

Plumbing Ordinance

No. 463

*Amended by
Ord. # 584*

AN ORDINANCE TO RESTRICT AND REGULATE PLUMBING EQUIPMENT AND INSTALLATIONS IN THE CITY OF KIRKLAND ESTABLISHING STANDARDS AND REQUIREMENTS AS TO THE QUALITY OF MATERIALS USED, JOINTS AND CONNECTIONS, TRAPS AND CLEAN-OUTS, PROTECTION OF WATER SUPPLY, HANGERS AND SUPPORTS, SOIL AND WASTE PIPES FOR SANITARY SYSTEMS, VENTS AND VENTING, INDIRECT CONNECTIONS TO WASTE PIPES, AND MAINTENANCE PROVIDING INSPECTIONS, TESTS, LICENSES AND PENALTIES.

Division I.—General Regulations

1-1. Installation of Piping: Horizontal drainage piping shall be run in practical alignment and shall be supported at intervals not exceeding 10 feet. The minimum slopes shall be as follows: Not less than 1/4 inch fall per foot for 1 1/4- to 1-inch diameters, inclusive; not less than 3/8 inch fall per foot for 2 1/2- to 6-inch diameters, inclusive. Stacks shall be supported at their bases, and shall be rigidly secured. Piping shall be installed without undue stresses or strains and provision made for expansion, contraction and structural settlement. No structural member shall be weakened or impaired beyond a safe limit by cutting, notching, or otherwise, unless provision is made for carrying the structural load.

1-2. Changes in Direction: Changes in direction drainage piping shall be made by the appropriate use of 45° wyes, half wyes, long-sweep quarter bends, sixth, eighth, or sixteenth bends, or by combinations of these fittings, or by use of equivalent fittings or their combinations: except that sanitary tees may be used in vertical sections of drains or stacks, and short quarter bends may be used in drainage lines where the change in direction of flow is from the horizontal to the vertical. Tees and crosses may be used in vent pipes and in water distributing pipes. No change in direction greater than 90° in a single turn shall be made in drainage pipes.

1-3. Prohibited Fittings: No double hub, or double-tee branch, shall be used on soil or waste lines. The drilling and tapping of building drains, soil, waste, or vent pipes, and the use of saddle hubs or bands are prohibited. Any fitting or connection which has an enlargement, chamber, or recess with a ledge, shoulder, or reduction of the pipe area, that offers obstruction to flow through the pipe, is prohibited.

1-4. Prohibited Connections:

No fixture, device, or construction shall be installed which will produce a backflow connection between a distributing system of water for heating and domestic purposes and a gas system, soil, or waste pipe to permit or make possible the flow of sewage or waste into the

when subjected to a temperature of 150°, nor be soluble in any of the wastes carried by the drainage system.

3-3. Vitrified Clay and Concrete Pipe: Joints in vitrified clay and concrete pipe, or between such pipe and metals, shall be hot-poured or cemented joints. Hot-poured joints shall be packed with approved packing and filled with an approved jointing compound at one pouring. Cemented joints shall be packed with approved packing and secured with portland cement.

3-4. Cast-Iron Pipe: Cast-Iron pipe joints shall be calked.

3-5. Screw Pipe to Cast Iron: Joints between wrought iron, steel pipe, and cast-iron pipe shall be either calked or screw joints made as specified in sections 3-2 (a) and (b).

3-6. Lead to Cast Iron, Wrought Iron or Steel: Joints between lead and cast iron, wrought iron or steel pipe shall be made by means of calking ferrules, soldering nipples or bushings as specified in section 3-2 (a), (b), and (c).

3-7. Floor Connections: Floor connections for water closets and other fixtures shall be made by means of an approved brass or cast-iron floor flange soldered securely or calked to the drain pipe. The joint between the fixture and floor flange shall be made tight by means of an approved fixture setting compound.

3-8. Roof Flashings: Joints at the roof shall be made water-tight by use of lead or zinc-coated (galvanized) iron flashings, cast-iron plates, or other approved materials.

3-9. Increasers and Reducers: Where different sizes of drainage pipes or pipes and fittings are to be connected, proper sizes of standard increasers and reducers shall be employed. Reduction of size of drain pipes in the direction of flow is prohibited, except for a 3 by 4 water closet bend, and a 3 by 4 TY for water closets.

