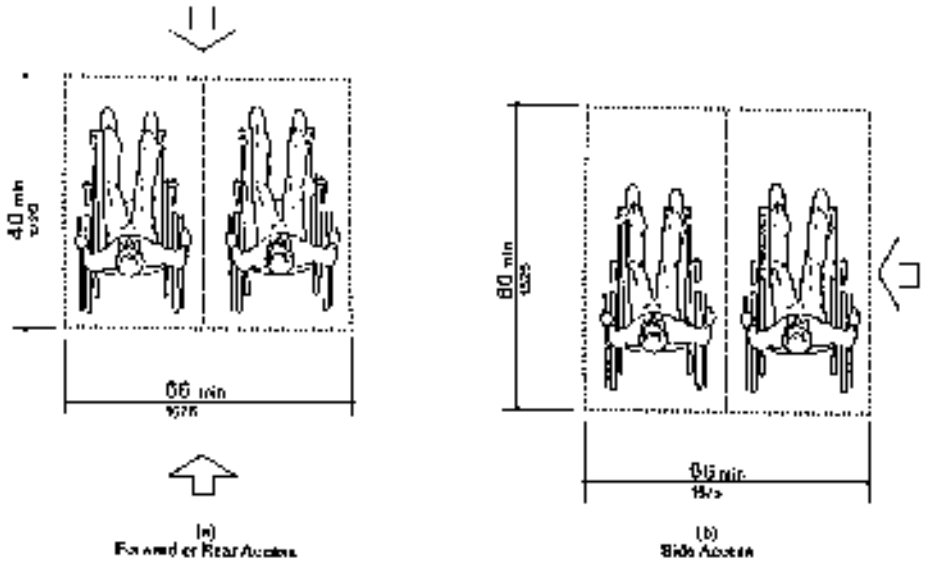
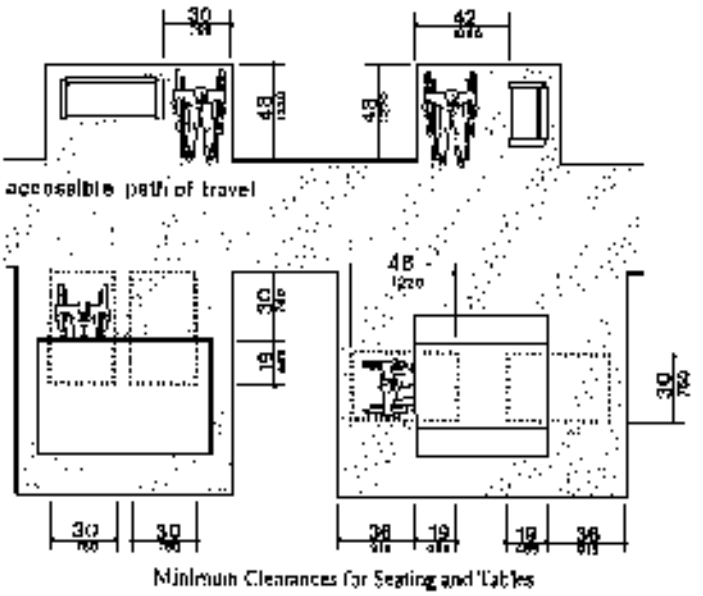


Fig. 12 Reach Ranges



Space Requirements for Wheelchair Seating Spaces in Series



Minimum Clearances for Seating and Tables

Figure 13
Wheelchair Seating

DIVISION VIII

NOTE: Pursuant to Iowa Code section 103A.10, subsection 4, paragraph *"a,"* Division VIII applies to any new construction to which the state of Iowa building code generally applies, to all new construction in jurisdictions which have adopted the state of Iowa building code, a local building code, or a compilation of requirements for building construction, and, in addition, to any new construction anywhere in the state which will contain more than 100,000 cubic feet of enclosed space that is heated or cooled.

661—16.800(103A) Iowa state building code thermal and lighting efficiency standards.

