

THE CORPORATION OF THE DISTRICT OF BURNABY

BY-LAW NO. 4951

A BY-LAW to regulate the Plumbing and  
Sewerage of Buildings.

The Council of The Corporation of the District  
of Burnaby ENACTS as follows:

1. This By-law may be cited as "BURNABY PLUMBING  
BY-LAW 1966".

2. The By-law is divided into the following parts:

Part A	Definitions
Part B	Administration
Part C	General Requirements
Part D	Materials
Part E	Plumbing Fixtures
Part F	Soil Waste & Storm Water Pipe & Systems
Part G	Joints & Connections
Part H	Traps, Interceptors & Cleanouts
Part I	Venting System
Part J	Water Supply & Distribution
Part K	Special Installations

Part A DEFINITIONS

3. In this By-law, unless the context otherwise  
requires, the following words and terms shall have the meaning  
hereby assigned:

(1) "ACCESSIBLE" shall mean:

(a) Not closed in by obstructions or finish of  
a building; or

(b) Capable of being removed without disturbing  
the building structure, finish or devices.

(2) "AIR GAP", in a water supply system, shall mean the  
unobstructed vertical distance between the outlet of any  
faucet or pipe and the flood level rim of the water-supplied  
Fixture or Receptacle.

(3) "APPROVED" shall mean accepted as satisfactory to the Plumbing Inspector.

(4) "AREA DRAIN" shall mean a drain installed to collect surface or rain water from an open area.

(5) "BACKFLOW" shall mean such flow of:

(a) Water, polluted or non-polluted, from any place other than the source of supply of potable water; or

(b) Any solid, liquid, or gaseous substance, or any combination thereof into a potable water distributing pipe as may make the water in that pipe non-potable.

(6) "BACKFLOW PREVENTER" (Vacuum Breaker) shall mean a device for installation in a water supply pipe to prevent Backflow from the connection on the outlet end of the water supply system.

(7) "BACK VENT" shall mean a pipe installed to vent a trap, soil pipe or waste pipe, and connected to the general vent system at a point above the fixture served by the trap, soil pipe, or waste pipe or terminating in the open air; BACK VENTED has a corresponding meaning.

(8) "BASEMENT" shall mean that portion of a building (house) between two floor levels which is partly underground but which has at least one half of its height from finished floor to finished ceiling above adjacent finished grade as determined by the Building Inspector.

(9) "BRANCH" shall mean that part of a pipe system which extends from a water distribution pipe, or from a main soil or waste pipe, to one or more fixtures, or the pipe connecting one or more individual vents with a vent stack.

(10) "BRANCH INTERVAL" shall mean a length of soil or waste stack corresponding in general to a storey height, within which the horizontal branches from one floor or storey of the building are connected to the stack.

(11) "BRANCH VENT" shall mean a vent pipe connecting one or more individual vent pipes to a vent stack or stack vent.

(12) "BUILDING (House) DRAIN" shall mean that part of the lowest horizontal piping which receives the discharge from

soil, waste, and other drainage pipes within a building and conveys it to the building (house) sewer beginning thirty inches outside the building wall.

(13) "BUILDING (House) SEWER" shall mean that part of a drainage system outside a building commencing at a point thirty inches from the outer face of the wall of the building and connecting the building (house) drain to the main sewer or place of disposal of sewage.

(14) "BUILDING (House) SEWER EXTENSION" shall mean that part of the public sewer which connects or is intended to connect a building (house) sewer with any main sewer.

(15) "BUILDING (House) SUB-DRAIN" shall mean that part of a drainage system which cannot drain by gravity into the building (house) sewer.

(16) "BUILDING INSPECTOR" shall mean the person appointed from time to time by the Council as Chief Building Inspector of The Corporation of the District of Burnaby.

(17) "CATCH BASIN" - See Sump.

(18) "CELLAR DRAIN" or "BASEMENT DRAIN" shall mean that part of any drainage system which conveys the subsoil or ground water from the foot of walls, or below the cellar floor in any building, to a sump-trap or catch-basin, connecting with the storm sewer.

(19) "CIRCUIT VENT" shall mean a branch vent that functions for two or more traps and extends from a point on a horizontal branch in front of the last fixture connection to a vent stack; CIRCUIT-VENTED has a corresponding meaning.

(20) "CIRCUIT-VENTED BRANCH" shall mean a group of circuit-vented floor outlet fixtures in line on the same floor or level and discharging into a stack or building drain at the same floor or level.

(21) "CLEANOUT" shall mean a pipe fitting that has a removable plug, cap or cover and is so constructed that it can be installed at the end of a pipe or on a "Y" so that the plug, cap or cover can be removed to permit pipe cleaning.

(22) "COMBINED SEWER" shall mean a sewer which carries both storm water and sewage.

(23) "CONTINUOUS VENT" shall mean a continuation of a vertical waste pipe above the connection of the waste fitting.

(24) "CONTINUOUS WASTE" shall mean a waste or soil pipe from two or more fixtures connected to a single trap.

(25) "CORPORATION" shall mean The Corporation of the District of Burnaby.

(26) "CROSS CONNECTION" shall mean any physical connection or arrangement, between a potable water supply system and any plumbing fixture or any tank, receptacle, equipment or device, through which it may be possible for non-potable water or other substances to enter any part of such potable water system under any condition.

(27) "CROWN WEIR" shall mean the highest portion of the inside lower surface of a trap.

(28) "DEAD END" shall mean any pipe that is two feet or more in developed length and terminates with a cap, plug or other closed fitting.

(29) "DEVELOPED LENGTH or DISTANCE" shall mean the length along the centre line of pipe and fittings.

(30) "DISPOSAL FIELD" shall mean a designed system of pipes for the disposal of sewage effluent laid in shallow excavations or trenches backfilled with specified material.

(31) "DOUBLE OFFSET" shall mean two offsets installed in succession in the same line.

(32) "DRAINAGE SYSTEM" shall mean any system of piping that conveys sewage or run-off water to a building (house) sewer.

(33) "DRY VENT" shall mean any vent that does not carry water or water-borne wastes.

(34) "EFFECTIVE OPENING" shall mean the minimum cross-sectional area between the end of the supply fitting outlet (spout) and the inlet to the controlling valve or faucet. The basis of the measurement is the diameter of a circle of

equal cross-sectional area. If two or more lines supply one outlet, the effective opening is the sum of the effective opening of the individual lines or the area of the combined outlet, whichever is the smaller.

(35) "EXISTING WORK" shall mean a plumbing system or any part thereof which has been installed prior to the effective date of this By-law.

(36) "FERROUS PIPE" shall mean pipe obtained from iron.

(37) "FIXTURE UNIT" shall mean a design factor for drainage piping in which the rate of discharge from a wash basin having one and one-quarter inch outlet is taken as unity, and the rate of discharge from all other fixtures is related to it.

(38) "FLOOD LEVEL", when used with reference to a fixture, shall mean the level at which water begins to overflow the top rim of the fixture.

(39) "FLOOD LEVEL RIM" shall mean the top edge of a fixture from which water overflows.

(40) "FLOOR DRAIN" shall mean a fixture used to receive water from the floor of a building.

(41) "FLUSHOMETER" shall mean a device which discharges a predetermined quantity of water to fixtures for flushing purposes and is actuated by direct water pressure.

(42) "GRADE" shall mean the slope or fall of a line of pipe in reference to a horizontal plane. In drainage it is usually expressed as the fall in a fraction of an inch or percentage slope per foot length of pipe.

(43) "HORIZONTAL BRANCH" shall mean a drain pipe extending laterally from a soil or waste stack or building drain with or without vertical sections or branches which receives the discharge from one or more fixture drains and conducts it to the soil or waste stack or to the building (house) drain.

(44) "HORIZONTAL PIPE" shall mean a pipe installed in a horizontal position, or which makes an angle of less than forty-five degrees with the horizontal.

(45) "INDIRECT WASTE" shall mean a waste pipe not directly connected to a drainage system but which discharges freely into or over a trapped fixture.

(46) "INDIVIDUAL VENT" has the same meaning as a Back Vent; INDIVIDUALLY VENTED has a corresponding meaning.

(47) "INDUSTRIAL WASTE" shall mean any and all liquid or water-borne waste from industrial or commercial processes except domestic sewage.

(48) "INTERCEPTOR" shall mean a device designed and installed so as to separate and retain deleterious, hazardous, or undesirable matter from normal wastes and permit normal sewage or waste water to discharge into the disposal terminal by gravity. In case of acid wastes, an interceptor is a device in which the acid wastes are neutralized prior to their discharge into the soil or waste system of the premises, the building (house) sewer, private sewer or public sewer.

(49) "LEADER" shall mean any pipe or conduit carrying rain or storm water from a roof to the storm sewer or other point of disposal.

(50) "LICENCE" shall mean a licence issued pursuant to the Licence By-law of The Corporation of the District of Burnaby.

(51) "LIQUID WASTE" shall mean the discharge from any fixture, appliance or appurtenance in connection with a plumbing system which does not receive fecal matter.

(52) "LOOP VENT" shall mean a circuit vent except that the vent pipe loops back over the flow line of the fixture and reconnects with the main soil or waste stack vent.

(53) "LOT" shall mean any one of the portions of subdivisions into which a block or parcel of land has been divided, and which is duly registered in the Land Registry Office for the New Westminster Registration District.

(54) "MAIN" shall mean any system of horizontal, vertical or continuous pipe which receives the wastes, vent, or

or vents, from fixtures, directly or through branch pipes.

(55) "MAIN SEWER or SEWER MAIN" shall mean the public sewer in a street, lane or other location.

(56) "MAIN VENT" shall mean the principal artery of the venting system to which vent branches may be connected.

(57) "MEDICAL HEALTH OFFICER" shall mean the person appointed from time to time by the Council as the Medical Health Officer of The Corporation of the District of Burnaby.

(58) "MUNICIPAL COUNCIL or COUNCIL" shall mean the Municipal Council of The Corporation of the District of Burnaby.

(59) "MUNICIPAL ENGINEER" shall mean the person appointed from time to time by the Council as the Municipal Engineer of The Corporation of the District of Burnaby.

(60) "OFFSET"; an offset in the line of piping shall mean a combination of elbows or bends which brings one section of the pipe out of line but into a line parallel with the other section.

(61) "OWNER" shall mean that person, in respect of any real property, who is the registered owner of an estate in fee simple, and in the event of there being registered a life estate, includes the Tenant for Life. In the event that there is registered an Agreement for Sale and Purchase, "OWNER" shall mean the registered holder of the last registered Agreement for Sale and Purchase. ~~In all cases "OWNER" shall mean a person actually occupying the premises or intending to occupy permanently in a single family dwelling in respect of which a plumbing permit is required.~~

In the case of real property held in the manner mentioned in Sections 335 and 336 of the Municipal Act, "OWNER" shall mean the holder or occupier as therein set out.

(62) "PERSON", when necessary, shall mean and include natural persons, associations, corporations, bodies politic, co-partnerships, partnerships, whether acting by themselves or by a servant, agent, or employee and the heirs, executors,

administrators, successors, and assigns or other legal representative of such person to whom the context can apply according to law.

(63) "PLUMBING or PLUMBING SYSTEM" shall mean any system or arrangement of one or more pipes, including fittings and appliances attached thereto, in, upon, or about any premises, and within the property line, installed for the purpose of supplying such premises with water, or for the conducting or carrying away of waste or of rain or surface water, including the required vent pipe or pipes.

(64) "PLUMBING CONTRACTOR" shall mean any person, corporation or firm licensed to install, construct, alter, reconstruct, repair, or extend any plumbing system.

(65) "PLUMBING FIXTURES" shall mean approved type installed receptacles, devices or appliances, including floor-drains and roof-drains which are supplied with water or which receive liquid or liquid-borne wastes and discharge such wastes into the drainage system to which they may be directly or indirectly connected. Industrial or commercial tanks, vats and similar processing equipment are not plumbing fixtures, but may be connected to or discharge into approved traps or plumbing fixtures when and as otherwise provided for elsewhere in this By-law.

(66) "PLUMBER" shall mean any person who does or offers to do the work of installing, constructing, reconstructing, repairing or extending any plumbing for gain.

(67) "PLUMBING INSPECTOR" shall mean the Plumbing Inspector appointed pursuant to the provisions of this By-law and shall also include any Assistant Plumbing Inspector appointed pursuant to the provisions of this By-law.

(68) "POTABLE WATER" shall mean water which does not contain objectionable pollution, contamination, minerals, or infection, and is considered satisfactory for domestic consumption.

(69) "PRIVATE SEWAGE DISPOSAL SYSTEM" shall mean a private system consisting of one or more settling or septic



tanks and an absorption field or some approved method of liquid disposal.

(70) "PUBLIC HEALTH INSPECTOR" shall mean the person appointed from time to time by the Council as the Public Health Inspector of The Corporation of the District of Burnaby.

(71) "PUBLIC SEWER" shall mean a common sewer directly controlled by public authority.

(72) "RAIN or STORM WATER CONDUCTOR" shall mean a pipe which conveys rain or storm water from the roof of any building.

(73) "RELIEF VENT" shall mean a vent on a circuit system connected to a horizontal waste or soil pipe at a point between the soil stack and the first or nearest fixture and carried above the flow line of the highest fixture to the main vent or stack vent.

(74) "RISER" shall mean a water supply pipe which extends vertically one full storey or more to convey water to branches or fixtures.

(75) "ROOF DRAIN" shall mean a fixture used to receive water from the roof of a building which discharges into the drainage system, except for a gutter and downspout system discharging to a weeping tile drain.

(76) "ROUGHING IN" shall mean the installation of all parts of the plumbing system which can be completed prior to the installation of fixtures, subject to the sufficiency of back-up construction for the system. This may include drainage, vent and water pipes and all valves concealed in partitions or walls and all necessary fixture supports.

(77) "SANITARY SEWER" shall mean a sewer which carries any liquid or water-borne waste except storm water.

(78) "SEPARATE SYSTEM AREA" shall mean an area in which the Municipal Engineer requires the separate disposal of storm water and sewage.

(79) "SEPTIC TANK" shall mean a water-tight receptacle which receives the discharge of a drainage system or part

thereof, designed and constructed so as to retain solids, digest organic matter through a period of detention and allow the liquids to discharge into the soil outside of the tank through a system of open joint piping or a rock pit meeting the requirements of this By-law, and the Health By-law of The Corporation of the District of Burnaby.

(80) "SEWAGE" shall mean any liquid waste containing animal or vegetable matter in suspension or solution and may include liquids containing chemicals in solution.

(81) "SEWAGE SUMP" shall mean an approved airtight tank or pit which receives sewage or liquid waste and which is located below the normal grade of the gravity system and which must be emptied by mechanical means.

(82) "SEWER MAIN" - see MAIN SEWER.

(83) "SINGLE FAMILY DWELLING" shall mean a building designed to be used as a home by the owner of such building and shall be the only dwelling located on a parcel of ground with or without the usual accessory buildings.

(84) "SOIL PIPE" shall mean any pipe which conveys the discharge of water closets, or fixtures having similar functions, with or without the discharge from other fixtures to the building (house) drain or building (house) sewer.

(85) "SPECIAL WASTES" shall mean, wastes which require some special method of handling such as the use of indirect waste piping and receptors, corrosion resistant piping, sand, oil or grease interceptors, condensers or other pre-treatment facilities.

(86) "STACK" shall mean the vertical main of any system of soil, waste or vent pipes.

(87) "STACK VENT" shall mean the extension of a soil or waste stack above the highest horizontal drain connected to the stack.

(88) "STORM SEWER or STORM DRAIN" shall mean a public sewer which carries only storm water and surface water but excludes sewage and polluted industrial waste.

(89) "STORM WATER" shall mean water resulting from or

following rainfall or snowfall but not containing sewage.

(90) "SUBSOIL DRAIN" shall mean a drain installed for collecting or conveying subsurface or seepage water.

(91) "SUMP" shall mean a receptacle installed to intercept the flow of deleterious matter into the house sewer or public sewer and to prevent the outflow of sewer gas.

(92) "TRAP" shall mean a fitting or device so designed as to provide a liquid seal which will prevent the back passage of air without materially affecting the flow of sewage.

(93) "TRAP DIP" shall mean the lowest portion of the inside upper surface of a trap.

(94) "TRAP SEAL" shall mean the vertical distance between the crown weir and the trap dip of the trap.

(95) "TRAP WEIR" - see CROWN WEIR.

(96) "VACUUM BREAKER" - see BACKFLOW PREVENTER.

(97) "VENT PIPE" shall mean a pipe or system of pipes installed to provide a circulation of air within such system to protect the trap seal from siphonage and back pressure.

(98) "VENT STACK" shall mean a vertical vent pipe installed to provide a flow of air to or from a drainage system.

(99) "VERTICAL PIPE" shall mean a pipe installed in a vertical position or which makes an angle of not more than forty-five degrees with the vertical.

(100) "WASTE ARM" shall mean the portion of the waste pipe between the fixture trap and vent.

(101) "WASTE PIPE" shall mean any pipe which receives the discharge from any fixture except water closets or similar fixtures, and conveys it to the building (house) drain, soil or waste stack.

(102) "WATER CLOSET" shall mean a water-flushed fixture for the reception and transmission (to ultimate disposal) of human excreta.

(103) "WATER-DISTRIBUTING PIPE" shall mean a pipe in a building or premises which conveys potable water from the building supply pipe to the plumbing fixtures and other water outlets.

(104) "WATER (Street) MAIN" shall mean a water supply pipe for public or community use.

(105) "WATER SERVICE PIPE" shall mean the pipe, with necessary controls, extending from the water main or other source of supply to the building served.

(106) "WATER SUPPLY SYSTEM" shall mean the pipe, fittings, control valves, and all appurtenances, in or adjacent to a building, for conveying water from the water service pipe to plumbing fixtures or other apparatus or devices.

(107) "WEEPING TILE DRAIN" shall mean a series of clay, concrete or perforated bituminous fibre pipes laid underground so as to accept and convey subsurface drainage.

(108) "WET VENT" shall mean a vent which receives the discharge of wastes with maximum of two fixture units each.

(109) "YOKE VENT" shall mean a pipe connecting upward from a soil or waste stack to a vent stack for the purpose of preventing pressure changes in the stacks.

#### ABBREVIATIONS:

FU; F-U; fu; f-u; shall mean Fixture-unit.

np or n.p. shall mean "not permissible".

\* or (\*) shall mean, further explanatory notes.

psi or p.s.i. shall mean "pounds per square inch".

#### Part B ADMINISTRATION

##### 4. Duties of the Building Inspector

(1) It shall be the duty of the Building Inspector and he is hereby authorized and empowered to require that all the provisions of this By-law shall be carried out.

(2) The Building Inspector shall maintain and keep records of all work undertaken in connection with the inspection of plumbing.

5. Appointment of Plumbing Inspectors

(1) The Council may from time to time appoint a person or persons to be Plumbing Inspector or Inspectors.

(2) The Plumbing Inspector or Inspectors shall at all times be subject to the control and direction of the Building Inspector.

6. Duties of the Plumbing Inspector

(1) The Plumbing Inspector shall examine and pass upon plans and specifications for plumbing.

(2) The Plumbing Inspector shall attend tests of all works and inspect or cause to be inspected all plumbing work in course of installation, alteration or repair, subject to the provisions of this By-law.

(3) The Plumbing Inspector shall have the authority and power to direct the immediate suspension or correction of all or any portion of the plumbing, by attaching a notice to that effect, on such premises whenever it is found by him that such work is not being performed in accordance with the provisions of this By-law.

7. Right of Entry

(1) The Building Inspector and the Plumbing Inspector or Inspectors are authorized to enter at all reasonable times upon any property or premises in order to ascertain whether the regulations contained in this By-law are obeyed, or to enforce or carry into effect the same.

(2) Any person interfering with or obstructing the entry of the Building Inspector or Plumbing Inspector or Inspectors into any premises, which said entry is made or attempted to be made pursuant to the provisions of this By-law shall be deemed to be guilty of an infraction of this By-law and shall be liable to the penalties hereof.

(3) No person shall hinder or prevent the Building Inspector or Plumbing Inspector or Inspectors from entering and making reasonable inspection of any building or premises whenever necessary to secure compliance with, or

prevent a violation of, any provisions of this By-law.

8. Existing Plumbing

(1) Whenever it is found that any plumbing is defective, insanitary or inadequate, the Plumbing Inspector shall notify the owner, agent or person in charge of such premises, pointing out wherein such defect, insanitary condition or inadequacy exists, and order that such plumbing be placed in a proper, safe and sanitary condition.

(2) Whenever in the opinion of the Plumbing Inspector there is reason to suppose that the plumbing in any building has become dangerous or defective on account of the settlement of such building or through abuse, accident or for any other cause whatsoever, the Plumbing Inspector may require the owner, agent or person in charge to apply a smoke test to the waste and vent pipes of such building to ascertain whether any defective condition exists.

(3) Whenever it is found that the plumbing and drainage system of a mobile home is defective, insanitary or inadequate, the Plumbing Inspector shall notify the owner, agent or person in charge of the trailer park to immediately disconnect the mobile home from the water supply and sewer connection and order that such plumbing and drainage system be placed in a proper, safe and sanitary condition.

(4) Nothing contained in this By-law shall be construed to require any construction or work, regulated by this By-law, to be altered, changed, reconstructed, removed or demolished if such construction or work was installed in accordance with any law in effect prior to the effective date of this By-law, or to require the alteration, changing, reconstruction, removing or demolishing of any construction or work regulated by this By-law, except when any such construction or work regulated by this By-law is dangerous, unsafe, insanitary or a menace to life, health or property, in the judgment of the Plumbing Inspector.

9. Alternate Materials

(1) (a) The provisions of this By-law are not intended to prevent the use of any material, or any method of construction not specifically prescribed in this By-law, provided any such alternate has been approved and its use authorized by the Plumbing Inspector.

(b) The Plumbing Inspector may approve any such alternate, provided he finds the material, method, or work offered is, for the purpose intended, at least equivalent of that prescribed in the By-law in quality, strength, effectiveness, durability, and safety.

(c) The Plumbing Inspector shall require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding the sufficiency of any such proposed material or type of construction.

(2) (a) When there is insufficient evidence to substantiate claims for alternates, the Plumbing Inspector may require tests, as proof of compliance, to be made by an approved agency at the expense of the applicant.

(b) Tests shall be made in accordance with generally recognized standards, but in the absence of such standards, the Plumbing Inspector shall specify the test procedure.

10. Discretionary Powers of the Plumbing Inspector

(1) Where, in or on any premises, it is desired to install special fixtures, machines or appliances for which no provision is made in respect thereof in this By-law, the Plumbing Inspector may issue a special permit for the installation of such fixtures if in his opinion they are satisfactory, and the installation does not disturb or interfere with the plumbing in the said premises.

(2) In or on any existing building where physical conditions make it necessary to deviate from the regulations of this By-law, the Plumbing Inspector may with the approval of the Building Inspector or Medical Health Officer, permit such variation as in his opinion may be necessary,

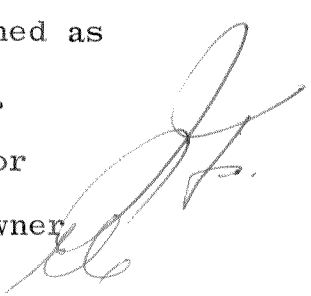
and provided further, the owner of the said premises file with the Building Inspector a statement setting forth wherein such deviation occurs and an acceptance of full responsibility for same.

11. Permits:

(1) (a) Except as provided in subsection 3 hereunder, no construction, reconstruction, replacement, alteration or extension of any plumbing system or part thereof shall be started until a permit to do so has been obtained.

(b) Except as provided in subsection 3 hereunder, no person shall do any plumbing, or install any plumbing fixtures as defined in this By-law, except the plumbing provided for in a permit issued to such person and as specified in the application for such permit.

(c) No connection shall be made with any Municipal sewer until a permit to do so has been obtained as provided for in "Burnaby Sewer Connection By-law 1961".

(2) No person except a Plumbing Contractor holding a current Municipal Business Licence or ~~home~~ owner as herein defined, shall be granted a plumbing permit. 

