



UNIFORM PLUMBING CODE

BASED ON THE 2015 UNIFORM PLUMBING CODE
QUICK-CARDS® A UNIQUE QUICK-REFERENCE GUIDE



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PLUMBING SYSTEMS - GENERAL REGULATIONS

UNIFORM PLUMBING CODE

The Uniform Plumbing Code (UPC) provides minimum standards for plumbing in order to safeguard life, health, property and public welfare. This code includes standards for all of the following topics: Plumbing Fixtures and Fixture Fittings; Water Heaters; Water Supply and Distribution; Sanitary Drainage; Indirect Wastes; Vents; Traps and Interceptors; Storm Drainage; Fuel Gas Piping; Health Care Facilities and Medical Gas and Medical Vacuum Systems; Firestop protection; Alternate Water Sources for Nonpotable Applications; and Nonpotable Rainwater Catchment Systems.

HANGERS & SUPPORTS (UPC Table 313.3)

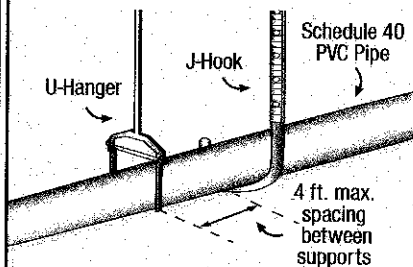
MATERIALS	TYPES OF JOINTS	HORIZONTAL	VERTICAL
Cast-iron Hubless	Shielded Coupling	Every other joint; Each joint if over 4 ft.	Base and Each Floor = 15 ft. max.
Steel Pipe for Water or DWV	Threaded or Welded	10 ft., if 3/4" or smaller 12 ft., if 1" or larger	Every Other Floor = 25 ft. max.
Schedule 40 PVC and ABS DWV	Solvent Cemented	4 ft., all sizes Allow for expansion every 30 ft.	Base and Each Floor = mid-story guides Note: Provide for expansion every 30 ft.
CPVC	Solvent Cemented	3 ft., if 1" or smaller 4 ft., if 1-1/4" or larger	Base and Each Floor = mid-story guides
PEX	Cold Expansion, Insert and Compression	32 in., if 1" or smaller 4 ft., if 1-1/4" or larger	Base and Each Floor = mid-story guides
PEX-AL-PEX	Metal Insert and Metal Compression	98 in., if 1/2", 3/4" or 1"	Base and Each Floor = mid-story guides

Note: This is an abridged table. For complete table see 2015 UPC Table 313.3

TRENCHING, EXCAVATION & BACKFILL (UPC 314.0)

- Trenches deeper than the footing of a building or structure and paralleling the same must be no less than 45° from the bottom exterior edge of the footing.
- Tunneling and driving is permitted in yards courts or driveways of a building site.
- Tunnels are permitted to be used between open-cut trenches if there is sufficient depth.
- Tunnels must have a clear height of 2' above the pipe and must be limited in length to one-half the depth of the trench, with a max. length of 8'.
- Where pipes are driven, the drive pipe must be no less than one size larger than the pipe to be laid.
- Excavations must be backfilled as soon after inspection as practicable.
- Trenches must be backfilled in thin layers to 12" above the top of the piping with clean earth.
- Fill must be properly compacted.
- Precautions must be taken to ensure permanent stability for pipe laid in filled or made ground.

SUPPORT AND SPACING



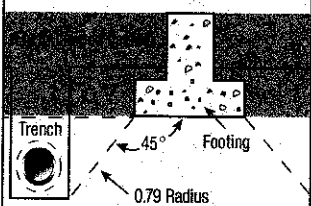
PROTECTION OF PIPING, MATERIALS & STRUCTURES (UPC 312.0)

- Building sewer or other drainage piping must not be installed under or within 2' of a building or structure or less than 1' below the surface of the ground.
- Water, soil or waste pipes must not be installed outside of a building, in attics or crawl spaces or in an exterior wall, unless freezing protection is provided.
- Joints at the roof around pipes, ducts or other appurtenances must be watertight by the use of lead, copper galvanized iron or other approved flashings or flashing material.
- Exterior wall openings must be made watertight.
- Plastic and copper or copper alloy piping penetrating framing members to within 1" of the exposed framing must be protected by steel nail plates a min. of No. 18 gauge in thickness.
 - The steel nail plate must extend along the framing member a min. of 1-1/2" beyond the outside diameter of the pipe or tubing.
- Piping through concrete and masonry walls and concrete floors must be protected by sleeves.
- Strainer plates on drain inlets must be designed and installed so that no opening exceeds 1/2" in the least dimension.
- ABS piping must not be exposed to direct sunlight, unless protected by water based synthetic latex paints.
- PVC piping must not be exposed to direct sunlight, unless protected by water based synthetic latex paints or must be wrapped with a min. of 0.04" thick tape.

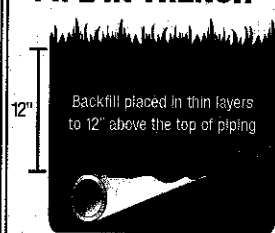
HANGERS & SUPPORTS (UPC 313.0)

- Piping must be supported in such a manner as to maintain its alignment and prevent sagging.
- Piping in the ground must be laid on a firm bed for its entire length.
- Hangers and anchors must be of sufficient strength to support the weight of the pipe and its contents.
- Piping must be isolated from incompatible materials.
- Hanger rod sizes must not be smaller than those shown in Table 313.6.

PIPE NEAR FOOTING LOCATION



PIPE IN TRENCH



HANGER ROD SIZES (UPC Table 313.6)

PIPE & TUBE SIZE (MIN.)	ROD SIZE (MIN.)
1/2" to 4"	3/8"
5" to 8"	1/2"
10" to 12"	5/8"

Note: Hanger rod sizes must not be smaller than those listed in this table. Hangers must be of sufficient strength to support the weight of the pipe and its contents.

TEST GAUGES (UPC 318.0)

PRESSURE TEST	GAUGE INCREMENTATION
10 psi or less	0.10 psi or less
Greater than 10 psi to 100 psi	1 psi or less
Greater than 100 psi	2% or less the required test pressure

Note: Tests which are performed utilizing dial gauges, must be limited to gauges having the pressure graduations or incrementations listed on this table.

PLUMBING FIXTURES & FIXTURE FITTINGS

INFO YOU MUST KNOW!

Fixture connections between drainage pipes and water closets, floor outlet service and urinals must be made by means of approved copper alloy, hard lead, ABS, PVC or iron flanges caulked, soldered, solvent cemented; rubber compression gaskets; or screwed to the drainage pipe. (UPC 402.6)

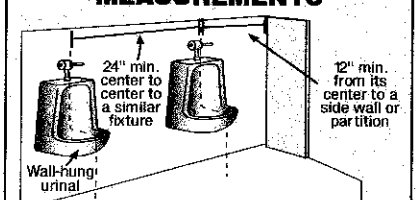
SECURING FLOOR-MOUNTED, BACK-OUTLET WATER CLOSET BOWLS (UPC 402.6.3)

- Floor-mounted, back-outlet water closet bowls must be set level with an angle of 90° between the floor and wall at the centerline of the fixture outlet.
- The floor and wall must have a flat mounting surface a min. of 5" to the right and left of the fixture outlet centerline.
- The fixture must be secured to the wall outlet flange or drainage connection and to the floor by corrosion-resistant screws or bolts.
- The closet flange must be secured to a firm base.
- Where floor-mounted, back-outlet water closets are used, the soil pipe must be a min. of 3" in diameter.
- Offset, eccentric or reducing floor flanges must not be used.