16.800(1) *Scope*. Rules 661—16.800(103A) to 661—16.802(103A) establish thermal and lighting efficiency standards for the design of new buildings and structures or portions thereof and additions to existing buildings which provide facilities or shelter intended primarily for human occupancy or use by regulating their exterior envelopes and selection of their heating, ventilation, and air-conditioning systems, service water heating, electrical distribution and illuminating systems and equipment for the efficient use of energy.

16.800(2) *Applicability.* Rules 661—16.800(103A) to 661—16.802(103A) apply to design and construction of buildings which provide facilities or shelter intended primarily for human occupancy or use throughout the state of Iowa. Rule 661—16.801(103A) establishes standards for design and construction of low-rise residential buildings. Rule 661—16.802(103A) establishes standards for nonresidential and high-rise residential design and construction.

NOTE: In any case in which the language of a code adopted herein by reference is in conflict with these rules or the Code of Iowa, the language of these rules or the Code of Iowa shall prevail.

661—16.801(103A) Adoption of residential energy code. The "Model Energy Code," 1992 edition, chapters 1 through 7 and including all charts, figures, and appendices, as published by the Council of American Building Officials, 5203 Leesburg Pike, Falls Church, Virginia 22041, is adopted by reference as the residential energy code of the state of Iowa building code, applicable to low-rise residential construction throughout the state of Iowa on or after November 16, 1994, with the following amendments:

16.801(1) Add a new subsection 101.3.1.3 as follows:

101.3.1.3 Other exemptions—Exemptions of other buildings or classes of buildings shall be requested from the commissioner in writing. Exemptions shall be granted if the commissioner determines the requirements are unreasonable as they apply to a particular building or class of buildings based upon the data supplied with the written request or additional data if requested by the commissioner.

16.801(2) Add a new subsection 101.3.2.4 as follows:

101.3.2.4 Occupancy — The occupancies and use of all buildings shall be as defined by the uniform building code as adopted by the state building code, Iowa Code chapter 103A.

16.801(3) Add a new subsection 102.3 as follows:

102.3 Code compliance. All materials and equipment used to comply with the requirements of this code shall meet the minimum requirements of the Iowa state building code or other applicable building codes.

16.801(4) Add to section 103 the following:

Procedures for obtaining approval of alternate materials and methods of construction are specified in rule 661—16.3(103A).

16.801(5) Delete section 104.1 and replace with the following:

104.1 General requirements. Nothing in these rules shall exempt or change the requirements of Iowa Code chapters 114 and 118, pertaining to registered architects or engineers.

104.1.1 Review by architect or engineer. The plans and specifications for all buildings to be constructed after January 1, 1978, and which exceeds a total volume of 100,000 cubic feet of enclosed space that is heated or cooled shall be reviewed by a registered architect or registered engineer for compliance with applicable energy efficiency standards.

104.1.2 Statement of review. A statement that a review has been accomplished and that the design is in compliance with the energy efficiency standards shall be signed and sealed by the responsible registered architect or registered engineer. This statement shall be filed with the commissioner on the form furnished by the commissioner, prior to construction or the obtaining of any local permits.

104.1.2.1 Submission fee. Included with the statement shall be a remittance of $15.00 (checks shall be made payable to the Treasurer, State of Iowa).

104.1.3 Additional buildings. If the plans and specifications relating to energy efficiency for a specific structure have been approved, additional buildings may be constructed from those same plans and specifications without need of further approval if construction begins within five years of the date of approval. Alterations of a structure which has been previously approved shall not require a review because of these changes, provided the basic structure remains unchanged and no additional energy is required for heating, cooling or lighting.

104.1.4 Changes to approved plans. No changes shall be made to any approved plan or specifications which either decreases or increases the amount of energy used for heating, cooling, or lighting, unless approved by the responsible registered architect or registered engineer in writing and notice filed with the commissioner.

104.1.5 Local plan review. The review of plans and specifications for buildings constructed with a volume of less than 100,000 cubic feet of enclosed space which is heated or cooled shall be in accordance with local or other building code requirements pertaining to plan review, as required by Iowa Code section 103A.19.

