BUILDING STANDARDS
for the
HANDICAPPED
1980

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TABLE OF CONTENTS

PREFACE

One in every seven Canadians has a disability associated with aging or a physical impairment.

The full integration of disabled people into society implies the adoption of appropriate standards which provide for all necessary aspects of public and private accessibility. The term accessibility is used in its broadest sense with the intent of facilitating use by persons in wheelchairs and by ambulatory people with all types of handicaps including visual impairment.

The implementation of the standards in this document will enable persons with physical or sensory disabilities to utilize buildings and facilities more independently. While these standards attempt to identify the needs of handicapped users, their implementation will make buildings safer and more accessible for everyone.

This document is written in a form suitable for adoption as legislation or for application as guidelines by those who wish to ensure that the buildings they design are accessible to the handicapped. It is intended to augment the requirements in the National Building Code that primarily affect accessibility for physically handicapped persons.

The National Building Code references these standards for details that are considered to be necessary for buildings falling within the definition of public buildings. These details are intended to be mandatory when the National Building Code is adopted by a jurisdictional authority and are set out in full in Appendix A.

Appendix B contains supplementary material and diagrams to assist the designer. The first line of each item in Appendix B contains in bold-face type the reference to the requirement in this document to which the supplementary material is applicable. These references have been placed in numerical order to ensure that they are easily found when they are referred to in the text.

All values in this fifth edition are given in metric units. Imperial conversions of the metric values are included in Appendix C as an interim measure until document users become more familiar with the metric values. The values in the appendix are not intended to be legal equivalents but are provided solely for information.

Comments on the content of this document and suggestions for revision are welcomed and should be sent to the Secretary, Associate Committee on the National Building Code, National Research Council, Ottawa, Ontario K1A 0R6.

Ce document est disponible en français.

LIST OF ABBREVIATIONS

Abbreviations of words and phrases in this document have the following meanings:

ACNBC.....Associate Committee on the National Building Code
°.....degree(s)
ft .....foot (feet)
in. .....inch(es)
lx .....lux (illuminance)
m .....metre(s)
min. .....minimum
mm .....millimetre(s)
N .....newton(s)

SECTION 1 SCOPE

SUBSECTION 1.1 GENERAL

1.1.1. These Standards apply to the design of buildings and to associated site development for use by physically handicapped persons.

1.1.2. In designing buildings and building sites to accommodate physically handicapped persons, the designer shall take into consideration the requirements of persons with aging or other physical or sensory disabilities, with wheelchair use generally being the most limiting design condition. (See Appendix B.)

SECTION 2 SITE DEVELOPMENT

SUBSECTION 2.1 WALKS (See Appendix B.)

2.1.1. Walks that are required to accommodate physically handicapped persons shall conform to Articles 2.1.2. to 2.1.6. (See also Subsection 3.2.7. and Article 9.9.2.9. of the National Building Code of Canada 1980.)

2.1.2. Exterior walks shall have nonslip surfaces.

2.1.3. Exterior walks shall form a continuous surface and shall not have abrupt changes in level such as steps and curbs.

2.1.4. Exterior walks shall be at least 920 mm in width.

2.1.5. Where the gradient of a walk exceeds 1 in 20 it shall be designed according to the requirements for a ramp. (See Article 3.3.1.)

2.1.6. Obstructions such as signs, guy wires, trees and parking meters shall not be permitted along outdoor walkways where they create a potential hazard to the user of the walkway, particularly to blind persons.

SUBSECTION 2.2 PARKING AREAS (See Appendix B.)

2.2.1. Where parking spaces are required to be provided for physically handicapped persons, such spaces shall be at least 3.7 m wide, hard surfaced and level, located near an accessible entrance and shall be identified for the use of physically handicapped persons.

SECTION 3 BUILDINGS

SUBSECTION 3.1 ENTRANCES (See Appendix B.)

3.1.1. Doorways and ramps at the entrance to a building which accommodate physically handicapped persons shall conform to Subsections 3.2 and 3.3, respectively.

3.1.2. Vestibules required to accommodate physically handicapped persons shall be designed to allow the movement of wheelchairs between the doors.

3.1.3. Where a building is required to have a principal entrance to accommodate physically handicapped persons, signs shall be installed where necessary to indicate the location of the principal entrance that is suitable. (See Appendix B.)

3.1.4. Where a facility is required to accommodate physically handicapped persons, such facility shall be identified by a sign consisting of the international symbol of accessibility for handicapped persons and such other graphic or written directions as are needed to indicate clearly the intended facility. (See Appendix B.)

SUBSECTION 3.2 DOORS AND DOORWAYS (See Appendix B.)

3.2.1. Except as required in Subsection 4.3, doorways required to accommodate physically handicapped persons shall have a clear opening, free of protruding hardware, of at least 762 mm when the door is in the open position.

3.2.2. Thresholds that are not flush with the floor in doorways that are required to accommodate physically handicapped persons shall not exceed 13 mm in height and shall be sloped to facilitate the passage of wheelchairs.