3-10. Supports: Connections of wall hangers, pipe supports, or fixture settings to masonry or concrete backing shall be made with approved bolts without the use of wooden plugs.

Division IV. Traps and Clean-Outs

4-1. Types and Sizes of Traps: Every trap shall be self-cleaning, shall be of the same nominal size as the drain to which it is connected, and shall conform to accepted standards. Only "P" or drum traps are permitted. The diameter of the drum trap shall not exceed 4 inches.

The minimum size (nominal inside diameter) of trap and fixture drain for a given fixture shall be not less than shown in the following table:

Table II

Fixtures	Size of trap and fixture drains inches
Bath tubs	1 1/2
Combination fixtures	1 1/2
Drinking fountains	1 1/4
Floor drains	2 or 3
Laundry trays	1 1/2
Lavatories	1 1/4
Shower stalls	2
Sinks, kitchen, residence	1 1/4

over an unexcavated area or those provided with a receptor, shall be equipped with a pan extending at least 2 inches above finished floor and graded to trap.

4-13. Backwater Valves: Backwater valves shall have all bearing parts of corrosion-resisting metal, and be so constructed as to provide a positive mechanical seal against backwater. The area of valve seat shall be equal to the cross-sectional area of the pipe connection.

Division V. Water Supply

5-1. Quality of Water Supply: (a) Potable water.—The quality of the water supply for all premises intended for human occupancy shall conform to the accepted standards of purity for potable water as established by the United States Public Health Service or by state or local authority, for civilian use.

(b) Nonpotable Water.—A water supply not conforming to accepted standards of purity for potable water, when used in an entirely separate system, and when such use is specifically approved by proper administrative authority, may be used for flushing water closets and urinals and other purposes not requiring potable water; such water shall not be readily accessible for drinking.

5-2. Protection of Water Supply: (a) Interconnections: Potable and nonpotable water supplies shall be distributed through systems entirely independent of each other, and any interconnection between such supplies is prohibited.

(b) Back-flow connections.—Every supply outlet or connection to a fixture or appliance shall be protected from back flow in accordance with the provisions of American Standards Association, A40—1941, or by an approved back flow preventer.

Pumps, wells, and hydrants: All water pumps, tanks, wells, hydrants, filters, softeners, appliances, and devices shall be protected from superficial ground or surface water and other contamination by approved covers, walls, copings, or casings.

Water supply tanks: All nonpressure potable water supply tanks shall be properly covered to prevent entrance of foreign material into the water supply. Soil or waste lines shall not be permitted to pass directly over such tanks except on special approval by competent authority.

Protection against freezing: All water pipes, tanks, appliances, and devices subject to freezing temperatures shall be effectively protected against freezing.

5-3. Material: "Water supply pipe.—Material for water supply pipes shall be made of lead, cast iron, wrought iron, open hearth iron, steel, brass, or copper with approved fittings. All threaded ferrous pipe and fittings shall be zinc-coated or cement-lined."

Allowance for characteristics of water.—When selecting the material and size of pipe for water supply, due consideration should be given to the corrosiveness of the water and possible incrustation. No second-hand pipe, tube, or fit-

provided for each outdoor connection in freezing climates.

Division VI.—Hangers and Supports

6-1. Vertical Piping: (a) Vertical piping shall be secured at points sufficiently close to keep the pipe in alignment and carry the weight of the pipe.

(b) Vertical drainage piping shall also be supported at the base of the stack.

(c) Provision for expansion shall be provided as necessary.

6-2. Horizontal Piping: Horizontal piping shall be supported at points sufficiently close to keep it in alignment but at intervals not exceeding 10 feet.

6-3. Hangers: Hangers shall be made of suitable material of adequate strength and shall be securely attached to the building construction without the use of wooden plugs.

6-4. Underground Pipes: Underground piping shall be supported in such a manner that it will remain in alignment and so that undue stress on joints will be prevented.

Division VII.—Soil and Waste Pipes for Sanitary Systems

7-1. Materials:

(a) Soil and waste piping for a sanitary drainage system within a building shall be of cast iron, galvanized iron or steel, or lead.