16.801(6) Add an additional subsection to 104 as follows:

104.3 Retention of plans and specifications. Plans and specifications shall not be filed with the commissioner, however, the person signing the approval statement or the owner shall maintain a copy of the approved plans and specifications, for a period of five years following substantial completion of the construction.

16.801(7) Delete subsections under section 105 and insert in lieu thereof the following:

105.1 Inspections. Inspection and review of construction shall be performed in the same manner as the other construction, in accordance with Iowa Code section 103A.19.

16.801(8) Delete the exception to section 402.5 and replace it with the following:

EXCEPTION: Except for a comparison of energy consumption between the alternative design and the standard design, single and multifamily dwellings are exempt.

16.801(9) Add the following subsections and figures to section 502.2.

502.2.1.6 HOME HEATING INDEX. In addition to the requirements of this code for detached one- and two-family dwellings the calculated Home Heating Index (HHI) of Type A-1 residential buildings shall be no greater than Five Btu per Fahrenheit Degree—Day per square foot.

502.2.1.6.1. The Home Heating Index shall be calculated using the following formula:

$$HHI = \frac{BLC \times 24 \times C}{A_t}$$

BLC = The Building Loss Coefficient expressed as Btu/hr. °F.

A_t = Total square foot area of heated space (including heated basements and basements which contain the heating equipment).

C = Correction factor from Figure 12 (to correct for solar gain and to adjust the maximum heat loss to an average hourly heat loss).

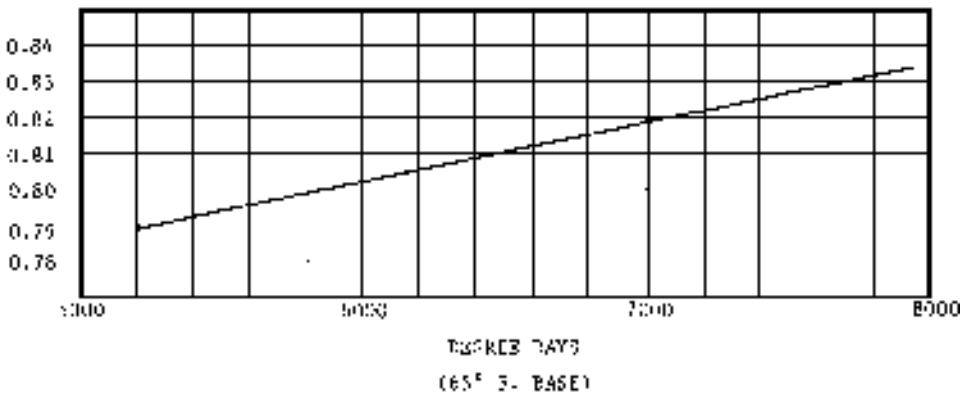
NOTE: The Building Loss Coefficient (BLC) shall include the above grade walls, below grade walls, roof/ceiling, floor over unheated space, slabs on grade and infiltration based on ½ air change per hour. These values are obtained by using the standard ASHRAE methods and equations 1 and 2 in this chapter, infiltration heat loss (H_{inf}) shall be computed as follows unless the procedure used includes infiltration in determining the component heat loss.

H_{inf}(Btu/hr. °F) = (VOLUME OF HEATED SPACE IN CUBIC FEET) × 0.009

Other methods of calculation may be used to verify the HHI such as the Thermal Performance Calculation Method (including solar) as developed by the Iowa State University Energy Extension Service, Manual "J" as published by the Air Conditioning Contractors of America or any other recognized method.

FIGURE 12

CORRECTION FACTOR C



16.801(10) Add the following subsection to section 503.4:

503.4.3.1 Vent dampers. Automatic vent dampers may be added to gas fired equipment not otherwise equipped under the following conditions:

1. The unit and installation procedure must be approved by the American Gas Association.
2. The installation must be made in accordance with the approved installation procedures.
3. The installation does not effect the operation or the warranty provisions of the equipment to which it is attached.