(3) No permit shall be required for the repair of leaks in water pipes or the replacing of fixtures, provided such fixtures and the installation thereof otherwise conform to the requirements of this By-law, nor for the removal of stoppage in soil or waste pipes, provided cleanouts are used for this purpose, and no soil or waste pipe is broken.

(4) (a) Application for a permit shall be made to the Plumbing Inspector on a form provided for that purpose, and shall be accompanied by the required fee in accordance with the Schedule of Fees prescribed herein.

(b) When such application conforms to the provisions of this By-law, the Plumbing Inspector may issue a permit.

(5) (a) Every application for permit shall be accompanied by such plans and specifications as will thoroughly



describe the proposed work and as may be required by the Plumbing Inspector.

(b) If at any time during the installation, alteration or repair of plumbing, it is desired to alter in any essential manner, or deviate from the particulars of the application, the approval of the Plumbing Inspector shall first be obtained, and where such alteration or deviation involves the installation of any additional fixture, a further permit shall be obtained.

(c) A plumbing permit may be withheld by the Plumbing Inspector if the applicant for a permit is in receipt of outstanding objections for a previous plumbing installation and such permit withheld until said objections are cleared in accordance with this By-law and passed by the Plumbing Inspector.

(6) If, after the issuance of any permit, the plumbing authorized thereunder be not commenced within ninety (90) days from the date thereof, or if, after the commencement of operations thereon, the work be discontinued for a period of ninety (90) days through any cause other than strikes or lockouts, or if the work be not carried on continuously and in a bona-fide manner, such permit shall be void, and the work shall not be again commenced until a new permit shall have been issued; provided, however, that the Building Inspector may extend the said period of ninety (90) days for a further period of ninety (90) days, if in his opinion the delay in the commencement of the said work was beyond the control of the person to whom the permit was issued.

(7) Neither the granting of a permit, nor the approval of plans and specifications, nor inspections made by the Plumbing Inspector shall in any way relieve the Permit Holder from full responsibility for carrying out the work in strict accordance with this By-law.

(8) When after a permit has been obtained for the installation, alteration or repair of plumbing, it shall appear upon inspection and test that the plumbing done, or the

materials used do not in all respects conform to the provisions of this By-law, the Building Inspector may order such changes in workmanship or materials as shall be necessary to make the same conform to the provisions of this By-law, and if such order be not complied with, the Building Inspector shall revoke the permit and no further permit for such plumbing work shall be granted until all the defects mentioned in the said order have been remedied to the satisfaction of the Plumbing Inspector.

(9) (a) Every applicant for a plumbing permit shall pay to the Corporation the fee prescribed and as set forth in Appendix "A" attached hereto. For the purpose of this subsection, each roof drain, floor drain, interceptor, vacuum breaker in lawn sprinkler system, and vacuum breaker or approved double check valve assembly installed on an existing device, as required by the Plumbing Inspector, shall be classed as a fixture in determining the permit fee.

(b) In every case where, due to non-compliance with the provisions of this By-law or to unsatisfactory workmanship, more than two inspections are necessary, then for each inspection after the second inspection a fee of \$3.50 shall be paid.

(10) No fee or part thereof in payment of a plumbing permit as required by this By-law, shall be refunded if the work authorized by the permit has been commenced; but if no work has been commenced and the Building Inspector so certifies, the Corporation Treasurer may refund 90% of the plumbing permit fee.

12. Required Connection to Sewer

(1) If any part of the premises or lot or parcel of land upon which any building within the Municipality in which one or more persons reside or work, or carry on any occupation, trade or calling, is situated within one hundred and fifty (150) feet of any public sewer, the owner of such

building shall connect such building with such public sewer in the manner provided by the By-laws of the Municipality in that behalf, and such connection shall be made within one hundred and eighty (180) days of the completion of the public sewer for use.

(2) In default of any such owner connecting any such building with such public sewer within the applicable period referred to in (1) above, the connection may be made by the Municipality at the expense of such owner and the Municipality may recover such expense thereof with interest at the rate of 6% per annum with cost in like manner as Municipal taxes.

(3) Any such owner so in default as aforesaid shall be deemed guilty of an infraction of this By-law, and liable to the penalties hereby imposed.

13. Permit for Connection to the Public Sewer

No person shall connect any house sewer to any house sewer extension without first obtaining a permit so to do from the Municipal Engineer.

14. Excavation on Street by Engineering Department

No person except by permission of the Municipal Engineer shall excavate any portion of any street for the purpose of connecting any house sewer to any house sewer extension or for the purpose of unstopping any house sewer extension.

15. Public Sewer on Private Property

Where any public sewer is laid in private property in respect of which the Corporation holds a sewer easement, no person shall connect to, or disturb such sewer except by direction of and with the permission of the Municipal Engineer.

16. Information to be Provided by Applicant

(1) In all cases where it is proposed to conduct

the waste from plumbing fixtures, trade waste, or surface or roof water to a sanitary sewer or storm sewer, whichever is applicable, the responsibility shall rest with the owner or plumber to make certain, by inquiring from the Municipal Engineer, that such sanitary sewer or storm sewer is at a sufficient depth and of sufficient capacity to receive such discharge.

(2) Every applicant to connect a house sewer with any house sewer extension shall furnish such information as the Municipal Engineer may require to show that the proposed house sewer and surface drains will be laid at such a depth and in such a position as to connect properly with the house sewer extension.

17. Use of Sewer Connections

(1) Sanitary sewer connections shall not be used during building operations or relaying operations or at any other time whatsoever for storm water drainage purposes, unless temporary sumps fitted to catch sediment or floating solids have been installed to the satisfaction of the Municipal Engineer.

(2) Storm sewer or storm drain connections shall not be used for the purpose of conveying sanitary effluent.

(3) No one shall connect or cause to be connected any storm drainage system to a sanitary sewer, and no person shall connect any soil or waste water to a storm sewer.

(4) No person shall connect or allow or cause any septic tank to be connected in any way with the Municipal sewer system.

(5) No person shall deposit or allow or cause to enter into the Municipal sewer system the sludge or material contained in any existing septic tank, except by written authority of the Municipal Engineer.

18. Enforcement:

(1) It shall be unlawful for any person to construct, install, remove, alter, repair, use or maintain

any plumbing, fire sprinkler system, or standpipe in violation of this By-law.

(2) No person shall cause, suffer or permit the disposal of sewage, human excrement, or liquid wastes, in any place or manner except through and by means of an approved plumbing system, conforming to this By-law.

(3) No person shall use or maintain any private sewage disposal system serving a building or structure on any lot or parcel of land which abuts on any public way or sewer easement in which a public sewer exists and is ready for use after having received notice from the Municipal Engineer to have such building or structure connected to the public sewer, as provided for in "Burnaby Sewer Connection By-law 1961".

(4) No person shall use any plumbing fixtures, appliance, apparatus, equipment, device or material, unless same has been approved by the Plumbing Inspector, as to its fitness and safety for its intended use or purposes.

(5) It shall be unlawful for any person to deposit by any means whatsoever, into any plumbing fixture, floor drain, interceptor, sump, receptacle or device, which is connected to any drainage system, public sewer, private sewer, septic tank or cesspool, any ashes, cinders, solids, rags, inflammable, poisonous or explosive liquids or gases, oils, grease or any thing which would, or could cause damage to the drainage system or public sewer.

(6) It shall be unlawful for any person to connect a vacuum cleaner or other mechanical device for removal of dust to the plumbing system or the sewer.

(7) Unless otherwise provided in this By-law, no person shall use any materials, fixtures or devices for the construction or installation of plumbing and drainage systems, or any parts thereof, unless such materials, fixtures or devices shall conform to the minimum applicable standards therefor as set forth in Tables 1 to 27 of this By-law or to other recognized and accepted standards approved

by the Plumbing Inspector.

(8) Every person shall conform to the requirements of this By-law as set forth in Parts C to K thereof.

Part C GENERAL REQUIREMENTS

19. Workmanship

(1) All plumbing shall be installed in a workmanlike manner and shall be subject to inspection and testing.

(2) No cracks, holes or imperfections shall be concealed by welding, brazing or soldering or by using thereon any paint, wax, tar, cement or other repair agents.

(3) All piping shall be straight and direct as possible, placed and arranged so that it may readily be inspected during installation.

(4) All valves, pipes and fittings shall be installed in correct relationship to the direction of flow.

20. Existing Buildings

(1) Existing building (house) sewers and building storm sewers may be used in connection with new buildings or new plumbing and drainage work only when they are found on examination and test to conform in all respects to the requirements governing new work and the Plumbing Inspector shall notify the owner to make any change necessary to conform to this By-law.

(2) No building or part thereof shall be erected or placed over any part of a drainage system which is constructed of materials other than those approved elsewhere in this By-law for use inside of a building.

21. Connection to a Sewage Disposal System

(1) All premises designed or used for human occupancy shall be connected to a public sewer intended to receive either sewage alone or sewage and drain water, if any part of such premises abuts upon a street or easement in which there exists a public sewer.

(2) Where any premises with plumbing installed therein and designed or used for human occupancy do not abut a street or easement in which there exists a public sewer, then such premises shall be connected to a private sewage disposal system, the design, construction and location of which shall be to the satisfaction of the Medical Health Officer, and no premises shall be connected to such private sewage disposal system until a permit so to do has been obtained from the Medical Health Officer.

(3) No owner or occupier of any land or premises shall permit any drainage or surface water to flow from such land or premises on to a Municipal street.

(4) There shall be a separate connection to the Municipal sewer for each separate parcel of land.

22. Connection to a Water Main

(1) Every building or premises used or intended to be used for human occupancy shall be connected to a water main of the Municipality when such premises abut upon or have access to a street or easement in which there exists a Municipal water main.

(2) Where any building or premises used or intended to be used for human occupancy do not abut upon or have access to a street or easement in which there exists a Municipal water main, then such building or premises shall be provided with a sufficient supply of pure and wholesome water in conformity with "Burnaby Health By-law 1926" and to the satisfaction of the Medical Health Officer.

23. Changes in Direction and Restricted Use of Fittings

(1) Changes in direction in horizontal soil pipe or waste pipe shall be made by the appropriate use of forty-five degree Y's, eighth, or sixteenth bends or by a combination of these, or by other approved fittings of equivalent sweep.

(2) Short-sweep Cast Iron or Long Sweep Copper quarter bends may be used to effect change from horizontal

to vertical drop.

(3) Single or double sanitary tapped T's or Crosses may be used only in a vent pipe and in a water distributing pipe.

(4) Single or double sanitary T-Y's may be used only in vertical sections of a drain or stack, provided however, a 3" double sanitary T-Y shall not be used to connect two water closets.

(5) Short sweep quarter bends may be used only for Vents, Cleanout Openings, or Fixture Connections, and only one short sweep quarter bend shall be permitted for a Fixture Connection, one Sixth bend with a quarter bend shall not be permitted on a waste arm.

24. Prohibited Fittings, Connections and Practices:

(1) No pipe or fitting with double hubs on the same run shall be used on soil or waste pipe.

(2) The drilling, tapping or welding of building drains, soil, waste vent pipes or fittings and the use of saddle hubs or bands is prohibited.

(3) Double Sanitary T-Y's are prohibited to receive waste from wall outlet toilets, blowout type urinals, or pump discharge fixtures.

(4) The waste pipe from a bath tub or other fixture shall not discharge into a water closet band or stub.

(5) A single fixture waste-arm, or a three-way elbow is prohibited for the use of more than one fixture.

(6) Four-by-three (4 x 3) reducing closet rings are prohibited.

25. Freezing Conditions

Water pipes shall not be installed under or within the lowest floor of a building, above a carport or other unprotected open area where freezing conditions may occur, unless such pipes are amply insulated against frost.



26. Dead Ends and Unused Pipes

(1) Where a dead end is installed it shall be graded so that all moisture accumulating in it drains back into the system.

(2) No unused open end in waste or vent pipes shall be permitted within the plumbing system inside the building, and all dead ends shall be so arranged as to permit drainage therefrom.

(3) When a waste pipe for future use is roughed in, the required vent pipe shall also be roughed in.

27. Hangers and Supports for Vertical Pipes

(1) Vertical cast steel or wrought pipe shall be supported and anchored with strong iron rests, set at least at the floor level of alternate storeys or twenty-five feet apart, whichever is the lesser distance, and where pipes are offset or are branched, the rests shall be placed at closer intervals to keep the pipe in alignment and to carry the weight of the pipe and its contents.

(2) Copper tubing one and one-half inches in diameter and over shall be supported or strapped at each storey, or ten feet intervals, whichever is lesser, and at not more than six feet intervals for one and one-quarter inches in diameter and under.

28. Hangers and Supports for Horizontal Pipes

(1) Flexible pipe shall be supported through its entire length when horizontal.

(2) Horizontal pipe shall be properly supported by approved straps and hangers at points sufficiently close to:-

(a) prevent the pipe from sagging when it is full of liquid; and

(b) keep it in alignment.

(3) No interval between supports for horizontal copper, steel or wrought pipe shall be greater than eight feet for pipe sizes to three and one-half inches, and not

greater than twelve feet for pipe sizes of four inches or more.

(4) Copper pipe up to and including three-quarter inch, in horizontal runs shall be supported at intervals of not greater than four feet.

(5) Lead pipe in horizontal runs shall be supported throughout its entire length.

(6) All horizontal Cast Iron pipe shall be supported at each hub, and not greater than five foot intervals.

(7) Strap hangers shall not be used to support horizontal pipe larger than four inches in diameter, but clevice ring hangers may be used for pipe of any size.

(8) Where a hanger of either type is attached to stone, brick, cement or other similar material, the attachment shall be made by means of metal or expansion type plugs inserted into the material.

(9) Hangers shall be made of metal and of sufficient strength to support the weight of the pipe and its contents.

(10) Waterpipe straps shall be of same material as the pipe being strapped.

(11) Underground pipe shall be laid in such a manner that undue stress in the pipe and joints shall be avoided.

(12) Where a drain is laid on an unstable base, it shall be of cast iron, and supported by a layer of concrete, or piers of brick, stone or concrete or other approved material.

(13) Where a layer of concrete is used, it shall not be less than four inches thick and six inches wider than the nominal diameter of the pipe.

(14) Where piers are used they shall:-

(a) have a cross section area each of not less than one-hundred and ten (110) square inches;

(b) be at intervals not greater than five feet; and

(c) extend down to a solid base.

29. Protection of Pipe

(1) A ferrous pipe passing under or through cinders or other corrosive material shall be protected against external corrosion by a heavy coat of bituminous or other similar material.

(2) All piping in connection with a plumbing system and a storm water system shall be installed without undue strains or stresses, and provision shall be made for expansion, contraction and structural settlement.

(3) No piping shall be built into or embedded in concrete or masonry walls, footings or foundations, except walls of hollow masonry construction.

(4) No structural member shall be seriously weakened by cutting, notching, or otherwise, and unless impractical due to structural conditions, all wood beams, girders, joists, studs and similar construction shall be bored with holes approximately the same diameter as the pipes passing through them.

(5) No building wall required to have a fire-resistance rating shall contain plumbing pipe if thereby the required resistance rating is reduced below the required minimum.

(6) All soil, waste, or storm water pipe shall be protected from freezing and damage in a manner approved by the Plumbing Inspector.

30. Trenching, Excavation and Backfill

(1) All excavations shall be completely back-filled as soon as possible after inspection and approval, with adequate precaution taken to insure proper compactness of backfill around piping without damage to such piping.

(2) Backfill should be placed in trenches in thin layers up to twelve inches above the top of the piping with clean earth which shall not contain stones, boulders,

cinder-fill, or other material which would damage or break the pipe or cause corrosive action.

(3) Suitable precaution shall be taken to insure permanent stability for pipe laid in filled or made ground.

31. Water Service Pipe in Sewer Trench

(1) Water service pipes, or any underground water pipes, shall not be run or laid in the same trench with non-metallic building sewer or drainage piping, except as provided in this section.

(2) Water service pipe may be placed in the same trench with a building drain or building sewer pipe, provided the following conditions are met:-

(a) The bottom of the water service pipe, at all points, shall be at least twelve inches above the top of the sewer line, and

(b) The water service pipe shall be placed on a solid shelf excavated at one side of the common trench.

32. Industrial Waste

Waste which may be injurious to any portion of the plumbing system, public sewerage system, or to the function of the sewage treatment works shall be treated or processed in accordance with the requirements of "Burnaby Sewer Connection By-law 1961".

33. Location of Sewers

Except where specifically required by the Plumbing Inspector and where proper legal easement has been obtained, and plans are approved by the said Plumbing Inspector, no plumbing system, drainage system, house sewer, private sewage disposal system or parts thereof shall be located in any lot other than the lot which is the site of the building, structure, or premises served by such facilities.

34. Indirect Waste Piping, Wet Vented Systems, and Special Wastes

Sumps, condensers and interceptors shall be adequately sized and designed, in relationship to the type of equipment connected, and subject to approval of the Plumbing Inspector.

35. Location of Piping and Fixtures

(1) Piping, fixtures, or equipment shall not be located in such a manner as to interfere with the normal operation of windows, doors, or other required means of access.

(2) Water-closets and urinals shall be located in a room adequately vented, lighted, and in accordance with the provisions of the "Burnaby Building By-law 1964".

36. Mezzanine Floor

A mezzanine storey or floor in or upon which a fixture is installed shall be deemed a separate storey or floor.

Part D MATERIALS

37. Quality of Material

Material used in any part of a plumbing system shall be free from defects which may affect its usefulness for the purpose of sanitation.

38. Specification for Material

(1) Material for plumbing systems shall comply with standards specified in this section, and in all instances conform with the Canadian Standards Association (C.S.A.) standards and specifications.

(2) Material for special conditions or materials not provided for in this By-law shall be used only on the approval of the Plumbing Inspector.

39. Non-Metallic Pipe

(1) Asbestos-cement pipe and couplings shall be sound; rubber rings for couplings shall consist of a moulded and vulcanized rubber compound.

(2) Asbestos-cement sewer pipe shall comply with the provisions of Table 1. Where tapered-end couplings are used they shall be asphalt-lined and a primer shall be used in assembling pipe to coupling.

40. Bituminized-fibre Pipe

Bituminized-fibre pipe, bends and couplings shall be dense, homogenous material without seams or laminations, and the interior surfaces of pipes and bends shall be smooth and free from obstructions, rough or flaky areas. The pipe, bends and couplings shall have a two percent taper at each end. Bituminized-fibre pipe shall comply with the provisions of Table 2.

41. Clay Sewer Pipe

Clay sewer pipe shall be first quality inside glazed vitrified earthenware, free from fractures, deep cracks, laminations, and surface roughness and shall comply with the provisions of Table 3.

42. Ferrous Pipe

(1) Cast iron pipe shall not be lighter than medium classification, sound and free from cracks, sand holes, and blow holes. Cast iron soil pipe and fittings shall comply with the provisions of Section 43.

(2) Every cast iron pipe and fitting shall be finished with a corrosive-retarding coating inside and outside.

43. Cast Iron Soil Pipe

(1) Cast iron soil pipe shall conform to Specification B70-1948, for "Cast Iron Soil Pipe and Fittings" of the Canadian Standards Association, except that it may be manufactured with a beaded spigot, on one end.

(2) The weight of a five foot length of soil pipe shall not be less than the number of pounds set forth in Table 4 according to the size of pipe.

(3) The weight of a five foot length of extra heavy soil pipe shall not be less than the number of pounds set forth in Table 4 - Column 2, according to the size of pipe.

44. Cast Iron Fittings

(1) Screwed cast iron drainage fittings shall be recessed to provide a smooth channel.

(2) Cast iron drainage fittings shall conform in wall thickness and hub dimensions to cast iron soil pipe.

45. Iron Pipe

(1) Wrought iron pipe may be butt-welded or lap-welded for sizes up to two inches, but larger sizes shall be lap-welded. Wrought iron pipe shall comply with the provisions of Table 6.

46. Steel Pipe

Welded and seamless steel pipe may be butt-welded for sizes up to four inches, but larger sizes shall be lap-welded.

47. Steel Pipe Specifications

Steel pipe shall comply with the provisions of Table 5. Couplings for steel pipe shall be wrought iron or steel.

48. Non-Ferrous Pipe

(1) Brass and copper pipe, iron pipe size, used in a plumbing system, shall comply with the provisions of Table 8.

(2) Copper tube for drain, waste and vent pipe within a building shall be drawn (hard) and shall be at least type "DWV" grade, as provided in Table 9.

(3) Copper tube for water distribution pipe within a building shall be drawn (hard) and shall be at least type "L" grade as provided in Table 10.

(4) Copper tube for underground water service pipe and underground water supply pipe, shall be annealed (soft) and shall be at least type "K" grade as provided in Table 11.

(5) Notwithstanding the above, where practical, copper, type "L" (soft) not greater than six feet in length, may be used horizontally. Risers may be of type "L" soft copper full length.

(6) Lead waste pipe shall weigh not less than prescribed in Table 12.

(7) All drainage fittings shall be of the solder hub-type and shall be recessed to provide a smooth channel.

49. Ferrules and Nipples

(1) Brass caulking ferrules shall comply with the provisions of Table 13.

(2) Brass soldering nipples shall comply with the provisions of Table 14.

(3) Brass soldering hubs shall comply with the provisions of Table 15.

50. Sheet Lead

(1) Sheet lead shall weigh not less than five pounds per square foot.

(2) Flashing lead shall weigh not less than three pounds per square foot.

51. Floor Flanges

Floor hanges for fixtures having an integral trap shall be not less than three-sixteenth inch thick, of brass, designed for soldering to lead pipe, and all floor flange bolts, washers, and nuts shall be of heavy brass.

52. Caulking Floor Flanges

Caulking flanges shall be of heavy brass of not less than three-sixteenth inch thick, with a depth of not less than one and one quarter inches, in weight not less than two pounds.



53. Identification of Materials

Every length of pipe and every fitting used in a plumbing system shall have cast, stamped or indelibly marked on it, the maker's name or mark and the weight and class of the product. All copper tubing shall be clearly marked as to type, at intervals of not less than six feet; colour identification shall be:

Green for type "K"

Blue for type "L"

Yellow for type "DWV"

54. Used Material

(1) Pipe or fittings which have been used for any purpose other than the distribution of potable water shall not be installed for distributing potable water.

(2) Used pipe or fittings shall not be re-installed in a new location except on the written consent of the Plumbing Inspector.

