



BATHROOM REMODEL

Guide

VERSION 1.0 REVISED 01/15/15

GENERAL

The purpose of this guide is to clarify the minimum building code requirements when remodeling an existing bathroom without adding, modifying or removing structural elements (floors, walls or ceilings).

The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.

TIP! Failure to complete items below prior to inspection may result in a re-inspection fee.

RESIDENTIAL BUILDING CODE REQUIREMENTS

1. Provide hardwired, interconnected [smoke and carbon monoxide alarms](#) w/battery backup:
 - a. Smoke alarms inside each bedroom and immediately outside the sleeping rooms and areas..
 - b. Carbon monoxide alarms immediately outside the sleeping rooms and areas.
 - c. On each level including basements (not including crawl spaces), and habitable attics.
 - d. Provide battery smoke and carbon monoxide alarms when hardwiring is not possible.
2. Provide safety glazing for tub / shower enclosures and doors. Minimum width of shower doors is 22". Doors shall open outward. Shower door or rod shall be installed prior to final.
3. Provide safety glazing for windows in tub or shower enclosures within 60" above the drain inlet.
4. Use only approved tile backer materials and gyp board in bathrooms:
 - a. Non-absorbent finish material minimum 72" above the standing surface of tubs and showers.
 - b. Cement, fiber-cement or glass-mat gyp backers for adhesive application of finish materials (tile or other nonabsorbent sheet materials), or paint (above 72"), installed per manufacturer's instructions within shower stalls and bathtub surrounds.
 - c. Water-resistant gyp board shall not be used within shower stalls, bathtub compartments or other wet or humid areas, or on ceilings with joists greater than 12" on center. NOTE: As of January 1, 2008, all paperbacked gypsum board products such as "Green board", "Purple board", and "Mold Resistant board" are prohibited in shower and tub compartments and shall not be used as a backer for tile lath or concrete/cementitious board such as HardieBacker or WonderBoard.
 - d. Water-resistant gyp backers for tile or paint per manufacturer's instructions at water closet compartments.
 - e. Regular gyp board for tile or paint on walls and ceilings other than above.
 - f. Shower and tub compartment approved tile backer methods:

- 1) Method 1 using fiberglass mat backer board such as DensShield or GlasRoc.
 - a) Do not install a water-resistive vapor barrier behind Fiberglass Mat Backer Board.
- 2) Method 2 using cement and fiber-cement backer boards such as HardieBacker, Glas-crete, WonderBoard or Durarock.
 - a) A water-resistive vapor barrier is required behind cement board (min. Grade B paper).
- 3) Method 3 using traditional mortar backed lath and plaster.
 - a) A water-resistive barrier (minimum Grade B paper) is required behind lath.
5. Overcutting of studs or plates to accommodate plumbing pipes shall be repaired with 1-1/2" wide metal strap and fastened with minimum six 16d nails on each side of the cut.
6. Use 2x6 studs when plumbing pipes are over 3". The max. hole size is 3-5/8" for 2x6 and 2-1/8" for 2x4 studs.
7. Provide blocking for rails and cabinets.
8. Provide fire blocking at top and bottom of walls, and at ceiling and floor penetrations around vents, pipes, traps and ducts. Approved foam and caulking shall be certified materials that resist the free passage of flame and the products of combustion such as Touch 'n Seal Gun Foam II and listed fire blocking caulk.
9. Tub waste openings in framed construction to crawl spaces shall be protected from rodent intrusion with no openings greater than 1/2" inch. See FIGURE B-1 for an approved method of protection/access.

