

# Bathroom Home Modifications



By Charles Schwab, Architect

**A** family of an exceptional child recently asked me if they could make their main level, 5' wide x 9' bathroom as accessible as possible without moving adjacent walls and getting into a major remodel. The exceptional child has limited use of his legs and is a wheelchair user.

Safety is a priority, especially in the bathroom.

## Doors

The existing door opening can be widened by two inches by using an offset hinge. You need at least a 2'10" opening for a wheelchair, so if your door is 2'8", these hinges will work for you.

If you have to replace the door, install a 3'-0" wide door or a pocket door. However pocket doors are difficult for people with limited hand use to operate. A swinging door will have to swing out as there will not be enough space in the bathroom for a wheelchair user to close the door. Also, this will allow you to get in if your assistance is needed in case of an emergency.

Replace the doorknob with a lever handle. You may also use a rubber lever that slips over the doorknob and also consider installing an emergency alarm switch no higher than 18" above the floor. A telephone with an alarm button can serve the same purpose.

## Floor Surface

If you keep your existing floor, apply a slip-resistant glaze on the surface. A good product for existing ceramic tile, stone or even agglomerates is Slip Tech (1-800-667-5470). Remove or tape down any rugs. If you prefer carpet, choose a low-pile anti-bacterial,

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indoor/outdoor type. If it is a new tile floor, select a tile with a minimum coefficient of friction for slip resistance (wet .60, dry .70). Even better yet, use an abrasive grain (coef. wet. 70, dry .80), non-slip tile. I like to use an accent border around the room and in the shower as well for visual definition.

## Sink

You might want to consider a power adjustable sink (ADAS Systems, 740-593-7155). If you want to keep a traditional cabinet sink you should replace it with one that is no higher than 34" which will work for seated and standing users. A sink 32" high would be best for

your child but may be a strain on the backs of those in the family who are taller and standing.

Choose a shallow sink bowl 6 1/2" deep that features a 3" overhang at the front of the counter and enhances accessibility (Kohler: 800 4-KOHLER). Replace the hot and cold knobs with a single-lever faucet. Consider moving it towards the front at the wall side of the sink. If limited hand strength is a real concern install a motion sensor sink. This will also conserve water. You may want to install a hose as well so the child could wash hair without going into the shower.

For the cabinet doors on the vanity, install slide-away door glides that allow the door to slide back inside the cabinet, allowing open knee space underneath. A minimum 29" high x 32"-36" wide clear space should be provided under the sink for access.

Always provide a pipe insulator inside to avoid leg burns. Two good products are Plumberex and Truebro. The countertop should always have rounded or bevel edges with color contrasting edging (Kuehn Bevel: 800-TO-BEVEL). This will help those with limited vision determine the edge of the countertop.

The mirror above the sink should be tilted and lowered to just above the back splash so it can be used while seated. You might want to consider an anti-fog mirror, activated with the flip of a switch (Electric Mirror or Clear Mirror). A side swing makeup mirror may be a good solution for close-up viewing if anyone in the family has limited eyesight (Baci -800-327-6585).

Install vanity lighting at both sides of the mirror. Above lighting will only cast shadows down on the face. Also install a full-length mirror to allow full-body viewing while seated. For storage drawers adjacent the sink, use full extension

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slide hardware which allows for full viewing and easy reach ability. Linen closets should not be deeper than 2'-0" for the same accessibility reasons.

## Toilet

The ideal toilet height varies according to physical capabilities of the family members. A standard toilet may be too low for those with limited leg strength while a seat that is 19" or higher may be awkward for wheelchair users, people who are short or children.

The stool height should be as close to the user's wheelchair height as much as possible for ease of transfer. Choose a toilet that has the flush control on the open side - it should be able to be used with low effort and minimum finger use. You can install an offset flange underneath the toilet that will let you raise the toilet 2 1/2" to 3" with a product called Toilevator, or you can use a toilet lift seat that ranges from 2" to 4 1/2" (Sani-Med 662-328-4000). Toilet seats may feature integral "sheltering arms", handles attached to each side of the seat that allow one to push up or grab onto for transfer. At very least, you will want to install fold-down grab bars at each side of the toilet. Choose an elongated toilet bowl.