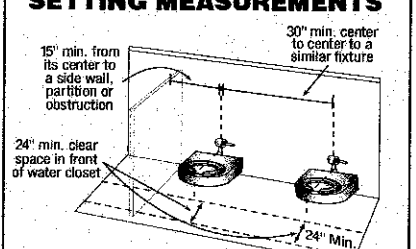
PLUMBING FIXTURES AND FIXTURE FITTINGS - MATERIALS & INSTALLATION (UPC 401.0; 402.0)

- Plumbing fixtures must be constructed of dense, durable, non-absorbent materials.
- Plumbing fixtures must have smooth, impervious surfaces, free from unnecessary concealed fouling surfaces.
- Plumbing fixtures must be installed in a manner to provide easy access for repairs and cleaning.
- Pipes from fixtures must be run to the nearest wall.
- Where a fixture comes in contact with the wall or floor, the joint between the fixture and the wall or floor must be made watertight.
- Floor-outlet or floor-mounted fixtures must be rigidly secured to the drainage connection and to the floor by screws or bolts of copper, copper alloy or other equally corrosion-resistant material.
- Wall-hung fixtures must be rigidly supported by metal supporting members so that no strain is transmitted to the connections.
- Flush tanks and similar appurtenances must be secured by approved non-corrosive screws or bolts.
- Fixtures must be set level and in proper alignment with reference to adjacent walls.
- No water closet or bidet must be set closer than 15" from its center to a side wall or obstruction nor closer than 30" center to center to a similar fixture.
- The clear space in front of a water closet, lavatory or bidet must be not less than 24".
- No urinal must be set closer than 12" from its center to a side wall or partition nor closer than 24" center to center.

URINALS - SETTING MEASUREMENTS



WATER CLOSET - SETTING MEASUREMENTS



INDIRECT WASTES

TERM ALERT!

★ **Air Gap, Drainage:** The unobstructed vertical distance through the free atmosphere between the lowest opening from a pipe, plumbing fixture, appliance or appurtenance conveying waste to the flood-level rim of the receptor.

MINIMUM AIR GAPS FOR WATER DISTRIBUTION (UPC Table 603.31)

FIXTURES WITH EFFECTIVE OPENINGS (IN DIAMETER)	WHERE NOT AFFECTED BY SIDEWALLS	WHERE AFFECTED BY SIDEWALLS
1/2" max.	1"	1-1/2"
3/4" max.	1-1/2"	2-1/4"
1" max.	2"	3"
Greater than 1"	2 times the diameter of effective opening	3 times the diameter of effective opening

CONNECTIONS FROM WATER DISTRIBUTION SYSTEM (UPC 801.5)

Indirect waste connections must be provided for drains, overflows or relief pipes from potable water pressure tanks, water heaters, boilers and similar equipment that is connected to the potable water distribution system. Such indirect waste connections must be made by means of a water-distribution air gap constructed in accordance with Table 603.31.

INDIRECT WASTE PIPING (UPC 803.3; 805.0; 806.0)

- No vent from indirect waste piping must combine with a sewer-connected vent, but must extend separately to the outside air.
- Indirect waste pipes exceeding 5' but less than 15' in length must be directly trapped, but such traps don't need to be vented.
- Indirect waste pipes less than 15' in length must not be less than the diameter of the drain outlet or tailpiece of the fixture, appliance or equipment served and in no case less than 1/2".
- Angles and changes of direction in such indirect waste pipes must be provided with cleanouts so as to permit flushing and cleaning.
- Indirect waste connections must be provided for drains, overflows or relief vents from the water supply system and no piping or equipment carrying wastes or producing wastes or other discharges under pressure must be directly connected to a part of the drainage system.
- Appliances, devices or apparatus such as stills, sterilizers and similar equipment requiring water and waste and used for sterile materials must be drained through an air gap.

FOOD & BEVERAGE HANDLING ESTABLISHMENTS (UPC 801.2; 801.31 - 801.3.3; 801.4)

- The size of the indirect waste pipe must not be smaller than the drain on the unit; min. of 1".
- The developed length must be 15' max.
- The size of the indirect waste pipe for ice-making machines must not be smaller than the drain on the unit; min. of 3/4".
- The piping from the food-handling fixtures or equipment to the receptor must not be less than the drain on the unit; min. 1/2".
- Each indirect waste pipe from food-handling fixtures or equipment must be separately piped to the indirect waste receptor and must not combine with other indirect waste pipes.
- For walk-in coolers, floor drains are permitted to be connected to a separate drainage line discharging into an outside receptor.
- The flood-level rim of the receptor must be no less than 6" lower than the lowest floor drain.
- Cleanouts must be provided at 90° turns and be accessible.
- Waste must discharge through an air gap or air break into a trapped and vented receptor.
- A full-size air gap is required where the indirect waste pipe is under vacuum.
- Where the trap serving the sink of a bar, soda fountain or counter cannot be vented, the sink drain must discharge through an air gap or air break into an approved receptor that is vented.
- The max. developed length from the fixture outlet to the receptor must be 5'.

PIPE CONNECTIONS IN BLOWOFF CONDENSERS AND SUMPS (UPC Table 810.1)

BOILERS BLOWOFF	WATER OUTLET	VENT
3/4"	3/4"	2"
1"	1"	2-1/2"
1-1/4"	1-1/4"	3"
1-1/2"	1-1/2"	4"
2"	2"	5"
2-1/2"	2-1/2"	6"

CONDENSATE WASTES & CONTROL (UPC 814.0)

- Condensate from air washers, air-cooling coils, condensing appliances and the overflow from evaporative coolers and similar water-supplied equipment or similar air-conditioning equipment must be collected and discharged to an approved plumbing fixture or disposal area.
- Where discharged into the drainage system, equipment must drain by means of an indirect waste pipe.
- The waste pipe must have a min. slope of 1/8" per foot or 1% slope and must be of approved corrosion-resistant material not smaller than the outlet size.
- Condensate or wastewater must not drain over a public way.
- Air-conditioning condensate waste pipes must connect indirectly to the drainage system through an air gap or air break to properly trapped and vented receptors, dry wells, leach pits or the tailpiece of plumbing fixtures.
- Condensate waste must not drain over a public way.

SUMPS, CONDENSERS & INTERCEPTING TANKS (UPC 810.2; 810.3; 810.4)

- Sumps, condensers or intercepting tanks that are constructed of concrete must have walls and bottom a min. of 4" in thickness and the inside must be cement plastered a min. of 1/2" in thickness.
- Condensers constructed of metal must not be less than No. 12 U.S. standard gauge and such metal condensers must be protected from external corrosion by an approved bituminous coating.
- Sumps and condensers must be provided with suitable means of access for cleaning and must contain a volume of not less than twice the volume of water removed from the boiler or boilers connected thereto where the normal water level of such boiler or boilers is reduced to a min. of 4".
- An indirect waste interceptor receiving discharge-containing particles that would clog the receptor drain must have a readily removable beehive strainer.

INDIRECT WASTE RECEPTORS (UPC 804.0)

- Plumbing fixtures or other receptors receiving the discharge of indirect waste pipes must be:
 - approved for the use proposed.
 - of such shape and capacity as to prevent splashing or flooding.
 - located where they are readily accessible for inspection and cleaning.
- A standpipe receptor for a clothes washer must extend a min. of 18" and a max. of 30" above its trap.
- A trap for a clothes washer standpipe receptor must be roughed in a min. of 6" and a max. of 18" above the floor.
- No indirect waste receptor must be installed in a toilet room, closet, cupboard or storeroom, nor in a portion of a building not in general use by the occupants thereof.
- Standpipes for clothes washers are permitted to be installed in toilet and bathroom areas where the clothes washer is installed in the same room.

MIN. CONDENSATE PIPE SIZE (UPC Table 814.3)

EQUIPMENT CAPACITY	MIN. CONDENSATE PIPE DIAMETER
up to 20 tons of refrigeration	3/4"
21 to 40 tons of refrigeration	1"
41 to 90 tons of refrigeration	1-1/4"
91 to 125 tons of refrigeration	1-1/2"
126 to 250 tons of refrigeration	2"

TRAPS

TRAPS (UPC 1001.0; 1002.0; 1003.0)

- Each plumbing fixture must be separately trapped by an approved type of liquid seal trap.
- The liquid seal must be a min. of 2" and a max. of 4".
- One trap is permitted per trap arm.
- Food waste disposers installed with a set of restaurant, commercial or industrial sinks must be connected to a separate trap.
- Each domestic clothes washer and each laundry tub must be connected to a separate and independent trap.
- A trap serving a laundry tub can also receive the waste from a clothes washer if it is adjacent to it.
- The vertical distance between a fixture outlet and the trap weir must be as short as practicable; the tailpiece from a fixture must not exceed 24" in length.
- One trap can serve a max. of 3 single compartment sinks or laundry tubs of the same depth or 3 lavatories immediately adjacent to each other and in the same room where the waste outlets are no more than 30" apart.
- The trap must be centrally located where 3 compartments are installed.
- Each plumbing fixture trap must be protected against siphonage, backpressure and air circulation must be assured throughout the drainage system by means of a vent pipe.
- A trap arm is permitted to change direction without the use of a cleanout if change of direction does not exceed 90° F.
- Each trap must be self-cleaning.
- Traps must be of ABS, cast-brass, cast-iron, lead, PP, PVC or other approved material.

