A simple touch leads to endless possibilities

Accessibility Guidelines for Sensory Loss

2020

3rd Edition

DeafBlind
ONTARIO SERVICES

Table of Contents

Introduction

Introduction

DeafBlind Ontario Services

DeafBlind Ontario Services provides accessible residential and customized support services across the province. Our holistic approach to Intervenor Services empowers people with deafblindness to achieve their goals and dreams.

DeafBlind Ontario Services' professional intervenors foster independence through a holistic and person-centered approach of "do with, not for". They support people with deafblindness to gain independence, build their life skills, and actively participate in all areas of their lives.

Intervenors are professionally trained to act as the "eyes" and "ears" of the individual with deafblindness through the sense of touch. By facilitating the exchange of information and assisting with communication methods, intervenors empower people with deafblindness to thrive. Our team of professionals are dedicated to ensuring consistent and holistic person-centered plans are in place for each person we support to live full, meaningful lives.

DeafBlind Ontario Services is a leader in the field with programs in remote communities and urban centres across the province.

The intent of this guide is to provide guidance and information to architects, designers and service providers in understanding deafblindness, and how to create spaces that are user friendly and inclusive for individuals with varying sensory losses. In addition, a section in this guide is dedicated to useful "do it yourself" projects/products that may enhance the accessibility and functionality of an environment or activity for individuals with varying levels of sensory loss.

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About the Accessibility Guidelines for Sensory Loss

Acknowledgements

DeafBlind Ontario Services gratefully acknowledges the following individuals/ organizations for their contributions to our *Accessibility Guidelines for Sensory Loss*:

- Amanda Mathews, DeafBlind Ontario Services, on her contributions to the DIY Accessibility and Orientation Enhancements section of this guide.

- Pretium Anderson Building Engineers, Universal Design Consulting Services and Lesley MacDonald of Pretium Engineering Inc for writing and researching the *Accessibility Guidelines for Sensory Loss* for DeafBlind Ontario Services.

- Rick Mugford (B.ARCH and a Universal Design Specialist) for his contributions in developing the Concept Drawings to be detailed and reflective of the guidelines.

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Accessibility Guidelines

As noted above the original intent of our accessibility guidelines is to provide guidance and information to architects, designers and service providers who design and retrofit our residential locations. We also wish to share our accessibility guidelines to the broader community such as: engineers and organizations who provide services to people with sensory loss, as well as families of people with sensory loss. We have included a section with helpful tips and ideas that focus on establishing inclusive environments for individuals with varying degrees of sensory loss.

The designs and concepts provided, emphasize the importance of inclusive design, space maneuverability, illumination, the use of colour, texture and specialized products. The objective of our accessibility guidelines in our locations is to increase the functionality, safety, independence and access to spaces for people with varying abilities.

DeafBlind Ontario Services acknowledges when retrofitting our existing residential locations to meet our guidelines, some of the requirements, such as those for bathrooms may not be able to be met given the current available space, without the assistance and advice of an architect and/or engineer to retrofit the space.

Please note, for the purposes of this guide, we take as a starting point the residential locations we operate and own, shall meet national, provincial building codes, fire codes and similar regulations.

These guidelines are meant to augment those codes and regulations; nothing in these guidelines will override them. When in doubt, the requirement providing the most accessible and accommodating solution should apply. It is important to note, the Ontario Human Rights Code supersedes the Ontario Building Code (OBC) and the AODA. The OBC and the AODA provide minimum accessibility requirements.

Tool Kit

The Tool Kit section provides information regarding the tools and devices you may use to conduct an accessibility review. In addition, the section provides tips on how to use the recommended tools and devices.

Quick Design Tips

The Overall Design Basics section provides quick tips and an overview of the broader recommendations presented in the Accessible Design Guidelines section. Please refer to the Accessible Design Guidelines section of this guide for additional information.

DIY Orientation and Accessibility Enhancements

The DIY (Do-it-yourself) Accessibility and Orientation Enhancements section is intended to share additional information and products that may increase the understanding and functionality of the environment or activity for individual with varying degrees of sensory loss.

Deafblindness

What is Deafblindness?

Deafblindness is a combination of hearing and vision loss that is unique to each person and impacts access to information, communication, and mobility. Over 1% of Canada's population or approximately 466,420 people are deafblind. In Ontario, an estimated 211,250 individuals are deafblind.

Deafblindness and Communication

Because every person with deafblindness experiences a varying degree of sensory loss, each person will use their own unique and individual way to communicate. By facilitating the exchange of information and assisting with communication methods, intervenors empower people with deafblindness to thrive. With the right supports in place, the potential of a person with deafblindness is limitless.

Types of Deafblindness

Diagnosis and the identification of sensory losses are difficult. **The impact that deafblindness has on an individual will uniquely vary by cause, degree of sensory loss and the age of onset.**

- **Congenital Deafblindness -** Individuals with congenital or early adventitious deafblindness have lost their senses of sight and hearing, prenatally or shortly after birth; before developing language and communication skills.

- **Acquired Deafblindness -** Acquired deafblindness refers to individuals who become deafblind at a later stage in their life. An individual may have a vision or hearing impairment, and suddenly or gradually lose the other sense. An individual with both senses may develop sight and hearing impairments due to a genetic condition, an accident or old age.

- **Causes of Deafblindness**

    - Genetic or hereditary conditions
    - Illness and accidents
    - Infections acquired during pregnancy
    - Premature birth
    - Rare syndromes
    - Sensory loss due to old age

- **CHARGE Syndrome -** CHARGE Syndrome is a rare genetic condition that affects people of all ages. Approximately 50% of children with CHARGE Syndrome have a mutation in the gene CHD7.

- CHARGE Syndrome presents a wide range of medical challenges including physical difficulties, sight and hearing impairments and heart problems. Many individuals diagnosed with CHARGE Syndrome also experience delays in cognitive ability.

- **Rubella/ Congenital Rubella Syndrome -** Rubella, often referred to as the German measles, is a preventable disease caused by the Rubella virus. The symptoms of Rubella are typically mild, and some people may not experience any symptoms. However, the virus may be serious when a pregnant woman is infected during the early stages of her pregnancy.

- An infant affected by the Rubella virus is said to have Congenital Rubella Syndrome. A baby affected by Congenital Rubella Syndrome may have hearing loss, cataracts, eye conditions and heart problems that will be present throughout the life of the individual. The risk of birth defects caused by Congenital Rubella Syndrome depends on how early in the pregnancy the Mother is infected.

- **Usher Syndrome -** Usher Syndrome is a genetic or inherited condition that affects hearing, vision and balance. There are three broad types of Usher Syndrome: types one, two and three. The age of onset and the degree of sight, vision and balance problems varies with each individual and each type of Usher Syndrome.

- As there is no cure for Usher Syndrome, early diagnosis is imperative. Diagnosis is often based on hearing and vision tests. Balance tests may also play a role in diagnosis. Today, identification and diagnosis of Usher Syndrome is significantly improving.

CHARGE/ Rubella/ Usher Syndrome Resources: http://www.sense.org.uk

Overall Design Basics

The aim of our *Accessibility Guidelines for Sensory Loss* is to provide solutions to creating spaces that promote independence, functionality, and safety for individuals who are deafblind /with a sensory loss in a residential environment. DeafBlind Ontario Services' *Accessibility Guidelines* may also be considered for use in the wider context of the built environment when designing inclusive spaces.

Contrary to popular belief, accessible design does not need to be expensive and may esthetically enhance a space. Many of the solutions provided in our *Accessibility Guidelines* require some simple techniques and adaptations to make spaces within a residential environment more accessible.

When designing residential environments for individuals who are deafblind, many of the design requirements and elements of accessible/Universal Design will be similar for individuals' with a vision loss and for individuals who are deaf, deafened or hard of hearing.

We consider Universal Design for the built environment to be a broad–spectrum solution that strives to make spaces usable for individuals of all abilities. Universal Design is defined as:

"The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaption or specialized design." *~NC State University, The Centre for Universal Design~*

Universal Design

Universal Design is based on seven principles:

1. **Equitable Use**: the design is useful and marketable to individuals with diverse abilities.
2. **Flexibility in Use**: the design accommodates a wide range of individual preferences and abilities.
3. **Simple and Intuitive Use**: use of the design is easy to understand, regardless of the users' experience, knowledge, language skills, or current concentration level.
4. **Perceptible Information:** the design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
5. **Tolerance for Error:** the design minimizes hazards and adverse consequences of accidental or intended actions.
6. **Low Physical Effort:** the design may be used efficiently and comfortably and with minimum fatigue.

7. **Size and Space for Approach and Use:** Appropriate size and space is provided for approach, reach, manipulation, and use regardless of the user's body size, posture or mobility.

The key to any design project is to think about Universal Design from the beginning. Some items to consider are: the overall foot print of the building, the location of the home relative to the street and sidewalk, the grade level, a straight-forward approach to the accessible front door and back deck, level accessible sidewalks to the main entrance and surrounding outdoor areas and utilization of natural light to enhance the illumination within the home.

Key Elements of Design

There are five key design elements to keep in mind that underline all other recommendations and guidelines provided in this *Accessible Design Guidelines* manual:

1. **Layout**

   A logical, straightforward layout of a given space, including well defined areas, straight lines, right angles for paths of travel and lines of sight are key components to assist individuals who are deafblind with orientation within a space. Open spaces may be challenging to navigate for many individuals who are deafblind. To assist with orientation in open spaces, such as living rooms, dining areas and recreational spaces within the group home the placement of furniture, texture changes on the walls and floors in addition to the use of high colour contrast will provide orientation clues, in addition to providing a means to define the spaces and assist with orientation.

   An area free of clutter from items that are not necessary should also be considered. Items such as winter boots, boxes, mobility devices etc. should be contained in storage spaces adjacent to the main circulation routes. Walls incorporating the use of textures, floor textures, fixtures such as tactile signs and furniture appropriately placed to provide directional clues may be used to assist individuals with their orientation with in a space.

   Many individuals with vision loss are able to develop a mental map of a space and understand the location of objects and within a space and the relation of objects relative to themselves. It is important objects with in a space remain in their designated location.

2. **Lighting**

   Good lighting is the single most important feature for individuals who are deafblind with functional vision. The lighting needs of each individual will vary depending on their particular eye condition. Most individuals will benefit from augmented illumination to assist with the navigation of a space and to carry out daily living activities. In spaces, such as bedrooms, consideration should be given to dimmer switches to adjust the amount of light required. Task lighting is always recommended for desks and counter tops in kitchens and bathrooms.

Tips for lighting in residential setting:

- Walls painted with pastel colours will reflect light
- Make use of natural light remembering to reduce glare with vertical or horizontal blinds
- Ensure the artificial light sources do not create glare
- Select lamp shades that encourage the spread of light.
- Use diffused light on the walls and/or ceilings
- Include lighting under cupboards, in cupboards and in closets.

Adequate lighting is the single most important aid to vision. As individuals age, generally, more light is required.

There are many styles of lighting for different types of situations. The key principles of accessible lighting are:

- Evenness
- Transition
- Glare
- Colour
- Task

3. Colour/Luminance Contrast

Visual contrast has two components: luminance contrast and difference in colour. For people with low vision, luminance contrast is essential. The difference in colour or tone may supplement luminance contrast.

The importance and use of high colour contrast to define features and spaces in residential environments will also assist with orientation and accessibility.

Doors and doorframes should colour contrast with the surrounding wall surfaces and floors. The nosing on stairs should colour contrast with the treads. The handrails should colour contrast with the surrounding walls. In addition, fixtures, counters, doors, cupboard door hardware, cupboard doors and appliances should colour contrast with the surrounding areas. Appliance controls should colour contrast with the appliance.

Similarly, furniture such as couches, chairs, tables and beds should colour contrast with their surrounding surfaces such as the walls and floor. Furniture that colour contrasts with the surrounding areas may aid in identifying the furniture and assist individuals with their depth perception. Furniture that is the same or a similar colour or shade will blend in and make identification of the items difficult.

Colour contrast is the degree of difference between one colour and another colour on the colour wheel. The more visually different the colours are, the greater the contrast.

Luminance contrast is the degree of difference in brightness between one object or surface and another. The brightness is measured from just above the brighter object (B1) 200 - 250 mm and then above the darker area (B2). Then use these measurements in the formula.

$$\text{Colour/ Brightness Contrast} = \frac{B1 - B2 \times 100}{B1}$$

B1 is the light reflectance value (LRV) of the light area;
B2 is the light reflectance value (LRV) of the darker area.

The greater the difference in brightness levels, the greater the contrast. Light meters may be used to measure the luminance reflected from the surface of one object to another.

Use noticeably different colours, side-by-side, to distinguish key elements in kitchens and the built environment. Colours considered to provide good colour contrast are:

- Black/white
- Yellow/black
- Dark brown/white or cream
- Dark blue/white
- Dark purple/white
- Orange/white
- Dark red/white
- Yellow/green
- Dark grey/white
- Dark green/White

Colours considered to have poor luminance contrast are:

- Yellow/grey
- Light grey/white
- Yellow/white
- Blue/red
- Light blue/white

Colour combinations to avoid, as they are particularly difficult for those with colour blindness to discern:

- Red/green
- Blue/green

4. Texture

Regardless of the amount of vision or hearing loss a person with deafblindness may experience, the sense of touch is an important means of obtaining information and orientation clues about the environment. The sense of touch often becomes the verifying means by which individuals who are deafblind navigate their environment. The consistent use of different textures on walls and floors in addition to the use of tactile symbols may create a system of orientation clues.

Textures maybe used to symbolize spaces within a home. When considering the use of tactile/texture clues and landmarks, attention should be given to providing enough differences between the textures such as size and shape of the clues or landmarks. Some textures are easier to recognize than others. Sand paper is rough and requires a simple touch and does not require much movement of the hand to identify; as does a corduroy material or a piece of fur. Other types of textures may require additional tactile exploration to distinguish what it is. Select materials that are easily identifiable by touch and have a high colour contrast from the surrounding surfaces.

The consistent use of different floor textures has traditionally been used to assist individuals with vision loss and individuals with deafblindness to orient themselves to a space. Flooring materials, providing differing textures adjacent to each other; such as vinyl, wood, ceramic tiles or cork may assist with defining spaces. As an example, cork floors and wood floors will provide a softer feel under the foot, then say a ceramic or vinyl flooring material. One application of this concept is to carpet all of the bedrooms, provide wood flooring in the hallway, dining and living spaces and ceramic tiles in the bathrooms and kitchens. It is important to note the use of multiple ground/floor surfaces (more than 3) may be difficult for individuals to remember the significance of each texture.

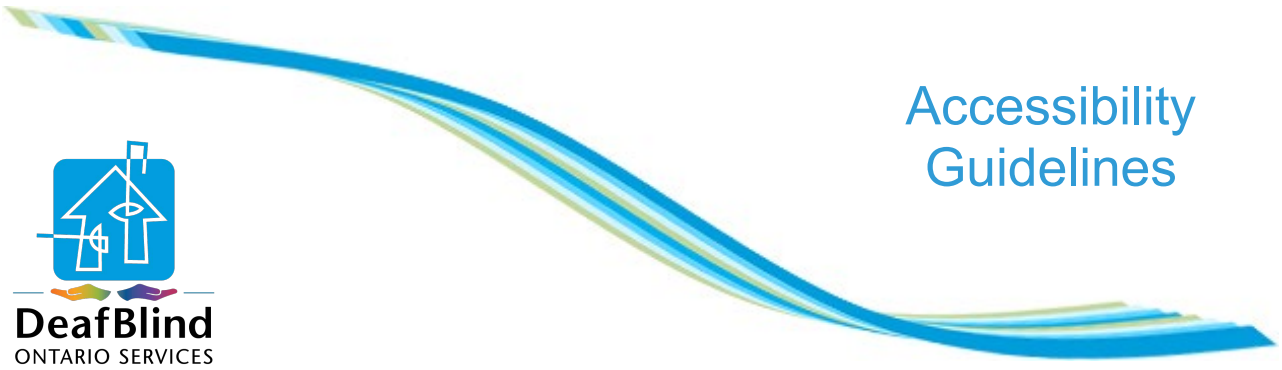
The use of textures should be consistent throughout a space to provide context for “mental mapping” of the space. The use of varying wall surface textures may also assist with orientation and identifying individual rooms, wall tiles with an assortment of textures positioned in different patterns or textured wall treatment and wall plates may be used. Railings on walls should be limited for orientation purposes as all spaces will seem the same if railings are used throughout the home. Consider installing one railing in a hallway for orientation purposes and support. Devises that create a unique vibration at a doorway either on the floor or beside the door may be explored to assist with identify spaces.

5. Acoustics

Generally, a space that is acoustically alive may assist a person with their orientation; however an abundance of sound may be problematic particularly for a person with a hearing loss. The use of sound may provide useful information about a space such as how large a space is, where objects are located and the location of openings within a space. The use of reflected sound may be useful for orientation purposes and is known as echolocation. Echolocation is achieved be creating a sound such as snapping the fingers or

tapping of the cane, for example. When the sound is reflected from an object, a person may hear the differences of the sound reflected from an object with a hard surface such as glass or concrete, to reflected sounds produced from materials such as carpets or cork.

The use of carpets, curtains and ceiling tiles may be used to absorb and dampen sound. Double pane glass may assist with dampening outside sound form entering the home. Sound masking devices may be used to effectively reduce unwanted sounds. The key is to create a good balance of sound absorption materials and materials that reflect sound so that individuals who have the ability may use the sound to interpret the space.



Accessibility Guidelines

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Accessible Design Guidelines

Illumination

Illumination contributes greatly to the ambience and aesthetics of homes. In addition, the right amount of illumination should enhance visibility and increase safety and security within, and around, the home. Appropriate lighting is extremely important from an inclusive design perspective. Proper illumination and type of lighting may enhance independence within the home, e.g., ability to navigate in the home safely.