(b) The building drain to 3 feet outside of the building, when underground, shall be of standard cast iron.

(c) The building drain from 3 feet outside the building to sewer shall be of vitrified clay, or concrete.

7-2. Minimum Sizes: The minimum required sizes of soil and waste pipes, depending on location and conditions of service, shall be in accordance with the following sections and tables of this Division.

7-3. Fixture Units: The following table of fixture unit values designating the relative load weights of different kinds of fixtures shall be employed in estimating the total load carried by a soil or waste pipe and shall be used in connection with tables of sizes for waste and drain pipes in which the permissible load is given in terms of fixture units.

Table IV.—Fixture units per fixture or group

Fixture and type of installation	Number of fixture units
Lavatory or wash basin:	
Public	2
Private	1
Water closet:	
Public	10
Private	6
Bathtub:	
Public	4
Private	2
Shower head:	
Public	4
Private	2
Pedestal urinal, public	10
Wall or stall urinal, public	5
Service sink	3
Kitchen sink, private	2
Bathroom group, private	8
Bathroom group with separate shower stall, private	10
Two or three laundry trays	

be of cast iron, zinc-coated (galvanized) wrought iron or steel or cement-lined steel or lead.

8-2. Protection of Trap Seals: The seal of every fixture trap in a plumbing system shall be adequately protected by a properly installed vent or system of venting. A stack vent, back vent, relief vent, dual vent, or a combination of two or more of these forms installed in the manner and within the limitations specified in sections 5, 6, 7, and 8, inclusive, shall be considered as adequate protection of trap seals in the sense of this division.

8-3. Stack Vents Required: Every soil or waste stack shall be extended vertically as a stack vent to at least 6 inches above the highest horizontal branch and then to the open air above the roof; or the stack vent and vent stack may be connected together within the building at least 6 inches above the flood level of the highest fixture, with a single extension from the connection to the open air.

8-4. Vent Stacks Required: A vent stack or main vent shall be installed with a soil or waste stack whenever relief vents, back vents, or other branch vents are required in two or more branch intervals. The vent stack shall terminate independently in the open air outside the building or may be connected with the stack vent as prescribed in section 3 and shall connect with the soil or waste stack through, at, or below the lowest horizontal branch or with the primary branch of the building drain.

8-5. Distance of Trap From Vent: Except for water closets, pedestal urinals, trap standard service sinks, and other fixtures which depend on siphon action for the proper functioning of the fixture, each fixture trap shall have a protecting vent located so that the total fall in the fixture drain from the trap weir to the vent fitting is not more than one pipe diameter and the developed length of drain from trap weir to vent fitting is not less than two pipe diameters nor more than 5 feet. A back vent or relief vent, preferably in the form of a continuous waste and vent, shall be installed within these limits as may be necessary for compliance with this requirement.

8-6. Dual Vents Permitted: A dual vent for two fixture traps installed as a verticle continuous waste and vent, or a stack vent in a dual capacity, may be employed under the following conditions and no additional vents for the traps thus vented shall be required. When both fixture drains connect with a verticle drain or stack at the same level, and the developed length and total fall of each of the two fixture drains are within the limits given in section 5.

8-7. Group Vents Permitted: (a) A lavatory trap and a bathtub or shower stall trap may be installed on the same horizontal branch with a back vent for the lavatory trap and with no back vent for the bathtub or shower stall trap, provided the vertical section of the lavatory drain is of not less than 1 1/2-inch diameter, connects with the tub or shower stall drain vertically and the developed

water supply system.

(b) No interconnection or cross-connection shall be made between a water supply system carrying water meeting accepted standards of purity and any other water supply system.

1-5. Protection of Pipes: Pipes passing under or through walls shall be protected from breakage. Pipes passing through or under cinder concrete or any other corrosive material shall be protected against external corrosion.

1-6. Protection of Electrical Machinery: No water or drainage piping shall be located over electrical machinery or equipment unless adequate protection is provided against drip caused by condensation of the piping.

1-7. Protection of Water Tanks and Food Supply: Drainage piping shall not pass over water supply tanks or reservoirs, unless such tanks or reservoirs are watertight; nor shall drainage piping pass directly over food processing or food storage areas.

1-8. Workmanship: Workmanship shall be of such character as to fully secure the results sought in all sections of this standard.

