

**TABLE 702.1  
DRAINAGE FIXTURE UNIT VALUES (DFU)**

PLUMBING APPLIANCES, APPURTENANCES, OR FIXTURES	MINIMUM SIZE TRAP AND TRAP ARM <sup>7</sup> (inches)	PRIVATE	PUBLIC	ASSEMBLY <sup>8</sup>
Bath tub or Combination Bath/Shower	1½	2.0	2.0	—
Bidet	1¼	1.0	—	—
Bidet	1½	2.0	—	—
Clothes Washer, domestic, standpipe <sup>5</sup>	2	3.0	3.0	3.0
Dental Unit, cuspidor	1¼	—	1.0	1.0
Dishwasher, domestic, with independent drain <sup>2</sup>	1½	2.0	2.0	2.0
Drinking Fountain or Water Cooler	1¼	0.5	0.5	1.0
Food Waste Disposer, commercial	2	—	3.0	3.0
Floor Drain, emergency	2	—	0.0	0.0
Floor Drain (for additional sizes see Section 702.0)	2	2.0	2.0	2.0
Shower, single-head trap	2	2.0	2.0	2.0
Multi-head, each additional	2	1.0	1.0	1.0
Lavatory	1¼	1.0	1.0	1.0
Lavatories in sets	1½	2.0	2.0	2.0
Washfountain	1½	—	2.0	2.0
Washfountain	2	—	3.0	3.0
Mobilehome or Manufactured Home, trap <sup>9</sup>	3	6.0	—	—
Receptor, indirect waste <sup>1,3</sup>	1½	—	See footnote <sup>1,3</sup>	
Receptor, indirect waste <sup>1,4</sup>	2	—	See footnote <sup>1,4</sup>	
Receptor, indirect waste <sup>1</sup>	3	—	See footnote <sup>1</sup>	
Sinks	—	—	—	—
Bar	1½	1.0	—	—
Bar <sup>2</sup>	1½	—	2.0	2.0
Clinical	3	—	6.0	6.0
Commercial with food waste <sup>2</sup>	1½	—	3.0	3.0
Exam Room	1½	—	1.0	—
Special Purpose <sup>2</sup>	1½	2.0	3.0	3.0
Special Purpose	2	3.0	4.0	4.0
Special Purpose	3	—	6.0	6.0
Kitchen, domestic <sup>2</sup> (with or without food waste disposer, dishwasher, or both)	1½	2.0	2.0	—
Laundry <sup>2</sup> (with or without discharge from a clothes washer)	1½	2.0	2.0	2.0
Service or Mop Basin	2	—	3.0	3.0
Service or Mop Basin	3	—	3.0	3.0
Service, flushing rim	3	—	6.0	6.0
Wash, each set of faucets	—	—	2.0	2.0
Urinal, integral trap 1.0 GPF <sup>2</sup>	2	2.0	2.0	5.0
Urinal, integral trap greater than 1.0 GPF	2	2.0	2.0	6.0
Urinal, exposed trap <sup>2</sup>	1½	2.0	2.0	5.0
Water Closet, 1.6 GPF Gravity Tank <sup>6</sup>	3	3.0	4.0	6.0
Water Closet, 1.6 GPF Flushometer Tank <sup>6</sup>	3	3.0	4.0	6.0
Water Closet, 1.6 GPF Flushometer Valve <sup>6</sup>	3	3.0	4.0	6.0
Water Closet, greater than 1.6 GPF Gravity Tank <sup>6</sup>	3	4.0	6.0	8.0
Water Closet, greater than 1.6 GPF Flushometer Valve <sup>6</sup>	3	4.0	6.0	8.0

For SI units: 1 inch = 25 mm

**Notes:**

- <sup>1</sup> Indirect waste receptors shall be sized based on the total drainage capacity of the fixtures that drain therein to, in accordance with Table 702.2(2).
- <sup>2</sup> Provide a 2 inch (50 mm) minimum drain.
- <sup>3</sup> For refrigerators, coffee urns, water stations, and similar low demands.
- <sup>4</sup> For commercial sinks, dishwashers, and similar moderate or heavy demands.
- <sup>5</sup> Buildings having a clothes-washing area with clothes washers in a battery of three or more clothes washers shall be rated at 6 fixture units each for purposes of sizing common horizontal and vertical drainage piping.
- <sup>6</sup> Water closets shall be computed as 6 fixture units where determining septic tank sizes based on Appendix H of this code.
- <sup>7</sup> Trap sizes shall not be increased to the point where the fixture discharge is capable of being inadequate to maintain their self-scouring properties.
- <sup>8</sup> Assembly [Public Use (see Table 422.1)].
- <sup>9</sup> For drainage fixture unit values related to lots within mobilehome parks in all parts of the State of California, see California Code of Regulations, Title 25, Division 1, Chapter 2, Article 5, Section 1268. For drainage fixture unit values related to lots within special occupancy parks in all parts of the State of California, see California Code of Regulations, Title 25, Division 1, Chapter 2.2, Article 5, Section 2268.