Exterior Spaces

Illumination should be provided to enhance visibility and orientation. In addition illumination will increase security/safety around the building and driveway. Illumination may also be used to create an atmosphere and highlight architectural features. Areas to consider applying illumination are along exterior paths of travel, parking areas, porches, decks, gazebos, exterior stairs, ramps and along the sides of the homes.

Energy-efficient options such as solar lighting, motion activators and timers are wise choices these days when considering energy consumption and economics. Overall consideration should be given to lighting that is adjustable, adaptable and sustainable.

Lighting should be glare free with little light reflection produced from the ground and surrounding surfaces. Lighting should be distributed evenly throughout outdoor spaces. The minimum lighting levels for outdoor paths, spaces and stairs/ramps should be 100 lux when measured at ground level.

Exterior motion detection lights, for security purposes, should be considered for paths of travel such as stairs, ramps, parking areas and along the sides of homes.

Supplementary lighting and accent lighting may assist in drawing attention to the landscape design and may be incorporated into the site. Care should be taken to ensure the supplemental light does not spill onto the exterior paths of travel creating uneven light levels or glare.

Living Rooms and Dining Rooms

Illumination levels in the living and dining rooms should be evenly dispersed at a minimum of 200 lux. Ideally, illumination should be available at a high level to enable light levels to be adjusted (dimmer switches) for those who may want brighter lighting. For maximum safety, lighting should be at a bright level and consistent through out a space, so as not to create shadows or dark areas. Lighting systems that sense when a

person has entered a room, and when a room is not occupied, are responsible options in illumination and energy control.

When table lamps or stand lamps are provided in living and dining areas, the lamps should be sturdy and of the touch variety to enable those with limited dexterity to turn lights on and off with a closed fist. Table and floor lights can enhance lighting levels at reading areas and writing surfaces. Consider lighting that reflects light up towards the ceilings and walls to diffuse the light in addition to recessed lighting to illuminate the corners of rooms. Ensure the lighting is reflected off walls or ceilings to disperse and diffuse the light.

Consider including numerous electrical outlets, that are distributed throughout a space. Additional electrical outlets will minimize the chances of tripping over cables and extension cords.

Kitchens

When designing kitchen spaces, indirect lighting should be considered. Indirect lighting may be accomplished by reflecting light off ceilings, walls or the under sides of cabinets. Indirect lighting mitigates glare and assists in creating very even, pleasant light throughout a space.

There are many different types of lighting designs to accomplish a diffused effect. Suspended indirect fixtures may also provide even, diffused lighting. The suspended fixtures are hung from ceilings and are designed with reflectors that provide a spread of light that washes the ceiling evenly. When selecting indirect lighting, ensure the fixtures, are designed to be capable of deflecting light onto the ceilings or walls.

Task lighting should be provided in areas where food preparation occurs, e.g., counter spaces. This may be accomplished by either mounting lights under cabinets or suspending fixtures from ceilings When there are no cabinets available, suspending lights from the ceiling may be considered to provide task lighting

Light-emitting diodes (LED) lights emits an energy efficient source of lighting that is also a clean, sparkling light. LEDs provide bright, focused points of light and little heat which make LEDs are ideal for illuminating objects. LEDs light up instantly, may easily be dimmed, operate silently and require only a low-voltage power supply. By combining indirect lighting with task lighting, flexibility is provided to respond to specific light needs for individuals who require more localized lighting. Overall kitchen lighting should be a minimum of 300 lux when measured from the floor and a minimum of 500 lux for task areas such as countertops and oven spaces. In addition, LED lighting is recommended to be installed along toe kick plates, to light the floor surface areas along the bases of cabinets. The light will assist in defining the floor space. Toe kick plate lighting should be a minimum of 100 lux.

Consideration should be given to installing LED lighting in shelf spaces, as this will assist people to see into the shelf space.

Where possible, all light fixtures should be controlled with dimmer switches/controls that will enable the level of light to be adjusted to suit individual needs, as they arise. High-wattage light bulbs should be used to provide a range of light levels.

Bathrooms

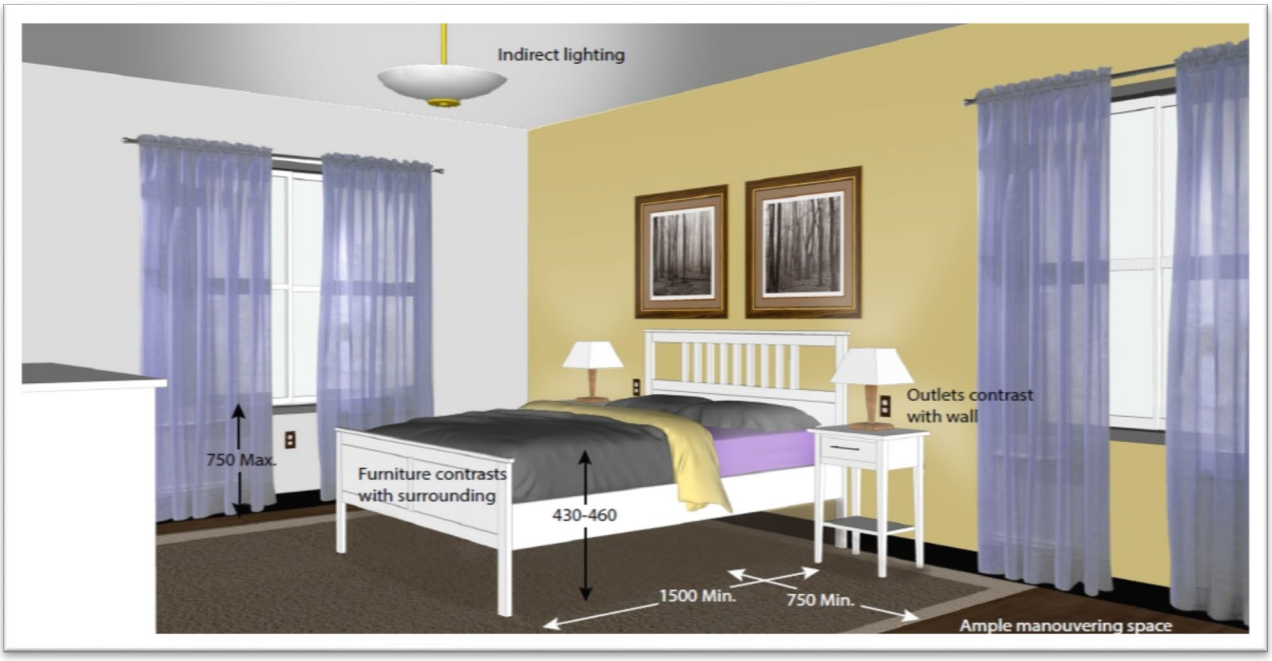
Providing a range of different lighting levels, is one way of creating relaxing, spa-like atmospheres in bathrooms, and is an inclusive design approach. Providing occupation detection, activating lights will assist those who may be unable to locate or activate light switches.

Minimum light levels of 200 lux measured at the floor should be provided evenly throughout bathrooms. Adjustable, directed task lighting allows for extra illumination in key areas of bathrooms such as showers and vanities. Vanities should have a minimum of 300 lux measured at the counter.

Uniform/diffused lighting such as fluorescent lighting, when encased and directed to the walls or ceilings, offers an effective means of diffusing light and reducing glare.

Bedrooms

The overall level of illumination in bedrooms should provide a minimum of 200 lux. Ideally, illumination should be available at the brightest levels so that the light levels may be adjusted (dimmer switches) to suit an individual's preference. Consideration should be given to include occupant sensors that activate the light sources upon entry into bedrooms.



When table lamps or standard lamps are provided in bedrooms, the lamps should be sturdy, and of the touch variety, to enable those with limited reach or dexterity to turn the lights on or off with a closed fist. Task lighting should be provided at desks and provide a minimum of 500 lux.

Illumination should be provided inside all closets. An electrical outlet should be provided on the inside of the closet, close to the door. The illumination level in the closet should be a minimum of 100 lux.

Wall finishes, ceilings and flooring material should not produce any glare from artificial illumination or natural light.

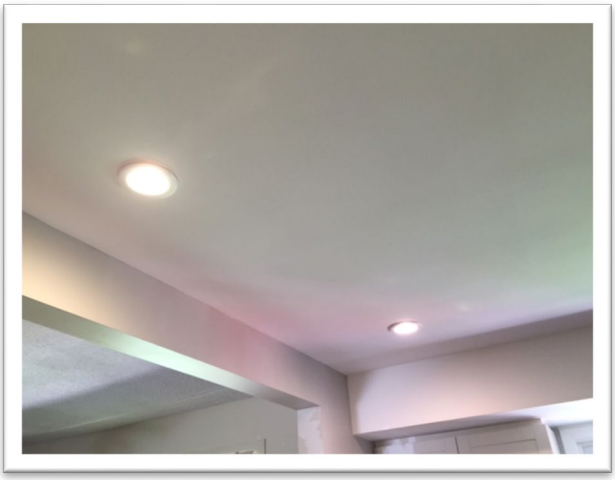
Laundry Rooms

Lighting levels in laundry rooms should be a minimum of 200 lux measured at the floor. Lighting levels at the countertops and ironing boards should be 300 lux measured from the counter tops. The lighting provided should be indirect and diffused light.

The light controls should be located on the latch sides of doors. Ideally, laundry room lights should be controlled by occupant sensors. Occupant sensors consider a person entering the room carrying a laundry basket.

Diffused Lighting

Recessed task lighting used over counters



Exterior Spaces

Outdoor spaces are increasingly becoming extensions of interior spaces of homes. As such, inclusive design plays an important role in the design of exterior spaces; e.g., landscaping, play spaces, gardens, eating and cooking areas, and elevated spaces.

When designing exterior spaces to be more inclusive, several design elements should be taken into consideration:

- Manoeuvring space for mobility aids
- Minimal effort
- Safety
- Protection from the elements
- Paths of travel
- Landscaping

Design elements to consider for exterior spaces:

- Walkways
- Stairs
- Railings
- Illumination
- Gardens
- Porches and Gazebos
- Entrance doors
- Ramps
- Seating
- Driveways & Parking
- Porches
- Electrical outlets
- Benches/picnic tables

Entrance Doors

Entrance doors should provide a minimum clear width of 900 mm. Entrance doors leading from decks, porches or patios should provide level thresholds: a vertical change in level of less than 6 mm should be beveled when the threshold is between 6 mm and 13 mm. Doors should include hardware that is mounted 900 mm - 1100 mm from the flooring. Hardware should be operable with a closed fist and not require grasping, pinching or twisting of the wrist and a force to pull or push a door of not more than 38 N., for exterior swinging doors D-shaped’”-shaped, lever-style handles are push plate/ door pull handles are preferred. Some handles such as knob handles, and thumb-latch handles can be challenging to use and may catch on clothing or bags.

Fully glazed doors, frameless glass doors and sidelights must include, continual (full width) tonal contrasting strips at least 50 mm high, mounted at a height of 1350 mm - 1500 mm above the finished floors. The strips may incorporate logos or symbols.

Seating

When seating is provided, different options should be given. Seating should be provided along the paths of travel, set back from the main paths of travel. The ground surface surrounding the seating areas should be provide a different texture from the main path of travel. Furniture should be free of hazards such as sharp edges and splinters. Edges should be rounded, and the seating should colour contrast with the surrounding surfaces. Seating areas should provide a clear space beside the seat/bench of at least 850 mm -1200 mm for a mobility device, service animal, walker etc. adjacent to the seat/bench. The clear ground space should be level and firm.

Consideration should be given to including benches and seating that may accommodate two people sitting side-by-side (one seat for the intervenor and one for the person who is deafblind). Seating provided by benches, should be at a height of 450 mm to 500 mm above the surrounding ground surface and be 380 mm - 510 mm deep. Back rests should be provided on at least 50% of benches/chairs. Arm rests should be provided on the benches or seats. Consideration should be given to provide benches/seating with no am rest beside the space allocated for mobility devices to allow a person to transfer onto the seat/bench from a mobility device.

Picnic benches when provided should be adjacent to accessible routes and be located on level and firm surfaces that extend at least 2000 mm on all sides of the picnic table. Picnic tables should be accessible for those using wheelchairs. Knee clearances under the tables should be at least 750 mm wide x 480 mm deep x a minimum of 680 mm high.

Shade umbrellas, overhanging or protruding objects such as hanging baskets, heaters and other related items, should not be located and/or interfere with accessible routes of travel.

Landscaping

Landscaping is not only decorative; it may be used to effectively assist those with vision loss with their orientation.

Thorny plants, plants with large seed pods, or fruit-bearing trees overhanging the paths of travel may interfere with accessibility in such a way that the leaves, berries or pods may cause a potential slipping/tripping hazard. Consideration should be given to the location of these types of plants within the gardens.

Low landscaping may be considered to shelter/hide amenities that must be provided by law, e.g., landscaping may act as a buffer between pedestrians and fire hydrants, gas meters, fire hoses and gas standpipes while still allowing maintenance and safety personnel easy access to the items.

Raised flower beds are a point of interest in gardens and will make flower beds accessible for those using mobility devices and have difficulty reaching the ground level. Raised gardens should be 800 mm high and clear paths of travel surrounding the flower beds should be provided.

To accommodate service animals, such as guide dogs, areas should be designated as service animal relief areas. Relief areas should include grass or pea stone; waste receptacles should be provided. Appropriate signage should be provided to direct users to the relief area.

Trees, such as oak, retain their leaves in the winter and may provide a good orientation clue when the wind blows through the leaves and will assist people with vision loss. Wind chime and running fountains may serve as good sound localizers and should be considered for gardens, and decks to assist with orientation to the space.

Exterior Paths of Travel

All pedestrian paths of travel should provide secure, even, slip-resistant surfaces with non-glare finishes. Contrasting colours and use of textures should be used to distinguish different walkways and paths of travel. The perimeter of pathways should incorporate colour-contrasting material to assist in defining the edges of sidewalks, e.g., concrete sidewalks with dark perimeters or black asphalt driveways with grey concrete perimeters.

Material such as asphalt, concrete, textured concrete and brick pavers are texturally distinct from one another. Consider designing gardens that incorporate a circuit of pathways that bring you back to the starting point. Pathways should be straight, as those that wander and curve are difficult for those with vision loss to effectively use, e.g., define walkways and distinguish different walkways.

Paths of travel should provide a minimum width of 1500 mm. Objects along accessible routes of travel should not protrude more than 100 mm unless they are cane detectable at a height of 680 mm from the ground surfaces. Awnings, overhead canopies, guy wires and tree branches should not obstruct any parts of the accessible paths. Clear headroom, along accessible routes, should not be less than 2100 mm.

The slopes of exterior paths of travel should not exceed 1:20 (5%). The cross slopes of exterior paths of travel should not exceed 1:20. During the winter, consideration should be given to using sand instead of salt on paths, ramps and stairs, as salt may be harmful to the paws of service animals.

Consideration should be given to installing heating units for ramps and stairs to melt snow and ice. The full width of stairs and ramps should be cleared of ice and snow. Adequate drainage should be provided on accessible routes of travel. When grating is used, the grating spaces should not be greater than 13 mm wide in one direction and be placed so that the long dimensions are perpendicular to the dominant directions of travel.

Material and Finishes for Paths of Travel

Several materials and finishes are available for decks, pathways, patios and walkways. Aesthetics and personal preferences will determine the material used for exterior spaces. Ideally, surfaces should be smooth and easy to traverse for people using mobility aids. Cobblestones and exposed aggregate paving may be difficult to traverse at times due to the tendency of cobble stone to heave over time.

The chart below contains characteristics of available material in relation to usability. These characteristics should be kept in mind when selecting material for exterior ground surfaces.