3.2.3. Door closers shall be of a type that permits the door being opened with a minimum of effort and that is slow closing to allow uninterrupted passage of a wheelchair.

SUBSECTION 3.3 RAMPS AND STAIRS (See Appendix B.)

3.3.1. Where ramps are required to accommodate physically handicapped persons, the ramps shall conform to the requirements of Articles 3.3.2. to 3.3.8.

3.3.2. Ramps shall have a nonslip surface.

3.3.3. Ramp surfaces shall have a minimum width of 914 mm.

3.3.4. Gradients for ramps shall not exceed 1 in 12, except that the authority having jurisdiction may permit a steeper slope where it is not practicable to provide a slope of 1 in 12, but in no case shall the slope exceed 1 in 8.

3.3.5. A level area of 1.52 m by 1.52 m shall be provided at the bottom of a ramp.

3.3.6. A level area of at least 1.52 m by 1.52 m shall be provided on the top of a ramp leading to a door so that at least 305 mm projects beyond the latch edge of the door opening, except that where the door opens away from the ramp, the depth of the level area may be reduced to 914 mm. (See Appendix B.)

3.3.7. Where there are abrupt changes in the direction of a ramp, or where the ramp exceeds 9 m in length, it shall have a level landing at intervals of not more than 9 m measuring at least 1.22 m long and of at least the same width as the ramp.

3.3.8. All ramps and landings shall be equipped so they can be illuminated to average levels of at least 50 lx at floor level.

SUBSECTION 3.4 HANDRAILS (See Appendix B.)

3.4.1. Except as provided in Articles 3.4.2. and 3.4.3., ramps shall have a suitable handrail on at least 1 side which shall extend at least 300 mm beyond the top and bottom of the ramp. This extension shall be located so that it does not constitute a hazard. (See also Sentences 3.4.8.5.(1) to (5) of the National Building Code of Canada 1980.)

3.4.2. Ramps with a gradient steeper than 1 in 12 shall have 2 handrails spaced not less than 865 mm and not more than 1 015 mm apart.

3.4.3. No handrails are required for ramps where the ramp height does not exceed 200 mm.

SUBSECTION 3.5 ELEVATORS (See Appendices A and B.)

3.5.1. Where elevators are required to accommodate physically handicapped persons, the requirements of Articles 3.5.2. and 3.5.3. shall apply.

3.5.2. The uppermost button in the elevator cab control panel shall be located not more than 1.52 m above floor level.

3.5.3. At least 1 handrail shall be provided in each elevator car.

SUBSECTION 3.6 TOILET ROOMS (See Appendix B.)

3.6.1. Where a special toilet room is provided for the use of handicapped persons of both sexes and their attendants, in lieu of facilities for handicapped persons in washrooms used by the general public, the special toilet rooms shall conform to Articles 3.6.2. to 3.6.7.

3.6.2. Doors to the special toilet rooms referred to in Article 3.6.1. shall be capable of being locked from the inside.

3.6.3. Special toilet rooms shall contain at least 1 water closet and associated grab bars conforming to Subsection 3.8 and 1 lavatory conforming to Subsection 3.9.

3.6.4. Where vestibules are provided, doors in vestibules shall conform to Articles 3.1.2., 3.2.1. and 3.2.2.

3.6.5. Special toilet rooms shall have no dimension less than 1.68 m.

3.6.6. Fixture clearance shall conform to the requirements in Subsections 3.7 to 3.9, inclusive.

3.6.7. The door to the special toilet room shall be identified for use by physically handicapped persons. (See Appendix B for Article 3.1.4.)

SUBSECTION 3.7 WATER CLOSET STALLS (See Appendix B.)

3.7.1. Where a washroom is required to be installed for use by physically handicapped persons, at least 1 water closet stall shall conform to Articles 3.7.2. to 3.7.9.

3.7.2. Water closet stalls shall be at least 1.37 m in width by 1.52 m in depth.

3.7.3. The water closet stall door shall be a minimum of 813 mm in width and shall swing outward.

3.7.4. Doors on water closet stalls shall be capable of being locked from the inside and provision shall be made for closing the door from within the stall, for example by a pull mounted near the hinged side of the door. (See Appendix B.)

3.7.5. Except as provided in Article 3.7.6., the water closet shall be located 457 mm from the centre of the fixture to an adjacent side wall.

3.7.6. At least 914 mm shall be provided from the centre line of a water closet to an adjacent wall on at least 1 side of the water closet.

3.7.7. The water closet stall shall be provided with a grab bar conforming to Article 3.7.8.

3.7.8. Grab bars shall have a diameter of not less than 45 mm and not more than 50 mm. The space between the bar and the wall shall be approximately 45 mm. Such grab bars shall be mounted at the side of the water closet approximately 400 mm from the centre line of the water closet.

3.7.9. A coat hook with rounded edges shall be mounted 1.52 m above the floor on a side wall, projecting not more than 25 mm from the wall.

SUBSECTION 3.8 WATER CLOSETS (See Appendix B.)