Division II. Materials, Quality

2-1. Quality of Materials: Materials used in any plumbing system or part thereof shall meet the requirements of government standards, and shall be free from defects.

2-2. Identification of Materials: Each length of pipe, and each fitting, trap, fixture, and device used in a plumbing system, shall have cast, stamped, or indelibly marked thereon maker's mark or name; and also, size and quality thereof, when required in the specifications.

Division III. Joints and Connections

3-1. Tightness. All joints and connections shall be made gas-tight water-tight.

3-2. Types of Joints:

(a) Caulked joints: All caulked joints shall be firmly packed with oakum or hemp and shall be secured only with molten caulking lead, not less than one inch deep, well caulked. No paint, varnish, or putty shall be permitted on the jointing material, until the joint has been tested.

(b) Screw joints: All screw joints shall be American Standard. All burrs or cuttings shall be removed. Pipe shall be reamed or filed out to the original bore.

(c) Wiped joints: Wiped joints in lead pipe, or between lead pipe and brass or copper pipes, ferrules, soldering nipples, or traps, in all cases on the sewer side of the trap and in concealed joints on the inlet side of the trap, shall be full-wiped joints, with an exposed surface of the solder on each side of the joint not less than 3/4 inch and a minimum thickness at the thickest part of the joint of not less than 3/8 inch, where a round joint is made. An exposed surface of not less than 3/8 inch for bushings and flange joints shall be provided.

(d) Joints in lead pipe: Lead burned joints between lead pipes and between lead pipe and fittings are permitted.

(e) Hot poured joints: Material for hot poured joints (concrete or tile pipe) shall not soften sufficiently to destroy the effectiveness of the joint

- Sinks, public 2
- Sinks, small, pantry or bar 1 1/4
- Sinks, dishwasher 1 1/2
- Sinks, service 2
- Urinals, trough 2
- Urinals, stall 2

For water closets and other fixtures with integral traps, the fixture drains shall not be smaller than the fixture trap outlet.

4-2. Traps Required: Each fixture shall be separately trapped by an approved trap placed as near to the fixture as possible or integral therewith, except that a set of not more than three fixtures, such as lavatories, or laundry trays, or a set of two laundry trays and one sink may connect with a single trap provided they are not more than 3 inches apart, for three fixtures, trap to be centrally located.

4-3. Trap Seal: Each fixture shall have a water seal of not less than 2 inches and not more than 4 inches.

4-4. Trap Clean-outs: Each fixture trap, except those in combination with fixtures in which the trap seal is readily accessible, shall have a trap screw of ample size, protected by the water seal, or the top of the waste pipe shall not be more than 1 inch below the top of the clean-out, except that when the bottom portion of a trap can be completely removed for cleaning purposes no trap screw is required.

4-5. Trap Levels and Protection: All traps shall be set true with respect to their water seals and protected from frost.

4-6. Pipe Clean-outs Required: Accessible clean-outs shall be provided at or near the foot of each vertical waste or soil stack and each inside leader that connects to the building drain, and at each change in direction of the building drain greater than 45°. The distance between clean-outs in horizontal soil lines shall not exceed 50 feet. Clean-outs shall be of the same nominal size as the pipes up to 4 inches and not less than 4 inches for larger pipes.

4-7. Accessibility of Traps and Clean-outs: Underground traps and clean-outs of a building, except where clean-outs are flush with the floor, and exterior underground traps that are not readily accessible shall be made accessible.

4-8. Grease Interceptors: Grease interceptors shall be installed when required by and in accordance with the regulations of the authority having jurisdiction over plumbing.

4-9. Oil Interceptors: Oil interceptors shall be installed when required by and in accordance with the regulations of the authority having jurisdiction over plumbing, and provided with a relief vent.

4-10. Sand Interceptors: Sand interceptors, when installed, shall be so designed and placed as to be readily accessible for cleaning.

4-11. Floor Drains: Floor drains shall be considered a fixture and provided with a strainer. Floor drains located above the ground floor level shall be provided with seepage drains and pans or flashings to prevent leakage to lower floors.