Asphalt	
Pros	**Cons**
• Slip resistant • Smooth and hard; good for mobility aids • Easy to maintain • Good for patios, walkways, pathways, gazebo floors	• May become rough with time • May break over time, especially over roots of trees • Proper drainage required to prevent water from pooling • Sealants may be required over time

Interlocking Stones	
Pros	**Cons**
• Variety of textures • Variety of colours • Good for patios, walkways, pathways gazebo floors • Aesthetically appealing	• May be slippery when wet • May provide firm, bumpy surfaces (depends if edges are bevelled) • Stones need to be properly installed to ensure level surfaces • Hard • Periodic lifting of stones with freezing and thawing resulting in potential tripping hazard

Paving Slabs	
Pros	**Cons**
• Smooth; ideal for mobility aids • Variety of colours • Suitable for patios, walkways, pathways and gazebo floors • Easy to maintain and clean	• Slippery when wet • Tripping edges, due to movement over time

Poured Concrete	
Pros	**Cons**

• Not slippery when wet provided surfaces are brush finished or stamped with a texture • Very smooth; ideal for mobility aids • Suitable for patios, walkways, pathways, porches and gazebo floors	• More expensive and difficult to maintain than individual paving slabs • Mainly white/grey although concrete may be coloured with chemical finishes • Subject to cracking

Rubberized Surfaces	
Pros	**Cons**
• Slip resistant when surfaces are textured • Available in smooth and textured material • Smooth and level • Excellent resilience • Easy to clean • Comes in a variety of colours • Easy to maintain	• May be expensive • Staining may occur • Smooth textures may cause slipping • Grease spills may create slipping problems • May instigate environmental allergies

Cedar and Pressure - Treated Woods	
Pros	**Cons**
• Provides some resilience • Slip resistant when dry • Firm but bumpy surface. • May be stained in a variety of colours • Easy to maintain • Suitable for decks, porches and gazebo floors	• Slippery when wet • Deteriorate with time and exposure • May break under pressure

Woodchips	
Pros	**Cons**
• Slip resistant when dry • Uneven surface difficult for those with mobility aids to utilize	• Requires ongoing maintenance to ensure ruts are filled, and surfaces are well covered

• Available in a variety of colours • Resilient, good for those prone to falling • May be used for pathways and floors	• Weeding may be required • Surfaces need to be replaced • Difficult to move mobility aids over

Wood Composite and Engineered Decking	
Pros	**Cons**
• Most manufactured decking is slip resistant dry or wet • Looks and feels like wood • Firm surface but bumpy • Resilient, easy to maintain • Variety of colours • Suitable for walkways, decks, porches	• Low tolerance to vibration • Bumpy • May be expensive

If exterior paths or walkways have sloped surfaces of greater than 1:20, they are considered to be a ramp. Ramps should include:

- Minimum widths of 1100 mm
- Slopes no steeper than 1:15 (6.67%)
- Cross slopes no greater than 1:50 mm
- Handrails on either side with a clear width of 1100 mm between handrails
- Handrails provide a high colour contrast with surrounding surfaces
- Handrails that are circular and not less than 30 mm and not more than 40 mm wide
- Clearances of at least 50 mm between the railings and walls
- Handrails at least 865 mm to 965 mm in height, measured vertically from the tops of the rails to the ramp surfaces
- Handrails that extend horizontally not less than 300 mm beyond the tops and bottoms of the ramps
- Horizontal rail extensions that return to the posts, floors or walls

- 50 mm colour-contrasting strips applied at the tops and the bottoms of ramps, running across the full width of the ramp
- Gates mounted at the tops of ramps leading from decks and porches

This is an example of an accessible ramp. Plants provide good colour contrast with their surroundings

Exterior Stairs

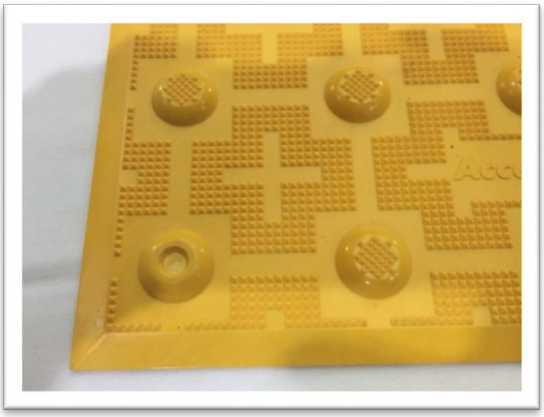
When designing exterior spaces such as verandas, decks or raised elevations, consider an inclusive design approach by including ramps or sloped surfaces rather than stairs. Often handrails and stairs may diminish the style of the gardens and landscaping. Should you wish to include stairs in exterior spaces, accessible routes such as ramps or sloped surfaces should be included.

- Rises and Runs of Stairs
  - A rise of treads not less than 125 mm and no more than 175 mm should be provided
  - Treads should have a run not less than 280 mm and not more than 355 mm between steps
  - Stairs should have uniform treads and risers
- Nosing:
  - Should project not more than 38 mm
  - Have no abrupt undersides
  - Have a radius of curvature, at the leading edges of the treads, of not more than 13 mm

- Include 50 mm horizontal colour-contrasting strips that extend across the full widths of the tread

- Handrails should:
  - Be provided on both sides of the stairs
  - Be mounted not less than 865 mm and not more than 965 mm high
  - Be continuous on the inside edges of stairs
  - Have circular cross sections of 30 mm to 40 mm and at least 50 mm clearance from walls
  - Return to the walls, and not obstruct pedestrian travel
  - Extend at least 300 mm parallel to floor surfaces at the tops and bottoms, continue to slope for a distance equal to the depth of one tread at the bottom and then extend at least 300 mm parallel to the floor surface
  - Colour contrast with surrounding surfaces
- Tactile Walking Surface Indicators (TWSIs) should:
  - Be included at the tops of all exterior stairs and extend the full width of the stairs
  - Extend the full width of the steps and have a depth of 610 mm commencing one tread step back from the edge of the top step
  - Colour contrast with the surrounding surfaces

Examples of Tactile Walking Surface Indicators.



Verandas, Decks and Raised Elevations

Verandas, decks and surfaces with raised elevations should include railings along the perimeter of the spaces. Where stairs or ramps lead from a raised elevation, gates should be provided on the upper deck/porch.

The placement of railings should take into consideration the viewing characteristics of people who may be seated, to enhance visibility for everyone, in particular people with a vision loss.

Driveways

Driveways should have surfaces that are even and stable. The slopes of driveways have a maximum slope of 1:50 with maximum cross slopes of 1:50. Consideration should be given to ensure enough space is provided for access aisles beside parking spaces. Parking spaces should be a minimum width of 3400 mm. The access aisles should lead to the accessible routes/pathways to the homes. Access aisles should be 1500 mm wide and extend the full length of parking spaces. The access aisles should be identified with high tonal contrasting diagonal lines.

Accessible paths of travel should be provided beside the driveways from the street that provide adequate space for people using mobility devices. Pathways adjacent and combined with the driveway should be defined with barriers such as railings, planters or bollards.

The address identification number of the house should be provided at the street level. The address numbers should colour contrast with the background and should be provided in a tactile format.

Electrical Outlets, Switches and other Operating Mechanisms

Controls should:

- Be easy and intuitive to use
- Not require grasping, twisting of the wrist or fine motor movements
- Be clearly visible and located within the reach of individuals who may be standing or in a seated position

Pathways to the controls should be clear of obstructions. Controls should be 400 mm - 1200 mm from the ground.

Living Rooms and Dining Rooms

Living rooms and dining rooms are places to relax and feel comfortable. Open concept floor plans with fewer hallways, and rooms that flow into one another, are more accessible than plans with smaller rooms.

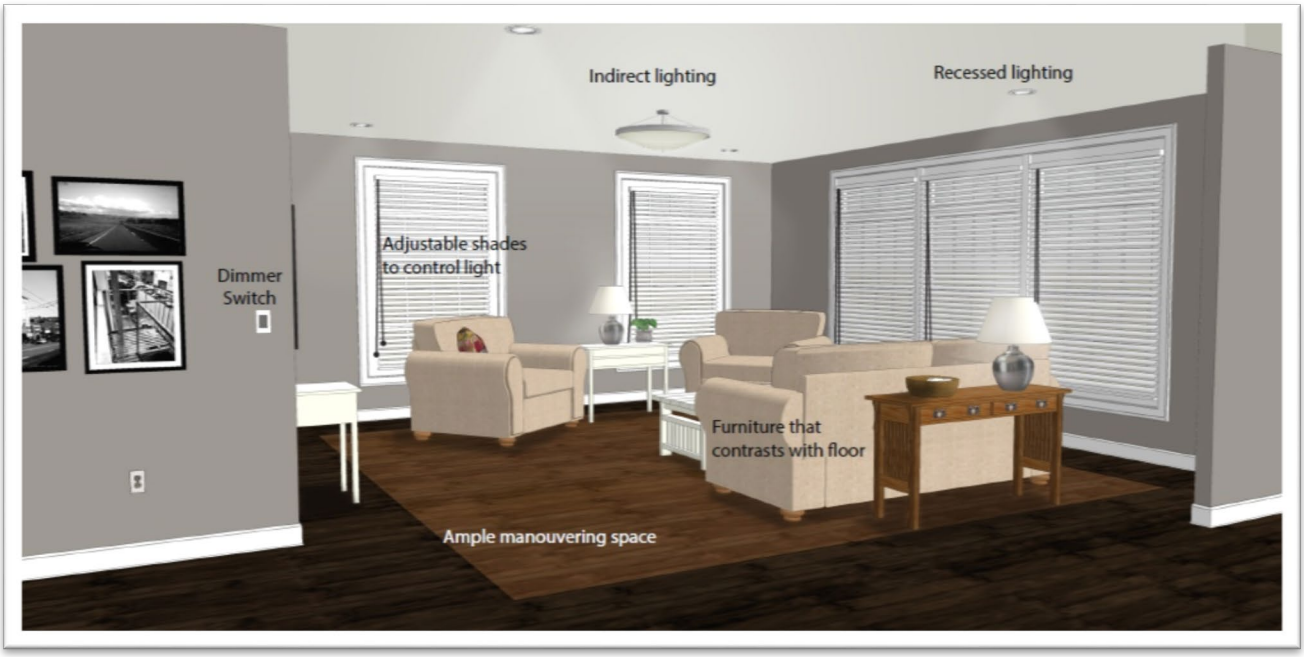
When designing living rooms from an inclusive design perspective, it is a good idea to consider:

- Space manoeuvrability
- Use of colour
- Placement of furniture
- Illumination
- Sight lines

Continuous, accessible paths of at least 915 mm wide should be provided throughout living spaces. People with vision loss and limited mobility need clear spaces to navigate a room easily. The paths should provide access to all of the furniture, switches, controls and storage. Large open spaces may be divided into smaller groupings for special use areas.

Colour/Luminance Contrast

When it comes to living spaces, the use of colour for furniture should be considered. Select furniture with bright, bold colours such as orange, red and yellow (these colours are easier to see and identify). The furniture selected should contrast with the surrounding walls.



Walls should colour contrast with furniture, baseboards should colour contrast with walls, and baseboard colours should define the perimeter of the floors from the walls. An example would be light-coloured floors with dark-coloured baseboards.

The walls and ceilings should provide low gloss surfaces. Highly-polished surfaces should be avoided.

Furniture

Furniture should be sturdy, stable and provide good support. Seating should have firm cushions or padding and stable arm rests. Seats should be 450 mm to 500 mm in height.

Furniture that is height adjustable may be customized to suit individual needs.

Two-person couches and love seats should be considered to accommodate those who may wish to use an interpreter or intervenor.

The dining room table should be rectangular or square shape. The straight lines of the table will assist people with vision loss in orienting themselves to the table and space around the table. The ding room chairs should be sturdy and colour contrast with the floor. A dark dining table will assist in providing good colour contrast when white plates are used. Adequate space should be provided around the dining room table/chairs, taking into consideration the space requirements of people sitting at the dining table and people passing behind a person in a seated position.

Windows and Window Treatments

Windows are a great way to bring natural light into the living and dining spaces. The windows should be large enough to bring in the light and fresh air. Window treatments should be provided to control the amount of natural light entering the room. Too much sun light may wash out a room and make it difficult to see items. Windows that are intended for viewing should have sills no higher than 750 mm above the finished floor. The window openers should have opening and locking mechanisms that are 400 mm - 1200 mm from the finished floors. Clear spaces in front of window controls should be provided.

Sliding windows are a good choice, as sliding windows are usually easy to reach and open. Double-hung windows often require fine motor skills and the use of two hands to open. Remote control windows are another great option.

Drape/blind controls, locks and cords are easier to see when they colour contrast with the surrounding surfaces.

Acoustics

Acoustics may help or hinder the ability to hear the phone, the doorbell or people speaking. A quiet environment assists those with hearing loss. Rooms that are acoustically alive and the use of hard surfaces and furniture that is not upholstered may

create noisy backgrounds and reflect sounds more readily. The use of soft elements such as curtains, upholstered furniture, carpets and ceiling tiles may improve the acoustic quality of the spaces by absorbing sound.

Flooring material that may assist in dampening sound:

- Carpet
- Cork
- Rubber

It is also important not to dampen ambient sound completely, as sound clues may assist those with vision loss with their orientation.

Other design items to consider:

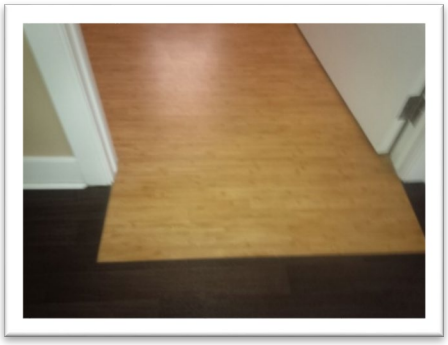
- Minimizing background noise from mechanical equipment by selecting quieter products.
- Using sound dampening installation methods.
- Sound proofing walls and ceilings.
- Placing exterior equipment that is noisy away from windows and doors.

Walls

Along paths of travel within homes, it is best to avoid abrasive wall finishes such as brick, textured concrete or profiled wood, people with vision loss may trail walls with their hands and these surfaces are considered abrasive to trail along with the hands. In addition, finishes that require minimal maintenance, such a vinyl wall covering, is preferred. Kick plates and corner guards along hallways will help to minimize potential damage from mobility devices.

Flooring

Area carpets that colour contrast with the floor may help define spaces and provide orientation clues for individuals with vision loss. Use of different colour and /or texture of flooring may define different rooms.



The colour and textural contrast of the flooring extending beyond the doorways, indicates a room

Area carpets should be securely fastened to the floor with nails or tape to prevent or slipping. Carpets should have a low pile, low V.O.Cs. Avoid thick, fluffy carpets.

The flooring material in the living and dining areas should be smooth, slip resistant and easy to roll on. Consider matte finishes in wood, tile, stone or cork to reduce glare.

Electrical outlets

The electrical outlets, light switches and thermostats should colour contrast with the wall surfaces. Thermostats should have raised, easy-to-read numbers. Controls with audible clicks may be helpful.

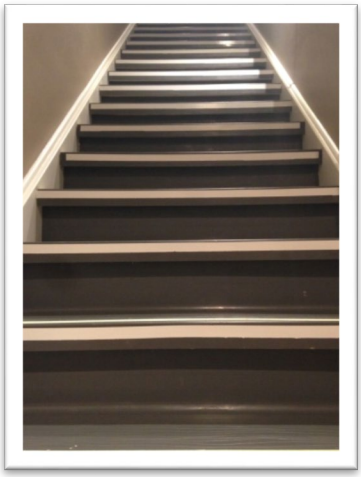
The electrical switches, outlets, and thermostats should be no lower than 400 mm and no higher than 1200 mm, where there are no obstructions in front of the device.

Interior Stairs

Stairs in a home should provide:

- Uniform risers and tread depths (the tread is the place you place your foot and runs horizontally to the floor and the riser runs perpendicular to the floor)

- Risers not more than 175 mm high
- Treads not less than 280 mm deep, measured from the riser to the nosing
- Closed risers
- A minimum illumination level of 200 lux measured at all treads



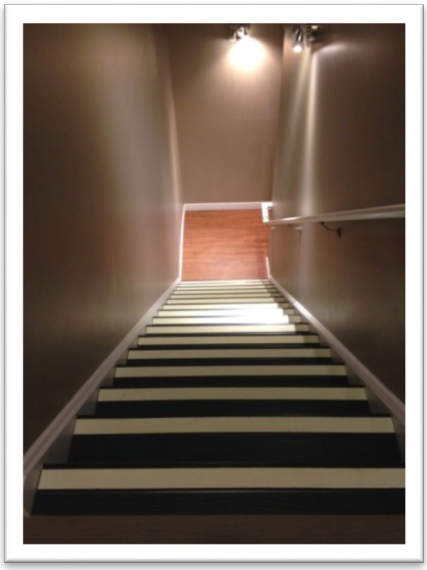
In addition, there should also be two 50 mm horizontal strips located along the full width of the edge of each tread and at the top of each riser on the nosing, the two strips may be combined into one (the nosing is the part of the step that over hangs the step below). The strips should colour contrast with the tread and be slip resistant. Ideally treads should be a dark colour and the 50 mm strips should be a light colour.

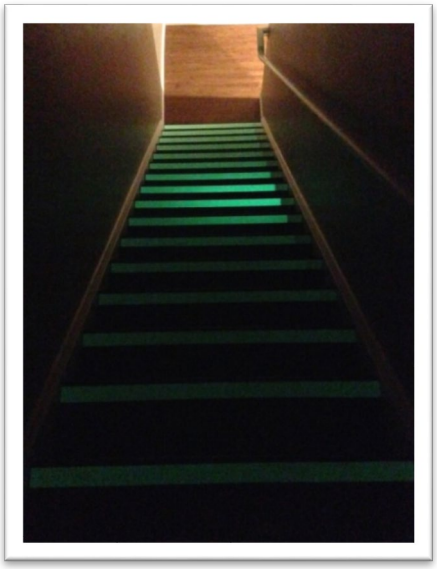
The stringers (the surface on the wall beside the edge of each of the steps to the left and right) should be a light colour when used in combination with a dark tread.

The nosing on each step should:

- Project no more than 38 mm
- Have no abrupt undersides(the foot may catch on the abrupt undersides)
- Be slip resistant

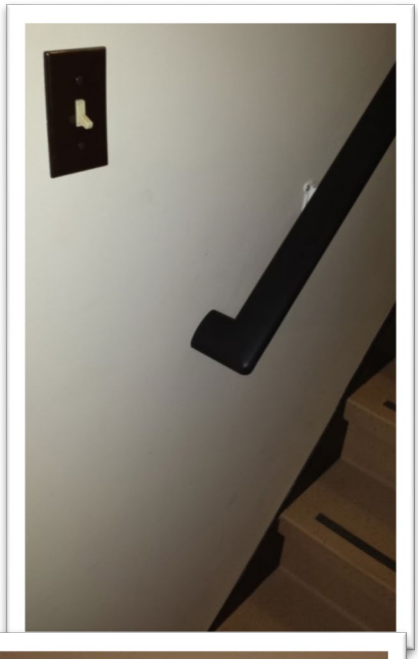
Tactile attention indicators could be used at the tops of stairs commencing one tread step back from the edge of the stair, extend the full width of the steps and have a length of 610 mm.