Table 1. ASBESTOS-CEMENT SEWER PIPE

Col.1 Item No.	Col.2 Pipe Size in Inches	Col.3 Min. Wall Thickness in Inches	Col.4 Flexural Strength Min. Total Load in Pounds	Col.5 Max. Span in Feet	Col.6 Supporting Strength Min. Ex.3- Bearing Load in Pounds
1	4	.22	550	9	1740
2	5	.22	900	9	1680
3	6	.22	1290	9	1420
4	8	.35	4300	12	2500
5	10	.37			2200
6	12	.41			2200
7	14	.41			2200
8	16	.45			2200
9	18	.48			2100
10	20	.52			2200
11	24	.58			2200

Table 2. BITUMINIZED-FIBRE DRAIN and SEWER PIPE

Col.1 Item No.	Col.2 Pipe Size in Inches	Col.3 Min.Wall Thickness in Inches	Col.4 Min. Flat- plate crushing load per Lin. ft. in Pounds	Col.5 Min. Length in Coupling in In- ches	Col.6 Min.Flat- plate crushing load per Coupling in pounds
1	2	.23	1100	2.90	270
2	3	.28	1100	3.42	315
3	4	.32	1100	3.92	370
4	5	.41	1300	3.92	430
5	6	.46	1300	3.92	430
6	8	.57	1600	5.00	670

Table 3. VITRIFIED CLAY GLAZED SEWER PIPE

Col.1 Item No.	Col.2 Pipe Size in Inches	Col.3 Min.Wall Thickness of Barrel in Inches	Col.4 Min. Inside Diameter of Barrel in Inches	Col.5 Support- ing Strength Min.3- Bearing Load per Lin.Ft. in Pounds	Col.6 Min. Inside Dia- meter of Socket Mouth in Inches	Col.7 Min. Depth of Socket in Inches
1	4	1/2	4	1000	5 3/4	1 3/4
2	6	5/8	6	1000	8 1/4	2 1/4
3	8	3/4	8	1000	10 1/2	2 1/2
4	9	3/4	9	1050	11 5/8	2 1/2
5	10	7/8	10	1100	12 3/4	2 1/2
6	12	1	12	1200	15 1/8	2 3/4
7	15	1 1/4	15	1370	18 3/4	2 3/4
8	18	1 1/2	18	1665	22 1/4	3
9	21	1 3/4	21	1995	25 7/8	3 1/4
10	24	2	24	2400	29 3/8	3 3/8

Table 4. CAST IRON SOIL PIPE and FITTINGS

The weight of a 5 ft. length of soil pipe - see Section 43

Size of Pipe in Inches	Column 1	Column 2
	Minimum Weight of Soil Pipe in Pounds	Minimum Weight of Extra-heavy Soil Pipe in Pounds
2	20	25
3	30	42
4	42	57
5	55	70
6	68	88
8	140	140
10	205	205
12	250	250
15	350	350

Table 5. WELDED and SEAMLESS STEEL PIPE

Col.1 Item No.	Col.2 Pipe Size in Inches	Col.3 Min.Actual O/S Dia.in Inches	Col.4 Min.Wall Thickness in Inches	Col.5 Min.Weight per Lin. Ft.Threaded with Coup- lings in Pounds	Col.6 Min.No. of Threads in each Threaded Inch
1	3/8	0.675	.091	0.57	18
2	1/2	0.840	.109	0.85	14
3	3/4	1.050	.113	1.33	14
4	1	1.315	.133	1.68	11 1/2
5	1 1/4	1.660	.140	2.28	11 1/2
6	1 1/2	1.990	.145	2.73	11 1/2
7	2	2.375	.154	3.68	11 1/2
8	2 1/2	2.875	.203	5.82	8
9	3	3.500	.216	7.62	8
10	3 1/2	4.000	.226	9.20	8
11	4	4.500	.237	10.89	8
12	5	5.563	.258	14.81	8
13	6	6.625	.280	19.19	8
14	8	8.625	.277	25.00	8
15	10	10.750	.279	32.00	8
16	12	12.750	.330	45.00	8

Table 6. CONCRETE SEWER PIPE

Col.1 Item No.	Col.2 Pipe Size in Inches	Col.3 Min.Wall Thickness of Barrel in Inches	Col.4 Min. Inside Dia. of Barrel in Inches	Col.5 Supporting Strength Min.3- Bearing Load per Lin.Ft. in Pounds	Col.6 Min.In- side Dia. of Socket Mouth in Inches	Col.7 Min. Depth of Socket in Inches
1	4	9/16	4	1000	6	1 1/2
2	6	5/8	6	1100	8 1/4	2
3	8	3/4	8	1300	10 3/4	2 1/4
4	10	7/8	10	1400	13	2 1/2
5	12	1	12	1500	15 1/4	2 1/2
6	15	1 1/4	15	1750	18 3/4	2 1/2
7	18	1 1/2	18	2000	22 1/4	2 3/4
8	21	1 3/4	21	2200	26	2 3/4
9	24	2 1/8	24	2400	29 1/2	3

Table 7. ALLOYED OPEN-HEARTH IRON PIPE

Col.1 Item No.	Col.2 Pipe Size in Inches	Col.3 Min.Wall Thickness in Inches	Col.4 Min. Internal Hydro- static Press.for furnace butt welded pipe in Pounds per sq. inch	Col.5 Min. Internal Hydro- static Press.for Elec.- welded pipe in pounds per sq. inch	Col.6 Min. Weight per lin. ft. threaded with Couplings in Pounds	Col.7 Min. No. of Threads in each threaded Inch
1	3/8	.091	700		0.57	18
2	1/2	.109	700		0.85	14
3	3/4	.113	700		1.13	14
4	1	.133	700		1.68	11 1/2
5	1 1/4	.140	800	1000	2.28	11 1/2
6	1 1/2	.145	800	1000	2.73	11 1/2
7	2	.154	800	1000	3.68	11 1/2
8	2 1/2	.203	800	1000	5.82	8
9	3	.216	800	1000	7.62	8
10	3 1/2	.226	1200		9.20	8
11	4	.237	1200		10.89	8
12	5	.258	1200		14.81	8
13	6	.280	1200		19.18	8
14	8	.322		1200	28.81	8
15	10	.365		1000	41.13	8
16	12	.375		1000	50.71	8

Table 8. COPPER and BRASS PIPE

Col. 1 Item No.	Col.2 Pipe Size in Inches	Col. 3 Min.Wall Thickness in Inches	Col.4 Copper Pipe Min.Weight per Ft. in Inches	Col.5 Brass Pipe Min. Weight per Ft. in Pounds
1	3/8	.0905	0.643	0.630
2	1/2	.1075	0.957	0.938
3	3/4	.1140	1.30	1.27
4	1	.1265	1.83	1.79
5	1 1/4	.1460	2.69	2.63
6	1 1/2	.1500	3.20	3.13
7	2	.1565	4.23	4.14
8	2 1/2	.1875	6.14	6.00
9	3	.2190	8.75	8.56
10	3 1/2	.2500	11.41	11.17
11	4	.2500	12.94	12.66
12	4 1/2	.2500	14.46	14.15
13	5	.2500	16.21	15.85
14	6	.2500	19.41	18.99
15	7	.2815	25.17	24.63
16	8	.3125	31.63	30.95
17	9	.3440	38.83	38.03
18	10	.3655	46.22	45.20

Table 9. STANDARD SIZES and WEIGHTS OF  
COPPER DRAINAGE TUBE DWV

Col. 1	Col. 2	Col. 3	Col. 4
Standard Size in Inches	Actual Outside Diameter in Inches	Nominal Wall Thickness in Inches	Theoretical Weight in Pounds per Foot
1 1/4	1.375	.040	.650
1 1/2	1.625	.042	.809
2	2.125	.042	1.07
3	3.125	.045	1.69
4	4.125	.058	2.87
5	5.125	.072	4.43
6	6.125	.083	6.10

Table 10. COPPER TUBE (TYPE L) and WATER  
DISTRIBUTION WITHIN A BUILDING

Col.1	Col.2	Col.3	Col.4	Col.5
Item No.	Tube Size in Inches	Min. Actual Outside Diameter in Inches	Min. Wall Thickness in Inches	Min. Weight Lin. Ft. in Pounds
1	3/8	0.500	0.035	0.198
2	1/2	0.625	0.040	0.285
3	5/8	0.750	0.042	0.362
4	3/4	0.875	0.045	0.455
5	1	1.125	0.050	0.655
6	1 1/4	1.375	0.055	0.884
7	1 1/2	1.625	0.060	1.14
8	2	2.125	0.070	1.75
9	2 1/2	2.625	0.080	2.48
10	3	3.125	0.090	3.33
11	3 1/2	3.625	0.100	4.29
12	4	4.125	0.110	5.38
13	5	5.125	0.125	7.61
14	6	6.125	0.140	10.20

Table 11. COPPER TUBE (TYPE K) FOR UNDERGROUND  
WATER SERVICE

Col.1	Col.2	Col.3	Col.4	Col.5
Item No.	Tube Size in Inches	Min. Actual Outside Diameter in Inches	Min. Wall Thickness in Inches	Min. Weight Lin. Ft. in Pounds
1	3/8	0.500	0.049	0.269
2	1/2	0.625	0.049	0.344
3	5/8	0.750	0.049	0.418
4	3/4	0.875	0.065	0.641
5	1	1.125	0.065	0.839
6	1 1/4	1.375	0.065	1.04
7	1 1/2	1.625	0.072	1.36
8	2	2.125	0.083	2.06
9	2 1/2	2.625	0.095	2.93
10	3	3.125	0.109	4.00
11	3 1/2	3.625	0.120	5.12
12	4	4.125	0.134	6.51
13	5	5.125	0.160	9.67
14	6	6.125	0.192	13.9

Table 12. MINIMUM DIMENSIONS and WEIGHTS FOR  
LEAD WATE PIPE

Col. 1 Item No.	Col. 2 Nominal Inside Diameter in Inches	Col. 3 Min. Weight per Yard in Pounds
1	1 1/4	7
2	1 1/2	8
3	2	10 1/2
4	3	16 1/2
5	4	24

Table 13. BRASS CAULKING FERRULES

Col. 1 Item No.	Col. 2 Size in Inches	Col. 3 Min. Actual Inside Dia. on Ferrule in Inches	Col. 4 Min. Length in Inches	Col. 5 Min. Weight in Pounds
1	2 x 1 1/4	1 1/2	4 1/2	1
2	2 x 1 1/2	1 3/4	4 1/2	1
3	2	2 1/4	4 1/2	1
4	3	3 1/4	4 1/2	1 3/4
5	4	4 1/4	4 1/2	2 1/2

Table 14. BRASS SOLDERING NIPPLES

Col. 1 Item No.	Col. 2 Size in Inches	Col. 3 Min. Length in Inches	Col. 4 Min. Weight of Min. Length in Pounds
1	1 1/4	3	3/8
2	1 1/2	3	1/2
3	2	3	7/8
4	2 1/2	4	1 3/8
5	3	4	2
6	4	4	3 1/2

Table 15. BRASS SOLDERING HUBS

Col. 1 Item No.	Col. 2 Hub Size in Inches	Col. 3 Min. Actual Inside Diameter in Inches	Col. 4 Min. Overall Length in Inches	Col. 5 Min. Weight in Ounces
1	3 x 2	3	2 7/16	17
2	2 x 1 1/2	2 3/8	2 3/16	14
3	2 x 1 1/4	2 3/8	2 3/16	13

Part E PLUMBING FIXTURES

55. Installation

(1) A fixture shall be so installed as to be readily accessible for the intended use and for cleaning.

(2) Where feasible, all pipes from a fixture shall be run to a wall and any pipe or trap of a type subject to damage shall be adequately protected if it extends to within twelve inches of the floor.

(3) A suitable access door shall be provided in the construction to facilitate repairs and replacements of the connection of built-in bath tubs and other built-in fixtures which have a concealed union, slip-joint, or gasket, water or waste connection; such access opening shall not be less than twelve inches in any dimension.

(4) Setting - Fixtures shall be set level and in proper alignment with referēce to adjacent walls. No water closet shall set closer than fifteen inches from its center to any side wall or partition nor closer than thirty inches center to center with another water closet.

(5) Securing Fixtures - Floor outlet fixtures shall be rigidly secured to the floor by approved brass or other approved corrosion resistant screws or bolts, suitable backing and/or supports shall be provided for wall hung fixtures, including shower heads.

(6) All plumbing fixtures shall be adequately supported and secured, by all provisions made for same.

56. Soil and Waste Connections

Soil and waste 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.

57. Materials

Every plumbing fixture shall be made of approved

materials with smooth, hard, impervious, corrosion-resistant surfaces, free from flaws or blemishes that would tend to interfere with ready cleaning.

58.           Water-Closet Bowls

(1) A water-closet bowl shall be made of vitreous china, or vitreous glazed earthenware, or any approved material having an equally smooth, hard, impervious, corrosion-resistant surface.

(2) A water-closet may be siphon-jet, washdown, reverse trap, or blow-out type with floor outlet; or siphon-jet, or blow-out with wall outlet.

(3) A water-closet bowl shall be in one piece, and so constructed that when the bowl is filled with water to the point of trap overflow, the volume will be sufficient to prevent fouling of the surface of the bowl, and the bowl shall have an integral flushing rim so constructed as to flush the entire surface, and shall be equipped with a refilling device.

(4) A water-closet bowl shall be securely attached to the floor or wall, and a wall-hung closet shall be so supported that no strain is transmitted to the piping.

(5) A water-closet bowl shall be equipped with a seat of an elongated open-front type in any building which may be used by the public.

59.           Water-Closet Tanks

A water-closet tank shall have a water capacity sufficient to flush properly the water-closet bowl to which it is connected, and shall be adjusted to provide that capacity. The flush pipe shall have an inside diameter of not less than that of the spud on the tank, and on low tanks the spud shall not be less than two inches in diameter.

60.           Direct Flush Valves (Flushometer)

(1) A direct flush valve (flushometer) shall have



a vacuum breaker and be so installed that it is readily accessible.

(2) When the valve is operated it shall complete its cycle of operation automatically, opening fully and closing positively under the service pressure. At each operation the valve shall deliver water in sufficient volume and at a rate that will thoroughly flush the fixture and refill the fixture trap.

(3) Means shall be provided for regulating the flow to direct flush valves.

61. Urinals

(1) A urinal shall be made of material similar to that prescribed for water-closet bowls.

(2) Each urinal shall be flushed either by an acceptable flush tank or acceptable direct flush valve. All urinal tanks shall have an over-rim supply with pet cock type adjusting valve.

(3) A urinal of a siphon-jet, blow-out, or pedestal type shall have its flushing rim and its trap integral with it, and the water seal shall be not less than two inches.

(4) The floor in front of any urinal, for a distance of not less than two feet, and the adjacent floor and wall area on either side for a distance of not less than twelve inches, shall be made impervious and water-tight with a material that is approved by the Plumbing Inspector. The surrounding walls shall be treated in the same manner to a height of not less than four feet above the floor.

(5) Stall type urinals shall be connected to the waste pipe by a strainer and spud and shall be so installed that water does not accumulate on the walls or flooring or under the fixture.

(6) Wall type urinals shall be installed in accordance with Clause (4) hereof.

(7) The installation of trough urinals is prohibited.

62. Urinal Tanks

(1) A urinal tank shall have a water capacity, flush valve, and pipe connections such as will ensure at all times a supply of water sufficient to flush the urinal thoroughly of not less than:

Three gallons for 1 - 2 urinals

Five gallons for 3 - 5 urinals

(2) No five gallon tank shall serve over five urinals.

(3) All urinal tanks shall have an over-rim supply and be of the siphon type.

63. Urinal Flush Valves

No manually operated direct flush valve shall be used to flush more than one urinal.

64. Wash Basins

A wash basin shall be of material prescribed by Section 57 of this part and shall be provided with a waste fitting having an opening of not less than one and one-quarter inches in diameter.

65. Sinks

(1) Except as hereinafter provided, a sink shall comply with the conditions prescribed by Section 57 of this part.

(2) A sink, other than a laboratory sink, shall be provided with a waste fitting having a size not less than that of the trap to which it is connected, but in no case less than one and one-half inches in diameter.

(3) No concealed overflow shall be provided on sinks except those for laboratory purposes.

66. Laundry Trays

(1) A laundry tray shall comply with the conditions prescribed by Section 57 of this part.

(2) Each compartment of a laundry tray shall be provided with a waste fitting of not less than one and one-half inches in diameter with a stopper.

(3) A concrete laundry tray may be installed provided:-

(a) The tray is made of a strong dense concrete, moulded in one piece with edges and corners rounded inside and out; and

(b) The top edges are protected with a rim of zinc-coated steel securely bonded to the tray, and corners of the rim are rounded; and

(c) The sides and partitions are not less than one and one-eighth inches thick at the top and one and one-quarter inches thick at the bottom, and the bottom slab is not less than one and one-quarter inches thick.

67. Shower Receptors

(1) A shower receptor, except a bath tub, shall be provided with a waste fitting not less than two inches in diameter, and with a strainer constructed to permit a full two inch discharge.

(2) A shower drain shall be considered a fixture and shall be provided with a trap having a water seal of not less than two inches.

(3) For gang showers see Table 18.

(4) Each shower receptor shall be constructed of vitrified china or earthenware, ceramic tile, porcelain enameled metal or of such other material as may be acceptable to the Plumbing Inspector. No shower receptor shall be installed unless it conforms to acceptable standards as required by this By-law, or until a specification or a proto-type or both of such receptor has first been submitted to the Plumbing Inspector and approval obtained.

(5) Each shower receptor shall be an approved type and be so constructed as to have a finished dam, curb or threshold which is at least one inch lower than the sides and back of such a receptor. In no case shall any finished dam or threshold be less than two inches or more than nine inches in depth when measured from the top of said dam or threshold to the top of the finished floor of

the receptor.

(6) No shower stall or receptor shall have a finished interior dimension which is less than thirty inches, and each shower compartment shall be of a finished size capable of completely encompassing a thirty inch circle when the door or curtain is closed, or when measured to the center of the dam or threshold. No shower receptor shall have a floor area less than nine hundred square inches.

(7) The construction of on-site built-up shower receptors is permitted by one of the following means:-

(a) Shower receptors built directly on the ground shall be water-tight and shall be constructed from approved type dense, non-absorbent and non-corrosive materials. Each such receptor shall be adequately reinforced, shall be provided with an approved flanged floor drain designed to make a water-tight joint in the floor, and shall have smooth impervious and durable surfaces. See (8)(b) of this Section. When the base is of concrete construction the floor and curb walls shall be monolithic.

(b) When shower receptors are built above ground, the sub-floor and rough side walls to a height of not less than three inches above the top of the finished dam or threshold shall be first lined to conform with Lead Pan Construction. All lining materials shall be pitched one-half inch per foot to weep holes in the sub-drain by means of a smooth and solidly formed sub-base. All such lining materials shall extend upward on the rough jambs of the shower opening to a point of not less than three inches above the top of the finished dam or threshold and shall extend outward over the top of the rough threshold and be turned over and fastened on the outside face of both the rough threshold and the jambs.

(8) (a) Lead Pan Construction - If the pan is to be laid on a wood base, the inside of the lead pan shall be coated with asphaltum and fifteen pound building felt laid over the entire surface. A hole shall be cut in

the building felt just large enough to fit snugly around the drain at pan level.

(b) At the sides of the pan, the building felt shall be turned up and cut out at the corners to avoid bunching, a flap being left to turn around the corner. The corner shall be painted with asphaltum over the joint in the building felt. If more than one sheet of building felt is required to cover the pan, the sheets shall be overlapped not less than four inches and the laps shall be coated with asphaltum.

If the sub-flooring is concrete, the installation is identical, except that the bottom and outside of the pan shall also be coated with asphaltum before setting it on the building felt which in turn rests upon the concrete sub-floor.

Material used instead of a lead pan or flashing, if impervious to corrosion by the materials of the floor, shall not require the protective layer of building felt.

(c) The lead pan or other acceptable material shall be caulked into or clamped to the trap or drain in such a manner as to permit seepage from the lead pan to escape into the trap or drain and so as not to leak around the trap or drain. No nails or screws shall pierce the lead pan.

(d) Inspection shall be called for the lead pan and shower drain prior to the concealment of the lead pan by finish shower materials.

(9) Floors of public shower rooms shall have a non-skid surface and shall be drained in such a manner that waste water from one bather will not pass over areas occupied by other bathers. Gutters in public or gang shower rooms shall have rounded corners for easy cleaning and shall be sloped not less than one percent toward drains. Drains in such gutters shall be spaced not more than eight feet from side walls or more than sixteen feet apart.

(10) Shower walls shall be constructed of dense non-absorbent waterproof materials to a height of not less

than six feet above the floor.

(11) Hinged shower doors shall open outward.

(12) Inspection shall be called for the piping to a shower head prior to concealment of piping by wall covering.

68. Bathtubs

A bath tub shall have a smooth, hard interior surface impervious to water as prescribed by Section 57 of this Part, and shall be equipped with a waste and overflow fitting not smaller than one and one-half inches in diameter.

69. Drinking Fountains

(1) A drinking fountain shall be of such materials as prescribed by Section 57 of this Part and of a design that it may be readily cleaned.

(2) The orifice shall be of the shielded type. All drinking fountain nozzles with orifice diameter not greater than seven-sixteenth inch or 0.150 square inch area shall be placed so that the lower edge of the nozzle orifice is at an elevation not less than three-quarter inch above the flood level rim of the receptacle.

(3) The orifice shall direct the water at an angle of approximately forty-five degrees upwards from horizontal and means shall be provided for regulating the flow of water.

70. Floor Drains

(1) A floor drain in any room where food or beverage is stored, prepared or served shall be considered a fixture and shall have a proper trap and vent in accordance with the provisions of this By-law. In any toilet or washroom where automatic flushing devices are installed, a trapped floor drain shall be installed. (See Table 18).

(2) Where sanitary sewers are available, floor drains installed shall be trapped and shall be connected to such sanitary sewer. Connection of floor drains to a

storm sewer shall only be made in the absence of sanitary sewer. The exception to the foregoing shall be in dwellings or in buildings wherein the moisture trap seal of a floor drain could be lost through evaporation, in which case the floor drain may be connected to the storm sewer or to a rock pit for weeping tile foundation drain.

(3) Industrial and commercial floor drains to be trapped and run direct to a sump (with no connection to the storm water system) shall only be connected to sanitary sewer.

(4) A floor drain shall be installed adjacent to any hot water storage tank situated on any floor having finished rooms. Such drains shall be of sufficient size to receive the full relief valve discharge or tank leakage.

71. Special Fixtures and Specialties

(1) Sinks and special use fixtures may be made of soapstone, chemical stoneware, or may be lined with lead, copper-base alloy, nickel-copper alloy, corrosion-resistant steel, or other materials especially suited to the use for which the fixture is intended.

(2) Water connections - Baptistries, ornamental and lily ponds, aquaria, ornamental fountain basins and other similar constructions, when provided with water supplies, shall be protected from back-siphonage by use of an approved back-flow preventor.

(3) Specialties requiring water and waste connections shall be submitted for approval of the Plumbing Inspector.

72. Used Plumbing Fixtures

(1) A used plumbing fixture shall not be reinstalled in a new location unless it is found upon inspection to conform in all respects to the requirements of this By-law, and to be in satisfactory and sanitary condition, and then only on written consent of the owner of the building in which it is to be installed.

(2) A used fixture which is to be installed on premises other than where originally installed shall be plainly labelled "USED FIXTURE" before delivery to the other premises, and such label shall be maintained until after installation and final inspection and approval by the Plumbing Inspector.

73. Fixture Overflow

(1) The overflow pipe from a fixture shall be connected on the building or inlet side of the trap and be so arranged that it can be readily and effectively cleaned.

(2) The overflow fitting shall be so designed that the standing water in the fixture cannot rise in the overflow when the stopper is closed nor remain in the overflow when the fixture is empty.

74. Fixture Strainers

A fixture, other than a water-closet, full flush urinal, clinical service sink, bed-pan washer or similar fixture, shall be provided with a strong metallic or porcelain strainer with an outlet area not less than that of the interior of the trap and waste pipe.

75. Prohibited Fixtures

(1) A pan, valve, plunger, offset, washout, latrine, frostproof and other water closets having an invisible seal or an unventilated space or having walls which are not thoroughly washed at each discharge are prohibited. Any water closet which might permit siphonage of the contents of the bowl back into the tank is prohibited.

(2) Drinking fountains shall not be installed in toilet rooms.

(3) Fixed wooden wash trays or sinks for domestic use shall not be installed in any building designed or used for human habitation. No sheet metal lined wooden bath tub shall be installed or reconnected. No dry or chemical closet (toilet) shall be installed in any building used for human



habitation, unless first approved by the Medical Health Officer.

Part F SOIL, WASTE and STORM WATER PIPE SYSTEMS

76. Materials

(1) Soil and waste pipe within a building shall be of cast iron, brass, copper or lead or other approved material. The pipe and fittings for each type of pipe shall comply with the specifications set out in Part D - Materials .

(2) All pipe underground within a building and to a point thirty (30) inches beyond the exterior wall shall consist of cast iron, with the exception of storm water to a sump.

77. House Sewers and House Sewer Connections to Public Sewers

Building (house) sewerpipe shall be of vitrified clay, asbestos cement, bituminized fibre, cast iron or concrete.

78. Building (House) Drains

(1) Building (house) drain and soil branches, minimum size shall be four inch diameter when underground or may be three inches above ground.

(2) Any portion of the building (house) drain situated underground under any portion of a building shall be of cast iron pipe, and such cast iron pipe shall extend at least thirty inches beyond the exterior walls of such building.

79. Size of House Sewer

No building (house) sewer shall be less than four inches in diameter; provided however, where any house sewer is receiving surface water the size of such sewer shall be determined by the total area of the premises drained and paved surfaces thereby in accordance with Table #26.