DRAINAGE FIXTURE UNITS FOR A TRAP & TRAP ARM (UPC Table 702.2)

SIZE OF TRAP & TRAP ARM	DRAINAGE FIXTURE UNITS (MAX.)
1-1/4" trap and trap arm	1 drainage fixture unit
1-1/2" trap and trap arm	3 drainage fixture units
2" trap and trap arm	4 drainage fixture units
3" trap and trap arm	6 drainage fixture units
4" trap and trap arm	8 drainage fixture units

DRAINAGE FIXTURE UNIT VALUES (DFU) (UPC Table 702.1)

PLUMBING APPLIANCES, APPURTENANCES OR FIXTURES	MIN. SIZE TRAP & TRAP ARM	PRIVATE	PUBLIC
Bath tub or Combination Bath/Shower	1-1/2"	2.0	2.0
Kitchen, domestic sink (with or without food waste grinder, dishwasher or both)	1-1/2"	2.0	2.0
Lavatory, single	1-1/4"	1.0	1.0
Shower, Single-Head Trap	2"	2.0	2.0
Water Closet, 1.6 GPF Gravity Tank	3"	3.0	4.0
Water Closet, 1.6 GPF Flushometer Tank	3"	3.0	4.0

Note: This is an abridged table, for complete table see 2015 UPC Table 702.1.

TERM ALERT!

★ **Trap:** A fitting or device that prevents the back passage of air without materially affecting the flow of sewage or wastewater through it.

HORIZONTAL LENGTHS OF TRAP ARMS^{1,2,3} (UPC Table 1002.2)

TRAP ARM PIPE DIAMETER	DISTANCE TRAP TO VENT MINIMUM	LENGTH MAXIMUM
1-1/4"	2-1/2"	30"
1-1/2"	3"	42"
2"	4"	60"
3"	6"	72"
4"	8"	120"
Exceeding 4"	2 x Diameter	120"

¹ Maintain 1/4 inch per foot slope.
² The developed length between the trap of a water closet or similar fixture (measured from the top of the closet flange to the inner edge of the vent) and its vent must not exceed 6 feet.
³ This table is not applicable to water closets and similar fixtures.

PLUMBING FIXTURES & FIXTURE FITTINGS

MAXIMUM FIXTURE & FIXTURE FITTINGS FLOW RATES (UPC Table L 402.1)

FIXTURE TYPE	FLOW RATE
Showerheads	2.0 gpm at 80 psi
Lavatory faucets residential	1.5 gpm at 60 psi
Metering faucets	0.25 gallon/cycle
Water closets - other than remote locations	1.28 gallon/flush
Water closets - remote locations	1.6 gallons/flush
Urinals	0.5 gallons/flush

Note: This is an abridged table. For complete table see 2015 UPC Table L 402.1

BATHTUBS & WHIRLPOOL BATHTUBS (UPC 409.0)

- Bathtubs and whirlpool bathtubs must be provided with a waste outlet and tailpiece a min. of 1-1/2" in diameter.
- Waste outlets must be provided with an approved stopper or strainer.
- The max. hot water temperature discharging from the bathtub and whirlpool bathtub filler must be limited to 120°F.
- The water supply to a bathtub and whirlpool bathtub filler valve must be protected by an air gap.
- Bathtubs and whirlpool bathtubs must be installed in accordance with the manufacturer's installation instructions.
- Access openings must be of size and opening to permit the removal and replacement of the circulation pump.
- Whirlpool pump access located in the crawl space must be located a max. of 20' from an access door, trap door, or craw hole.
- The circulation pump must be located above the crown weir of the trap.
- The pump and the circulation piping must be self-draining to minimize water retention.

FLUSHOMETER VALVES (UPC 413.2)

- No manually controlled flushometer valve must be used to flush more than one urinal.
- Each urinal flushometer valve must be an approved, self-closing type discharging a predetermined quantity of water.
- Flushometers must be installed so that they are accessible for repair.
- Flushometer valves must not be used where the water pressure is insufficient to properly operate them.
- Where the valve is operated, it must complete the cycle of operation automatically, opening fully, and closing positively under the line water pressure.
- Each flushometer must be provided with a means for regulating the flow through it.

SHOWERS & SHOWER COMPARTMENTS (UPC 408.0)

- Showerheads must have a max. flow rate of 2.5 gpm at 80 psi.
- Showers must have a waste outlet and fixture tailpiece a min. of 2" in diameter.
- Strainers serving shower drains must have a waterway at least equivalent to the area of the tailpiece.
- Shower compartments, regardless of shape, must have a min. finished interior of 1024 in² and must also be capable of encompassing a 30" diameter circle.
- The min. required area and dimensions of a shower compartment must be measured at a height equal to the top of the threshold and at a point tangent to its centerline.
- The area and dimensions of a shower compartment must be maintained to a point of no less than 70" above the shower drain outlet with no protrusions other than the fixture valve or valves, showerhead, soap dishes, shelves and safety grab bars or rails.
- Fold-down seats in accessible shower stalls are allowed to protrude into the 30" circle.
- Showers with a built in place, permanent seat or seating area must be first lined with sheet plastic, lead, copper or must be lined with other durable and watertight materials that extend a min. of 3" above horizontal surfaces of the seat or the seating area.
- Showers and tub-shower combinations must be provided with individual control valves of the pressure balance, thermostatic or combination pressure balance/thermostatic mixing valve type.
- Control valves must provide scald and thermal shock protection for the rated flow rate of the installed showerhead.
- Handle position stops must be provided on such valves and must be adjusted per the manufacturer's instructions to deliver a max. mixed water setting of 120°F.

WATER CLOSETS - TYPE & MATERIAL (UPC 411.3)

- Water closet seats must be of smooth, non-absorbent material.
- Water closet seats, for public use, must be of the elongated type and either of the open front type or have an automatic seat cover dispenser.
- Water closet seats must be properly sized for the water closet bowl type.

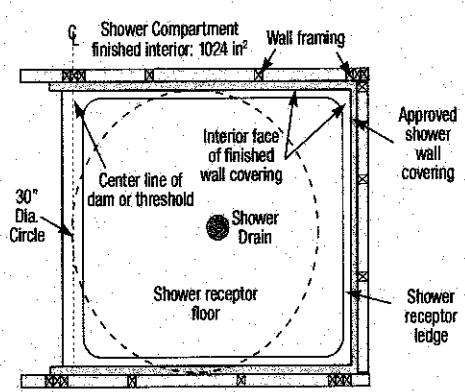
BIDETS (UPC 410.0)

- The water supply to the bidet must be protected by an Air Gap, an Atmospheric Vacuum Breaker (AVB), a Pressure Vacuum Breaker Backflow Prevention Assembly (PVB) or a Spill-resistant Pressure Vacuum Breaker (SVB).
- The max. hot water temperature discharging from a bidet must be limited to 110°F.

WATER SUPPLY FOR FLUSH TANKS (UPC 413.4)

- The water supply for flushing tanks and flushometer tanks equipped for manual flushing must be controlled by a float valve or other automatic device designed to refill the tank after each discharge and to completely shut off the water flow to the tank when the tank is filled to operational capacity.
- Provision must be made to automatically supply water to the fixture so as to refill the trap seal after each flushing.