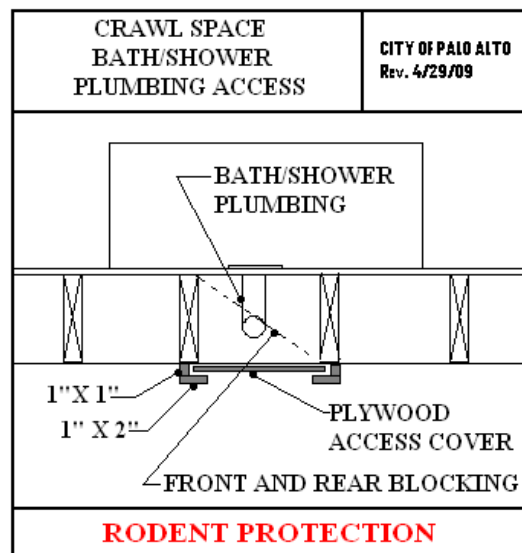


FIGURE B-1

ELECTRICAL CODE REQUIREMENTS

1. All new receptacles installed shall be tamper-resistant.
2. Provide a 20 amp dedicated circuit for new bathroom.

3. Provide at least 1 GFCI protected, tamper resistant receptacle within 3' of the edge of lavatory basin, or on the side of the vanity cabinet within 12 inches of the top. All receptacles in Bathrooms shall be GFCI protected and tamper resistant.
4. Receptacles shall not be installed within or directly over a bathtub or shower stall.
5. No parts of cord-connected luminaires (fixtures), chain-, cable- or cord-suspended-luminaires (fixtures), lighting track, pendants, or ceiling-suspended (paddle) fans shall be located within a zone measured 3 ft. horizontally and 8 ft. vertically from the top of the bathtub rim or shower stall threshold. This zone is all encompassing and includes the zone directly over the tub or shower stall. Luminaires (lighting fixtures) located in this zone shall be listed for damp locations, or listed for wet locations where subject to shower spray. See FIGURE E-1 on page 7 of this handout for more details.
6. Lighting fixtures in steam showers shall be listed for steam shower/vapor proof, GFCI protected, and shall have an electrical disconnect for the steam generator.
7. Hydro massage tubs shall be on a separate readily accessible GFCI protected circuit. The motor and all metal piping systems and all grounded metal parts in contact with water shall be connected with a solid copper bonding jumper not smaller than 8 AWG.
8. Where the hydro massage tub is cord and plug connected and the supply receptacle accessible only through the access opening, the receptacle shall be installed so the face is within direct view and not more than 12" from the access opening.

ENERGY BUILDING CODE REQUIREMENTS

1. Installing contractors shall fill out an individual CEC-CF2R form appropriate to their work and attach a signed copy to the building permit. Forms shall be reviewed by the building inspector at final inspection.
 - a. If new LIGHTING is installed, provide form [CEC-CF2R-LTG-01-E](#) (Revised 06/14).
 - b. If new INSULATION is installed, provide form [CEC-CF2R-ENV-03-E](#) (Revised 06/14).
 - c. If new WINDOWS are installed, provide form [CEC-CF2R-ENV-01-E](#) (Revised 06/14).
2. If adding new windows, the maximum U-Factor shall be 0.32 (No minimum SHGC)
3. If replacing / retrofitting existing windows, the maximum U-Factor shall be as follows:
 - a. Up to 75 square feet of windows, U-Factor 0.40 (No minimum SHGC)
 - b. More than 75 square feet of windows, U-Factor 0.32 (No minimum SHGC)
4. If adding or replacing skylights, the maximum U-Factor shall be as follows:
 - c. Up to 16 square feet of skylight, U-Factor 0.55 and minimum SHGC of 0.30.
 - d. More than 16 square feet of skylight, U-Factor 0.32,
5. NFRC temporary labeling on new windows shall not be removed until after inspection.
6. Install R-15 (or per CF-1R Performance) insulation in 2 x 4 walls, (R-19 in 2 x 6 walls), between conditioned and unconditioned space.