16.801(11) Add new subsections to section 503.4 as follows:

503.4.8 Oversizing of equipment. System design heating/cooling capacity. The rated capacity of the heating/cooling system at design conditions shall not be greater than 130 percent for heating, 115 percent for cooling at design output load calculated in accordance with section 503.2 whenever appropriate equipment is available. Equipment designed for standby purposes is not included in this capacity limitation requirement. The cooling capacity of heat pumps is exempt from this limitation.

503.4.9 Combustion air. Combustion air shall be supplied as required by chapter 6 of the uniform mechanical code as adopted as part of the state building code.

16.801(12) Add at the end of the first paragraph of section 503.10:

Provisions of the duct requirements of the uniform mechanical code as adopted as part of the state building code shall be used if different from these standards.

16.801(13) Delete section 601.1 and replace with the following:

601.1 General. The requirements contained in this chapter are applicable only to buildings containing less than 100,000 cubic feet of enclosed heated or cooled space and three stories or less in height. The provisions of this chapter are limited to residential buildings, which have more than two dwelling units, that are heated only or heated and mechanically cooled and to other buildings that are heated only. Buildings constructed in accordance with this chapter are deemed to comply with this code.

One- and two-family dwellings must comply with the Home Heating Index requirements of amendment 16.801(9) above.

16.801(14) Add to RS-8 in Section 701.1:

IES pamphlets EMS-1, EMS-2, and EMS-3 are included as part of this standard.

Rules 16.100(103A) to 16.800(103A) are intended to implement Iowa Code sections 103A.7, 103A.9 and 104A.2 and chapter 104B and Public Law 100-430.

661—16.802(103A) Adoption of nonresidential energy code. The 1993 codified version of "ASHRAE/IES 90.1-1989, Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings," including appendices A, B, C, and D, published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 1971 Tullie Circle N.E., Atlanta, Georgia 30329-2398, is adopted by reference as the nonresidential energy code of the state of Iowa building code, applicable to nonresidential or high-rise residential construction within the state of Iowa on or after November 16, 1994, with the following amendments:

16.802(1) Article 101 is amended by adding the following exception:

(4) Exemptions to applicability of the nonresidential and high-rise residential energy code to other buildings or classes of buildings shall be requested from the commissioner in writing. Exemptions will be granted if the commissioner determines that the requirements are unreasonable as they apply to a particular building or class of buildings based upon the data supplied with the written request or additional data requested by the commissioner.

16.802(2) Article 101 is further amended by adding the following new section 101.1:

101.1 Application to existing buildings.

101.1.1 Additions to existing buildings. Additions to existing buildings may be made without requiring the entire building or structure to comply. Additions to buildings or structures shall be constructed in conformance with the provisions of this standard which apply to new construction.

101.1.2 Historic buildings. Historic buildings are exempt from the provisions of this standard. For purposes of this rule, a "historic building" is a building which has been specifically designated as historic pursuant to Iowa Code section 103A.42 or which has been included in the National Register of Historic Places or has been determined to be eligible for such a listing.

101.1.3 Change of occupancy. A change of occupancy or use of an existing building or structure constructed under this code which would result in an increase in demand for either fossil fuels or electrical energy supply shall not be permitted unless the building or structure complies with the provisions of this code.

101.1.4 Mixed occupancy. When a building houses more than one occupancy, each portion of the building shall conform to the requirements for the occupancy housed therein.

EXCEPTION: When minor accessory uses occupy no more than 10 percent of the area of any floor of a building, the major use shall be considered the building occupancy.

101.1.5 Occupancy. The occupancies and uses of all buildings shall follow the definitions established in the Uniform Building Code, 1991 edition, published by the International Conference of Building Officials.

16.802(3) Article 102 is amended by adding the following unnumbered paragraph at the end of the article:

Alternate materials and methods of construction. Procedures for the approval of alternate materials and methods of construction are established in rule 661—16.3(103A).

16.802(4) Article 105 is amended by adding the following unnumbered paragraph at the end of the article:

Code compliance. All materials and equipment used to comply with the requirements of this standard shall meet the minimum requirements established in this chapter or other applicable building codes.