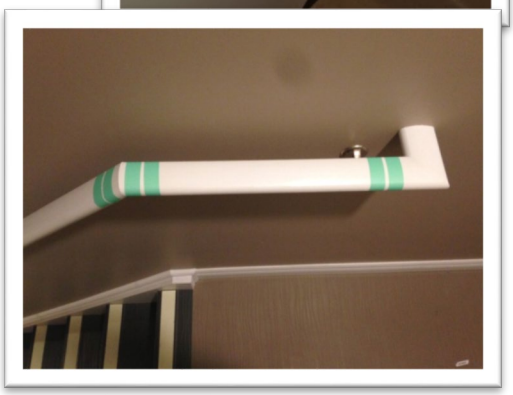




Glow-in-the-dark strips on stairs

Handrails should be provided for stairs with the following:





- Be installed on both sides of the stairs
- Be of uniform height from 860 to 920 mm measured vertically from the leading edge of the tread
- Be continuous around landings less than 2100 mm in length
- Be circular with an outside diameter of 30 to 40 mm
- Located between 35 mm and 45 mm from a smooth wall surface
- Colour contrast with the surrounding wall surface
- Have a continuous gripping surface
- The railings should return to the wall, post or floor
- Should extend at the top of the stairs 300 mm parallel to the floor surface. At the bottom of the stairs, the railings should continue to slope one tread and extend at least 300 mm parallel to the floor surface. These handrail extensions provide support and orientation for people using stairs. The extensions may be turned sideways so they do not protrude into the line of travel

Kitchens

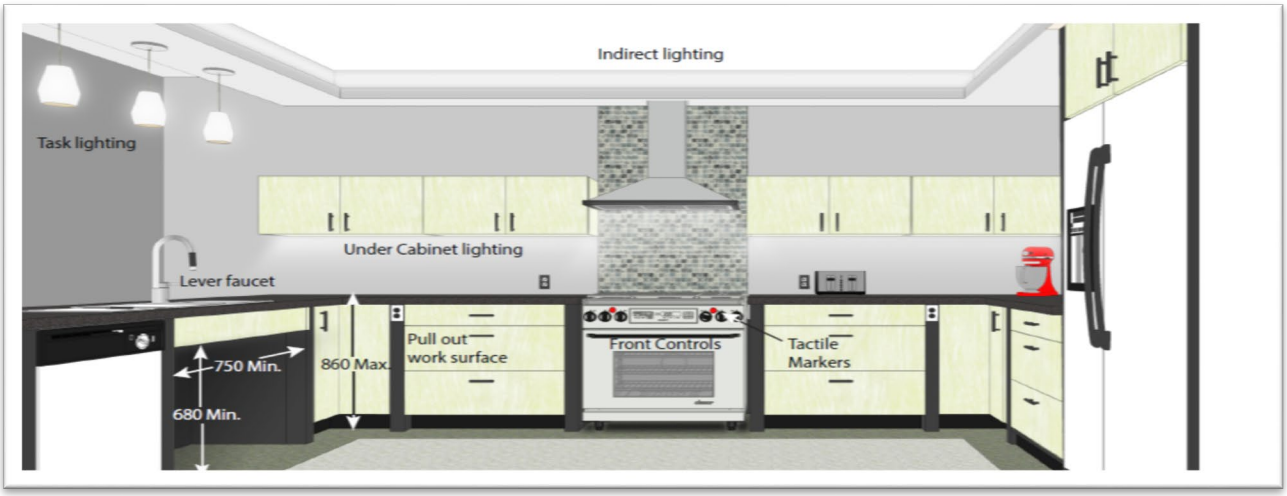
Universally-designed kitchens are comfortable and safe for everyone. They assist those with different abilities to be independent. Inclusive kitchens take into consideration all the design elements of kitchens.

When designing inclusive kitchens, there are several things to keep in mind:

- Efficient design
- Manoeuvring space for mobility devices
- Minimal effort of use
- Ease of cleaning
- Illumination

- Safety

Entrances to kitchens should provide minimum openings of 900 mm to consider the needs of those with mobility aids. Kitchen entrances without entrance doors are preferable. Kitchens should be near the main entrances, close to the dining areas and in locations that are convenient for garbage removal. When doors are provided at kitchen entrances, the doors and door frames should be colour/ luminance contrasted with the surrounding wall surfaces. When entrances do not have doors, entrance spaces should be defined by 50 mm contrasting borders on either side of the entrance openings.

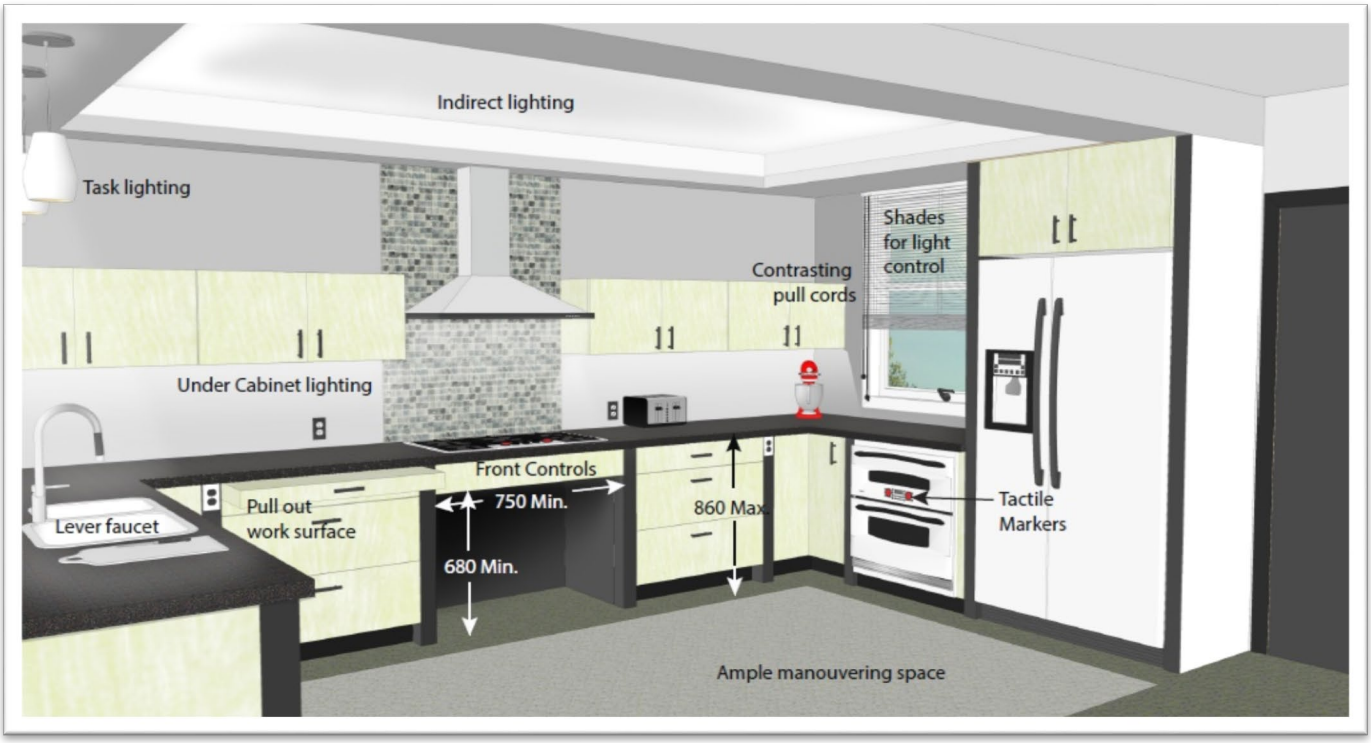


Lighting levels in the kitchen should be a minimum of 300 lux measured from the floor. In addition task lighting should be provided at counters and stoves at a minimum of 500 lux measured from the counter and stove. Consideration should be given to provide toe plate illumination of 100 lux.

Colour/ Luminance Contrast

The use of colour/luminance contrast in the built environment may effectively be used for many purposes. Colour may be used to identify door openings, to draw attention to light switches, define spaces, define routes and assist with identifying potential hazards in the environment.

When designing kitchens, colour schemes need to be taken into consideration from the onset. Well thought out colour schemes in kitchens will assist with defining the features and enhancing the ability of those with low vision to understand and discern the features in kitchen environments.



The following colour scheme is preferred for those with vision loss: Light-coloured flooring assists by opening the spaces. Some people with vision loss and/or cognitive disabilities perceive dark-coloured material on floors as drop offs or irregularities in the flooring.

Light-colored flooring schemes could be cream, white, or a light grey with defined perimeters of colour contrasting material such as base board a minimum of 100 mm wide when combined with light-coloured walls.

Cabinetry should be dark in colour combined with light-coloured drawers and cabinet pulls, providing contrast with the cabinets. Countertops should be light in colour with dark-coloured backsplashes. The vertical edges on the countertops should be light in colour with wall surfaces that are light in colour. The floor trim should be dark in colour and door trims should be a dark colour.

An alternate colour scheme to consider is dark-coloured flooring, light - coloured cabinets, dark counters, light backsplashes, dark coloured drawer pulls, dark-coloured walls with light coloured outlets on the wall and light coloured trim.

All electrical outlets on the walls should colour contrast with the surrounding wall surfaces.

When dark-coloured countertops are provided, light-coloured sinks should be considered. Appliances should be white to provide contrast against the dark counters and cabinets. Door trim should be dark in colour and contrast with the light-coloured walls.

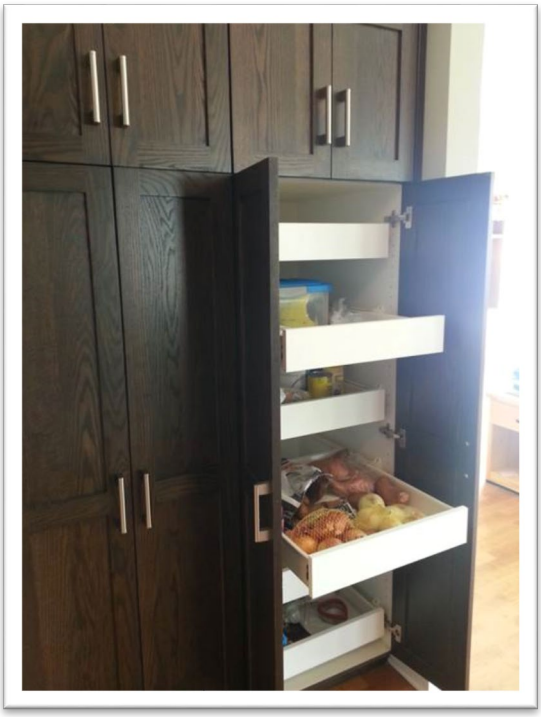
Kitchen furniture should colour contrast with the flooring. Dark kitchen furniture for example will provide sufficient colour contrast against light-coloured flooring and walls.

Appliances

- Refrigerators
    - Side-by–side refrigerators are preferable
    - Roll-out shelves or drawers improves access to the refrigerator contents
    - Through-the-door ice and water dispensers are convenient for many users
- Dishwashers
    - Consider dishwashers with heights that make it easy to load and unload dishes
- Cooktops
    - Operating controls should be located at either the fronts (preferred) or the sides of cooktops to prevent users from having to reach across heated surfaces
    - Surface heights should be located 810 mm - 860 mm from the floors

- Adjacent work surfaces should be provided at least 400 mm wide at the same height as cooktops
- Knee clearances should be centered on Cooktops, at least 750 mm wide x 200 mm deep x 680 mm high, with additional toe clearances at 750 mm wide x 230 mm deep x 230 mm high
- Insulation or other protection is needed on the undersides where knee clearances are provided
- Clear floor areas of at least 750 mm x 1200 mm, which may extend up to 480 mm underneath cooktops, should be provided
- Cooktops with flat ceramic surfaces should not be used for those with vision loss

- Ovens
  - Wall ovens with side-opening doors are preferred
  - Ovens should be self-cleaning
  - Wall ovens should have controls located on the front of oven panels. Controls should be located 400 mm - 1200 mm from the floors
  - Heat-resistant pull-out shelves, under oven doors or beside the latch sides of oven doors, should be considered; they should pull out to at least 250 mm



Cabinets and Storage

Cabinets, drawers and shelves should have at least one shelf not more than 1100 mm from the floor. The interior of the drawers and cupboards should be light in colour to increase visibility into the cabinetry Shelving should be provided above the counters and drawers or pull-out shelves below the counter. “D”- type pulls should be mounted close to the bottom of the upper cabinet doors and near the top of the base cabinet doors. “D”- type pulls should contrast in colour with the surrounding surfaces such as the cabinets and drawers.

Full-extension drawers and shelves provide storage space that is easy to reach and use. “Lazy Susan” trays also provide accessible storage.

All cabinets, drawers and shelves should include braille and raised print with information regarding the contents. The braille and raised print should be consistently placed for ease of use.

Upper-cupboard systems are available that may be electronically raised or lowered; in addition, there are shelving and racking systems that may be installed in existing cupboards which enable the entire racks to be pulled out and down increasing the usability of the upper cupboards for everyone.

Base cabinets should have toe space clearances of a minimum of 150 mm deep x 230 mm high.

Counters

To accommodate people using mobility aids, a kitchen should have at least one counter space that is/has:

- At least 750 mm wide x 600 mm deep
- A height between 730 mm and 860 mm
- A clear floor area of at least 750 mm wide x 480 mm deep x 680 mm high
- No sharp or abrasive surfaces under it

Include electrical outlets that colour contrast with the surrounding surfaces and are located on the sides or fronts of counters.

Pull-out work boards, below the countertop levels, are advisable.

Countertops should be continuous and be linked to the appliances.

Countertop surface material should not produce glare and should be solid in colour.

Rounded or bull-nose edges on counters help to increase safety by eliminating the hazard of sharp corners and assist with items falling off the counter.

Sinks

Sinks should be located with the centerline at least 460 mm from a side wall.

The rim heights of the sinks should be located 810 mm - 860 mm from the floors.

Sinks should have knee clearances centered on the sinks at least 750 mm wide x 200 mm deep x 680 mm high with additional toe spaces of at least 750 mm wide x 230 mm high.

Sinks should colour contrast with countertops. If this is not possible, the edges of the sinks should be defined by colour-contrasting strips.

Sinks should have no sharp or abrasive surfaces underneath and hot water and drain pipes should be offset to the rear and not abut with clear spaces.

Faucets should automatically activate or have handles that are of the lever type. Faucets should have tall gooseneck spouts, and sinks should be deep to allow large pots to be easily washed without having to be turned sideways.

Windows and Window Treatments

When windows are intended for viewing, except when located above counters in kitchens, window sills should be no higher than 750 mm from the flooring; the opening and locking mechanisms of windows should be located within 400 mm - 1200 mm and be operable with one hand without tight grasping, pinching, or twisting of the wrist and with a force not to exceed 22N.

Blinds should be considered for windows in kitchens to enable the amount of light entering the space may be adjusted, when required. Kitchen blinds offering light-filtering options and are made of fabric should be considered, as they may be versatile in style and assist in blocking out unwanted light and glare. At other times, such as when there is no light, blinds provide privacy.

The kitchen window frames should colour contrast with the surrounding wall surfaces as described in the Luminance Contrast section.

Flooring

Kitchen flooring material should provide distinct texture from adjacent flooring material used in the home. Unique texture, when perceived underfoot, will enable people with vision loss to understand that the flooring material denotes kitchen space. When using an open concept design, and when kitchen doors are absent, the distinct flooring material will aid in identifying the transitions into dining/living or hall areas.

Durability, ease of cleaning, non-glare surfaces and the use of a safe, non-slip material are prime considerations when selecting flooring for kitchens. Avoid waxed flooring as it may produce glare. Cork flooring provides a good surface and is resilient, comfortable, easy to wheel on and assists in reducing leg fatigue. Other flooring options include: vinyl, considered to be low maintenance; wood; or ceramic tile, a harder surface that is considered easy to clean and to wheel on. Ensure flooring is level with adjacent areas to avoid any lips or rises when entering or exiting the kitchen spaces. As mentioned, the flooring texture and material may be used to help define kitchen spaces from hall, living and dining areas, assisting with orientation to the surrounding spaces.

Floor mats may be used when they are fixed to the floor; otherwise, floor mats may be considered a slipping or tripping hazard.

There should be clear floor areas of at least 750 mm x 1200 mm for access between items cabinets and appliances etc., to provide spaces for mobility aids.

Switches and Controls

Electrical outlets for kitchen appliances should be strategically located at the front of counters so that they are accessible by those with limited reach or those in a seated position.

Operating controls should be located 400 mm - 1200 mm above finished the floor:

- Electrical outlets
- Switches
- Thermostats
- Fire alarm pulls
- Activation devices
- Window operators and locks
- Faucets

All controls should:

- Be operable with one hand and not require the user to grasp pinch or twist the wrist
- Require tactile and/or auditory information indicating function and position
- Be colour-contrasted with background surfaces

Bathrooms

Bathrooms designed from an inclusive design perspective are comfortable and safe for everyone. Inclusive design assists those with different abilities to be independent.