3.8.1. Where a water closet stall is installed for use by physically handicapped persons, at least 1 water closet in such stall shall conform to Articles 3.8.2. to 3.8.5.

3.8.2. Water closet seats shall not exceed 457 mm in height above floor level.

3.8.3. Water closet seats with spring-up action shall not be used.

3.8.4. Flushing controls shall be hand operated, of the lever type and easily accessible to a wheelchair user.

3.8.5. A back support shall be provided for each water closet.

SUBSECTION 3.9 LAVATORIES

3.9.1. Where a washroom is required for use by physically handicapped persons, lavatories and soap and towel dispensers shall be installed in conformance with Articles 3.9.2. to 3.9.7.

3.9.2. Lavatories shall have a clearance of 660 mm beneath the bottom of the lavatory to a point at least 254 mm in from its front.

3.9.3. Waste outlet pipes which constitute a burn hazard shall be insulated.

3.9.4. Lavatory faucet handles shall be of the lever type.

3.9.5. Lavatories shall be mounted a minimum of 457 mm from the side wall to the centre of the fixture.

3.9.6. Soap dispensers, shelving or other projections in a lavatory that may cause injury to users, particularly blind persons, shall be located in such a position that they will not create a hazard.

3.9.7. Soap and towel dispensers shall be located so that they are accessible to physically handicapped persons, including persons in wheelchairs. The dispensers shall be not more than 1 m above the floor.

SUBSECTION 3.10 PUBLIC TELEPHONES

3.10.1. Public telephones provided for use by physically handicapped persons shall meet the requirements of Articles 3.10.2 to 3.10.5.

3.10.2. The booth or enclosure shall be located so that it can be entered by a person in a wheelchair and shall be suitably identified for use by physically handicapped persons.

3.10.3. The dial, handset and coin deposit slots shall be mounted not more than 1.22 m above the floor.

3.10.4. Telephones for use by persons with hearing difficulties shall be designed so that they may be used by persons with or without hearing aids.

3.10.5. A telephone directory shelf shall be mounted approximately 750 mm above the floor.

SECTION 4 DWELLING UNITS

SUBSECTION 4.1 GENERAL (See Appendix B.)

4.1.1. Dwelling units required to be designed for the use of physically handicapped persons shall conform to Articles 4.1.2. to 4.15.1.

4.1.2. All living areas and essential facilities in and related to the dwelling unit shall be accessible to persons in wheelchairs.

SUBSECTION 4.2 GARAGES, CARPORTS AND PARKING SPACES

4.2.1. A garage, carport or parking space serving a dwelling unit for physically handicapped persons shall be at least 3.7 m wide, hard surfaced and located near an accessible entrance. The parking space shall be level and connected to the dwelling unit by a continuous hard surface path.

SUBSECTION 4.3 WALKS

4.3.1. Walks shall have a width of at least 914 mm with a gradient of not more than 1 in 20, constructed without steps or abrupt changes in level.

SUBSECTION 4.4 RAMPS

4.4.1. Ramps shall conform with the requirements of Subsection 3.3.1.

SUBSECTION 4.5 ENTRANCES

4.5.1. At least 1 entrance to each dwelling unit shall be designed for use by persons in wheelchairs.

SUBSECTION 4.6 DOORS AND DOORWAYS

4.6.1. Doorways at the entrance to the dwelling unit and at the entrance to each room shall conform to Subsection 3.2, except that where doors or openings are located at right angles to a hallway that is less than 1 015 mm in width, such doors or openings shall provide a clear opening of not less than 865 mm. All other doorways shall provide a clear opening of at least 760 mm.

SUBSECTION 4.7 HALLWAYS

4.7.1. The clear width of a hallway shall be at least 965 mm.

SUBSECTION 4.8 KITCHENS (See Appendix B.)

4.8.1. A clearance of at least 1.37 m shall be provided in front of base cabinets, work surfaces, counter tops and appliances.

4.8.2. Knee space shall be provided under the sink to accommodate persons in wheelchairs. Adequate thermal protection shall be provided on exposed pipes and traps to prevent burns.

4.8.3. Base cabinets shall be provided with a toe space of at least 150 mm in depth and 220 mm in height.

SUBSECTION 4.9 BATHROOMS (See Appendix B.)

4.9.1. Bathrooms shall be designed to allow access by a person in a wheelchair to each fixture.

4.9.2. The access area to a bathtub shall be at least 762 mm wide by 1 067 mm in length to allow adequate space for transfer from a wheelchair.

4.9.3. Clearance at one side and in front of a water closet shall be at least 762 mm.

4.9.4. Lavatories shall have a clearance of 660 mm under the bowl to a point at least 254 mm from the front of the fixture.

4.9.5. Faucet handles shall be of the lever or cross type.

4.9.6. Pipes which may constitute a burn hazard shall be insulated.

4.9.7. Where a shower is installed as a separate fixture, the shower stall shall be at least 914 mm wide by 1.22 m deep. The sill of such stalls shall be designed to permit easy entrance of a wheelchair.