SHOWERS AREA



SHOWERS - FINISHED CURB OR THRESHOLD (UPC 408.5)

- Where a shower receptor has a finished dam, curb or threshold it must be a min. of 1" lower than the sides and back of such receptor.
- In no case must a dam or threshold be less than 2" or more than 9" in depth where measured from the top of the dam or threshold to the top of the drain.
- Each such receptor must be provided with an integral nailing flange to be located where the receptor meets the vertical surface of the finished interior of the shower compartment.
- The flange must be watertight and extend vertically a min. of 1" above the top of the sides of the receptor.
- The finished floor of the receptor must slope uniformly from the sides towards the drain a min. of 1/4" per foot and a max. of 1/2" per foot.
- Thresholds must be of sufficient width to accommodate a min. 22" door.
- Shower doors must open so as to maintain a min. of 22" unobstructed opening for egress.
- Shower receptors must have the subfloor and rough side of walls to a min. height of 3" above the top of the finished dam or threshold must be first lined with sheet plastic, lead or copper or other durable and watertight materials.

OVERFLOWS IN FLUSH TANKS (UPC 413.5)

- Flush tanks must be provided with overflows discharging into the water closet or urinal connected thereto.
- Overflows supplied as original parts with the fixture must be of sufficient size to prevent tank flooding at the maximum rate at which the tank is supplied with water under normal operating conditions and where installed in accordance with the manufacturer's installation instructions.

VENTS

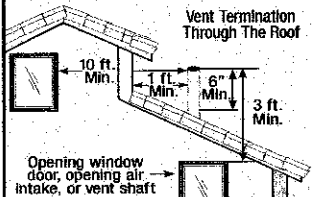
VENTS - GENERAL REQUIREMENTS (UPC 901.2 - 902.1)

- Air circulation must be ensured throughout all parts of the drainage system by vent pipes.
- The vent system must be designed to prevent a trap seal from being exposed to a pressure differential that exceeds 1" water column on the outlet side of the trap.
- Vent piping is not required where an interceptor acts as a primary settling tank and discharges through a horizontal indirect waste pipe into a secondary interceptor.

VERTICAL WET VENTING (UPC 908.1)

- Wet-vented fixtures must be within the same story.
- No wet vent must exceed 6' in developed length.
- Each wet-vented section must be a min. of 2'.
- Each wet-vented section must exceed the required min. waste pipe size of the upper fixture and the required min. pipe size by at least one pipe size.

ROOF TERMINATION



VENT - ROOF TERMINATION (UPC 906.0)

- Each vent pipe or stack must extend through its flashing and must terminate vertically a min. of 6" above the roof and a min. of 1' from a vertical surface.
- Each vent must terminate a min. of 10' from or 3' above an operable window, door, opening, air intake, or vent shaft.
- Each vent must terminate a min. of 3' in every direction from a lot line, alley and street excepted.
- Vent pipes must be extended separately or combined a min. of 6" above the roof or fire wall.
- Vents within 10' of a part of the roof that is used for other assembly purposes or parking must extend a min. of 7' above such roof and must be securely stayed.
- Joints at the roof around vent pipe must be made watertight by the use of approved flashings or flashing material.

VENT PIPE GRADES & CONNECTIONS (UPC 905.0)

- Vent and branch vent pipes must be free from drops or sags.
- Each vent must be level or must be so graded and connected as to drip back by gravity to the drainage pipe it serves.
- Where vents connect to a horizontal drainage pipe, each vent pipe must have its invert taken off above the drainage centerline of such pipe downstream of the trap being served.
- Each vent must rise vertically to a point no less than 6" above the flood-level rim of the fixture served before off-setting horizontally.
- Where 2 or more vent pipes converge, each such vent pipe must rise to a point not less than 6" in height above the flood-level rim of the plumbing fixture it serves before being connected to any other vent.
- Vents less than 6" above the flood-level rim of the fixture must be installed with approved drainage fittings, material and grade to the drain.
- Vent pipes must extend undiminished in size above the roof or must be reconnected with a soil or waste vent of proper size.
- The vent pipe opening from a soil or waste pipe must not be below the weir of the trap.
- Two fixtures must be permitted to be served by a common vertical pipe where each such fixture wastes separately into an approved double fitting having inlet openings at the same level.

MAX. UNITS & LENGTH OF VENT PIPING - HORIZONTAL & VERTICAL (UPC Table 703.2)

Size of Pipe	1-1/4"	1-1/2"	2"	3"	4"	5"	6"	8"
Max. Units	1	8	24	84	256	600	1380	3600
Max. Lengths	45	60	120	212	300	390	510	750

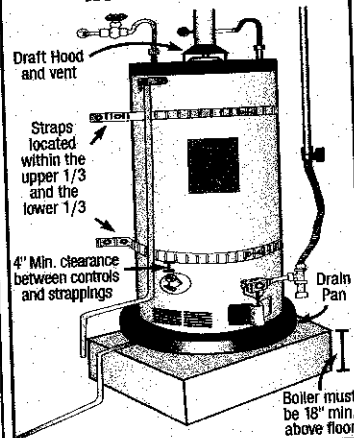
Note: This is an abridged table. For complete table see 2015 UPC Table 703.2

WATER HEATERS

INFO YOU MUST KNOW!

It is unlawful for a person to install, remove or replace a water heater without first obtaining a permit from the Authority Having Jurisdiction. (UPC 502.2)

WATER HEATER INSTALLATION



WATER HEATER INSTALLATION SUPPORT (UPC 507.0)

Ground Support: A water heater supported from the ground must rest on level concrete or other approved base extending a min. of 3" above the adjoining ground level.

Drainage Pan: Where a water heater is located in an attic in or on, attic-ceiling assembly, floor-ceiling assembly or floor-subfloor assembly where damage may result from a leaking water heater, a watertight pan of corrosion-resistant materials must be installed beneath the water heater with a min. of 3/4" diameter drain to an approved location. Such pan must be a min. of 1-1/2" in depth.

Installation in Garages: Appliances in garages and in adjacent spaces that open to the garage that are not part of the living space of a dwelling unit must be installed so that burners and burner-ignition devices are located a min. of 18" above the floor.

- Appliances installed in garages, warehouses or other areas subject to mechanical damage must be installed behind protective barriers or be elevated or located out of the normal path of vehicles.
- Access from the Outside Only. Appliances installed within a garage, enclosed in a separate, enclosed space having access only from outside of the garage, such appliances are permitted to be installed at floor level, provided the required combustion air is taken from the exterior of the garage.

Seismic Provisions: In seismic design categories C, D, E and F water heaters must be anchored or strapped to resist horizontal displacement due to earthquake motion.

- Strapping must be at points within the upper 1/3 and lower 1/3 of its vertical dimensions.
- At the lower point, a distance of no less than 4" must be maintained from the controls with the strapping.

LIMITATIONS OF HOT WATER (UPC 225.0; 409.4; 410.3; 407.3)

APPLIANCES, APPURTENANCES OR FIXTURES	MAXIMUM TEMPERATURE
Bathtubs and Whirlpool Bathtubs	120°F
Bidets	110°F
Public Lavatories	120°F
Water Heater or Hot Water Heating Boiler	210°F

INFO YOU MUST KNOW!

Backflow prevention devices with atmospheric vents or ports must not be installed in pits, underground or submerged locations. (UPC 603.4.9)

TERM ALERT!

★ **Water Heater or Hot Water Heating Boiler:** An appliance designed primarily to supply hot water for domestic or commercial purposes and equipped with automatic controls limiting water temperature to a maximum of 210°F.

WATER HEATERS - VENTS & CLEARANCES (UPC 504.2; 504.3)

- Water heaters of other than the direct-vent type must be located as close as practical to the chimney or gas vent.
- The clearances must not be such as to interfere with combustion air, draft hood clearance and relief and accessibility for servicing.
- Listed water heaters must be installed in accordance with their listings and the manufacturer's installation instructions.
- Unlisted water heaters must be installed with a clearance of 12" on all sides and rear.
- Combustible floors under unlisted water heaters must be protected in an approved manner.