When designing accessible bathrooms, a number of design elements should be taken into consideration:

- Efficient design
- Manoeuvring space for mobility aids
- Minimal effort of use
- Ease of cleaning
- Illumination
- Safety, such as the slip resistance of floors and grab bars
- Storage
- Use of colour

Design elements of inclusive bathrooms:

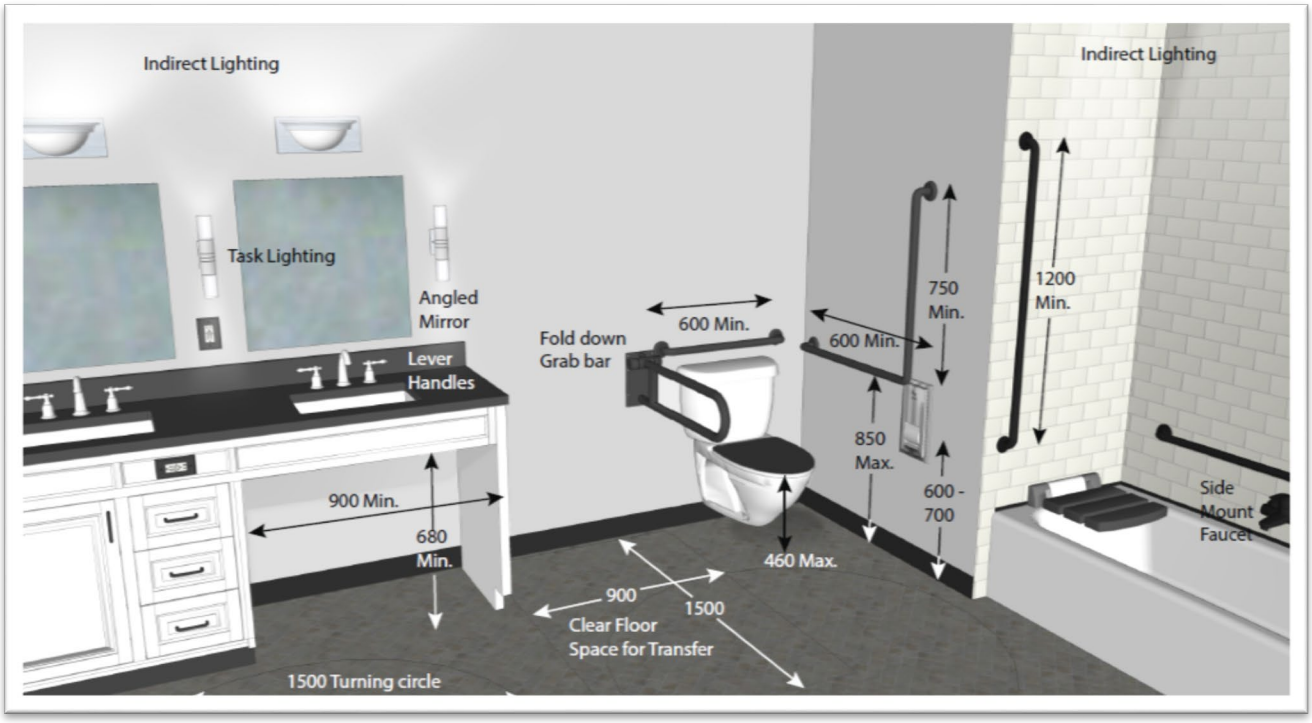
- Illumination
- Flooring material
- Switches and controls
- Doors
- Vanities, drawers and storage
- Grab bars
- Toilets
- Showers
- Bathtubs

Colour/Luminance Contrast

The use of colour contrast should be considered in bathrooms. When dark flooring is used, dark wall surfaces will assist in providing contrast with light-coloured fixtures, outlets, toilets, tubs and showers. Light-coloured baseboards and light-coloured doors and door frames will work well with dark-coloured walls. In addition, light-coloured vanities and light-coloured cupboards with “D” pulls should be considered. “D” pulls should colour contrast with the surrounding surfaces.

Toilets

- Ideally toilet fixtures should be hung from walls. Wall-hung toilets provide additional space at toe level. Floor mounted toilets may be used where appropriate
- Toilets should be mounted 400 mm - 460 mm above flooring. Filler rings and thicker toilet seats are available to adjust the height of a toilet seat if needed
- Transfer spaces should be provided next to the seat at least 900 mm wide by 1500 mm long
- A space of 1500 mm should be provided, measured from the wall behind the toilet (includes the toilet) to the front space of the toilet. The space will be aligned with the transfer space
- Toilets should have back supports when there are no seat lids or tanks
- Toilet seats should colour contrast with the toilet and surrounding surfaces
- The centre lines of toilets should be 460 mm - 480 mm from the walls to ensure grab bars are within reach



- Grab bars should have a diameter of 30 mm - 40 mm and be slip resistant and colour contrast with the wall. The grab bar should have a space 35 mm to 45 mm between the wall and grab bar. The gab bar should not rotate within its fittings
    - The first grab bar should, be “L” shaped and mounted on the wall beside the toilet with 760 mm long horizontal and vertical components mounted to the wall. The horizontal component should be mounted 760 mm - 900 mm above the floor and the vertical component 150 mm in front of the toilet bowls
    - The second grab bar should be at least 600 mm in length mounted horizontally on the wall behind the toilet from 840 mm - 920 mm above the floor. When a water tank is provided the grab bar should be 150 mm above the tank
    - An option is to provide a fold-down grab bar on the transfer side of the toilet that is at least 760 mm in length at the same height as the horizontal grab bar on the wall. It should extend 150 mm beyond the toilet seat. It should not require a force of more than 22.5 N to pull down
- The flush controls should be located on the transfer side of the toilet
- When toilet paper dispensers are provided, they should be located below the grab bars in line with, and not more than, 300 mm in front of the toilet seat at a height of not less than 600 mm from the floor. Recessed toilet paper dispensers are preferred

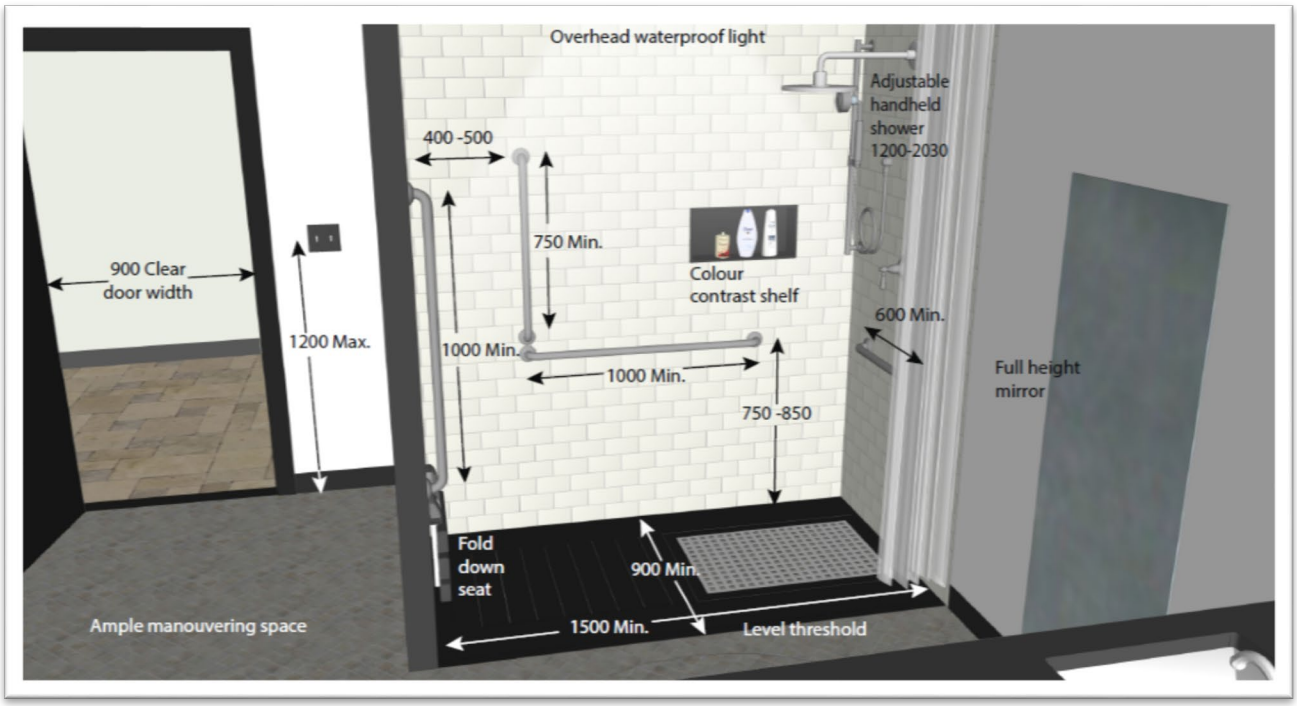
Showers

Roll in shower stalls eliminate the hazard of stepping over thresholds and are essential for those using mobility devices. “Wet rooms” are becoming increasingly popular. The equipment within showers should colour contrast with the walls.

- Shower areas should be not less than 1500 mm wide and 900 mm deep
- Clear spaces, not less than 900 mm deep, the same width as the shower, should be provided in front of the shower
- Shower floors should be slip resistant and entry thresholds should be level or bevelled with a maximum slope of 1:2 (50%) and not more than 13 mm high. When bevelled, bevels should colour contrast with the flooring
- When raised thresholds to showers are provided, the raised threshold should colour contrast with the surrounding flooring. Thresholds to roll-in showers should be not higher than 13 mm and not wider than 100 mm
- A shower seat should be provided that folds up and colour contrasts with the wall

- Seats should be at least 400 mm wide and extend the full depth of the shower stall, less space for the curtain

- Shower heads should be hand held type and be provided with a hose at least 1500mm long and allow use in a fixed position and be mounted vertically. The shower head should be adjustable between 1200 mm and 2030 mm and not obstruct the grab bars



- Roll-in showers should include four grab bars. The Grab bars should be mounted as follows:

    - One mounted horizontally on a side wall - at least 600 mm in length and between 750 mm and 850 mm from the floor

    - One mounted vertically on the opposite side wall - at least 1000 mm in length, with the lower end 600 - 650 mm from the floor and 50 - 80 mm from the adjacent clear floor area

    - One mounted horizontally on the back wall at least 1000 mm in length and between 750 mm and 850 mm from the floor

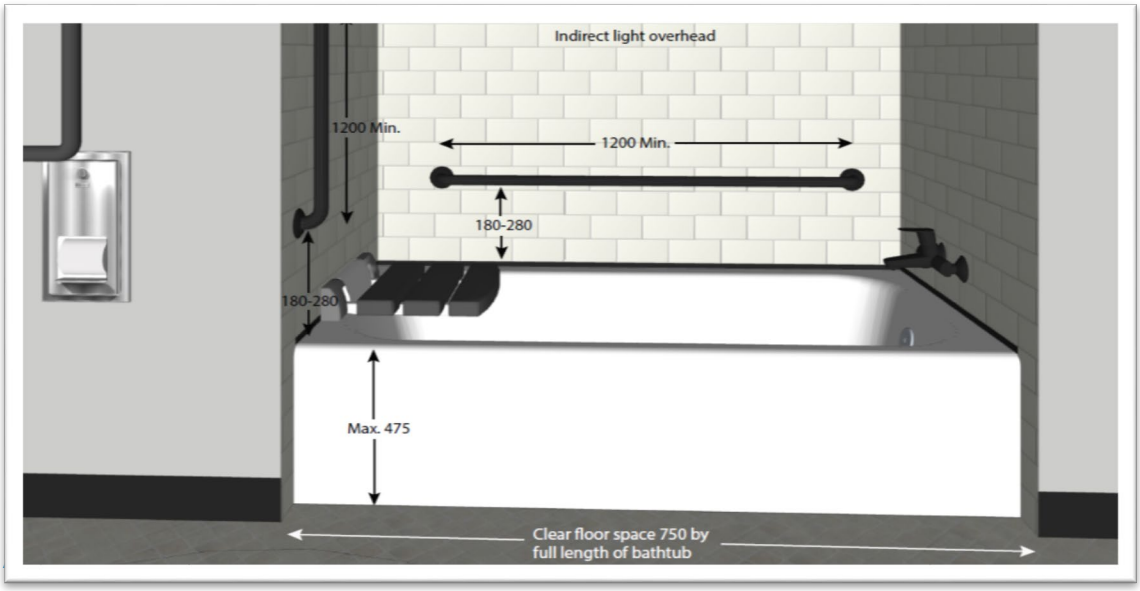
    - One mounted vertically on the back wall at least 750 mm in length, with the lower edge 50 - 60 mm above the horizontal grab bar on the back wall and located 400 mm - 500 mm from the side wall on which the other vertical grab bar is located

- Soap holders should be recessed and located 900 mm - 1200 mm above the flooring. Soap holders should be placed above handrails
- Controls should be lever style or other devices that are operable with a closed fist
- Showers should include temperature regulators to avoid scalding

Bathtubs

Clear floor spaces of 750 mm should be provided in front of bathtubs, along the full length of the tub. When seats are provided in bathtubs the seats should be located at the end of the bathtub. Seats should be the full width of the bathtub and be 400 mm deep and flush with the edges.

- The maximum height of bathtub rims should be 475 mm above the floor
- Two grab bars that colour contrast with the surrounding walls should be provided:
    - One horizontally, centred on and along the length of the bathtub that is between 180 and 280mm above the bathtub rim and at least 1200 mm in length
    - One vertically, at the foot end of the bathtub adjacent to the clear floor area, whose lower end is between 180 and 280 mm above the bathtub rim; that is at least 1200 mm in length and between 80 and 120 mm from the adjacent clear floor area
- Faucets should be placed in a position that makes them easily accessible by those seated in bathtubs. Faucets should not be more than 450 mm above the bathtub rim. Faucets may be positioned either in the middle of the bath tub or at the foot end of the bathtub. Mounting the faucets in the middle of the bathtub will make it easier to access the faucets from a seated position
- The bottom bases of bathtubs should be slip resistant



Sinks

Ideally, sinks should not be placed on pedestals. Preferably, sinks should be deep, so as not to splash water on users.

- Accessible sinks should be mounted at least 460 mm from the adjacent wall
- Tops of the sinks (counters) should be located between 820 mm - 840 mm above floors
- Accessible sinks should have:
    - A knee clearance of not less than:
        - 920 mm wide
        - 700 mm high at the front edge
        - 685 mm high at a point 205 mm back from the front edge
    - 230 mm high over the distance from a point 280 mm to a point 430 mm back from the edge
    - A toe clearance of not less than 350 mm high from a point 300 mm back from the front edge to the wall
- Pipes should preferably be in the wall or under sinks at the rear
- Faucets should be operable with a closed fist (lever style) or be automatically operable
- Hot water should be located on the left
- Clear floor spaces in front of sinks that are a minimum 1370 mm deep x 750 wide allow for forward approaches in a mobility device of which a maximum of 500 mm may be under sink

Vanities

- Drawers and cupboards in vanities should have “D”- pull handles that colour contrast with the vanities. Touch and release drawers are also universally accessible

- Full-length mirrors, or mirrors that are mounted over sinks with the bottom edge of the mirror at 100mm or on an angle, are ideal so that those in a seated position may see themselves

- All edges on vanities should be rounded with a lip for safety and to prevent items from slipping off the vanity

Shelving and Other Projections

- Shelving and/or other projections should not:
    - Be located more than 1100 mm above the floors
    - Protrude from walls more than 100 mm
    - Be placed more than 200 mm above sinks, as a person may need to reach an item on the shelf from a seated position

Doors

Bathroom doors should provide minimum clear widths of 900 mm and be designed to maximize maneuvering space. Pocket doors may be used, particularly in smaller spaces. “D” pulls should be used on pocket doors as they are easy to grasp and pull. “D” pulls should colour contrast with doors. Doors and door frames should colour contrast with the surrounding wall surfaces.

Consideration should be given to provide a power door operator for the accessible bathrooms, to facilitate opening of the door by all users.

Flooring

- Some things to consider when selecting flooring material for bathrooms include: durability, ease of cleaning, glare free and non–slip flooring surfaces. In addition, consideration should be given to flooring that is easy to roll on

- Vinyl and rubber flooring are available in sheets. Vinyl is easy to clean and low in maintenance. Ceramic flooring may be waterproof, easy to clean and easy to wheel on. Polished marble floors may be very slippery when wet. Heated flooring should be considered for bathrooms. Bath mats on floors should not be used due to the potential slipping/tripping hazard

- Flooring material should provide level surfaces throughout bathrooms and adjacent flooring. Rises at door thresholds may be difficult to roll over for someone using a mobility device and they could be a potential tripping hazard

- The material selected for the flooring should provide a different texture from the adjacent room or hallway

Switches and Controls

The switches/outlets and controls for lights, fans, heating, electrical outlets, etc., should colour contrast with the surrounding wall surfaces. They should be strategically located to be within reach of those in seated positions. The operable controls should be located at a height of 400 mm – 1200 mm from the floor surfaces.

Bedrooms

Bedrooms are places where people may relax and feel at ease. While designing accessible bedrooms is not complicated, some planning is required.

When designing bedrooms some design elements to take into consideration are:

- Maneuvering space for mobility devices
- Location of beds
- Flooring
- Window location and height of the window

Design elements for inclusive bedrooms:

- Colour contrast
- Light switch outside the door
- Closet space
- Clothes rail height
- Low dressers
- Illumination
- Closet doors
- Height of beds
- Colour contrasting bedding

One of the first things to consider is the space requirements for the room. Bed and dresser sizes need to be considered before the room space is planned. Closets may require additional planning and design detail to ensure maximum storage capacity.

Additional items for consideration:

- Will bedrooms require single, double or king-size beds? Clear floor areas of at least 750 mm x 1500 mm, should be provided on at least one side of the bed. One way to create additional floor spaces, if needed, is to adjust the bed sizes for the room. Consideration should be given to selecting an appropriate height for the beds. Tops of mattresses should be 430 mm - 460 mm from floors to enable easy transferring from mobility devices to beds. People using mobility devices often prefer to dress and undress while sitting on beds.

- Dressers that provide drawers, between 400 mm and 1200 mm from the floor are recommended for people accessing the drawers from a seated position, as the top drawers of higher dressers may be difficult to reach. Dressers with three side-by-side columns of narrow, lightweight drawers with single pulls are easier to access than wider drawers that require double pull handles. “D” pulls are preferred, as they do not require twisting of the wrist or pinching of the fingers. “D” pulls should colour contrast with dressers. Consideration should be given to clearance spaces; when dresser drawers are fully open, clearance spaces of 1.3 meters should be provided.

- When desks or tables are provided, a knee clearance of at least 810 mm wide x 740 mm deep will be required to accommodate mobility devices.

Colour/Luminance Contrast

The appropriate use of colour contrast may assist in defining bedroom space, identify features in the bedroom, and enhancing overall accessibility. Walls and ceilings should provide a matte, low-gloss finish.