80. Joints

Where permitted on storm water pipe systems the hub and spigot of vitrified pipe at each joint shall be thoroughly wetted and laid concentrically. A gasket of oakum or caulking rope shall be forced to the bottom of each socket and the remaining annular space shall be filled completely with cement-mortar made of one-part Portland cement and two parts of clean sharp sand, and the joint finished off with a trowel. The inside of the pipe shall be carefully wiped out with a suitable scraper. See Section 115 of Part G.

81. Minimum Grade of Sewer

The grade of a four inch diameter house sewer shall be not less than one-quarter inch per foot if the load on the house sewer is under thirty fixture units and shall be not less than one-eighth inch per foot if the load is thirty fixture units or greater.

82. Sewer to be Laid in Straight Line

The house sewer shall as far as possible be laid in a straight line to its connection with the house sewer extension but where it is necessary to change the direction of such house sewer, only Y's or one-eight or lesser degree bends shall be used.

83. Depth of House Sewer

When a proper foundation consisting of a natural bed of earth, sand or shale can be obtained, a house sewer may be of vitrified earthenware, asbestos-cement, bituminous fibre, cast iron or concrete, and shall not be laid within thirty inches of any building, nor less than four feet below the surface of the ground except on private property where there is no vehicular traffic over the same, in which event such pipe may be laid with one-and one-half feet of covering over same.

84. Vitrified Pipe

Vitrified earthenware pipe used for house sewers

shall be glazed over the inside surface thereof, uniform in size and free from cracks, blisters or other defects.

85. Sewer Trenches and Piping

Excavations for house sewer trenches shall have a uniform grade at the bottom. Each length of pipe shall be given a solid bearing using gravel, if necessary, and the soil on each side of the pipe shall be well rammed.

Sewer trenches to be not less than twelve inches wider than the outside diameter of the pipe to be installed.

86. House Sewer on Filled or Unsound Ground

Where ground is made up or filled or is otherwise unstable, cedar planking min. 3" x 8" x 8' long shall be used for support or the house sewer may be of cast iron pipe with caulked lead joints, and when considered necessary by the Plumbing Inspector, such pipes shall be protected with pitch or asphaltum.

87. Inspection

(1) No house sewer shall be covered in until such house sewer has been inspected and approved by the Plumbing Inspector.

(2) No existing house sewer shall be disturbed or relaid without first obtaining permission from the Plumbing Inspector.

88. Sewer Through Septic Tank

The house sewer where run through an abandoned septic tank shall have bedding support as hereinbefore specified without interference by walls of the septic tank.

89. Cleanouts

(1) Where the existing four inch stack cleanout plug is not readily accessible, an additional four inch Y fitting and four inch cleanout plug shall be installed at the upper end of the sewer line with cast iron pipe and fittings and if outside the building shall be brought up to finish ground surface and cast into a 12" x 12" x 3" concrete pad.

(2) On straight runs of house sewer cleanouts shall be provided at seventy-five foot spacing if made with Y fitting as in (1) above, or at one hundred and fifty foot spacing if made with Man-Hole extended to finish ground surface.

90. No Connection to Sewer

(1) No basement, cellar, surface or weeping drain shall be connected with any sanitary sewer.

(2) No water cooled compressors, degreaser or any other water cooled equipment shall be connected with any sanitary sewer.

91. Multiple Sewers and Drainage Systems

Unless otherwise approved by the Plumbing Inspector, no sanitary sewer shall pass under any building other than the building it serves, and the plumbing system of every building or premises shall be separate from and independent of that of every other building or premises as far as the street or property line.

92. Slope of Pipes

(1) A slope of not less than one-quarter inch per foot shall be provided for:-

(a) a fixture waste pipe or fixture drain; and

(b) a horizontal branch not larger than four inches in diameter.

(2) A horizontal drain pipe larger than four inches in diameter shall have a slope of not less than one-eighth inch per foot.

(3) Where conditions do not permit a building (house) sewer to have the slope prescribed in Table 21, it may have a lesser slope but the rate of flow of the liquid shall not be less than two feet per second.

93. Fixture Units

(1) A fixture itemized in Table 18 shall be considered to produce a hydraulic load equal to the number of

fixture units specified, and this Table shall be used in estimating the total load carried by soil or waste pipes.

(2) A fixture not itemized in Table 18 and having a waste pipe or trap itemized in Table 19 shall be considered to produce a hydraulic load equal to the number of fixture units prescribed therein.

(3) The maximum number of fixture units that may be connected to a given size of horizontal or vertical waste or soil pipe or drain shall comply with Tables 20 or 21, whichever one is applicable, provided however that no water closet shall be connected to a pipe less than three inch diameter.

94. Minimum Size of Soil and Waste Stacks

No soil or waste stack shall be smaller than the largest horizontal branch connected thereto except that a 4 x 3 water closet connection shall not be considered as a reduction in pipe size.

95. Future Fixtures

When provision is made for the future installation of fixtures, those to be provided for shall be included in calculating the required sizes of drain pipes. Construction to provide for such future installations shall be terminated with a plugged fitting or fittings and shall be vented as required in Part I - VENTING.

96. Drainage Below Sewer Level

(1) All building (house) drains which cannot be discharged to the sewer by gravity flow shall be discharged into a gas-tight sewage sump properly vented with a vent of not less than three inch, so located as to receive the sewage by gravity of flow, from which sump the contents shall be lifted and discharged into the building soil system by automatic pumps, ejectors or any equally efficient method. The discharge from a pump and piping therewith shall be of not less than three inch diameter.

(2) Potable water supplies shall not be used for ejectors.

(3) Laundry tray pumps shall only be installed when approved by the Plumbing Inspector.

(4) The capacity of the sewage sump shall be such that the maximum storage period under any condition shall not be greater than twelve hours. If a sufficient number of automatically flushed fixtures are not installed to accomplish the change in the contents of the sewage sump, a special automatic flushing device accomplishing the change shall be provided. See Table 18.

(5) In every case, an approved check valve, and gate valve, shall be placed in the discharge line or lines from the sump to the soil system, and the connection from the discharge line to the soil system shall be by means of a Y, with the Y branch on top.

(6) All soil or waste pipe leading to a sewage sump shall be vented the same as though direct connection with the sewer had been established.

(7) All sewage sumps shall have a gas tight metal cover except that float control or switch rods shall operate without binding. Such covers shall be designed and constructed with sufficient strength to bear normal traffic and use without hazard or damage.

(8) In a combined sewer area, sub-soil drains below the sewer level shall discharge into a separate intercepting sump, and then discharge into the sewage sump. The sub-soil sump shall have a back-water valve installed inside the sump on the discharge outlet to the sewage sump. The sewage and sub-soil sumps shall be adjacent wherever practical.

97. Basement and Subsoil Drainage

Every basement, cellar, surface and weeping drain connected with any combined or storm sewer within the Municipality shall be effectively trapped by means of a sump constructed and equipped as set forth in section 152

of this Part. The drain line between sump and the Municipal sewer or private disposal system shall be of tight jointed construction.

98. Hot Water and Steam Connections

(1) No direct connection of a system discharging steam or hot water at a temperature in excess of 180 degrees Fahrenheit shall be made with the building drainage system. When higher temperatures exist, proper cooling methods shall be provided, subject to the approval of the Plumbing Inspector or Engineer.

(2) Discharge of hot water from industrial or commercial establishments to the Municipal sewer shall be referred to the Municipal Engineer.

99. Storm Sewers

(1) Any conductor or roof leader and any surface or ground water drain may be connected with a storm sewer, provided that in the opinion of the Municipal Engineer, such storm sewer is of sufficient capacity.

(2) No conductor, roof leader or any surface or ground water drain shall be or remain connected with the sanitary sewer.

(3) A rain water leader shall not be used for a soil, waste or vent pipe, and a soil, waste or vent pipe shall not be used for a rain water leader.

(4) Unless otherwise approved by the Plumbing Inspector, no storm sewer shall pass under any building other than the building it serves.

100. Waste Pipe Connection

No waste pipe shall be connected to a subsoil drain.

101. Minimum Size of Horizontal Leader Drain

No rainwater leader inside a building shall be connected to a horizontal drain less than four inches in diameter which shall be of cast iron, hub vitrified pipe, or other approved material and subject to inspection, unless the drainage area of the roof is one-half that of the areas

shown in Table 16 for vertical rainwater leaders or conversely the size of the horizontal drain is increased over that of the vertical leader to a corresponding area in Table 17.

102. Storm Drains and Roof Water Leaders

(1) All roof drainage fittings shall be of approved engineered design. Roof hoppers are prohibited. On all mill constructed roofs or where construction is subject to shrinkage or settling an expansion type connection shall be installed.

(2) All rainwater leaders and storm drains shall be installed in accordance with this Part and Part C - GENERAL REQUIREMENTS.

(3) A direct storm drain within a building shall be cast iron underground.

(4) Every rainwater leader inside a building shall be constructed of cast iron, copper, or other pipe approved by the Plumbing Inspector. Galvanized wrought iron, or galvanized steel pipe may be used when intercepted by a sump. Cleanouts shall be installed at the base of each stack.

(5) One five foot length of cast iron pipe shall be installed horizontally at the base of all inside rainwater leaders.

(6) A rainwater leader outside a building may be sheet metal where intercepted by a sump. Where an outside leader is of sheet metal and connected with a storm sewer, it shall be connected to a cast iron drain extending at least twelve inches above the finished grade, except in positions where a sheet metal leader may be subject to damage in lanes or other traffic-ways, cast iron drain shall extend sixty inches above the finished grade.

103. Separate Systems

The sanitary and the storm drainage system of a building shall be entirely separate, except for internal rainwater leaders of approved material directly connected



to a house drain or a combined sewer.

104. Leader Size

A vertical rainwater leader shall be not less than the size prescribed by Table 16.

105. Horizontal Storm Drain Size

The required size of a horizontal storm drain shall be determined in accordance with Table 17.

106. Combined Sewer

The size of a combined sewer shall be determined by Tables 26A, 26B or 26C.

107. Parapet Roofs

(1) Where any roof is entirely enclosed by parapet walls, a sufficient number of overflow outlets shall be installed in such parapet walls to drain the roof in the event of any rain water conductors becoming obstructed.

(2) No rain water conductor shall project more than three inches over the street line.

Table 16. SIZE OF VERTICAL RAINWATER LEADERS

Diameter of Leader or Conductor (* ) in Inches	Maximum Projected Roof Area in Square Feet
2	960
2 1/2	1,733
3	2,933
4	6,133
5	11,532
6	18,000
8	38,666

Table 17. SIZE OF HORIZONTAL STORM DRAINS

Column 1	Column 2	Column 3	Column 4
Diameter of Drain in Inches	Maximum projected roof area in square feet, for various slopes		
	Slope of drain, per foot of length		
	1/8 inch	1/4 inch	1/2 inch
3		1,544	2,192
4		3,533	5,013
5		6,292	8,904
6	7,133	10,066	14,266
8	15,333	21,733	30,666
10	27,600	38,932	55,200
12	44,400	62,665	88,800
15	79,200	112,000	158,663

NOTE: Table 17 is based on gravity flow in a full pipe and a maximum rate of rainfall of three inches per hour.

Part G. JOINTS and CONNECTIONS

108. Tightness

All joints and connections used in a plumbing system shall be air-tight and water-tight and shall be capable of meeting the tests specified in Part B - ADMINISTRATION.

109. Caulked Joints

(1) A caulked joint for cast iron soil pipe shall be:-

(a) made with the spigot end downstream from the hub end in the direction of flow;

(b) firmly packed with oakum or hemp or other approved packing material; and

(c) secured only with molten caulking lead not less than one inch deep, caulked tight. Lead not to exceed more than one-eighth inch below rim hub; or

(d) of other approved jointing material which shall be used according to manufacturers' specifications.

(2) No paint, varnish, putty or other coating shall be applied on the jointing material until the joint has been tested and inspected.

110. Screw Joints

(1) Pipe threads shall be as prescribed in the Tables for various pipe classifications.

(2) Pipe ends shall be reamed or filed out to the size of the bore and all chips and cuttings shall be removed.

(3) Pipe-joint cement and paint shall be permitted only on external threads.

111. Wiped Joints

(1) Wiped joints in lead pipe or between lead pipe

and other metals shall be made of wiping solder with an exposed surface on each side of the joint not less than three-quarters inch in width and a thickness at the thickest part of the joint not less than three-eighth inch.

(2) Wiped flange joints shall be reinforced with a lead flange not less than three-quarters inch wide.

112. Soldered or Sweat Joints

(1) Soldered or sweat joints for tubing shall be made with approved fittings. Surfaces to be soldered or sweated shall be cleaned bright. The joints shall be properly fluxed with approved non-corrosive paste type flux and made with approved solder. The use of self-cleaning fluxes or paste type solder is prohibited.

(2) Joints in copper water tubing shall be made by the appropriate use of approved brass or copper water fittings properly sweated or soldered together.

113. Flared Joints

All flared joints for copper water tube shall be made with fittings meeting approved standards and the tube shall be expanded with the proper flaring tool.

114. Hot-Poured Joints

(1) Material for hot-poured joints for vitrified clay or concrete sewer pipe shall not soften sufficiently to destroy the effectiveness of the joint when subject to a temperature of 160 degrees Fahrenheit, nor be soluble in any of the wastes carried by the drainage system.

(2) Hot-poured joints shall be caulked with twisted oakum and rammed; approved compound shall be at least one inch deep all around the pipe.

115. Cement Joints

(1) Except for repairs and connections to existing lines constructed with such joints, cement mortar and oakum joints are prohibited on building (house) sewers less than eight inches in diameter connected to sanitary sewers.

(2) Where permitted, a cement joint for vitrified clay sewer pipe or for cement concrete pipe shall be made by ramming a closely twisted hemp or oakum gasket or approved packing material, of suitable size to pass around the annular space between pipes. The remaining space shall be filled with mortar compound of not more than two parts clean sharp mortar sand to one part portland cement. The portland cement paste or mortar shall be first tempered for a minimum of twenty minutes and a maximum of one hour before using.

(3) Each joint shall be carefully banked and the joint and pipe thoroughly swabbed and cleaned inside.

116. Precast Joints

Precast collars shall be formed in both the spigot and bell of the pipe in advance of use. Collar surfaces shall be conical with side slopes of three degrees with the axis of the pipe, and the length shall be equal to the depth of the socket. Prior to making joint contact, surfaces shall be cleaned and coated with solvents and adhesives. When the spigot end is inserted in the collar, it shall bind before contacting the base of the socket, Precast joint material shall be inert and reasonably proof against damage from wastes carried in the pipe.

117. Rubber Gasket Joints

Gaskets made from rubber will be permitted providing they are compounded specially to resist sewage and other waste acids and alkalies. When rubber gaskets are used the annular space shall meet the necessary requirements specified by the gasket manufacturer. The gaskets shall be installed and pipe coupled according to the gasket manufacturer's recommendations.

118. Burned Lead Joints

Lead "burned" or "welded" to brass or copper ferrules or pipe shall be lapped and fused together. The "burning" lead shall be a minimum of three-eighths inch

from each side of the joint and one and one-half times as thick as the lead being joined.

119. Welded Joints

(1) Welded joints are prohibited unless otherwise approved by the Plumbing Inspector.

(2) When approved, brazing or welding shall be performed in accordance with the requirements of recognized published standards of practice and by certified welders.

120. Slip Joints and Unions

(1) Slip joints and unions may have metal-to-metal or gasket seats.

(2) Slip joints and gasket unions may be used only in the trap seal or in the waste pipe between the trap seal and the fixture, and must be readily accessible.

121. Expansion Joints

Expansion joints shall be accessible and shall be used where necessary to provide for expansion and contraction of the pipes.

122. Trap Standard Joints

Joints between drains and trap standards of cast iron shall be soldered, screwed, or caulked to the waste pipe.

123. Cast Iron Pipe Joints

(1) Cast iron pipe shall have caulked joints specified by Section 109 of this Part.

(2) Joints between cast iron pipe and brass or copper pipe shall be either caulked or screwed joints with approved ferrules.

124. Lead Joints

Joints between lead and cast iron pipe shall be made by means of wiped or burned joints to a caulking ferrule or soldering nipple.

125. Copper Tubing to Screwed Pipe Joints

Joints from copper tubing to threaded pipe shall be made by the use of brass or copper adapter fittings. The joint between the copper tubing and the fitting shall be properly sweated or soldered, and the connection between the threaded pipe and the fitting shall be made with a standard pipe size screw joint.

126. Copper Water Tubing

(1) All concealed joints for copper water tubing below ground or within buildings shall be soldered, sweated or flared.

(2) No sweated or mechanical joints, or soldered joints made with lead based solder will be permitted under a concrete slab.

(3) Brass fittings shall not be joined with silver solder or other brazing material.

127. Copper Tubing Installed under Concrete, etc.

(1) Copper water tubing shall not be held rigid by concrete or plaster.

(2) Copper water tubing to copper to iron elbows or tees at fixture connections or other screwed outlets, shall be made with "drop-ear" fittings securely fastened by wood screws of not less than one inch long.

(3) Copper tubing installed under basement floors or concrete slabs shall be:

(a) Annealed (soft) and may be type "L" grade; and

(b) Encased in standard weight flexible polyethylene pipe of at least one size larger than copper tubing. Such polyethylene piping shall extend not less than one inch above the concrete floor or slab and any joints that may be necessary shall be securely wrapped with plastic tape.

128. Urinals, Trap Standards and Water Closets

(1) The connection between drainage pipes, floor outlet service sinks, pedestal urinals, and earthenware trap standards, shall be made by means of a flanged trap connection. The floor flange shall be securely set on a firm base and bolted to the trap flange. The joint shall be sealed with an asbestos graphite gasket or with a closet setting compound.

(2) Except in the case of concrete floor construction, the connection from urinals, trap standards and water closets to cast iron or copper soil pipe shall be made of lead. The length of the lead connection shall be not less than three inches between the burned join and the underside of the floor. In concrete floor construction where cast iron pipe is used, an approved brass caulking floor flange may be caulked to the pipe and shall be bolted to the fixture.

129. Vitrified Clay Sewer Pipe

(1) All joints between vitrified clay pipe and between such pipe and cast iron pipe shall be as specified for cement joints or hot-poured joints.

(2) The connections between vitrified clay pipe into iron pipe shall be made with a cast iron increaser.

130. Increasesers, Reducers and Adaptors

(1) Where different sizes of pipe or pipe and fittings are to be connected to soil, waste or vent, proper size increasers, reducers or adaptor fittings shall be used between the two sizes.

(2) Brass or cast iron body cleanouts shall not be used as a reducer or adaptor from cast iron soil pipe to steel or wrought/pipe.

131. Prohibited Joints and Fittings

(1) Any fitting or connection which has an enlargement, chamber, or recess, with a ledge, shoulder or reduction of the pipe area in the direction of flow on the outlet side of any trap which might effect the flow shall be prohibited.

(2) Notwithstanding the above, the enlargement of a three inch ferrule to a four inch ferrule shall not be considered an obstruction provided an approved three inch to four inch eccentric ferrule is used with four inch lead bends.

Part H TRAPS, INTERCEPTORS, and CLEANOUTS

132. Traps Required

Each plumbing fixture, excepting those having integral traps, shall be separately trapped by an approved type water-seal trap.

133. Traps, Multiple Use

It is provided however, that one trap may serve a set of not more than a three compartment sink or laundry tub of the same depth, or three lavatories, immediately adjacent to each other and in the same room, if the waste outlets are not more than thirty inches apart and the trap is increased one size.

134. Separate Traps

(1) No food disposal unit shall be installed with any set of restaurant, commercial, or industrial sinks served by a single trap; each such food waste disposal unit shall be connected to a separate trap.

(2) Each domestic clothes washer and each laundry tub shall be connected to a separate and independent trap; except that a trap serving a laundry tub may also receive the waste from clothes washers set adjacent thereto with an approved hose of not more than five feet in length.

(3) No clothes washer or laundry tub shall be connected to any trap for a kitchen sink.

135. Clothes Washer Trap

Maximum height for independent domestic automatic clothes washer trap shall be twelve inches above the floor.

136. Trap Location

Every fixture shall be separately trapped as close



to the fixture as is practicable with regard to its location and effectiveness; no trap shall be more than two and one-half feet from its fixture outlet, and such fixture outlet shall be placed vertically above such a trap.

137. Grease Interceptors as Traps

A grease interceptor may serve as a trap under conditions as defined in Section 149 of this Part.

138. Special Appliances

(1) A separate trap shall be provided for a diswashing machine which drains by gravity and is directly connected to the drainage system. Machines having drainage pumps may discharge into the waste outlet piping of an adjacent kitchen sink by means of a Y-Branch fitting on the inlet side of the sink trap provided that the pump discharge line rises to an elevation at least as high as the underside of the sink rim or counter.

(2) Approved Y or other directional type branch fittings shall be installed in all continuous wastes connecting or receiving the discharge from food waste disposal units, dishwashers, clothes washers or other force discharge fixtures or appliances.

(3) No dishwasher drain shall be connected to a sink tailpiece, continuous waste or trap on the discharge side of a food waste disposal unit.

139. Type and Size of Traps

Every trap shall be self-cleaning, and shall be at least the same nominal size as the fixture waste opening to which it is connected. The size of the trap for a given fixture shall not be less than prescribed in Table 18.

140. Fixture Trap Size

A fixture trap shall be the same nominal size as the fixture waste arm.

141. Underground Trap Size

The minimum size of underground traps shall be two

inches and the material shall be cast iron.

142. Fixture Waste Pipe Size

The fixture waste pipe for water closets and other fixtures with integral traps shall not be smaller than the fixture outlet.

143. Trap Type

Except in the case of water closets, pedestal slop sinks, drinking fountains and any other fixture for which special provision is made in this By-law, all traps shall be of the ordinary "P" pattern. Every trap shall have a smooth and uniform interior waterway.

144. Trap Seal

Each fixture trap shall have a water seal of not less than one and one-half inches, and the trap seal of a floor drain shall not be more than four inches. All traps shall be protected against loss of trap seal from variations in pressure, freezing or evaporation.

145. Trap Cleanouts

Each fixture trap, except those in combination with fixtures with integral traps, shall be provided with an accessible one inch brass trap screw, protected by the water seal, except that when a portion of a trap can be completely removed for cleaning purposes no trap screw is required. Where traps are concealed between floors no cleanout shall be permitted.

146. Laboratory Sinks

See Part K - SPECIAL INSTALLATIONS.

147. Prohibited Traps

(1) No trap which depends on the action of movable parts for its seal shall be used.

(2) No trap which depends upon interior partitions or reflectors for its seal or reseal, or which has an interior partition that in case of defect would allow the passage of sewer gas, shall be used, except for earthenware

fixtures where the seal of the trap is plainly visible.

(3) No water-jacketed grease trap shall be used.

(4) No fixture shall be double trapped.

(5) No crown-vented or bell trap shall be installed.

148. Cleanouts

(1) Each horizontal soil, waste and/or storm water drainage pipe shall be provided with a cleanout at its upper terminal, and at such other locations as the Plumbing Inspector may deem necessary.

(2) Each cleanout in piping two inches or less in size shall be so installed that there is a clearance of not less than twelve inches in front of the cleanout. Cleanouts in piping larger than two inches shall have a clearance of not less than eighteen inches in front of the cleanout. Cleanouts in underfloor piping shall be extended to or above the finished floor or shall be extended outside the building where there is less than twenty-four inches vertical and thirty inches horizontal clearance from the means of access to such cleanout.

(3) Cleanouts shall be not more than twenty-five feet apart in horizontal drainage lines of two inches nominal diameter or less, nor more than fifty feet apart in horizontal drainage lines of two and one-half, three, or four inches nominal diameter and not more than one hundred feet apart for larger pipe size.

(4) A cleanout shall be placed in every horizontal sink waste of twenty feet or less in length and an additional cleanout shall be installed at each additional twenty feet of length or portion thereof of such sink waste, and also at each change of direction greater than twenty-two and one-half degrees in any such waste.

(5) A vent which does not terminate in the open air (back-vented to general vent system) shall be provided with an easily accessible cleanout plug, so located as to allow the vent pipe to be cleared when stopped. See Part

I, Section 168. A dry vent subject to flooding shall have an accessible cleanout installed.