VENTING OF GAS APPLIANCE PRESSURE REGULATORS (UPC 507.21)

- A regulator must not be vented to the appliance flue or to the exhaust system.
- In the case of vents entering the combustion chamber, the vent must be located so the escaping gas is able to be readily ignited by the pilot and the heat liberated thereby will not adversely affect the normal operation of the safety shutoff system.
- The terminus of the vent must be securely held in a fixed position relative to the pilot.
- Vent lines must not terminate in positive-pressure-type combustion chambers.

GAS VENTS (UPC 509.6.2.5; 509.6.3.2)

- A gas vent must extend through the entire roof flashing, roof jack or roof thimble and be terminated with a listed termination cap.
- Type B or Type L vents must extend in a vertical direction with offsets not exceeding 45° except that a vent system having not more than one 60° offset is permitted.

FIRST HOUR RATING (UPC Table 610.1(1))

The min. capacity for storage water heaters must be in accordance with the first hour rating.

Number of Bathrooms	1 to 1.5					2 to 2.5					3 to 3.5											
	1	2	3	4	5	3	4	5	6	3	4	5	6									
Number of Bedrooms	1	2	3	2	3	4	5	3	4	5	6	42	54	54	54	67	67	80	67	80	80	80
First Hour Rating, Gallons	42	54	54	54	67	67	80	67	80	80	80											

WATER SUPPLY AND DISTRIBUTION

GENERAL REQUIREMENTS FOR ASSEMBLIES (UPC 603.4.3; 603.4.4)

Access and Clearance: Must follow the manufacturer's instructions and be a min. of 12" between the lowest portion of the assembly and grade, floor or platform.

Elevated Installations: Installations exceeding 5' above the floor or grade must be provided with a permanent platform capable of supporting a tester or maintenance person.

Connections:

- Where potable water is discharged to the drainage system, it must be by means of an approved air gap of two pipe diameters of the supply inlet, but in no case must the gap be less than 1".
- Connection must be permitted to be made to the inlet side of a trap provided that an approved vacuum breaker is installed a min. of 6" above the flood-level rim of such trapped fixture, so that at no time will such device be subjected to backpressure.

WATER SUPPLY FIXTURE UNITS (WSFU) & MIN. FIXTURE BRANCH PIPE SIZES - SINKS (UPC Table 610.3)

TYPE OF SINK	MIN. FIXTURE BRANCH PIPE SIZE	PRIVATE	PUBLIC
Bar	1/2"	1.0	2.0
Clinic Faucet	1/2"	—	3.0
Clinic Flushometer valve with or without faucet	1"	—	8.0
Kitchen, domestic with or without dishwasher	1/2"	1.5	1.5
Laundry	1/2"	1.5	1.5
Service or Mop Basin	1/2"	1.5	3.0
Washup, each set of faucets	1/2"	—	2.0

WATER SUPPLY INLETS (UPC 603.5.5)

Water supply inlets to tanks, vats, sumps, swimming pools and other receptors must be protected by one of the following means:

- An approved air gap.
- A listed vacuum breaker installed on the discharge side of the last valve with the critical level not less than 6" or in accordance with its listing.
- A backflow preventer suitable for the degree of hazard, installed in accordance with the requirements for that type of device or assembly.

WATER CLOSET & URINAL FLUSHOMETER VALVES (UPC 603.5)

Backflow Prevention: Water closet flushometer tanks must be protected against backflow by an approved backflow prevention assembly, device or method.

Atmospheric Vacuum Breaker: Where the valves are equipped with an atmospheric vacuum breaker, the vacuum breaker must be installed on the discharge side of the flushometer valve with the critical level a min. of 6" above the overflow rim of a water closet bowl or the highest part of a urinal.

Ballcock: Water closet and urinal tanks must be equipped with a ballcock. The ballcock must be installed with the critical level a min. of 1" above the full opening of the overflow pipe.

In cases where the ballcock has no hush tube, the bottom of the water supply inlet must be installed 1" above the full opening of the overflow pipe.

WATER SUPPLY FIXTURE UNITS (WSFU) & MIN. FIXTURE BRANCH PIPE SIZES (UPC TABLE 610.3)

FIXTURE	MIN. FIXTURE BRANCH PIPE SIZE	PRIVATE	PUBLIC
Bath tub or Combination Bath/Shower (fill)	1/2"	4.0	4.0
Bath tub or Combination Bath/Shower (fill) 3/4 inch Bathtub Fill Valve	3/4"	10.0	10.0
Bidet	1/2"	1.0	—
Clothes Washer	1/2"	4.0	4.0
Dental Unit, cuspidor	1/2"	—	1.0
Dishwasher, domestic	1/2"	1.5	1.5
Drinking Fountain or Water Cooler	1/2"	0.5	0.5
Hose Bibb	1/2"	2.5	2.5
Lavatory	1/2"	1.0	1.0
Lawn Sprinkler, each head	—	1.0	1.0
Mobile Home, each (min.)	—	12.0	—
Shower, per head	1/2"	2.0	2.0
Urinal, flush tank	1/2"	2.0	2.0
Wash Fountain, circular spray	3/4"	—	4.0
Water Closet, 1.6 GPF Gravity tank	1/2"	2.5	2.5
Water Closet, 1.6 GPF Flushometer Tank	1/2"	2.5	2.5
Water Closet, greater than 1.6 GPF Gravity Tank	1/2"	3.0	5.5

Note: This is an abridged table. For complete table see 2015 UPC Table 610.3.

SANITARY DRAINAGE

INFO YOU MUST KNOW!

The min. size of vertical and horizontal drainage piping is determined by the total number of fixture units connected and by the length run of the pipe. See Unit Loading and Length of Drainage and Vent Piping Table.

DRAINAGE PIPING (UPC 701.2)

- Galvanized wrought-iron, galvanized steel and stainless steel 304 pipe must be kept a min. of 6" aboveground.
- Vitrified clay pipe or fittings must be kept a min. of 12" belowground.

SEWAGE DISCHARGE (UPC 710.2)

Drainage piping serving fixtures that are located below the crown level of the main sewer must discharge into an approved watertight sump or receiving tank, so located as to receive the sewage or wastes by gravity. From such sump or receiving tank, the sewage or other liquid wastes must be lifted and discharged into the building drain or building sewer by approved ejectors, pumps or other approved mechanical devices.

SUMP & RECEIVING TANK

(UPC 710.8; 710.9; 710.10)

- Sumps and receiving tanks must be watertight and must be constructed of concrete, metal or other approved materials.
- Where constructed of poured concrete, the walls and bottom must be adequately reinforced.
- Metal sumps or tanks must be of such thickness as to serve their intended purpose and must be treated internally and externally to resist corrosion.
- Sumps and receiving tanks must be automatically discharged and, where in a "public use" occupancy, must be provided with dual pumps or ejectors arranged to function alternately in normal use and independently in case of overload or mechanical failure.
- The pumps must have an audio and visual alarm that signals pump failure or an overload condition.
- The lowest inlet must have a min. clearance of 2" from the high-water or "starting" level of the sump.
- Sumps and receiving tanks must be provided with substantial covers having a bolt-and-gasket-type manhole or equivalent opening to permit access for inspection, repairs and cleaning.
- The top must be provided with a vent pipe that must extend separately through the roof or, where permitted, be combined with other vent pipes.
- Vent must be large enough to maintain atmospheric pressure within the sump under normal operating conditions and, in no case, must be less in size than that required for the number and type of fixtures discharging into the sump, nor less than 1-1/2" in diameter.
- Where the vent, after leaving the sump, is combined with vents from fixtures discharging into the sump, the size of the combined vent does not need to exceed the required for the total number of fixtures discharging into the sump.
- No vent from an air operating sewage ejector must combine with other vents.

DRAINAGE FITTINGS (UPC 701.3; 701.5; 701.6)

- Materials for drainage fittings must be of the same diameter as the piping served and such fittings must be compatible with the type of pipe used.
- Fittings on screwed pipe must be of the recessed drainage type.
- Burred ends must be reamed to the full bore of the pipe.
- Threads of drainage fittings must be tapped to allow 1/4" per ft. grade.
- Fittings used for drainage must be of the drainage type, have a smooth interior water-way and be constructed to allow 1/4" per ft. grade.
- Sheet lead for safe pans - min. 4 lb/ft² or 1/16" thick.
- Sheet lead for flashings or vent terminals - min. 3 lb/ft² or 0.0472" thick.
- Lead bends and lead traps must be a min. of 1/8" wall thickness.
- Caulking ferrules and soldering bushings must be manufactured from copper or copper alloy.