4.9.8. Grab bars shall be provided at the water closet, bathtub and shower and shall be adequately anchored.

SUBSECTION 4.10 CLOTHES CLOSETS

4.10.1. Floors in clothes closets shall be at the same level as the floor of the room they serve.

SUBSECTION 4.11 BEDROOMS

4.11.1. At least 1 bedroom shall be specially designed to allow free movement of a wheelchair within the bedroom.

SUBSECTION 4.12 LAUNDRY FACILITIES

4.12.1. A clearance of at least 1.37 m shall be provided in front of laundry tubs, automatic washers and dryers.

SUBSECTION 4.13 CONTROLS

4.13.1. Controls for lights, cooking, heating and ventilation equipment, windows, draperies, communication systems and all similar controls of frequent or essential use shall be placed within reach of persons in wheelchairs. (See Appendix B for Subsection 4.5.)

4.13.2. Electrical receptacles shall be at least 457 mm above the floor.

4.13.3. Electrical receptacles for counter top use in kitchens and bathrooms shall be located so that they will be accessible to persons in wheelchairs.

SUBSECTION 4.14 WINDOWS

4.14.1. Openable windows shall be designed and located so that they can be easily opened by persons in wheelchairs. Opening mechanisms shall allow easy operation.

SUBSECTION 4.15 SHARED FACILITIES

4.15.1. Shared recreation and service facilities in multi-family occupancies shall be accessible to persons in wheelchairs.

APPENDIX A

EXTRACTS
from the
National Building Code of Canada 1980

(This Appendix contains the requirements for building standards for the handicapped from the National Building Code of Canada 1980.)

EXTRACTS FROM THE NATIONAL BUILDING CODE OF CANADA 1980

Public building (as applied to requirements for the design of *buildings* for physically handicapped persons) means a *building* to which the public is admitted, but does not include apartment *buildings,* houses, boarding houses or *buildings* of Group F *major occupancy.*

(Details of occupancies can be found in Part 3 of the National Building Code of Canada 1980.)

3.2.7.1. Every *public building* shall have at least 1 principal entrance designed in conformance with the ACNBC publication "Building Standards for the Handicapped 1980" for use by physically handicapped persons, opening to the outdoors at sidewalk level or to a ramp conforming to Article 3.4.8.8. leading to a sidewalk.

3.2.7.2.(1) Every *public building* shall provide access for physically handicapped persons from the entrance described in Article 3.2.7.1. to public spaces on the entrance floor, and to at least 1 elevator where elevators are provided.

(2) Where elevators are installed to serve *storage garages* in *public buildings,* access for physically handicapped persons shall be provided from at least 1 parking level to the elevator.

3.2.7.3. Washroom facilities in *public buildings* shall conform to Article 3.6.4.4.

3.6.4.4. In every *public building* where more than 2 water closets are required, at least 1 washroom shall be provided that is designed for and is accessible to physically handicapped persons in conformance with the appropriate provisions in the ACNBC publication "Building Standards for the Handicapped 1980."

9.9.2.7. Every *public building* shall have at least 1 principal entrance designed in conformance with the ACNBC publication "Building Standards for the Handicapped 1980" for use by physically handicapped persons, opening to the outdoors at sidewalk level or to a ramp leading to a sidewalk.

9.9.2.8. Every *public building* shall provide access for physically handicapped persons from the entrance described in Article 9.9.2.7. to public spaces on the entrance floor and to at least 1 elevator when elevators are provided in conformance with the ACNBC publication "Building Standards for the Handicapped 1980."

APPENDIX B

SUPPLEMENTARY MATERIAL
for
Building Standards
for the Handicapped 1980

(This Appendix contains notes and diagrams that apply to the requirements of this document. The bold-face reference numbers that introduce each item apply to the requirements in the main body of the document to which this material is applicable. The bold-face captions following these reference numbers describe the subjects to which the references apply.)

Article 1.1.2. General Information on Designing for Physically Handicapped Persons

For the purposes of this publication, a person is handicapped when he has a loss of bodily function which decreases his ability to move throughout the community in a normal manner.

Such losses include weakness, paralysis or absence of 1 or more limbs, loss of balance and co-ordination, spastic muscles, and painful, stiff or deformed joints.

Walking aids, including canes, crutches, braces and artificial limbs, may prevent the free use of arms and hands for other purposes. In addition, loss of function of other parts of the body including visual and hearing defects and poor exercise tolerance associated with heart or lung disease will interfere with mobility. More than one such disability may be present in one individual. The likelihood of disabilities occurring increases markedly with age. Because the non-ambulatory person or wheelchair user has the greatest number of mobility problems, additional information concerning the wheelchair is presented below.

Wheelchair Dimensions

The dimensions of common models vary as follows:

	Range of Dimensions	Usual Dimension
Length	850 mm to 1 220 mm	1 070 mm
Width when open	470 mm to 760 mm	660 mm
Width when collapsed	230 mm to 370 mm	280 mm
Height of seat above floor	360 mm to 510 mm	460 mm
Height of armrest from floor	500 mm to 850 mm	750 mm
Height of handle from floor	840 mm to 1 360 mm	940 mm

Functioning of a Wheelchair

The average space for turning through 180° is 1.52 mm by 1.52 mm. A minimum width of 1.52 mm is required for 2 wheelchairs to pass each other.