16.802(5) Article 106 is amended by omitting the introductory paragraph and inserting the following new sections in lieu thereof:

106.1 Review by architect or engineer. The plans and specifications for any building constructed after January 1, 1978, which exceed 100,000 cubic feet of enclosed space that is heated or cooled, shall be reviewed by an architect registered pursuant to Iowa Code chapter 544A or by an engineer registered pursuant to Iowa Code chapter 542B for compliance with applicable energy efficiency standards.

106.1.1 Statement of review. A statement that a review for compliance with applicable energy efficiency standards and that the design is in compliance within these standards shall be signed and sealed by the responsible registered architect or registered engineer. The statement shall be filed with the commissioner on a form prescribed and provided by the commissioner prior to construction or the issuance of any local building permits.

106.1.1.1 Submission fee. Included with the statement of review shall be a remittance of $15. Checks should be made payable to "Treasurer, State of Iowa."

106.1.2 Additional buildings. If plans and specifications related to energy efficiency have been approved for a specific structure, additional buildings may be constructed from those same plans and specifications, without need of further approval regarding compliance with energy efficiency standards, if construction of any additional structure commences within five years of the date of approval of the plans and specifications. Alterations of a structure for which the design has been previously approved shall not require review or further approval, provided that the basic structure of the building remains unchanged and that the alterations do not result in increased energy usage for heating, cooling, or lighting.

106.1.3 Changes to approved plans. No changes shall be made in approved plans or specifications prior to completion of original construction which would result in either decreased or increased demand for energy used for heating, cooling, or lighting, unless the changes are approved by the responsible registered architect or registered engineer in writing and notice of the changes has been filed with the commissioner.

106.1.4 Local plan review. The review of plans and specifications for buildings of less than 100,000 cubic feet of enclosed space that are heated or cooled shall be conducted in accordance with local or other building code requirements for plan reviews established pursuant to Iowa Code section 103A.19.

106.1.5 General requirements. Nothing in these rules shall be interpreted to alter the requirements established in Iowa Code chapter 542B or the rules of the engineering and land surveying examiners board pertaining to registered engineers or in Iowa Code chapter 544A or the rules of the architectural examining board pertaining to registered architects.

106.2 Details. The plans and specifications shall show all pertinent data and features of the building and equipment and systems governed by this standard including, but not limited to, design criteria, exterior envelope component materials, "U" values of the envelope system, "R" values of insulating materials, size and type of apparatus and equipment, equipment and systems controls and other pertinent data to indicate conformance with the requirements of this standard.

106.3 Retention of plans and specifications. The building owner or the registered architect or registered engineer who signs the approval statement shall maintain a copy of the approved plans and specifications and of the signed approval statement for a period of five years following substantial completion of the construction. Plans and specifications shall not be filed with the commissioner but shall be made available to the commissioner on request.

16.802(6) Article 107 is amended by omitting the introductory paragraph and inserting in lieu thereof the following:

Inspections and review of construction regarding this standard shall be performed in the same manner as inspections and review of construction related to other portions of this chapter.

16.802(7) Section 301.1 Exterior Design Conditions is amended by adding the following ASHRAE Alternative Component Package Tables: Burlington, IA #35; Des Moines, IA #63; Mason City, IA #130; Moline, IL #144; Omaha, NE #159; and Sioux City, IA #202.

16.802(8) Section 403.1 is amended by inserting the following new subsections:

403.1.1 Vent dampers. Automatic vent dampers may be added to gas-fired mechanical equipment, not otherwise equipped, if all of the following conditions are met:

403.1.1.1 The unit and installation method must be approved by the American Gas Association.

403.1.1.2 The installation must be made in accordance with approved installation procedures.

403.1.1.3 The installation does not affect the operation or warranty provisions of the equipment to which the vent damper is attached.

16.802(9) Section 403.2.4 is amended by adopting the ventilation standard established by the Uniform Building Code, 1991 edition, published by the International Conference of Building Officials as the referent for the minimum ventilation requirement.

16.802(10) The first exception to section 403.2.6.6 is amended by adding the ventilation requirement of the Uniform Building Code, 1991 edition, as the referent for the minimum ventilation requirement.