Highly-polished surfaces should be avoided. Walls and furniture should contrast against each other, for example, when using dark furniture, walls should be light coloured and the bedspreads should be a dark colour. Another example would be dark walls and light-coloured furniture with a light-coloured bedspread.

The junctions between the floors and walls should be clearly visible by using colour contrasting on the baseboards. The electrical outlets, switches and thermostats should contrast in colour with the walls.

Closet Spaces

A clear floor area of 750 mm x 1200 mm should be provided in front of clothes closets. Clothes rails should be no higher than 1200 mm - 1400 mm from the floor. When shelves are provided, at least three shelves should be 400 mm - 1200 mm from the floor.

The openings to closets should be as wide as practical; minimum door widths of 900 mm should be provided. Wide openings make it easier to access clothing; however, in order to open and close wide swinging doors, substantial maneuvering space is needed in front of the door. While ideally, sliding doors and bi-fold doors may reduce the amount of clearance space required in fronts of closets, they may create other challenges; for instance, sliding doors only allow access to one side of a closet at a time. Closet doors should have “D” pulls that contrast in colour with the doors.

Walk-in or “roll-in” closets should provide a minimum of five-foot-wide aisles into closet spaces. Clothing rails should be accessible at a height of 1200 mm - 1400 mm. When shelves are provided at least three shelves should be between 400 mm and 1200 mm from the floor.

Windows and Window Treatments

Bedroom windows should be large enough to bring light and fresh air into the room, but not so large as to create unwanted glare. Too much sun may wash out a room and make it difficult to see items. Windows that are intended for viewing, except when located above counters, should have sills no higher than 750 mm from the floors, and when operable for ventilation, they should have openings and locking mechanisms that are 400 mm - 1200 mm from the floors. Consideration should be given to provide clear floor spaces of 760 mm x 1200 mm, in front of the controls for windows. Window

drape/blind controls, locks and cords should colour contrast against the surrounding surfaces.

Doors

Sufficiently-wide doors are advantageous to individuals using mobility aids. Clear door widths of a minimum of 900 mm should be provided. Doors and door frames should colour contrast with the surrounding wall surfaces. Door hardware and operating devices such as handles, pulls and latches should be mounted 900 mm - 1100 mm from the floors and colour contrast with the surrounding surface. The door hardware should be operable without tight grasping, pinching or twisting of the wrist and should not require a force of more than 22.2 N (5 lb) See the section on Measuring Tips. Lever-shaped door handles are preferable, as round door knobs require a grasp and twisting of the wrist.

Power door operators may be a consideration for bedroom doors to assist individuals opening their bedroom door independently and assist caregivers opening the bedroom doors.

Consideration should be given to provide a unique texture on the door frames (the perpendicular portions of the door frames) to assist people in identifying their bedroom. Consideration could also be given to place a unique tactile item on the latch side of the door on the wall, to assist with identifying the bedrooms.

Flooring

The choice of flooring material and finishes within a home is based on personal preference. Characteristics to consider for flooring in the bedrooms include: slip resistant, smooth, glare free surfaces and flooring that facilitates ease of movement with the use of a mobility aid. The use of different floor textures within a home may be used as clues to assist with orientation with in a space. The use of floor textures should be consistently used with in a space. Ideally limit the use of textures to no more than three different types, as the overuse of floor textures may be challenging for individuals to remember what each texture represents.

Electrical Outlets

Electrical switches, outlets and thermostats should be mounted no lower than 400 mm and no higher than 1200 mm, where there are no obstructions. Controls with different shapes may assist people with identifying different controls. The controls should be operable with one hand. A clear space in front of the controls of 750 mm by 1200 mm should be provided.

Light switches should be easily located and consistently placed in bedrooms, e.g., light switches should all be placed on the walls on the latch sides of bedroom doors.

Consideration should also be given to include a bedroom light switches on the exterior side of the bedroom to be utilized to announce the arrival of a visitor.

Laundry Rooms

Laundry rooms designed from an inclusive design perspective are both comfortable and safe for everyone. Inclusive design assists people with different abilities to be independent. Inclusive laundry rooms take into consideration all the design elements of laundry rooms.

When designing laundry rooms, several design elements should be considered:

- Efficient design
- Manoeuvring space for mobility devices
- Minimal effort of use
- Ease of cleaning
- Acoustically alive
- Illumination
- Safety

Ideally, laundry rooms should be located on the same floor as the bedrooms and bathrooms. In many cases, laundry rooms tend to be smaller rooms within a home, so turning radius requirement for those using a wheel chair is 1500 mm and will need to be taken into consideration.

Entrances into laundry rooms should have a minimum opening of 900 mm. Door-free entrance ways are preferable, to facilitate ease of use when carrying laundry to and from laundry rooms.

When doors are provided at laundry room entrances, the doors and door frames should contrast in colour/luminance with the surrounding wall surfaces. When the entrances don’t have doors, spaces should be defined by 50 mm contrasting strips. As an example, if the hallway flooring is light colour, then the 50 mm strips would be dark in colour and the flooring material in laundry rooms would be light in colour. Another example would be to use light-coloured flooring in the hallways or adjacent spaces and dark-coloured flooring in the laundry rooms. Dark-coloured flooring in laundry rooms is preferable when using white appliances. The dark flooring will provide good colour contrast with white appliances.

Colour/Luminance Contrast

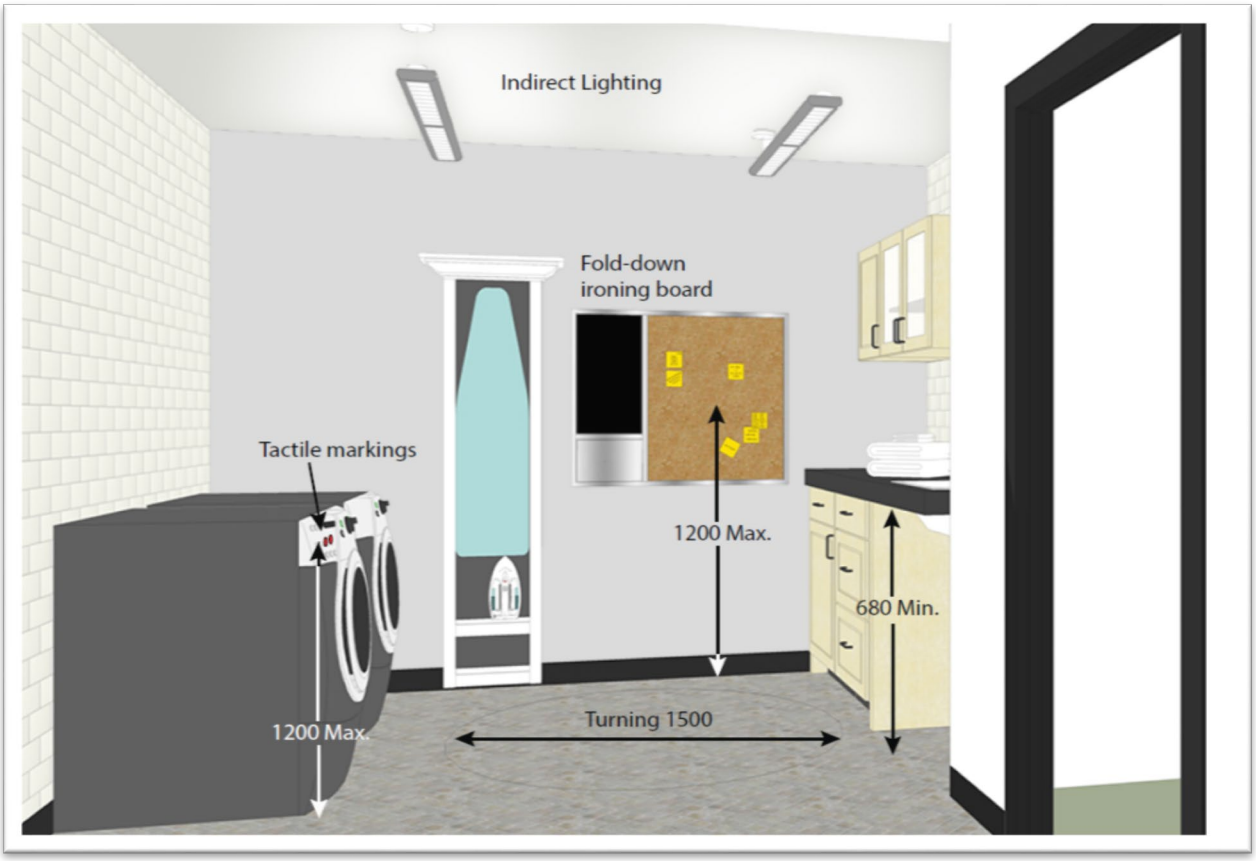
The use of colour/luminance contrast in the built environment may be effective for many purposes. Colour may be used to identify door openings, draw attention to light

switches, define routes, assist with locating appliances or act as a warning for people with vision loss.

When designing laundry rooms, colour scheme needs to be taken into consideration. A well thought out colour scheme will assist in defining laundry room spaces and assist those with low vision to understand and discern the features of laundry rooms.

The following colour scheme is one option to consider for people with low vision. A darker coloured floor with white appliances, white counters, dark sinks, light-coloured cabinetry with darker coloured pulls on the cupboards. The vertical edges of laundry room counters should be darker in colour. The walls should be darker with a light-coloured baseboards, light-coloured doors and light-coloured door frames. The use of light-coloured flooring in the spaces adjacent to laundry rooms, such as hallways or family rooms, will assist in defining each of the spaces, particularly when doors to laundry rooms are not provided. (Please refer to the Overall Basics Designs section for more information on colour and luminance contrast).

Another option of use of colour contrast:



Appliances

Appliances should be front loading and consideration should be given for safety of the appliances. The CSA certification mark on appliances provides assurances that the products have been tested and are certified to meet applicable Canadian guidelines performance and safety.

The exteriors and interiors of appliances should have enough lighting to assist individuals to see and operate appliances. Front loading washing machines and dryers are preferable when mounted on the floor surfaces; as stacked appliances and top loading appliances may be difficult for people using a mobility aid to reach down to the inside of the appliance.

Maneuvering space around appliances is a key consideration, as space may be required for people using mobility aids. Clear spaces of at least 1500 mm x 1500 mm should be provided for people who use manual wheelchairs and 2100 mm x 2100 mm for those using larger, powered wheelchairs and mobility aids.

Controls should be easy and intuitive to use. Preferably, the controls should be front mounted. Pinching or grasping of the controls should not be required. The controls should be easy to see, be colour-contrasted with the surrounding surfaces, and be tactile.

The control settings may be identified and marked with colour contrasting material that provides a texture to assist in identify the control settings.

Fold-down ironing boards may be considered when space is limited. Fold-down ironing boards are easy to use and will free up space when not in use. Ironing board heights should be 730 mm - 860 mm above the floors.

Counters and Cabinets

The laundry room counters should be located within close proximity to washers and dryers. One counter in the laundry room should be at least 750 mm wide x 600 mm deep at a height of 730 mm - 860 mm with a clear floor area of at least 750 mm x 1200 mm with a centered knee clearance of at least 750 mm x 480 mm deep x 680 mm high. Electrical outlets should be visible and accessible on the sides or fronts of counters.

Cabinets should have “D”-type pulls that colour contrast with the surrounding surfaces. Shelving should be provided above counters, and drawers should be provided below counters.

Flooring

Laundry room flooring should be easy to clean, non - slip and glare free. Polished or waxed flooring should not be used.

Cork flooring provides a good surface and is resilient, comfortable, and easy to wheel on with a mobility aid and assists in reducing leg fatigue. Resilient flooring is considered to be low maintenance. Tile is harder but considered easy to clean and wheel on.

Flooring should be level throughout the spaces, and the thresholds between spaces should not be more than 13 mm (from 7 mm - 13 mm the change in level should be beveled).

Floor mats may be used, provided they are securely fixed to the floor; otherwise, floor mats may be considered a slipping /tripping hazard.

Electrical Outlets and Controls

All electrical outlets on walls or counters should contrast in colour with the surrounding wall or counter surfaces.

Door Entrances

- Minimum clear width 900 mm

Appliances

- Front loading appliances
- CSA certified appliances
- Controls easy to use and mounted on the front of the appliance
- Maneuvering for mobility devices is provided around appliances
- Controls colour contrast with the surrounding surfaces

Counters and Cabinets

- Counters should be located close to appliances
- One counter should be accessible to a person using a mobility device
- Electrical outlets to the side or in front of the counter
- “D’ pulls should be used on the cupboards
- Shelving is provided above the counter

Flooring

- Surfaces should be:
- Non slip
- Glare free
- Easy to wheel on
- Easy to clean
- Level

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Toolkit

Measuring Tips

To assist in reviewing the accessibility requirements for your residential homes you will require a few tools/items to assist you. We recommend as a starting point to acquire the following tools/items:

- Measuring tape
- Door pressure gauge
- Light meter
- Electronic level

1. Measuring Tape

Measuring tapes are available in metric and imperial units of measurement. We recommend a measuring tape with both metric and imperial units. When measuring distances, place one end of the measuring tape at one end of the item or space you wish to measure. When the length of the space or item stops read the measurement.

When measuring a door clearance, open the door to the fullest and measure the narrowest distance (at the floor) between the 2 closest points of the door and/or door frame.

Measuring tapes are available online and hardware stores.

Measuring tape

2. Two Door Pressure Gauge

Doors present some of the most common accessibility issues. Doors may be too “heavy” requiring too much force to open. People with disabilities and seniors with limited upper body strength often find heavy doors challenging. People who use mobility devices such as wheelchairs or walkers may not be able to pass through doors with a door closer fast enough.

Often it is a simple matter of adjusting the door closers. Most door closures are located at the top of a door or above the door or on the door jamb. Some door closures are located inside the door frame. These door closures can be adjusted or may need to be repaired.

A door pressure gauge is a device used to measure the pressure required to open a door. To measure the door pressure, unlatch the door, put the pressure gauge against the door (where you would push a door to open it). The black rubber ring should be at the base of the tube. Push the pressure gauge gently until the door opens all the way. The read out on the gauge, (the new position of the rubber ring) indicates the force required to open the door. Some gauges have hooks to assist with pulling the door handle to open the door.

Door pressure gauges are available on line and in specialty hardware stores.

Door pressure gauge

Door pressure gauge with a hook

3. Electronic Level

The electronic level may be used for measuring the slope of surfaces or determining if a surface is level. An electronic level will provide you with a measurement in the form of a percentage (%) for sloped surfaces.

When measuring sloped surfaces such as a ramp place the level on the sloped surfaces. A visual display will indicate the percentage of the slope. When measuring a ramp take a few measurements along the ramp and at each “leg” of the ramp; a minimum of three readings should be taken on each leg of a ramp, such as at the top of the ramp middle of the ramp and near the bottom of the ramp. All slope readings should meet the indicated requirements.

Electronic levels are available online and in hardware stores.

4. Light Meter

A light meter is intended to measure the amount of illumination provided for indoor spaces and outdoors. Lux is an international unit of measurement used for measuring the amount of illumination falling on a surface.

When measuring the amount of illumination in an indoor environment the blinds and curtains should be closed or cover the sources of outdoor illumination entering the space. Turn the lights on. Place the light meter on the floor/ground surface or counter/table for task lighting, depending on the requirement. Stand away from the light source and ensure no objects are blocking or interfering or creating shadows with the sources of illumination to the light meter. Three measurements in varying locations should be taken for each light source. Additional measurements may be considered for larger spaces.

Outdoor illumination levels will need to be measured after sunset, when sunlight is not present. The illumination levels should be measured at the ground level for the paths of travel, steps, ramps, patios and decks.

Light meters may be obtained online.