SEWAGE EJECTOR & PUMPS (UPC 702.3; 710.3)

- A sewage ejector or sewage pump receiving the discharge of water closets or urinals must have a min. discharge capacity of 20 gpm.
- In single dwelling units, the ejector or pump must be capable of passing a 1-1/2" diameter solid ball.
- In single dwelling units the discharge piping of each ejector or pump must have a backwater valve and gate valve and must be a min. of 2" in diameter.
- In other than single-dwelling units, the ejector or pump must be capable of passing a 2" diameter solid ball.
- In other than single-dwelling units, the discharge piping of each ejector or pump must have a backwater valve and gate valve and be a min. of 3" in diameter.
- For a continuous flow into a drainage system, such as from a pump, sump ejector, air conditioning equipment, or similar device, 2 fixture units must be equal to each gallon per minute (gpm) of flow.

DISCHARGE LINE (UPC 710.4)

- The discharge line from such ejector, pump or other mechanical device must be provided with an accessible backwater or swing check valve and gate or ball valve.
- Where the gravity drainage line to which such discharge line connects is horizontal, the method of connection must be from the top through a wye branch fitting.
- The gate or ball valve must be located on the discharge side of the backwater or check valve.
- Gate or ball valves, where installed in drainage piping, must be fullway type with working parts of corrosion-resistant metal.
- Sizes 4" or more in diameter must have cast-iron bodies and sizes less than 4" cast-iron or copper alloy bodies.

GRADE OF HORIZONTAL DRAINAGE PIPING

(UPC 708.0; 709.0)

- Horizontal drainage piping must be run in practical alignment and a min. uniform slope of 1/4" per foot or 2% toward the point of disposal.
- Where practicable, plumbing fixtures must be drained to the public sewer or private sewage disposal system by gravity.

SIZE OF BUILDING DRAINS & SEWERS (UPC 710.5)

- Building drains or building sewers receiving discharge from a pump or ejector must be adequately sized to prevent overloading.
- Two fixture units must be allowed for each gallon per minute of flow.

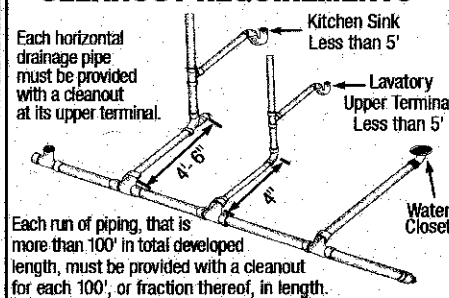
CLEANOUTS (UPC 707.0)

- Each cleanout fitting for cast-iron pipe must consist of a cast-iron or copper alloy body and an approved plug.
- Each cleanout for galvanized wrought-iron, galvanized steel, copper or copper alloy pipe must consist of a plug or a standard weight copper alloy cap, or an approved ABS or PVC plastic plug, or an approved stainless steel cleanout or plug.
- Plugs must have raised square heads or countersunk rectangular slots.
- Cleanouts must be watertight and gastight.
- Each horizontal drainage pipe must be provided with a cleanout at its upper terminal, and each run of piping, that is more than 100' in total developed length, must be provided with a cleanout for each 100', or fraction thereof, in length of such piping.
- An additional cleanout must be provided in a drainage line for each aggregate horizontal change of direction exceeding 135°F.
- Each cleanout must be installed so that it opens to allow cleaning in the direction of flow of the soil or waste or at right angles thereto and vertically above the flow line of the pipe.
- Each cleanout extension must be considered as drainage piping and each 90° cleanout extension must be extended from a wye-type fitting or other approved fitting of equivalent sweep.
- Each cleanout for an interceptor must be outside of such interceptor.
- Each cleanout, unless installed under an approved cover plate, must be above grade, readily accessible and so located as to serve the purpose for which it is intended.
- Each cleanout in piping 2" or less in size must be installed so that there is a min. clearance of 18" in front of the cleanout.
- Cleanouts in piping exceeding 2" must be installed so that there is a min. clearance of 24" in front of the cleanout.
- Cleanouts in under-floor piping must be extended to or above the finished floor or must be extended outside the building where there is less than 18" vertical overall, allowing for obstructions such as ducts, beams and piping and 30" of horizontal clearance from the means of access to such cleanout.
- No under-floor cleanout must be located exceeding 5' from an access door, trap door or crawl hole.
- Countersunk cleanout plugs must be installed where raised heads cause a hazard.
- Where a hubless blind plug is used for a required cleanout, the complete coupling and plug must be accessible for removal or replacement.

CLEANOUTS (UPC Table 707.1)

SIZE OF PIPE	SIZE OF CLEANOUT	THREADS (PER INCHES)
1-1/2"	1-1/2"	11-1/2
2"	1-1/2"	11-1/2
2-1/2"	2-1/2"	8
3"	2-1/2"	8
4" & larger	3-1/2"	8

CLEANOUT REQUIREMENTS



MAX. UNIT LOADING AND MAX. LENGTH OF DRAINAGE AND VENT PIPING (UPC Table 703.2)

SIZE OF PIPE (Inches)	1-1/4	1-1/2	2	3	4	5	6	8	10	12
DRAINAGE PIPING¹ - MAXIMUM UNITS										
Vertical	1	2 ²	16 ³	48 ⁴	256	600	1380	3600	5600	8400
Horizontal	1	1	8 ³	35 ⁴	216 ⁵	428 ⁵	720 ⁵	2640 ⁵	4680 ⁵	8200 ⁵
DRAINAGE PIPING - MAXIMUM LENGTH (FEET)										
Vertical	45	65	85	212	300	390	510	750	—	—
Horizontal	UNLIMITED									
VENT PIPING⁶ - HORIZONTAL & VERTICAL										
Maximum Units	1	8 ³	24	84	256	600	1380	3600	—	—
Maximum Length	45	60	120	212	300	390	510	750	—	—

- NOTES**
- Excluding trap arm.
 - Except sinks, urinals and dishwashers - exceeding 1 fixture unit.
 - Except six-unit traps and water closets.
 - Only four water closet or six-unit traps allowed on a vertical pipe or stack; and not to exceed three water closets or six-unit traps on a horizontal branch or drain.
 - Based on 1/4" per ft. slope. For 1/8" per ft. slope, multiply horizontal fixture units by a factor of 0.8.
 - The diameter of an individual vent must be not less than 1-1/4" nor less than one-half the diameter of the drain to which it is connected.

STORM DRAINAGE

STORM DRAINAGE (UPC 1101.2)

- Roofs, paved areas, yards, courts, courtyards, vent shafts, light wells or similar areas having rainwater, must be drained into a separate storm sewer system or into a combined sewer system if a separate storm sewer system is not available.
- In the case of one- and two-family dwellings, storm water is permitted to be discharged on flat areas, such as streets or lawns, so long as the storm water flows away from the building and away from adjoining property and the water does not create a nuisance.

SUBSOIL DRAINS & SUMP (UPC 1101.6)

- Buildings having basements, cellars, crawl spaces or floors below grade must have subsoil drains around the perimeter.
- Such subsoil drains must be permitted to be positioned inside or outside of the footing.
- Subsoil drains must be of perforated or open-jointed approved drain tile or pipe, a min. of 3" in diameter and must be laid in gravel, slag, crushed rock, approved 3/4" crushed, recycled glass aggregate or other approved porous material with a min. of 4" surrounding the pipe.
- Filter media must be provided for exterior subsoil piping.
- Subsoil drains must be piped to a storm drain, to an approved water course, to the front street curb or gutter, to an alley or the discharge from the subsoil drains must be conveyed to the alley by a concrete gutter.
- Where it is not possible to convey the drainage by gravity, subsoil drains must discharge to an accessible sump provided with an approved automatic electric pump.
- The sump must be a min. of 15" in diameter, 18" in depth and provided with a fitted cover.
- The sump pump must have an adequate capacity to discharge water coming into the sump as it accumulates to the required discharge point and the capacity of the pump must be a min. of 15 gpm.
- The discharge piping from the sump pump must be a min. of 1-1/2" in diameter and have a union or other approved quick-disconnect assembly to make the pump accessible for servicing.