4-12. Shower Stalls: Shower stalls shall be considered a plumbing fixture, and shall be provided with a proper drain and strainer. All shower stalls, except those directly

connected to a water supply system, shall be provided with a separate shut-off valve.

5-4. Water Supply to Buildings: (a) Water service: The water service pipe shall be of sufficient size to furnish an adequate flow of water to meet the requirements of the building at peak demand.

(b) Water supply control: An accessible shut-off valve shall be provided on every water service pipe. Supply lines taken from pressure or gravity tanks shall be valved at or near their source.

(c) Shut-off valves: Separate stop cocks or valves, always accessible, shall be placed at the foot of each riser line, and, in multiple dwellings, for each group of fixtures controlled by one tenant on one floor. On each single unit, one valve control will suffice.

5-5. Size of Fixture Supply Branches: The minimum size of fixture branches and other supply outlets shall be as follows:

	Inch
Sill cocks	1/2
Domestic water heaters	3/4
Laundry trays	1/2
Sinks	1/2
Lavatories	3/8
Bathtubs	1/2
Water-closet tanks	3/8
Water-closet flush valves	1
Flush valves for pedestal urinals	1
Flush valves for wall or stall urinal	1/2

5-6. Hot Water Supply Systems: Where hot water supply systems are installed, the hot water riser shall be covered with approved insulating material unless the hot and cold water risers are 6 inches or more apart. In all buildings of more than 4 stories in height supplied with hot water and in all other buildings where the developed length of the hot water piping from the source of hot-water supply to the extreme hot-water return exceeds 100 feet, a circulation system shall be installed. In no case may the circulation return be less than 1/2 inch in diameter.

5-7. Relief Valves: A suitable pressure relief valve shall be installed on hot-water storage tanks. Suitable means shall be taken on the hot-water system to prevent the heating and storage of hot water above its boiling point at atmospheric pressure or temperature and to prevent pressure and temperature relief valve shall be considered suitable and approved by the American Gas Association, and so located that there is no shut-off between tank and the relief valve.

5-8. Air Chamber devices shall be provided with air absorbers.

5-9. Water Supply to Fixtures: All plumbing fixtures shall be provided with a sufficient supply of water for use in a sanitary closet or urinal by means of an flush valve supplying at least 2 gallons per flushing for water closets and for urinals, and shall be adjusted to prevent the waste of water.

5-10. Outdoor Connections: An accessible shut-off valve shall be provided for each outdoor connection. An accessible shut-off valve shall be provided for each outdoor connection.

with single trap, private ... 3

- Combination sink and laundry tray, private 3
- Sewage ejector or sump pump, for each 25 gpm. 50

7-4. Stacks To Be Vertical: Soil and waste stacks shall extend in a vertical line from the highest to the lowest horizontal branch or fixture branch connected thereto, except as provided for in section 5, and shall be vented in accordance with the requirements of Division VIII.

7-5. Size of Soil and Waste Pipes: The total number of fixture units installed on a soil or waste stack or horizontal branch of given diameter shall be in accordance with table V. No soil or waste shall be smaller than the largest horizontal branch connected thereto.

Table V.—Permissible number of fixture units on horizontal branches and stacks

Diameter of pipe (inches)	Fixture units on	
	horizontal branch	stack
1 1/4	1	2
1 1/2	2	4
2	6	10
3, waste only	32	48
3, soil	20	30
4	160	240
5	360	540
6	640	960

7-6. Horizontal and Primary Branches: (a) The required sizes of horizontal branches and primary branches of the building drain shall be in accordance with table VI.

Table VI.—Capacities of horizontal branches and primary branches of the building drain

Diameter of pipe (inches)	Horizontal branch at minimum permissible slope or greater		
	1/2 inch fall per foot	1/4 inch fall per foot	1/8 inch fall per foot
1 1/4	1	2	2
1 1/2	3	5	7
2	6	21	26
3, waste only	32	36	48
3, soil	20	24	36
4	160	180	240
5	360	400	540
6	600	660	960

In case the sanitary system consists of one soil stack only or of one soil stack and one or more waste stacks of less than 3-inch diameter, the building drain and building sewer shall be of the same nominal size as the primary branch from the soil stack as given in table VI.