Electronic level

Light Meter

Quick Design Tips

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Quick Design Tips

Illumination

Exterior Spaces

- Minimum light level - 100 lux on stairs, ramps, porches, parking areas and paths of travel
- Glare free
- Light evenly distributed

Living Rooms and Dining Rooms

- Lighting levels should be a minimum of 200 lux
- Lighting should be controlled by dimmer switches
- Lighting should not produce glare or shadows
- Lighting should be diffused by reflecting light off ceilings or walls
- Table lights and standard lamps should be sturdy
- Electrical outlets should be distributed throughout rooms

Kitchens

- Indirect, diffused light on ceilings or walls
- Ceiling lighting should be measured at 300 lux from the floor
- Dimmer switches for all lighting to accommodate individual needs
- Task lighting under cabinets and over centre islands, open countertops and tables
- Task lighting should be 500 lux measured at counters and stove tops
- Natural light, that does not create glare, will add to use of conventional lighting
- Ensure lighting does not create glare or a flickering effect
- Light should be evenly dispersed (indirect lighting) throughout the spaces
- Ensure light transitions well with lighting used in other spaces
- Use lights at the toe kick plates to define floor spaces
- LED lights in shelf and drawer spaces will increase visibility

Bathrooms

- Indirect, diffused lighting
- Task lighting at the vanity
- Lighting levels a minimum of 200 lux, measured at floor

Bedrooms

- Minimum light levels should be 200 lux, measured at the floor
- Dimmer switches for lights
- Lighting in closets
- Electrical outlets in closets
- Table lights and free-standing lights should be sturdy and operable with a closed fist
- Task lighting for desks

Laundry Rooms

- Use indirect, diffused light
- A minimum of 300 lux at counter top and on the ironing board
- Colour luminance contrast
- Motion detector for light

Exterior Spaces

Landscaping

- Designated service animal relief areas
- Wind chimes at front of houses and near back deck entrances
- Do not place plants with large seed pods over paths
- Do not place thorny plants beside paths of travel
- Include trees that retain leaves in the winter, e.g., oak

Exterior Paths of Travel

- Minimum clearance widths of 1500 mm
- Minimum head clearances of 2100 mm

- Protruding objects along pathways, minimum 100 mm, unless cane detectable at 680 mm
- Path slopes not to exceed 1:20
- Adequate drainage, when gratings provided, should have spaces not greater than 13 mm wide
- Slip resistant, smooth and easy to traverse in wheelchairs

Ramps

- Ramps, minimum width of 1100 mm
- Hand railings on either side of ramps
- Hand railings circular, not less than 30 mm and not more than 40 mm wide
- Hand rail heights, 865 mm - 965 mm
- Hand railings, extend at tops and bottoms
- Railings, high contrast with surrounding surfaces

Stairs

- Riser, 125 mm - 175 mm
- Tread, 280 mm - 355 mm between steps
- Uniform treads and risers
- Nosing should project not more than 38 mm
- Include 50 mm colour-contrasting edges
- No abrupt undersides on the nosing
- Tactile walking surfaces at the top of stairs

Seating

- Seating, near accessible paths of travel but set back from main paths of travel
- Seating area surface textures different from main path surface textures
- Furniture, rounded edges
- Height of seats, 430 mm - 500 mm
- Back rests on seating
- One arm rest for benches
- Space for wheelchairs provided beside benches, 850 mm - 1200 mm long

Verandas, Decks and Raised Elevations

- Railings necessary
- With railings, consider viewing distance of those in wheelchairs
- Contrast railing colours with surrounding areas
- Gate at top of stairs

Electrical Outlets, Switches and Operating Mechanisms

- Pathways to controls should be clear
- Controls located 400 mm - 1200 mm above ground
- Controls clearly visible from paths

Living and Dining Rooms

Colour/Luminance Contrast

- Contrast wall colours with furniture
- Contrast wall and baseboard colours with floors
- Paint ceilings and walls with matte, low-gloss paints
- Contrast fixture, outlet and thermostat colours with surrounding surfaces

Windows and Window Treatments

- Window sills should be no higher than 750 mm from floors
- Window operators should be 400 mm - 1200 mm from floors
- Clear spaces should be provided in front of windows
- The drape/blind controls, locks and cords should colour contrast with surrounding areas

Acoustics

- Place exterior equipment, such air conditioners, away from windows and doors
- Consider soundproofing walls and ceilings, where appropriate
- Use ceiling tiles to assist with dampening sound, where needed

Flooring

- Surfaces should be:

  - Smooth
  - Matte
- Area carpets should be:
  - Securely fastened to the floor
  - Low pile
  - In contrasting colours to flooring
- Ensure minimum clearance space is provided around furniture and to exits and entrances

Stairs

- Should have uniform riser heights and tread depths
- No open risers
- Illuminated to a minimum of 200 lux
- Circular hand rails with a diameter of 30 to 40 mm
- Handrails should be provided on both sides of the stairs
- 50 mm colour contrasted nosing on the tread and riser
- Nosing should project no more than 38 mm
- Nosing should not have abrupt under sides
- Tactile attention indicators surfaces that are 610 mm deep should be provided

Electrical Outlets

- Electrical outlets, light switches and thermostats should colour contrast with the surrounding wall surface
- Electrical outlets, light switches, thermostats and controls should be located 600 mm - 1200 mm from ground surfaces
- Thermostats should provide tactile markings and indicators that click

Kitchens

Colour/Luminance Contrast

- Use noticeably different colours to provide high luminance/colour contrast to define spaces

- Light-coloured floors should have darker cabinets with light-coloured “D”-pull handles and either dark counters with light-coloured leading edges or light-coloured backsplashes
- Dark floors should have light-coloured cabinets and dark-coloured “D” pulls
- Electrical outlets, colour contrast with surrounding surfaces when used on walls or counters
- Colour contrast kitchen furniture with the floor surfaces

Kitchen Entrances

- Entrances into kitchens, minimum 900 mm clear width openings
- Kitchen entrances, without doors, should provide 50 mm contrasting borders, defining entrance openings
- Doors and door frames, colour luminance contrast with wall surfaces

Counters

- One counter should be accessible to mobility devices. The accessible counter should:
  - Be 750 mm wide x 600 mm deep
  - Have a height of 730 mm and 860 mm
  - Have a clear floor space 750 mm x 1200 mm, which may extend up to 480 mm underneath the work surface
  - Have a centered knee clearance of at least 750 mm wide x 480 mm deep x 680 mm high
  - Have no sharp or abrasive surface under the counter
- Electrical outlets, located at side and/or front of counters
- Rounded or bull nose edging on counters

Cabinets

- One shelf should not be more than 1,100 mm from the floor
- “D” pulls, mounted on all cabinets and drawers
- “D” pulls, colour contrast with surrounding drawer or cabinet surfaces
- Interior drawers and cupboards, light in colour to increase visibility
- Full height extension drawers and shelves that pull out
- Braille and raised print on all cabinets and drawers with information regarding the contents
- Base cabinets should have toe space clearances of 150 mm deep and 230 mm high

Appliances

- Cooktops
  - Controls, front of cooktops
  - Surface heights, 810 mm- 860 mm from the floors
  - Clear floor spaces of 750 mm x 1200 mm
  - Knee clearances of 750 mm wide x 200 mm deep x 680 mm high
  - No cooktops with flat ceramic surfaces, difficult to determine location of burners
- Ovens
  - Wall ovens preferred, as height may be adjusted
  - Self-cleaning with side-opening doors
  - Controls located on front panels of ovens
  - Controls should be 400 - 1200 mm from floors
  - Heat resistant, pull-out shelves under oven doors or beside the latch sides of oven doors.
- Refrigerators
  - Side-by-side fridges are easy to access
  - Roll-out shelves or drawers are easy to access
  - Though-the-door ice making machines are convenient

Sinks

- Faucets should have tall goose neck spouts
- Sinks should be deep
- Faucets should be automatically activated or have lever-style handles
- Sinks should colour contrast with countertops
- Rim heights of sinks should be 810 mm - 860 mm

Flooring

- Surfaces should be:
  - Distinct in texture from the rest of the spaces within the homes
  - Non glare
  - No wax
  - Non slip

  - Easy to wheel on
  - Level with adjacent flooring
- Cork, wood and vinyl are considered good flooring material
- Ceramic tiles are considered easy to clean

Safety Considerations

- Consider emergency stroboscopic lighting, for all homes, as a visual enhancement to fire alarms and/or emergency systems
  - Maximum frequency of 3 HZ (flash rate per second)
  - Active for a duration of not less than 30 seconds between rest periods
- Consider emergency lighting for all areas of the homes; lighting levels should not be less than 200 lux measured at floor levels

Bathrooms

Colour/Luminance Contrast

- Colour contrast, materials and fixtures
- Darker floors and light baseboards; light to medium coloured doors and door frames with darker walls

Toilets

- Grab bars in “L” shape on walls beside toilets
- Grab bars behind toilets
- Fold down grab bars on transfer side of toilets
- Flush controls on transfer side of toilets
- Toilet paper dispensers in line with front rims of toilet seats
- Toilets hung from walls where possible

Bathtubs

- Rims of bathtubs, maximum of 475 mm from floors
- Grab bars in bathtubs, vertical and horizontal

- Faucets, reachable from seated position
- Controls, located at either the foot ends of bathtubs or the centre
- Controls, located no more than 450 mm above bathtub rims
- Slip resistant surface in bathtub

Showers

- Non-slip flooring
- Entry areas level or bevelled
- Grab bars in showers on all walls
- Fold down seat in shower

Flooring

- Surfaces should be:
  - Non slip
  - Glare free
  - Easy to wheel on
  - Level with adjacent surface
  - Easy to clean

Bedrooms

Overall Design

- Consider size of beds and transfer spaces beside beds
- Transfer spaces beside beds should be a minimum of 750 mm x 1200 mm
- Manoeuvring spaces in front of dressers should be a minimum of 750 mm x 1200 mm
- Provide manoeuvring space for walking inside a walk-in closet
- Adequate space in front of the closet door

Colour/Luminance Considerations

- Walls should colour contrast with the furniture
- Walls should colour contrast with baseboards
- Furniture should contrast with the floors

Closets

- Clear floor spaces of 750 mm x 1200 mm in front of doors
- Clothes rails between 1200 mm - 1400 mm from floors
- Wide door opening, a minimum of 900 mm clear width, should be provided
- Closet doors should have “D” pulls that colour contrast with the door

Windows and Window Treatments

- Windows should have sills no higher than 750mm from floors
- Locking and opening devices should be located 400 mm - 1200 mm from floors
- Blinds or curtains to reduce glare
- Colour-contrasting pulls for curtains/blinds
- Clear floor space in front of the window controls of 760 mm – 1200 mm

Doors

- Minimum clear door width of 900 mm
- Doors and door frames should colour contrast with surrounding wall surfaces
- Door hardware should be mounted 900 mm – 1100 mm from floors
- Lever-style door handles should be provided that colour contrast with the door
- Texture identification on the door frames

Flooring

- Surfaces should be:
  - Non glare
  - Slip resistant
  - Smooth
  - Easy to roll on

Electrical Outlets

- Electrical outlets, switches and thermostats should contrast with the walls
- Light switches should be located on the door latch side of the wall
- Outlets should be located 600 mm - 1200mm from the ground

Laundry Rooms

Door Entrances

- Minimum clear door width of 900mm

Appliances

- Front loading appliances
- CSA certified appliances
- Controls easy to use and mounted on the front of the appliance
- Manoeuvring for mobility devices is provided around appliances
- Controls colour contrast with the surrounding surfaces

Counters and Cabinets

- Counters should be located close to appliances
- One counter is accessible to a person using a mobility device
- Electrical outlets to the side or in front of the counter
- “D” pulls should be used on the cupboards
- Shelving is provided above the counter

Flooring

- Surfaces should be:
  - Non slip
  - Glare free
  - Easy to wheel on
  - Easy to clean
  - Level

DeafBlind
ONTARIO SERVICES

DIY Orientation and Accessibility Enhancements

DIY Orientation and Accessibility Enhancements

Illumination

Living Rooms and Dining Rooms

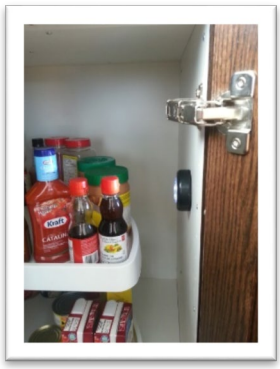
- Install push lights in cupboards and drawers
- Use book lights with magnifiers for reading such things as TV guide, newspaper or magazines
- Exits: Use of illuminating signs to visibly indicate exit

Kitchens

- Install push lights in cupboards and drawers
- Use book lights with magnifiers for reading menus or labels
- Use task lighting above workspace/under cabinets

Bathrooms

- Install push lights in cupboards and drawers
- Install shower-specific task lighting



Bedrooms

- Install push lights near beds or in closets
- Use book lights with magnifiers for reading at night

Switch Plates

- Use contrasting or textured colours on light switch plates and outlets
- You may also use glow-in-the-dark paints to enhance the switch plates in the dark, or you may purchase switches that glow or contrast in colour

The left switch cover has no colour/ texture contrast, while spray paint enhances the visual and textural contrast of the cover on the right.

Exterior Spaces

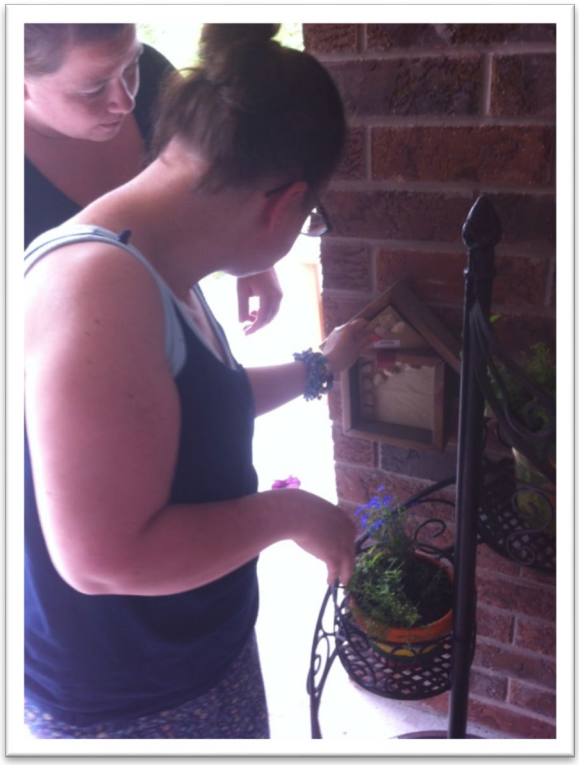
Signage/Room Indicators

A room cue can assist a person to identify a room through the use of various mediums; tactile cue, visual picture, raised braille and large font for room name.

Tactile House Markers

- May indicate residential setting with matching textured cue

Examples of Tactile House Identifiers



Doors

- Contrast door colours from the house colour
- Use door bells that light up outside
- Door bells should make sounds as well as light up inside
- Have lighting at the door way (inside and out)

A level, accessible path of travel leading to the front door. Brightly-coloured flower pots indicate the edge of the patio, leading to the front door.

Landscaping

- Contrast colours or textures to separate gardens and grass
- Use bright contrasting colours to create a “Sensory Garden”
- Wind chimes may be a clue or marker for individuals with residual hearing
- Use flowers with different smells and textures
- Gardens and yard should have lots of lighting
- Yard should be level with no pot holes

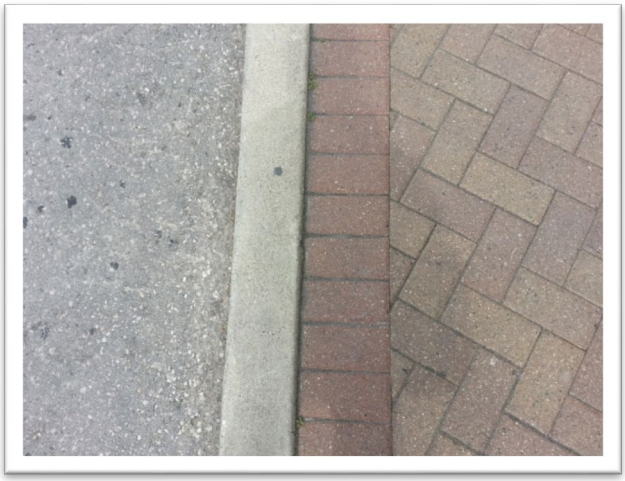
Raised garden, or flowers around trees, helps to indicate the location of the trees.

Pathways, Walkways and Driveways

- Create steady and clear pathways
- Add railings, if needed
- Contrast colours or textures from driveways to walkway
- Contrast colour of walkways and driveways where the house and road begins
- Add a raised edge where the lawn begins
- Pathways, walkways and driveways should have lots of lighting at nighttime.

Raised gardens can assist with locating /defining spaces and increases efficiency with mobility challenges.

The use of the different textures may assist in defining the driveway from the accessible path of travel.



The use of colour contrast may be used to define structures.

Patios

- Patio furniture should be sturdy with contrasting colour to the ground
- Patios should be well lit
- Use an awning or gazebo for sun and weather protection
- If you use an umbrella make sure is it high enough that it doesn't get bumped or run into
- Ground should be level and smooth
- Contrasting colours should be used on any stairs
- Use contrasting colour of patio ground to house, fence or yard

Fences and Gates

- Fences should be sturdy and durable
- Latches should colour contrast with gate and/or fence
- Gates should open smoothly
- Gates should be in contrasting colours to fences
- Avoid chain link or wire fencing, as there is not enough contrasting colour and may look invisible to those with low vision

Living Rooms

Signage/Room Indicators

A room cue may assist a person to identify a room through the use of various mediums; tactile cue, visual picture, raised braille and large font for room name.

Appliances

- Use larger television screens

- Apply raised dots to mostly-used buttons on remote, TV, and DVD player, e.g., “on/off”, “play”, and “channel up”)
- Use Closed Captioning while watching TV shows and movies

Furniture

- Furniture should colour contrast with the floor and walls
- Use non-glare finishes on furniture
- Throw pillows should colour contrast with the sofa

Colour contrast material, e.g., light wood to dark cushions and defining textural differences.

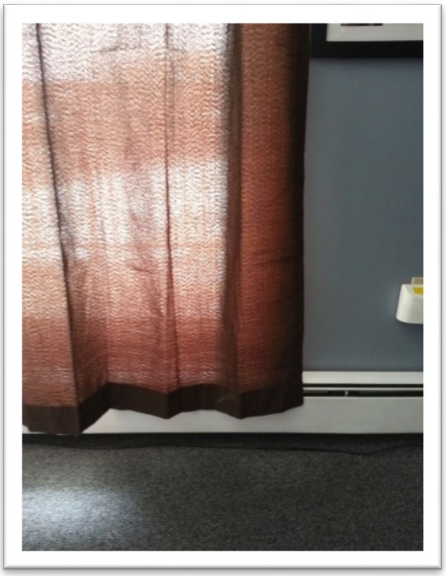
- Use electrical tape to highlight important areas of furniture (handles, doors, around bottom and top)

The pictures below show how colour contrasting the handles with the drawers assists in defining the drawer handles.

Dark tape outlines the handle and contrasts with the floor.

Window Treatments

- Contrast window treatment colours to the walls and floors



Flooring

- Use non-glare surfaces
- When rugs and mats are used, they must be of low pile and be securely fastened; otherwise, they may pose as a slipping/tripping hazard
- Contrast flooring colours to the chairs and tables

Dining Rooms

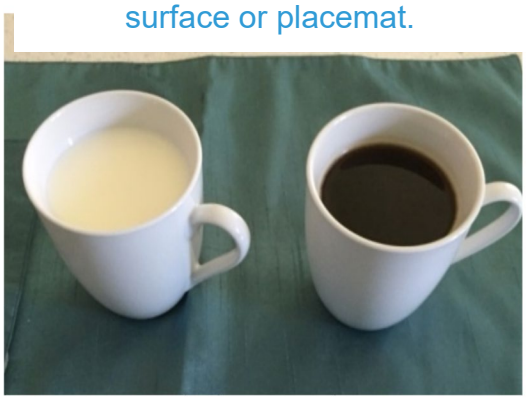
Tableware

- Plates and Bowls
    - Use contrasting borders around plates and bowls
    - Contrast plates, utensils, cups, and place mat to tables

- Avoid using glass cups, plates, or serving items

- Cups
  - Contrast cup colours to the items being used, e.g., use a white cup for coffee and a dark cup for milk
- Glasses
  - Use contrasting colours, preferably not clear

Plates, bowls and utensils should colour contrast with the table surface or placemat.