A product for transferring from a wheelchair to a toilet is a fold-down transfer seat (Access Able Designs, Inc.—877-853-7816). These effectively widen the toilet seat and give a person a solid surface to push off of when transferring from the wheelchair to the toilet. With this product you never actually touch the stool itself. Toilet stools typically are not designed for this kind of force and can pull out of their mounts with an unbalanced force causing them to "slide away".

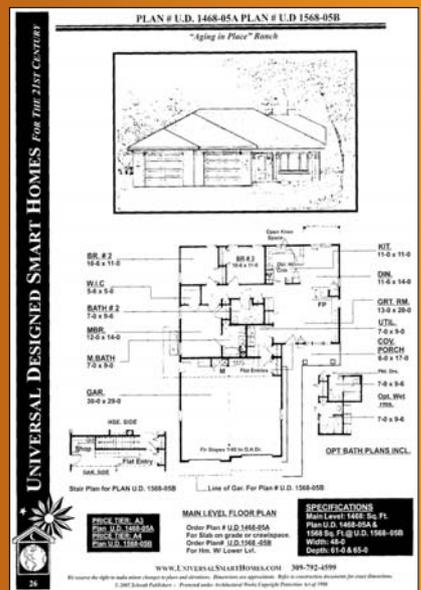
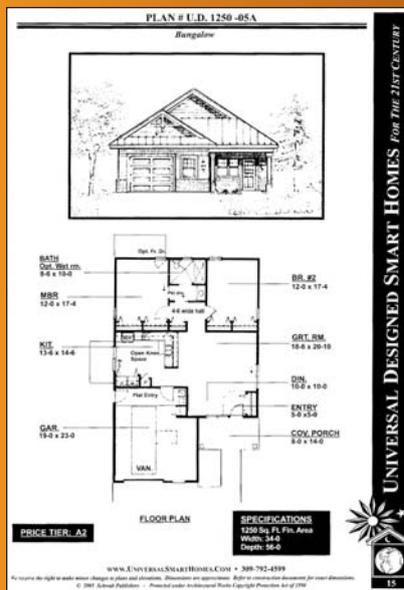
In new construction, I specify wallboard backed by 3/4" marine-grade plywood so you can install grab bars anywhere you choose. The toilet should be located adjacent to a side wall in new construction for placement of side grab bars. Since this is a home-modification, not a big remodel, I would recommend a grab bar fastening product, originally designed for the space



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Charles M. Schwab, a member American Institute of Architects, is a graduate of the College of Architecture at the University of Colorado. He also studied architecture at the University of Regensburg in Germany. Schwab was an architect in training in Aspen, Colorado when he was hired for his first

project as an architect project manager for an environmental center in Aspen with passive solar heating, hot water heating and other green features. Upon returning to the Midwest, he started his own practice while serving as a caregiver for his grandfather who had suffered a series of strokes. It was then that Schwab realized the standard American home does not meet the needs of an aging population or those with special needs. Combining universal design and green sustainable features became the rational of *Universal Designed Smart Homes for the 21st Century*, written and published by Schwab in 2003. The book features 102 homes that were designed by Schwab, and it is available through *Exceptional Parent* magazine by calling 1-800-361-3860 ext. 110.



shuttle, called Wingits (877-8WINGIT). Another is called Toggler (914-347-2727) brand anchors used for steel studs. Wingits hold up to 1,000 lbs. when installed with 1/2" wallboard and ceramic tile or in a 1/4" - thick fiberglass tub surround. In 5/8" wallboard alone they hold 450 lbs. and in 1/2" wallboard they hold up to 250 lbs. Whatever methods for grab bar attachment you choose, always make sure the bars hold at least 250 lbs. Always follow the manufacturer's instructions for installation.

Towel racks are not designed to be grab bars. You might want to buy a couple more Wingits and install a horizontal grab bar to replace the towel bar. When people are falling, they will grab anything. The bar can then serve a dual purpose. Grab bars now come in all kinds of colors and finishes. If you choose to remodel the bathroom down to the studs use 2 x 8 blocking which will provide room for adjustments. Always use 16d nails for connection to the wall studs. You may want to install plywood above all around the bathroom.