7. Install R-19 (or per CF-1R Performance) insulation at bathroom floors with accessible crawl spaces below.
8. Install R-30 (or per CF-1R Performance) insulation at ceilings exposed to unconditioned space.
9. Insulation shall be installed correctly with no gaps, voids or compressions, with interior surface flush with the face of framing members. Vapor barrier shall face the conditioned space. Insulation shall be in contact with all six sides of the framed bay.
10. Air leaks at bathroom windows shall be sealed and weather-stripped.
11. Air leaks at the building envelope shall be sealed prior to insulation installation.
12. Recessed lights in insulated ceilings shall be rated for insulation cover and air tight (IC / AT), and shall be sealed between the bottom of the housing and the top of the ceiling drywall with gasket or caulk. Note: The foam gasket often included with the trim ring is not sufficient to provide a seal.
13. Each bathroom shall have a minimum of one high efficacy luminaire. All other lighting in bathrooms shall be high efficacy or controlled by; approved vacancy sensor switches. More than one circuit of luminaires may be attached to the same vacancy sensor.
14. Bathroom ventilation fans shall comply with the following:
 - a. Bathroom fans shall be switched separately from lighting.
 - b. Bathroom fans shall be minimum 50 CFM.
 - c. Bathroom fans shall be controlled by switch or other device specified by the designer.
 - d. Bathroom fans shall be Energy Star Rated and shall be ducted to the exterior of the building.

GREEN BUILDING CODE REQUIREMENTS

1. Where a permit is issued for an addition or alteration that increases the conditioned floor area or volume of the home, and the scope of work includes an existing bathroom remodel or new bathroom, plus, the bathroom fan is not being used as part of whole house ventilation for Indoor Air Quality (IAQ), the fan shall be controlled by a humidistat control as follows:
 - a. The humidistat controls shall be capable of adjustment of relative humidity between 50% minimum to 80% maximum.
 - b. The controls may be manual or automatic.
 - c. The control component may be separate from or integral to the exhaust fan.
2. Where a permit is issued for remodeling an existing bathroom without adding, modifying or removing structural elements (floors, walls or ceilings), a humidistat is not required. However it is strongly recommended that a humidistat control for bathroom fans be installed as below.
3. If bathroom fan is being used as part of whole house ventilation for Indoor Air Quality (IAQ), a humidistat is not required. (This is because the fan must be in continuous operation).
4. If bathroom fan is being used as part of whole house ventilation for Indoor Air Quality (IAQ), the minimum ventilation rate is 1 Cubic Foot per Minute (CFM) per each 100 square feet of floor area plus 7.5 CFM per each bedroom.

5. If bathroom fan is used as IAQ ventilation it shall be rated for continuous operation with a manual override switch.
6. Maximum sound rating for a bathroom ventilation fan is 3 sones. However, if the bath fan is used to maintain Indoor Air Quality (IAQ), the maximum sound rating is 1 sone. A sone is a measure of loudness. The higher the sone rating the louder the sound. Sone ratings can be found on manufacturer's literature or website.
7. Note that a fan is required in a bathroom that contains a bathtub, shower, or tub/shower combination. A fan is not required in a bathroom that contains only a toilet and lavatory.
8. Supplemental electrical heater unit may be installed in a bathroom provided the capacity does not exceed 2 kW or 7,000 BTU per hour and is controlled by a maximum 30 minute timer.