ROOF DRAINS (UPC 1102.0)

- Roof drains must be constructed of aluminum, cast-iron, copper alloy of not more than 15% zinc, leaded nickel bronze, stainless steel, ABS, PVC, polypropylene, polyethylene or nylon.
- Roof drains must have domed strainers.
- Connection between the roof and roof drains that pass through the roof and into the interior of the building must be made watertight by the use of proper flashing material.
- Where lead flashing material is used, it must be a min. of 4 pounds per square foot.
- Where copper flashing material is used, it must be a min. of 12 ounces per square foot.

SIDE WALLS DRAINING ONTO A ROOF (UPC 1103.4)

Where vertical walls project above a roof so as to permit storm water to drain to the roof area below, the adjacent roof area must be permitted to be computed from Table 1101.12, Sizing Roof Drains, Leaders and Vertical Rainwater Piping Table.

- **For one wall** - add 50% of the wall area to the roof area figures.
- **For two adjacent walls of equal height** - add 35% of the total wall areas.
- **For two adjacent walls of unequal height** - add 35% of the total common height and add 50% of the remaining height of the highest wall.
- **For two opposite walls of same height** - add no additional area.
- **For two opposite walls of differing heights** - add 50% of the wall area above the top of lower wall.

For walls on three sides - add 50% of the area of the inner wall below the top of the lowest wall, plus allowance for the area of the wall above the top of the lowest wall, in accordance with the requirements of two adjacent walls of unequal height and two opposite walls of differing heights (see above).

For walls on four sides - no allowance for wall areas below the top of the lowest wall - add for areas above the top of the lowest wall in accordance with the requirements of one wall, two adjacent walls of unequal height and two opposite walls of differing heights and walls on three sides (see above).

ROOF DRAINAGE (UPC 1101.12)

Primary Roof Drainage

- Roof areas of a building must be drained by roof drains or gutters.
- The location and sizing of drains and gutters must be coordinated with the structural design and pitch of the roof.
- Roof drains, gutters, vertical conductors or leaders, and horizontal storm drains for primary drainage must be sized based on a storm of 60 minutes duration and 100 year return period.

Secondary Drainage

- Secondary (emergency) roof drainage must be provided by an open-sided roof or scuppers where the roof perimeter construction extends above the roof in such a manner that water will be entrapped.
- An open-sided roof or scuppers must be sized to prevent the depth of ponding water from exceeding that for which the roof was designed.
- Scupper openings must be a min. of 4" high and have a width equal to the circumference of the roof drain required for the area served, sized in accordance with Table 1101.12 Sizing Roof Drains, Leaders and Vertical Rainwater Piping Table.
- The secondary roof drains must be located a min. of 2" above the roof surface.
- The secondary roof drains must connect to a piping system in through a separate piping system or a combined system.

CONTROLLED-FLOW ROOF WATER DEPTH & DISTANCE OF SCUPPER BOTTOMS ABOVE ROOF (UPC Tables 1105.1(1) & 1105.1(2))

ROOF RISE*	MAX. WATER DEPTH AT DRAIN (1105.1(1)) / ABOVE ROOF LEVEL AT DRAIN (1105.1(2))
Flat	3"
2"	4"
4"	5"
6"	6"

* Vertical measurement from the roof surface at the drain to the highest point of the roof surface by the drain, ignoring a local depression immediately adjacent to the drain.

SIZING ROOF DRAINS, LEADERS AND VERTICAL RAINWATER PIPING (UPC Table 1101.12)

SIZE OF DRAIN, LEADER OR PIPE	FLOW	MAX. ALLOWABLE HORIZONTALLY PROJECTED ROOF AREAS AT VARIOUS RAINFALL RATES (SQUARE FEET)											
		1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)	7 (in/h)	8 (in/h)	9 (in/h)	10 (in/h)	11 (in/h)	12 (in/h)
Inches	Gpm												
2	30	2,880	1,440	960	720	575	480	410	360	320	290	260	240
3	92	8,800	4,400	2,930	2,200	1,760	1,470	1,260	1,100	980	880	800	730
4	192	18,400	9,200	6,130	4,600	3,680	3,070	2,630	2,300	2,045	1,840	1,675	1,530
5	360	34,600	17,300	11,530	8,650	6,920	5,765	4,945	4,325	3,845	3,460	3,145	2,880
6	563	54,000	27,000	17,995	13,500	10,800	9,000	7,715	6,750	6,000	5,400	4,910	4,500
8	1,208	116,000	58,000	38,660	29,000	23,200	19,315	16,570	14,500	12,890	11,600	10,545	9,600

IDENTIFICATION & DEFINITIONS

IDENTIFICATION OF POTABLE AND NONPOTABLE WATER SYSTEMS (UPC 601.3 - 601.3.5)

CLASSIFICATION	BACKGROUND COLOR	COLOR OF LETTERS	WORDING
Potable Water	Green	White	"POTABLE WATER"
Nonpotable Water Systems	Yellow	Black	"CAUTION: NONPOTABLE WATER, DO NOT DRINK."
Gray Water Systems	Purple	Black	"CAUTION: NONPOTABLE GRAY WATER, DO NOT DRINK"
Reclaimed (recycled) Water Systems	Purple	Black	"CAUTION: NONPOTABLE RECLAIMED (RECYCLED) WATER, DO NOT DRINK"
On-site Treated Water Systems	Purple	Black	"CAUTION: ON-SITE TREATED NONPOTABLE WATER, DO NOT DRINK"
Rainwater Catchment Systems	Purple	Black	"CAUTION: NONPOTABLE RAINWATER WATER, DO NOT DRINK"

Note: The background color and required information must be indicated every 20 ft. but not less than once per room and must be visible from the floor level.

TERM ALERT!

- ★ gpm: gallons per minute
- ★ psi: pounds-force per square inch
- ★ Min.: Minimum
- ★ Max.: Maximum

MIN. LENGTH OF COLOR FIELD & SIZE OF LETTERS (UPC Table 601.3.2)

OUTSIDE DIA. OF PIPE OR COVERING	LENGTH OF COLOR FIELD	SIZES OF LETTERS
1/2" to 1-1/4"	8"	1/2"
1-1/2" to 2"	8"	3/4"
2-1/2" to 6"	12"	1-1/4"
8" to 10"	24"	2-1/2"
Over 10"	32"	3-1/2"



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PLUMBING FIXTURES & FIXTURE FITTINGS

MAXIMUM FIXTURE & FIXTURE FITTINGS FLOW RATES (UPC Table L 402.1)

FIXTURE TYPE	FLOW RATE
Showerheads	2.0 gpm at 80 psi
Lavatory faucets residential	1.5 gpm at 60 psi
Metering faucets	0.25 gallon/cycle
Water closets - other than remote locations	1.28 gallon/flush
Water closets - remote locations	1.6 gallons/flush
Urinals	0.5 gallons/flush

Note: This is an abridged table. For complete table see 2015 UPC Table L 402.1

BATHTUBS & WHIRLPOOL BATHTUBS (UPC 409.0)

- Bathtubs and whirlpool bathtubs must be provided with a waste outlet and tailpiece a min. of 1-1/2" in diameter.
- Waste outlets must be provided with an approved stopper or strainer.
- The max. hot water temperature discharging from the bathtub and whirlpool bathtub filler must be limited to 120°F.
- The water supply to a bathtub and whirlpool bathtub filler valve must be protected by an air gap.
- Bathtubs and whirlpool bathtubs must be installed in accordance with the manufacturer's installation instructions.
- Access openings must be of size and opening to permit the removal and replacement of the circulation pump.
- Whirlpool pump access located in the crawl space must be located a max. of 20' from an access door, trap door, or crawl hole.
- The circulation pump must be located above the crown weir of the trap.
- The pump and the circulation piping must be self-draining to minimize water retention.