7-7. Sumps and Receiving Tanks: All building subdrains shall discharge into a sump or receiving tank so located as to receive the sewage by gravity, from which sump or receiving tank the sewage shall be lifted and discharged into the building sewer by pumps, ejectors, or any equally efficient method. Such sumps shall either be automatically discharged or be of sufficient capacity to receive the building sewage and wastes for not less than 24 hours. Sump shall be provided with tight cover and separate vent.

Division VIII—Vents and Venting

8-1. Material: Vent pipes shall

lengths of both fixture drains are within the limits given in section 5.

(b) Two lavatory traps and two bathtub or shower stall traps may be installed on the same horizontal branch with a dual vent for the lavatory traps and with no back vents for the tub or shower stall traps, provided that the horizontal branch, except the separate fixture drains, shall be at least 2 inches in diameter and the fixture drains for bathtubs or shower stalls connect as closely as practicable upstream or downstream from the vent by means of a drainage Y, and the developed length of both fixture drains are within the limits given in section 5.

(c) Bathroom groups, each consisting of a water closet, lavatory, and a bathtub or shower stall, may be installed on a soil stack with any of the following forms of group venting.

(d) One bathroom group may be installed in the highest branch interval of the soil stack or on a vertical yoke-vented branch not less than 3 inches in diameter with no branch vents other than the yoke vent, provided each fixture drain connects independently to the soil stack in the highest branch interval and each fixture drain in all except the highest branch interval connects independently with the yoke-vented branch within the limits given in section 5.

(e) Two bathroom groups may be installed on each of two floors with the following form of venting:

Top floor bathrooms as described in (b). First floor bathrooms same as above except to have relief vent from water closets.

(f) Two bathroom groups with group venting in accordance with section 8-7 (a) and 8-7 (b) may be installed in the same branch interval of a soil stack, provided a relief vent is installed for the second and lower branch intervals from the top.

8-8. Size and Length of Main Vents: Vent stacks or main vents shall have a diameter of at least one-half that of the soil or waste stack, and shall be of larger diameter in accordance with the limits of length and number of fixture units as given in table VII. The length of the main vent for application with table VII shall be the total developed length as follows:

(a) From the lowest connection of the vent system with the soil stack, waste stack, or primary branch to the terminal of the vent, if it terminates separately to the open air.

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the pressure has reached all parts of the system. He may modify or change the order of any of the tests prescribed in sections 5, 6, and 7 or may substitute a different test to meet special conditions; provided that the tests used are, in his opinion, as effective as those required in the sections enumerated.

11-3. Notification for Test:

(a) It shall be the duty of the plumber to notify the authority having jurisdiction over plumbing and the owner, or his authorized agent, orally by telephone, or in writing, not less than one working day before the work is to be inspected or tested.

(b) It shall be the duty of the plumber to make sure that the work will pass the test prescribed before any above notification.

(c) If the authority having jurisdiction over plumbing finds that the work will not stand the test, the plumber shall be required to renotify the authority.

11-4. Labor and Equipment for Tests: The equipment, material, power, and labor necessary for the inspection and test shall be furnished by the plumber, unless otherwise provided by the authority having jurisdiction over plumbing.

11-5. Tests of Drainage System:

(a) Water test.—A water test may be applied to the system in its entirety or in sections. If applied to the entire system, all openings in the piping shall be tightly closed, except the highest opening, and the system filled with water to the point of overflow. If the system is tested in sections, each opening shall be tightly plugged (except the highest opening of the section under test) and the section shall be filled with water. In testing successive sections at least the upper 10 feet of the next lower section shall be retested (except the uppermost 10 feet of the system) and shall have been subjected to at least a 10 foot head of water.

The water level shall remain constant without any further addition for sufficient time to inspect the entire section under test, but in no case less than 15 minutes.

(b) Air test.—In place of the water test, an air test may be applied as follows: With all openings tightly closed, air should be forced into the system until there is a uniform pressure sufficient to balance a column of mercury 10 inches in height (or 5 pounds per square inch) on the entire system or section under test. The air pressure shall be maintained on the system or section without any further addition of air for a sufficient time to determine tightness but in no case for less than 15 minutes.

11-6. Final Test: Final test, if required by local practice, shall be applied after all fixtures have been permanently connected and all trap seals filled with water. A smoke or air test under a pressure of approximately 1-

inch water column shall be applied to the sanitary system.