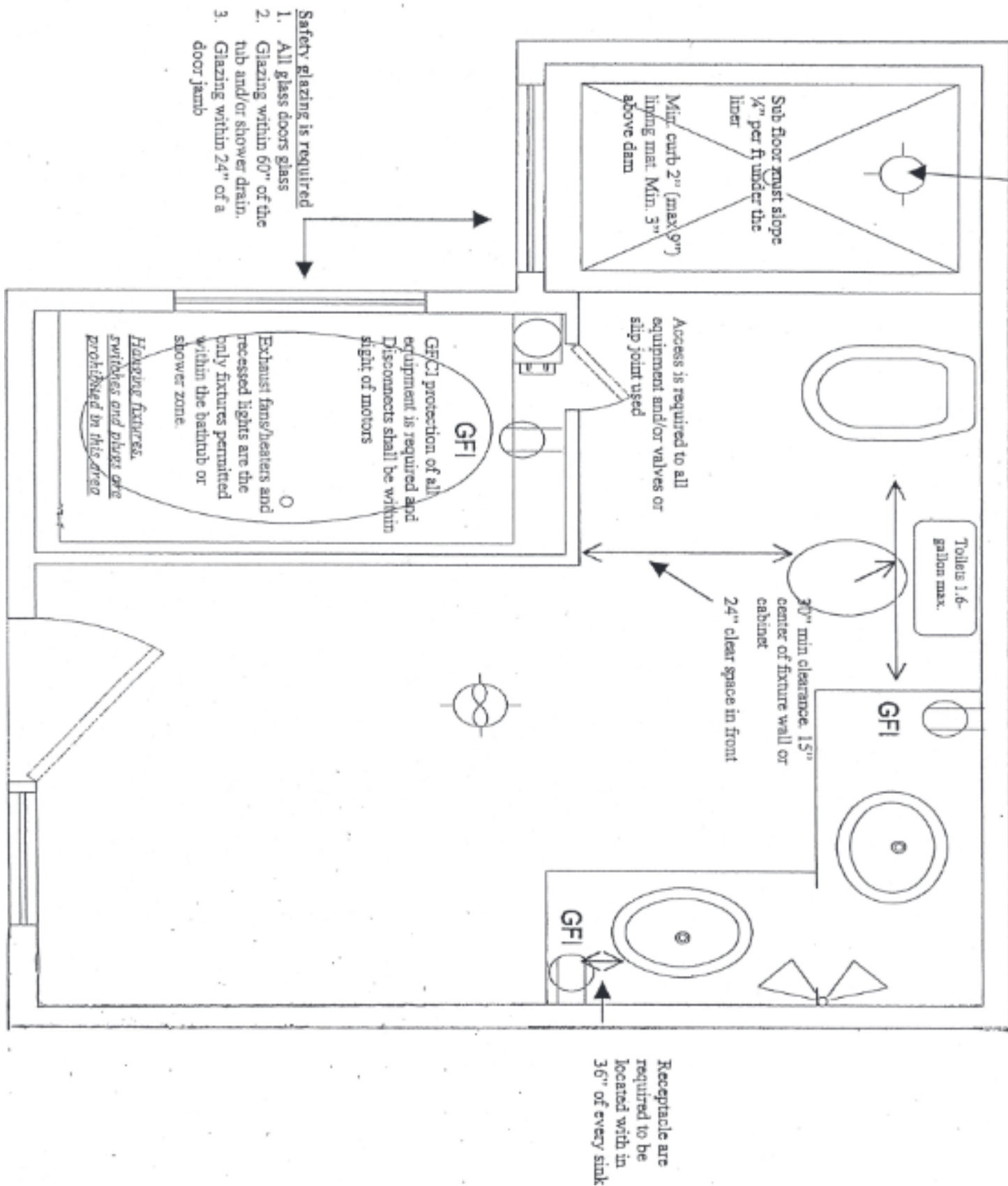
MECHANICAL CODE REQUIREMENTS

1. Provide a bathroom ventilation fan. Note that a bathroom is defined as a room with a toilet, sink and a , bathtub, shower or tub/shower combination.
2. Bathroom vents shall terminate not less than 3' from openings and property lines.

PLUMBING AND GREEN BUILDING CODE REQUIREMENTS

1. Shower heads shall be maximum 2.0 gallons per minute (GPM).
2. Multiple shower heads controlled by a single valve shall have a combined flow rate not to exceed 2.0 gallons per minute. Alternately, the valve may be designed to allow only one shower head (with a flow rate not to exceed 2.0 gallons per minute) to be in operation at a time. A hand held shower is considered a shower head.
3. Shower valves shall be a pressure/temperature balanced type that conforms to ASME 1016.
4. Vacuum breakers required for handheld shower head.
5. Where two separate handles control the hot and cold water, the left-hand faucet shall control hot water.
6. Locate the showerhead on the side wall of the shower compartment
7. Showers shall be finished with a nonabsorbent finish to a height of at least 72" above floor.
8. Showers shall be at least 32" x 32" or 1024 square inches with not less than 30" width. The measurement is taken from the top of the curb at the curb centerline to opposite wall. The clear area shall be maintained to minimum 70" above the drain.
 - a. An exception is allowed where an existing bathtub is replaced by a shower having an overall dimension of 30" wide by 60" long.
9. Steam showers shall be installed in accordance with the manufacturer's installation instructions. The instructions shall be available at inspections.
10. Bathtub fillers shall be limited to 120 degrees F by a device that conforms to ASME 1070.
11. Hydro massage tubs shall be installed in accordance with the manufacturer's installation instructions. The instructions shall be available at inspections.

