

Bathrooms

Design considerations

Most social housing projects, especially older buildings, were constructed with bathrooms that are simply too small to renovate for residents with disabilities. Taking over existing space to make a bathroom bigger is not typically done. In many cases, residents will be moved to an accessible suite, if one exists.

Creating a bathroom that maximizes safety and convenience is the cornerstone of good design.

If tenants have limitations in their mobility or balance, it is important to consider additional safety aspects such as the placement of controls within easy reach and the presence of grab bars beside the toilet and near the bathtub or shower.

When designing a bathroom for someone who uses a walker or wheelchair, sufficient manoeuvring space of 760×1,220 mm (30×48 in.) should be provided in front of or beside all fixtures including the bathtub, shower and storage spaces. It is especially important to consider the manoeuvring space in front of all of the controls, so that it is not necessary for someone to lean to access them, which may result in a fall. Do not forget to provide sufficient manoeuvring space in front of all windows and window controls (see figures 1 and 2).

A minimum manoeuvring space of 1,525×1,525 mm (60×60 in.) within the bathroom will allow users to turn around and to approach all elements of the bathroom. For users of power wheelchairs or scooters, the required turning radius is larger; in this case, the manoeuvring space needs to be 1,830×1,830 mm (72×72 in.), depending on the size of the mobility device. Room should also be provided for people who give assistance or provide care in the bathroom (see figures 3 and 4).

Figure 4 features a bathroom design that incorporates both a shower and a bathtub and provides sufficient manoeuvring space for either a side or angled approach to the toilet and access to the bathtub, shower and vanity. It is important to note that, unlike public washrooms, which are typically designed to meet minimum requirements identified in the building code, residential bathrooms can be built to meet the specific requirements of the person with a disability who uses them.

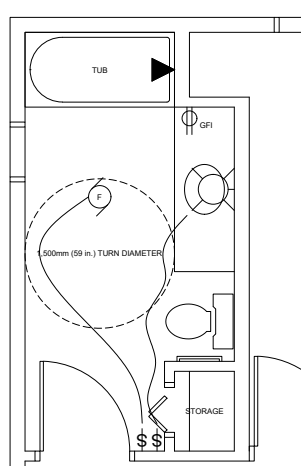


Figure 1: A small accessible bathroom

Diagram by: Ron Wickman Architect

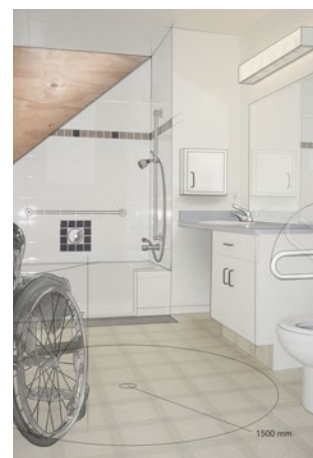


Figure 2: A FlexHousing™ approach complete with a 1,525-mm (60 in.) turning circle and plywood backing on all bathroom walls

Diagram by: Ron Wickman

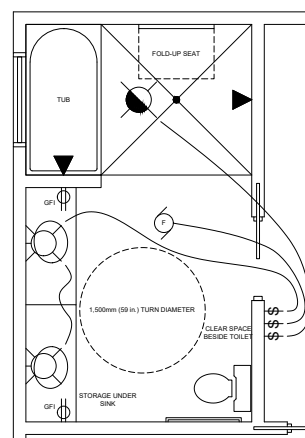


Figure 3: Bathroom with curbless shower and bathtub, two wash basins, toilet and storage space

Diagram by: Ron Wickman Architect



Figure 4: Bathroom with large curbless shower and bathtub (note the ceiling track lift)

Photo by: Ron Wickman

When making decisions about the selection of bathtubs, floors, toilets and showers, consider the surface finishes. For example, wall and floor surfaces in the shower should be designed to drain fully to prevent mould from growing. Adequate ventilation in the bathroom is extremely important to eliminate moist air and the potential for mould or mildew growth. Flooring should be slip-resistant, yet easy to clean and maintain.

Showers

Design the bathroom as a wet room by providing a large open tiled floor and wall area with drainage. This not only accommodates more than one person in the shower, but it also allows adequate space for someone using a shower bench or shower wheelchair who requires some assistance while bathing (see figures 3 and 4 in Design considerations).

The custom-built, curbless, wheel-in shower is the best design to accommodate as many people as possible. Most prefabricated shower units are built to be 915×1,525 mm (36×60 in.), and they typically come complete with a curb. Even if this curb is only 25 mm (1 in.) high, most people who use wheelchairs would need to transfer into these shower units. A wheel-in shower should be at least 1,525×1,525 mm (60×60 in.).