In the case of a smoke test, a thick penetrating smoke produced by one or more smoke machines (not by chemical mixtures) shall be introduced into the entire system through a suitable opening. As the smoke appears at the stack openings, they shall be closed and a pressure equivalent to 1-inch water column shall be applied.

11-7. Tests of the Water Supply System: The water supply system shall be tested in its entirety by filling the entire system with water under a pressure of at least 100 pounds per square inch, or by applying air pressure of at least 35 pounds per square inch (70 inches of mercury column) in case the water test is not feasible or not desirable. The test in either case shall be applied for sufficient time to determine tightness.

11-8. Final Condition: All parts of the plumbing system and associated equipment shall be otherwise tested and adjusted to work properly and be left in good operating condition.

After each of the above tests has been made and proved acceptable, the authority having jurisdiction over plumbing shall issue a written approval.

11-9. Defective Work:

(a) If inspection or test shows defects, such defective work or material shall be replaced and inspection and the tests repeated.

(b) All repairs to piping shall be made with new material, no calking of screwed joints, cracks, or holes will be acceptable.

11-10. Tests of Leaders: Leaders and their roof connection within the walls of buildings, or their branches on an outside system where such branches connect with the building drain or are less than 3 feet from the wall of the building, shall be tested by the water or air test. Branches on the outside system may be tested in connection with the house drain.

11-11. Certificate of Approval: Upon the satisfactory completion and final test of the plumbing system, a certificate of approval shall be issued by the authority having jurisdiction over plumbing to the plumber to be delivered to the owner.

11-12. Test of Defective Plumbing: The smoke or air test shall be used in testing the sanitary condition of the plumbing system of a building where there is a reason to believe that the system has become defective. In plumbing found defective by the authority having jurisdiction over plumbing, the alterations required shall be considered as new plumbing.

11-13. Inspections and Test Not Required: No test or inspection shall be required where a plumbing system or part thereof is set up for exhibition purposes and not used for toilet purposes and not directly connected to a sewerage system; nor after the repairing, or the replacement by a new one to be used for the same purpose, of an old fixture, faucet, or valve, nor after forcing out stoppages and repairing leaks.

Section 12-14. Before plumbing is installed on any premises the owner shall be required to pay into the City authorities the sum of Fifty Cents

(\$.50) for a plumbing permit and after the work has been performed an additional Fifty Cents (\$.50) for inspection thereof.

Section 12-15. All master plumbers performing plumbing in the City of Kirkland shall secure a license before doing any plumbing work in the City of Kirkland. Said license shall be in the sum of Fifty Dollars (\$50.00), payable and due on January 2 of each year to the Treasurer of the City of Kirkland, except in the year 1942 the license shall be Twenty-five Dollars (\$25.00) payable on July 1, 1942. No journeyman plumber shall be permitted to repair, install or do plumbing work in the City of Kirkland unless he be in the employ of a regularly licensed Master Plumber. The license for journeymen plumbers shall be One Dollar Fifty Cents (\$1.50) each, payable on January 2 of each year, except in the year 1942, the license shall be One Dollar (\$1.00) payable on July 1, 1942.

Section 12-16. The Mayor is hereby authorized to make such appointments as are necessary to insure the proper compliance with an effectiveness of this code.

Section 13. Penalty. Any person who shall violate any of the provisions of this Ordinance shall be deemed guilty of a misdemeanor and on conviction shall be fined a sum not exceeding One Hundred Dollars (\$100.00) or imprisoned for not more than twenty (20) days, or both.

Section 14. If any provisions of this Ordinance, or the application thereof to any person or circumstance, is held invalid, the remainder of the Ordinance, and the application of such provisions to other persons or circumstances, shall not be affected thereby. If any section, sub-section, sentence, clause, or phrase of this Ordinance is for any reason held to be unconstitutional, such decisions shall not affect the validity of the remaining portions of this Ordinance.

Section 15. All Ordinances or parts of Ordinances in conflict with, or derogation of, this Ordinance or any part of this Ordinance, be and the same are hereby repealed in so far as the same are in conflict with, or in derogation of this Ordinance, or any part hereof.

Passed and approved this 22nd day of June, 1942.