12. Lavatory faucets shall be maximum 1.5 gallons per minute (GPM).
13. Minimum 1" airgap separation between flood level of sink and tub and the water supply outlet
14. Water closets shall be maximum 1.28 gallons per flush (GPF).
15. Dual flush water closets are permitted, provide the average of 2 reduced flushes and one full flush does not exceed 1.28 gpf. Example: If the dual flush toilet uses 1.6 gal for a full flush, and 1.0 gal for a reduced flush, $1.6 + 1.0 + 1.0 = 3.6 \text{ gal} / 3 = 1.2 \text{ GPF} = \text{OK}$, since the composite is less than 1.28 GPF.
16. Provide 30" minimum clear width for the water closet.
17. Provide 15" minimum clear side clearance from the center of water closet.
18. Provide 24" minimum clear in front of the water closet.
19. Provide caulking at the bottom of all water closets.
20. If using site constructed built-up shower receptors, all lining, hot-mopped or other approved materials shall be pitched one-quarter (1/4) inch per foot to weep holes in the sub drain of a smooth and solidly formed sub-base. All such lining materials shall extend upward on the rough jambs of the shower opening to a point no less than three (3) inches above the top of the finished dam or threshold and shall extend outward over the top of the rough threshold and be turned over and fastened on the outside face of both the rough threshold and the jambs. There shall be no perforations/nails lower than 1" above dam.
21. Shower pans shall be tested for water-tightness by filling with water to the level of the rough threshold. The test plug shall be so placed that both upper and under sides of the sub-pan shall be subjected to the test at the point where it is clamped to the drain. Test shall be 24 hours minimum. See FIGURE P-1 on Page 6.
22. At time of inspection, qualified person with proper tools shall remove test plug and demonstrate the weep hole function.



Top three frequently missed/inspection failures:
1. WRONG BACKER BOARD 2. WRONG FASTENERS 3. WRONG TEST PLUG

NOT ALLOWED:

GREEN BOARD, PURPLE BOARD, MOLD RESISTANT BOARD, ANY PAPER FACED BOARD IS NOT ALLOWED IN SHOWER AND TUB COMPARTMENTS.

APPROVED TILE BACKER METHODS FOR SHOWER AND TUB COMPARTMENT CRC R702.4.2

METHOD 1* FIBERGLASS MAT BACKER BOARD (DENSIELD, GLASROC)

• DO NOT INSTALL A WATER-RESISTIVE VAPOR BARRIER BEHIND FIBERGLASS MAT BACKER BOARD

METHOD 2. CEMENT AND FIBER-CEMENT BACKER BOARDS (HARDI-BACKER, GLAS-CRETE, DURAROCK)

• A WATER-RESISTIVE VAPOR BARRIER IS REQUIRED BEHIND CEMENT BOARD (MIN. GRADE B PAPER)