Furniture

Furniture should colour contrast with the floors.

- Tables
  - Use non-glare table tops
  - Contrast colours to the floors and to items that will be placed on them
- Chairs
  - Use non-glare surfaces
  - Avoid using heavy patterns, as this will make it hard to see items
  - Contrast cushion colours to chairs and tables
  - Contrast colours to the floors

Colour contrast may be used to assist in identifying liquids in a cup or glass. The white cup with the white milk provides little contrast, while the dark liquid in a white cup provides high contrast.

The use of black electrical tape, at the base of the chair and table legs, creates colour contrast.

Flooring

- Use non-glare surfaces
- When rugs and mats are used, they must be of low pile and be securely fastened; otherwise, they may pose as a slipping/tripping hazard
- Contrast flooring colours to the chairs and tables

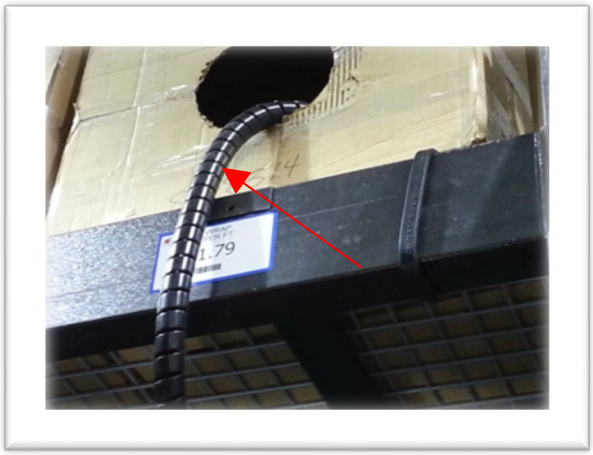
Kitchens

Signage/Room Indicators

A room cue can assist a person to identify a room through the use of various mediums; tactile cue, visual picture, raised braille and large font for room name.

Appliances

- Fridges
  - Use painted or plastic wire loom covered handles



Plastic wire loom can be purchased at auto locations. It is wrapped around the original white fridge door handles. Provides colour contrast and textural difference.

- Stoves
  - Painted handles and knobs provide a visual contrast. Raised dots on common or important settings (on/off buttons or 375 degree dials) allow individuals to locate with touch and vision.

- Microwave Ovens
    - Microwaves with “sensory cook” or “sensory reheat” buttons will automatically heat or reheat food to the appropriate temperature

Painting handles or putting colour-contrasting tape on the handles/pulls, in addition to providing raised dots that colour contrast with the surrounding surface to identify commonly-used buttons (such as the “Start” button), are recommended.

- Dishwashers
    - Painted handles, electrical tape, and raised dots on commonly-used buttons, e.g., start, are recommended

- Coffee Makers
    - Use one-cup coffee makers
- Kettles
    - Use electric kettles that indicate on/off with light indicators
- Toasters
    - Use raised dots on push-down toasters

Cabinetry

- Cupboards and Drawers
    - Contrast colours to walls, floors and countertops

For open cupboards, mark the inside edges with contrasting colours (e.g., tape) to help define the edges.

Label edges of shelves/drawers with large font/braille to indicate where items are to be located.

- Handles
  - Use contrasting colours
  - Do not use knobs that require twisting and turning of the wrist
  - “D” handles are easier to hold and grip
  - Hardware should be in a colour contrasting colour

Countertops and Sinks

- Contrast colours from walls and cupboards
- Use non-glare surfaces
- Avoid using heavy-patterned countertops, as this will make it hard to see items on the countertops
- Use coloured drain covers to enhance drains

Kitchenware

- Utensils
  - Use different colours and textures to help differentiate items
  - Use of protective covers on knives can enhance safety while locating knives in drawers
- Plates/Bowls

  Use contrasting borders around plates and bowls
- Cups
  - Contrast cup colours with items being used, e.g., use a white cup for coffee or hot chocolate and a dark cup for milk

This picture depicts the importance of colour contrast with identifying liquids. Colour contrast may assist with locating the cup visually as well as the pouring of liquids into the cup.

The cup on the left shows low colour contrast between the cup and liquid while the cup on the right shows a stronger contrast of colour between the liquids and counter.

  - A liquid level is helpful, as it indicates when the liquid has reached the top

- Glasses
  - Use contrasting colours, preferably not clear
- Measuring Tools
  - Use contrasting colours, e.g., red measuring cups for flours and starches

- Cutting Boards
  - Use contrasting colours, e.g., a white cutting board for a colour-contrasting vegetable and a dark-coloured cutting board for a contrasting vegetable

- Knives
    - Use secured handles and covers in contrasting colours
    - Using “knife guard aids” will enable users to apply pressure safely when cutting
    - They slip over the top of any knife blade
- Milk Containers
    - Use a darker container, e.g., green with white milk

Furniture

- Tables
    - Use non-glare surfaces
    - Contrast colours to the floors and the items that will be placed on them
- Chairs
    - Use non-glare surfaces
    - Avoid using heavy patterns, as this will make it hard to see items
    - Contrast colours to the floors
- Stools
    - Paint tops of stools in contrasting colour to the floor

- Garbage Cans

- Contrast colours to the floors and cupboards
- Ensure garbage cans are easy to open
- Avoid using foot openers, as they are harder to see

Window Treatments

- Use non-glare window coverings, especially if windows exist above sinks, as light from the windows may shine into the sinks and reflect off the metal, making it difficult to wash dishes or see what is in the sinks
- Use adjustable window treatments, as they will allow better control of the natural light
- Contrast window treatment colours to the walls and floors

Bathrooms

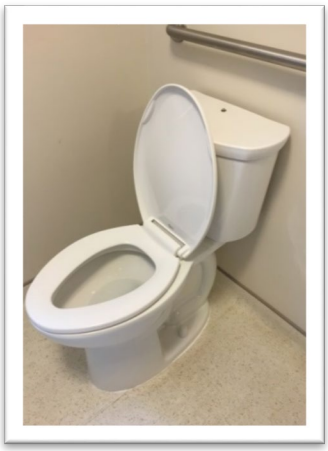
Signage/Room Indicators

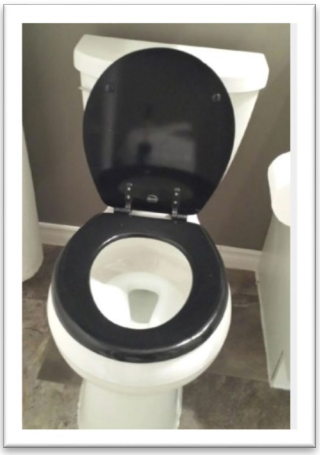
A room cue may assist a person to identify a room through the use of various mediums; tactile cue, visual picture, raised braille and large font for room name.

Facilities

- Toilet Seats
    - Use contrasting colours

      The picture on the left depicts low colour contrast/definition with the toilet, background wall, and floor colors, while the picture on the right depicts strong colour contrast with the black toilet seat and colour contrast with the wall and flooring.

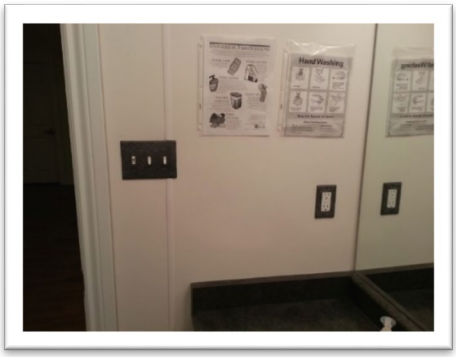




- Tub and Shower Mats
    - Use colour contrasting non-slip mats in showers and tubs to prevent slipping/tripping. This provides a colour differential and textural difference for foot placement

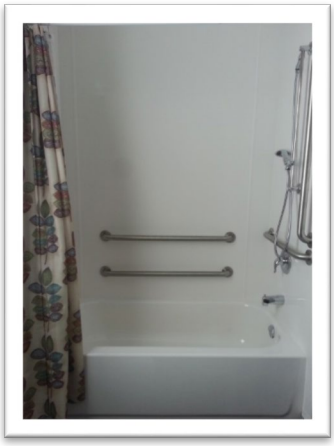
Counters and Cupboards

- Contrast colours from flooring to walls
- Contrast colours from sinks to countertops



Hardware

- Do not use knobs that require twisting and turning of the wrist. “D” handles are easier to hold and grip. Hardware should be in a colour contrasting colour



Bedrooms

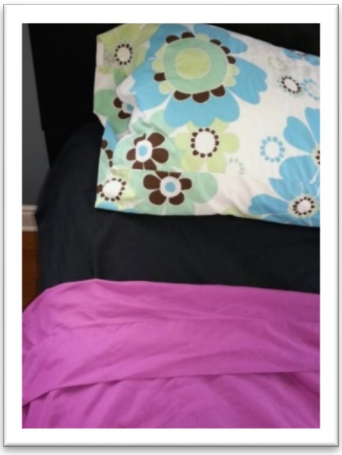
Signage/Room Indicators

A room cue can assist a person to identify a room through the use of various mediums; tactile cue, visual picture, raised braille and large font for room name.

- Use specific texture and colours for bedroom indicators

Bedding

- Use contrasting bedding (different fitted and top sheets) to help individuals with low vision distinguish between the two sheets

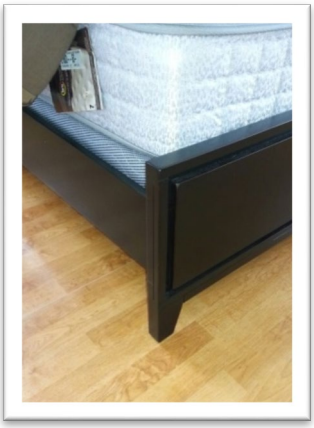


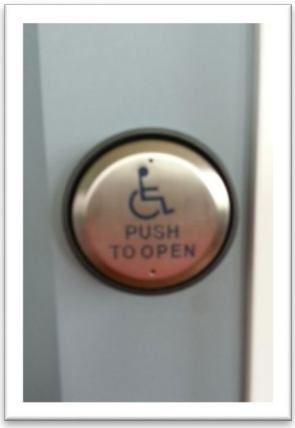
Furniture

- Use bed frames that colour contrast to walls and floors
- Dressers and night stands should be in contrasting colours to walls and floors

- Installing automatic door openers increases mobility transition and independence of this process

- Wireless door chimes with lights; this allows deaf individuals to know when visitors are at their bedroom do





Closets

- Make closet doors wide for wheelchair accessibility

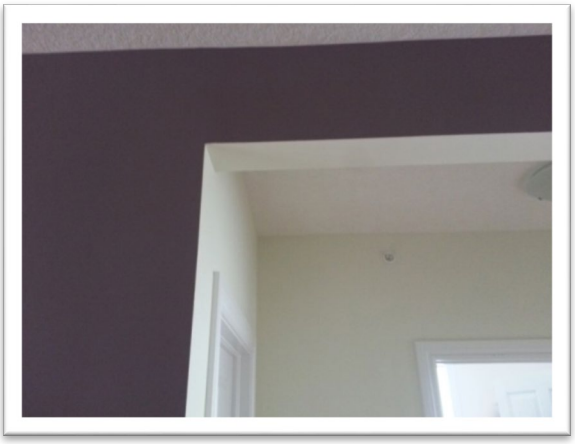
- Use electrical tape to outline shelving

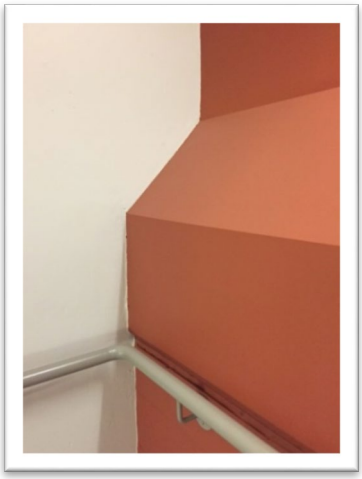
Window Treatments

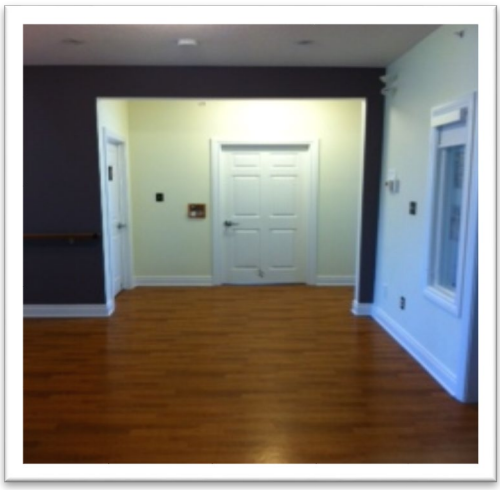
- Use non-glare window coverings
- Use adjustable window treatments, as they will allow better control of the natural light
- Contrast window treatment colours to the walls and floors

Wall Colours

- Use contrasting colours from ceilings and flooring
- Paint any angled or recessed wall a different colour







Flooring

- When rugs and mats are used, they must be of low pile and be securely fastened; otherwise, they may pose as a slipping/tripping hazard

Laundry Rooms

Room indicators/Signage

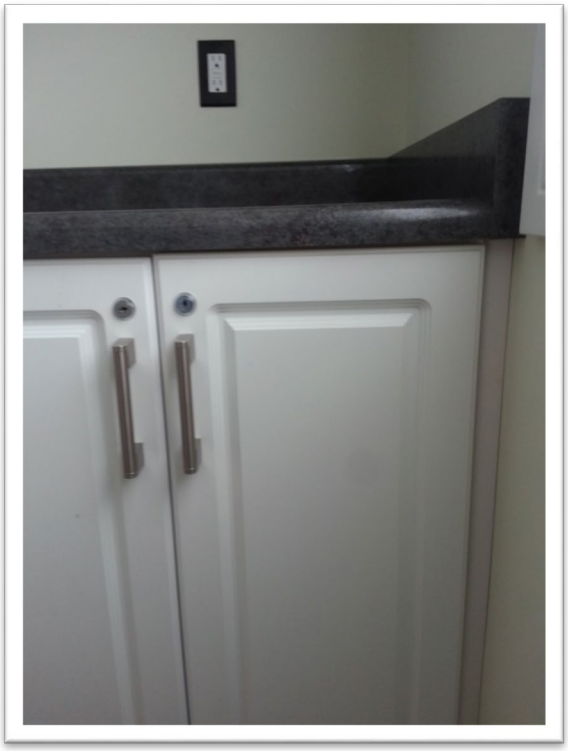
A room cue may assist a person to identify a room through the use of various mediums; tactile cue, visual picture, raised braille and large font for room name.

Appliances

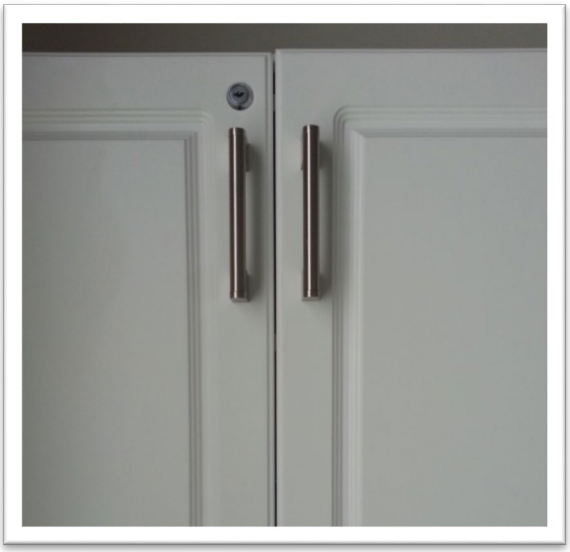
- Contrast wall colours to countertops and flooring
- Use front load appliances or ones with contrasting colours
- Use raise dots to indicate important buttons, e.g., “on” and “off”

Cabinets and Countertops

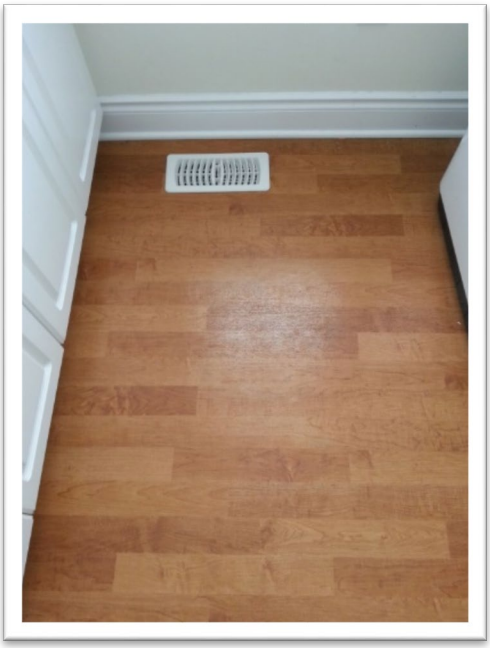
- Contrast colours to walls and flooring



- Do not use knobs that require twisting and turning of the wrist. “D” handles are easier to hold and grip. Hardware should be in a colour contrasting colour



- Flooring
  - Use non-glare surfaces
  - Contrast flooring colour to walls and cabinets



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