## SANITARY DRAINAGE

Maximum drainage fixture units for a fixture trap and trap arm loadings for sizes up to 4 inches (100 mm) shall be in accordance with Table 702.2(1).

**702.2 Intermittent Flow.** Drainage fixture units for intermittent flow into the drainage system shall be computed on the rated discharge capacity in gallons per minute (gpm) (L/s) in accordance with Table 702.2(2).

**702.3 Continuous Flow.** For a continuous flow into a drainage system, such as from a pump, sump ejector, air conditioning equipment, or similar device, 2 fixture units shall be equal to each gallon per minute (gpm) (L/s) of flow.

**TABLE 702.2(1)  
MAXIMUM DRAINAGE FIXTURE UNITS FOR A  
TRAP AND TRAP ARM\***

SIZE OF TRAP AND TRAP ARM (inches)	DRAINAGE FIXTURE UNIT VALUES (DFU)
1¼	1 unit
1½	3 units
2	4 units
3	6 units
4	8 units

For SI Units: 1 inch = 25 mm

\* **Exception:** On self-service laundries.

**TABLE 702.2(2)  
DISCHARGE CAPACITY IN GALLONS PER MINUTE FOR  
INTERMITTENT FLOW ONLY\***

GPM	FIXTURE UNITS
Up to 7½	Equals 1 Fixture Unit
Greater than 7½ to 15	Equals 2 Fixture Units
Greater than 15 to 30	Equals 4 Fixture Units
Greater than 30 to 50	Equals 6 Fixture Units

For SI units: 1 gallon per minute = 0.06 L/s

\* Discharge capacity exceeding 50 gallons per minute (3.15 L/s) shall be determined by the Authority Having Jurisdiction.

### 703.0 Size of Drainage Piping.

**703.1 Minimum Size.** The minimum sizes of vertical, horizontal, or both drainage piping shall be determined from the total of fixture units connected thereto, and additionally, in the case of vertical drainage pipes, in accordance with their length.

**703.2 Maximum Number of Fixture Units.** Table 703.2 shows the maximum number of fixture units allowed on a vertical or horizontal drainage pipe, building drain, or building sewer of a given size; the maximum number of fixture units allowed on a branch interval of a given size; and the maximum length (in feet and meters) of a vertical drainage pipe of a given size.

**703.3 Sizing per Appendix C.** For alternate method of sizing drainage piping, see Appendix C.

### 704.0 Fixture Connections (Drainage).

**704.1 Inlet Fittings.** Drainage piping shall be provided with approved inlet fittings for fixture connections,

correctly located according to the size and type of fixture proposed to be connected.

**704.2 Single Vertical Drainage Pipe.** Two fixtures set back-to-back, or side-by-side, within the distance allowed between a trap and its vent shall be permitted to be served by a single vertical drainage pipe provided that each fixture wastes separately into an approved double-fixture fitting having inlet openings at the same level.

**704.3 Commercial Sinks.** Pot sinks, scullery sinks, dish-washing sinks, silverware sinks, and other similar fixtures shall be connected directly to the drainage system. A floor drain shall be provided adjacent to the fixture, and the fixture shall be connected on the sewer side of the floor drain trap, provided that no other drainage line is connected between the floor drain waste connection and the fixture drain. The fixture and floor drain shall be trapped and vented in accordance with this code.

### 705.0 Joints and Connections.

**705.1 ABS and ABS Co-Extruded Plastic Pipe and Joints.** Joining methods for ABS plastic pipe and fittings shall be installed in accordance with the manufacturer's installation instructions and shall comply with Section 705.1.1 through Section 705.1.3.

**705.1.1 Mechanical Joints.** Mechanical joints shall be designed to provide a permanent seal and shall be of the mechanical or push-on joint. The push-on joint shall include an elastomeric gasket in accordance with ASTM D3212 and shall provide a compressive force against the spigot and socket after assembly to provide a permanent seal.

**705.1.2 Solvent Cement Joints.** Solvent cement joints for ABS pipe and fittings shall be clean from dirt and moisture. Pipe shall be cut square and shall be deburred. Where surfaces to be joined are cleaned and free of dirt, moisture, oil, and other foreign material, solvent cement in accordance with ASTM D2235 shall be applied to all joint surfaces. Joints shall be made while both the inside socket surface and outside surface of pipe are wet with solvent cement. Hold joint in place and undisturbed for 1 minute after assembly. *[HCD 1 & HCD 2] Plastic pipe and fittings joined with solvent cement shall utilize Low VOC primer(s), if a primer is required, and Low VOC cement(s) as defined in Section 214.0.*

**705.1.3 Threaded Joints.** Threads shall comply with ASME B1.20.1. A minimum of Schedule 80 shall be permitted to be threaded. Molded threads on adapter fittings for transition to threaded joints shall be permitted. Thread sealant compound shall be applied to male threads, insoluble in water, and nontoxic. The joint between the pipe and transition fitting shall be of the solvent cement type. Caution shall be used during assembly to prevent over tightening of the ABS components once the thread sealant compound has been applied.