Functioning of an Adult in a Wheelchair

The upward reach from the floor ranges from 1.37 m to 1.98 m with an average reach being equal to 1.52 mm. The average horizontal working reach at a bench or table is 460 mm beyond the front edge of the seat. The average forward reach upwards, as when using a wall mounted dial telephone, is 1.22 m. Removable arm rests may increase some of these dimensions slightly. Transference from the chair to a car, bed or water closet is usually achieved either by a slide, after removing an arm rest, or off the front corner of the wheelchair. Ideally, the 2 seats should be level. In any event, the chair seat should not be more than 80 mm higher than the seat or bed.

Designing for Children

The preceding dimensions are for adults of average stature. In designing buildings for children, it may be necessary to alter some dimensions, such as the height of handrails.

Section 2. SITE DEVELOPMENT

Almost any building can be made accessible to physically handicapped persons by planning the site, so that terraces, retaining walls and winding walks are used effectively. An accessible route should exist from the sidewalk or roadway and parking area to an accessible building entrance. This route should be located so that physically handicapped persons do not have to pass behind parked cars. Particular attention should be paid to the junction of walkways with driveways, parking areas and other walks. The provision of nonslip surfaces on steps, walks and floors greatly assist those with semi-ambulatory disabilities.

Subsection 2.2 PARKING AREAS

Zoning or parking Bylaws should include requirements for parking for the physically handicapped.

Article 2.1.4.

Although the minimum width for walks is 914 mm, it is highly desirable that, where space allows, they be 1.52 m in width to allow wheelchair users to pass each other.

Subsection 3.1 BUILDINGS

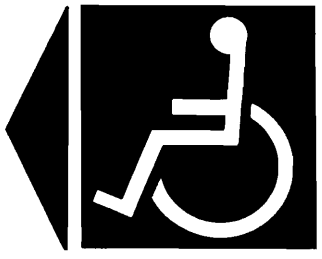
As much of the building as possible should be accessible to physically handicapped persons, especially areas used by the public. Special attention should be given to the accessibility of entrances, washrooms and elevators. The international symbol of accessibility for handicapped persons was adopted in 1969 by the International Society for the Rehabilitation of the Disabled to indicate that building services are accessible to the physically handicapped.

It is essential that the finish of all floors should have nonslip qualities even when standard flooring materials are used. Highly polished finishes should be avoided. Particular attention should be given to the selection of materials used on vestibule and entrance hallway floors, as these may become dangerous when wet. A minimum of wax should be used on the maintenance of floors to prevent surplus amounts being transferred to the soles of shoes. Nonslip waxes containing fine abrasive particles are recommended. Any temporary floor covering material should be of a kind that does not constitute a tripping hazard.

Carpet flooring should be compact with a dense surface of loop pile or felt type and should be attached to subsurfaces so as to allow wheelchairs to move freely without excessive friction, bunching or binding.

Article 3.1.3.

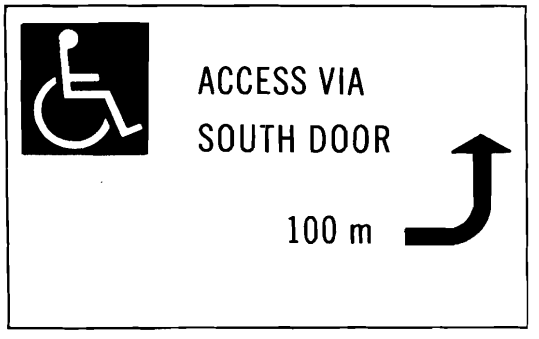
This symbol when displayed on a building indicates to physically handicapped persons that they will have reasonable freedom of movement within that building. An arrowhead can be added to either side of the symbol to indicate direction or the location of an accessible ground level entrance.



Article 3.1.4.

These symbols can be used to notify physically handicapped persons that rest room and other facilities that are so marked have been made accessible to them, and to indicate their location.

The background (shown here as black) is blue in the official symbol, but for aesthetic purposes different colours can be used. Where the colour will not be clear when the sign is in position because of lighting conditions, for example, the sign can be centred on a white background made from self-adhesive decorator vinyl covering, which adheres to glass and is waterproof. The design of the symbol allows for easy reproduction in many building materials.



(Additional information on the availability and use of this international symbol can be obtained from: The Canadian Rehabilitation Council for the Disabled, Suite 2110, One Yonge Street, Toronto, Ontario M5E 1E8.)