Framing all of the bathroom walls and ceiling with 19-mm (¾-in.) plywood, floor to ceiling, allows for the future installation of grab bars, handrails and ceiling lifts. Framing the floor of the bathroom with joists shorter than the rest of the dwelling allows for the construction of the wet room bathroom. All of this framing is more difficult and expensive to complete in a renovation.

One very useful product for a bathroom renovation and shower area is a water dam. This is a flexible “sponge like” product that is fixed to the floor at the entrance to the shower area. It is 25 mm (1 in.) high to keep the water in the shower area and easily flattens when stepped on or wheeled over (see figure 5).

The floor should have positive drainage, and the water should flow to the drain via gravity. The drain should be located to the side where people will not be standing or wheeling on it. A linear trench drain, rather than a circular drain, allows the shower floor to be evenly sloped, which is easier to move on for people who use wheelchairs.

Shower controls should be located so that they are easily reached at a maximum height of 1,220 mm (48 in.). A hand-held pliable shower hose increases flexibility and usability. The hose should be a minimum of 1,525 mm (60 in.) long or even longer if it is to be used by someone seated on a shower bench or seat (see figure 6).

Safety hazards in the bathroom deserve the highest consideration. The bathroom is the site of many accidents and falls. Heat and steam can cause surfaces to get slippery in a bathroom. A non-slip flooring surface is extremely important, especially when wet. Adequate lighting and ventilation are also very important (see chapter 6, Other building features, for more details).



Figure 5: Water dam at entrance to shower area

Photo by: Ron Wickman



Figure 6: Shower controls and grab bars in curbless shower area

Photo by: Ron Wickman

Shower heads at a variety of different heights and positions are increasingly being installed by builders. Multi-function shower heads that spray in a fine aerated mist or a vigorous revitalizing massage are also a good idea.

Shower controls should be intuitive and easy to use by everyone. Colour and texture contrast can be used to reinforce information on the controls.

Some people may use a portable shower seat; others may prefer a fold-down bench, which should be firmly anchored. The seat should allow easy access to the controls and be constructed with a non-slip surface, which is particularly important in view of the slippery nature of soaps and shampoos.

Shower curtains can be used to manage water in the shower area. Ensure to use a non-rusting (stainless steel or aluminum) shower rod complete with shower curtain carriers. Most importantly, the washable curtain should have a weighted hem and hang 25 mm (1 in.) off the floor.

Bathtubs

In selecting a bathtub, the first consideration is to assess needs and preferences. It is important for safety purposes to have a non-slip surface, grab bars and a flat-bottomed tub to provide stability.

Grab rails or hand grips in prefabricated bath enclosures should be checked to ensure they have adequate reinforcement to support a person's weight.

There is a wide variety of mechanisms and lifts that can be used in the bathtub to lower and raise a person in and out of the water. Many of these are designed with a bath seat that swivels to allow for ease of use. Check with an occupational therapist or a medical supply store for further information (see figure 7).

Waterproof bath seats offer another option and are especially useful given their portability. Bath seats should be placed in the tub within reach of the controls and be non-slip and free of hazards.

An existing bathtub can be converted into a walk-in shower with a cut out into the side wall of the tub. This is an inexpensive way to make a safer bathing situation for seniors and others with mobility limitations (see figure 8).

Another option is to consider bathtubs with doors that allow for easy entry. This option is popular among people with limited balance and agility, older people and those who often prefer a bath to a shower (see figure 9).

The bath has a door that is equipped with a locking system, which is lever-operated, and ensures a safe seal to prevent any water leakage.



Figure 7: Swivel bathtub seat



Figure 8: Cut-out bathtub



Figure 9: Walk-in bathtub complete with door

Photo by: Ron Wickman

Walk-in bathtubs have lengths that vary from 1,070 to 1,320 mm (42 to 52 in.) and widths that vary from 660 to 760 mm (26 to 30 in.). It should be kept in mind that it will be necessary to remain in the tub while it fills up and until the water has drained; some models drain faster than others.

Toilets

The market offers a wide range of toilets; it is important to select one that meets a person's needs. A low water volume or dual-flush toilet is an excellent sustainable option.

Manoeuvring and generous transfer space at a toilet must be carefully considered. If there is someone in the household who needs some assistance or may require it in the future, it is important to provide adequate space for the caregiver, either in front of the toilet or beside the toilet. Additionally, a person using a wheelchair may approach the toilet from the side, from the front or at an angle from the side. Consider personal preferences and space requirements (see figure 12).