(6) A cleanout shall be installed at each change of direction of the building (house) drain greater than forty-five degrees.

(7) Cleanouts shall be of the hub and ferrule, or other approved type, with brass nuts or brass screwed plugs. The body of a cleanout ferrule shall conform in thickness to that required for pipe and fittings of the same metal, and shall extend not less than one and one-half inches above the hub.

(8) The cleanout plug shall be of heavy brass not less than one-eighth inch thick and shall be provided with a solid raised nut or slotted (\*). The nut shall be not less than three-quarters inch high and not less than one inch in the smallest horizontal dimension.

(\*) Slots for cleanout plugs shall have the following dimensions:

Nominal Size of Clean out	Length of Slot	Width of Slot	Depth of Slot
1 1/2"	1"	5/16"	1/4"
2	1 1/2	5/16	1/4
2 1/2	1 5/8	1/2	3/8
3	1 3/4	1/2	3/8
3 1/2	2	1/2	3/8
4	2 1/2	1/2	1/2

(9) A cleanout shall be of the same nominal size as the pipe up to four inches and not less than four inches for larger pipe.

(10) A cleanout on a building (house) drain shall be formed by a Y or approved fitting and, where necessary, shall be extended without change of direction and made accessible.

#### 149. Interceptors

(1) A gasoline, oil or grease interceptor shall be provided with a vent pipe, maximum four inch, on the waste outlet from all public garages, automobile washfloors, cleaning establishments and elsewhere as required by the Plumbing Inspector or Municipal Engineer.

(2) An interceptor shall be so designed that it will not become airborne and shall be so located as to be readily accessible for cleaning. All interceptors shall be vented as prescribed by this By-law. The design of all interceptors shall be subject to the approval of the Engineer.

(3) A grease or oil interceptor shall be of sufficient capacity to intercept all grease or oil likely to flow into it under normal conditions. The trap for automobile wash floors shall have a capacity sufficient to retain the sand or grit reaching the trap during any ten hour period.

(4) A grease interceptor may serve as a trap for a two or three compartment sink or dishwashing machine.

(5) A food disposal unit or a potato peeler shall not be connected to a grease trap.

(6) Each grease interceptor shall be vented as required elsewhere in this By-law and each fixture discharging into a grease interceptor shall be individually trapped, and vented in approved manner except that an approved type grease interceptor may be used as a fixture trap for a single fixture when the horizontal distance between the fixture outlet and the grease interceptor does not exceed four feet and the vertical tail pipe or drain does not exceed two and one-half feet. See Part H Section 133. (Typical drawing for restaurant).

(7) An approved type grease interceptor complying with the provisions herein shall be installed in the waste line leading from sinks, drains and other fixtures or equipment in the following establishments when in the judgment of the Plumbing Inspector or Public Health Inspector, waste pre-treatment is required; restaurants, cafes, lunch counters, cafeterias, bars and clubs, hotels, hospitals, sanitariums, factories or school kitchens, or other establishments where grease can be

introduced into the drainage or sewerage system in quantities that can effect line stoppage or hinder sewage treatment of private sewage disposal. A grease interceptor is not required for individual dwelling units or for any private living quarters.

(8) Plans shall be submitted to the Plumbing Inspector and approval obtained prior to the installation of any plumbing system or part thereof designed to receive the waste from any food establishment.

(9) Interceptors shall be maintained in efficient operating condition by periodic removal of the accumulated grease. No such collected grease shall be introduced into any drainage piping, public or private sewer.

(10) Each grease interceptor shall be constructed of durable materials satisfactory to the Plumbing Inspector and shall have a full size gas tight cover which can be easily and readily removed.

(11) No water jacketed grease interceptor shall be approved or installed.

(12) Each grease interceptor shall have an approved water seal of not less than two inches in depth or the diameter of its outlet, whichever is the greater.

(13) No grease interceptor required by this By-law shall be installed until the type or model of each size thereof has been subjected to, and has fully complied with the test specified therefor by the Plumbing Inspector and has been approved by same.

(14) The Plumbing Inspector shall require such tests as they may deem necessary to determine the grease collecting efficiency of various types and kinds of grease interceptors to establish the rate of flow or other rating thereof. Such test requirements may be revised or modified from time to time as may be deemed necessary by the Plumbing Inspector. A list of approved interceptors shall be kept on file in the office of the Plumbing Inspector.

(15) No grease interceptor shall hereafter be installed which does not comply in all respects with the type or model of each size thereof approved by the Plumbing Inspector.

(16) Whenever it shall come to the attention of the Plumbing Inspector that any grease interceptor does not comply, said Plumbing Inspector shall immediately suspend or revoke such approval.

150. Special Waste Connections

(1) Refrigerator, safe, drip pan, dental and other special waste pipes shall be of cast iron, brass, lead or copper, with proper drainage fittings. Such waste pipes shall be constructed and vented, in accordance with Part I and Part K.

(2) Waste pipes from refrigerators, safes, drip pans and other special waste pipe lines shall be as short as possible and discharge into the open air over an open water-supplied approved fixture. When there is more than one connection in any vertical line of any refrigerator waste pipe, each branch of the same shall be as short as possible and shall be separately trapped with a trap and clean-out placed as near the inlet as possible, and such waste pipe shall extend through the roof of the building. The diameter of such waste pipes and branches therefrom shall be not less than the following:

In buildings one storey in height - 1 1/4 inches in diameter.

In buildings two, three or four  
storeys in height - 1 1/2 inches in diameter.

In buildings five storeys in  
height or more - 2 inches in diameter.

(3) In all buildings where the occupancy is such that large quantities of water are used for manufacturing purposes, waste pipes from machines may discharge on to water-tight floors, having curbs not less than six inches in height, and equipped with properly constructed catch basins, floor wastes, or drains. All such wastes shall discharge to a storm sewer.

(4) Waste pipes from milk vats, sterilizers, sinks and other receptacles used in creameries, dairies and milk houses, shall discharge on to a water-tight floor, laid and equipped with a catch basin in accordance with the regulations of the Milk By-law. No waste shall discharge inside a milk storage room.

(5) Every floor waste\* installed in clinical rooms, laboratories, hotels, clubs, and restaurant kitchens, water closet, bath and wash rooms shall be provided with an adjustable brass strainer and shall be separately trapped and vented in accordance with Part I of this By-law.

\*except basement floor drains.

(6) Photo-engraving plants, battery charging stations, chemical laboratories and all premises where acids are liable to be discharged, shall be equipped with an acid neutralizer, the design, capacity and location of which shall be to the satisfaction of the Plumbing Inspector; such neutralizer shall be installed between the sewer and point of discharge of any acid liquid. The neutralizer shall be properly trapped in such a manner as to guard the seal from being destroyed through evaporation and shall be so constructed as to facilitate the removal of the neutralizing substance.

(7) The waste pipe between the sink and the neutralizer shall be of heavy lead or other approved material, and the waste pipe beyond the neutralizer shall be of medium cast iron inside the building, but may be of vitrified earthenware outside the building, provided all the joints are caulked with jute or oakum and poured with an approved bituminous cement.

151. Slaughter Houses, Packing Establishments, etc.

Every fish, fowl and animal slaughter house or establishment, every fish, fowl and meat packing or curing establishment, and every soap factory, tallow rendering, fat rendering and hide curing establishment, or any other establishment from which considerable amounts of grease are likely



to be discharged into any plumbing system, sewer system, or private sewage disposal system, shall be connected to and shall drain or discharge into a grease interceptor of a design approved by the Plumbing Inspector.

152/ Storm Drain Traps, Sumps and Valves

(1) Every storm water drain installed for the purpose of draining basements, cellars, area ways and surface water, and connected by a storm sewer connection, shall be effectively trapped by means of a sump or catch basin, and no "P" trap or running trap shall be allowed. The floor and walls of such sump or catch basin shall be of concrete not less than four inches in thickness, and made watertight. The walls shall be brought up to the finished floor of the basement or cellar, and if installed outside the building, brought up to within twelve inches of the finished ground surface; such sump or catch basin shall have a floor area of not less than four square feet, or if circular, then a diameter of not less than twenty-four inches, and a liquid depth of seventeen inches, and where required shall be equipped with an efficient backwater valve on the sewer side with a seal of not less than eight inches, and not less than twelve inches of cast iron shall be caulked on the outlet side of such backwater valve.

(2) The body of the valve shall be of cast iron and bear the name of the maker; all bearing parts shall be of brass or other non-corrosive metal. The valve and seat shall be machine faced or equal, so constructed as to provide a positive mechanical seal against back water. The hinge pin shall be of brass or equal, not less than one-quarter inch diameter and so fitted as to insure free positive action. The area of the valve seat shall be equal to the cross sectional area of the pipe connection and shall be caulked into the body with lead. The access cover shall be fitted, made water tight and provided with minimum four, five-sixteenth inch hexagon head bronze bolts for inspection and repairs. Every sump or catch basin placed within a building

shall be equipped with a cast iron, boiler plate or two-inch cedar plank cover; exterior sumps or catch basins may be equipped with a removable cover of three-inch thick cedar wood. Where the depth of a sump exceeds four feet from grade level the floor area shall have a minimum inside dimension of two and one-half feet by four feet.

(3) In any low lying area or district within the Municipality which may be designated by the Municipal Engineer, connections to the Municipal storm sewer which are required to take the drainage from basements, cellars, surface drains or weeping tile drains shall be effectively trapped by means of a sump, which sump shall be of such design, size, material and construction as shall be satisfactory to the Plumbing Inspector. Such sump shall be provided with an efficient back-water valve and tidal-gate valve with bronze working parts and with a handle which shall allow of ready access, even when any basement or cellar may be flooded.

(4) Where the storm sewer connection to any rainwater conductor is intercepted by a sump or catch basin, such sump or catch basin shall be installed in accordance with clauses (1) or (2) of this subsection.

#### Part I Venting Systems

##### 153. Protection of Trap Seal

The seal of every fixture trap in a plumbing system shall be protected against siphonage and back pressure, and air circulation shall be assured throughout the drainage system by a properly installed individual vent, or system of venting, except as otherwise provided herein.

##### 154. Water Closet Branch

A horizontal water closet branch shall be installed as high as possible, and in no case shall the vertical drop exceed three feet.

##### 155. Materials

Vent pipes shall be of cast iron, brass, lead

or copper, or other approved material.

156. Noxious or Explosive Gases

Any device containing or giving off noxious or explosive gases shall be vented with approved material, in a safe manner, directly to the outside air.

157. Main Stack

Every building in which plumbing is installed shall have at least one main vent stack or stack vent not less than three inches in diameter.

158. Stack Vents and Vent Stack

(1) Every soil or waste stack shall be extended vertically as a stack vent to a point three inches above the flood level rim of the highest fixture, then to the open air through the roof; or the stack vent and vent stack may be connected together within the building above the flood level rim of the highest fixture with a single extension from the connection to the open air through the roof.

(2) A vent stack or main vent shall be installed with a soil or waste stack whenever back vents, relief vents or other vents are required in five or more branch intervals.

(3) The vent stack or main vent shall connect full size at its base to the main soil or waste pipe at or immediately below the lowest horizontal branch or by special permission to the building drain and shall extend to the roof and to open air, or it may be connected with the stack vent as described herein.

159. Vents, Locations, Termination

(1) Every soil and waste pipe shall be placed within the building.

(2) Each vent pipe or stack shall extend through its flashing and shall terminate vertically not less than ten inches above the roof or fire wall, nor less than one foot from any vertical surface.

(3) Each vent shall terminate not less than ten feet from or at least two feet above any window, door, opening,

air intake or vent shaft, nor less than ten feet in every direction from any commercial lot line; lane and street excepted.

(4) Vent pipes shall be extended separately or combined, of full required size, not less than ten inches above the roof or fire wall. Flagpoling of vents is prohibited except where the roof is used for purposes other than weather protection. In such cases the vent shall extend not less than seven feet above the roof and be securely stayed.

(5) Vent pipes for outdoor installations shall extend at least ten feet above the surrounding ground and shall be securely supported.

(6) Openings at the roof around vent pipes shall be made water-tight by the use of approved flashings or flashing material.

(7) On wood frame buildings, flashings shall be of telescopic design, with a minimum three-inch overlap at the top.

(8) A vent termination adjacent to a dormer window may be located not less than twenty-four inches behind the dormer, measured horizontally from the face of the window wall.

160. Distance of Vent from Trap

The maximum developed length of the soil or waste pipe from the trap weir to the vent fitting shall conform with Table 22.

161. Waste Arm Fall to Vent

Except water closets, pedestal urinals, trap standards and other fixtures which depend on siphoning action for the proper functioning of the fixture, each fixture trap shall have a protecting vent so located that the total fall in the fixture waste pipe from the trap weir to the vent pipe is not greater than the diameter of the waste pipe.

162.

Wet Vents

Figure 1 - WET VENTING (Max. 2 fixture unit fixtures only)

Column 1	Column 2	Column 3
Diameter of Branch or Stack in Inches	Limit per floor four fixture units	Wet venting system five f.u. fixture or discharging into stack above highest w.c.
1 1/2	2 fixture units	N.P. fixture units
2	4 " "	3 " "
2 1/2	6 " "	4 " "
3	8 " "	6 " "
4	36 " "	10 " "
5		16 " "
6		23 " "

Note: An offset in a wet vent stack shall not exceed four feet from the vertical line up to two inch pipe, or eight feet for three inch pipe or over. Only one offset shall be permitted.

Sizing Wet Vented Waste Lines and Stacks

Column 1. - lists the size of the wet venting waste line or stack, or the soil stack, whichever is applicable.

Column 2. - lists the total fixture units that may be connected to waste stacks at different levels without reventing, provided all fixtures are within the developed length from the fixture trap to the stack as prescribed in Table 22.

Each fixture shall have a maximum rating of two fixture units. The total discharge allowed at any one branch interval shall not exceed four fixture units. Stack to extend full size through the roof.

Column 3. - lists the total fixture units that may be connected to a waste pipe.

(1) Wet venting a water closet or other minimum five fixture unit (three inch outlet) fixture, or fixtures connected symmetrically. The horizontal run on such waste pipe shall not exceed eight feet or where a maximum two fixture unit waste arm is connected thereto, the balance of the horizontal run to the wet vent stack shall not exceed four feet for two inch pipe. Fixtures rated at four fixture units or less shall not be vented across a stack or house drain below a water closet or other five fixture unit fixtures, or

(2) the total fixture units that may discharge into a stack without reventing, provided such fixture connections are made above the connection to the highest water closet and the fixture unit rating of the stack is not otherwise exceeded, provided all fixtures are within the developed length from the fixture trap to the stack as prescribed in Table 22.

N.P. shall mean - not permitted.

163. Circuit, Loop and Relief Vents

(1) A circuit or loop vent for floor-outlet fixtures only shall be permitted as follows:

(a) A horizontal branch soil or waste pipe, minimum four inch, to which two or more water closets, or five fixture unit fixtures connected in a series or battery formation, may be vented by a circuit or loop vent, which shall be taken off in front of the last fixture connection.

(b) A circuit vented soil pipe may serve additional separately vented maximum four fixture unit fixtures provided said fixtures are on the same floor and group as the circuit vented fixtures and within the limits stated in Table 20.

(c) Not more than eight fixtures shall be connected to a battery type branch soil or waste pipe, unless a two inch relief vent is provided between each additional eight fixtures or fraction thereof.

(d) Any branch waste pipe, minimum three inch, to which a group of two or more two inch outlet fixtures are connected.

(2) Where the discharge of fixtures above any circuit system branch shall exceed the area of the soil or waste stack in connection therewith, a relief vent of not less than two inches in diameter shall be placed in front of the nearest fixture branch thereof, or when the branch is connected to a building drain, each branch shall have a two inch relief vent taken off in front of the first fixture connection.

(3) A circuit vent shall be sized according to Table 24.

(4) With the exception of floor drains, a branch of not greater than five feet may be used coming out of a Y or Boston Y, on a loop or circuit vented soil or waste pipe. For floor drains see Table 22.

(5) The vertical vent arm of a circuit or loop system shall not receive waste from fixtures.

(6) The vertical leg of a waste pipe on battery vented fixtures shall not exceed three feet in length.

(7) All wall outlet fixtures to be separately vented.

164. Sump Vents

Every sump receiving sewage shall be vented by a vent pipe not less than one size smaller than the largest inlet pipe of the sump, with a minimum size of three inch, and the maximum need not exceed four inch. (See section 26 of Part C).

165. Venting of Offsets

(1) An offset in soil or waste stacks at an angle greater than forty-five degrees from the vertical, and receiving more than one hundred fixture units above such offset shall be:-

(a) provided with a yoke vent equal in diameter to the main vent stack or soil stack, whichever is the smaller, and the lower end of the yoke shall connect to the soil or waste stack through a Y below the lowest horizontal branch above the offset, and the upper end shall connect to the vent stack not less than three feet above the floor level; or

(b) vented by installing a yoke vent as a vertical continuation of the lower section of the stack or as a side vent connected into a Y on the lower section between the offset and the next lower fixture or horizontal branch, and sized as follows: The portion of the stack above the offset shall be sized as for a regular stack based on the total number of fixture units above the offset.

(c) sized as for a building drain (see Table 21). The portion of the stack below the offset shall be sized as for the offset, or based on the total number of fixture units on the entire stack, whichever is the larger (see Table 20, Col.4). In no case shall a horizontal branch connect to the stack within two feet above or below the offset.

166. Yoke Vents

(1) All soil or waste stacks in buildings over five branch intervals in height, shall be provided with a yoke vent at each five branch interval measured from the top floor down. The size of the yoke vent shall be equal to the size of the vent stack to which it connects.

(2) The lower end of the yoke vent shall connect to the soil or waste stack through a Y below the horizontal branch serving that branch interval, and the upper end shall connect to the vent stack not less than three feet above the floor level.

(3) A yoke vent shall be required on a wet vent stack. (See Column 2 of Section 162 of this Part).

167. Vent Headers

(1) A stack vent or vent stack may be connected into a common vent header at the top of the stack and extended to the open air at one point through the roof.

(2) Sections of a vent header and its vent extension through the roof shall be in accordance with Table 24. In determining the size of such piping, the column headed "Size of soil or waste stack, in inches" shall be disregarded and the size shall be based upon the sum of the fixture unit loads of the stacks vented through such section of the header, and the developed length shall be that of a vent stack having the longest developed length to the open air.

168. Vent Pipe Grades and Connections

(1) Vent pipes shall be as direct as possible and shall be free from drops or sags and be so graded and connected as to drip back to the soil or waste pipe, or vent



stack by gravity through the fixture connections.

(2) Where a dry vent pipe is connected to a horizontal soil or waste pipe, the vent pipe shall be taken off above the centre line of the soil or waste pipe wherever possible and shall rise vertically to a point not less than three inches above the flood level of the fixture it is venting. A cleanout shall be installed on a dry vent subject to flooding or chokage.

(3) The connection between a vent pipe and vent stack shall be not less than three inches above the flood level rim of the highest fixture served by such vent.

169. Size and Length of Vents

(1) The minimum size of piping for trap vents shall be in accordance with Table 23 and no vent pipe shall be less than one and one-quarter inches in diameter.

(2) The diameter and the maximum length of a vent pipe shall be in accordance with Table 24.

(3) The length of a vent stack or main vent shall be its developed length from the lowest connection of the venting system with the soil stack, waste stack (or with building drain by special permission) to:

(a) the vent stack terminal if it terminates separately in the open air through the roof; or

(b) the connection of the vent stack with the stack vent, plus the developed length of the stack vent from that connection to the terminal in the open air.

(4) The length of a stack vent shall be the developed length from the highest horizontal or fixture branch connected to the stack to the terminal of the stack vent in the open air.

(5) The diameter of a relief vent shall be at least equal to one-half of the diameter of the soil or waste branch it serves, with a minimum of two inches.

(6) Branch vents connecting more than one individual vent to a vent stack or stack vent shall be in accordance with Table 24. In determining the size of such

pipings, the column headed "Size of Soil or Waste Stack in Inches" shall be disregarded, and the size shall be based upon the number of fixture units connected thereto, and the developed length of the branch vent measured from its vent stack or stack vent connection to the farthest fixture drain connection served by the branch vent.

170. Additional Vents Not Required

When fixtures are set back-to-back on the same floor and the distance from the traps to the soil or waste stack complies with Table 22, no additional vent shall be required, provided that each fixture wastes separately into an approved multiple fitting and no water closet or minimum five fixture unit fixture discharges into the stack above such connection.

171. Special Venting for Island Fixtures

(1) Subject to Permission of the Plumbing Inspector:-

(a) Traps for island sinks and similar equipment shall be roughed in above the floor and may be vented by extending the vent as high as possible, but not less than the drainboard height and then returning it downward and connecting it to the horizontal sink drain immediately downstream from the vertical fixture drain.

(b) The returned vent shall be connected to the horizontal drain through a Y branch fitting and shall in addition be provided with a foot vent taken off the vertical fixture vent by means of a Y branch immediately below the floor and extending to the nearest partition and thence through the roof to the open air or may be connected to other vents at a point not less than six inches above the flood level rim of the fixtures served.

(c) Drainage fittings shall be used on all parts of the vent and a minimum slope of one-quarter inch per foot back to the drain shall be maintained.

(d) The minimum size of the waste and vent shall be two inches.

(e) Special Venting of Island Fixtures - Figure

2.