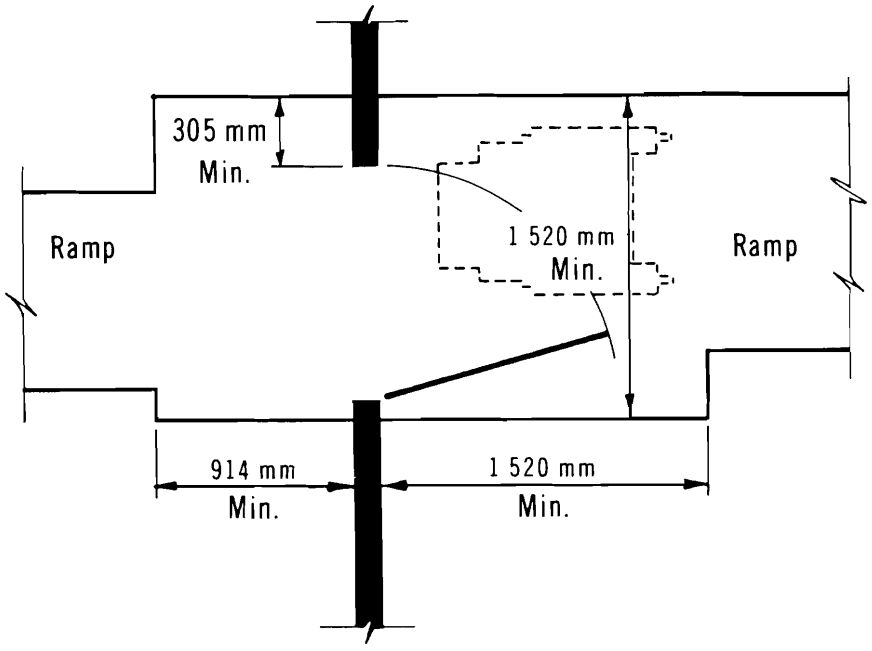
Subsection 3.2 Doors and Doorways

Doors that require little strength to operate, that have an easily gripped handle, that are reasonably wide and that do not have a threshold can be safely used by most people. Space for wheelchair manoeuvring should be provided on both sides of the door. Door handles should be of the lever type. The door operating pressure should not exceed 22.5 N.

Subsection 3.3 Ramps and Stairs

A change in the level of a walk or floor area becomes a major problem for people with physical disabilities. Flat surfaces are desirable, but if a change in level occurs, a ramp of low slope should be used. As the slope of the ramp decreases, the number of people who can safely use the ramp increases; a slope of 1 in 12 is the suggested maximum. Provision of a nonslip surface at all times is essential. Where a ramp is located outside a building, it should be protected from snow and ice accumulation by providing a roof, snow melting device or other means.

Article 3.3.6 Level Areas at End of Ramps Leading to Doorways



Article 3.3.9. Stair Design

Stairs should have plain faces. Open risers or nosings projecting out over the face of closed risers are not recommended. Colour contrast should be maintained between treads and risers and at the top and bottom of each flight of stairs.

Subsection 3.4 Handrails

Although Article 3.4.1. permits a handrail on only one side if the ramp slope is 1 in 12 or less, it is preferable to have handrails on both sides regardless of the slope.

Subsection 3.5 Elevators

Public buildings of more than 600 m^2 of building area with more than 1 storey should have an elevator or other acceptable means of access from one floor to another for persons in wheelchairs.

Subsection 3.6 Special Toilet Rooms

There are several ways of arranging the fixtures in a special toilet room to accommodate wheelchair use. One important factor is to provide sufficient clear area to manoeuver a wheelchair without obstruction in front of the lavatory, in front of the toilet and on one side of the toilet. (An area of 762 mm by 1 067 mm is necessary to manoeuver a wheelchair.)