CSA Standard B651 specifies a range of heights for the toilet seat, from 405 to 455 mm (16 to 18 in.). Children and some people who use a wheelchair and transfer independently prefer a lower height as it is easier to use. Alternatively, many older people prefer a toilet that is a little higher, as it is easier for them to sit down and get up. A raised seat can be added to an existing toilet; this is a cost effective solution that requires no renovation work (see figure 10). People with weakness in their leg muscles may miss the toilet when attempting to sit. A raised toilet seat should not be at a height where someone's feet do not touch the floor, as this may affect the person's balance. Ideally, the toilet should be at the same height as the wheelchair used by the person wanting to transfer.

The toilet should be installed with its centre line between 455 and 485 mm (18 and 19 in.) from the wall. This ensures that grab bars are within reach for those transferred onto the toilet and there is room for a commode chair (see figure 11).

The flush control should be located within easy reach, on the open transfer side of the toilet farthest from the wall. The placement of the tissue dispenser should also be carefully considered, so that it is easy to find and does not interfere with the use of the grab bar. It should also be within easy reach, not requiring that someone lean too far over to the side or reach back. An extremely useful item that can be added to an existing toilet is a bidet seat. This toilet seat

comes complete with a remote control and allows persons with limited hand mobility or persons without arms to independently use a toilet that sprays water for cleaning followed by hot air for drying (see figure 12).

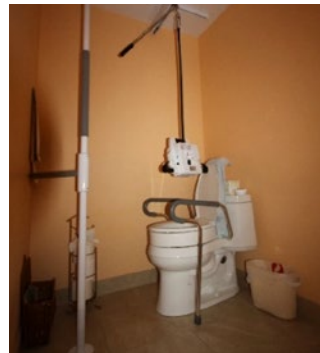


Figure 10: Raised seat
Photo by: Ron Wickman



Figure 11: Toilet with sufficient transfer space
Photo by: Ron Wickman



Figure 12: Toilet seat with built-in water sprayer and dryer
Photo by: Ron Wickman

Vanities, drawers and storage

The key to proper height placement of the countertop is to keep the counter to a minimum thickness. This maximizes the ability to keep the countertop low enough for those users in wheelchairs to reach into the sink; the countertop can also be high enough to allow the same users in wheelchairs to get underneath the counter. The front edge of the counter can also be in a contrasting colour to assist individuals with limited vision. A grab bar located in front of the counter could assist those individuals with balance issues while they are standing at the sink.

Countertops with sinks generally work better than wall-hung or pedestal sinks. The countertop provides storage space for the placement of medical items, equipment and bags (see figure 13). If the countertop is more than 915 mm (36 in.) wide, base cabinets with drawers can be included in the bathroom. This will provide additional storage space.

Sinks should be shallow enough to allow people in wheelchairs to get in underneath. Also, it is important to keep users' legs from coming into contact with exposed hot pipes. To prevent potential burns to legs, the pipes can be insulated or a protective panel can be placed in front of exposed pipes. A third option is to offset the sink pipes as far back up against the wall, where users' legs could never come into contact with exposed pipes (see figure 14).



Figure 13: Sink complete with countertop

Photo by: Ron Wickman



Figure 14: Counter and sink with offset drain

Photo by: Ron Wickman

Storage space that is lost to provide wheelchair access underneath the sink can be made up with a full-height cupboard complete with pullout shelves. Medicine cabinets must also be mounted so they are within easy reach of someone sitting in a wheelchair.

An accessible sink should provide knee space clearance—760 mm (30 in.) high, 785 mm (31 in.) wide and 610 mm (24 in.) deep—to allow someone using a wheelchair to wheel under the sink.

A faucet controlled by a single lever or a motion detector is most convenient. This provides flexibility and ease of use for all family members. Pullout faucet hoses help keep the sink clean. Faucet controls can also be mounted at the side of a sink to allow for easier access for those individuals who have limited reach.

Storing related things in the same drawer or cupboard where they are easy to find is appreciated by everyone but is especially important for someone with limited mobility or a visual impairment. Some people who use incontinence supplies need to have easy access to storage near the toilet and sink area. Also, storing items helps to reduce clutter and distractions for persons with cognitive limitations.

Installing drawers that pull out fully, to display their contents for easy retrieval, is an excellent approach. Cupboards and drawers should have D-type pull handles that are also colour-contrasted with their background, making them easier for people with reduced mobility, agility or sight to use. A contrasting colour for the interior of drawers and cupboards may also increase accessibility for people with limited vision.