## Tub/Shower

Replace the tub with a roll/walk-in shower. There are several prefab units on the market. There are showers that are curbless and have a collapsible water membrane that keeps the water in the shower. Several good manufacturers include Best Bath (800-727-9907); Aqua Bath (800-232-2284); Aqua Glass (731-632-0911); Barrier Free Architecturals (877-717-7027); Bath Ease Inc. (727-786-2604); Mustee (216-267-3100); Kohler; Lasco (800-877-2005); and National (815-886-5900). Pre-fabricated units will have integral grab bars.

Install a shower curtain with weights to keep it down. Curtains are less cumbersome than swinging or sliding doors. Avoid dark-colored curtains as they block light and tend to invite mold. Try to find a curtain that has a 2'-0" border across the top that allows light to come through. Install the curtain rod as you would a grab bar so that it also can withstand a pulling force of 250 lbs. minimum. If you prefer a door, make sure it is made of tempered, laminated safety glass or acrylic to avoid injury.

Install a vapor resistant light in the shower. A good product is the Iris Line, made by Cooper lighting. A fold-down shower seat should be at least 15" wide. A good product is one with four legs that mounts to any roll-in shower without the need for wall re-enforcement. The stainless steel frame holds up to 420 lbs. It measures a nice 32" wide x 21"D (Accessible Designs, Inc., 877-853-7816).

The shower controls should be offset towards the room side of the shower so you don't have to reach or bend over to turn on the controls. The controls should have pressure balancing valves and a scald-protection device (Powers, 847-673-6700). This shower control has LCD temperature display within 1/10 of a degree and a ergonomic lever handle. It also has a high temperature limit stop.

Use a slide bar showerhead. This adjusts easily to accommodate a seated or standing bather. Alsons (800-421-0001) has a dual-purpose product that combines the features of a hand-held shower with the security of a grab bar. The full spray hand shower has a push button pause control and hoses come up to 70". This is model PB462. Delta also has a model, 912A, which is chrome, while Alsons is white. You can find the Delta model at your nearest home depot. It also has a pause control and comes with a 5'-0" hose. An 86" hose can also be purchased and is recommended. Alsons also has an ADA compliant Shower Spa body spray system that combines the features of a hand shower and the luxury of a whirlpool. It has two body sprays on the side wall land and one single body spray under the seat. Another good shower system is Jacló (800-852-3906).

## Lighting and Ventilation

A motion sensing light switch may be a good idea. Make sure there is a nightlight in the bathroom and that it is always on if you do not install a motion detector switch. Good lighting in the bathroom is one of the most important considerations to avoid accidents. This facilitates grooming and helps in finding the correct medicine bottle. You might want to hang a

magnifying glass immediately near the medicine cabinet to solve the problem of reading the small print on prescription bottles.

Dimmer switches will cut glare and heat when lights are not being used for close work. Choose lighting fixtures with blue UL labels (lights have been approved by the underwriters laboratory for use near a water source). Make sure your outlet has a ground fault interrupter (GFI) that is an instantaneous circuit cut-off in emergencies. Make sure a licensed electrician installs these.

Skylights should be made of white opal acrylic that diffuses and softens the light, as opposed to clear glass or plexiglass that projects a hard light. A tubular skylight I have used in the past is the Suntunel by Velux. It can stretch 20'-0 through a duct. This can go through the roof, down a shaft in the second floor, end at your bathroom ceiling and still be very luminous.

Regular skylights should have ultra-violet filters or an easily operated louvered shade that prevents sun damage and reduces sun-generated heat which is of great concern in warm climates. Check frequently for mold build-up near and in the skylight.

Motion sensor ventilation systems automatically turn on when you enter the room and you can adjust the shut off time from anywhere from 5 to 60 minutes after motion stops (Braun, 800-558-1711 and Nutone, 888-336-3948).

## Storage

Accessibility is of utmost concern here. Open shelves are a good idea. Drawers should always be the full extension type and linen closets should not be deeper than 24" so you can reach in without strain.

I hope this helps resolve some home improvement concerns in your existing home or things to think about in a new home. My book, *Universal Designed Homes for the 21st Century*, available through *Exceptional Parent* magazine, has 102 home plans and 20 pages of room-by-room features and benefits for the accessible home. Call 800-372-7368 ext. 110 to order. 