FIGURE 2  
SPECIAL VENTING  
OF ISLAND FIXTURES

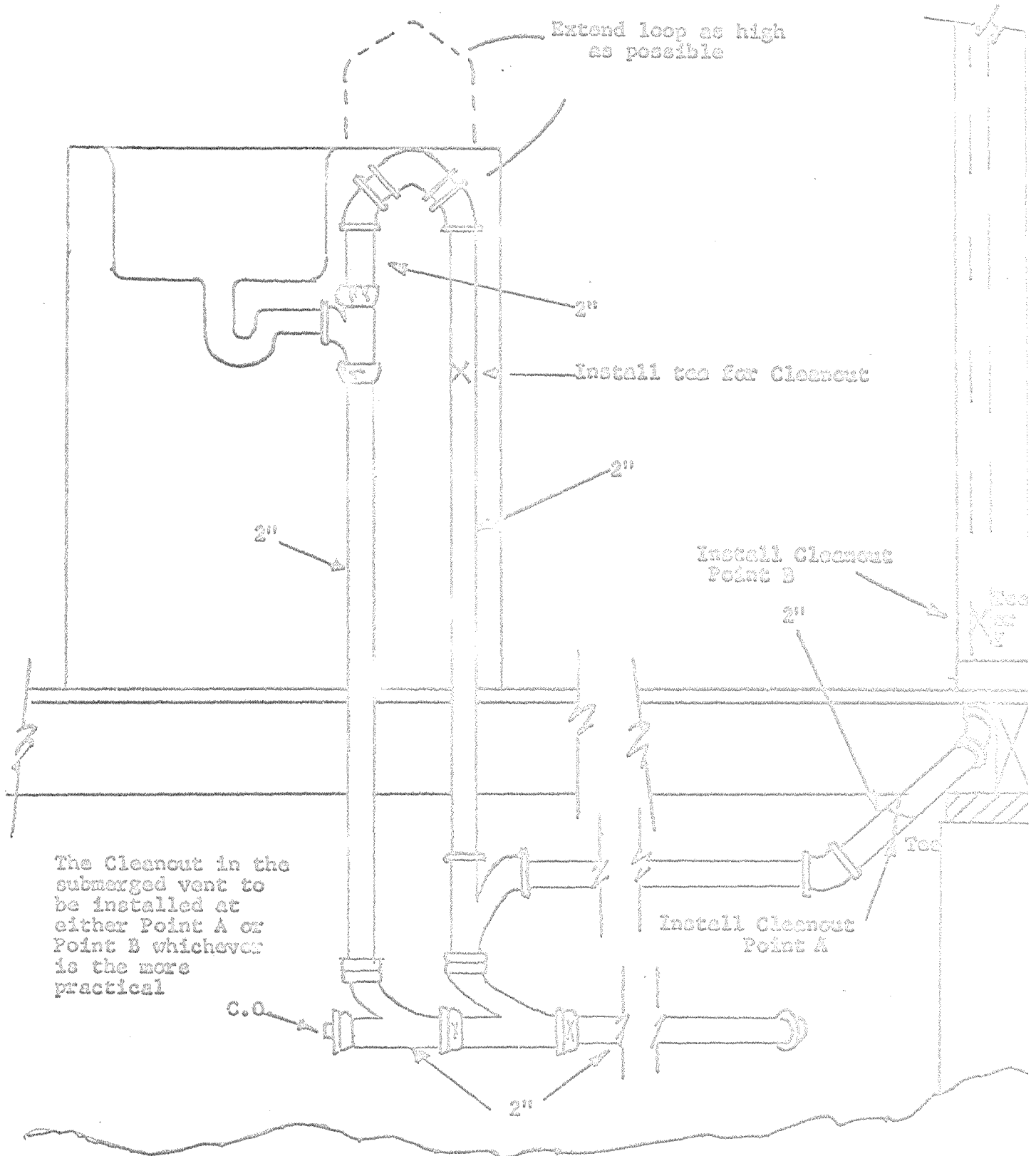


Table 18. FIXTURE UNIT VALUES MIN. TRAP DIAMETERS  
MIN. DRAIN SIZES

Item No.	Fixture and Class of Installation	Min. Size of Trap & Fixture connection in inches	No. of Fixture Units
1	Autopsy Table	1 1/2	2
2	Bathroom group consisting of one lavatory, 1 water tank closet or small flush valve closet, and 1 bathtub or 1 shower stall		8
3	Bathroom group consisting of one lavatory, 1 large flush valve water closet, and 1 bathtub or 1 shower stall		10
4	Bath; tub, sitz, foot, slab ****	1 1/2	1 1/2
5	Bidet	1 1/2	3
6	Beer Cabinet	1 1/2	1 1/2
7	Clothes Washer (Domestic)	1 1/2	2
8	Combination sink and laundry tray (individually trapped)	1 1/2	2
9	Dental Unit or Cuspidor	1 1/4	1
10	Dental lavatory	1 1/4	1
11	Dishwashing Machine (Commercial)	2	3
12	Dishwasher (Domestic)	1 1/2	1 1/2
13	Drinking Fountain	1 1/4	1
14	Food disposal Unit (Commercial)	3	5
15	Floor Drain; Ceiling hung with cleanout	2	3
16	Floor Drain; Rim Flush	3	5
17	Floor Drain; Serving one to three laundry trays	3	5
18	Floor Drain; Toilet Room ***	3	5
19	Floor Drain; Underground	3	5
20	Ice-box (Domestic)	1 1/4	1
21	Laundry Tray; Single or Double Compartment	1 1/2	1 1/2
22	Laundry Tray; Triple Compartment	2	3
23	Lavatory or Bar Sink	1 1/4	1
24	Lavatory; Barber Shop or Beauty Parlor	1 1/2	1 1/2
25	Lavatory; Multiple, Circular and Semi-Circular	2	3
26	Lavatory; Multiple Wash Sink	2	2 (Each set of faucets)
27	Potato Peeler	2	3
28	Showers; Gang (See Below) **		
29	Shower Stall, Multiple Spray	2	4
30	Shower Stall, Shower Head only *	2	2
31	Sink: Bed Pan	3	6
32	Sink: Butler's or Pantry	1 1/2	2
33	Sink: Dishwasher	1 1/2	3
34	Sink: Hotel or Restaurant	1 1/2	2
35	Sink: Indirect Waste	1 1/2	2
36	Sink: Kitchen, for Residence or Apartment	1 1/2	1 1/2
37	Sink: Laboratory	1 1/2	1 1/2
38	Sink: Surgeons Scrub-up	1 1/2	1 1/2
39	Sink: Medicine or Instrument	1 1/4	1
40	Sink: Clinic (Service) (Bed Pan Hopper)	3	6

Table 18 - Continued

Item No.	Fixture and Class of Installation	Min. Size of Trap & Fixture connection in inches	No. of Fixture Units
41	Sink: Lunch Counter, Soda Bar or Rinse	1 1/2	2
42	Sink: Slop (Service)	2	3
43	Sink: Slop Trap Standard (Service)	2	4
44	Sink: Siphon-jet Slop, Flush Rim or Mop (service)	3	6
45	Sterilizer or Steamer; Bed Pan	1 1/2	1
46	Sterilizer; Instrument, Utensil or Water	1 1/2	1
47	Sterilizer; Autoclave	1 1/2	1
48	Sterilizer; Autoclave, Water Cooled Exhaust	1 1/2	2
49	Sump: Up to 24" diameter with perforated cover	4	6
50	Urinal: Blow out to Siphon jet	2	4
51	Urinal: Flushing Rim (Wall)	1 1/2	2
52	Urinal: Pedestal	3	5
53	Urinal: Stall	2	3
54	Urinal: Wall, lip type, Flush valve	2	4
55	Washer: Sterilizer, Bed Pan	3	6
56	Water Closet: Flushometer Valve (large)	3	8
57	Water Closet: Flushometer Valve (small)	3	6
58	Water Closet; Tank	3	6

\* A shower head over a bath tub adds no Fixture Units.

\*\* Gang Showers: Two (2) Heads - two (2) inch trap and three (3) fixture units.  
 Three (3) Heads - three (3) inch trap and five fixture units.  
 Four (4) Heads - three (3) inch trap and five (5) fixture units.  
 Five (5) heads - four (4) inch trap and six (6) fixture units.

\*\*\* Floor Drain serving 15 fixture units or less, minimum 2 inch.

\*\*\*\* Minimum Trap size underground - 2 inch cast iron.

(1) For discharges such as those from overflow pipes, condensers, sump pumps, or sewage ejectors, each gallon per minute of constant discharge shall be considered as two (2) fixture units.

(2) In converting sump pump discharge, ejecting storm water, each twelve hundred (1200) square feet of drainage area shall be counted as twenty-five (25) gallons per minute discharge capacity.

Flush Floor Drains

All major and/or minor operating rooms, delivery rooms, emergency rooms, autopsy rooms and/or mortuary work rooms shall be provided with a floor drain of the flushing type. An acceptable vacuum breaker (back flow preventer) installation shall be provided between the control valve and the water supply connection to the floor drain.

See Part J.

Table 19. EQUIVALENT FIXTURE UNITS FOR FIXTURES NOT ITEMIZED IN TABLE 18

Size of Waste Pipe or Trap in Inches	No. of Fixture Units.
1 1/4 or less	1
1 1/2	2
2	3
2 1/2	4
3	5
4	6

Table 20. MAXIMUM ALLOWABLE NO. OF FIXTURE UNITS FOR HORIZONTAL FIXTURE BRANCHES & STACKS (other than building drains and sewers)  
Maximum Total Load in Fixture Units

Item No.	Dia. of Branch or Stack Pipe in Inches	For Horizontal Fixture Branch (1)	For stack not exceeding 3 storeys	For Stack exceeding 3 storeys	
				Total load for stack	Total Load for each branch interval or storey
1	1 1/4	1	2	2	1
2	1 1/2	3	4	8	2
3	2	6	10	24	6
4	2 1/2	12	20	42	9
5	3	30(2)	50(4)	(3) 60	(2) 16
6	4	180	240	500	90
7	5	390	540	1,100	200
8	6	700	960	1,900	350
9	8	1,600	2,200	3,600	600
10	10	2,500	3,800	5,600	1000
11	12	3,900	6,000	8,600	1,500

- (1) Does not include branches of the building drain.  
 (2) Not over two 6-unit traps or fixtures.  
 (3) Not over six 6-unit traps or fixtures.  
 (4) Not over two 6-unit traps or fixtures at each

branch interval.

Table 21

Diameter of Sewer in Inches	Maximum allowable no. of fixture units (sanitary) only Max. total load in fixture units, for any portion (1) of a building drain or building sewer of various slopes			
	Slope of Sewers in Inches per Foot			
	1/16	1/8	1/4	1/2
2			(3) 21	(3) 26
2 1/2			(3) 24	(3) 31
3		20	(2) 27	(2) 36
4		180	240	300
5		390	480	670
6		700	840	1,300
8	1,400	1,600	2,250	3,370
10	2,500	3,000	4,500	6,500
12	3,900	5,400	8,300	13,000
15	7,000	10,400	16,300	22,500

- (1) includes branches of the building drain.

- (2) Not over two 6-unit traps or fixtures.

(3) Table 20 shall be used if any fixture trap is connected within 3 feet vertical distance, above horizontal branch of building drain.

Table 22. MAXIMUM DISTANCE OF FIXTURE TRAP FROM VENT.

Size of Fixture Drain in Inches	Distance from Trap to Vent in Feet
1 1/4	4
1 1/2	5
2	5
3	6
4	10

Table 23. SIZE OF VENT PIPES FOR TRAPS

Trap Size in Inches	Vent Pipe Size in Inches
1 1/4	1 1/4
1 1/2	1 1/2
2	1 1/2
2 1/2	1 1/2
3	2
4	2
5	2
6	2

Table 24. SIZE OF VENT STACKS AND BRANCH VENTS

Size of Soil or Waste Stack in Inches	Total Hydraulic Load in Fixture Units connected	Diameter of Vent required in Inches & Max. Developed Length in Feet											
		1 1/4	1 1/2	2	2 1/2	3	4	5	6	8			
1 1/4	0-2*	30											
1 1/2	3-8	np	150N										
2	9-24	np	50N	150									
2 1/2	25-42	np	np	100	300								
3	43-60	np	np	np	80	400							
4	61-500	np	np	np	np	180	700						
5	501-1100	np	np	np	np	np	200	700					
6	1101-1900	np	np	np	np	np	np	200	700				
8	1901-3600	np	np	np	np	np	np	np	250	800			
10	3601-5600	np	np	np	np	np	np	np	np	np	250		

NOTE:- No more than one-third of the total permitted length may be installed in a horizontal position.

N - Except five-unit traps or fixtures.

- Column "Size of Soil or Waste Stack in Inches" to be disregarded except when sizing vent stacks.

np- Not permitted

\* - See Table 23.

Table 25. AREAS AND CIRCUMFERENCE OF CIRCLES

Diameter	Circumference	Area
1/8	.39270	.01227
1/4	.78540	.04909
3/8	1.1781	.11045
1/2	1.5708	.19635
3/4	2.3562	.44179
1	3.1416	.7854
1 1/4	3.9270	1.2272
1 1/2	4.7124	1.7671
2	6.2832	3.1416
2 1/2	7.8540	4.9087
3	9.4248	7.0686
4	12.566	12.566
5	15.708	19.635
6	18.850	28.274
7	21.991	38.485
8	25.133	50.265
9	28.274	63.617
10	31.416	78.540

Table 26A. COMBINED STORM AND SANITARY BUILDING SEWER SIZES.  
1/8" FALL PER FT. "REQUIRED DIAMETERS FOR COMBINE  
BUILDING DRAINS AND SEWERS"

Drainage Area—sq. ft. \ Fixture Units	0	30	180	300	400	500	600	700	800	900	1000	1100	1300	1600	2300	3000	4200	5400
0	0	4	4	6	6	6	6	6	8	8	8	8	8	8	10	10	12	12
1 200	4	4	6	6	6	6	6	6	8	8	8	8	8	8	10	10	12	12
2 000	4	4	6	6	6	6	6	6	8	8	8	8	8	8	10	10	12	12
2 500	4	4	6	6	6	6	6	6	8	8	8	8	8	8	10	10	12	12
3 500	6	6	6	6	6	6	6	8	8	8	8	8	8	8	10	10	12	12
4 000	6	6	6	6	6	8	8	8	8	8	8	8	8	8	10	10	12	12
5 800	6	6	6	8	8	8	8	8	8	8	8	8	8	8	10	10	12	12
7 500	6	6	8	8	8	8	8	8	8	8	8	8	8	10	10	10	12	12
9 000	6	8	8	8	8	8	8	8	8	8	8	8	10	10	10	10	12	12
11 000	8	8	8	8	8	8	8	8	8	10	10	10	10	10	10	10	12	12
13 500	8	8	8	8	10	10	10	10	10	10	10	10	10	10	10	12	12	12
15 300	8	8	10	10	10	10	10	10	10	10	10	10	10	10	10	12	12	12
19 000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	12	12	12	15
22 000	10	10	10	10	10	10	10	10	10	10	10	12	12	12	12	12	12	15
25 000	10	10	10	10	10	10	12	12	12	12	12	12	12	12	12	12	15	15
27 000	10	10	12	12	12	12	12	12	12	12	12	12	12	12	12	12	15	15
31 000	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	15	15	15
36 000	12	12	12	12	12	12	12	12	12	12	12	12	12	12	15	15	15	15
41 000	12	12	12	12	12	12	12	15	15	15	15	15	15	15	15	15	15	15
44 000	12	12	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15

Table 26B. COMBINED STORM AND SANITARY BUILDING SEWER SIZES—  
1/4" FALL PER FT. "REQUIRED DIAMETERS FOR COMBINE  
BUILDING DRAINS AND SEWERS"

Drainage Area—sq. ft. \ Fixture Units	0	30	240	300	400	500	600	700	840	1000	1100	1500	1900	2250	3400	4500	6400	8200
0	0	4	4	6	6	6	6	6	6	8	8	8	8	8	10	10	12	12
1 500	4	4	4	6	6	6	6	6	6	8	8	8	8	8	10	10	12	12
2 200	4	4	4	6	6	6	6	6	6	8	8	8	8	8	10	10	12	12
3 500	4	4	6	6	6	6	6	6	6	8	8	8	8	8	10	10	12	12
5 000	6	6	6	6	6	6	6	6	8	8	8	8	8	8	10	10	12	12
7 000	6	6	6	6	6	6	8	8	8	8	8	8	8	8	10	10	12	12
8 500	6	6	6	8	8	8	8	8	8	8	8	8	8	8	10	10	12	12
10 000	6	6	8	8	8	8	8	8	8	8	8	8	8	8	10	10	12	12
13 000	8	8	8	8	8	8	8	8	8	8	8	8	10	10	10	10	12	12
16 000	8	8	8	8	8	8	8	8	8	8	10	10	10	10	10	12	12	12
19 000	8	8	8	8	8	8	10	10	10	10	10	10	10	10	10	12	12	12
21 700	8	8	10	10	10	10	10	10	10	10	10	10	10	10	12	12	12	15
25 000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	12	12	12	15
30 000	10	10	10	10	10	10	10	10	10	10	10	10	10	12	12	12	12	15
35 000	10	10	10	10	10	10	10	10	12	12	12	12	12	12	12	12	15	15
38 900	10	10	12	12	12	12	12	12	12	12	12	12	12	12	12	12	15	15
45 000	12	12	12	12	12	12	12	12	12	12	12	12	12	12	15	15	15	15
51 000	12	12	12	12	12	12	12	12	12	12	12	12	12	15	15	15	15	15
57 000	12	12	12	12	12	12	12	12	12	12	15	15	15	15	15	15	15	15
62 000	12	12	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15



Table 26C. COMBINED STORM AND SANITARY BUILDING SEWER SIZES—  
1/2" FALL PER FOOT" REQUIRED DIAMETERS FOR COMBINE  
BUILDING DRAINS AND SEWERS"

Fixture Units Drainage Area—sq. ft.	0	30	300	400	500	600	700	900	1100	1300	1800	2300	2800	3370	5000	6500	9000	13000
0	0	4	4	6	6	6	6	6	6	6	8	8	8	8	10	10	12	12
2 500	4	4	4	6	6	6	6	6	6	6	8	8	8	8	10	10	12	12
3 500	4	4	4	6	6	6	6	6	6	6	8	8	8	8	10	10	12	12
5 000	4	4	6	6	6	6	6	6	6	6	8	8	8	8	10	10	12	12
7 500	6	6	6	6	6	6	6	6	6	6	8	8	8	8	10	10	12	12
10 000	6	6	6	6	6	6	6	8	8	8	8	8	8	8	10	10	12	12
12 500	6	6	6	8	8	8	8	8	8	8	8	8	8	8	10	10	12	12
14 200	6	6	8	8	8	8	8	8	8	8	8	8	8	10	10	10	12	12
18 000	8	8	8	8	8	8	8	8	8	8	8	8	8	10	10	10	10	12
22 000	8	8	8	8	8	8	8	8	8	8	10	10	10	10	10	12	12	15
26 000	8	8	8	8	8	8	8	10	10	10	10	10	10	10	10	12	12	15
30 600	8	8	10	10	10	10	10	10	10	10	10	10	10	10	12	12	12	15
36 000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	12	12	12	15
43 000	10	10	10	10	10	10	10	10	10	10	10	10	12	12	12	12	15	15
50 000	10	10	10	10	10	10	10	10	12	12	12	12	12	12	12	12	15	15
55 200	10	10	12	12	12	12	12	12	12	12	12	12	12	12	12	15	15	15
64 000	12	12	12	12	12	12	12	12	12	12	12	12	12	12	15	15	15	15
72 000	12	12	12	12	12	12	12	12	12	12	12	12	12	15	15	15	15	15
80 000	12	12	12	12	12	12	12	12	12	12	15	15	15	15	15	15	15	15
88 800	12	12	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15

Part J. WATER, SUPPLY and DISTRIBUTION

172. Running Water Required

(1) The capacity of a potable water system shall be sufficient to provide a positive flow and a positive pressure at each supply opening. The capacity of a water service pipe shall be at least equal to the peak demand flow. The capacity of a pipe that supplies a fixture shall at least equal the flow that will flush the fixture and keep it in a sanitary condition.

(2) Water closets shall be flushed by means of an approved tank or flushometer valve.

173. Protection of Water Supply

(1) No device designed to introduce another substance into the water in the connection between the building and the water (street) main shall be installed unless a permit is obtained from the Plumbing Inspector who, in consultation with the Engineer, shall insure that the device is designed and installed in such a manner that a dangerous dosage of such substance cannot be introduced into the water (street) main.

(2) If after the installation of such a device the water (street) main system is changed so that the device might become dangerous such device shall be removed by order of the Plumbing Inspector.

(3) Non-potable water shall not be distributed to any part of a food processing establishment where food is being processed.

(4) Water pumps, tanks, wells, filters, softeners, appurtenances, and devices shall be protected from superficial ground or surface water and other contamination by satisfactory covers, walls, copings or castings.

(5) Every well shall be provided with a water-tight cover and approved outer casing extending at least ten feet below the ground surface, and any pipe or other connection made therein shall be effectively sealed with an approved fitting.

(6) All non-pressure, potable water supply tanks shall be properly covered to prevent entrance of foreign material into the water supply.

(7) No installation of potable water supply piping of part thereof shall be made in such a manner that it will be possible for used, unclean, polluted or contaminated water, mixtures or substances to enter any portion of such piping from any tank, receptacle, equipment or plumbing fixture by reason of back siphonage, by suction or any other cause, either during normal use and operation thereof or when any such tank, receptacle equipment or plumbing fixture is flooded, or subject to pressure in excess of the operating pressure in the hot or cold water piping.

(8) No person shall make a connection or allow one to exist between pipes or conduits carrying domestic water supplied by any public or private water service system and any pipes, conduits or fixtures containing or carrying water from any other source or containing or carrying water which has been used for any purpose whatsoever, or any piping carrying chemicals, liquids, gases, or any substances whatsoever, unless there is provided an approved backflow prevention device.

(9) Direct connections between potable water piping and sewer connected wastes shall not exist under any

condition with or without backflow protection. Where potable water is discharged to the drainage system it shall be by means of an approved air gap of two pipe diameters of the supply inlet, but in no case shall the gap be less than one inch. Connection may only be made to the inlet side of a fixture trap provided that an approved vacuum breaker is installed not less than six inches above the flood level rim of such trapped fixture so that at no time will any such device be subjected to any back pressure.

(10) No potable water piping shall be installed or maintained within any piping or device conveying sewage wastes or other materials hazardous to health and safety.

174. Backflow Protection for Fixtures

No plumbing fixture, device or construction shall be installed or maintained or shall be connected to any domestic water supply, when such installation or connection may provide a cross-connection between a distributing system of water for drinking and domestic purposes and water which may become contaminated by such plumbing fixture, device or construction unless there is provided an approved backflow prevention device.

175. Water Supply Protection

No water piping supplied by any private water supply system shall be connected to any other source of supply without the approval of the Plumbing Inspector and Medical Health Officer.

176. Cross-Connection Control

(1) No person shall install any water operated equipment or mechanism, or use any water treated chemical or substance, if it is found that such equipment, mechanism, chemical or substance may cause pollution of the domestic water supply. Such equipment or mechanism may be permitted only when equipped with an approved backflow prevention device, provided:

(a) before any device is installed for the prevention of backflow or back siphonage, it shall

have first been approved by the Plumbing Inspector. Devices shall be tested in conformity with recognized standards or other standards acceptable to the Plumbing Inspector which are consistent with the intent of this By-law.

(b) all devices installed in a potable water supply system for protection against backflow shall be maintained in good working condition by the person or persons having control of such devices. The Plumbing Inspector may inspect such devices and, if found to be defective or inoperative, shall require the repair or replacement thereof. No device shall be removed from use or relocated or other device substituted, without the approval of the Plumbing Inspector.

(2) Fixture inlets or valved outlets with hose attachments which may constitute a cross-connection shall be protected by an approved vacuum breaker installed at least six inches above the highest point of usage and located on the discharge side of the last valve. Fixtures with integral vacuum breakers manufactured as a unit may be installed in accordance with their approval requirements.

(3) In cases where it is impractical to correct individual cross-connections on the domestic water line, the line supplying such outlets shall be considered a non-potable water line. No drinking or domestic water outlets shall be connected to the non-potable water line. Backflow or back siphonage from the non-potable water line into the domestic water line shall be prevented by the installation of a gravity tank, or by a tank having a pump for desired non-potable water. The domestic water inlets to the non-potable water tank shall have an approved air gap. Where it is impractical to install tanks as set forth above, an approved pressure type backflow or back-siphonage prevention device shall be installed as follows:

(a) when reverse flow due only to gravity or a vacuum within the line can occur, an approved pressure type vacuum breaker shall be installed in the supply line.

Each pressure type vacuum breaker shall be installed at a height of at least twelve inches above the highest tank, equipment or point of usage of the non-potable water. Other approved backflow prevention devices shall be installed in a manner satisfactory to the Plumbing Inspector, but in no case less than twelve inches above the surrounding ground or floor.

(b) where backflow can occur due to steam boilers, pumps, etc., creating a higher pressure in the non-potable water line, an approved backflow prevention device shall be installed in the supply line. Such backflow prevention device shall be installed at least twelve inches above the surrounding ground or floor.

(c) whenever possible, all portions of the non-potable water line shall be exposed and all exposed portions shall be properly identified in a manner satisfactory to the Plumbing Inspector. Each outlet on the non-potable water line which may be used for drinking or domestic purposes shall be posted: DANGER - UNSAFE WATER.

177. Water Closet Flushometer Valves

Water closet flushometer valves shall be equipped with an approved vacuum breaker. Each such device shall be installed on the discharge side of the flushometer valve with the critical level\* at least six inches above the overflow rim of the bowl.

178. Toilet and Urinal Tanks

Toilet and urinal tanks shall be equipped with an approved ball-cock. The ball-cock shall be installed with the critical level at least one inch above the full opening of the overflow pipe. In cases where the ball-cock has no hush tube, the bottom of the water supply inlet shall be installed one inch above the full opening of the overflow pipe.

\* The critical level C-L or  $\frac{C}{L}$  marking on a backflow prevention device or vacuum breaker is a point established by

the testing laboratory and (usually stamped on the device by the manufacturer) which determines the minimum elevation above the flood level rim of the fixture or receptacle served on which the device may be installed. When a backflow prevention device does not bear a critical level marking the bottom of the vacuum breaker, combination valve, or the bottom of any such approved device shall constitute the critical level. All ball-cocks shall be equipped with a refilling device.

179. Urinal Flushometer Valves

Urinals, when served by a flushometer valve shall be equipped with an approved vacuum breaker installed on the discharge side of the flushometer. The critical level shall be not less than six inches above the highest part of the fixture.