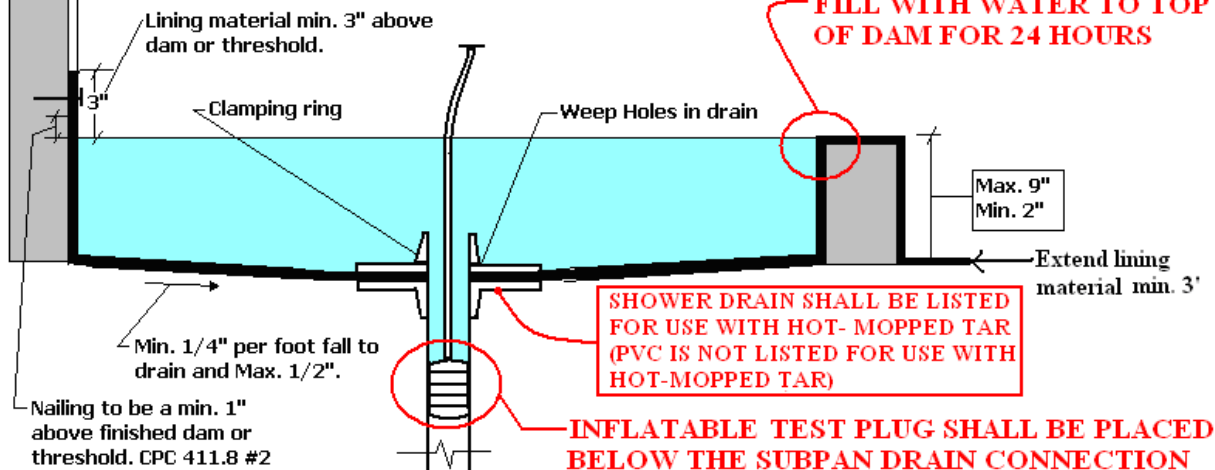
* MORTAR BACKED (LATH AND PLASTER)

• A WATER-RESISTIVE BARRIER (MINIMUM GRADE B PAPER) IS REQUIRED BEHIND LATH

ON-SITE BUILT-UP SHOWER RECEPTORS

FASTENERS SHALL BE CORROSION RESISTANT AND LISTED FOR THE BACKER BOARD (NOT BLACK DRYWALL SCREWS)