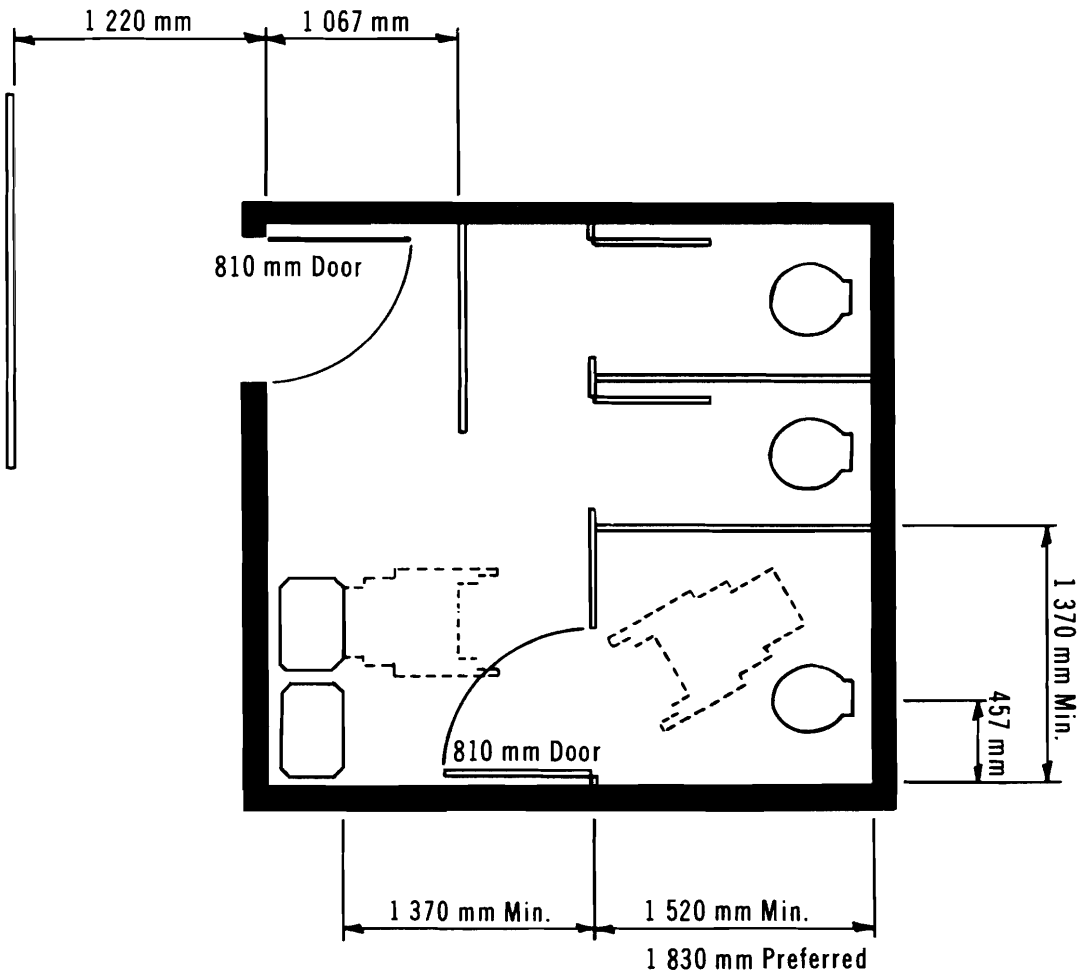
A second factor is to maintain the minimum distances of fixtures from walls and from other fixtures. The centre line of a lavatory should be located at least 381 mm from a wall or another fixture, and the centre line of a toilet at least 457 mm from a wall or fixture. The door should open outwards. If the door opens inwards it should not interfere with the clear manoeuvering area.

Subsection 3.7 Water Closet Stalls

Water closet stall doors should preferably swing outward against a side wall. A handle located on the hinged side of the door to facilitate closing from the inside may be replaced by a full width horizontal handle or self closing device. Grab bars are equally as effective when installed in a horizontal position or mounted diagonally between 600 mm and 1.3 m from the floor at the side of the water closet and 150 mm forward of the seat. In existing buildings, water closet stalls for persons with physical disabilities can be provided by combining 2 standard water closet stalls into 1 by removing the common partition, the second water closet and fitting a suitable door.

Subsection 3.7 (Cont'd)

Minimum Clearances for Screens



Plan view of water closet stall

Subsection 3.8 Water Closets

Wall-mounted toilet fixtures or floor models with receding bases are desirable because they provide the least amount of obstruction.

The back support required in Article 3.8.5. may be of a fixed type or can be provided by the seat lid. It should be fixed or should rest approximately 5° from the vertical.

Subsection 3.9 Lavatories

Where mirrors are provided, they should be mounted with the lower edge not more than 1 m above the floor.

Subsection 4.1 General (Dwelling Units)

As more and more handicapped persons are living in normal surroundings, dwelling units in multi-family housing as well as individual housing should be designed to be accessible and usable by physically handicapped persons. A minimum of 5 per cent of dwelling units should be designed with facilities to accommodate handicapped persons. In all other types of residential occupancies, whether institutional or commercial sleeping accommodations, a minimum of 5 per cent of the units provided should be accessible and usable by disabled persons.

Single-storey dwellings, either on the floor level close to grade or on floors accessible by ramps or elevators, are acceptable.

In elevator equipped residential buildings, all shared facilities should be accessible and usable by handicapped persons. This includes site development, car parking, recreational facilities, service facilities, designated building entrances, vestibules, lobbies, administration offices, mail rooms, lounges, laundries, storage lockers, elevators and dwelling unit entrances.

Where balconies are provided in individual dwelling units, they should be made accessible.

(For additional design guidelines refer to "Housing the Handicapped," NHA 5076, published by Canada Mortgage and Housing Corporation.)

Subsection 4.2 Garages, Carports and Parking Spaces

Where a garage is provided for use by physically handicapped persons, the door should be electrically operated.

Subsection 4.6 Doors and Doorways

Lever type door hardware facilitates use by handicapped persons. The end of the lever should be angled inwards so as not to catch on clothing.

Subsection 4.8 Kitchens

Appropriate working surface levels may vary with the type of handicap, but generally the counter surface should be at a height of 840 mm for the average worker in a seated position. A retractable cutting board (or boards) should be provided as an accessible auxiliary work surface. The kitchen sink counter should be designed to provide clearance for wheelchairs with arms. A 250 mm open shelf should be provided under the sink 380 mm from the floor.