FLUSHOMETER VALVES (UPC 413.2)

- No manually controlled flushometer valve must be used to flush more than one urinal.
- Each urinal flushometer valve must be an approved, self-closing type discharging a predetermined quantity of water.
- Flushometers must be installed so that they are accessible for repair.
- Flushometer valves must not be used where the water pressure is insufficient to properly operate them.
- Where the valve is operated, it must complete the cycle of operation automatically, opening fully, and closing positively under the line water pressure.
- Each flushometer must be provided with a means for regulating the flow through it.

SHOWERS & SHOWER COMPARTMENTS (UPC 408.0)

- Showerheads must have a max. flow rate of 2.5 gpm at 80 psi.
- Showers must have a waste outlet and fixture tailpiece a min. of 2" in diameter.
- Strainers serving shower drains must have a waterway at least equivalent to the area of the tailpiece.
- Showers compartments, regardless of shape, must have a min. finished interior of 1024 in² and must also be capable of encompassing a 30" diameter circle.
- The min. required area and dimensions of a shower compartment must be measured at a height equal to the top of the threshold and at a point tangent to its centerline.
- The area and dimensions of a shower compartment must be maintained to a point of no less than 70" above the shower drain outlet with no protrusions other than the fixture valve or valves, showerhead, soap dishes, shelves and safety grab bars or rails.
- Fold-down seats in accessible shower stalls are allowed to protrude into the 30" circle.
- Showers with a built in place, permanent seat or seating area must be first lined with sheet plastic, lead, copper or must be lined with other durable and watertight materials that extend a min. of 3" above horizontal surfaces of the seat or the seating area.
- Showers and tub-shower combinations must be provided with individual control valves of the pressure balance, thermostatic or combination pressure balance/thermostatic mixing valve type.
- Control valves must provide scald and thermal shock protection for the rated flow rate of the installed showerhead.
- Handle position stops must be provided on such valves and must be adjusted per the manufacturer's instructions to deliver a max. mixed water setting of 120°F.

WATER CLOSETS - TYPE & MATERIAL (UPC 411.3)

- Water closet seats must be of smooth, non-absorbent material.
- Water closet seats, for public use, must be of the elongated type and either of the open front type or have an automatic seat cover dispenser.
- Water closet seats must be properly sized for the water closet bowl type.

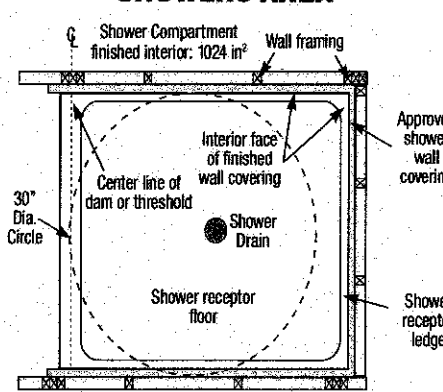
BIDETS (UPC 410.0)

- The water supply to the bidet must be protected by an Air Gap, an Atmospheric Vacuum Breaker (AVB), a Pressure Vacuum Breaker Backflow Prevention Assembly (PVB) or a Spill-resistant Pressure Vacuum Breaker (SVB).
- The max. hot water temperature discharging from a bidet must be limited to 110°F.

WATER SUPPLY FOR FLUSH TANKS (UPC 413.4)

- The water supply for flushing tanks and flushometer tanks equipped for manual flushing must be controlled by a float valve or other automatic device designed to refill the tank after each discharge and to completely shut off the water flow to the tank when the tank is filled to operational capacity.
- Provision must be made to automatically supply water to the fixture so as to refill the trap seal after each flushing.

SHOWERS AREA



SHOWERS - FINISHED CURB OR THRESHOLD (UPC 408.5)

- Where a shower receptor has a finished dam, curb or threshold it must be a min. of 1" lower than the sides and back of such receptor.
- In no case must a dam or threshold be less than 2" or more than 9" in depth where measured from the top of the dam or threshold to the top of the drain.
- Each such receptor must be provided with an integral nailing flange to be located where the receptor meets the vertical surface of the finished interior of the shower compartment.
- The flange must be watertight and extend vertically a min. of 1" above the top of the sides of the receptor.
- The finished floor of the receptor must slope uniformly from the sides towards the drain a min. of 1/4" per foot and a max. of 1/2" per foot.
- Thresholds must be of sufficient width to accommodate a min. 22" door.
- Showers doors must open so as to maintain a min. of 22" unobstructed opening for egress.
- Showers receptors must have the subfloor and rough side of walls to a min. height of 3" above the top of the finished dam or threshold must be first lined with sheet plastic, lead or copper or other durable and watertight materials.

OVERFLOWS IN FLUSH TANKS (UPC 413.5)

- Flush tanks must be provided with overflows discharging into the water closet or urinal connected thereto.
- Overflows supplied as original parts with the fixture must be of sufficient size to prevent tank flooding at the maximum rate at which the tank is supplied with water under normal operating conditions and where installed in accordance with the manufacturer's installation instructions.

VENTS

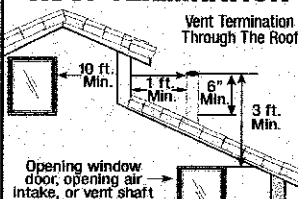
VENTS - GENERAL REQUIREMENTS (UPC 901.2 - 902.1)

- Air circulation must be ensured throughout all parts of the drainage system by vent pipes.
- The vent system must be designed to prevent a trap seal from being exposed to a pressure differential that exceeds 1" water column on the outlet side of the trap.
- Vent piping is not required where an interceptor acts as a primary settling tank and discharges through a horizontal indirect waste pipe into a secondary interceptor.

VERTICAL WET VENTING (UPC 908.1)

- Wet-vented fixtures must be within the same story.
- No wet vent must exceed 6' in developed length.
- Each wet-vented section must be a min. of 2'.
- Each wet-vented section must exceed the required min. waste pipe size of the upper fixture and the required min. pipe size by at least one pipe size.

ROOF TERMINATION



VENT - ROOF TERMINATION (UPC 906.0)

- Each vent pipe or stack must extend through its flashing and must terminate vertically a min. of 6" above the roof and a min. of 1' from a vertical surface.
- Each vent must terminate a min. of 10' from or 3' above an openable window, door, opening, air intake, or vent shaft.
- Each vent must terminate a min. of 3' in every direction from a lot line, alley and street excepted.
- Vent pipes must be extended separately or combined a min. of 6" above the roof or fire wall.
- Vents within 10' of a part of the roof that is used for other assembly purposes or parking must extend a min. of 7' above such roof and must be securely stayed.
- Joints at the roof around vent pipe must be made watertight by the use of approved flashings or flashing material.

VENT PIPE GRADES & CONNECTIONS (UPC 905.0)

- Vent and branch vent pipes must be free from drops or sags.
- Each vent must be level or must be so graded and connected as to drip back by gravity to the drainage pipe it serves.
- Where vents connect to a horizontal drainage pipe, each vent pipe must have its invert taken off above the drainage centerline of such pipe downstream of the trap being served.
- Each vent must rise vertically to a point no less than 6" above the flood-level rim of the fixture served before off-setting horizontally.
- Where 2 or more vent pipes converge, each such vent pipe must rise to a point not less than 6" in height above the flood-level rim of the plumbing fixture it serves before being connected to any other vent.
- Vents less than 6" above the flood-level rim of the fixture must be installed with approved drainage fittings, materials and grade to the drain.
- Vent pipes must extend undiminished in size above the roof or must be reconnected with a soil or waste vent of proper size.
- The vent pipe opening from a soil or waste pipe must not be below the weir of the trap.
- Two fixtures must be permitted to be served by a common vertical pipe where each such fixture wastes separately into a approved double fitting having inlet openings at the same level.

MAX. UNITS & LENGTH OF VENT PIPING - HORIZONTAL & VERTICAL (UPC Table 703.2)

Size of Pipe	1-1/4"	1-1/2"	2"	3"	4"	5"	6"	8"
Max. Units	1	8	24	84	256	600	1380	3600
Max. Lengths	45	60	120	212	300	390	510	750

Note: This is an abridged table. For complete table see 2015 UPC Table 703.2