**705.2 Cast-Iron Pipe and Joints.** Joining methods for cast-iron pipe and fittings shall be installed in accordance with

**TABLE 703.2  
MAXIMUM UNIT LOADING AND MAXIMUM LENGTH OF DRAINAGE AND VENT PIPING**

SIZE OF PIPE (inches)	1¼	1½	2	3	4	5	6	8	10	12
<b>Maximum Units</b>										
Drainage Piping <sup>1</sup>										
Vertical	1	2 <sup>2</sup>	16 <sup>3</sup>	48 <sup>4</sup>	256	600	1380	3600	5600	8400
Horizontal	1	1	8 <sup>3</sup>	35 <sup>4</sup>	216 <sup>5</sup>	428 <sup>5</sup>	720 <sup>5</sup>	2640 <sup>5</sup>	4680 <sup>5</sup>	8200 <sup>5</sup>
<b>Maximum Length</b>										
Drainage Piping										
Vertical, (feet)	45	65	85	212	300	390	510	750	—	—
Horizontal (unlimited)										
<b>Vent Piping</b>										
Horizontal and Vertical <sup>6</sup>										
Maximum Units	1	8 <sup>3</sup>	24	84	256	600	1380	3600	—	—
Maximum Lengths, (feet)	45	60	120	212	300	390	510	750		

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm

**Notes:**

- <sup>1</sup> Excluding trap arm.
- <sup>2</sup> Except sinks, urinals, and dishwashers – exceeding 1 fixture unit.
- <sup>3</sup> Except six-unit traps or water closets.
- <sup>4</sup> Only four water closets 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.
- <sup>5</sup> Based on ¼ inch per foot (20.8 mm/m) slope. For ⅓ of an inch per foot (10.4 mm/m) slope, multiply horizontal fixture units by a factor of 0.8.
- <sup>6</sup> The diameter of an individual vent shall be not less than ¼ inches (32 mm) nor less than one-half the diameter of the drain to which it is connected. Fixture unit load values for drainage and vent piping shall be computed from Table 702.1 and Table 702.2(2). Not to exceed one-third of the total permitted length of a vent shall be permitted to be installed in a horizontal position. Where vents are increased one pipe size for their entire length, the maximum length limitations specified in this table do not apply. This table is in accordance with the requirements of Section 901.3.

the manufacturer’s installation instructions and shall comply with Section 705.2.1 or Section 705.2.2.

» **705.2.1 Caulked Joints.** Caulked joints shall be firmly packed with oakum or hemp and filled with molten lead to a depth of not less than 1 inch (25.4 mm) in one continuous pour. The lead shall be caulked thoroughly at the inside and outside edges of the joint. After caulking, the finished joint shall not exceed ⅛ of an inch (3.2 mm) below the rim of the hub. No paint, varnish, or other coatings shall be permitted on the joining material until after the joint has been tested and approved.

» **705.2.2 Mechanical Joints and Compression Joints.** Mechanical joints for cast-iron pipe and fittings shall be of the elastomeric compression type or mechanical joint couplings. Compression type joints with an elastomeric gasket for cast-iron hub and spigot pipe shall comply with ASTM C564 and be tested in accordance with ASTM C1563. Hub and spigot shall be clean and free of dirt, mud, sand, and foreign materials. Cut pipe shall be free from sharp edges. Fold and insert gasket into hub. Lubricate the joint following manufacturer’s instructions. Insert spigot into hub until the spigot end of the pipe bottom out in the hub. Use the same procedure for the installation of fittings.

A mechanical joint shielded coupling type for hubless cast-iron pipe and fittings shall have a metallic shield in accordance with ASTM A1056, ASTM C1277, ASTM C1540, or CISPI 310. The elastomeric

gasket shall comply with ASTM C564. Hubless cast-iron pipe and fittings shall be clean and free of dirt, mud, sand, and foreign materials. Cut pipe shall be free from sharp edges. Gasket shall be placed on the end of the pipe or fitting and the stainless steel shield and clamp assembly on the end of the other pipe or fitting. Pipe or fittings shall be seated against the center stop inside the elastomeric sleeve. Slide the stainless steel shield and clamp assembly into position centered over the gasket and tighten. Bands shall be tightened using an approved calibrated torque wrench specifically set by the manufacturer of the couplings.

**705.3 Copper or Copper Alloy Pipe (DWV) and Joints.** «  
Joining methods for copper or copper alloy pipe and fittings shall be installed in accordance with the manufacturer’s installation instructions and shall comply with Section 705.3.1 through Section 705.3.4.

« **705.3.1 Brazed Joints.** Brazed joints between copper or copper alloy pipe and fittings shall be made with brazing alloys having a liquid temperature above 1000°F (538°C). The joint surfaces to be brazed shall be cleaned bright by either manual or mechanical means. Piping shall be cut square and reamed to full inside diameter. Brazing flux shall be applied to the joint surfaces where required by manufacturer’s recommendation. Brazing filler metal in accordance with AWS A5.8 shall be applied at the point where the pipe or tubing enters the socket of the fitting.