The medicine cabinet or storage area for pharmaceutical supplies should be installed with the shelves at a maximum height of 1,395 mm (55 in.), if it is to be reached by someone using a wheelchair, and within a reach of 510 mm (20 in.). It should also be usable by someone with limited dexterity. If there are children in the home or people who should not have access to the cabinet, it is recommended that a locking device be installed.

The preferred solution for bathroom mirrors is to bring the mirror right down to the top of the countertop; this allows both individuals who are standing and those who are in a wheelchair to effectively use the mirror. The lower edge must be mounted at a maximum height of 990 mm (39 in.). A magnifying mirror located in a bathroom is especially useful for people with visual limitations. A full length mirror also helps everyone see their full body.

Grab bars

Grab bars are fixtures that assist people to transfer onto and back off a toilet. They can also be used around bathtubs, shower areas, counters and walls to assist anyone with balance issues. A good rule is that too many grab bars are better than not enough. Today, grab bars are designed to fit in with any residential bathroom decor. It is a good idea to use grab bars that are slip-resistant.

Grab bars should be 30 to 40 mm ($1\frac{1}{4}$ to $1\frac{5}{8}$ in.) in diameter and should have a non-slip surface. Grab bars must be installed into a wall with sufficient support (into studs or reinforced walls) to carry a person's weight. A space of 35 to 45 mm ($1\frac{3}{8}$ to $1\frac{3}{4}$ in.) is recommended between the grab bar and the wall, with sufficient clearance above the grab bar to allow a person to grasp it.

CSA Standard B651 requires that grab bars be mounted so they provide a minimum support of 133 kg (approximately 290 lb.). An excellent approach during construction is the structural reinforcement of the walls surrounding bathtubs and toilets for grab bar installation, which prevents the need to remove the tiling and walls at a later date. This approach also allows for customized location of the grab bars to suit the user. Using 19-mm ($\frac{3}{4}$ -in.) plywood on all the walls of the bathroom is the most universal solution.

Grab bars near the toilet

Grab bars should be provided beside the toilet for support. Fold-down grab bars are particularly helpful in installations where there is no wall beside the toilet (see figure 15). Another advantage of fold-down grab bars is that they can be folded up out of the way for when the bathroom is used by other family members.

Most people prefer a horizontal grab bar on the side and back walls, although others might prefer a fold-down grab bar on account of space limitations.

Grab bars beside a toilet should be mounted at a height of 305 mm (12 in.) above the toilet seat. They should extend at least 455 mm (18 in.) in front of the toilet seat to allow them to be grasped while transferring from a wheelchair.

The grab bar behind the toilet should also extend horizontally at least 610 mm (24 in.) in length.

Grab bars in the shower

A vertical grab bar at the entrance of the shower area should be mounted at least 80 to 120 mm (3 to 5 in.) from the outside edge of the shower enclosure and with its lower end



Figure 15: Fold-down grab bar that does not restrict usage in the bathroom

Photo by: Ron Wickman

at a height of 610 to 660 mm (24 to 26 in.) from the floor. It should extend at least 990 mm (39 in.) in length to ensure it can be easily grasped by everyone. Floor-to-ceiling wood backing on all shower walls will allow for the most strategic placement of grab bars to meet an individual's needs, for now and in the future.

Grab bars near the bathtub

Getting safely into and out of the bathtub, especially for older people and people with balance limitations, can be a challenge. Bathtubs are one of the most common locations for falls in the home. A vertical grab bar on the wall beside the bathtub is highly recommended for everyone. It should be a minimum of 1,220 mm (48 in.) in length and mounted immediately inside the bathtub enclosure.

Grab bars should be installed to suit the particular users. Most people prefer a horizontal grab bar along the side walls, although others might prefer two grab bars, one horizontal and one vertical, to assist in getting out of the tub. For more information, see CMHC's Research Highlight, "Evaluation of Optimal Bath Grab Bar Placement for Seniors."

A horizontal grab bar installed to meet a person's needs should be placed at a height between 180 and 280 mm (7 and 11 in.) above the rim of the bathtub. Another common installation is a vertical grab bar in a location that can be reached while seated in the bathtub.

There are now towel rails that have been designed to also act as grab bars and can provide support in the bathroom. The reverse is also true, grab bars may be installed and can serve the function of a towel rail (see figure 16).

Grab bars should be installed to suit the particular users. There is a wide variety of types of grab bars.



Figure 16: Dual purpose towel rack and grab bar
(note the emergency pull cord just above the towel bar)

Photo by: Ron Wickman



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