180. Over Rim Supplies to Plumbing Fixtures

Over rim supplies to plumbing fixtures shall be at least one inch above the flood level rim of the fixture.

181. Inlets to Tanks, Vats, Sumps, and Other Receptors

Inlets to tanks, vats, sumps and other receptors, when protected by an approved vacuum breaker shall have such device installed on the discharge side of the last valve with the critical level not less than six inches above the overflow rim of such equipment. Water supply inlets not protected by vacuum breakers shall be installed not less than two pipe diameters, but in no case less than two inches above the overflow rim of such tank, vat, or similar equipment.

182. Lawn Sprinkling Systems

Lawn sprinkling systems shall be equipped with an approved vacuum breaker installed on the discharge side of each control valve. The vacuum breakers shall be installed at least six inches above the surrounding ground and above a sufficient number of heads so at no time will the vacuum breaker be subjected to back pressure or drainage.

183. Fixture Inlets or Valved Outlets with Hose Attachments Which May Constitute a Cross-Connection

Fixture inlets or valved outlets with hose attachments which may constitute a cross-connection shall be protected by an approved vacuum breaker installed at least six inches above the highest point of usage and located on the discharge side of the last valve. Fixtures with integral vacuum breakers manufactured as a unit may be installed in accordance with their approval requirements.

184. Medical, Therapeutic, Surgical, Mortuary or Similar Places

Medical, therapeutic, surgical, mortuary or similar places shall have all water outlets protected by approved vacuum breakers on the discharge side of the last valve and installed not less than five and one-half feet above the floor, and at no time less than thirty-six inches above any fixture or equipment served, unless such vacuum breaker is an integral part of the fixture or equipment having an approval as a unit and provided the unit vacuum breaker will not be subjected to back pressure under any condition.

185. Water Cooled Compressors, Degreasers or Other Water Cooled Equipment

(1) Water cooled compressors, degreasers or any other water cooled equipment shall be protected by an approved vacuum breaker installed ahead of the equipment on the discharge side of the last valve and at least six inches above the highest point reached by any water passing through or discharging from such equipment.

(2) Equipment subject to continuous flows for periods of more than twelve hours shall be provided with an approved "pressure type" vacuum breaker installed at least twelve inches above the highest point reached by any water passing through or discharging from such equipment.

(3) When in the opinion of the Plumbing Inspector no hazard to the potable water supply system is evident, special approval may be obtained to omit the vacuum breakers.

(4) Water cooled equipment shall not be connected with any sanitary sewer. (See Part F, Section 90(2)).

186. Aspirators

Aspirators shall not be directly connected to a sewer connected waste pipe, but may be connected to the inlet side of a trap and shall be equipped with an approved vacuum breaker installed at least six inches above the aspirator unit. The discharge pipe from the aspirator unit shall be designed for free flow and shall discharge through an approved air gap. The length of such discharge pipe or tube from the aspirator shall at no time exceed twelve inches.

187. Vacuum Breakers for Hot Water Over 160°

Vacuum breakers for hot water over 160°F shall be of approved type designed to operate at temperatures of one hundred sixty degrees or more without rendering any portion of the device inoperative.

188. Steam and Steam Boiler Connections

Steam and steam boiler connections shall be protected by an approved backflow prevention device.

189. Vacuum Breaker Location

A vacuum breaker shall be placed in a visible position, adequately protected and be readily accessible for examination and/or replacement. In extenuating circumstances the location of the approved vacuum breaker shall be subject to the approval of the Plumbing Inspector.

190. Protection Against Freezing

(1) All water pipes, tanks, appurtenances, and devices shall be effectively protected against freezing.

(2) In all buildings of frame construction, subject to Section 191 of this Part, water pipes installed within the framework of outer walls shall be adequately protected against freezing by the use of glass wool insulation material or equal, installed prior to inspection.

191. Outer Wall Installation

Risers, diverter valves and all other <sup>cast</sup>brass control valves shall not be installed within the framework of an



outer wall.

192. Underground Water Pipes

Where possible, all water pipes installed underground shall be laid at least twenty-four inches deep.

Where such pipes cannot be so laid they shall be effectively protected from frost.

193. Water Distributing Pipe, Tube and Fittings

(1) Material for water distributing pipe and tube shall be of brass, copper, lead, cast iron, wrought iron, open-hearth iron, galvanized steel, with approved fittings or other approved materials.

(2) All threaded ferrous pipe and fittings shall be zinc-galvanized or cement lined.

(3) The water service pipe to any building shall be of sufficient size to provide an adequate supply of water to the fixtures to be served, and in no case shall its internal diameter be less than three-quarters of an inch; such service pipe shall be continued full size up to and including the stop and waste cock.

(4) The water service and water distributing system for apartment buildings shall not be less than as set forth in the figure 3 following:

Figure 3. WATER PIPE SIZES (Based on Flush Tanks)

No. of Apts.	<u>Cold &amp; Hot Water Combined</u>				<u>Cold Water</u>				<u>Hot Water</u>			
	Fixture Units		Pipe Size		Fixt. Units		Pipe Size		Fixt. Units		Pipe Size	
	GPM	Copper	Galv.	INCHES	GPM	Copper	Galv.	INCHES	GPM	Copper	Galv.	INCHES
1	8	7	3/4	3/4	6	5	3/4	3/4	4.5	1/2	3/4	3/4
2	16	12	3/4	1	12	8	3/4	3/4	9	7	3/4	3/4
3	24	17	1	1 1/4	18	13	1	1	13.5	10	3/4	1
4	32	21	1	1 1/4	24	17	1	1 1/4	18	13	1	1
5	40	24	1 1/4	1 1/4	30	20	1	1 1/4	22.5	16	1	1 1/4
6	48	28	1 1/4	1 1/2	36	23	1 1/4	1 1/4	27	18	1	1 1/4
7	56	32	1 1/4	1 1/2	42	25	1 1/4	1 1/4	31.5	21	1	1 1/4
8	64	34	1 1/2	1 1/2	48	28	1 1/4	1 1/2	36	23	1 1/4	1 1/4
9	72	36	1 1/2	1 1/2	54	30	1 1/4	1 1/2	40.5	25	1 1/4	1 1/4
10	80	38	1 1/2	1 1/2	60	32	1 1/4	1 1/2	45	27	1 1/4	1 1/2
11	88	41	1 1/2	2	66	35	1 1/2	1 1/2	49.5	28	1 1/4	1 1/2
12	96	43	1 1/2	2	72	37	1 1/2	1 1/2	54	30	1 1/4	1 1/2
13	104	45	1 1/2	2	78	38	1 1/2	1 1/2	58.5	32	1 1/4	1 1/2

Figure 3, Continued

No. of Apts.	Cold & Hot Water Combined				Cold Water				Hot Water			
	Fixture Units	GPM	Pipe Size Copper Galv. INCHES		Fixt. Units	GPM	Pipe Size Copper Galv. INCHES		Fixt. Units	GPM	Pipe Size Copper Galv. INCHES	
14	112	47	1½	2	84	40	1½	1½	63	33	1¼	1½
15	120	48	1½	2	90	41	1½	2	67.5	35	1½	1½
16	128	50	1½	2	96	43	1½	2	72	36	1½	1½
17	136	52	1½	2	102	44	1½	2	76.5	38	1½	1½
18	144	54	2	2	108	46	1½	2	81	40	1½	1½
19	152	55	2	2	114	47	1½	2	85.5	41	1½	1½
20	160	57	2	2	120	48	1½	2	90	42	1½	2
21	168	59	2	2	126	50	1½	2	94.5	43	1½	2
22	176	60	2	2	132	51	1½	2	99	44	1½	2
23	184	62	2	2	138	52	1½	2	103.5	45	1½	2
24	192	63	2	2	144	53	2	2	108	46	1½	2
25	200	65	2	2	150	55	2	2	112.5	47	1½	2
26	208	67	2	2	156	56	2	2	117	48	1½	2
27	216	68	2	2	162	57	2	2	121.5	49	1½	2
28	224	70	2	2	168	58	2	2	126	50	1½	2
29	232	72	2	2	174	60	2	2	130.5	51	1½	2
30	240	73	2	2	180	61	2	2	135	52	1½	2
31	248	74	2	2	186	63	2	2	139.5	53	2	2
32	256	76	2	2	192	64	2	2	144	54	2	2
33	264	78	2	2	198	65	2	2	148.5	55	2	2
34	272	80	2	2	204	66	2	2	153	56	2	2
35	280	82	2	2	210	67	2	2	157.5	57	2	2
36	288	83	2	2	216	68	2	2	162	58	2	2
50	400	106	2	2	300	85	2	2	225	70	2	2
100	800	179	2½	2½	600	144	2½	2½	450	115	2	2
150	1200	234	3	3	900	194	2½	2½	675	157	2½	2½
200	1600	283	3	3	1200	234	3	3	900	194	2½	2½
250	2000	327	3	3	1500	270	3	3	1125	224	3	3

Figure 4. EQUIVALENT FIXTURE-UNITS (includes Combined Hot and Cold Water Demand)

FIXTURE	NUMBER OF FIXTURE UNITS - Private Use
Bar Sink	1
Bathtub (with or without Shower over)	2
Hose Bib or Sill Cock (standard type)	3
House Trailer (each)	6
Laundry tub or Clotheswasher (each pair of faucets)	2
Lavatory	1
Lavatory (Dental)	1
Lawn Sprinklers (Standard type, each head)	1
Shower (each head)	2
Sink (bar)	1
Sink or Dishwasher	2
Water Closet (flush tank)	3
Water Closet (flushometer valve)	6
Water Supply outlets for items not listed above shall be computed at their maximum demand, but in no case less than:-	
3/8 inch	1
1/2 inch	2
3/4 inch	3
1 inch	6

194. Exceptions

(1) The provisions relative to size of water piping shall not apply to the following:-

(a) Designed piping systems for domestic, commercial or industrial establishments, swimming pools, tanks or similar places, requiring large quantities of water, if approved by the Plumbing Inspector.

(b) Additions to existing installations provided the Plumbing Inspector finds that there will be a reasonably adequate water supply for all fixtures.

(c) Replacement of existing fixtures or appliances.

(d) Piping which is part of fixture or equipment.

(e) Unusual conditions where, in the judgment of the Plumbing Inspector a reasonably adequate supply of water is provided.

195. Inadequate and Excessive Water Pressure

(1) Whenever the water pressure in the main or other source of supply will not provide a water pressure of at least fifteen pounds per square inch, after allowing for pressure loss, a tank and pump or other means which will provide said fifteen pounds pressure shall be installed.

(2) Where local water pressure is in excess of eighty-five pounds per square inch, fire lines and lawn sprinklers excepted, an approved type pressure regulator or regulators shall be installed as near the point of entry as practicable, preceded by an adequate strainer and the pressure reduced to eighty-five pounds per square inch or less. Each such regulator and strainer shall be of the same nominal diameter as the water service or building supply, whichever is the larger, and shall be accessibly located and shall have the strainer readily accessible for cleaning without removing the regulator or strainer body or disconnecting the supply piping.

196. Control of Water Service and Supply Pipes

(1) The supply pipe from the water main shall be equipped with a stop and waste cock of equal size placed

inside the building as near the point of entry as possible.

(2) On sizes of pipe one inch or over, a shut-off valve with a drip valve shall be provided on the inner side of the wall through which the service enters the building.

(3) Where the building is of slab construction, or a crawl space is not readily accessible (two feet six inches or more), a stop and waste valve or cock must be installed on the main floor level and be readily accessible.

(4) The supply line taken from pressure or gravity tanks shall be valved at or near its source, and an interior stop and waste valve or cock shall be provided for each exterior outlet or group of outlets.

(5) Each hot water storage tank or direct fired water heater shall be equipped with a rated automatic temperature-pressure relief valve or separate temperature and pressure relief valves, and a boiler drain cock, all of which (hot water storage tanks included) shall be readily accessible for repair and/or replacement.

(6) Where the supply pipe from the water main is not placed inside a building, such pipe shall be equipped with a stop and waste cock, and water pipes serving any underground lawn sprinkler system, fountain, fish pond or stand pipe shall be equipped with a stop and waste cock placed in a position so as to thoroughly drain the said pipes.

(7) All water pipes shall be so graded or pitched that the entire system or parts thereof can be drained, and the formation of traps or sags shall be avoided where possible, but where they occur, such sags, traps or inverts shall have provision for complete drainage.

(8) Hot and cold water supply pipes to all plumbing fixtures, tanks, appurtenances and devices shall be provided with accessible shut-off valves, located as close to the above units as possible, so installed that the water supply may be shut off at any one fixture, tank, appurtenance or device without interference to others.

(9) In two-family and multiple-family dwellings, the water supply for each family unit shall be controlled

by an arrangement of shut-off valves which will permit each family unit and the individual fixtures to be shut off without interference with the water supply to any other family unit or portion of the building.

(10) In all buildings other than one-family, two-family or multiple family dwellings, shut-off valves shall be installed which will permit the water supply to all equipment in each separate room to be shut off without interference with the water supply to any other room or portion of the building.

197. Spring or Quick Closing Valves

When in any premises spring action or quick closing valves are installed, and used in association with the water supplied, (i.e. automatic dishwashers and laundry machines, flushometers, etc.) the water supply pipe to such premises shall be equipped with an air chamber or other approved mechanical device, designed for the purpose.

198. Hydraulic Elevators

The water supply pipe to any hydraulic elevator shall be equipped with a hydraulic relief valve and check valve placed in a position satisfactory to the Plumbing Inspector.

199. Fire Sprinkler Systems

The water supply pipes leading to or forming part of any fire sprinkler system shall not be used for any other purpose, except with the approval of the Plumbing Inspector.

200. Water Supply to Fixtures

(1) The water supply branch to every fixture shall be such that a sufficient amount of water will be available to flush the fixture to the extent necessary to keep it in a sanitary condition.

(2) Fixtures supplied with Hot and cold water shall have the hot water outlet on the left side of the fixture (left being the user's left as facing the fixture).

201. Water Supply Tanks

(1) Every water storage tank shall be adequately supported, and pipes shall be connected to each tank so that no weight stress is transmitted from the tank to the pipes or pipe connections.

(2) Tanks other than pressure tanks shall be covered to prevent contamination and all tanks shall be protected from frost.

(3) An adequate overflow pipe protected from frost shall be provided for water supply tanks and in no case shall such overflow be connected directly to any drainage system.

(4) Every water supply tank shall be provided with a valved drain line located at its lowest point and discharged above flood level rim of the receptacle into which the drain water flows, and as required for overflow pipes herein.

202. Safety Devices

(1) A separate pressure relief valve, when used, shall be installed between the hot water storage tank and the cold water supply stop to such tank and shall be not more than three feet from the tank.

(2) The drainage or discharge line from a temperature or pressure relief valve shall be the same size as the tapping and terminate two inches above a floor drain, sump, laundry tray or similar fixture or through an air gap connection to a safe location outside the building. The discharge line from the air gap connection shall be at least two sizes larger than the discharge line from the relief valve.

(3) All tankless heater installations shall be provided with an approved water tempering valve and a pressure relief valve.

(4) Closed hot water storage tanks shall have a combined temperature and pressure relief valve or separate temperature and pressure relief valves installed where check valve, pressure regulating valve, meter or other device is installed in the water pipe, which prevents the free return

of water or steam to the water main. Such valves shall comply with ASA Z 21.22 - 1958-60 requirements and shall have a maximum setting of 210° temperature and one hundred and twenty-five pounds pressure.

(5) Temperature relief valves installed on hot water storage tanks having a capacity in excess 200,000 BTU input, shall be water rated on the basis of 1250 BTU for each G.P.H. of water discharge at thirty pounds working pressure and a maximum temperature of 210°F. Such valves shall be tested and rated by an approved and qualified testing agency and shall be certified to be in compliance with these provisions.

(6) Pressure relief valves, installed on hot water storage tanks having a capacity in excess of 200,000 BTU input, shall have the capacity to prevent a pressure rise in excess of 10% of the set opening pressure. Such relief valves shall be set at a pressure not exceeding the working pressure of the tanks or heater and shall be steam rated and certified by the National Board of Boiler and Pressure Vessel Inspectors to be in compliance with the ASME Low Pressure Heating Boiler Code.

(7) Combined temperature and pressure relief valves installed on hot water storage tanks having a capacity in excess of 200,000 BTU input, shall comply with the requirements as outlined in sections 202 (5) and 202 (6) of this By-law.

(8) Temperature relief valves shall be installed within three inches of the hot water storage tank, either into a separate tapping on the top of such tank or into a tee fitting on the tank side of a heat trap and shall be in direct contact with the hot water system.

203. Special Requirements - Multiple Occupancy

(1) The following requirement shall apply to apartment houses, lodging and boarding houses, private hospitals and all occupancies licensed under the Welfare Institutions Act, and homes converted to multiple occupancy.

(2) The water line to sprinkler heads shall be taken off either ahead of or immediately behind the stop and waste valve. No shut-off valve is to be installed, on the waste line to the sprinkler heads and no other fixture is to be served by a sprinkler line.

Table 27. MINIMUM SIZE OF WATER SUPPLY PIPE TO FIXTURES

Fixture	Minimum Pipe
Bath Tub	1 /2
Combination sink and tray	1/2
Drinking Fountain	3/8
Dishwasher, domestic	1/2
Kitchen sink, domestic	3/8
Kitchen sink, commercial	1/2
Lavatory	3/8
Laundry Tray - 2 or 3 compartments	1/2
Shower, single head	1/2
Sink, service, slop	1/2
Sink, flushing rim	3/4
Urinal, flush tank	1/2
Urinal, direct flushometer valve	3/4
Water-closet, flushometer valve type	1
Water-closet, tank type	3/8
Hose bib	1/2
Wall hydrant	1/2

Part K SPECIAL INSTALLATIONS

204. This Part shall apply to and supplement the installation specification requirements of this By-law mutatis mutandis.

205. Septic Tanks  
When Required and Specifications

All buildings fitted with toilets, urinals, lavatories, or baths, or any such fixtures, and having no means of connection to the public sewers shall treat sewage in a septic tank and disposal field constructed according to plans and specifications to be seen in the office of the Plumbing Inspector or Public Health Inspector, for which plans a fee may be charged, or alternatively, according to plans and specifications submitted to and approved by the Public Health Inspector.

206. Inspection and Permit Procedure.

(1) Except as provided in (2) hereof, no connection to, construction, re-construction, replacement, alteration, or extension of any septic tank or part thereof shall be started until a permit to do so has been obtained.

(2) No permit shall be required for the repair of leaks in effluent pipes or the replacement of tank covers or wall timbers, provided such materials and the installation thereof other wise conform to the requirements of this By-law, nor for the removal of stoppages in inlet or outlet pipes.



(3) All applications for a permit herein shall be made in accordance with the provisions of section 7.4(2) of the Burnaby Zoning By-law and the permit fee shall be as prescribed in the Burnaby Health By-law.

(4) The septic tank and disposal field and all drains shall be completed and properly connected before inspection is requested, and shall not be used until they have been inspected and approved by the Public Health Inspector.

207. Location

Septic tanks, disposal fields and the tile drain connecting them shall always be located to the satisfaction of the Public Health Inspector, and in such a position as will prevent sewer soaked seepage from reaching the basement of the building which is served, or any adjoining building.

208. Effluent Discharge

(1) In no case shall the sewage from more than one building be allowed to drain into the same septic tank.

(2) The effluent from septic tanks shall not be permitted to discharge directly on a public street or lane.

209. Maintenance

(1) All septic tanks shall be opened and their top scum and bottom sludge removed at intervals of approximately two years, and in no case shall such tank be more than three years without sludge removal.

(2) All such material removed from any septic tank shall be disposed of by burying in a hole dug to receive it and covered with not less than one foot of earth forthwith, or disposed of in a manner approved by the Public Health Inspector.

(3) Septic tanks abandoned as a result of connection of premises to a Municipal sewer shall have all waste pumped therefrom and the tank thereafter filled and compacted with clean gravel of pit-run quality or better. Waste pumped from a septic tank shall be conveyed to a municipal sewer and there disposed of as directed by the Municipal Engineer.

210. Mobile Home or Trailer Park Plumbing and Drainage System

(1) General

(a) Before any plumbing or sewage disposal facilities are installed or altered in any trailer park, duplicate plans and specifications shall be filed and proper permits obtained from the department or departments having jurisdiction. Plans shall show in detail:-

(i) Plot plan of the park drawn to scale, indicating elevations, property lines, driveways, existing or proposed buildings and the sizes of trailer sites.

(ii) Complete specifications and piping layout of proposed plumbing system or alteration.

(iii) Complete specifications and layout of proposed sewage disposal system or alterations:

(2) Construction

(a) Each trailer site shall be provided with a three inch male or female threaded connection extending above the surrounding grade from a three inch minimum size vented P-trap. Traps shall be located with reference to the immediate boundary lines of the designated space or area within each trailer site that will actually be occupied by the trailer. Each such trap shall be located in the rear third quarter section along the left boundary line of the trailer parking area not less than one foot or more than three feet from the road side of the trailer and shall be a minimum of five feet from the rear boundary of the trailer site. This location may be varied by permission of the Plumbing Inspector, when unusual conditions are encountered. Each trap inlet connection shall be protected at grade with a metal casing or shall be encased in a concrete pad measuring not less than four inches in thickness and eighteen inches square. No trap shall be more than twenty-four inches below grade. Each trap inlet connection shall be effectively capped with a screw type plug or cap when not in use.

(b) All traps, tail pieces and vertical vents shall be fabricated from materials approved for underground use within a building, provided, however, that approved

type non-metallic pipe may be used for the balance of the system when not under any trailer or possible future building site. Refer to typical plumbing layout for trailer park (Figure 6.)

(c) The drainage system of a utility or other building shall not discharge into a circuit vented line. No building (house) sewer shall discharge into a circuit vented line.

(d) No building (house) sewer or part thereof, shall function as a circuit vent.

(e) Each circuit vented drainage system shall be provided with a vent not more than fifteen feet downstream from its upper trap, and long mains shall be provided with additional relief vents at intervals of no more than one hundred feet thereafter. The minimum size of any vent serving a circuit vented system shall be three inches in diameter and each such vent shall equal approximately one-half the cross-sectional area of the drain served. It is provided, however, that no such vent need be larger than four inches in diameter.

(f) Vents shall be installed as provided in Part I (Venting System) of this By-law, and outdoor vents shall be securely fastened to a four by four (4" x 4") minimum cedar post or have equivalent support. Galvanized iron vents may be anchored in a substantial concrete base and the four by four post eliminated, provided that the concrete extends not less than twelve inches above the junction with the cast iron pipe or fitting. Galvanized steel vent pipe may extend below ground vertically and may directly intersect a drainage line if the entire section around both the drain and the galvanized pipe is encased in concrete to prevent any movement. Galvanized steel pipe encased in concrete shall be first coated with bituminous paint or equivalent protective material.

(g) Cleanouts shall be provided as required by Part H (Traps, Interceptors and Cleanouts) of this By-law, except that outdoor cleanouts may be spaced at intervals of not more than one hundred feet. All cleanouts (except sewer cleanouts) shall be approved type brass plugs accessible at or

above grade. All parts of any cleanout extension shall be cast iron pipe terminating at a protected location below access covers or in concrete pads. Cleanouts in the building (house) sewer shall conform to the requirements of Part H of this By-law.

(h) For the purpose of determining pipe sizes, each trailer site connection shall be assigned a waste loading value of six fixture units and each trailer park drainage system shall be sized as provided in Figure 5 hereof. Private sewage disposal shall conform to the requirements of the Medical Health Officer.

Figure 5. Minimum pipe size for drainage systems shall be as set forth in the table below:

Max. Number of trailers individually vented systems	Max. Number of trailers circuit vented systems	Size of Drain
2	1	3" *
30	10	4"
100	50	6"

\* The maximum length of any three inch trap branch is six feet from its vent.