L. H. JAYCOX,
Mayor.

Attest:
W. B. WITTENMYER,
Clerk.

Approved as to form: Maurice D. Powell, City Attorney.

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Table VII.—Size and length of main vents

Diameter of soil or waste stack (inches)	Number of fixture units on soil or waste stack	Maximum permissible developed length of vent				
		1½-in. vent Feet	1½-in. vent Feet	2-in. vent Feet	2½-in. vent Feet	3-in. vent Feet
1¼	2	75	...	...	...	...
1½	8	70	150	...	...	...
2	24	28	70	300	...	...
3	40	...	20	80	260	650
3	80	...	18	75	240	600
4	310	...	...	30	95	240
4	620	...	...	22	70	180

(b) From the lowest connection of the vent system with the soil stack, waste stack, or primary branch to the sack vent plus the developed length of the stack vent to its terminal in the open air, if the stack vent and vent stacks are joined with a single extension to the open air.

8-9. Size of Back Vents and Relief Vents: The nominal diameter of a back vent, when required, shall be not less than 1¼ inches nor less than one-half the diameter of the drain to which it is connected, and under conditions that require a relief vent for approved forms of group venting, the sum of the cross sections of all vents installed on the horizontal branches in one branch interval shall be at least equal to that of either the main vent or the largest horizontal branch in the branch interval.

8-10. Location of Vent Terminals: No vent terminals from the sanitary drainage system shall be within 12 feet of any door, window, or ventilating opening of the same or an adjacent building unless it is at least 3

feet higher than the top of such opening. Extensions of vent pipes through a roof shall terminate at least 1 foot above it and shall be properly fastened. Vent terminals extending through walls shall not terminate within 12 feet horizontally of any adjacent building line, shall be turned to provide a horizontal opening downward, shall be effectively screened, and shall be properly flashed, calked, or otherwise sealed.

Division IX.—Indirect Connections to

Waste Pipes					
9-1. Indirect Wastes: Waste pipes from the following shall not connect directly with any building drain, soil, or waste pipe: a refrigerator, ice box, or other receptacle where food is stored; an appliance, device, or apparatus used in the preparation or processing of food or drink; an appliance, device or apparatus using water as a cooling or heating medium; a sterilizer, water still, water treatment device, or water operated device.					
Such waste pipes shall in all cases empty into and above the flood level of an open plumbing fixture. Indirect waste connections shall not be located in inaccessible or unventilated cellars or other spaces.					
9-2. Size of Refrigerator Wastes: Refrigerator waste pipes shall be not less than 1¼ inches in diameter for one opening; 1½ inches for 2 or 3 openings; and 2 inches for 4 to 12 openings. Each opening shall have a trap and cleanout so installed as to permit proper flushing and cleaning					

of the waste pipe.

Division X.—Maintenance

10-1. Defective Plumbing: Any part of the plumbing system found defective or in an unsanitary condition shall be repaired, renovated, replaced, or removed within 30 days upon written notice from the authority having jurisdiction over plumbing.

10-2. Temporary Toilet Facilities: Toilet facilities provided for the use of workmen during the construction of any building shall be maintained in a sanitary condition.

10-3. Condensate and Blow-off Connections: No direct connection of a steam exhaust, boiler blow-off, or drip pipe shall be made with the building drainage system. Waste water when discharged into the building drainage system shall be at a temperature not higher than 140° F. Where higher temperatures exist, proper cooling methods shall be provided.

Division XI.—Inspection, Tests, Licenses and Penalties

11-1. Inspection: All piping, traps, and fixtures of a plumbing system shall be inspected by the authority having jurisdiction over plumbing to insure compliance with the requirements of this text and the installation and construction of the system in accordance with the approved plans.

11-2. Tests Required: Every plumbing system shall be subjected to tests for tightness. The complete water supply system of the building shall be subjected to a water or air pressure test. The drainage system within or under every building of two stories or more shall be subjected to a water or air pressure test before the pipes are concealed or the fixtures are set in place, and the sanitary drainage and vent system shall be subjected to a final smoke or air pressure test after the system has been completed and the fixture traps have been connected, if required by local practice. The authority having jurisdiction over plumbing may require the removal of any plug or cap during the test to determine whether

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