FILL WITH WATER TO TOP OF DAM FOR 24 HOURS



WRONG METHOD OF TESTING

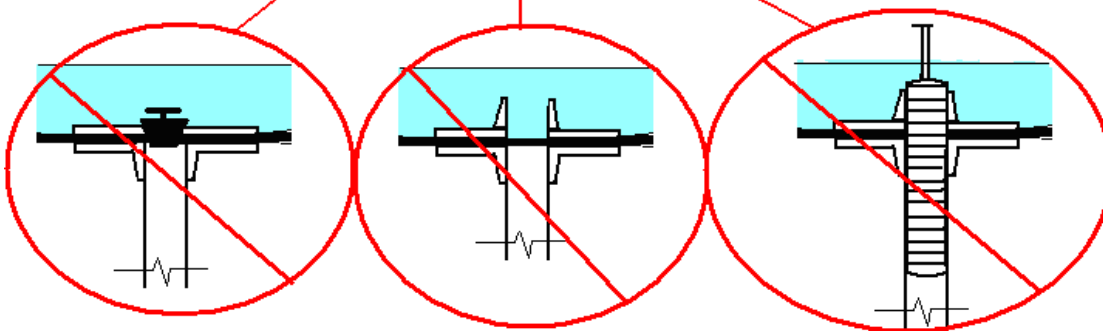


FIGURE P-1

Bathtub and shower zone

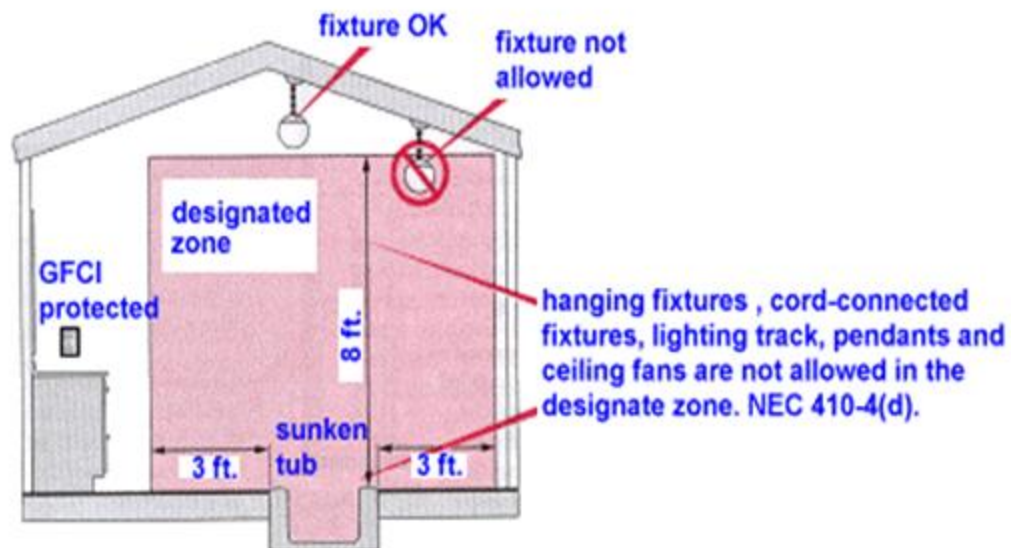
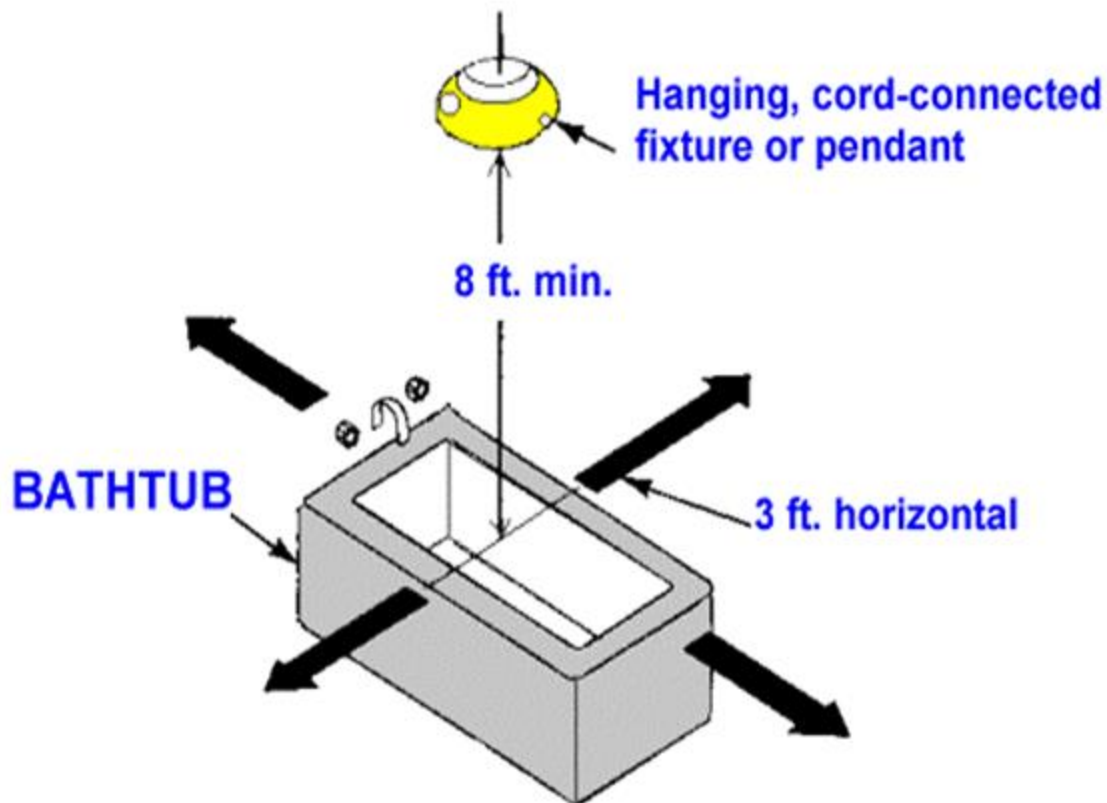


FIGURE E-1