16.802(11) Subsection 403.2.9.3 is amended by adding the following unnumbered paragraph at the end of the subsection:

Provisions of the duct requirements of the Uniform Mechanical Code, 1991 edition, published by the International Conference of Building Officials and the International Association of Plumbing and Mechanical Officials shall apply.

These rules are intended to implement Iowa Code section 103A.7 and Public Law 102-486.

[Filed and effective 7/15/75]
[Filed 7/7/77, Notice 4/20/77—published 7/27/77, effective 9/1/77]
[Filed 11/14/77, Notice 9/21/77—published 11/30/77, effective 1/4/78]
[Filed emergency 12/13/77—published 12/28/77, effective 1/4/78]
[Filed 9/27/78, Notice 3/22/78—published 10/18/78, effective 11/22/78]
[Filed emergency after Notice 2/6/79—published 3/7/79, effective 2/6/79, Notice 11/1/78]†
[Filed 12/15/80, Notice 6/25/80—published 1/7/81, effective 3/1/81]*
[Filed 10/30/81, Notice 9/2/81—published 11/25/81, effective 1/1/82]
[Filed 6/16/83, Notice 4/13/83—published 7/6/83, effective 8/12/83]
[Filed 8/10/84, Notice 5/23/84—published 8/29/84, effective 10/3/84]
[Filed 10/17/86, Notice 7/16/86—published 11/5/86, effective 1/1/87]
[Filed 12/23/86, Notice 7/16/86—published 1/14/87, effective 2/19/87]
[Filed 8/31/87, Notice 6/3/87—published 9/23/87, effective 11/1/87]
[Filed 4/1/88, Notice 9/23/87—published 4/20/88, effective 5/25/88]
[Filed 10/25/88, Notice 9/7/88—published 11/16/88, effective 1/1/89]**
[Filed emergency 7/21/89—published 8/9/89, effective 7/21/89]
[Filed 10/13/89, Notice 8/9/89—published 11/1/89, effective 12/6/89]
[Filed 12/22/89, Notice 10/18/89—published 1/10/90, effective 2/14/90]
[Filed emergency 1/17/90—published 2/7/90, effective 2/14/90]
[Filed emergency 12/21/90—published 1/9/91, effective 1/1/91]
[Filed 3/29/91, Notice 11/28/90—published 4/17/91, effective 6/1/91]
[Filed 5/10/91, Notice 4/3/91—published 5/29/91, effective 7/3/91]
[Filed 8/28/92, Notice 5/27/92—published 9/16/92, effective 11/1/92]
[Filed 2/12/93, Notice 10/14/92—published 3/3/93, effective 5/1/93]
[Filed 9/23/94, Notice 7/6/94—published 10/12/94, effective 11/16/94]
[Filed 5/16/97, Notice 11/20/96—published 6/4/97, effective 7/15/97]
[Filed 11/26/97, Notice 10/22/97—published 12/17/97, effective 2/1/98]
[Filed 11/9/00, Notice 7/26/00—published 11/29/00, effective 1/3/01]
[Filed 11/9/00, Notice 10/4/00—published 11/29/00, effective 1/3/01]
[Filed emergency 3/23/01—published 4/18/01, effective 4/1/01]
[Filed emergency 9/27/01—published 10/17/01, effective 10/1/01]

*Effective date of IAB amendments to [O.P.P. 5.600 to 5.629] Division VI (16.600 to 16.629) delayed 70 days by the Administrative Rules Review Committee.
†Inadvertently dropped out from 1/7/81 IAC Supplement replacement pages.
**Effective date (1/1/89) of 16.120(2)[3802 "h" only] delayed until adjournment of the 1988 Session of the General Assembly by the Administrative Rules Review Committee at its December 13, 1988, meeting.

CHAPTER 17
CRIME VICTIM REPARATION

[Prior to 4/20/88, see Public Safety Department[680] Ch 17]
Program transferred to the Department of Justice—Attorney General[61] Ch 9, IAB 9/20/89. See 1989 Iowa Acts, House File 700.