(3) Water Distributing System

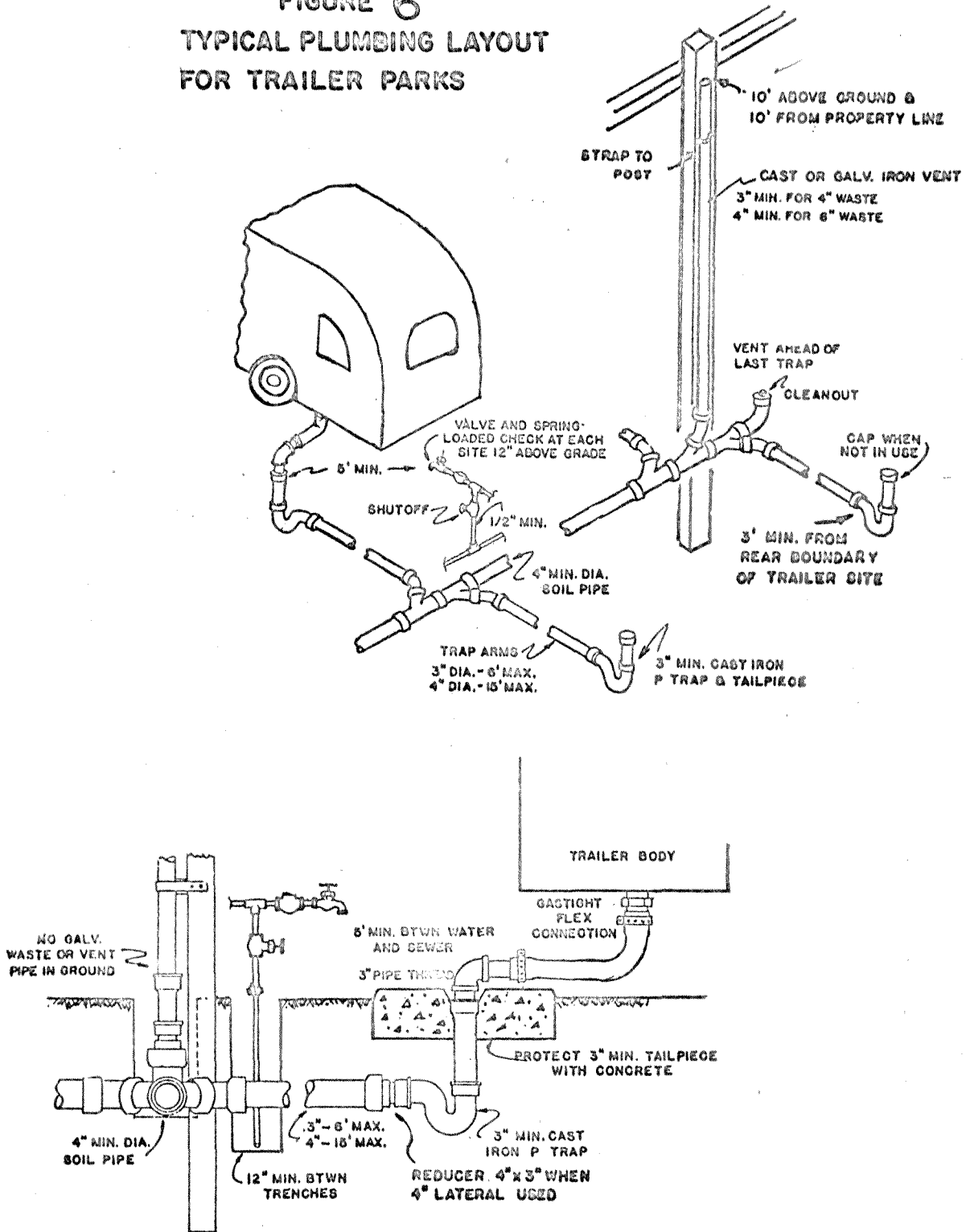
(a) Each trailer park water distributing system shall conform to the requirements of Part J (Water Supply and Distribution) of this By-law, and shall be so designed and maintained as to provide a pressure of not less than twenty psi at each trailer site under normal operating conditions.

(b) Each trailer site branch water supply connection shall be not less than one-half inch in diameter.

(c) An approved backflow preventer shall be installed on the water supply branch to each trailer at, or near, the trailer connection. Such devices shall be adequately protected from frost and at least twelve inches above surrounding grade.

(d) A stop and waste cock shall be installed on the water supply branch on the pressure side of the backflow preventive device.

**FIGURE 6**  
**TYPICAL PLUMBING LAYOUT**  
**FOR TRAILER PARKS**



(e) Water supply piping shall be installed in a separate trench not less than twelve inches from non-metallic drainage piping or may be installed on a shelf in the same trench with the drainage piping, provided it is not less than twelve inches above.

(3) Testing

Installations shall be tested and inspected as required by Part C of this By-law.

(4) Responsibility

(a) When it is evident that there exists, or may exist, a violation of any pertinent regulations, the owner, operator, lessee, person in charge of the park or any other person causing a violation, shall immediately disconnect the trailer water supply and sewer connection from the respective park system and shall employ such other corrective measures as may be ordered by the appropriate enforcement agency.

(b) All required devices or safeguards shall be maintained in good working order. The owner, operator or lessee of the trailer park or his designated agent shall be responsible for their maintenance.

211. Swimming Pools

(1) Plan Required

Every application for a swimming pool permit shall be accompanied with a plan showing the location of the proposed pool and all water supply piping, waste piping and appurtenances. The waste water shall be disposed of as hereinafter set forth in this Section and the type of disposal proposed shall be approved by the Plumbing Inspector prior to the commencement of any work.

(2) Construction

(a) There shall be no direct connection between any domestic water supply line and any circulating pump, filter, water softener, or other apparatus, or device that comes in contact with the water in or from the pool. Recirculating systems shall take the water supply to the pool

from an open surge tank or other approved system. The supply to the surge tank shall be above the extreme overflow level in such manner as to prevent water from the tank entering the supply line.

(b) Except as provided in (c) hereof, when a storm sewer of adequate capacity is available for use, swimming pool waste water shall be discharged thereinto and permission shall be obtained from the proper authority to do so. A copy of such permission stating the maximum size of the waste line between the sump and the sewer shall accompany any application for a permit made to the Plumbing Inspector.

(c) Where space and conditions are such that no hazard, nuisance or insanitary condition is evidenced, swimming pool waste water may be used for irrigation by surface or sub-surface spreading.

(d) All swimming pools shall have the bottom and inner sides constructed of smooth non-absorbent materials and be so constructed as to be properly drained through one or more metal grated openings. All such drains shall have a gate valve installed therein, located in an accessible sump, adjacent to the outside walls of the pool. When the sump is connected to a sewer or otherwise subject to back-flow of sewage, a back-water valve shall be installed as required by Part H (Traps, Interceptors and Cleanouts).

(e) No direct connection shall be made between any storm drain, sewer, drainage system, or sub-soil drainage line, and any line connected to a swimming pool.

(f) Scum gutter drains and/or floor drains serving the walks around the pool may be installed as special waste pipes provided each outlet is trapped and independent vent pipes are installed on the high ends of mains in a manner that will assure a circulating of air.

## 212. Special Wastes

### (1) Indirect Wastes

(a) Waste from the following shall not discharge directly into any building drain, soil or waste pipe:

(i) a refrigerator, ice-box or other receptacle, appliance or device, or apparatus that is used for storage, preparation or processing of food or drink; and

(ii) an appliance, device, or apparatus using water as a cooling or heating medium, and

(iii) a sterilizer or a water still; and

(iv) a water treatment device or a water-operated device; and

(v) an outlet of a pressure, temperature or other relief valve as specified in Part J (Water Supply and Distribution).

(2) Indirect Waste Pipes

(a) Indirect waste pipes shall be installed in accordance with Part F.

(b) A refrigerator waste pipe shall discharge into a trapped and vented water-supplied open sink or receptacle which shall be located in an accessible ventilated place.

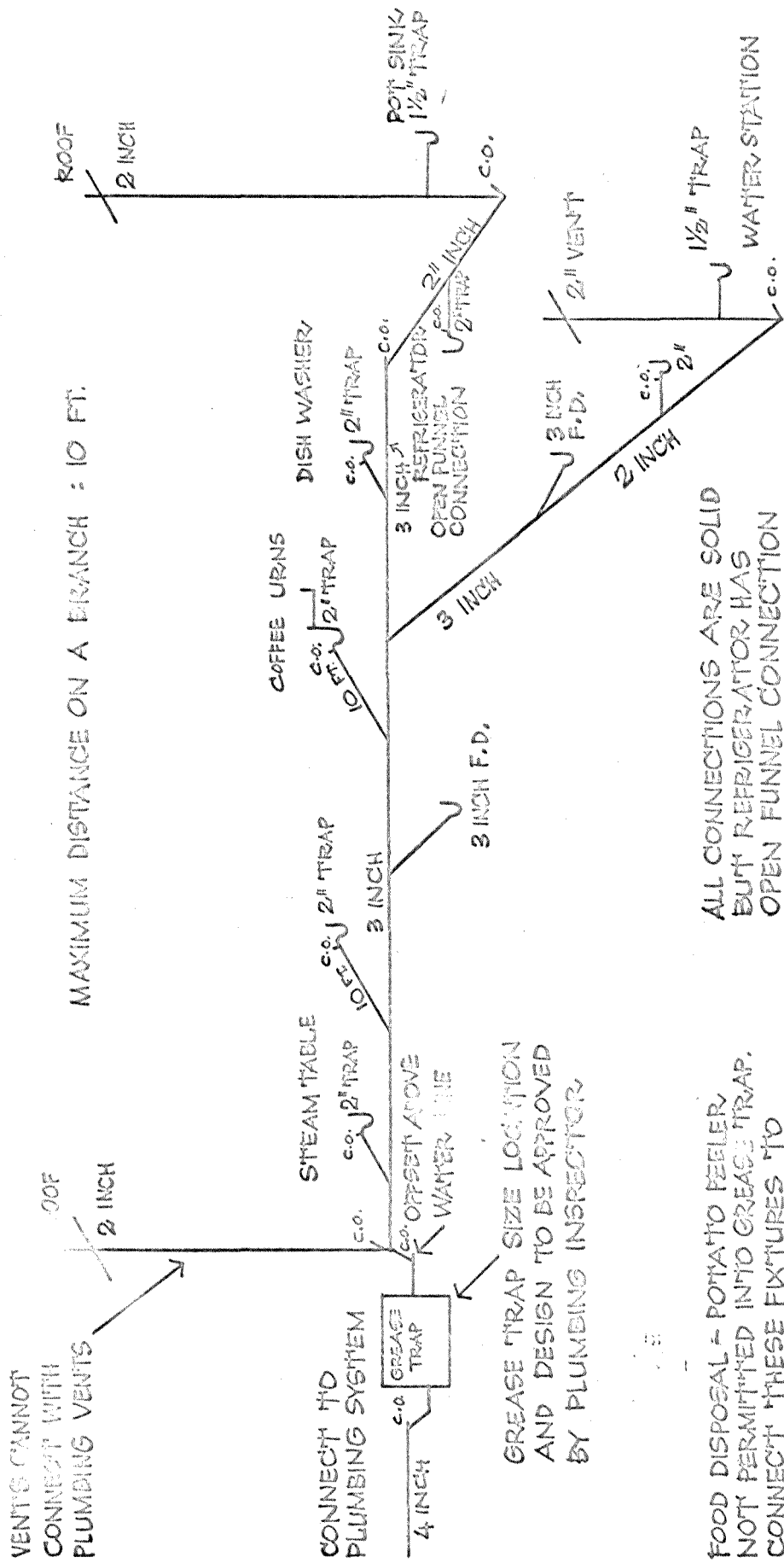
(c) An air gap as specified in Part J (Water Supply and Distribution) shall be provided between the outlet end of the waste pipe of each fixture and the flood level rim of the receiving tank, receptacle, or waste pipe. The air gap shall be equal to or greater than the nominal diameter of the waste pipe.

(d) Water lifts, expansion tanks, cooling jackets, sprinkler systems, drip or overflow pans, or similar devices which waste clear water only, shall discharge into a sump, or to a rainwater drain, or so as to drain into a trapped fixture.

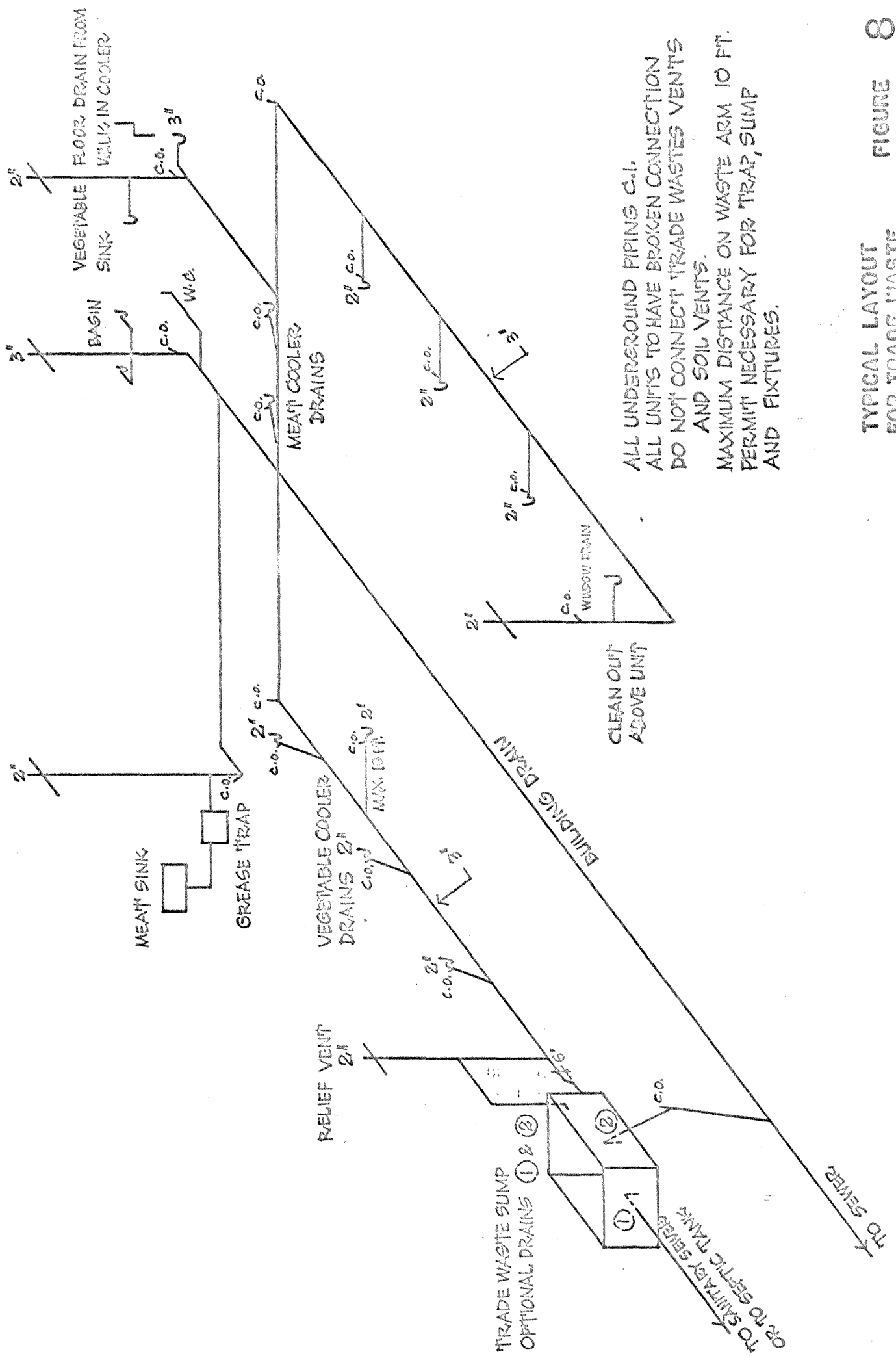
(e) An indirect waste pipe receiving the discharge from drinking fountains or refrigerators on three or more floors shall be vented by being extended through the roof.

(f) Except as provided in (e) hereof, fixtures connected to an indirect waste pipe shall be trapped but need not be vented.





TYPICAL LAYOUT FOR RESTAURANT **FIGURE 7**



ALL UNDERGROUND PIPING C.I.  
 ALL UNITS TO HAVE BROKEN CONNECTION  
 DO NOT CONNECT TRADE WASTES VENTS  
 AND SOIL VENTS.  
 MAXIMUM DISTANCE ON WASTE ARM 10 FT.  
 PERMIT NECESSARY FOR TRAP, SUMP  
 AND FIXTURES.

TYPICAL LAYOUT FOR TRADE WASTE FIGURE 8

(g) The drip pipe from a food receptacle shall have a trap at each opening and a cleanout at all right-angle changes of direction and shall be so arranged to permit flushing and cleaning.

(3) Trade Waste System

(a) A trade waste system shall be permitted only where the structural conditions preclude the installation of conventional systems as otherwise prescribed by this By-law.

(b) Plans and specifications for each trade waste system shall be first approved by the Plumbing Inspector before any portion of any such system is installed.

(c) Each trade waste system shall consist of a wet vented installation of waste piping in which the trap for one or more plumbing fixtures is not separately and independently vented, and in which the waste pipes or piping shall be provided with an adequate vent or vents to assure free circulation of air therein, and in which any branch more than ten feet in length is separately vented in an approved manner.

(d) Refer to Figure 8 - "Typical Layout for Trade Waste" for general layout and pipe sizing.

(4) Chemical Wastes "Laboratory Sinks" etc.

(a) Chemical or industrial liquid wastes likely to damage or increase maintenance costs on the sanitary sewer, which detrimentally affect sewage treatment, or contaminate surface or sub-surface waters, shall be pretreated to render them innocuous prior to discharge into a drainage system. Detailed plans and specifications of the pretreatment facilities shall be required.

(b) Each waste pipe receiving or intended to receive the discharge of any fixture in which any acid or corrosive chemical is placed, and each ventilating pipe connected thereto shall be constructed of high silicon iron pipe or lead pipe, of not less than one-eighth inch wall thickness, or approved type ceramic glazed vitrified clay, or approved type plastic pipe or glass pipe.

(c) All jointing materials shall be of approved type and quality.

(d) Wherever practical, all piping shall be readily accessible and installed with a maximum of clearance from other services.

(e) The owner shall make and keep a permanent record of the location of all piping and venting carrying chemical waste.

(f) No chemical vent pipe shall intersect vent pipes for other services.

(g) No chemical wastes shall be discharged into the ground, local sewer, or other means without the approval of the Plumbing Inspector.

(h) The provisions herewith relative to materials and methods of construction need not apply to minor installations such as small photographic or X-ray dark rooms, or small research or control laboratories, where minor amounts of adequately diluted chemicals are discharged.

(i) The pretreatment facilities shall mean a neutralizer approved by the Plumbing Inspector.

(j) Any group of laboratory sinks or waste openings may be connected into a circuit waste and vent system with a vent at the start of the circuit waste system and a vent at the end of the system. Additional vents may be required between the starting and end vents.

(k) Every fixture opening in any circuit system shall be individually trapped and the maximum length of any branch arm shall not exceed eight feet without a vent being installed.

(l) The minimum size trap on a circuit system shall be two inch.

(m) Any fixture or opening may be individually trapped and vented with continuous waste and vent.

### 213. Foundation Drains

(1) Where a drainage system consisting of concrete or clay tile, or perforated bituminous fibre pipe, of approved manufacture, is laid around the perimeter of foundation of all types of buildings it shall be laid so that the top of the tile

or pipe at the high point is at least three inches below the top of the floor slab or crawl space cover of the building.

(2) Drainage from the drainage system shall enter a municipal storm or combined sewer, but where such sewer is not available, then drainage may enter a ditch or dry well.

(3) (a) Drain tile or pipe installed to provide gravity drainage at a minimum slope of one inch to eight feet shall be laid on undisturbed or well compacted soil, with the butt ends of tile one-quarter inch to three-eighth inch open and covered over the top half perimeter with a minimum three inch wide fifteen pound asphalt or tar-saturated felt.

(b) Top and sides of drain pipe or tile shall be covered with six inches or more of minimum three-quarter inch diameter drainage gravel.

(c) Manufactured tile corner fittings and tile leader connections are to be installed at all corners and where rain water leaders drain into drain tile.

(4) Drain tile lines to rock-pits or ditches shall have a minimum of twelve inches of cover over tile or shall be a pipe having sealed joints.

(5) Sizing of perimeter drainage tile, based on a minimum slope of one-eighth inch to one foot, shall be as follows:-

For Ground Seepage and Roof Drainage

4" & up to 2,500 sq. ft. maximum area  
6" & up to 7,000 sq. ft. maximum area  
8" & up to 15,000 sq. ft. maximum area  
10" & up to 28,000 sq. ft. maximum area

For Ground Seepage Only

4" & up to 3,750 sq. ft. maximum area  
6" & up to 10,500 sq. ft. maximum area  
8" & up to 22,500 sq. ft. maximum area  
10" & up to 42,000 sq. ft. maximum area

(6) Where drainage from driveways enters into perimeter drain tile, a sand-trap interceptor of minimum inside dimensions of 18" x 18" x 18" shall be provided.

(7) (a) Back-filling of drain tile shall take place within ten (10) days from the time it is inspected and acceptance posted, otherwise acceptance of the system shall be withdrawn and re-inspection required.

(b) The requirements of subsection (8) shall apply where backfill does not take place and re-inspection is required.

(8) For all inspections required after the second inspection, or for examining corrections or errors on any foregoing inspections, the permit holder shall be charged the amount of ten (\$10.00) Dollars for each subsequent inspection.

(9) Sizing of rock pits or dry wells shall be based on one cubic yard drainage gravel per thousand square feet of drainage area.

214. Penalties:

(1) Every person who violates any of the provisions of this By-law, or who causes, suffers or permits any act or thing to be done in contravention or in violation of any of the provisions of this By-law, or who neglects or refrains from doing anything required to be done by any of the provisions of this By-law, or who carries out or who suffers, causes or permits to be carried out any work in a manner prohibited by or contrary to any of the provisions of this By-law or who fails to comply with any order, direction or notice given under this By-law shall be deemed to be guilty of an infraction of this By-law and shall be liable to the penalties hereby imposed.

(2) Every person, firm, or corporation violating any provision of this By-law shall be liable on summary conviction to a fine of not less than Twenty-five (\$25.00) Dollars nor more than Five Hundred (\$500.00) Dollars for each offence; and a separate offence shall be deemed to be committed on each day during or on which a violation occurs or continues.

215. By-law No. 542, being "Burnaby Plumbing By-law 1926" and amendments thereto, are hereby repealed effective the 6th day of September, 1966.

216. This By-law shall come into force and take effect on and after the 6th day of September, 1966.

Read a first time this 4th day of July , 1966.  
Read a second time this 4th day of July , 1966.  
Read a third time this 18th day of July , 1966.  
Reconsidered and adopted this 25th day of July , 1966.



*Ernest Coffey*  
REEVE

*J. Shaw*  
CLERK

APPENDIX "A"

SCHEDULE OF PLUMBING PERMIT FEES

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- |     |   |         |
|-----|---|---------|
| (1) | For the installation of one (1) fixture, a fee of   | \$ 3.50 |
|     | For the installation of two (2) fixtures a fee of   | 5.00    |
|     | For the installation of three (3) fixtures a fee of   | 7.50    |
|     | For the installation of four (4) fixtures a fee of  | 10.00   |
|     | For the installation of five (5) fixtures a fee of  | 12.50   |
|     | For the installation of six (6) fixtures a fee of   | 15.00   |
|     | For the installation of seven (7) fixtures a fee of   | 17.50   |
|     | For the installation of eight (8) fixtures a fee of   | 20.00   |
|     | For the installation of nine (9) fixtures a fee of  | 22.50   |
|     | For the installation of ten (10) fixtures a fee of  | 25.00   |
|     | For the installation of each additional fixture a<br>fee of   | 2.00    |
| (2) | For the alteration of plumbing where no fixtures<br>are involved, for each 35 feet of drainage piping<br>installed or portion thereof | \$ 3.50 |
| (3) | For the connection of the Corporation water supply<br>to any hydraulic equipment a fee of   | \$4.00  |
| (4) | For the installation of each hose connection in<br>a fire line system a fee of  | \$ .75  |