As the upper kitchen cabinets are only partially accessible to persons in wheelchairs, an open shelf should be provided below these cabinets. A pantry should also be provided to ensure adequate food storage space.

Where kitchen ranges are provided, the controls should be accessible without having to reach over the burners or elements. Separate counter top elements and ovens usually provide better accessibility for physically handicapped cooks. In all cases, the counter surface and burner top should be at the same level.

Faucet handles should be of the lever or cross type.

Subsection 4.9 Bathrooms

An important factor of arranging the fixtures in a bathroom to accommodate wheelchair use is to provide enough floor space to manoeuver a wheelchair without obstruction in front of the lavatory, beside the bathtub and on one side of the toilet. (An area of 762 mm by 1 067 mm is necessary to manoeuver a wheelchair.) The centre line of toilets should be located 457 mm from a side wall or other fixture and the centre line of lavatories should be located a minimum of 381 mm from a side wall or other fixture.

The bathroom door should either open outwards or be a sliding door. If the bathroom door opens inwards it should not infringe on the clear manoeuvering area. Where built-in vanities are used, they should allow for knee space and should not obstruct wheelchair movement at the floor level.

All bathroom accessories should be accessible.

Grab bars should be securely attached to the framing members or masonry. The type and arrangement of grab bars within dwelling unit bathrooms may vary with the type of handicap of the occupant and should preferably be decided upon in consultation with the future occupant of the dwelling. Vertical or diagonal grab bars should not be used around the bathtub or shower. An eye bolt adequately anchored to the ceiling should be provided for the suspension of a chain or stirrup grip for use by handicapped persons getting into and out of the bathtub.

Installation of telephone-type showers in the bathtub is recommended for use by handicapped persons.

A thermostat control should be provided for the bathtub and shower.

Subsection 4.10 Clothes Closets

Clothes closets should have adjustable hanging rods.

Subsection 4.12 Laundry Facilities

Automatic washers and dryers should be of the front-loading type.

Subsection 4.14 Windows

Window sills should be no higher than 760 mm so as to provide an exterior view from a seated position.

APPENDIX C

EQUIVALENT IMPERIAL VALUES

EQUIVALENT IMPERIAL VALUES

Reference	Metric Unit	Imperial Unit	Remarks
2.1.4	1.52 m	5 ft	
2.2.1.	3.7 m	12 ft	
3.2.1.	762 mm	2 ft 6 in.	
3.2.2.	13 mm	½ in.	
3.3.3.	914 mm	3 ft	
3.3.5.	1.52 m	5 ft	
3.3.6.	1.52 m	5 ft	
3.3.6.	914 mm	3 ft	
3.3.6.	305 mm	1 ft	
3.3.7.	9 m	29 ft 6 in.	
3.3.7.	1.22 m	4 ft	
3.3.8.	50 lx	5 foot candles	
3.4.1.	305 mm	1 ft	
3.4.2.	864 mm	2 ft 10 in.	
3.4.2.	1 016 mm	3 ft 4 in.	
3.4.3.	200 mm	8 in.	
3.5.2.	1.52 m	5 ft	
3.6.5.	1.68 m	5 ft 6 in.	
3.7.2.	1.37 m	4 ft 6 in.	
3.7.2.	1.52 m	5 ft	
3.7.3.	813 mm	2 ft 8 in.	
3.7.5.	457 mm	1 ft 6 in.	
3.7.6.	914 mm	3 ft	
3.7.8.	25 mm	1 in.	
3.7.8.	50 mm	2 in.	
3.7.8.	45 mm	1¾ in.	
3.7.8.	400 mm	1 ft 4 in.	
3.7.9.	1.52 m	5 ft	
3.7.9.	25 mm	1 in.	
3.8.2.	457 mm	1 ft 6 in.	
3.9.2.	660 mm	2 ft 2 in.	
3.9.2	254 mm	10 in.	
3.9.5.	457 mm	1 ft 6 in.	
3.9.7.	1 m	3 ft 3 in.	
3.10.3	1.22 m	4 ft	
3.10.5.	750 mm	30 in.	
4.2.1.	3.7 m	12 ft	
4.3.1.	914 mm	3 ft	
4.6.1.	1 016 mm	3 ft 4 in.	
4.6.1.	864 mm	2 ft 10 in.	
4.6.1.	762 mm	2 ft 6 in.	
4.7.1.	965 mm	3 ft 2 in.	
4.8.1.	1.37 m	4 ft 6 in.	
4.8.3.	150 mm	6 in.	
4.8.3.	220 mm	8½ in.	
4.9.2.	762 mm	2 ft 6 in.	
4.9.2.	1 067 mm	3 ft 6 in.	
4.9.3.	762 mm	2 ft 6 in.	
4.9.4.	660 mm	2 ft 2 in.	
4.9.4.	254 mm	10 in.	
4.9.7.	914 mm	3 ft	
4.9.7.	1.22 m	4 ft	
4.12.1.	1.37 m	4 ft 6 in.	
4.13.2.	457 mm	1 ft 6 in.	

INDEX